ADVANCING GLOBAL EDUCATION

PATTERNS OF POTENTIAL HUMAN PROGRESS

VOLUME 2

Janet R. Dickson
Barry B. Hughes
Mohammod T. Irfan

PARADIGM

PARDEE CENTER for International Futures

OXFORD UNIVERSITY PRESS

ADVANCING GLOBAL EDUCATION

PATTERNS OF POTENTIAL HUMAN PROGRESS

VOLUME 2

Published in the United States by Paradigm Publishers, 3360 Mitchell Lane Suite E, Boulder, CO 80301 USA.

Paradigm Publishers is the trade name of Birkenkamp & Company, LLC, Dean Birkenkamp, President and Publisher.

Distributed on the Indian Subcontinent by Oxford University Press India, 1 Jai Singh Road, Post Box 43, New Delhi 110001 India.

Library of Congress Cataloging-in-Publication Data
Dickson, Janet R.
Advancing global education / Janet R. Dickson... [et.al.].
p. cm. — (Patterns of potential human progress v.2)

Includes bibliographical references and index.

ISBN 978-1-59451-755-6 (hardcover : alk. paper)
1. International education. I. Title.
LC1090.D54 2010
370.116–dc22
2009026878

Cover design by Bounford.com
Designed and typeset by Bounford.com.

Printed and bound in Canada by Friesens Corporation

14 13 12 11 10 1 2 3 4 5

Picture credits
(Photos are from left to right):

Chapter 1
Thomas DeClerk
Andres Dottir
Wayne Armstrong/ University of Denver

Chapter 2
Sarah Meyer
Jessica Crotta
Nancy Clarkson

Chapter 3
Thomas DeClerk
Wayne Armstrong/ University of Denver
Maya Casagrande

Chapter 4
Nancy Clarkson
Wayne Armstrong/ University of Denver
Maya Casagrande

Chapter 5
Mitch Chrisme
Nicole Vilegi
Maya Casagrande

Chapter 6
Kendra Smith
Vanessa Devereaux
Wayne Armstrong/ University of Denver

Chapter 7
Ashley Latimer
Wayne Armstrong/ University of Denver
Emily Ruppel

Chapter 8
Peter Birmingham
Wayne Armstrong/ University of Denver
Kendra Smith

Chapter 9
Amanda Schveitzer
Kendra Smith
Ashley Marks

Cover Art

The cover art, an oil painting by Margaret Lawless, represents many elements related to the volume's theme of advancing global education. The processes of education require the interaction of adults and young people within the home and community as well as in the school. The diversity of human figures captures the diversity of human populations and of participants in the educational process. The division of education into levels—primary, secondary, and tertiary—is now all but universal, although the precise specifications of the levels and the periods spent in each may vary. The upward sloping path of the picture represents not just the progression of people through stages of education but the broader concept of progress this volume series explores. It even hints at the S-shaped character that transitions in human development so often follow. The transformation of the global human condition to long-term, sustainable well-being encompasses many such transitions, which are therefore a pervasive theme and image of work from the Frederick S. Pardee Center for International Futures.

ADVANCING GLOBAL EDUCATION

PATTERNS OF POTENTIAL HUMAN PROGRESS

VOLUME 2

Janet R. Dickson
Barry B. Hughes
Mohammod T. Irfan

Barry B. Hughes, Series Editor

PARDEE CENTER for International Futures
University of Denver

Paradigm Publishers
Boulder • London

OXFORD UNIVERSITY PRESS
Oxford University Press India
New Delhi

Preface

Advancing Global Education **is the second in a series of volumes on Patterns of Potential Human Progress, a series that explores prospects for human development and the improvement of the global human condition. Each volume considers one key aspect of how development appears to be unfolding globally and locally, how we would like it to evolve, and how better to assure that we move it in desired directions.**

The first volume was dedicated to the issue of global poverty reduction, presenting a long-range, base case forecast—an elaboration of the path we appear to be on. It also explored an extensive set of variations in that path, each tied to alternative domestic and international interventions. The current volume applies a similar methodology—a long-range, base case forecast and alternative assumptions—to global advances in education participation and attainment. A coming volume will similarly look at improving global health.

The volumes emerge from the Frederick S. Pardee Center for International Futures at the University of Denver's Josef Korbel School of International Studies. The International Futures (IFs) modeling and analysis project has worked for three decades to develop and use the strongest possible global, long-term, multiple-issue capability for exploring the future of global issues. Among the philosophical underpinnings of the IFs project are the beliefs that (1) prediction is impossible, but forecasting is necessary to understand change and to support policy development; (2) analysis should be built around alternative possible futures; and (3) tools for forecasting should be as fully open and transparent as possible.

This second volume drills down into arguably the most important option for consciously making the future better than the past: the expansion of global educational opportunities and levels of education attainment. It explores the remarkable transition in global patterns of participation in education that, at least on the timescale of most historical human change, is moving with quite incredible speed toward women's and men's universal basic education and literacy. More advanced levels of education are also spreading rapidly across the global population. The century of change between 1960 and 2060, roughly our focal horizon, promises to be of historic importance in the advance of education.

Education brings much private gain but also provides substantial benefits to the broader society. Fortunately, societies largely recognize this and act to enhance educational opportunities. Nonetheless, one of the central questions for this volume is whether a further acceleration of participation rates across multiple levels of formal education would bring individuals and societies a still greater return on their investment.

Overall, the answer to that question is a resounding "yes." The time lag between public investments in education and widely distributed social returns from that investment is long, but the payoffs are huge. It is impossible to imagine a sustainable, global society with widely distributed well-being unless that society is highly educated. The capabilities of individual human beings to function successfully and to live well depend on education. Incomes are certainly important indicators of such functioning, but represent only a part of the fulfillment that education brings. Education is also central to the potential of communities to provide a setting with peace and justice in which humans live long and happy lives.

We fully recognize that what we do in this volume is simple compared to the real work of bringing about transitions in global education patterns. It is too easy for authors of books and articles to identify countries or regions that can be said to lag in providing education and urge them to do better (or urge others to help them do so). However, with few exceptions, the human community is already collectively engaged in the monumentally important transformation of global education participation patterns, and hundreds of millions of people contribute daily to that process. We hope only that the attempt here to describe what is happening, and to explore the benefits of continuing and enhancing those efforts, can make its own small contribution to the process.

Acknowledgments

The authors owe special thanks to Frederick S. Pardee, who conceptualized the series that this volume continues and has provided ongoing funding for the work of the International Futures (IFs) project. In addition, he took special responsibility for the supporting data tables in the volume and online, and he has provided many useful ideas throughout the process.

The International Futures simulation model, the core tool of this volume, has been developed over the course of many years under the leadership of Barry Hughes, of the University of Denver. Thanks to the support of the University of Denver and the Frederick S. Pardee Center for International Futures, the complete system, including both a downloadable version and an online version, is available for all users at www.ifs.du.edu.

IFs, developed originally as an educational tool, owes much to the large number of students, instructors, and analysts who have used or reacted to the system over many years and provided much-appreciated advice for enhancing it. It is impossible to name all those who have provided feedback and ideas, but they include John Agard, James Allan, Alan AtKisson, Robert Ayres, Steven Bankes, Gerald Barney, Christian Berg, Donald Borock, Mark Boyer, Peter Brecke, Stuart Bremer, Matthew Burrows, Jonathan Cave, Richard Chadwick, Claudio Cioffi-Revilla, Sam Cole, Tom Coyne, Mark Crescenzi, Thomas Cusack, Jim Dator, Paul Desanker, Pol Descamps, Karl Deutsch, Bert de Vries, James Dewar, William Dixon, Faye Duchin, Joan Eamer, Rich Engel, Thomas Ferelman, Martina Floerke, Miriam Galt, Jay Gary, Ted Gordon, Paolo Guerrieri, Harold Guetzkow, Marshall Haith, Elizabeth Hanson, Jim Harris, Paul Herman, Henk Hilderink, Evan Hillebrand, Dennis Hodgson, Ronald Inglehart, Patrick James, Marco Janssen, Peter Johnston, Jari Kaivo-oja, Eric Kemp-Benedict, Ronald Kickert, Douglas Lemke, Diana Liverman, George Lopez, Paul Lucas, Jyrki Luukkanen, Pentti Malaska, Edward Mansfield, Monty Marshall, Mihajlo Mesarovic, Siwa Msangi, Sergei Parinov, Robert Pestel, Dennis Pirages, Brian Pollins, Weishuang Qu, Aromar Revi, John Richardson, Peter Rindfuss, Dale Rothman, Phil Schrodt, Paul Senese, Thomas Shook, Dale Smith, Jeff Staats, Harvey Starr, Douglas Stuart, Donald Sylvan, Thomas Tesch, William Thompson, Ildiko Tulbure, Matti Vainio, Eric Vardac, Bart Verspagen, Benjamin Warr, Ochola Washington, Brian Weatherford, Markku Wilenius, Jonathan Wilkenfeld, and Paul Williamson.

IFs team members who made special contributions to this volume include Jonathan Chesebro (data), Josiah Marineau (data), Jonathan Moyer (documentation and Web support), Jonathan Muellner (data), Marc Sydnor (project management on volume production), and especially Mohammod Irfan, who has labored for many years to construct a large-scale model of global education, and Janet Dickson, who accepted the responsibility for connecting this volume to the world of research on global education and oversaw the creation of an integrated, consistent study. Special mention and thanks are due to José Roberto Solórzano for the longtime and absolutely essential computer system development support he provided. IFs team members who offered more general support include Kazi Imran Ahmed, Sheila Flynn, Julius Gatune, Kia Tamaki Harrold, Jaime Melendez, and Cecilia Peterson. Important earlier colleagues in the IFs project include Debasis Bhattacharya, Shannon Brady, Warren Christopher, James Chung, Kay Drucker, Michael Ferrier, Bethany Fisher, Richard Fuchs, George Horton, Anwar Hossain, Michael Niemann, Edinson Oquendo, Padma Padula, Terrance Peet-Lukes, Jay Thompson, and Jamal Waheed. Current and former personnel at the University of Denver who assisted in many varied ways include Chad Burnham, Cindy Crouch, Chris Grubb, Steve Hick, Mat Nau, Kenneth Stafford, Robert Stocker, and Phil Tripp.

The most recent funding for IFs has come from Frederick S. Pardee, the United Nations Environment Programme (as part of its *Global Environmental Outlook 4*), and the U.S. National Intelligence Center (as part of its *Project 2020: Mapping the Global Future*

and the emerging *Project 2025*). Other recent developments within International Futures have been funded in part by the TERRA project of the European Commission (which has begun additional support in a new project), by the Strategic Assessments Group of the U.S. Central Intelligence Agency, and by the RAND Frederick S. Pardee Center for Longer Range Global Policy and the Future of the Human Condition. In addition, the European Union Center at the University of Michigan provided support for enhancing the user interface and ease of use of the IFs system. Thanks also to the National Science Foundation, the Cleveland Foundation, the Exxon Education Foundation, the Kettering Family Foundation, the Pacific Cultural Foundation, the United States Institute of Peace, and General Motors for funding that contributed to earlier generations of IFs.

An exceptional group of external reviewers greatly enhanced this volume. Poonam Batra, professor of education at the Maulana Azad Centre for Elementary and Social Education of the University of Delhi, has been deeply engaged with transforming pedagogy and teacher education, including the design and implementation of a new elementary teacher education baccalaureate. Her review of the draft manuscript provided perspectives from the field of practice, some of which we have included as boxed text inserts. Ruth Levine, vice president and senior fellow of the Center for Global Development, offered a number of helpful suggestions, as did Professor Lant Pritchett of Harvard's Kennedy School. Krishna Kumar, senior economist of the RAND Corporation and coauthor of the first volume in this series, provided a very useful review of the draft manuscript. Walter McMahon, professor emeritus of the University of Illinois, has written and consulted extensively on the social benefits of education and developed related forecasting capability. He provided extensive manuscript feedback and comparison with other work. Annababette Wils, director of research at the Education Policy and Data Center, has been a leader in forecasting of, and writing about, educational futures. She provided a remarkably detailed and useful review of the draft manuscript with ideas that have substantially improved the final volume. We are grateful also to Said O. Voffal of the UNESCO Institute for Statistics (UIS) for his extensive help in clarifying data questions and providing archived materials for our use.

At Paradigm Publishers, Jennifer Knerr, longtime editor and friend of the IFs project, was, as always, wonderfully helpful and supportive. And once again, Melanie Stafford greatly helped bring things together.

In short, the authors built on tremendous foundations of work directed toward advancing global education. The hope that motivated our work was that this study would contribute something to that ongoing stream of effort. Other than the authors, of course, none of the named individuals or institutions bears any responsibility for the current status of the model or for the analysis presented here. Their support is nonetheless greatly appreciated—it takes a very large community to write a volume on global education.

Barry B. Hughes
Series Editor

Contents

List of Boxes

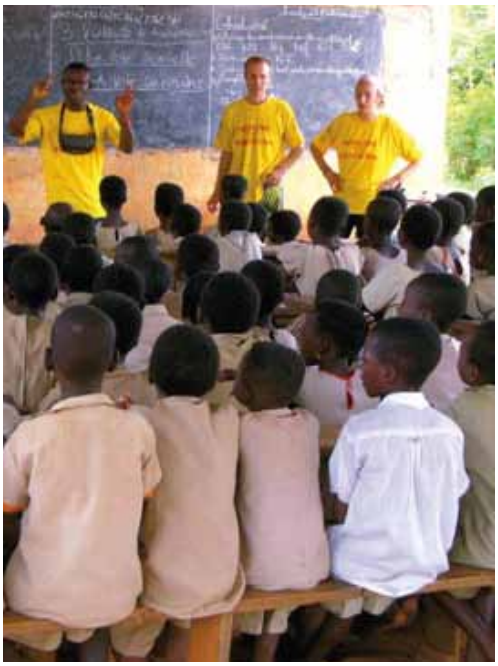
List of Figures

List of Tables

List of Abbreviations

AED	Academy for Educational Development
AIDS	acquired immune deficiency syndrome
BRICs	Brazil, Russia, India, and China (large emerging economies)
CMH	Commission on Macroeconomics and Health
CPI	Corruption Perceptions Index (Transparency International)
DALYs	disability-adjusted life years
DHS	Demographic and Health Surveys
DRC	Democratic Republic of Congo
EDI	Education Development Index
EFA	Education for All
EFA GMR	Education for All Global Monitoring Report
EPDC	Education Policy and Data Center
FTI	Fast Track Initiative
G-7	Group of 7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States)
G-8	Group of 8 (Group of 7 plus Russia)
GBD	Global Burden of Disease project (World Health Organization)
GDP	gross domestic product
GIS	geographic information system
GNI	gross national income
GPI	gender parity index
GTAP	Global Trade and Analysis Project
GUNI	Global University Network for Innovation
HDI	Human Development Index
HDR	Human Development Report
IBRD	International Bank for Reconstruction and Development (World Bank)
ICT	information and communication technology
IDA	International Development Association (World Bank)
IEA	International Association for the Evaluation of Educational Achievement
IEA	International Energy Agency
IFs	International Futures (modeling system)
IIASA	International Institute for Applied Systems Analysis
IMF	International Monetary Fund
ISCED	International Standard Classification of Education
K–12	kindergarten through twelfth grade
LDCs	Least Developed Countries
MDG	Millennium Development Goal
MER	market exchange rate
MFP	multifactor productivity
MICS	Multiple Indicator Cluster Survey
NIC	National Intelligence Council
OECD	Organization for Economic Cooperation and Development
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PPP	purchasing power parity
R&D	research and development
SAM	social accounting matrix
SEIA	Secondary Education in Africa project
SSA	sub-Saharan Africa
SWA	South and West Asia
TFR	total fertility rate
TI	Transparency International
TIMSS	Trends in Math and Science Study
UBASE	Universal Basic and Secondary Education project
UIS	UNESCO Institute for Statistics
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UPE	universal primary education
USAID	United States Agency for International Development
WDI	World Development Indicators (of the World Bank)
WEI	World Education Indicators

1



Introduction

Article 26 of the United Nations Universal Declaration of Human Rights asserted in 1948 that a minimum level of education is a basic right of every individual.[1] Both signaling and sparking education awareness and effort globally, the assertion contributed to the acceleration of a long and ongoing global transition in access to and attainment of formal education. The magnitude of that transition is quite remarkable. In 1950, the global primary gross enrollment rate was 58 percent; at the secondary level, it was 12.7 percent and at the tertiary level 1.4 percent.[2] By 2005, a relatively short fifty-five years later, global gross enrollment rates had moved strikingly higher: to 101 percent at the primary level,[3] to 70 percent at the secondary level, and to 31 percent at the tertiary level.

This volume attempts to extend understanding of the ongoing global education transition by addressing three central questions:

- How has the transition been unfolding, and where will we be in 2060 if the current expansion paths continue to unfold? We provide historical analysis since 1960 and a base case forecast to 2060, together framing a look at a very critical 100 years in the global transition.
- Can the education transition be further accelerated and, if so, by how much? We build a normative scenario that explores the possibility of such acceleration.
- What human development outcomes are associated with the education transition represented in the base case and in the normative scenario, and what benefits, in terms of economic returns and in progress in other dimensions of human development, are associated with faster rather than slower progress? Given that public policy always requires trade-offs for attention and resources, we explore the broader implications for human development of both the base case and the normative scenario.

Understanding the ongoing global education transition may help us accelerate it.

Despite remarkable global gains in education participation since 1950, serious shortfalls and disparities remain.

Where Are We Now in the Global Transition?

Despite significant progress, the education attainment of peoples falls short of desired levels almost everywhere and especially across the developing world. At the beginning of the twenty-first century, in 2005, 89 percent of the world's primary school "of-age" children were enrolled, yet in middle Africa, only 47 percent were. In the same year, whereas 70 percent of of-age children and youth were enrolled in secondary education globally, the portion in eastern Africa was just 26 percent. At the tertiary level, the gross enrollment rate was 31 percent globally, but it was at or below 2 percent in Afghanistan, Djibouti, Haiti, Papua New Guinea, and many sub-Saharan African countries. And the gap between education for women and men remains in some countries and regions—in South Asia, for example, 56 percent of of-age males were enrolled in secondary education, compared with 46 percent of females.

Worldwide in 2000, the average years of education attained by those twenty-five years of age and older reached only 6.9 years for men and 5.3 years for women. Although these numbers have increased, since 1960, by 2.5 years for men and just under 2 years for women, it is appalling that the average education of adults globally remains essentially at the level of primary completion and that it is so unequally distributed.

Table 1.1 shows both the remarkable global gains since 1950 in education participation and the shortfalls and disparities that persist. The relatively small difference in primary net enrollment rates across country income groupings reflects enormous progress toward universal primary enrollment over the past several decades. However, primary net enrollment rates in all country groupings are still below the goal of enrolling all children, and particularly so in the low-income grouping. Even more striking, the net enrollment rate at the secondary level in high-income countries is nearly three times that of low-income countries—a reality that places the low-income countries and their populations at ever-greater disadvantage in today's globalized world.

Differentials in education participation rates exist not just by the income level of countries but also by other social and individual characteristics. Throughout the world, enrollment rates of girls and young women have typically been lower than those of boys and young men before—and often after—the transition to large-scale participation, or "mass education," is under way. To be female in a low-income country is still to experience the lowest enrollment rate across all educational levels and country groupings, even though the disparities in female/male enrollment rates have narrowed markedly. For the other country income groupings, females and males now enroll at essentially the same rates at primary and secondary levels, and at the tertiary level, women enroll at higher rates than men—most notably in high-income countries but also in upper middle-income ones.

Where Might We Be Going? Global Education Goals

Around the world, regardless of income levels in societies, individuals with less education suffer disadvantages and deprivation relative to those with more. And countries with lower levels of education similarly find themselves at

Table 1.1 Enrollment rates by country income, level of education, and sex (2005)

	Primary		Secondary		Tertiary	
	Female	Male	Female	Male	Female	Male
Low-income countries	67.5	75.8	31.2	36.1	4.7	7.3
Lower middle-income countries	89.0	91.4	63.2	63.1	16.4	18.1
Upper middle-income countries	93.8	94.0	73.7	75.0	50.6	41.3
High-income countries	95.9	95.5	90.9	89.1	75.0	61.7

Note: Primary and secondary enrollment rates are net, and tertiary is gross.

Source: IFs Version 6.12 using UNESCO Institute for Statistics (UIS) data (henceforth referred to as UIS data) organized by World Bank country economy classifications.

a disadvantage relative to those with more. It is thus no surprise that both individual countries and the global community set and pursue goals for educational advance. In part because goals may outstrip our ability to accomplish them, and in part because the pace of the required advance to meet specific goals by specific dates—and our ability to increase the pace—may not have been well understood, the educational goals have often not been realized.

The primacy of universal primary education

When Article 26 of the Declaration of Human Rights first formally proclaimed universal primary education (UPE) as a global goal in 1948, it did not specify a target date for meeting that goal. Since then, target dates have been set three different times, for three successively later dates.

The first target dates were set when the United Nations Educational, Scientific, and Cultural Organization (UNESCO) convened regional education conferences during the 1960s (Asia in 1960, Africa in 1961, Latin America and the Caribbean in 1962, and the Arab States in 1966). Following these conferences, each region promulgated its own plan—with differently defined markers of progress—for achieving universal primary education by 1980.[4] An analysis based on 1977 data showed "spectacular enrolment growth" in all regions (Fredriksen 1980: 1), yet none of the four regions was on a trajectory to reach universal primary education by 1980. The main reason was growth in the number of school-age children beyond—and sometimes far beyond—the numbers that the planning processes had estimated. Africa was the extreme example, with approximately 53.5 million children between six and eleven years of age in 1980, compared to the 32.8 million that the planning process had anticipated twenty years earlier (Fredriksen 1980: 9). The result was that even though Africa met or exceeded its 1980 headcount targets, its primary gross enrollment rate reached approximately 81 percent rather than the 100 percent target.[5]

Ten years after the target date set by the regional conferences, the first World Conference on Education for All took place in Jomtien, Thailand, in 1990. In the Jomtien Declaration, delegates from 155 countries framed and affirmed global education goals with respect to "basic education" (a concept we will return to in a later section), one of which was universal primary education "before the end of the decade."[6]

Developing countries, as a whole, further increased their primary participation rates during the 1990s, but assessments prepared for a second global education meeting in 2000 (the World Education Forum in Dakar, Senegal) identified regions and countries that were still short of achieving universal primary education. The Dakar Framework for Action reaffirmed the goal, this time setting a target date of 2015 in a statement that clarified what UPE might encompass: "ensuring that … all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete, free and compulsory primary education of good quality" (UNESCO 2000: 8).[7]

Later that same year (2000), the United Nations Millennium Summit was held in New York. The resulting Millennium Declaration, reflecting a commitment to "human dignity, equality, and equity," included eight specific global Millennium Development Goals (MDGs). The second of the eight goals is "to ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling and that girls and boys will have equal access to all levels of education."[8]

By virtue of its inclusion on the "short list" of eight MDG goals, universal primary education attained a position of global prominence. The UNESCO Institute for Statistics (UIS) further assures focused global attention through its mandated annual monitoring and reporting on progress, processes that have the important secondary consequence of improving data definition, collection, and dissemination.

This positive attention to universal primary education, however, is not free from complications. One set of complications stems from the dubious wisdom of establishing a single and relatively short time frame for all countries to achieve UPE, regardless of vast initial differences in their primary education enrollment rates, resources, and other circumstances. For some of the countries with the lowest primary enrollment rates in 2000, the annual growth rates required to attain universal

Successive rounds of global goal-setting have focused on universal primary education (UPE).

Vast initial country-level differences in enrollment rates have worked against reaching UPE in a single and relatively short time frame.

Box 1.1 Institutionalization of poor quality: A perspective from the field

The setting of common targets across countries in complete disregard of socio-cultural, political, and economic contexts often contributes to the mechanical chasing of targets. With international and national pressures to achieve high enrolment and literacy rates in short periods of time, governments too often rely heavily on "economically viable" but "suboptimal" options, thus compromising quality. For example, alternative learning programmes often resort to short-term measures such as "condensed" capsules for primary education and under-qualified teachers.

Poonam Batra, Professor of Education
Maulana Azad Centre for Elementary and Social Education
University of Delhi

primary education by 2015—particularly if the country is still experiencing growth in the size of the primary school population—are almost certainly untenable, no matter how much "political will" exists and regardless of possible ongoing expansion at "blistering speed" in comparison with countries that completed the transition to universal primary education in earlier periods.[9] In addition, the setting of untenable temporal goals can contribute to perverse results in education quality (see Box 1.1). We believe that progress is better served in these countries if ambitious but context-specific targets for rates of change in primary school entry, persistence, and completion rates are set and monitored.

Levels of education beyond primary also require attention.

In addition, even while acknowledging the centrality of the goal of universal primary education, one might also question whether so much emphasis on this one goal has detracted from the important job of setting goals for, and preparing for changes in, other levels of formal education—or even from exploring what a "balanced" approach might look like under different country circumstances. One outcome from too great or too exclusive a focus on primary education could be secondary education systems not prepared to serve increased numbers of primary graduates who, as more and more people attain a primary education, see a need for further education to advance economically. In fact, a lack of perceived opportunities to pursue secondary education can in itself discourage families from making what may be necessary sacrifices in order to send their children to school. Further, regardless of the extent of participation in primary education, certain social as well as individual benefits of education are associated with at least some proportion of a population participating at secondary and tertiary levels.

The MDG goal of gender parity focuses on enrollment rates and levels of education attainment between girls and boys and between women and men.

Whatever one's perspective on the question of balance may be, it is clear that different countries have selected different paths in their pursuit of educational advancement. As a recent RAND Corporation study reported, China and India are a case in point (Goldman, Kumar, and Liu 2008: xi):

> The two countries started building their national education systems under comparable conditions in the late 1940s. However, different policies, strategies, and historical circumstances have led them through different routes. China has outperformed India in primary and secondary education along a broad spectrum of access, quality, and delivery indicators. India, on the other hand, enjoys a competitive edge over China in higher education. Recently, India has begun catching up with China in K–12 education, while China has already overtaken India in terms of the college enrollment and number of graduates.

Our cautions about a single time frame and a single sequential pathway for advancing education participation and coverage are not criticisms of the goal of universal primary education. The selection of UPE as the starting point for addressing the education commitment articulated in the United Nations Declaration of Human Rights is easily understood. It reflects, first of all, a commitment to provide, despite resource constraints, some level of education to all children. Further, not only is primary education typically seen as the avenue to universal basic literacy and numeracy—and therefore key to personal empowerment—it is also the prerequisite for other levels of formal education. Our argument is simply that a serious effort to advance participation in formal education needs to take individual country differences into account and to look more broadly across all levels of education systems during the education transition.

Other global goals for expansion of education

Gender parity

Education is explicitly central to another MDG goal—the goal of promoting gender equality and empowering women. The MDG target statement for this goal calls for the elimination

of gender disparity in primary and secondary education, preferably by 2005 (five years after the MDGs were adopted), and in all levels of education no later than 2015 (United Nations 2000: Item III.20).

Historically, in low-enrollment and transitional environments, boys and men have enrolled in higher—and often far higher—proportions than girls and women, and the concept of gender parity has been associated with equalizing opportunities for girls and women. However, as Table 1.1 showed, only in low-income countries as a group were girls and women still enrolled in disproportionately low numbers in 2005,[10] and in fact, in upper middle-income and high-income countries, women were pursuing tertiary education in substantially higher proportions than men. Thus, the question of gender parity in education has become more complicated than was perhaps recognized or anticipated when parity in enrollment rates was selected as the MDG target for promoting gender equality and empowering women.

Basic education

So far, we have limited our discussion of goals to those included within the Millennium Development Goal framework. However, both the Jomtien and Dakar documents articulate a broader framework—that of basic education more generally. In particular, although it does not set goals for postprimary formal education, the Dakar Framework includes a sentence that invites consideration of secondary education and its relationship to basic education: "No country can be expected to develop into a modern and open economy without a certain proportion of its work force having completed secondary education. In most countries this requires an expansion of the secondary system" (UNESCO 2000: 16).

This statement specifically introduced secondary education to the dialogue, yet it offered little specific guidance. Instead, the Dakar Framework's greatest significance may be the breadth of the vision with which it defined and considered basic education. As the term has come to be used, there is now a general consensus that the early years of secondary education (lower secondary) are the culminating years of basic education, whereas the latter years (upper secondary) provide more advanced and specialized preparation for work or for tertiary education. In fact, interestingly, it has been noted that many who attended the World Forum and endorsed the Dakar Framework believed the term *primary education* was a proxy for *basic education,* encompassing (generally) eight years of schooling, a period corresponding more often to primary and lower secondary together than to primary alone (Sperling 2006: xii).

Current status of postprimary goals

Although there is substantial consensus that universal lower secondary education should be a global goal, there is less thrust toward compulsory or universally available upper secondary education. Even the recent Universal Basic and Secondary Education (UBASE) project of the American Academy of Arts and Sciences (see Cohen, Bloom, and Malin 2006) was committed to universal basic and secondary education for all children ages six to sixteen rather than to age eighteen, the age constituting the full course of secondary education in most countries, including those throughout developing regions.

Human development and preparation for informed citizenship are the rationales for public support of universal basic education. The rationales for upper secondary education, and in particular for public support of broadly available upper secondary education, are more complicated and are receiving new and much-needed attention. Historically, upper secondary education—with its emphasis on preparation for work or advanced study—has often been viewed, at least economically, as providing more personal benefit than social or public benefit, and hence, it has not had the same public rationale. Given the knowledge and skill requirements for country as well as individual success in today's global environment, this becomes an increasingly dubious perspective. Nonetheless, it seems clear that the pace and extent of expansion can only occur within the context of region- and country-specific economic circumstances and opportunities.

The same things are true with respect to tertiary education, with added complications. One is that tertiary education is typically very expensive, both publicly and privately, and especially so in countries that have lower tertiary participation rates. Another is the migration of highly educated individuals from lower-income countries to countries that are

The concept of basic education generally includes the lower secondary level in addition to the primary level.

Rationales for and issues associated with expanding participation at upper secondary and tertiary levels are receiving renewed attention.

able to offer more opportunities for personal advancement. In addition, at both levels (upper secondary and tertiary), the barriers to participation of individuals from low-income families are exacerbated by higher per-student costs and a less historically clear public rationale for extensive participation than at the primary and lower secondary levels.

We believe that a single global goal for either upper secondary or tertiary education is neither desirable nor a reasonable expectation. However, recent developments that encourage country- and region-specific analyses and planning processes may lay a foundation for more geographically specific goals. At the secondary level, one example is the Secondary Education in Africa (SEIA) project that the World Bank initiated in 2003 in conjunction with African countries and donor agencies. At the tertiary level, examples include the projects and publications of the Global University Network for Innovation (GUNI), with regional networks of participants from Africa, the Arab States, Asia and the Pacific, Europe, and Latin America and the Caribbean, as well as projects hosted by the Boston College Center for International Higher Education (such as the International Network for Higher Education in Africa). On an operational level, applications for World Bank funds now require Poverty Reduction Strategy Papers that provide country-level analyses, goals, and plans spanning the primary, secondary, and tertiary education levels.[11]

Whatever happens in terms of future goal-setting for education at country, regional, or global levels, it is clear that attention—including in low-income countries—is substantially shifting from primary education alone to a broader range of outcomes. Accordingly, our analysis of where the world is and where it may go in the global education transition looks across all levels of formal education.[12]

Our analysis includes primary, secondary, and tertiary education over an extended historical and forecast period (100 years).

How Can We Explore the Possible Futures of the Transition?

The agenda of this volume—the exploration of possible alternative futures for the global transition to widespread education participation and attainment—is obviously quite ambitious. Our approach is based on quantitative analysis both of the history of the global education transition to date and of its future prospects. The major tool for our exploration is the International Futures (IFs) modeling system. Before considering the character of this system and how it can help us address the questions posed throughout the volume, we suggest some of the desirable characteristics of such an analytic tool.

Analysis of the global education transition

As suggested by the preceding discussions, extensive analysis of the global educational transition has several requirements:

- The need for analysis and exploration over a long time horizon
- The need for global and regional analysis in combination with the ability to flexibly explore a wide variety of country groupings and individual countries
- The need for analysis and exploration of all levels of formal education
- The need to explore education within a broader human development framework

We have chosen a 100-year horizon for most of the analysis, beginning in 1960, the point by which most African and Asian countries had achieved independence from colonial rule and the education transition truly became global. Moreover and not coincidentally, extensive data series began to emerge at that time. We extend the analysis to 2060: by that time, the transition to universal primary education should be complete except for pockets of the world subject to significant domestic conflict and/or discrimination against specific subpopulations, and the transition to universal lower secondary education should be very far along. In fact, given the dramatic expansion of global education since the original UN declaration, we would expect the landscape of attainment patterns to look very different from those today across all levels of formal education. Our time horizon also reflects the particular nature of education, whereby schooling itself extends (hopefully) over many years and many more years pass before changes in school participation rates reshape the education attainment patterns of the adult population.

Individual countries, given varying contexts and circumstances even within single geographic regions, are appropriate building

blocks for the analysis.[13] Country-level analyses and explorations allow the subsequent grouping of countries not only globally and by standard geographic regions but also by targeted groupings, such as income level or participation in special programs like the Fast Track Initiative (FTI)[14] or the World Education Indicators (WEI) project.[15]

As we have already emphasized, it is important for analysis of the global education transition to include all levels of formal education (primary, secondary, and tertiary) and the connections and patterns among them, including the separate representation of lower secondary and upper secondary levels. Further, it is impossible to seriously explore the future of education without recognizing the power of financial constraints and therefore thinking about the individual and collective costs of educating students at various levels of education, as well as the ability of governments and societies to mobilize resources to cover those costs.

Education systems and processes are complex within themselves, and beyond that, they are components of richly complex, broader social and human development systems. Given the juxtaposition of global educational trends and goals, on the one hand, and enormous differences in country and regional circumstances, on the other, the challenges are great for those who seek to understand, support, and further encourage global participation in education. We need tools that contribute to our understanding of patterns in education participation and expansion—past and current—and that also provide a platform for exploring possible future patterns and outcomes that link education to its broader human development context.

The International Futures global modeling system

International Futures is a computer software tool whose central purpose is to facilitate exploration of possible global futures through the creation and analysis of alternative scenarios. Developed since the mid-1970s, the IFs modeling system includes extensive databases going back to 1960, as well as dynamic forecasting capabilities through the integration of demographic, economic, agricultural, sociopolitical, environmental, and energy models. This book builds upon the recent development and addition of an education model that represents the national education systems of the 183 countries included in IFs. Within the education model, historical data and forecasting capabilities encompass participation rates; attainment levels; government support; and per-student and aggregate costs for primary, secondary, and tertiary education.

IFs represents dynamic connections among all of its various subsystems or domains. Changes in economic, demographic, and sociopolitical trends and patterns drive rates and levels of education participation and attainment. In turn, the changes in education participation and attainment affect economic, demographic, and sociopolitical systems. Consequently, the forecasts IFs produces, though they are grounded in historical data, are not extrapolations but rather represent the results of a dynamic interplay among variables in multiple domains of the human development system. In addition, the IFs user interface allows the exploration of impacts of policy orientations and of key uncertainties (such as economic growth rates) on the future of the education transition.

The particular strengths of IFs—and in fact its unique features with respect to education modeling and forecasting—derive in combination from its extended time frame, its extensive geographic coverage and capability for flexible groupings of countries for analysis and display, and its dynamic nature across multiple human systems. In addition, it is the only global education model we know of that encompasses all three levels of formal education (primary, secondary, and tertiary) in student flows or cohorts with a separate representation of lower secondary and upper secondary education—an important separation given their differing purposes, cost structures, and participation rates.

There are, of course, limitations as well as caveats and cautions about the use of IFs. A significant structural limitation is that IFs cannot yet forecast differential education participation and attainment rates for geographic regions or demographic groupings (other than by sex) below the country level (e.g., for specific ethnic groups and indigenous populations within the broader population, for the poorer or poorest citizens of a country,

Education systems and processes are components of complex and larger social and human development systems.

Possible global futures can be explored through the creation and analysis of alternative scenarios with the IFs modeling system.

The IFs system has unique strengths, but it—and indeed all modeling—has limitations too.

or for residents of rural areas, all of whom are known to be at an educational disadvantage). A second limitation, arising in large part from insufficient data, is the absence of forecasts of the extent of private education and private funding, even though private education and funding are prevalent in many developing countries; however, sufficient data exist for us to at least include some discussion of these topics. And third, given the importance of education quality as well as quantity, perhaps the most important limitation is the model's inability at this time to deal directly with questions of quality. Chapter 6 includes some analysis of correlates of education quality as measured by international learning assessments; however, a database allowing direct assessment of quality in a global modeling system does not exist. Neither do we currently include specific quality-related inputs in our model (most important, teachers and their training), but rely instead on student persistence and targeted public funding measures as proxies—albeit admittedly crude ones—for quality indicators.

In summary, we consider IFs to be a thinking tool, not a predicting tool. We present our results with the request that readers view them as descriptions of what might plausibly occur under alternative specifications of circumstances or policy interventions. Our hope is that by providing a structure and context for analysis and debate about possible futures, IFs will contribute to enhanced understanding and to the quality of choices made in policy arenas.

Conclusion and Road Map for This Volume

The benefits of education are large, and investments in education are warranted.

The three questions posed at the beginning of this chapter frame the volume. Rephrased slightly, the key questions are: (1) What is the history and future of the global education transition given its current path? (2) How much might the transition be accelerated? and (3) What are the implications for broader human development of such acceleration relative to the current path?

As background for the analysis, Chapter 2 provides a conceptual foundation for understanding education systems and especially their connections to the larger human development system. Chapter 3 then considers historical patterns, focusing on the years from 1960 through 2005, in order to build an understanding of the historical context for our use in thinking about alternative futures of the education transition.

Chapter 4 turns our attention to the future. It suggests various approaches to modeling the education transition and includes elaboration of IFs and its education model. Chapter 5 then uses IFs to continue addressing the volume's first question by initially exploring the base case forecast, which suggests where the education transition appears to be taking us through 2060. The chapter also considers some of the major uncertainties that could frame alternative futures as a way to begin helping us understand the likely range of alternative educational futures.

Chapter 6 develops a normative scenario that addresses the question of whether the global education transition, already progressing more rapidly than in previous periods, might, with even more significant attention, accelerate even faster. If so, how great might such acceleration be? Chapter 7 continues the analysis of the normative scenario of Chapter 6 by drilling down into its requirements and implications.

Finally, Chapter 8 investigates the broader economic and sociopolitical consequences of educational advancement in the base case and in the normative scenario, in part to consider the costs and benefits of pursuing the more aggressive normative scenario. It will help us understand the degree to which incremental investments in education may provide human development benefits (both economic and broader sociopolitical benefits) for those societies undertaking them, as well as the time frame over which such benefits might materialize.

Overall, the conclusion of our volume is a strong one. Given the lasting benefits education offers, societies tend significantly to underinvest in it. A long-term and integrated analysis shows that it may require a generation or more to repay through economic growth the financial costs of an investment in accelerating the advance of education, but the benefit stream continues to grow rapidly beyond that repayment horizon. Moreover, although the ultimate repayment of investment costs is important, accelerating the advance of education quite quickly confers other human and social developmental benefits that we cannot easily measure but that we know to have tremendous value.

1 The first part of Article 26 states: "Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit." See http://www.un.org/Overview/rights.html:4.

2 See Meyer et al. (1977: 244). There are significant methodological differences, which complicate comparison across time. The 1977 study had data from 1950 for fewer countries than recent studies cover, and it used simple country averages rather than population-weighted averages. However, these differences do not significantly change the overall conclusion regarding the dramatic growth in education.

3 See UNESCO (2007b: 291, 315, 322). Gross enrollment rates refer to the total enrollment of students as a percent of the number of persons in the age group defined by an education system as "of-age" or "on time" for that level of education. The rate can exceed 100 percent because some enrolled students are younger or older than the defined age range for the educational level.

4 The plan for Latin America and the Caribbean set a target date of 1970.

5 The 1980 enrollment estimate is from IFs version 6.12 and UNESCO data. African countries were just emerging from colonial status as the UNESCO African regional education conference and planning took place. Birger Fredriksen (1980: 15) pointed out that a complete population census had never been conducted in many of these countries, and hence, the actual size of their school-age populations was difficult to estimate and foresee.

6 See http://www.unesco.org/education/efa/ed_for_all/background.

7 The Dakar Framework includes six education goals that encompass learners of all ages in both formal and nonformal education settings. Two are central to the purposes of this volume: (1) universal free and compulsory primary education, and (2) gender equality in access to primary and secondary education, with a focus on ensuring girls access and achievement. The other goals speak to the importance of early childhood care and education, learning and life skills programs for young people and adults, improvements in adult literacy, and improvements in education quality to assure that students achieve "literacy, numeracy, and essential life skills." The Dakar Framework is available at http://www.unesco.org/education/efa/ed_for_all/framework.shtml.

8 The other goals are eradicating extreme poverty and hunger; promoting gender equality and empowering women; reducing child mortality; improving maternal health; combating HIV/AIDS, malaria, and other diseases; ensuring environmental sustainability; and developing a global partnership for development. See http://www.un.org/millenniumgoals.

9 *Blistering speed* has become a widely used term to describe the pace of the education transition in today's developing countries. Clemens (2004: 22) first used it in a background paper authored for the UN Millennium Project Task Force on Education and Gender Equality.

10 There are still individual countries in every income group in which the educational participation of girls and women remains substantially below that of boys and men. Our presentation of aggregate data and of instances of "reverse" gender imbalances are not meant to suggest such disparities are unimportant. Country-specific data and forecast tables at the back of this volume include measures of gender parity.

11 For recent discussion of issues and approaches to expanding secondary education, see Alvarez, Gillies, and Bradsher 2003; Cuadra and Moreno 2005; and Holsinger and Cowell 2000. At the tertiary level, see *Higher Education in Developing Countries: Peril and Promise,* the 2000 report of the Task Force on Higher Education and Society, convened by the World Bank and UNESCO.

12 IFs does not include nonformal education because global nonformal education statistics are not readily available. An Education Policy and Data Center (EPDC) background paper for the 2008 Global Monitoring Report included an important initial effort to describe and quantify the role and extent of nonformal education in developing countries (EPDC 2007b: 35–42). Using UNESCO household Multiple Indicator Cluster Survey (MICS) data from twenty-eight countries as its source, the report noted: "Nonformal programs are an umbrella designation for a wide array of activities, including alternative primary schools, youth training, literacy programs, and professional education" (EPDC 2007b: 35).

13 In fact, it would be desirable to analyze at subnational levels, but numerous data issues greatly complicate that effort.

14 The FTI was launched in 2002 by the World Bank as a project between donor and developing countries to focus domestic and international attention and resources on accelerating progress toward UPE. Participating countries are required to have "education sector plans" that encompass all levels of formal education. As of November 2008, there were thirty-six countries with endorsed education sector plans (World Bank 2008: 32).

15 The WEI project is a joint program involving UNESCO, the Organization for Economic Co-operation and Development (OECD), and nineteen middle-income countries (twelve when the project was initiated in 1997). The program focuses on the development of policy-relevant education indicators, and it includes data collection and reporting. A recent project report, *Education Counts: Benchmarking Progress in 19 WEI Countries*, provided comparative education outcomes for the WEI participants and OECD member countries (UNESCO Institute for Statistics 2006).

2

Understanding the Education Transition and Its Context

The global transition in education participation and attainment is but one of many interacting global human development transitions proceeding simultaneously. It is impossible to explore in depth either the past or the future of education without considering many of these other transitions and education's interactions with them.

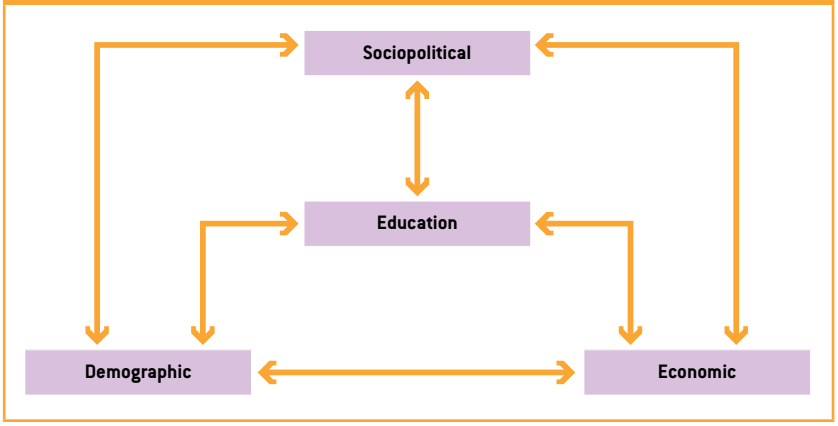
The demographic transition is key among the other transitions. In the short period between 1960 and 2005, advances in health raised global life expectancy at birth from 50 years to 68 years. During this period, life expectancy increased most dramatically—from 45 to 66 years—in countries classified by the World Bank as developing economies. Even in sub-Saharan Africa, life expectancy rose from 41 years in 1960 to over 50 in 1990; since then, it has hovered between 48 and 50 years as a result of the AIDS epidemic. On the fertility side of the transition—where change tends to follow increases in life expectancy—the total fertility rate of the world declined from 4.6 to 2.6 lifetime births per woman over the same period, and that of countries classified as developing economies dropped from 5.1 to 2.7. In sub-Saharan Africa, the total fertility rate declined from 6.7 to 5.3, with the decline really beginning only in 1985 and now proceeding steadily.

We could similarly trace large-scale change in many other dimensions of transition—in urbanization, in an ongoing reduction of the rates of poverty around the world (although not in the absolute numbers of poor or hungry), in increased levels of income per capita in essentially all regions except Africa, in the portion of the world's population living in relatively democratic societies, and more. Figure 2.1 provides a simple schematic of connections among demographic, educational, economic, and sociopolitical systems, giving education—since it is our focus here—the central position.

Our understanding of the purposes of education, roughly framed by its contribution to

the elements shown in Figure 2.1, has changed over time, a topic the next section explores. And our theoretical and empirical understanding of the two-way relationships between education and other elements of the broader human development system has become stronger. We will return to our knowledge about those relationships later, before presenting some of the conceptual foundations of education systems themselves to provide a basis for discussion of the history and future of the education transition in the following chapters.

Figure 2.1 Education within a broader human development system



Education as an Expression of Social Purpose

Education has been a powerful instrument to serve social purposes since the times of ancient civilizations. Often, those purposes have included the perpetuation of a privileged status quo. However, as the Millennium Task Force on Education and Gender Equality pointed out, education can also be a key stimulus for social change: "Educating the poor is particularly important for triggering broader social change. Education has a special quality: the human capital acquired through formal education cannot be appropriated. In that respect it is different from land or financial assets. Education is an asset that enables its owner to earn more and to communicate and obtain information more successfully" (Birdsall, Levine, and Ibrahim 2005: 25).

Formal education was the province of elite groups and elite members of societies until relatively recent times. The widespread dispersion of primary education began in the Western industrialized countries only in the latter half of the nineteenth century. Compulsory primary education was first mandated in the United States (specifically, in Massachusetts) in 1852;[1] other countries that formally mandated compulsory primary education before the end of the nineteenth century were Great Britain, Canada, Australia, Italy, New Zealand, France, and Japan (Clemens 2004: 51).

Industrial workforce needs were, in large part, responsible for the expansion of basic education in industrialized countries in the latter half of the nineteenth century. Public funding for education came with the expectation of economic growth and economic returns at the national level. Only after World War II did the 1948 United Nations Universal Declaration of Human Rights articulate access to some basic level of education as a right of all people, globally. Still more years passed before sub-Saharan Africa and much of Asia emerged from colonial status and could begin to move beyond education systems whose primary purpose had been the preparation of a relatively small number of individuals for positions in the colonial bureaucracies.

The coexistence of these different purposes or rationales for education—for the perpetuation of an established order, as a force for social change, to augment the role of human beings in producing wealth, and to secure the rights of the individual—complicates discourse, research, and policy to this day. Some advocates of education's expansion focus on the various instrumental roles that education might play; others focus on the intrinsic value of education as a human right.[2] Either position can be—and sometimes is—adopted or expressed as if the various instrumental and intrinsic outcomes are dichotomous rather than, as is surely the case, interwoven in complex interacting patterns. As the Millennium Task Force on Education and Gender Equality noted, "Both the inputs to and the outputs from education are far more complex than much of the usual international discourse suggests" (Birdsall, Levine, and Ibrahim 2005: 23).

Public education policies are likely to differ markedly depending on varying perceptions of the rationales and consequences of education and its expansion. Despite the UN's assertion of

Education can be a tool to maintain a status quo that may be highly unequal—or it can be used as a powerful force for positive social change.

Public education policies have reflected changing perceptions over time of the role and consequences of education.

education as a universal human right in 1948, most analyses of education at that time focused on instrumental rationales and consequences within the nascent fields of development studies and development economics. Dominated by the need for reconstruction in the aftermath of World War II and by the emergence of sub-Saharan Africa and large portions of Asia from colonial status, early development studies typically concentrated exclusively on economic growth and development, and particularly on the role of capital inputs.

The role of labor as a factor in production ("human capital") emerged as a development focus during the 1960s, and education came into the picture insofar as it was seen to enhance the contribution of labor to the production function.[3] Typically, during this period, studies focused on individual and social rates of return to education as manifested solely in individual wage and national income differentials associated with different levels of education. Public and private costs of education were typically compared with the wage and income results to produce cost-benefit analyses, and nonwage impacts of education (even if they might have a future connection to further economic growth) were typically excluded.

In the 1960s, analyses emphasized education's contribution to economic growth through the creation of human capital.

As Woodhall pointed out (2004: 87), in countries where women were not represented in large proportions in the wage economy, it was not unusual for such studies to find that education was likely to be less profitable for women than for men. Obviously, such a finding did not necessarily mean the authors were advocating withholding education from women. Nonetheless, the approach could be used to support such a conclusion, particularly in a state with scarce resources and/or a repressive tradition toward girls and women. Even from a rather strict economic development perspective, however, one could take such a finding to task on the grounds of downplaying both potential and measurable nonwage benefits of female education as well as women's potential contributions to economic growth as wage earners.

Not surprisingly, critiques of the human capital approach centered on the extent to which it focused on earnings and "observed output" to the exclusion of other aspects of development. One response to such critiques was an effort to extend cost-benefit analyses to include the value of education's "nonmarket" economic effects. In a seminal study published in the 1980s, Haveman and Wolfe (1984: 382–386) included what they described as a "catalog of impacts of schooling, nature of impacts, and evidence on magnitude of level and value of impact." Their catalog includes, among others, health, fertility, crime reduction, social cohesion, savings, and charitable giving. Two things are noteworthy. The first is the broad extension of the range of possible impacts from increased education. The second is the continued centrality of economic benefits as the metric for evaluation.[4]

However, a new development framework has broadened and refocused the inquiry. The approach, as elaborated by Amartya Sen, focuses on human capabilities rather than on humans as a form of capital, and it emphasizes the role of development in expanding personal freedoms by enhancing those capabilities and fostering an environment conducive to the functioning of those capabilities. As stated by Sen (1999: 3): "Development can be seen, it is argued here, as a process of expanding the real freedoms that people enjoy. Focusing on human freedoms contrasts with narrower views of development, such as identifying development with the growth of gross national product, or with the rise in personal incomes, or with industrialization, or with technological advance, or with social modernization." He continued: "We must go *beyond* the notion of human capital, after acknowledging its relevance and reach. The broadening that is needed is additional and inclusive, rather than, in any sense, an *alternative* to the 'human capital' perspective" (Sen 1999: 296). Mahbub ul Haq (2003: 21) further clarified both the relationship and the distinction between the human capabilities approach and the human capital approach as follows:

> None of the economic issues is ignored, but they all are related to the ultimate objective of development: people. And people are analyzed not merely as the beneficiaries of economic growth but as the real agents of every change in society whether economic, political, social or cultural. To establish the supremacy of people in the process of development—as the classical writers always did—is not to denigrate economic growth but to rediscover its real purpose.

In addition to rejecting the view that economic growth alone, as measured by gross domestic product (GDP) per capita, will provide for other central human needs, the capability approach to development is tied to concepts of social justice and the removal of disparities in opportunity and entitlement (Walker 2006; Maddox 2008: 185). As stated by Nussbaum (2003: 328), "It is very important to insist that development is a normative concept and that we should not assume that the human norms we want will be delivered simply through a policy of fostering economic growth."

As one might expect, education is a central component of the human capability framework. Nussbaum (2003: 335) described education's especially significant and central role in developing and enhancing women's capabilities as follows: "Literacy (and education in general) is very much connected to women's ability to form social relationships on a basis of equality with others and to achieve the important social good of self-respect. It is important, as well, to mobility (through access to jobs and the political process), [and] to health and life (through the connection to bodily integrity and exit options)." As this statement suggested, in the human capability framework to be illiterate and innumerate is, inter alia, to be deprived of an enabling environment for the enjoyment of a long, healthy, and creative life.

In a recent discussion of the capability model of education, Robeyns (2006: 69) described education's contribution to personal empowerment and personal enjoyment (its intrinsic value) and also its personal and collective instrumental value, including but not limited to economic impacts. Though instrumental impacts may be more easily measured and demonstrated, we believe that the unique power of education is the possibility of its contribution to both domains and that, in fact, the two are not readily separable but together constitute human development.

Placing Education in a Human Development Framework

Hopefully, the preceding exploration of the social purposes of education suggests something of the highly interactive and complex connections between education and other components of human development systems. Two characteristics of the connections are especially important to our efforts to understand and model the spread of education and its consequences. First, the connections between education and each of the other major components of the system are *bidirectional*. For example, just as education affects demography via its impact on health and fertility rates, demography affects education systems and opportunities via the size and characteristics of school-age and older populations. Second, in addition to the direct bidirectional linkages shown in Figure 2.1, there are multiple secondary or indirect impacts. Consider education and the economy. A *direct* impact of education might be enhanced economic growth as a result of a literate and skilled workforce. An *indirect* impact might be enhanced economic growth as a result of a workforce that is healthier, a condition to which education has also made a contribution.

In the remainder of this chapter we briefly consider three aspects of education's connections to other components of the human development system. We look first at some of the ways other components affect education and then turn to education's impacts on other components, a topic that Chapter 8 explores in some depth. And finally, we suggest some of the factors that complicate analyses and forecasts of education in a human development system.

More recently, education has been viewed as central to the development of broadly defined human capabilities.

The impact of the broader human development system on education

We begin our consideration of how each of the other components in Figure 2.1 might separately affect demand for and supply of educational opportunity with demography.

At the level of aggregate demand, other things being equal, larger school-age populations place a greater demand on education systems. However, two factors significantly interact with the absolute size of the school-age population in shaping demand pressures. First, a school-age or youth population that is large as a percentage of the overall population—and especially one that is growing relative to the economically active population—will translate into greater effective or felt demand. Second, not surprisingly, various demographic characteristics of families correlate with school participation rates. Poverty and various forms of social exclusion create

Education has bidirectional linkages with demographic, economic, and sociopolitical systems that affect both the demand for and the supply of education.

formidable barriers to participation even when schools with capacity are available. Children living in poverty, children in linguistic and ethnic minority groups, children who live in rural areas, and children with disabilities (and particularly, in a number of countries, girls in these circumstances) are less likely to attend school, especially in the early stages of a country's education transition. At the same time, parental education is strongly related to children's school participation; children whose parents have attended primary school are more likely to attend themselves, including children in poor families and children (including girls) in socially excluded groups.

Demographic and economic factors clearly interact in determining both education supply and education demand, as indicated by the previously mentioned lower enrollment rates of children from poor families and by a quite consistent global relationship between enrollment rates and per capita GDP. It is not just that poor families may not be able to afford the direct costs of education (school fees, uniforms, and sometimes tuition). In addition—and perhaps depressing demand in low-income economies even more—families may not be able to afford the opportunity costs associated with sending their children to school, such as giving up the paid or unpaid work their children perform. In yet another connection with the economy, because of the extreme hardship involved for many families in sending their children to school, parents need to be able to anticipate their children will realize future benefits from education, especially access to jobs (and hopefully better jobs), as a result of that hardship.[5]

On the supply side, the strength of a country's economy obviously shapes its ability to expand adequately resourced school capacity in an environment with a growing school-age population (either absolutely or relatively) or in an environment in which an increasing proportion of families want to send their children to school. Societies are especially challenged if both dynamics are occurring at the same time, as has happened in most sub-Saharan African countries in recent decades. The strength of a country's economy also affects its capacity to stimulate employment opportunities for a more educated populace.

Sociopolitical forces interact with demographic and economic environments to create and implement education systems. Governments ultimately make decisions about the priority afforded education in the face of varying perceptions of public responsibility, competing public needs and demands, varying levels of access to resources, and greater or lesser levels of government effectiveness.

Among the sociopolitical decisions that significantly shape educational systems and enrollment levels are:

- The relative proportion of public sector resources going to education, to health, to the military, to the direct creation of jobs, and to other compelling public needs
- The level of public spending per student at the primary, secondary, and tertiary levels
- Costs, if any, that are viewed as the responsibility of families
- The special attention, if any, that is directed at subpopulations or groups of school-age children who are particularly at risk of not attending or completing school
- The relative balance between quantity and quality, particularly if there are both internal desires and external pressures to rapidly increase participation levels
- The balance of emphasis across primary, lower secondary, upper secondary, and tertiary levels[6]
- Participation in programs that provide international assistance

The manner in which governments and communities respond to these issues interacts with families' perceptions of educational opportunities and hence the decisions they make regarding their children's education. A special concern is the extent to which all children have equal access to a quality education (see Box 2.1).

Education's impact on other aspects of human development

Education clearly also has impacts on other human systems, and a great many studies have sought to understand the benefits of education, its possible neutral or even adverse consequences, and the circumstances under which varying impacts arise.

Box 2.1 Social exclusion: A perspective from the field

Social exclusion is no longer a question of "denied physical access to schooling" but is a more complex reality. In an increasing search for elusive quality, for instance, many communities may opt for low fee-paying private schools. This often results in a massive shift of school-going populations away from dysfunctional state schools to private schools, while those left in state schools of poor quality are children from the socially marginalized and economically deprived communities. While the accomplishment of physical access is easily demonstrated in quantitative terms through the provision of suboptimal options of low quality schools in "hard-to-reach" habitations, it is the quality of education that determines access to learning and is reflected in completion and success rates of schooling. For the disadvantaged, schooling can become yet another form of oppression and social exclusion.

Poonam Batra, Professor of Education
Maulana Azad Centre for Elementary and Social Education
University of Delhi

Hannum and Buchmann (2006: 496) recently completed an extensive literature review of such studies, analyzing the research findings of over 100 empirical studies in sociology, demography, economics, political science, and anthropology relative to the following assertions:[7]

- Human capital stock is central to national economic development, as better-educated citizens are more productive. *(Economic System)*
- Within societies, the expansion of educational opportunities enables individuals to improve their economic circumstances. *(Economic System)*
- Educational expansion narrows social inequalities within countries by promoting a meritocratic basis for status attainment in which the talented can achieve appropriate positions in the economy, regardless of social background. *(Sociopolitical System)*
- Countries with better-educated citizens have healthier, slower-growing populations, as educated individuals make better health choices, live longer, and have healthier and fewer children. *(Demographic System)*
- Countries with more educated populations are more democratic, as their citizens are able to make more informed political decisions. *(Sociopolitical System)*

From their review, Hannum and Buchmann concluded that empirical evidence most strongly supports the assertions of positive health impacts and reduced fertility from expanded participation in primary and secondary education, as well as enhanced (although not ensured) economic circumstances of individuals. They pointed to a more ambiguous outcome with respect to national economic development, stating that "many empirical studies find a positive relationship, but other studies cast doubt on it" (Hannum and Buchmann 2006: 521)—a point we will return to in some detail in Chapter 8. In the meantime, we quote at greater length their finding with respect to education's impact on narrowing social inequalities: "Numerous empirical studies in sociology have indicated that while educational expansion tends to offer absolute benefits to disadvantaged groups, it is less likely to erode social inequalities rapidly, except perhaps for inequalities associated with gender. Inequalities associated with economic origins or ethnicity often prove resistant to educational expansion, as educational access may expand faster for advantaged than disadvantaged groups" (Hannum and Buchmann 2006: 521).

They also find an ambiguous relationship between education (particularly at the primary and secondary levels) and democratization: "Though expansions of primary and secondary education are likely to improve the informed citizenship of individuals … democratization, perhaps more so than other outcomes, may hinge directly on the hard-to-measure content of education. This possibility is suggested in studies that find larger effects of tertiary education than lower levels of education" (Hannum and Buchmann 2006: 521).

In Chapter 8, we will draw on a range of specific studies to explore each of these five posited relationships, in order to explain how components of education's impact are included in the IFs modeling system. In addition, our analysis in Chapter 8 of sociopolitical systems extends beyond democratization to include government effectiveness, corruption, and state failure.

A great many studies have sought to understand education's impacts, and our understanding of causality and relationships continues to evolve.

Considering the education transition requires that we understand how the spread of education is analyzed and measured.

Difficulties in analyzing educational change and human development

Much complicates our ability to understand education as a component of social change. Perhaps first and foremost, difficulties in conceptualization and measurement arise from the inherent complexity of human and social phenomena. Second, even when we have a conceptual framework in place and a protocol for measurement exists, the data we need are often not available. And third, methodological issues and differences in research approaches, though potentially a path to clarification, frequently instead add further elements of uncertainty. Box 2.2 briefly describes some of the complicating factors that contribute to inconclusive or contradictory research results. As a result, we have a far from perfect understanding of the processes through which phenomena interact and change, and our understandings of causality are continually subject to refinement and modification. However, despite the many complicating factors, there is ample evidence of a virtuous cycle between education and broader human development.

In seeking to understand and diminish the frequency of research problems, Hannum and Buchmann (2006: 522–524) made four suggestions to researchers to enhance future studies and the interpretation of research results with respect to education's impacts: (1) use a long-term perspective to account for time lags; (2) pay attention to different consequences associated with the expansion of different levels of education; (3) consider connections between specific education characteristics (e.g., quality, content, and organizational structure) and differing outcomes; and (4) recognize the impact on education's outcomes of differences in the contexts and environments within which educated people live and work.

Participation in and Attainment of Education: A Conceptual Framework

An exploration of the unfolding global educational transition requires its own conceptual foundations, even before and somewhat independently of considerations of the relationship between education and other elements of the human development system. In particular, the distinction between the education participation rates of students and the education attainment levels of adults is foundational.

Assessing levels of attainment or progress toward educational goals begins (and too

Box 2.2 Examples of complicating factors in assessing education's impacts

Bivariate causality: Problems arise in the interpretation of the direction and magnitude of causality between related variables. For example, even though a strong association between levels of education and economic growth can be demonstrated, the balance of directionality is not clear. Does education lead to economic growth, or does economic growth lead to expanded education? Are both at play? Is the causality stronger in one direction than the other?

Spurious or false correlations: It is even possible that there is not—or not fully—a causal relationship between education and economic growth but rather an association driven by a third variable or a constellation of other variables. For example, technological advance might partially drive both education demand and economic growth.

Interaction effects: Third variables may affect or condition the relationship between two others under direct examination by largely determining one of them or by intervening between two of them. For example, Hanushek (2004) found education quality—as measured by standardized international assessments—has a greater association with economic growth than does education quantity. Similarly, the strength of an association between education and many other social phenomena is conditioned by the different contexts within which persons with given levels of education seek to apply the knowledge, skills, and capabilities acquired from their schooling. Jamison, Jamison, and Hanushek (2006: 14), for instance, found a stronger relationship between education and economic growth in an open economy than in a closed economy.

Temporal dynamics: Another problem involves lags, sometimes very long ones, in relationships between variables. For example, an increase in primary entry or intake rates of children at age six, assuming these children continue on to the secondary level, will take ten years or more before it impacts in measurable ways the life choices and circumstances of these children as they become young adults.

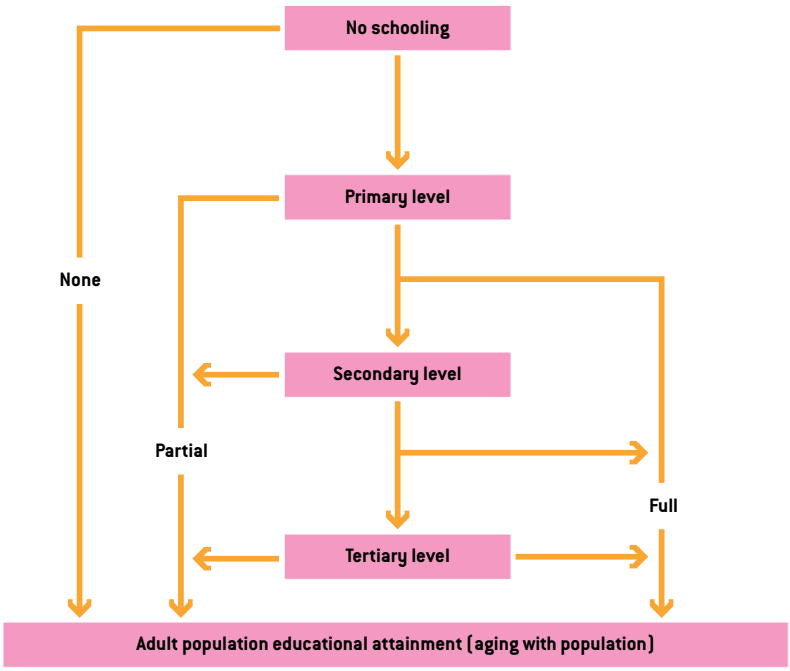
Generalization across levels of analysis: Still another difficulty arises from generalizing relationships from a marginal analysis to a systemwide outcome. For instance, there may be a strong relationship between lower secondary education and increased individual income when secondary enrollment rates are low. However, as the proportion of a population with lower secondary education moves toward 100 percent, the supply/demand dynamics change, and the previously observed relationship may no longer pertain.

often tends to end) with measurement of the participation rates or *flows* of individuals into, through, and out of components of education systems. The path or flow is one of entry into school, followed by progression from grade to grade or from level to level, culminating hopefully with completion of primary schooling or more advanced levels.[8]

To explore the implications of education for other components of human development, the assessment of student flows must be followed by the movement of school-age populations into the demographic cohorts of the adult population—cohorts who carry with them, as they age, their experiences of partial or full completion of education programs. In this way, the foundation is in place to explore relationships between varying educational patterns among adults and other social and human development characteristics.

In summary, the level of education attainment among an adult population is the time-lagged result of the participation (*flows*) of members of that population in an education system or systems. In the terminology of systems dynamics, the accumulated experiences of the adult population (or across a population of any age) constitute a *stock* of educational attainment, an important indicator of human capabilities. Figure 2.2 presents a simplified high-level view of education system flows and stocks.

Figure 2.2 Education flows and stocks



Student flow patterns

In reality, patterns of participation (flows) are considerably more complex than Figure 2.2 suggests. Using the primary level as an example, complexity arises around several interacting dynamics, including patterns of intake, progression, and completion (see Figure 2.3). We consider each in turn.

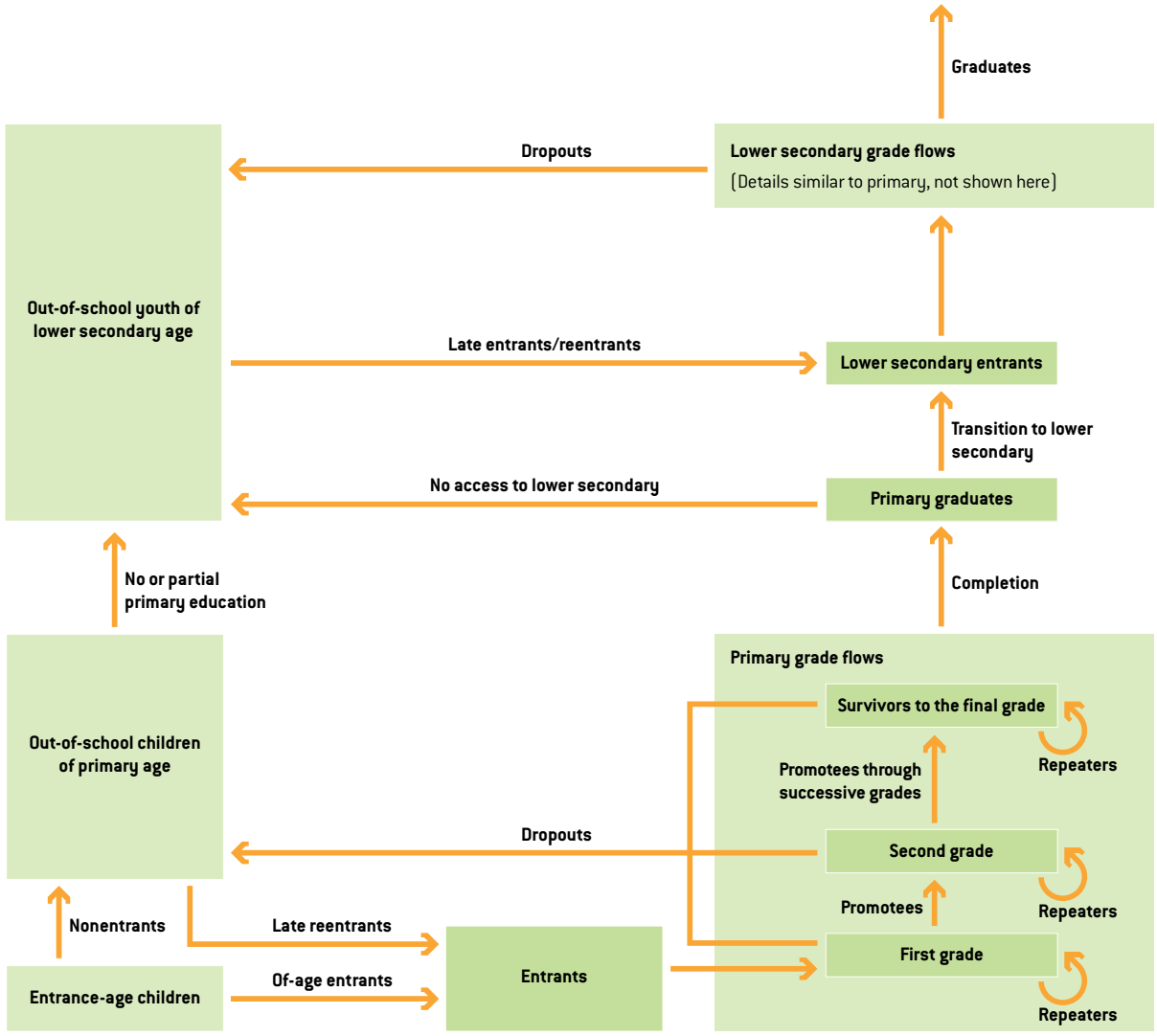
With respect to intake, children may enter the system at various ages, such as the designated entry age (most typically six for primary school) or above or below the designated entry age. The *net intake rate* refers to the number of students who enroll at the designated or expected entry age as a percentage of all children of that age (both those in school and those out of school), whereas the *gross intake rate* refers to entry of students of any age as a percentage of the population of the age expected to enroll.

Students may progress without interruption from one grade to the next. They may also repeat grades, and although primary *repetition rates* around the world and across grades average 6–7 percent annually, they vary widely. And finally, students may drop out either during the year or at the end of the year. Some of those who drop out will subsequently reenter; others will not.

Enrollment rates express the combined result of intake, progression, repetition, drop-out, and reentry patterns. *Gross enrollment rates* refer to all enrolled students as a percent of the population in the stipulated or expected age range for that level. *Net enrollment rates*, by contrast, refer only to the number of enrolled students within the stipulated or expected age range as a percentage of the total population (again, both those in and those out of school) in that age range. Whereas net enrollment rates, by definition, cannot exceed 100 percent, gross enrollment rates can and often do, sometimes by substantial margins. Three factors contribute to this possibility: (1) the entry of students who are younger than the stipulated entry age, (2) students who are enrolled beyond the expected age range either because they were older than the stipulated entry age when they started or because they

Education "flows" refer to participation rates of students, and education "stocks" refer to education attainment levels of adults in a population.

Figure 2.3 Patterns of student flows (primary level as example)



Source: Adapted from Irfan (2008).

have repeated one or more grades, and (3) reentry of students who drop out for a period and subsequently return.

Progression is measured by survival rates and completion rates. The *survival rate* is the percentage of an entering cohort persisting to the beginning of the final year of a given level of education,[9] whereas the *completion rate* is the ratio between the number of students completing an education level and the number of children or youth in the population at large who are the expected age to do so. At the primary level, for example, the completion rate is calculated as the number of children completing the final grade as a percentage of the population of the age a child would be who began first grade at the system-defined entry age and progressed without repetition or interruption through the final grade.[10]

Of those who complete the primary level, some will transition immediately to the lower secondary level, some will enroll in the lower secondary level after one or a number of years out of school, and some will never enter the lower secondary level—and so on through the upper secondary and tertiary levels. *Transition rates* to the new levels are calculated by dividing the number of new entrants to each

new level by the number of students who were in the final grade of the prior level the previous year.

Enrollment rates reflect the composite effect of specific intake rates along with specific grade-to-grade survival rates and therefore, not surprisingly, are the most frequently reported education flow variable. However, enrollment rates alone do not tell us about the underlying dynamics of education flows, for the same enrollment rate can result from a high entry rate combined with a low survival rate as from a lower entry rate combined with a higher survival rate. Decomposing enrollment rates into entry, progression, and survival components provides more information about flow patterns—such as whether a country is successful at providing access (high entry rates) but is less successful with respect to progression (low survival rates)—and is therefore of greater help to those seeking to understand and improve education systems.

Our primary source for student flow data is UNESCO. Between 1963 and 1999, data were published in annual UNESCO Statistical Yearbooks, first through the Division of Statistics on Education and then through the Office of Statistics. In 1999, the UNESCO Institute for Statistics (UIS) was established and assumed responsibility for global education data collection and dissemination (see Box 2.3).

Levels of education attainment

The consequence of a pattern of student flows is the state of educational attainment within a population at any given point in time. Two types of measures of attainment are frequently used. The first is the average years of education within the adult population, most often defined as the population twenty-five years of age and older or the population fifteen years of age and older (and often differentiated by sex).[11] The second frequently used measure is the distribution of attainment by levels of education across age categories (and often, again, categorized separately for males and females).

Problems afflict both measures, stemming from the availability and quality of the underlying data and from the estimation methodologies employed to address problems of missing data.[12] However, from a conceptual perspective, greater limitations are associated with the use of average years of education as an indicator of capabilities because of its highly aggregated nature. As a single population-wide measure, it provides no indication of the distribution of educational attainment around the average; an average educational attainment of five years could mean that all adults have five years of education or that half of them have ten years and half have none—surely two very different profiles of capabilities. Another limitation is the inability to see differential attainment rates by age groups in a single population-wide measure. Even so, comparisons of population-wide measures of average education years at different points do provide indicators of patterns across countries and trends within countries over time. Often, also, the numbers are provided separately for women

Enrollment rates alone do not tell us about the underlying dynamics of education flows.

Box 2.3 Data availability

UNESCO is charged with global responsibility for collecting, collating, and distributing country-level education data and for monitoring progress toward the MDG education goals of universal primary education and gender equity.

In cooperation with countries and with other international organizations, UNESCO's Institute for Statistics (UIS) is greatly increasing the quality and coverage of global data for all levels of formal education. Certain data series extend back as far as 1960 (and some even to 1950), providing the opportunity for analysis over a significant time period—which is obviously desirable when the goal is to track, understand, and forecast medium- to long-term patterns of significant social change. Nonetheless, data are very spotty for some series, such as primary completion rates, and sometimes missing almost altogether for individual countries, especially for countries in crisis.

Gross enrollment data, both aggregate and for males and females separately, are available for primary, secondary (lower and upper secondary levels combined), and tertiary levels since 1960, whereas primary and secondary net enrollment data are available from 1970 forward. Many more series are available beginning in 1999, including gender-specific primary intake rates by age categories, repetition rates, transition rates to the lower secondary level, and separate gross enrollment data for lower secondary and upper secondary levels. Although separate dropout and reentry data are not available from UIS, their net effect—along with the progression of students whose enrollment is continuous whether with or without grade-level repetition—is captured in primary survival rates provided by UIS.

Data are available online at http://stats.uis.unesco.org and are updated twice annually.

One typically used measure of education attainment is the average years of education among a population.

The second type of measure is the distribution of attainment by specific levels of education across age cohorts.

and men, so that parity—as measured by average years of education—can be analyzed.

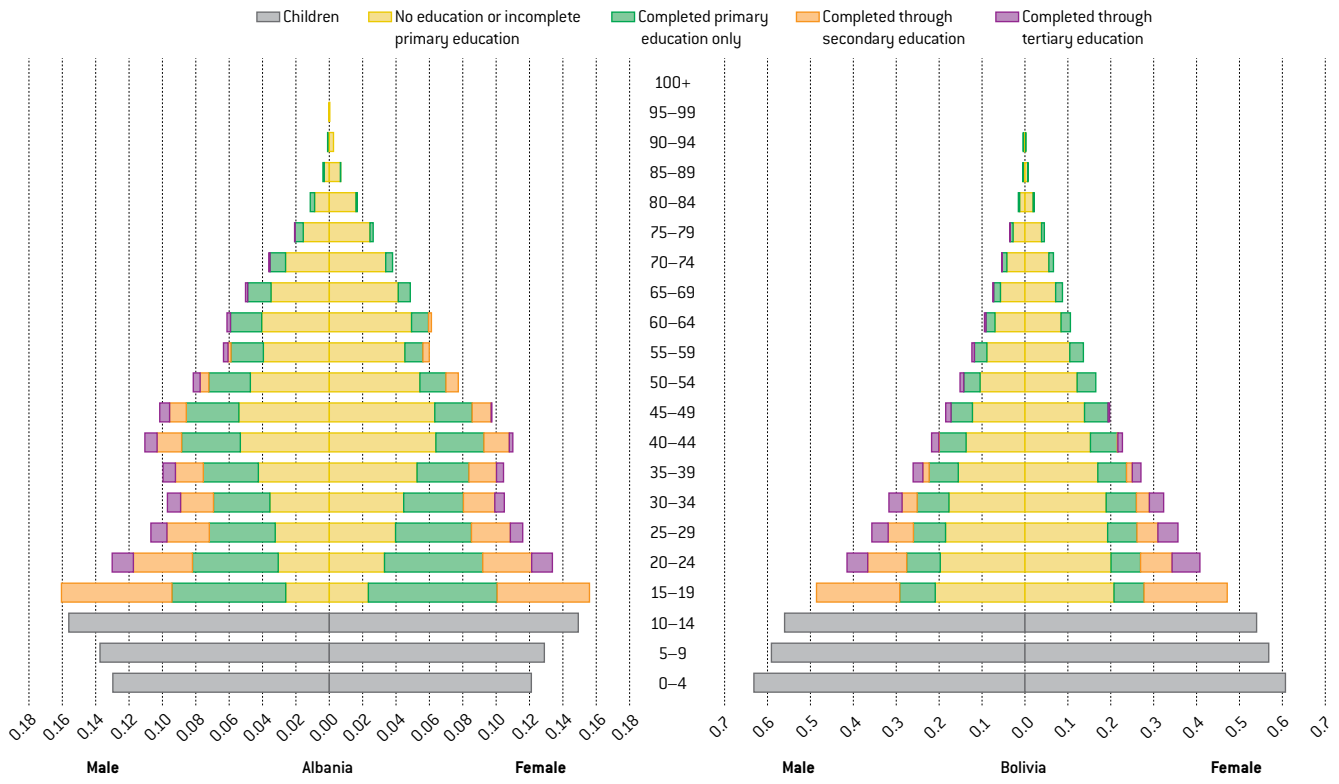
The second type of measure—the distribution of educational attainment by specific levels of education and by age categories—attempts to address the aggregation issues associated with the single average years of education measure. In this distributional approach, an overall population is typically divided into five-year age categories (e.g., 25–29, 30–34, and so on) by sex; then, the proportion of each age/sex category attaining all or part of varying levels of education (e.g., no education, primary education, secondary education, and tertiary education) is estimated. This approach allows for a richer exploration of relationships among the varying education/age/sex combinations and other dimensions of human development. The distributions of educational attainment are frequently displayed in education/age/sex population pyramids that visually reinforce the analysis, including making clear the time-lagged nature of increases in enrollment rates among children and educational attainment levels throughout the adult population.

Education/age/sex pyramids generated by the IFs modeling system for Albania and Bolivia in 2000 illustrate these points (see Figure 2.4). Although the estimated average years of education for adults twenty-five and over are just a bit below 6 years in both countries in 2005, the pyramids show quite different age structures and patterns of educational attainment, and appropriately suggest probable differences in other indicators of human development in the two countries now and in the future.

Conclusion

Thinking about the long-term dynamics of the global education transition involves many conceptual and analytic dimensions, including the relationship between the education transition and the broader human development context. As a foundation for considering the relationship of education to that broader

Figure 2.4 Estimated education/age/sex distribution for Albania and Bolivia (2005)



Source: IFs Version 6.12 estimates initialized with Barro and Lee data for 2000 (Barro and Lee 2001).

context, this chapter identified a range of values placed on education, including instrumental and intrinsic elements. We identified our own orientation as that of considering education in a broad human development framework, in which education has both instrumental social purposes and intrinsic value.

Continuing with the exploration of education in a human development context, we considered the close interactions of education with demographic, economic, and sociopolitical systems, and we noted the great complexity involved in understanding those relationships. As has happened for others before us, that complexity will make our exploration of educational futures difficult and inevitably both incomplete and somewhat tentative.

Considering education transition also requires, of course, that we understand how the spread of education is analyzed and measured. We described flow patterns of students and the concepts by which we understand them. We also identified the measurement of education attainment within adult populations as a critical interest. In the next chapter, we will use these concepts to explore the education transition over the past several decades.

Appendix to Chapter 2: Education System Elements

Some elements of education systems are perhaps surprisingly similar globally; others display more variability. We consider here some elements of education systems to provide a context for historical analyses and forecasts in subsequent chapters.

Levels of education

The International Standard Classification of Education (ISCED) has existed since the early 1970s. Designed by UNESCO and most recently refined in 1997, ISCED provides guidelines for countries to classify their educational programs by level (and at some levels by field), in order to establish an ongoing global repository of education indicators and statistics (UNESCO 1997: 1). The classifications are:

Level 0—Preprimary education
Level 1—Primary education
Level 2—Lower secondary education
Level 3—Upper secondary education
Level 4—Postsecondary nontertiary education
Level 5—First stage of tertiary education
Level 6—Second stage of tertiary education

A number of refining principles and guidelines further clarify the categories:

- The preprimary level includes both preschool and kindergarten programs.
- The primary level is the first stage of basic education, and the lower secondary level is the second stage of basic education.
- At the lower and upper secondary levels, there is a further division into general programs and vocational or technical programs.
- The postsecondary nontertiary level encompasses "programmes that straddle the boundary between upper-secondary and postsecondary education" (UNESCO 1997: 17).[13]
- The tertiary level is divided into two categories: level 5 refers to programs that do not lead to an "advanced research qualification," whereas level 6 refers to programs that do lead to such a qualification.
- Following this division, there are two subcategories in level 5: 5A includes theoretically based programs, research programs, and programs that prepare students for practice in high-skill professions; 5B includes practical, technical, and "occupationally specific" programs.

The specification of primary and lower secondary levels as the two stages of basic education and the separation of lower and upper secondary levels are especially important in the context of this volume. The ISCED classification system describes the distinguishing characteristic of primary education as the "beginning of apprenticeship of reading, writing, and mathematics" and the distinguishing characteristic of lower secondary education as the "full implementation of basic skills and foundation for lifelong learning" (UNESCO 1997: 10). In distinction, upper secondary programs move beyond basic education to prepare students for higher-level entry into the labor market or for advanced (tertiary) study. The very different purposes of lower and upper secondary education, widespread agreement on the importance of universal basic education

Enough standardization exists in the arrangement of the common elements of education to enable comparative study of education's expansion.

through the lower secondary level, and differing enrollment and cost patterns at the two secondary levels led to our decision to represent lower and upper secondary levels separately in the IFs education model, further including the separation into general versus vocational or technical programs as possible.[14]

Globally, the most typical pattern is six years at the primary level, three at the lower secondary level, and three at the upper secondary level.

Duration of education by level

Considerable similarity exists in the duration of the various levels of education across the world. Six years is the most frequent duration for primary education, three years for lower secondary, and three years again for upper secondary. What regional differences there are

Table 2A.1 Average duration of primary and secondary levels of education (2005)

	Primary	Lower secondary	Upper secondary	Basic education	Primary through upper secondary
Arab States	6	3	3	9	12
Central and Eastern Europe	4	4	3	8	11
Central Asia	4	5	2	9	11
East Asia and the Pacific (Poorer)	6	3	3	9	12
Latin America and the Caribbean	6	3	3	9	12
South and West Asia	5	3	4	8	12
Sub-Saharan Africa	7	3	3	10	13
East Asia and the Pacific (Richer)	6	3	3	9	12
North America and Western Europe	6	3	3	9	12
World	6	3	3	9	12

Note: Basic education is primary plus lower secondary; regional rates are unweighted country averages.
Source: Compiled by IFs team from UIS data.

Although the primary net enrollment rate is under 90 percent globally, primary education is compulsory virtually across the world.

Table 2A.2 Percent of countries with compulsory education at various levels (2005)

	Percentage of countries within region requiring		
	at least primary	at least lower secondary	all of upper secondary
Arab States	100	85	5
Central and Eastern Europe	100	95	11
Central Asia	100	100	22
East Asia and the Pacific (Poorer)	100	69	8
Latin America and the Caribbean	100	83	29
South and West Asia	100	44	0
Sub-Saharan Africa	98	29	0
East Asia and the Pacific (Richer)	100	100	0
North America and Western Europe	100	96	18
World	100	72	12

Note: Regional rates are unweighted country averages.
Source: Compiled by IFs team from UIS data.

by level are minimized when the durations are summed across the three levels. The average total duration for two regions (central and eastern Europe, and central Asia) is eleven years. The longest average duration is in sub-Saharan Africa (thirteen years); the average duration in all other regions is twelve years. No matter how primary and lower secondary are divided, with the exception of two reporting countries, the minimum number of years constituting basic education is eight (see Table 2A.1).

Compulsory education

The extent to which education is at least nominally compulsory (shown in Table 2A.2) may also be surprising. Of the 202 countries included in recent UIS data, only Gambia reported less than compulsory primary education.[15] Globally, 72 percent of countries (with a range from 29 percent to 100 percent by region) reported having compulsory education through the lower secondary level. Perhaps unexpectedly, only 12 percent of the countries reported having compulsory upper secondary education, another clear indication of the different ways in which lower and upper secondary education are currently viewed.[16]

Clearly, the formal requirements of compulsory primary and lower secondary education do not guarantee universal coverage. At the primary level, for example, with all but one country having a reported compulsory education requirement, the 2005 global primary net enrollment rate was just under 89 percent. Nonetheless, the existence of formal requirements indicates at least some level of public awareness and potential commitment and provides a path or policy lever for those urging further expansion of formal education.[17]

Globally, 72 percent of countries have compulsory lower secondary requirements, but only 12 percent do at the upper secondary level.

1 Citing Goldin 1999, Clemens (2004: 23) noted it was not until 1918 that all U.S. states had compulsory basic education laws.

2 The term *instrumental* typically refers to economic outcomes associated with increased education and sometimes also to noneconomic but still measurable outcomes such as fertility reduction or improved child health. By contrast, the term *intrinsic* is more often used when the reference is to not easily measured states of well-being and life satisfaction.

3 Becker and T. W. Schultz, in particular, were key in the development of the human capital perspective. In a 1961 paper in the *American Economic Review*, Schultz used the term *human capital* in the title, making the case for the importance of human skills and knowledge as a form of capital (see Schultz 1961).

4 Grossman has continued to explore the relationships between education and a variety of nonmarket outcomes within a human capital framework. In a recent paper, he provided an in-depth analysis of the relationship between education and various dimensions and indicators of health (Grossman 2005: 32–68).

5 Speaking to this point, Clemens (2004: 18) referred to a "takeoff" that occurs in primary enrollment rates when GDP per capita reaches a level that signals likely economic returns from education.

6 One approach to this question appears in a report of the UNESCO Regional Office for Education in Africa (BREDA). In making recommendations with respect to "student flow management," the report argued for a phased approach across levels, and it suggested that a number of African countries would need to consider reducing transition rates to the lower secondary level during the transition to UPE (UNESCO 2005b: 17, 134). Earlier, we cited a recent RAND study that pointed to the differing ways China and India have addressed the question of balance across levels (see Goldman, Kumar, and Liu 2008).

7 Each of the bulleted items is quoted directly from Hannum and Buchmann 2006. At the end of each bulleted item, we have inserted, in italics, the component of Figure 2.1 to which that item is most closely connected.

8 See the Appendix to this chapter for elaboration of similarities and differences in the educational systems of regions and countries around the world in terms of the levels and length of schooling and the degree to which schooling is compulsory.

9 Survival rates can also be defined as the rate of persistence to a certain grade rather than to the beginning of the final year of a level.

10 Countries have very different conventions as to what constitutes completion, ranging from "simply" progressing through a series of grades to successfully completing an exit examination. In addition, far fewer countries provide primary completion data as compared with those that provide survival data. For these reasons, survival rates (with an adjustment for dropouts in the final year) in conjunction with net enrollment rates are more frequently used as the proxy to track progress toward universal primary education.

11 Bloom (2006: 54) and others recently have directed attention to another important age group—the population of fifteen- to twenty-four-year-olds. As education participation rates increase, the attainment levels of fifteen- to twenty-four-year-olds record that change more quickly, providing a clearer indicator of future human capabilities within the population. Crespo-Cuaresma and Lutz (2007: iii), for example, noted that "differences in the education level of the younger age groups explain the differences in income per capita across countries significantly better than aggregate measures such as the education level of the entire adult population."

12 Bloom (2006: 53–61) provided a very useful discussion of this topic, including a comparison of the approaches and results of the Barro and Lee dataset (widely used by researchers for many years, including the IFs team) and the more recent Cohen and Soto dataset. To directly access those datasets and information about them, see Barro and Lee (2000, 2001) and also Cohen and Soto (2001, 2007).

13 A further clarification states: "Typical examples are programmes designed to prepare students for studies at level 5 who, although having completed ISCED level 3, did not follow a curriculum which would allow entry to level 5" (UNESCO 1997: 17).

14 The IFs education model includes ISCED level 1, ISCED level 2, and ISCED level 3 separately. ISCED levels 0 (preprimary) and 4 (postsecondary nontertiary) are not represented, and levels 5 and 6 (first and second stages of tertiary education) are combined.

15 Gambia reported 5 years of compulsory education and 6 years as the duration of primary education.

16 A number of countries reported compulsory years beyond a given level but less than the end of the next level, perhaps suggesting that changes have taken place in the structure of educational levels since compulsory years were first established. Whatever the reason, in Table 2A.2, countries are categorized by the complete level of education that is reported by the country as compulsory.

17 Caldwell (1980) explored the relationship between universal or compulsory education legislation and the actual advent of "mass schooling" in the Western industrialized countries in the nineteenth century. He noted (1980: 233) that "universal education legislation in many countries was the end point of a movement over several decades to bring all children into schools," lending credence to the idea that even though compulsory education does not guarantee universal coverage, it signals and assists in movement in that direction.

3

The Historical Context

Education transitions in developing countries today are proceeding much faster than those in industrialized countries in the nineteenth and early twentieth centuries.

Perhaps in response to the relatively more recent statements of global education goals (such as the Jomtien Declaration in 1990, the Dakar Framework in 2000, and the Millennium Development Goals in 2000), most discussions of change in education begin with very recent or current time frames.[1] Yet some key indicators describing education participation patterns around the world extend back at least to 1960. We begin our historical analysis from that date in order to provide a better understanding of the education transition as a long-term process that is still unfolding.

Clemens (2004) studied patterns of transition in primary enrollment rates between 1960 and 2000 across more than 100 developing countries, and he determined that growth in enrollment rates in these countries since 1960 has been much faster than that which characterized the education transition in industrialized countries in the nineteenth and early twentieth centuries. That does not mean, however, that the transition to universal education at the primary or basic level will seem fast in absolute terms. A study of 70 developing countries by Wils, Carrol, and Barrow (2005: 8) found that "even in countries with fast-growing educational trends, it takes at least six decades to produce anything close to basic education for all when a country starts from nearly zero. … A handful of countries, including Jordan, Gabon, and Indonesia, will have made the leap [from 10 percent primary school completion to 90 percent] in about 60 years, whereas the average interval for the 70 countries studied is 88 years." Of necessity, given their dependence on broad primary participation, large-scale transitions in secondary and tertiary participation require substantial extensions of this already prolonged period.

The Progression of Enrollment Expansion

Global progression in the expansion of participation in education, though long-term

and slower than desired, remains nothing short of remarkable. The world graph in Figure 3.1 shows massive global expansion of gross enrollment rates between 1960 and 2005. At the primary level, gross enrollment grew from 72 percent to 106 percent; over the same period, the global secondary gross enrollment rate for lower secondary and upper secondary levels combined climbed from 27 to 69 percent, and the tertiary gross enrollment rate expanded from 7 to 31 percent.

In every region of the world (see Box 3.1 for an explanation of the regional groupings), enrollment rates have grown considerably at one or more levels of education since 1960. Over the forty-five-year period (see, again, Figure 3.1), the primary gross enrollment rate in South and West Asia climbed over 70 percentage points (from 40 percent to 111 percent), whereas the rate in sub-Saharan Africa increased about 60 percentage points (from 40 percent to 100 percent), and the Arab States boosted their rates from just under 60 percent to about 100 percent.

Looking at secondary education, gross enrollment rates in the Arab States, in Latin America and the Caribbean, and in the poorer countries of East Asia and the Pacific all climbed nearly 60 percentage points; rates in both South and West Asia and in sub-Saharan Africa rose about 30 points. Perhaps most surprisingly, the countries of North America and Western Europe also added about 60 percentage points to their secondary enrollment rates. At the tertiary level, North America and Western Europe, the richer countries of East Asia and the Pacific, and Central and Eastern Europe each added about 50 percentage points. In the lower-income regions, tertiary participation rates in 2005 exceeded 35 percent only in the transition countries of Central and Eastern Europe, which had well-developed tertiary systems from the communist era. Even so, very appreciable increases occurred in the Arab States, in Central Asia, in Latin America and the Caribbean, and in the poorer countries of East Asia and the Pacific.

In short, at the levels of education that represented for various regions the cutting edge of their expansion efforts, those regions increased their gross enrollment rates by between 50 and 70 points over forty-five years, or between 1 and 1.5 percentage points each year. Perhaps even more remarkable, virtually every region had substantial enrollment rate gains at more than one level of education. Such rates may seem slow to impatient policy makers, but they are transformational in the far longer history of education's advance.

Although increases of those magnitudes in gross enrollment rates clearly show gains in education participation, gross enrollment rates can also present a somewhat exaggerated view of how well school systems are doing. Persistent gross enrollment rates above 100 percent indicate either high entry rates of older students or high repetition rates or both. And when gross enrollment rates are below 100 percent, it is not immediately clear what proportion of the enrollment is due to repetition or entry of overage students and what proportion can be attributed to age-appropriate entry and progression. Therefore, progress toward education goals is more appropriately measured by net enrollment rates. Unfortunately, data series for net enrollment are less extensive and complete (see Box 3.2).

Another important insight from the historical data of Figure 3.1 is that patterns of enrollment

Box 3.1 Regionalization of country-level data

UNESCO has defined and uses eight geographic regions in its presentation of data. The eight regions are: Arab States, Central and Eastern Europe, Central Asia, East Asia and the Pacific, Latin America and the Caribbean, North America and Western Europe, South and West Asia, and sub-Saharan Africa. The UNESCO regional groupings differ from those of other UN agencies and the World Bank.

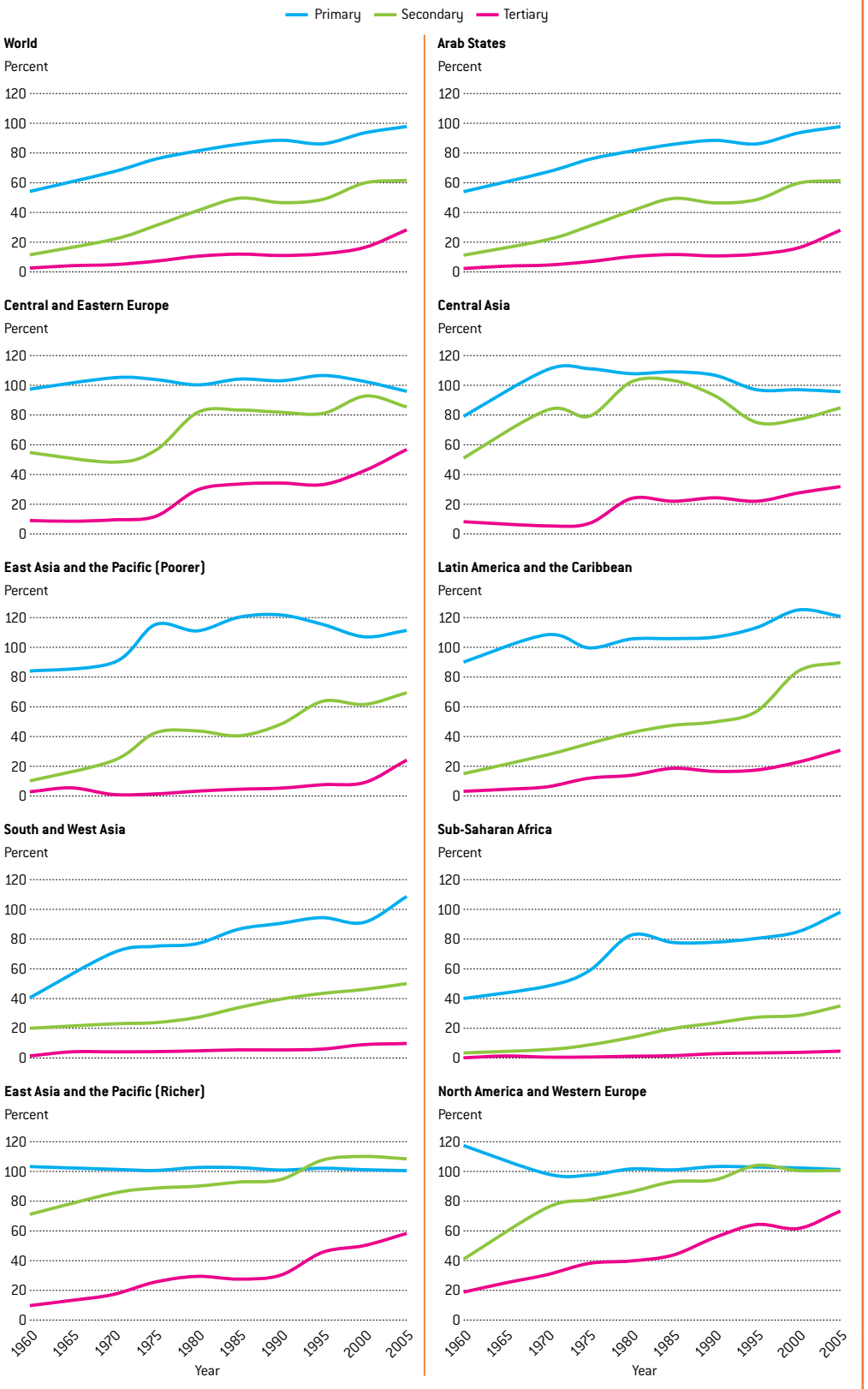
We use the UNESCO groupings in this volume but make one adjustment to correct for what we see as their major weakness. The UNESCO East Asia and the Pacific grouping aggregates Australia, Japan, the Republic of Korea, New Zealand, and Singapore with lower-income countries, including China. We divide the geographic region into two subgroupings because of marked differences on many measures. For ease of distinction, we refer to them as East Asia and the Pacific–Richer and East Asia and the Pacific–Poorer. The Appendix to the volume shows country members of the UNESCO regional groupings (including our adjustment).

Occasionally, we identify and use other country groupings for special purposes. Reported values are population-weighted in all groupings unless otherwise noted.

A massive global expansion of enrollment rates has taken place at all levels of formal education since 1960.

Between 1960 and 2005, gross enrollment rates increased 50–70 percentage points at the levels of education that were the focus of various regions' expansion efforts.

Figure 3.1 Gross enrollment rates by level (1960–2005)



Source: IFs Version 6.12 using UIS data.

Box 3.2 Historical data

Many data issues complicate the analysis of historical series.

Availability of data: Gross enrollment data are available at the primary, total secondary, and tertiary levels beginning with 1960, but net enrollment data are not available until 1970. With respect to lower and upper secondary levels, even gross enrollment data are not available until 1999 and net enrollment data not at all.

Data inconsistencies: Inconsistencies may reflect disruptions as disparate as weather patterns and political turmoil or conflict. At the regional level, however, many reflect intermittent country reporting patterns, resulting in population-weighted regional averages across changing subsets of reporting regional members. For this reason, regional data sometimes suggest impossible situations, such as reported net enrollment rates that are higher than reported gross enrollment rates (e.g., secondary enrollment rates in the poorer countries of East Asia and the Pacific in 1980 and 2000).

Distortions in aggregated data: A number of countries that had not reported previously began reporting in the 1990s, particularly near the end of the decade. Because newly reporting countries are often among those in the earlier stages of education transition, their addition to graphs and tables in recent years can distort the long-term patterns in large regional groupings by introducing a downward bias.

For these reasons, much of our reporting in this chapter, including that in Figure 3.1 and Table 3.1, is based on subsets of those countries in the UNESCO regions that have most consistently reported data over time. For these countries with near-complete data, we interpolate or extrapolate to fill missing values. Appendix 1 identifies countries in these subsets with an asterisk (*).

Despite extraordinary growth in education participation since 1960, growth patterns have varied within the period in response to multiple systemic forces.

expansion have by no means been consistent across time. Although reporting irregularities complicate the analysis, it appears that a period of rapid growth in primary enrollment rates in developing regions during the 1960s (and for sub-Saharan Africa, the early 1970s) was followed by periods of slowed or no growth in most regions during significant portions of the 1970s and especially the 1980s. Primary enrollment rate growth then accelerated again in the 1990s and early years of the twenty-first century, including rapid gains in sub-Saharan Africa. Subsequent discussion will turn to a consideration of systemic reasons for such variations in patterns.

Table 3.1 shows the growth from 1970 to 2005 in net enrollment rates at the primary and secondary levels. Note that growth in the primary net enrollment rate at the global level was not as great as in the gross rate. The net rate climbed from 72 percent in 1970 to 88 percent in 2005, less than half the gain that Figure 3.1 shows at the gross level. The biggest regional gains were in South and West Asia (59 percentage points to 86 percent in 2005) and sub-Saharan Africa (58 percentage points to 72 percent). However, at the secondary level, the countries of Latin America and the Caribbean increased net enrollment rates by 44 percentage points, and the Arab States gained nearly 50 percentage points.

Still another observation from Table 3.1 is that an advance in rates slows markedly when net enrollment rates begin to reach or exceed 90 percent—a phenomenon noted by many analysts. Because the final push to universal enrollment requires special attention, we describe a 90 percent net enrollment rate as "nearing universal enrollment" in order to signal that need and 97 percent as "universal enrollment." In all regions, the last 10 percent of students mainly come from the groups discussed in Chapter 2—poor families, families living in remote locations, and socially excluded groups such as the indigenous populations of Latin America, the scheduled castes of India, or the children of illegal immigrants in the United States. In many cases, these students are also disproportionately female.

Before concluding this section, it is important to consider the disaggregation of secondary enrollment rates to lower and upper secondary levels. An understanding of enrollment patterns at the lower secondary level is particularly important as attention increasingly turns from universal primary to universal basic education. The first year for which UIS provides separate lower and upper secondary enrollment data is 1999; Table 3.2 shows the gross enrollment data for 2000 and 2005. Variability of reporting across years and a short observation period make trend analysis very difficult, but significant progress at the lower secondary level is especially apparent in two developing regions over these recent years (central Asia and the poorer countries of East Asia and the Pacific). Many regions have a considerable

With increasing attention on universal basic education, an understanding of enrollment patterns at the lower secondary level is particularly important.

Table 3.1 Primary and secondary net enrollment rates (1970–2005)

	Primary				
	1970	1980	1990	2000	2005
Arab States	61.3	80.9	83.8	82.5	92.9
Central and Eastern Europe	95.1	97.0	91.8	94.8	92.1
Central Asia	no data	no data	no data	85.0	85.7
East Asia and the Pacific (Poorer)	88.1	89.3	97.4	92.6	94.3
Latin America and the Caribbean	77.2	81.1	90.9	92.8	94.7
South and West Asia	59.3	61.6	64.0	79.5	85.9
Sub-Saharan Africa	58.2	55.9	49.0	58.6	71.6
East Asia and the Pacific (Richer)	99.5	101.2	99.7	99.3	99.4
North America and Western Europe	94.3	97.4	96.9	96.4	94.7
World	71.6	86.3	93.2	84.8	88.4
	Secondary				
	1970	1980	1990	2000	2005
Arab States	20.2	38.2	50.8	62.2	69.4
Central and Eastern Europe	41.9	70.9	57.7	85.3	77.8
Central Asia	no data	no data	no data	72.1	79.6
East Asia and the Pacific (Poorer)	33.1	45.2	37.9	49.5	57.8
Latin America and the Caribbean	20.7	16.0	29.2	62.0	64.1
South and West Asia	22.8	27.6	24.2	33.1	28.6
Sub-Saharan Africa	5.8	11.1	8.8	28.1	25.7
East Asia and the Pacific (Richer)	84.7	90.1	94.4	97.3	98.1
North America and Western Europe	56.7	78.1	85.6	88.0	90.7
World	31.6	54.5	54.3	65.2	64.0

Notes: The table includes the subset of countries in each UNESCO region that most consistently reported data (see Box 3.1 and the Appendix to the volume). The 1980 primary value for South and West Asia is an average of 1970 and 1990, and net secondary values for the Arab States and for South and West Asia include statistical estimations to fill holes created by irregular reporting patterns.

Source: IFs Version 6.12 using UIS data.

distance to go (particularly South and West Asia and sub-Saharan Africa) to reach universal participation in basic education, the level that many see as critical for "full implementation of basic skills," for support of female choice with respect to family size, and more.

Gender Balance: Pursuing Parity

The transition to gender parity (typically defined as a ratio of the enrollment rates of girls to boys between 0.97 and 1.03) is also moving at substantial speed.[2] Figure 3.2 shows regional patterns for primary, secondary, and tertiary gross enrollment rates, and Table 3.3 displays net patterns at the primary and secondary levels. There are reporting anomalies in some regions and years,[3] but the anomalies and apparent distortions do not obscure the overall pattern, which is one of tremendous progress in parity for females between 1960 and 2005.

By 2005, most global regions had achieved apparent gender parity, at least on a regional

Table 3.2 Lower and upper secondary gross enrollment rates (2000 and 2005)

	Lower secondary		Upper secondary		Total secondary	
	2000	2005	2000	2005	2000	2005
Arab States	78.4	85.0	47.6	55.7	63.7	71.9
Central and Eastern Europe	92.0	86.5	90.8	87.5	86.4	85.5
Central Asia	80.4	91.4	68.6	71.5	77.1	84.8
East Asia and the Pacific (Poorer)	81.4	93.9	40.8	52.3	62.4	72.6
Latin America and the Caribbean	99.0	101.6	64.5	74.8	83.3	89.4
South and West Asia	58.2	65.2	31.7	37.2	43.9	49.6
Sub-Saharan Africa	33.4	41.2	21.7	25.8	26.6	33.3
East Asia and the Pacific (Richer)	104.8	102.3	120.3	119.0	109.1	107.6
North America and Western Europe	105.6	105.4	96.9	96.9	100.8	100.9
World	76.3	82.5	50.5	56.6	63.1	68.9

Note: The table includes the previously described subset of countries in each UNESCO region that most consistently reported data.

Source: IFs Version 6.12 using UIS data.

With respect to gender parity, the overall pattern between 1960 and 2005 shows tremendous progress for females.

basis, in both primary gross and net enrollment rates. Although the Arab States, South and West Asia, and sub-Saharan Africa had not yet reached parity at the primary level, all three were between 0.90 and 0.96 on both gross and net enrollment rates by 2005, reflecting remarkable progress since 1960. At the secondary level, despite the fact that South and West Asia and sub-Saharan Africa were not yet at 0.90 in either gross or net rates, progress was even more dramatic. Progress over the period was most significant in the Arab States, which ended the period with apparent gross parity (0.98) and a net gender ratio of 0.92.

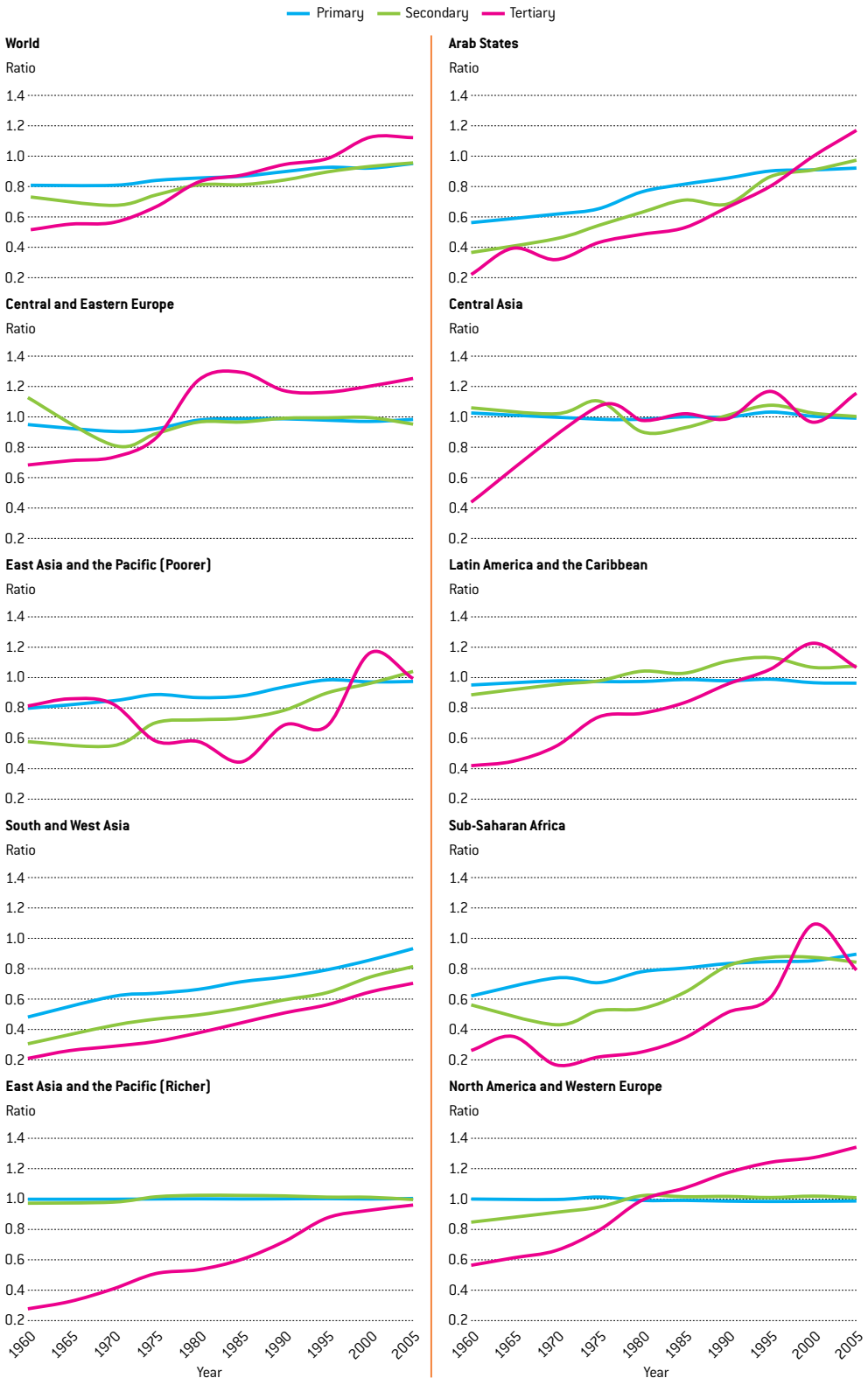
At the tertiary level, the picture is more mixed. In 2005, tertiary enrollment rates were still substantially higher for males than for females in two regions—South and West Asia and sub-Saharan Africa—although movement toward parity in those regions has progressed rapidly (particularly since 1990). One developing region, the poorer-country group in East Asia and the Pacific, was within the defined parity range of 0.97–1.03, and the richer-country group in East Asia and the Pacific, at a 0.96 parity ratio, was all but there. However, in all other regions, the enrollment rates of females exceeded those of males—from a low of 1.07 in Latin America and the Caribbean to a high of 1.27 in North America and western Europe—creating a reverse gender gap relative to that which motivated the Dakar Framework and MDG gender goals of removing the disparity in the education participation of girls.

Progress toward gender parity for girls has been significant and real, but in regional aggregations the presence of countries with male gender gaps (or even the presence of large countries or numerous countries close to parity) can mask the presence of other countries in the same regions with low female parity ratios. At the secondary level, for example, the aggregated Arab States had a 0.98 gender parity ratio in 2005, whereas one of the region's countries—Djibouti—had only a 0.68 parity ratio. At the tertiary level, the East Asia and the Pacific region of poorer countries provides an example: although the 2005 regional parity ratio was 0.99, Cambodia's gender parity ratio was just 0.47.

Figure 3.3 shows a distribution of reporting countries by region in 2005 according to their gender parity status (that is, the proportion of countries with parity, the proportion with a female parity gap, and the proportion with a male parity gap). Although Figure 3.3 does not indicate the degree of the disparities within countries, the distributions themselves help us understand something about the profile of gender patterns within regions and the extent

At the tertiary level, the enrollment rates of females exceed those of males in most regions, creating a "reverse" gender gap.

Figure 3.2 Gross gender parity enrollment rate ratios by level (1960–2005)



Note: Subsets of countries in UNESCO regions that most consistently reported data.

Source: IFs Version 6.12 using UIS data.

Table 3.3 Net gender parity enrollment rate ratios by education level (1970–2005)

	Primary				
	1970	1980	1990	2000	2005
Arab States	0.62	0.81	0.88	0.93	0.95
Central and Eastern Europe	1.00	1.00	1.00	1.00	0.98
Central Asia	no data	no data	no data	1.01	1.00
East Asia and the Pacific (Poorer)	0.89	0.91	0.96	0.97	0.98
Latin America and the Caribbean	0.98	0.98	0.99	1.00	1.01
South and West Asia	0.60	0.68	0.77	0.84	0.94
Sub-Saharan Africa	0.72	0.80	0.86	0.91	0.96
East Asia and the Pacific (Richer)	1.00	1.00	1.00	1.00	1.00
North America and Western Europe	1.01	1.01	1.00	1.00	1.01
World	0.80	0.94	0.97	0.93	0.97
	Secondary				
	1970	1980	1990	2000	2005
Arab States	0.46	0.62	0.79	0.87	0.92
Central and Eastern Europe	1.26	1.07	1.07	1.02	0.94
Central Asia	no data	no data	no data	1.03	1.01
East Asia and the Pacific (Poorer)	0.68	0.78	0.88	0.97	1.04
Latin America and the Caribbean	1.04	1.17	1.07	1.06	1.04
South and West Asia	0.44	0.48	0.52	1.04	0.77
Sub-Saharan Africa	0.42	0.66	0.59	0.93	0.87
East Asia and the Pacific (Richer)	1.00	1.03	1.04	1.01	1.02
North America and Western Europe	0.97	1.01	1.02	1.02	1.02
World	0.72	1.00	0.96	1.02	0.99

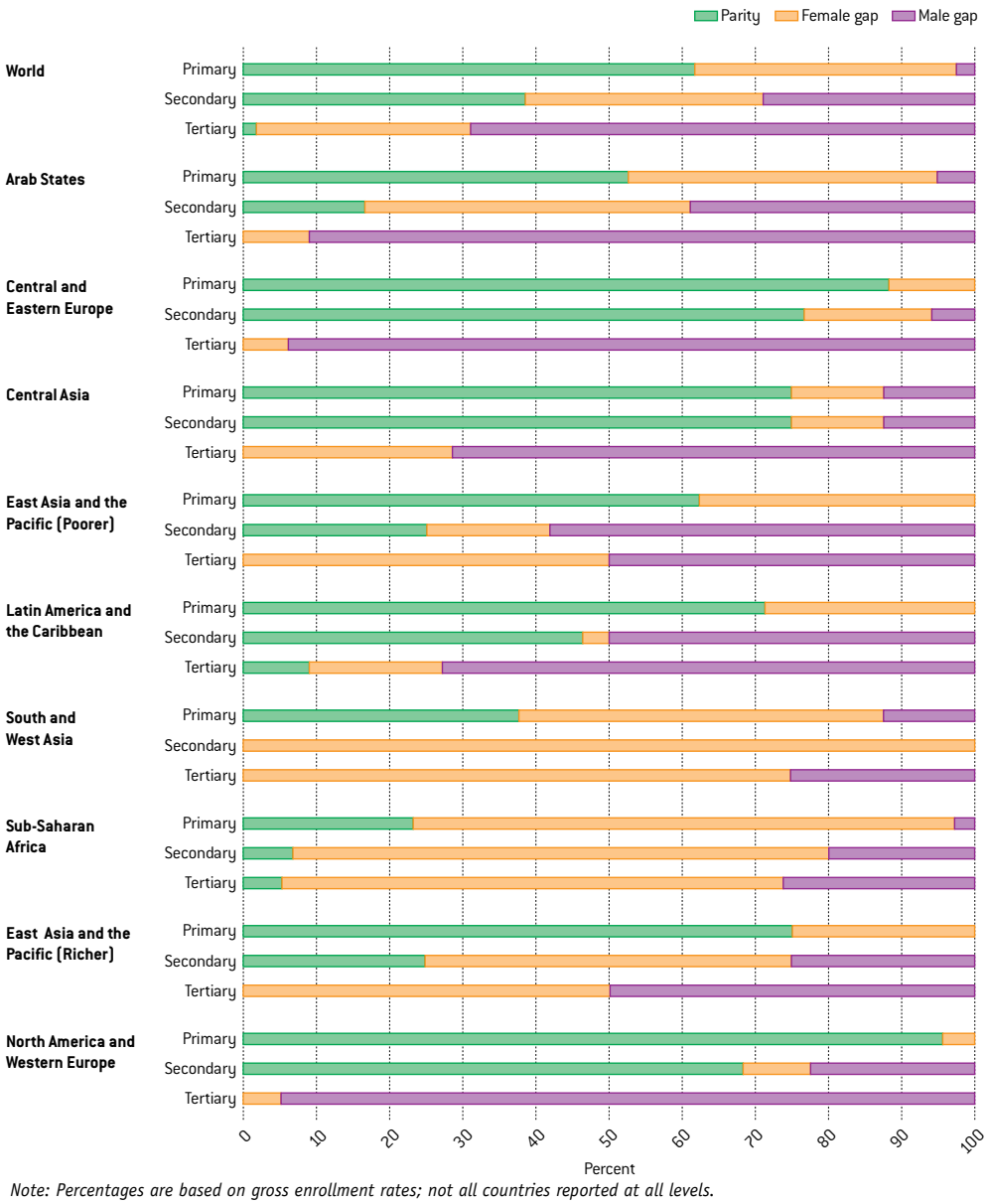
Note: Subsets of countries in UNESCO regions that most consistently reported data. South and West Asia and sub-Saharan Africa primary values combine data and IFs estimations, and the secondary values in 1980 for South and West Asia and for East Asia and the Pacific (Poorer) are averages of 1970 and 1990 values.

Source: IFs Version 6.12 using UIS data.

to which regional aggregations are masking individual country disparities.

The patterns of parity and disparity vary dramatically by education level. A majority of countries in 2005 showed parity at the primary level, but a substantial number of countries (38 percent) still showed a female gender gap, whereas male gender gaps were almost nonexistent. At the secondary level, however, only 39 percent of countries reported gender parity, and the sizable proportion of countries with female and male gender gaps was almost equal (32 percent and 29 percent, respectively). The most dramatic picture is at the tertiary level, where only 2 percent of countries reported parity and a full 69 percent reported male gaps in enrollment rates. Regionally, female gaps across levels were concentrated in the countries of South and West Asia and of sub-Saharan Africa, even though much progress has been made in these regions in terms of enrollment rates.

Figure 3.3 Percentages of countries with gender parity and gender gaps by education level (2005)



Note: Percentages are based on gross enrollment rates; not all countries reported at all levels.

Source: IFs Version 6.12 using UIS data.

Male gaps predominated in a number of other regions. The poorer countries of East Asia and the Pacific showed gaps at the secondary level, and the Arab States and Latin America and the Caribbean displayed male gaps at both the secondary and tertiary levels. There was also a high proportion of countries with male gaps at the tertiary level in central and eastern Europe, central Asia, and especially in North America and western Europe.

Disparity in female enrollment rates has been understood for some time to be the result of culturally based gender roles and cultural values that favor males, and it is reasonable to think the still-sizable female enrollment gaps at the primary level are remaining manifestations of those factors. However, as education proceeds to higher levels, the general pattern shows increasing gaps in male participation rates. In 2005, males had a

higher global primary gross intake rate than females (117 percent compared to 112) but a slightly lower primary survival rate (81 percent compared to 83). Transition rates to the lower secondary level were almost identical (85 percent for males and 84 percent for females), but again, males displayed a lower survival rate (82 percent versus 85).[4] The pattern shifts even more clearly in transition rates to the upper secondary level (59 percent for males and 63 percent for females) and also in upper secondary survival rates in some regions (e.g., 69 percent for males in Latin America and the Caribbean versus 75 percent for females). The relatively small differences in each flow variable accumulate across the levels, to create the very large shift we see in gender gaps between entry to the primary level and participation at the tertiary level.

Varied dynamics might account for the reported male gender gaps. As noted in the preceding paragraph, in most developing regions, there is a pervasive pattern of a smaller proportion of males than females progressing through the last grade of the primary level (that is, a lower survival rate for males), and hence, there is a smaller proportion eligible to proceed to the secondary level. Further, in a number of regions, boys more than girls attend religious schools, and they are not included in UIS reporting if the schools do not provide a state-certified full curriculum. Also, in some regions more boys than girls enroll in vocational and technical programs at the secondary level, but secondary transition and survival data are available only for general secondary programs (although enrollment rate data include all types of secondary programs). And in some countries, boys may be expected to leave school before completing their secondary education in order to enter the workforce, whereas there may be less of an expectation or tradition for girls to do so. At the tertiary level, more males than females may study abroad and thus be disproportionately absent from home-country enrollment statistics. It is possible, too, that males in some countries and regions may not need a tertiary education (or even an upper secondary education) as much as females do in order to find suitable work. More generally, across many regions, girls and women may still be in a tertiary "catch-up" mode, taking advantage of new opportunities to pursue education (for example, in the United States, adult women have been enrolling as first-time college students in higher proportions than men). Not all of these dynamics suggest that males in the countries displaying male gaps are disadvantaged relative to females in their pursuit of education, but some (particularly the lower survival rates) clearly point to a need for attention to the circumstances of males.

The remaining female gender gaps require attention as well. Despite the tremendous progress noted at the beginning of this section, at least fourteen countries in 2005 remained below a 0.90 gender parity ratio in primary net enrollment, as did at least eighteen in secondary net enrollment. Perhaps the most unexpected finding, given the pervasive male gender gap at the tertiary level, was that the tertiary gender parity ratio fell below 0.90 in thirty countries in 2005, including thirteen in sub-Saharan Africa (eight of which were below 0.50).

Understanding the History of Education's Advance

Patterns of expansion of participation in education and movement toward gender parity have been irregular and complex. Some effort to understand them in a broader historical context should be helpful in thinking about their further unfolding in coming decades.

Drivers of advance: The context of change

Chapter 2 emphasized the close and two-way relationships between education and broader demographic, economic, and sociopolitical aspects of the human development system. Demographic change is among the strongest of the shaping forces. After World War II, the global availability of antibiotics and other health advances gave rise to rapid declines in death rates, particularly in low-income countries. Birth rates fell much more slowly, causing population growth rate surges and huge new numbers of school-age children.

At the same time, through the 1950s and 1960s, the world experienced a "golden age" of global economic growth, partly as a catch-up from the period of the Great Depression and World War II; this provided the resources for growth in education participation rates despite unprecedented numbers of school-age children. However, this extended period of economic

Disparity in female enrollment rates has been understood for some time to be the result of culturally based gender roles and values favoring males.

A variety of factors may contribute to male gender gaps in enrollment rates.

With respect to net enrollment, at least fourteen countries at the primary level and eighteen at the secondary level had a female gender parity ratio below 0.90 in 2005.

A "golden age" of economic growth in the 1950s and 1960s provided resources for rising enrollment rates despite unprecedented numbers of school-age children.

More constrained economic circumstances prevailed in the 1980s.

Sociopolitical changes also spurred education's spread. Independence in Africa and much of Asia was one such change, and the Cold War was another.

growth helped create a commodity price boom in the 1970s that set the stage for a global collapse of commodity prices in the 1980s. More constrained economic conditions then prevailed for many countries—and especially low-income countries—into the 1990s. For most developing countries, significant economic growth resumed only in the mid-1990s, this time accompanied by even greater attention to the spread of education as a foundation for continued advance.

Critical sociopolitical changes following World War II interacted with these demographic and economic changes. Decolonization spread throughout Africa and much of Asia, and the newly independent societies were eager to advance education. This same period saw the waxing of the Cold War, with impacts on governance systems and development philosophies and mixed consequences for the spread of education. On the one hand, as could be seen in the enrollment rates for central and eastern Europe in Figure 3.1 and Table 3.1, education was a high priority in communist bloc countries. Similarly, competition in the Cold War spurred the expansion of education in the United States, particularly after the Russian launch of *Sputnik*. However, that same competition between superpowers (and their allies) led to involvement in many of the newly independent societies in ways that sometimes compromised their progress even while sometimes assisting in it.

Another ideational force during this historical period was the changing status of women in higher-income countries. The sexual revolution of the 1960s and 1970s and the longer-term move toward nuclear family structures challenged traditional patriarchal patterns and continue today to support more egalitarian gender patterns around the world. Other ideational and structural elements emanated from international financial institutions such as the World Bank and the International Monetary Fund and their programs and policies. Augmented by pushes for deregulation and globalization, these institutions participated significantly in shaping global economies and political choices with respect to government spending and behavior, including programs of fiscal discipline that periodically dampened public spending. And, of course, the global community's belief in the value of expanding education, as well as attaining gender parity, has been an ideational force of great power in reshaping global education.

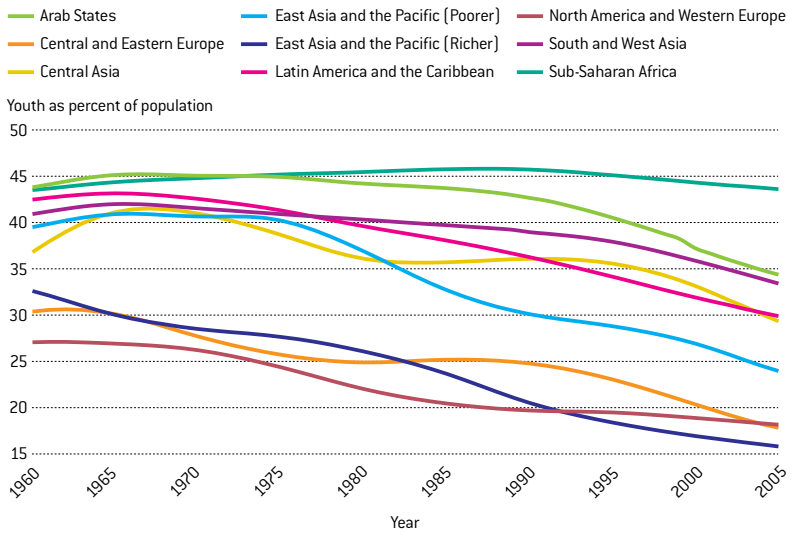
The critical role of demography

Demography is absolutely central to the ease or difficulty that countries have faced in expanding education participation. UNESCO (2007a: 29) noted that all countries have achieved universal primary education where primary school–age children constitute 12 percent or less of the total population. Yet Fredriksen (1980) reported how dramatically both African and Asian planners underestimated the growth in numbers of school-age children when making their plans in the 1960s for the movement to universal primary education. In Africa, the Addis Ababa plan of 1961 "underestimated (by some 63 percent) the size of the population of primary school age in 1980" (Fredriksen 1980: 7). Thus, although numbers of enrolled students increased dramatically and exceeded the plan numbers by as much as 50 percent, enrollment rates failed to reach anticipated levels. The Asian plan similarly fell short of its goals in part because of a 40 percent increase in the population of children between six and twelve years of age in just a thirteen-year period.

Even more important than the absolute size of the school-age population is its size relative to the adult population. The larger the relative size of the school-age population (expressed as a youth dependency ratio), the greater the demand for public and private resources placed on a relatively smaller adult population. In most countries, the burden of support has lessened, and sometimes dramatically, as the global population growth rate peaked between 1969 and 1971 and then declined. By 1980, the proportion of the population under fifteen was decreasing in all UNESCO regions except sub-Saharan Africa, where it did not begin to decrease until 1987 and 1988 (and then only marginally). In fact, as Figure 3.4 shows, after peaking at 45.8 in 1988, the youth dependency ratio in sub-Saharan Africa in 2005 was still over 43 percent—the same level as in 1960. This situation contrasts with notable declines in the relative size of school-age populations in all other regions, including those that, like sub-Saharan Africa, started the period with very high proportions of school-age children.

Fertility and mortality rates, and patterns in them over time, are the drivers that determine not only the size of the school-age population in a country or region but also the youth dependency ratio. All else being equal, a decrease in the mortality rate of infants and children up to five years old increases the relative size of the youth population, whereas a decrease in fertility rates reduces it. Almost always in demographic transitions, infant and child mortality rates begin to decrease before fertility rates do. In all regions, the mortality rates of infants and young children have declined dramatically since 1960. Despite being just slightly over half what it was in 1960, however, sub-Saharan Africa's child mortality rate in 2005 (140 infants and children per 1,000 live births) was over twice that of the region with the next highest rate (South and West Asia, at 66 infants and children per 1,000 live births). Not surprisingly, then, fertility rates began to decline later in sub-Saharan Africa than in other regions. In 2006, the total fertility rate in sub-Saharan Africa was still 5.3 children per woman, much higher than the 3.2 of the Arab States (the region with the next-highest fertility rate). The good news is that the fertility rate in sub-Saharan Africa has clearly trended downward since about 1980, at which time it was 6.7. In coming years—and in our forecasts—the continuing decline in fertility will lead to acceleration of the decline in the dependency ratio for sub-Saharan Africa.

Figure 3.4 Youth dependency ratios (1960–2005)



Source: IFs Version 6.12 using data published by the World Bank in the World Development Indicators 2008 (henceforth referred to as WDI data).

Economic level

The level and rate of economic development are also fundamental to education participation patterns, affecting both the demand for education and its supply. Figure 3.5 displays the disruption of economic growth in much of the developing world in the 1980s (sometimes called the lost decade). Per capita GDP fell in the Arab States after 1979 with the collapse of oil prices, coming back only in very recent years to its 1979 level. (Throughout this volume, we use GDP and GDP per capita at purchasing power parity [PPP] because PPP makes GDP and income comparable across countries.)[5] The debt burden incurred by Latin America in the 1970s contributed heavily to its smaller but still significant decline in GDP per capita in the 1980s. Yet it has been sub-Saharan Africa that has suffered the greatest economic burden. There, the period of independence for most of its countries began with a considerably lower level of GDP per capita than in the Arab States or Latin America and the Caribbean, and after experiencing some early gains, the region suffered through decades without further growth in GDP per capita.

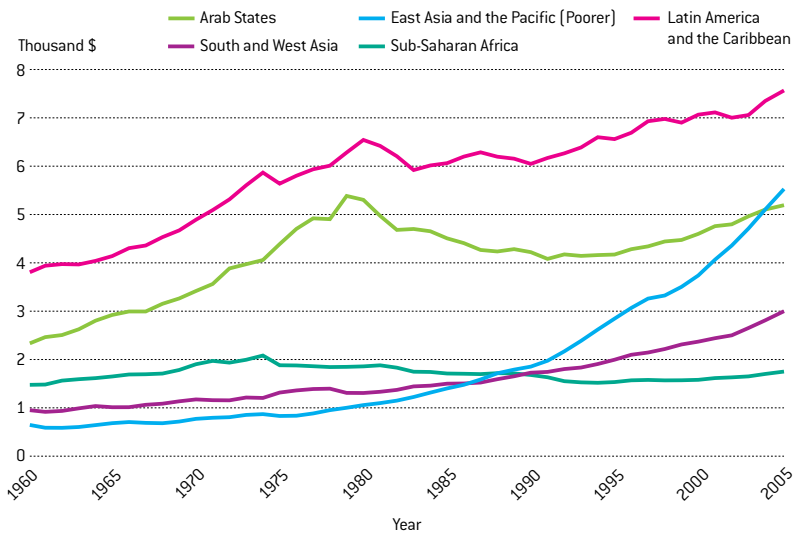
Two other developing regions, the largest of all demographically, experienced less economic disruption in the 1970s and 1980s. Most significantly, the less economically developed countries of East Asia and the Pacific, dominated in size by China, experienced some of the global turmoil of the 1970s but also a spectacular takeoff in economic growth during the 1980s. In still another pattern, South and West Asia—which in the eyes of most observers (and forecasters) in the 1960s and 1970s faced the most challenging burden of poverty and low growth prospects—experienced quite steady albeit slow growth across much of the historical period. Acceleration of growth in India, the region's demographic giant, has begun to move the regional average ahead rapidly in recent years.

Two regions (not shown in Figure 3.5) experienced greater turmoil in the 1990s than the 1980s. The breakdown of communist systems in Central and Eastern Europe and in

Other ideational forces, such as the changing status of women, have also been important factors in education's advance.

The size of the school-age population relative to the adult population is central to the ease or difficulty countries face in expanding education participation.

Figure 3.5 GDP per capita at PPP for selected regions (1960–2005)



Source: IFs Version 6.12 using WDI data.

The level of economic development of a country affects both the demand for education and the country's ability to provide it.

Central Asia greatly disrupted their economies, with recovery to 1990 levels coming only recently for most countries.[6]

Unlike demographics, where the effects of changes in fertility rates, mortality rates, and youth dependency ratios have a straightforward impact on the size of school-age populations, the consequences of fluctuations in income levels on enrollment patterns are not always direct. Countries can and sometimes do adjust to economic downturns by decreasing per-student expenditures rather than decreasing enrollment rates or by reallocating funds to education from other public expenditure categories. Similarly, individuals sometimes choose to advance their education during periods of economic downturn in order to be better positioned for the future, although in the midst of poverty this may not be an alternative. In any case, there was not a 1-to-1 correspondence between the widespread disruption of economic growth in the 1980s and changes in enrollment rates. In general (see, again, Figure 3.1), developing regions experienced a flattening of primary gross enrollment rates during the 1980s but continued growth in secondary enrollment rates (again, Central and Eastern Europe and Central Asia are exceptions). At the tertiary level, enrollment rates were either flat or grew more slowly in all regions (high-income as well as developing) during the 1980s in comparison with the two previous decades and after 1990.

Sociopolitical context

Demographic and economic circumstances are two of the three major systems with which education interacts. The third is the sociopolitical context of a country, particularly aspects of the character and quality of the government. We use three measures for which time-series data are reasonably available in order to explore the sociopolitical context within which the education transition is occurring. One is the extent of democracy, another is the perceived level of corruption, and the third is the extent of state stability or instability.

We use estimates and data from a scale developed by the Polity Project (currently at the Center for Systemic Peace and George Mason University) to explore the extent of democracy in the UNESCO regions from 1960 to 2004,[7] and we show them for developing regions in Figure 3.6 (again excluding Central and Eastern Europe and Central Asia because of a lack of data). The Polity Project's 20-point scale runs from most authoritarian or autocratic to most democratic (the highest values), labeling countries in the middle as "anocracies," or having mixed governments. The Arab States have been autocratic throughout the historical period, especially from 1970 to 1985. In fact, most of the developing regions (all but South and West Asia, in fact) experienced periods of relatively greater autocratic and less democratic governance during the early to middle period of the 1960–2004 time horizon (see Huntington 1991 on the retreat of the second wave of global democratization; also Hughes and Hillebrand 2006: 166–167). However, since 1980 and especially since 1990, democratization has advanced around the world.

Again, as with the economic context, we do not see a 1-to-1 correspondence between democratic governance and growth in education participation. In fact, the first of the two periods of greatest enrollment rate growth (roughly 1960 to 1980) corresponds to the period when most developing regions were displaying a decrease in democracy; the second and more recent period of greatest enrollment rate growth corresponds to the recent advance

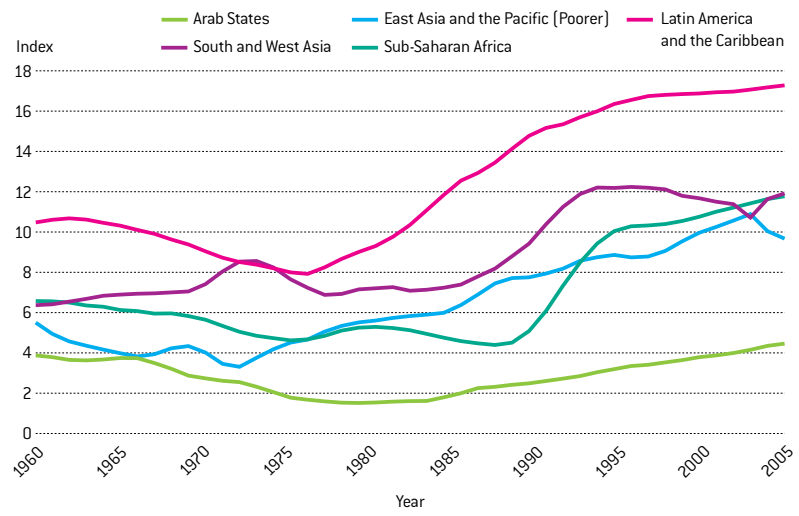
of democratic governance characteristics. We might expect that democracy—with its concern for providing equity, opportunity, and a voice for those who have been excluded—will value education. It seems reasonable that democracy's advance late in the twentieth century, like that of economies, has generally been supportive of education's expansion.

Obviously, democratization is not the only element of sociopolitical context, and for the expansion of education, it might not even be the most important. Although other measures of governance—such as effectiveness, regulatory quality, and lower levels of corruption (Kaufmann, Kraay, and Mastruzzi 2007)—correlate highly with the extent of democratic voice that citizens have, they can also be significantly independent of it (as they are to a considerable degree in Singapore, for example). Transparency International has measured perceived levels of corruption through expert assessments and opinion surveys for over 150 countries since 1995 (Lambsdorff 2008), with estimations going back to 1983 for 54 countries.[8] Though this is one of the longest series of such measures of government performance, the data do not easily allow analysis prior to 1995 because of the much smaller number of countries in earlier estimations.

The Transparency International measure is a 10-point scale, with 10 representing the least corruption. The world average in 2005 was just 3.6 (the North America and Western Europe region was perceived to be the least corrupt, with an assigned score of 7.4). The five developing regions represented in Figures 3.5 and 3.6, as well as Central and Eastern Europe and Central Asia in more recent years, have scored less than 4 points quite consistently and have in aggregate demonstrated little obvious progress. In short, average governance quality as reflected in perceptions of transparency and corruption has been and is poor across most of the developing world, and it does not seem in the aggregate to be related to varying rates of growth in education participation at regional levels.

Still another element of the sociopolitical context that is potentially important to education's advance is political stability and avoidance of domestic conflict. The Political Instability Task Force (formerly the State Failure Project) has collected and analyzed data on events and magnitudes of internal wars and government failures occurring since 1955 (Bates et al. 2003). These events include revolutionary wars, ethnic wars, adverse regime changes, genocides, and politicides.[9] Figure 3.7 shows the average annual occurrence of one or another of these events in the five UNESCO developing regions of this discussion; a value of 1 in a given year would suggest a disruptive occurrence in each country that year. Such events have occurred quite rarely in North America and Western Europe over the entire period, and they have seldom been seen since 1974 in the richer countries of East Asia and the Pacific; they have been quite common, however, in economically developing regions. These kinds of events marked more than 10 percent of the country-years for Latin America and the Caribbean and 20–25 percent of the country-years in the Arab States and sub-Saharan Africa between 1955 and 2001. In the case of the poorer countries of East Asia and the Pacific, the Vietnam War and its aftermath helped spike the frequency of such events to 80 percent of all country-years in the 1970s, as the Iran-Iraq and Afghan wars nearly did for South and West Asia in the 1980s. On a regional basis, education participation has increased despite these disruptions, but within individual countries, extreme conflict and disruption have often

Figure 3.6 Polity measure of democracy for selected regions (1960–2004)

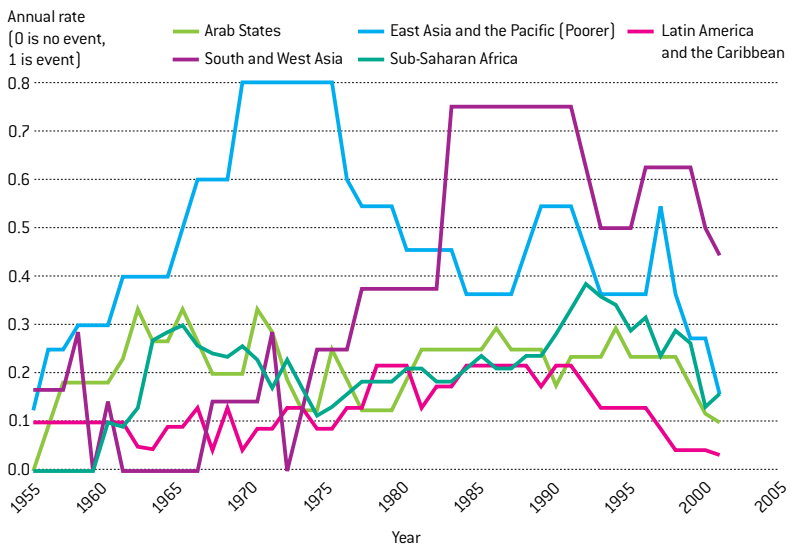


Note: Values are 5-year moving averages.

Source: IFs Version 6.12 using Polity Project data and scale.

State failure characterized by extreme conflict and disruption is associated with serious disruption of education systems as well.

Figure 3.7 Extent of political instability in selected developing regions (1955–2001)



Note: Regional rates are unweighted country averages.

Source: IFs Version 6.12 using data from the Political Instability Task Force.

In general, it is useful to think in terms of multiple, somewhat sequential, and interacting stages of the education transition.

Although there are general patterns to the education transition, there are also variations across regions and among countries within regions.

been associated with large-scale disruptions in education participation (e.g., in Afghanistan and Somalia). In many instances of less extreme disruption, enrollment rates have been less obviously affected. Nonetheless, state failure and disruption can hardly be thought to aid education's advance.

Exploring Patterns of Participation: Subregional and Cross-Regional Analyses

Despite great fluctuations across time and variations across countries and regions in the forces that drive or impede the rate of advance in education participation, there are general patterns to the education transition. The experience of high-income, middle-income, and increasingly also lower-income countries provides a basis for fairly strong expectations concerning the future unfolding of those patterns. Yet there are significant variations in the patterns as well. Looking at clusters of countries organized by characteristics in addition to (or in place of) geographic regions can help us explore both the general patterns and the variations. It can also help us see more clearly the relationships between demographic, economic, and sociopolitical patterns and the patterns of education's advance.

In general, it is useful to think in terms of multiple, somewhat sequential, and interacting stages of the education transition. We most often see a pattern whereby enrollment rates at a given level reach a significant threshold or "takeoff" point before enrollment rates tend to rise strongly at the next-higher level. For example, when primary net enrollment rates are below 80 percent, most countries have lower secondary gross enrollment rates that are 30–40 percentage points below their primary rates—but by the time they reach a 90 percent primary net enrollment rate, most countries have a similar or somewhat higher gross enrollment rate at the lower secondary level. But there are significant variations to this pattern. Some countries even more heavily emphasize high levels of primary net enrollment before building substantial lower secondary systems (e.g., Mauritania, Mozambique, Rwanda, Tanzania, and Uganda), and others have lower secondary enrollment rates that largely track levels of primary net enrollment even at relatively early stages of primary expansion (e.g., Ethiopia, Ghana, and Sudan).

Countries also display differing relationships between gross and net enrollment rates within a single level of education. At the primary level, most countries have gross enrollment rates that are no more than 10–20 percentage points higher than their net or of-age enrollment rates. Some, however, are in a catch-up mode and display a much larger spread between the gross and net enrollment rates; most of these are seriously disrupted and/or rapidly transforming societies in which recently expanded access generates demand among older children who previously lacked the opportunity to pursue education. We see a similar pattern and exceptions in the relationship between secondary gross and net enrollment rates.[10]

Overlaying these stages of enrollment growth is the movement toward gender parity, obviously attained no later than the achievement of universality but typically achieved quite a bit earlier. Wils and Goujon (1998: 367) found that gender parity in terms of girls' participation was approached "at enrollment levels beyond 60 percent for primary and secondary education, and at levels of 20–40 percent for tertiary education."

Further analysis of enrollment patterns in sub-Saharan Africa

The preceding tables and figures in this chapter show clear regional patterns, but they also mask tremendous differences among countries within regions. This is particularly true of a region as large and diverse as sub-Saharan Africa. By clustering sub-Saharan African countries in groups based on their primary net enrollment rates, we can begin to explore these differences.

Table 3.4 lists the sub-Saharan countries in three clusters: (1) those with primary net enrollment rates below 60 percent in 2005,[11] (2) those with primary net enrollment rates between 60 and 79 percent that year, and (3) those with 2005 primary net enrollment rates of 80 percent or above.[12]

Figure 3.8 shows different patterns of primary enrollment change in the three clusters. Although the patterns of all three during the 1980s reflect the economic downturn of that period, the high-enrollment group was able to maintain its previous levels, whereas the middle- and low-enrollment groups lost gains from the prior period. The high-enrollment group was also able to climb more steeply as the world economy improved, and it has now maintained a rapid primary enrollment growth rate for over a decade.

Figure 3.9 extends the story of change by turning to secondary gross enrollment rates for the same sets of countries. All three clusters began the period with extremely low secondary gross enrollment rates—from just 1.2 percent in the cluster of countries with low primary enrollment rates to 7.3 percent in the cluster with high primary enrollment rates. What Figure 3.9 makes clear is the substantial and rapid advance the sub-Saharan African high primary enrollment countries have made in secondary enrollment rates since 1980. For these countries, extrapolation suggests a period of just seventy-five years for the transition from 10 percent to 90 percent gross secondary enrollment—"blistering speed" indeed. The other two groupings also made significant gains in secondary gross enrollment rates during the 1960s and 1970s, but they then experienced prolonged periods of flat rates during the years of economic downturn. For them, the secondary enrollment transition is taking much longer.

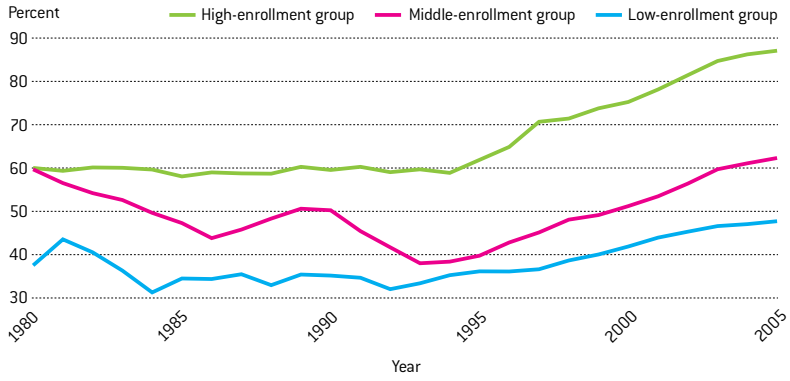
Analysis of sub-Saharan African country subgroups helps us see relationships between other variables (e.g., demography) and patterns of education's advance.

Table 3.4 Sub-Saharan African countries by primary net enrollment rate (2005)

Low-enrollment group (below 60 percent)	Middle-enrollment group (60–79 percent)	High-enrollment group (80 percent and above)
Angola	Benin	Botswana
Burkina Faso	Cameroon	Cape Verde
Burundi	Chad	Equatorial Guinea
Central African Republic	Ethiopia	Gabon
Comoros	Gambia	Madagascar
Congo, Dem. Rep. of	Ghana	Malawi
Congo, Rep. of	Guinea	Mauritius
Côte d'Ivoire	Kenya	Namibia
Eritrea	Lesotho	São Tomé and Principe
Guinea-Bissau	Liberia	South Africa
Mali	Mozambique	Tanzania, United Rep. of
Niger	Nigeria	Uganda
Sierra Leone	Rwanda	Zambia
Somalia	Senegal	Zimbabwe
	Swaziland	
	Togo	

Source: IFs Version 6.12 using UIS data.

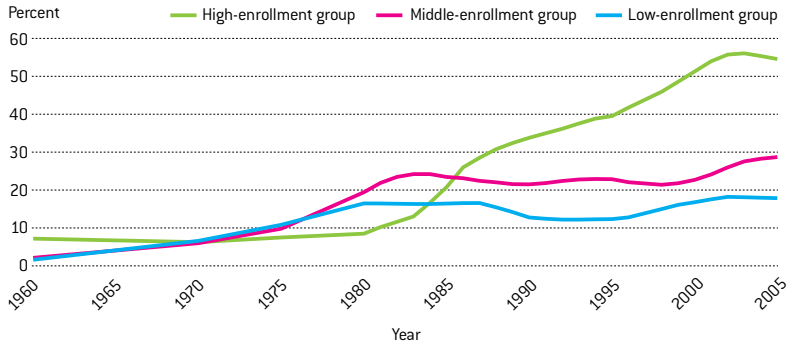
Figure 3.8 Primary net enrollment rates in sub-Saharan African country clusters (1980–2005)



Note: Values are 5-year moving averages; insufficient data to include period from 1970–1980.

Source: IFs Version 6.12 using UIS data.

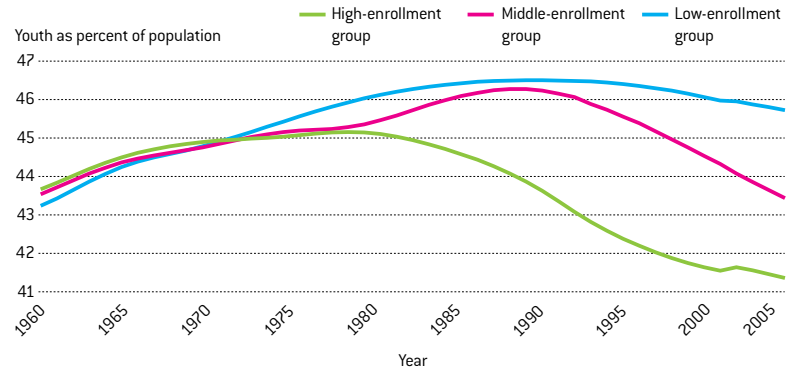
Figure 3.9 Secondary gross enrollment rates in sub-Saharan African country clusters (1960–2005)



Note: Values are 5-year moving averages after removing 1997 from all groups because of scant or nonexistent data.

Source: IFs Version 6.12 using UIS data.

Figure 3.10 Youth dependency ratios in sub-Saharan African country clusters (1960–2005)



Source: IFs Version 6.12 using WDI data.

Perhaps most remarkable, the primary high-enrollment country cluster has been able to expand its secondary enrollment rates consistently and dramatically for some twenty-five years, including throughout the economic downturn of the 1980s. However, the apparent reversal of growth in this group's enrollment rates in the most recent years is of concern. Neither recent demographic trends nor recent economic trends seem to explain this slowing. Some of the apparent change in pattern results from year-to-year differences in the subset of countries reporting. However, inspection of individual country patterns also reveals a general flattening and even, in some cases, a modest decrease in rates. It may be that a period of consolidation is following a long period of sustained growth, hopefully to serve as a plateau or platform from which further growth will ensue.[13]

The gains made by sub-Saharan African countries in bringing children into school at the primary level and now increasingly into the secondary level are quite extraordinary given their demographic, sociopolitical, and economic circumstances. With respect to demographics, children and youth under fifteen years of age accounted for 37 percent of the world's population in 1960 but 43.5 percent of sub-Saharan Africa's population. Today, the child and youth dependency ratio, worldwide, is 28. In sub-Saharan Africa, it remains over 40 percent—specifically, 41.5 percent in the primary high-enrollment cluster, 43.6 percent in the middle-enrollment cluster, and 46.2 percent (higher than in 1960) in the low-enrollment cluster (see Figure 3.10).

Although the dependency ratios remain absolutely high in all three groups, there are differences among them, explained in large part by differing changes in fertility rates. In 1960, the total fertility rate of all groupings was 6.6–6.7 children per woman. By 2005, the fertility rate in the high-enrollment group was 4.7, and in the middle-enrollment group it was 5.3. In the low-enrollment group in 2005, it was still over 6.3 children per woman. As a result, the youth dependency ratio of the high-enrollment group peaked earlier and at a lower level than that of the other two groups, whereas the youth dependency ratio of the low-enrollment group peaked highest and latest. Preparing to

look forward in subsequent chapters, we note that all three country subgroups now exhibit a promising downward movement in dependency ratios. It appears that the middle-enrollment group, in particular, may be poised for some educational "lift."

Looking at other elements in the context of education's advance across the three clusters, we see that in 1960, the primary high-enrollment group enjoyed an average GDP per capita almost twice that of the low-enrollment group; at that time, the GDP per capita of the low-enrollment group was almost twice that of the middle-enrollment group. Although all groups (especially the high-enrollment cluster) grew somewhat until the mid-1970s, none exhibited economic advance between that time and the end of the century. In fact, the low-enrollment group has lost ground since the mid-1970s, falling below the GDP per capita of the middle-enrollment group in the early 1990s, and found itself in worse condition in 2005 than in 1960 (e.g., its GDP per capita was $980 in 2005 compared to $1,516 in 1960).

In terms of sociopolitical context, the democracy level of the primary high-enrollment group (as measured by the Polity Project scale discussed earlier) was higher in 1960 than that of the other two, and it remained roughly stable through the 1970s and 1980s even as the two other groups became more authoritarian. All three groups have benefited from substantial democratization since the late 1980s, and all have been at or above the midpoint on the Polity Project scale for a number of years. However, all three groups have experienced fairly regular political instability or conflict on a consolidated measure of events using the data of the Political Instability Task Force. Interestingly, however, the countries in the middle- and high-enrollment groups have benefited from a decline in the rate of such events since the 1990s, whereas the low-enrollment group has experienced a rather marked increase. With respect to perceptions of corruption (as measured by the Transparency International scale referred to earlier), all three groups are perceived (on average) as being corrupt, with the primary high-enrollment group somewhat less so.

It remains very difficult to sort out the causality in all of these relationships, but it does appear that differences in demographic patterns significantly influenced the pace of education change in the three sub-Saharan African groups since the mid-1950s, and that the high-enrollment sub-Saharan African countries are now benefiting from a virtuous cycle linking demography, education, the economy, and the sociopolitical environment. Various data also suggest that countries in the middle-enrollment group are possibly on the threshold of a similar cycle. Quite different prospects for the coming years are likely across the three country clusters.

Beyond sub-Saharan Africa: Primarily secondary concerns

Although completion of the transition to universal primary education remains an issue not only for sub-Saharan Africa but also for a relatively small number of other countries, the central struggle of countries outside sub-Saharan Africa is now most often that of raising enrollment rates at the secondary level—and particularly at the lower secondary level for the completion of basic education. Having considered sub-Saharan Africa in the preceding section, we can look at Table 3.5 for a list of the twenty-seven countries outside sub-Saharan Africa with low- and middle-

Sub-Saharan African countries have made large gains in bringing children into primary school, and they are increasingly doing so at the secondary level as well.

Quite different prospects for the coming years are likely across the three sub-Saharan African country clusters.

Table 3.5 Countries outside sub-Saharan Africa with low and middle lower secondary gross enrollment rates (2005)

Low-enrollment group: below 60 percent (SSA excluded)	Middle-enrollment group: 60–79 percent (SSA excluded)
Afghanistan	Bangladesh
Bhutan	Ecuador
Cambodia	Honduras
Djibouti	India
Guatemala	Indonesia
Haiti	Israel
Iraq	Morocco
Lao PDR	Nepal
Mauritania	Nicaragua
Myanmar	Paraguay
Pakistan	Timor-Leste
Papua New Guinea	Trinidad and Tobago
Solomon Islands	
Vanuatu	
Yemen	

Source: IFs Version 6.12 using UIS data.

The central struggle of developing countries outside sub-Saharan Africa is now most often that of raising enrollment rates at the secondary level.

In countries with low or "middle" enrollment rates at the lower secondary level, the picture is one of progress but also of slow rates of growth.

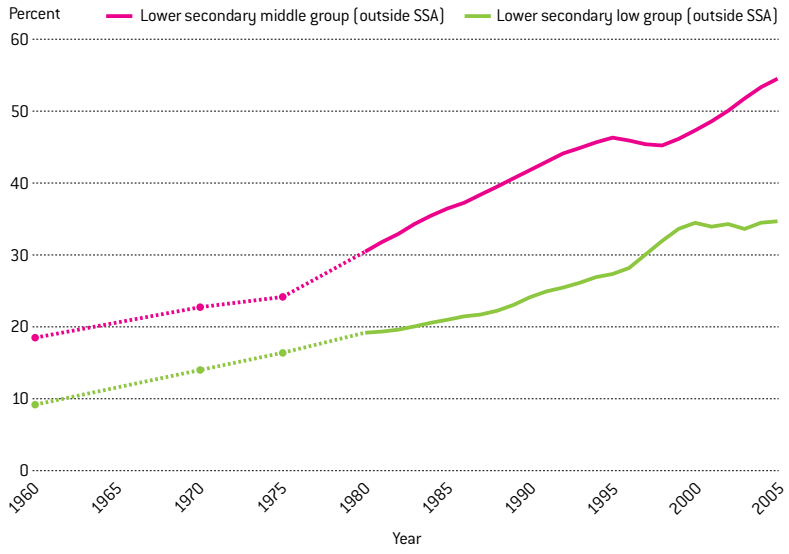
level lower secondary enrollment rates in 2005, arranged in two categories: (1) those with lower secondary gross enrollment rates below 60 percent, and (2) those with lower secondary gross enrollment rates between 60 and 79 percent.

Relatively speaking, countries in the Arab States and the poorer countries of East Asia and the Pacific are predominant in the low-enrollment cluster, and Latin American and Caribbean countries are significantly represented in the 60–79 percent enrollment cluster. South and West Asian countries are evenly represented in the two groups. Because we do not have an extended time series for lower secondary enrollment rates, Figure 3.11 shows the historical pattern of these countries in total or "all-of-secondary" gross enrollment rates.

As with the sub-Saharan African groupings of primary low- and middle-enrollment rate countries, the picture here is one of progress but also of slow rates of growth. Over a period of 45 years, the gross enrollment rate in countries with low enrollment rates at the lower secondary level only rose from 9 percent to 34 percent, and the middle-enrollment group rose from 18 to 53 percent. By extrapolation, those rates suggest 10–90 percent secondary enrollment rate transition periods of 190 and 119 years, respectively. These countries historically have had the slowest pace of secondary enrollment rate growth in the world except for the primary low-enrollment cluster in sub-Saharan Africa.

Given complex bidirectional relationships, in trying to understand the difference in educational performance between these two country sets we cannot talk so much about "drivers" as about "concomitants" in demographic, economic, and sociopolitical patterns. For example, the child and youth dependency ratios of the two groupings in the early 1960s were nearly identical, at 41–43 percent. The dependency ratio for the middle-level lower secondary enrollment group then began to decline in the 1960s, whereas it stayed high in the low-enrollment group until the late 1980s—another twenty-five years—before beginning a steep decline. Certainly, the additional population proved a handicap for the expansion of education in the low-enrollment group. Economically, the low-enrollment group actually had a small edge in GDP per capita at PPP throughout the 1960s and until the mid-1980s, but the group has experienced essentially no growth since 1980, even as the midlevel group has more than doubled its GDP per capita. Although there has been only a limited difference between the groups on perceptions of corruption, the midlevel group began the 1960s with a slightly higher level of democracy, and the gap has expanded (albeit erratically) over time, reaching about 6 points on the 20-point Polity Project scale by the early part of this century. And though both groups have experienced considerable conflict and instability on a consolidated measure of such events using the data of the Political Instability Task Force, the incidence has been higher in the low-enrollment group. Between the mid-1960s and the mid-1990s, the members of the low-enrollment group experienced, on average, a probability of about 0.5 of having some adverse event occur in any given year, compared to about half that probability in the middle-enrollment group. In

Figure 3.11 Secondary gross enrollment rates in countries outside sub-Saharan Africa with lower secondary low- and middle-enrollment rates (1960–2005)



Note: Data are very spotty until 1980 and so are shown with a dashed line. After 1980, values are 5-year moving averages after removing 1997 in the low-enrollment group because of inconsistent data.

Source: IFs Version 6.12 using UIS data.

short, the context for education's development (and human development more generally) improved in the middle-level enrollment group over time in what appears to be a positive feedback dynamic.

Education Spending

Another critical element of the education transition lies in patterns of financing. Total societal spending on education relative to the size of the economy tends to rise as countries become wealthier (or less poor), and spending per student at different levels of education changes in relatively consistent ways. Certainly, no given level of expenditures assures quantitative advances in education, much less educational quality. At the same time, however, it is difficult to imagine the success of the education transition without trained and appropriately compensated teachers, adequate infrastructure for education (e.g., schoolrooms and transportation systems that bring students to them), sufficient instructional materials, and more. In short, though expenditure patterns can be and often are inefficient, some significant level of expenditures is obviously essential.

Public spending: Global patterns

Two measures of education spending frame the discussion of total public spending levels: (1) public spending as a percentage of GDP, and (2) public spending as a percentage of total government spending.[14] In our analyses and forecasts, we focus on the first measure because it puts education spending in the context of total societal resources. Within that context, education is a "superior good" in economic terms, and societies spend greater portions of income on superior goods as they become more well-to-do. Thus, in general, education spending as a portion of GDP rises with GDP per capita. Education funding as a portion of total government spending is also a useful measure of societal commitment. In distinction from education spending as a percent of GDP, however, education funding as a portion of total government spending tends to decrease as societies become richer because total government spending, especially on transfer payments and health, rises even faster than that on education.

Globally, governments spent approximately $1.5 trillion on formal education in 2005, or about 4.8 percent of GDP. Figure 3.12 shows that there is tremendous variation in the percentage of GDP spent on education by country but also confirms a tendency for that spending to increase with GDP per capita.

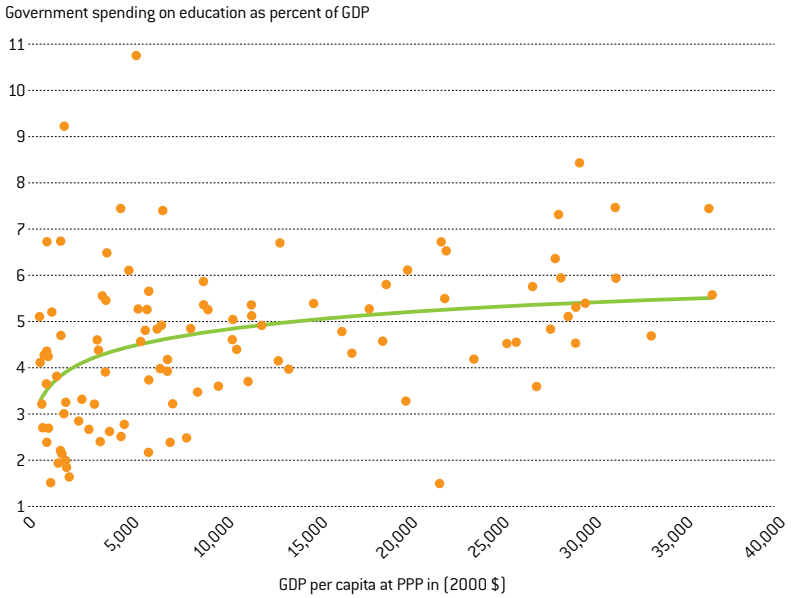
The tendency to increase education spending as a portion of GDP with increases in GDP per capita has helped boost the spending ratio over time, since GDP per capita has increased in almost all regions over the past several decades. Figure 3.13 shows patterns for the period from 1970 to 2005 for countries in four World Bank income categories.[15]

Two patterns stand out in Figure 3.13. The first, true throughout the period, shows that the higher the country income category was, the greater the portion of GDP the countries committed for education. The second is a trend toward convergence, such that the differences in public funding by country income levels diminished quite markedly over time. In fact, the difference between upper middle-income economies and high-income economies had all but closed by 2005 as the result of two things: (1) an increase of almost 40 percent in the

Total societal spending on education as a share of GDP tends to rise as countries become wealthier (or less poor).

In 2005, governments spent about $1.5 trillion on formal education, or about 4.8 percent of global GDP.

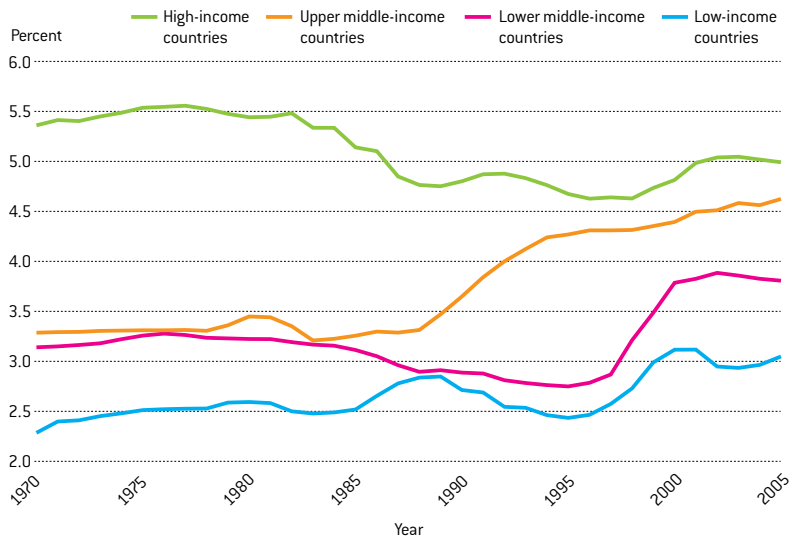
Figure 3.12 Public spending on education as a function of GDP per capita at PPP



Note: Equation: y = –0.1925 + 0.5491 Log(x); R-squared = 0.14

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Figure 3.13 Public expenditures on education as a portion of GDP by World Bank country economy classification (1970–2005)



Note: Values reflect 5-year moving averages and reporting intervals to smooth the data.

Source: IFs Version 6.12 using UIS and WDI data.

Differences in public funding for education by country income levels have diminished quite markedly over time.

portion of GDP spent on education by the upper middle-income countries over the period, and (2) a slight decrease in the proportion spent by high-income economies as their proportion and absolute number of school-age children declined. Low-income economies also increased the proportion of GDP spent on education by one-third over the same period. The least growth in public expenditures as a proportion of GDP has occurred in the lower middle-income economies, which include China, India, and Indonesia.[16]

External assistance has also supported rising spending in some countries. Between 1999 and 2004, commitments of aid from donor countries more than doubled, from $1.3 to $3.3 billion (UNESCO 2007a: 42). Although that amount is miniscule in the scope of global spending, it can be extremely significant for the very poorest countries.[17]

For all developing countries, it is likely the flat to declining expenditure rates in the 1980s were related, at least in part, to the global debt crisis of that period and the constraints it placed on spending. Near the end of the twentieth century, spending stabilized or climbed again in all country income groups. Many expected an economic dividend from the end of the Cold War, which resulted in a decline between 1990 and 2000 of more than 1 percent in GDP directed to the military in poor countries and something closer to 2–3 percent for the richest. That fact may account for part of the increase in education spending near the end of the century. Another portion almost certainly reflects somewhat faster economic growth around the world relative to the 1980s, as well as some success in dealing with the spending constraints associated with the debt crises following the oil shocks of the 1970s. Almost certainly, the increasingly obvious emergence of the global knowledge economy also helps explain the upward movement after the mid-1990s.

Turning to allocations of expenditures across levels, approximately 5 percent of global public education expenditures are at the preprimary level, 30 percent at the primary level, 40 percent at the secondary level (split quite equally between lower and upper secondary levels), and just over 20 percent at the tertiary level (the high share of tertiary reflects the higher per-student cost of tertiary education and the high tertiary enrollment rates in high-income countries). Behind these global averages are wide ranges.

Public spending: Regional patterns

Table 3.6 helps us see the considerable regional variation that lies below the pattern tied to income levels. Because of oil revenues, spending on education in the Arab States was already relatively high for a developing region in 1970, and it has since, with fluctuations, climbed higher. Three developing regions (Central and Eastern Europe, Latin America and the Caribbean, and sub-Saharan Africa) increased the share of GDP going to education by 1.0–2.2 percentage points from 1970 to 2005, bringing them into the range of 4–5 percent of GDP, similar to the spending range of high-income countries. Sub-Saharan Africa in particular consistently increased its share of GDP going to education over the period, demonstrating a quite extraordinary shift from 2.9 to 5.1 percent of GDP.[18] South and West Asia increased its share during the period also but much more modestly.

Perhaps unexpectedly, the East Asia and the Pacific poorer-country group not only began the period with the lowest level of GDP committed to education but also remained at essentially

the same level throughout the period. In part, this situation may reflect the fact that eight of the nineteen countries in the region (including China and Indonesia, the two largest countries) continued to charge tuition for public primary education at least as recently as 2006 (UNESCO 2007a: 112). However, in recent years, China has announced a plan to significantly increase the portion of its economy committed to education.[19] Central Asia is the other developing region exception to increased proportional resources to education; its public funding for education has fallen dramatically in the postcommunist era, which does not bode well for the future development of human potential.

The Dakar Framework for Action, agreed upon at the World Education Forum in 2000, declared that "no country shall be thwarted from meeting the [Education for All] goals due to a lack of resources" (UNESCO 2007a: 3). It seems highly improbable that expenditure shares of GDP in the 1–3 percent range, which characterized about thirty countries between 2000 and 2005, are adequate to provide universal primary education (much less good-quality primary education) with even modest attention to other levels of education. The push in recent years for higher intake and completion rates has strained the economic resources of low-income countries, and some have been unable or have failed to respond with public support. For a sense of the contrast, note that the lower secondary low-enrollment rate countries discussed earlier spend, on average, less than 2.5 percent of their GDP on education, whereas the African countries with high primary net enrollment rates average over 5 percent.

The push in recent years for higher intake and completion rates has strained the economic resources of low-income countries.

Public spending per student

We turn now from aggregate public spending to public spending per student, typically expressed as the public expenditure for one year of education for one student as a percentage of GDP per capita. Spending per student relative to GDP per capita is a useful comparative measure because salaries, which vary with GDP per capita, on average make up 75 percent of total education spending from preprimary through upper secondary levels.[20] Other current spending (e.g., for instructional materials) is on average 15 percent of the total, and capital spending constitutes the balance.

Table 3.7 provides a picture of how public per-student expenditure patterns varied by level and global region in 2005. We see, for example, that high-income regions spent, on average, about 20 percent of GDP per capita to educate each primary student, whereas some developing regions spent a considerably smaller portion of GDP per capita on each primary

Per-student expenditures vary widely across countries and education levels.

Table 3.6 Public spending on education as a percentage of GDP (1970–2005)

	1970	1980	1990	2000	2005
Arab States	3.8	3.2	4.8	5.0	4.0
Central and Eastern Europe	3.6	3.5	3.8	3.8	4.6
Central Asia				3.3	2.5
East Asia and the Pacific (Poorer)	2.2	2.2	2.0	2.3	2.1
Latin America and the Caribbean	3.2	3.2	3.1	4.3	4.8
South and West Asia	2.9	3.3	3.4	4.0	3.4
Sub-Saharan Africa	2.9	3.7	4.9	4.8	5.1
East Asia and the Pacific (Richer)	3.0	4.0	4.1	3.8	3.7
North America and Western Europe	5.9	6.0	4.8	5.0	5.3
World	4.9	5.0	4.4	4.5	4.8

Note: Used estimation and 5-year moving averages for East Asia and the Pacific (Poorer) to adjust for missing data for China in 2000 and 2005 and for Indonesia in 2000; excluded Central Asia in 1990 and earlier because of much missing data.

Source: IFs Version 6.12 using UIS and WDI data.

Table 3.7 Public expenditures per student as percent of GDP per capita at PPP (2005)

	Primary	Secondary	Tertiary
Arab States	17.0	26.0	66.9
Central and Eastern Europe	17.3	21.7	19.7
Central Asia	8.5	9.1	10.6
East Asia and the Pacific (Poorer)	8.6	8.8	17.5
Latin America and the Caribbean	14.7	14.9	32.8
South and West Asia	9.0	16.4	55.8
Sub-Saharan Africa	14.6	26.3	175.5
East Asia and the Pacific (Richer)	20.8	21.9	17.4
North America and Western Europe	19.8	24.0	27.4
World	14.1	19.0	46.2

Source: IFs Version 6.12 using UIS and WDI data.

Societies in relatively early stages of expanding a particular education level generally face high cost structures at that level.

Education systems around the world frequently display a complex intermingling of public and private auspices and funding.

student. We also see from Table 3.7 that public per-student expenditures tend to rise across the levels of education, and dramatically so in some developing regions.

One of the burdens experienced by countries struggling to expand education is that costs per student tend to be higher at low rates of enrollment than at high rates of enrollment. In Table 3.7, the expenditures per student at the tertiary level in sub-Saharan Africa illustrate that pattern most vividly. Reasons for this phenomenon include the costs associated with building new physical and administrative infrastructures and the costs of employing teachers. Teachers may be especially expensive in the absence of a well-developed system (secondary or above) for teacher preparation, as demand for their services frequently outstrips supply when an education system is in the early stages of expansion. Thus, societies that are still in relatively early stages of building their primary systems and that do not have significant secondary systems generally face high cost structures.

As GDP per capita rises, enrollment rates at all levels tend to rise as well. Because growth in GDP per capita pushes per-student spending up even as increases in enrollment rates push per-student expenditures down, the patterns of spending per student, especially for low- and middle-income societies, can be greatly varied. However, as societies become wealthier and enrollment rates reach quite high levels, public spending per student tends to stabilize. Higher enrollment levels suggest both economies of scale and experience in education delivery, either or both of which can mitigate continued increases in per-student costs. We can see in Table 3.7 that the two countervailing forces (the upward pressure of income growth versus the downward relief from enrollment rate growth) are still very active at the tertiary level.

The Role of Private Education

Private education plays a perhaps surprisingly large role in many global regions, and in some parts of the developing world it is playing a growing role. Data concerning private education are limited—especially with respect to its change over time—but we have at least some sense of its extent and of the distinctions between private auspices and private funding.

Private enrollment

UNESCO (2007a: 46) distinguishes between public and private education "according to whether a public agency or a private entity has ultimate control over the institution, regardless of the source of funds." Most countries now provide data that distinguish the relative proportions of students in public and private schools at the primary and secondary levels (see Table 3.8). The percentages of enrolled students in private institutions in 2005 reflect very different regional patterns both within and across the levels.[21] The very high secondary percentage in South and West Asia especially reflects the prevalence of private upper secondary education in the region (e.g., in recent years over 90 percent of secondary students in Bangladesh and over 50 percent in India).

Private spending

As the UNESCO distinction between public and private institutions on the basis of auspices rather than funding suggests, education systems around the world frequently display a complex intermingling of public and private auspices and funding. Particularly in developing regions, public funds frequently support, in whole or in part, the education costs of students in private schools.[22] In fact, whereas local communities, individuals, or private entities manage both

types, UNESCO (2007a: 46, 48) distinguishes between "government-dependent private schools" and "independent private schools" based on the proportion of government funding they receive. In some countries, many of the independent private schools are affiliated with religious organizations, whereas many of the government-dependent private schools have been established specifically to increase capacity in education systems.

The complex connections between public and private auspices and funding undoubtedly create opportunities in many instances for the expansion of education and for education that is responsive to the needs of local communities. At the same time, a heavy reliance on private institutions can also be an indication of public systems that are not performing adequately (see Box 3.3).

Just as enrollment in a private institution does not necessarily indicate family responsibility for costs (particularly at the primary level), neither does enrollment in a public institution necessarily indicate that students and families pay no tuition. Despite the Dakar Framework's stipulation regarding free and compulsory primary education, thirty-five countries still officially levied private tuition fees at public primary schools in 2006, and other countries may have unofficially required them as well (UNESCO 2007b: 112). However, thirteen other countries abolished tuition fees at the primary level between 2000 and 2006.[23]

UIS reporting of the private funding of education began with 1999 data. The reporting remains extremely spotty; in 2005, only 47 of the 207 countries in the UIS database included any private funding data, and many of those provided only partial data (e.g., aggregated across all levels or specified for some levels but omitted at others). However, it is clear that for some countries, private funding is substantial.

For the countries reporting a total private funding figure in 2005, private funding was 1.6 percent of GDP. In comparison with the global public funding average of 4.8 percent of GDP, this suggests that private support for education might be as high as 25 percent of total education funding (although countries with large private shares are probably more likely to report). For the countries reporting private expenditures by education level, private funding, on average, represented 0.1 percent of GDP at the primary level, just over 0.2 percent at the secondary level, and about 1.2 percent at the tertiary level. Clearly, at least for the countries reporting, tertiary education receives the bulk of private funding, consistent with the social value that governments place on providing basic education and with the increasing private value attributed to higher education.

Table 3.8 Enrollment in private institutions as percent of total enrollment (2005)

	Primary	Secondary
Arab States	16	15
Central and Eastern Europe	1	2
Central Asia	1	1
East Asia and the Pacific (Poorer)	12	21
Latin America and the Caribbean	13	21
South and West Asia	17	40
Sub-Saharan Africa	11	13
East Asia and the Pacific (Richer)	3	21
North America and Western Europe	11	14
World	8	16

Note: Values are 5-year moving averages.

Source: IFs Version 6.12 using UIS data.

Thirty-five countries still officially levied tuition fees at public primary schools in 2006.

Box 3.3 Public responsibility and private education: A perspective from the field

Too often dysfunctionality characterizes public systems of formal education. In response, private players step in to meet the demand for quality education, resulting in an indiscriminate mushrooming of unregulated private schools as well as teacher training institutions. This movement towards privatization as a direct consequence of a dysfunctional public system of education is likely to reduce the share of state funding in elementary education, thereby institutionalizing prevalent inequities in terms of access to quality education. This too often results in the slow but sure erosion of state responsibility and the failure to create sustainable systemic provisions for basic education.

Poonam Batra, Professor of Education
Maulana Azad Centre for Elementary and Social Education
University of Delhi

The limited data available suggest that private funding for education might be as high as 25 percent of total education funding in some regions.

The geographic pattern of the countries reporting private funding clearly seems to suggest that it is concentrated in higher-income countries and regions.[24] However, all thirty-five of the countries still charging tuition for public primary education in 2006 were in developing regions of the world, and private funding data for only four of them are included in the UIS database. Obviously, there are a number of countries in developing regions where private funding is contributing to education but is not yet included in administrative reporting to UIS.

The very spotty reporting not only makes it hard to determine the extent of private funding but also makes it hard to know how it is used. If such funding has been necessary in order to create capacity for rapidly expanding access, the dynamics and outcomes are very different than if it is used primarily to provide higher quality education for those who can afford to pay to attend elite schools. In the first case, as capacity is built and government resources increase, tuition fees can reasonably be abolished. In the second case, a two-tier system is created that perpetuates social distinctions and unequal opportunities.

It is important to note that IFs forecasts of costs and resources for expanded participation in education are forecasts of public sources only. The discussion of the IFs education model in the next chapter describes some of the implications of this approach, which is made necessary by the sparse data on private funding.

The education levels of adult populations fundamentally shape social change.

Adult Populations: Education Attainment

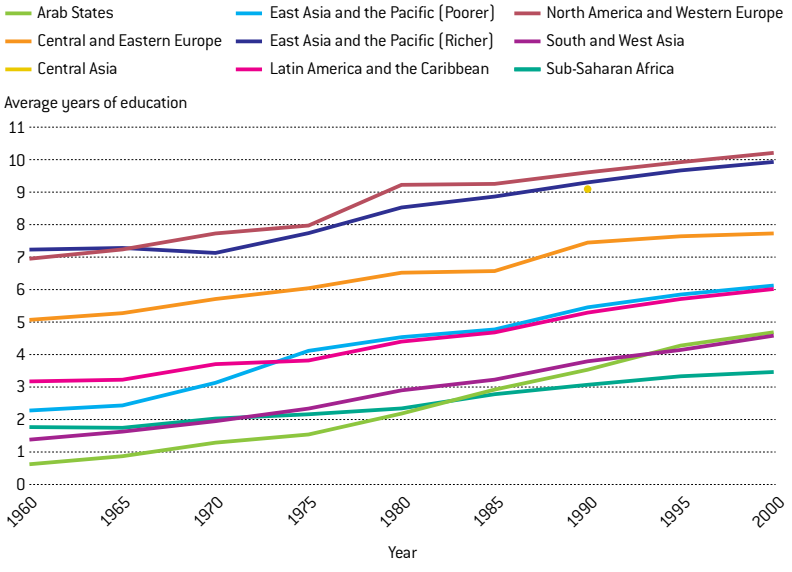
Students in school become adults in the workforce and in society more broadly, and the education levels of the adult population fundamentally shape social change. The education level of women in their childbearing years affects fertility rates, education of those in the workforce affects economic productivity, and education of voters of all ages has important implications for the stability of democracy. Hence, an understanding of education attainment has great importance for us.

The transition of adult populations to high levels of education attainment lags well behind the transition in participation rates of school-age children. Given the very low rates of participation in formal education among today's older adults in many countries—as well as life spans that encompass multiple generations—the playing out of the education transition across a country's adult population requires more than a century. Wils (2002: 3), for example, estimated that the "rise from 10 percent adult literacy to 90 percent takes from 60–100 years" and that the "rise from 10 percent adult primary education (and even less secondary) to 90 percent secondary education among adults takes about 150 years or 7 generations."

Average years of education

As discussed in Chapter 2, one of the most common measures of education attainment is the average years of education completed by those age twenty-five or older or, alternatively, of those age fifteen or older.[25] We use fifteen or older in this analysis in order to see changes in education attainment with less of a time lag and also because adult roles and responsibilities to work, family, and community frequently begin before age twenty-five. Barro and Lee (2000, 2001) and Cohen and Soto (2001, 2007) have compiled such information, most often using census survey data supplemented by estimations from UNESCO enrollment data.[26] Despite using

Figure 3.14 Average years of education in population age 15 and older (1960–2000)



Note: Central Asia has data for 1990 only.

Source: IFs Version 6.12 using data from Barro and Lee (2001).

similar data sources, the two teams arrived at somewhat differing results due to differences in methodology. Although both datasets are in the IFs historical series, we primarily use the Barro and Lee dataset in analyses because it includes separate measures for males and females, allowing the representation of levels of education attainment by age and sex.

Figure 3.14 shows the growth, since 1960, of average years of education completed by those fifteen years of age and older across the UNESCO country groupings. The figure suggests distinct sets of regions. First, the richer countries of East Asia and the Pacific and North America and Western Europe stand well apart from all other regions, maintaining over time their absolute lead in education years. (It is noteworthy that the richer East Asia and the Pacific region had an education stock level similar to that of North America and Western Europe already in 1960, early in the development surge of Japan and ahead of the development surges of the Republic of Korea and Singapore.) Second, South and West Asia, sub-Saharan Africa, and the Arab States stand out as the regions whose adults have had the fewest years of education throughout the period. Yet the Arab States, which began the historical period with the lowest average years of education, have progressed most rapidly.

With the exception of the Arab States, all regions have advanced roughly in parallel—albeit from very different starting points. The result is that the absolute difference in number of average years across regions has not changed much since 1960. However, in addition to average years increasing in every region, there has been some relative convergence in positions. In 1960, the relative distance between the region with the highest average education years and the region with the lowest was a ratio of over 7:1 for North America and Western Europe compared to the Arab States. In 2000, the greatest distance was a ratio of 4:1 for North America and Western Europe compared to sub-Saharan Africa.

Adult education by completed level

Table 3.9 adds to the description of education attainment by displaying the proportions of adult populations that had completed different levels of education across the same time period. Most fundamentally, the progress in nearly all regions at all levels suggests that a global education revolution, not just a global education transition, is under way. Yet it is also striking that, at the beginning of the twenty-first century, less than 50 percent of the population fifteen years of age and over in the Arab States, South and West Asia, and

Average years of education have increased substantially in all regions since 1960; progress has been most rapid in the Arab States.

Although change is rapid nearly everywhere, the advance of education attainment across the life spans of adult populations is in its early stages.

Table 3.9 Completed education by level in population 15 years of age and older (1960–2000)

	Primary			Secondary			Tertiary		
	1960	1980	2000	1960	1980	2000	1960	1980	2000
Arab States	6.4	20.4	42.2	0.9	5.7	15.2	0.1	1.2	3.3
Central and Eastern Europe	60.7	76.3	84.1	13.0	17.0	28.8	1.8	3.9	8.7
Central Asia									
East Asia and the Pacific (Poorer)	24.4	44.1	59.3	3.2	10.5	17.9	0.7	0.8	2.5
Latin America and the Caribbean	27.4	37.8	49.9	5.8	11.0	19.6	0.9	2.0	4.8
South and West Asia	10.6	24.6	37.2	0.8	7.4	11.2	0.1	0.7	2.0
Sub-Saharan Africa	14.3	18.1	27.3	1.8	1.9	4.5	0.2	0.3	0.9
East Asia and the Pacific (Richer)	70.1	78.1	87.0	28.2	31.1	44.8	2.6	7.5	12.0
North America and Western Europe	73.3	82.0	85.5	18.1	24.0	50.5	3.6	7.5	15.1
World	39.0	46.5	55.9	9.0	12.0	21.1	1.2	2.4	4.8

Note: No data are available for Central Asia.

Source: IFs Version 6.12 using data from Barro and Lee (2001).

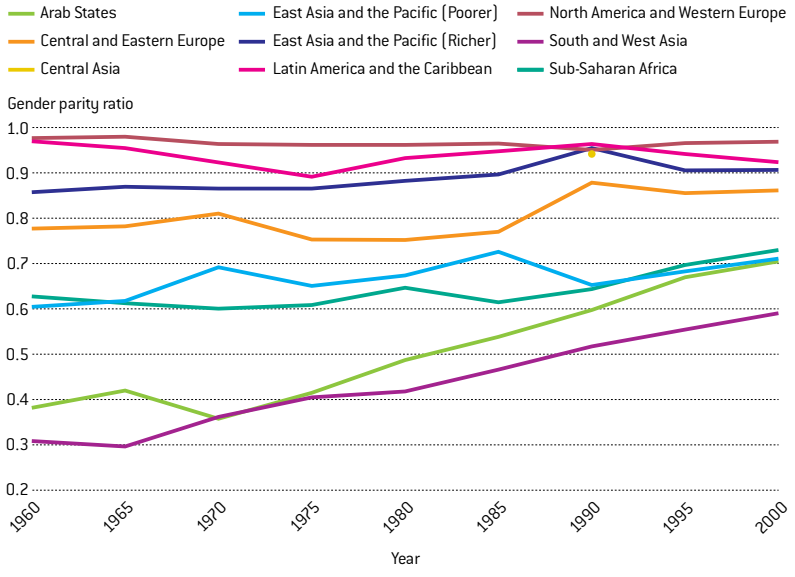
In 2000, even in North America and Western Europe, only 50 percent of adults had completed a secondary education.

sub-Saharan Africa had a primary education (and just 50 percent in Latin America and the Caribbean); that less than 20 percent in these regions and in the poorer countries of East Asia and the Pacific (and just 20 percent in Latin America and the Caribbean) had completed a secondary education; and that in all developing regions, 5 percent or less had completed a tertiary education. Although change nearly everywhere is rapid, the advance of education attainment across the life spans of adult populations remains in its early stages (note, for example, that in 2000, only 50 percent of all adults in North America and Western Europe had completed a secondary education).

Gender balance of adult education attainment

Figure 3.15 demonstrates that rough gender parity, as measured by average years of education, has characterized adult populations in Latin America and the Caribbean and in North America and Western Europe for a long period. Among the other regions, the two with the least parity in 1960 (the Arab States at .38 and South and West Asia at .31) have progressed most rapidly since that time.

Figure 3.15 Gender parity ratio of average years of education in population 15 years of age and older (1960–2000)



Note: Removed 1970 from Latin America and the Caribbean; data for Central Asia are available only for 1990.

Source: IFs Version 6.12 using data from Barro and Lee (2001).

The differences in most regions between the gender balance patterns among adults shown in Figure 3.15 and those in current student populations (see, again, Figure 3.2 and Table 3.3) are striking. The gender ratio for years of education in South and West Asia among individuals fifteen and older was only 0.59 in 2000, compared to gender parity values above 0.90 for enrolled students at the primary level, over 0.80 at the secondary level, and 0.74 (with a rapid rise in recent years) at the tertiary level. Education among adults in the transitional fifteen to twenty-four age category is also now quite quickly moving toward gender parity.

Whereas Figure 3.15 shows changes in gender parity indices of education attainment across time in global regions, Figure 3.16 shows how that relationship looks across countries in recent years and how it relates to the total level of education in a population. Overall, it appears that the gender balance for education in the adult population begins to reach equality when that population has about eight to ten years of education. The substantial contemporary movement toward gender parity in enrollments should, however, steadily reduce that level and shift upward the left-hand tail of the curve in Figure 3.16. The current gender patterns of adult education levels are, in essence, legacies of generations of imbalance in access to school.

Literacy

The standard definition of literacy is the portion of the population "who can, with understanding, read and write a short, simple statement on their everyday life" (UNESCO 2007b: 233). Not surprisingly, literacy is highly correlated with average years of education. By the time an adult population has attained an average of eight to nine years of formal education, its literacy rate will generally be over 90 percent.[27] However, literacy also can be acquired in other ways. Similarly, because of differences in education quality and in learner abilities, school participation is not a guarantee of literacy.[28]

What is clear, however, is that global literacy is advancing rapidly.[29] Figure 3.17 shows the progression of adult literacy by UNESCO region between 1970 and 2005. Three regions now have literacy rates of 97 percent or above: Central and Eastern Europe, Central

Asia, and North America and Western Europe. Three more are approaching universal literacy, with rates between 90 and 94 percent: the poorer countries of East Asia and the Pacific (demographically dominated by China), the richer countries of East Asia and the Pacific, and Latin America and the Caribbean. The remaining three developing regions—the Arab States, South and West Asia, and sub-Saharan Africa—have much lower literacy rates but have progressed almost linearly, in each case climbing above 60 percent. And differences in literacy rates across regional groupings of countries have narrowed markedly since 1970, from a range of 28 to 95 percent at that time to a range of 62 to 99 percent in 2005.

One of the most interesting aspects of the global education and literacy transition is going to be the relationship between the rapid transformation of education levels and human development systems more generally. Although the promise of more educated and literate populations is great, there will be challenges as well, including possible conflicts between more-educated younger generations and less-educated older generations; in addition, some countries (especially very poor ones) may not have the systems in place to take advantage of more educated populations (EPDC 2005: 6–7). Chapter 8 returns to these and other "forward linkages" or implications of education.

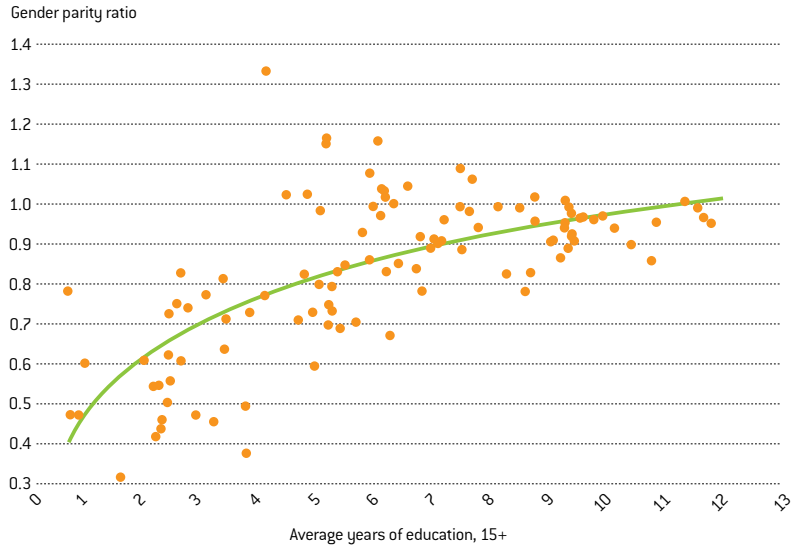
Conclusion

What is referred to as the education transition is actually a set of interrelated transitions, the first of which is an increase in education participation or student flows. The 1960s and 1970s were a period of especially rapid growth in student enrollment rates and numbers. Many countries struggled to maintain those gains during the 1980s and the first half of the 1990s, but increases in enrollment rates have accelerated again in recent years.

Ultimately, the transition that matters most is in the level of education attainment within adult populations. The transition of societies from low to high levels of education attainment is an especially slow process with at least a century-long scale; more realistically, it is a process that occurs across centuries. By historical standards, the transition in adult education attainment is dramatically under way around the world, reflecting the outcomes of great increases in school participation rates since the mid-1960s.

A third transition is that involving gender parity. The transition from low to equal participation rates for females has

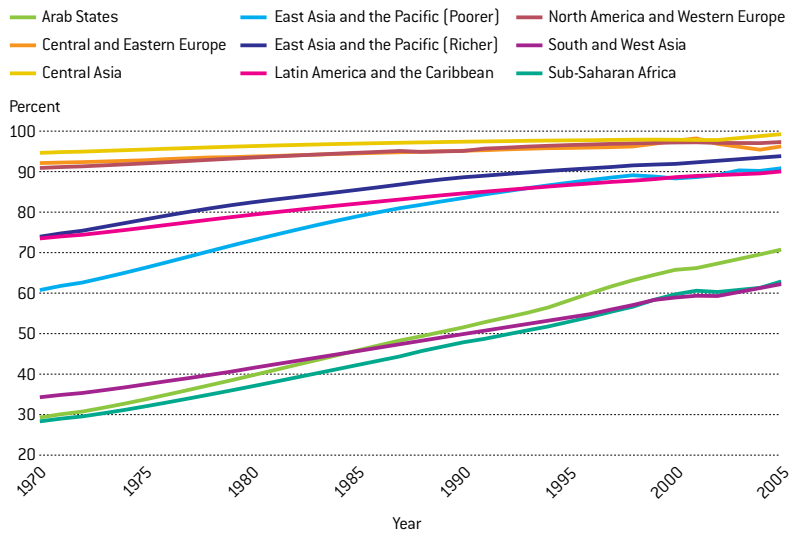
Figure 3.16 Relationship of gender parity ratio to average years of education of population 15 and older (2000)



Note: Patterned after Goujon and Wils (1996: 6). Equation: y = 0.4454 + 0.2291 Log(x); R-squared = 0.47

Source: IFs Version 6.12 using data from Barro and Lee (2001).

Figure 3.17 Literacy rates of population age 15 and older (1970–2005)



Note: Values are 5-year moving averages; eliminated the Arab States and sub-Saharan Africa after 2003 because of spotty data and large number of transients.

Source: IFs Version 6.12 using UIS blended series.

Global literacy is advancing rapidly, and differences in literacy rates across regional groupings of countries have narrowed markedly.

Although the promise of more educated and literate populations is great, education and literacy create challenges as well.

been progressing rapidly and is substantially accomplished at lower levels of education in most of the world. There is, however, much work to do in completing that transition. And an emerging concern is an increase in reverse gender imbalance. The enrollment ratio of girls to boys now exceeds 1.03 in a number of countries at the secondary and tertiary levels, and especially at the tertiary level in upper middle-income and high-income countries.

Most fundamentally for this volume, although all of these interacting education transitions have been playing out at a significant pace, there is obviously much more to come. At least three sets of circumstances cause us to raise the question of a possible or probable slowing of progress.[30] The first is that some slowing of progress over time occurs because of saturation effects—countries typically have difficulty achieving the final step from 90 percent to 97–100 percent, especially when there are children who are especially hard to reach or who are socially excluded due to remote location, extreme poverty, physical or mental handicaps, or ethnic and religious divisions.

Domestic economies and educational budgets may also be a factor in slowing enrollment rate growth over time. The very success of education advance to date has carried with it increasing expenditure burdens for low-income countries, particularly as increased numbers of students have completed primary education and now demand the opportunity to pursue secondary education. Expenditures of low-income countries on education as a portion of GDP have grown and are now much closer to the level of high-income countries than they were in 1970. In the process, the headroom for further expansion of spending has almost certainly been reduced, at the same time as the need to address quality issues—which often translates into higher per-student costs—is attracting widespread attention. The result for many countries may well be increased constraints on rates of enrollment growth, exacerbated in many cases by country-specific circumstances as divergent as droughts and armed conflicts.

Third—and framing the economic issues more broadly—the condition of the global political economy cannot help but affect much that happens in all countries and especially in lower-income ones. The financial crisis of 2008 and the major global downturn that it produced could continue to constrain public and private resources for education for several years.

There is at least one piece of good news for the future—demography. Perhaps the most significant factor in limiting growth in enrollment rates in many low-income countries and regions in recent decades was the surge in school-age children, not just in absolute numbers but also as a proportion of the overall population. However, current demographic trends, if they continue, should serve to facilitate rather than constrain education's advance. Even in the sub-Saharan Africa subset of countries with the highest fertility rates, the youth dependency ratio is beginning to decline.

1 Some longer-term historical reviews of global educational change do exist. They include Meyer et al. (1977); Fredriksen (1980); Wils and Goujon (1998); Clemens (2004); Wils, Carrol, and Barrow (2005); Bloom (2006); and Lutz et al. (2007).

2 The relatively straightforward measure of comparative female-to-male enrollment rates is obviously only one indication of the extent of gender parity in education. A volume edited by King and Hill (1993) covered many other aspects of the gender gap and analyzed the forces that perpetuate gender disparities and the broader socioeconomic implications of such disparities. More recently, Unterhalter (2003) critiqued the use of comparative female-to-male enrollment rates as an inadequate measure of the extent of true educational parity and suggested evaluative approaches more congruent with a human capabilities framework. Lewis and Lockwood (2006) also adopted a broader perspective to evaluate recent progress toward gender parity, focusing on multiple sources of exclusion and strategies for addressing them.

3 One such anomaly is seen in Central and Eastern Europe, where gender parity in secondary net enrollment appeared to decrease in 2005, whereas, in fact, parity ratios were overstated in earlier years because Turkey—with a 0.85 ratio in 2005—was missing from prior years' data.

4 At the secondary level, the only transition or survival flow rate provided by UIS is the transition to secondary (in actuality, the transition to lower secondary). However, UIS provides grade-by-grade enrollment numbers from which the IFs team calculates lower secondary survival rates and upper secondary transition and survival rates.

5 We also consistently use 2000 constant dollars throughout the volume.

6 Many of the countries of Central and Eastern Europe and of Central Asia did not exist within the configuration of the former Soviet Union, Czechoslovakia, and Yugoslavia. Because it is difficult (and sometimes impossible) to analyze them prior to the 1990s, they are absent from a number of the longer historical series in this chapter.

7 The Polity Project scale is not as well-known or widely used as the Freedom House measure of freedom (which we use in Chapter 8 to explore forward linkages from education), but we use it here because of the availability of data and estimates over a long historical period. Ted Robert Gurr initated the Policy Project, and Monty G. Marshall now directs it. Its data are available at http://www.systemicpeace.org/polity/polity4.htm.

8 The Transparency International Corruption Perceptions Index (CPI) and reports based on it are available at http://www.transparency.org/policy_research.

9 Information about the project and data are available at http://globalpolicy.gmu.edu/ptif. As with the Polity Project measure of extent of democracy described earlier, we use the Political Instability Task Force measures of political instability here because of the long time series of the data. In Chapter 8, we turn to the more widely known Fund for Peace failed state index to establish a forward linkage between education and political stability.

10 We refer here to secondary enrollment rates that combine the lower secondary and upper secondary levels into total secondary enrollments. At the separate lower and upper secondary levels, only gross enrollment data are currently available.

11 Outside UNESCO's sub-Saharan African grouping, only Djibouti (physically in Africa), at 34 percent, was below 60 percent primary net enrollment in 2005.

12 Within the fourteen countries in the higher-enrollment group, seven had net primary enrollment rates of 90 percent or above in 2005; the highest rate was 96 percent in São Tomé and Principe.

13 All three sub-Saharan African country groupings are showing some gains in tertiary gross enrollment rates. In 1970, the tertiary enrollment rate in the high primary education grouping was 1.8 percent, and it was less than 0.2 percent in the medium and lower education groupings. By 2005, the respective rates were 7.5, 4.3, and 3.0.

14 UNESCO (2007a: 8–14) discussed the two measures and their relationship.

15 Some authors begin their analysis of education expenditure patterns in 1960 (e.g., Coombs 1985: 139–143). However, data are available for just 71 countries that year, compared to 126 in 1970. We use the later date in Figure 3.12 because the magnitude of composition changes in the country sets presents an exaggerated view of change during the decade of the 1960s. In fact, despite regional goal-setting for education expansion, increases in school-age populations, and increases in enrollment rates, education expenditures as a percent of GDP in the low-income and lower middle-income countries reporting in both 1960 and 1970 show little change. The average expenditures of the eighteen low-income countries went from 1.7 percent of GDP to just 1.8 percent over the decade, and for the lower middle-income countries (sixteen reporting), the average changed only from 2.6 percent of GDP to 2.8 percent. Far larger changes occurred in the higher income groups. For the ten upper middle-income countries, the average went from 1.8 percent of GDP to 2.9 percent, and for the twenty-five high-income countries reporting both years, the average went from 4.0 to 5.3 percent of GDP.

16 Both China and Indonesia have historically allocated smaller than average percentages of GDP to education (about 2.0 percent). Neither country reported in 2000, thereby artificially inflating the 2000 value for lower middle-income countries. In 2005, Indonesia reported 2.9 percent (a significant increase from its earlier rates), but China again did not report, so the lower middle-income group value presumably remains inflated in 2005, although to a lesser extent than in 2000.

17 Birdsall, Levine, and Ibrahim (2005: 34) indicate that bilateral official development assistance for education rose from about 1 percent of the GDP of developing countries in the 1970s to as much as 4–6 percent by the late 1990s. That rise seems improbable, given that it would have required $3.6 billion simply to cover 4 percent of the GDP of sub-Saharan Africa. The numbers probably refer to Least Developed Countries (LDCs) only, for which 4 percent of GDP in 2000 would have been a bit below $3 billion.

18 In fact, a number of countries with lower public spending patterns were absent from the 2005 data; the real shift was very substantial but almost certainly not as great as these data suggest.

19 See, for example, the first page of the March 1, 2006, edition of *China Daily*, available at www.chinadaily.com.ca/english/doc/2006-03/01.

20 This figure is calculated from UIS data that report expenditures by category combined across all levels of education from preprimary through tertiary.

21 UIS does not include enrollment in private versus public tertiary institutions in its published data series.

22 To the extent that public funds are allocated directly to private schools, UIS reflects them in public expenditure data (i.e., both education expenditures as a percent of GDP and education expenditures per student as a percent of GDP per capita include such support).

23 The thirteen countries, identified in the 2008 Education for All Global Monitoring Report, were Yemen (Arab States); Cambodia, Timor-Leste, and Vietnam (East Asia and the Pacific); and Benin, Burundi, Ghana, Kenya, Lesotho, Madagascar, Mozambique, United Republic of Tanzania, and Zambia (sub-Saharan Africa). The reference here is specifically to tuition fees, and does not reflect fees far more commonly levied for such things as books, uniforms, and transportation costs.

24 By region, the countries that reported private funding in 2005 were distributed as follows: Arab States—1; Central and Eastern Europe—9; Central Asia—1; East Asia and the Pacific (Poorer)—1; Latin America and the Caribbean—6; South and West Asia—1; Sub-Saharan Africa—1; East Asia and the Pacific (Richer)—4; and North America and Western Europe—17.

25 Analysts sometimes define educational attainment in terms of education level undertaken but not necessarily completed, and such a definition was used by Wils in estimating the transition period from 10 percent primary participation to 90 percent secondary participation, cited earlier. However, our analysis focuses on completed activity.

26 Barro and Lee (2000) have at least one data point for each of 142 countries and complete datasets at five-year intervals from 1960 to 2000 for 109 countries. Cohen and Soto (2001) include 95 countries for the same time period and also provide forecasts to 2010.

27 The relationship between years of education and literacy rates, which is generally logarithmic, has an R-squared of over 0.8.

28 For many years, UNESCO relied on country reports of education attainment levels as a proxy for literacy, but it has recently shifted to estimates based on self-reporting in household surveys because of the multiple paths to literacy and because of other issues associated with the former proxy measure. We much appreciate the explanations of the change in methodology in personal communications from José Pessoa of the UIS.

29 To get a general sense of the progression of literacy over time, we have blended the two UNESCO series in the IFs database by adjusting the earlier series to be compatible with values from the more recent series. Specifically, we have used the ratio of values from the newer series to the older one (in the same year when possible or as extrapolated from the older data when necessary) to adjust all country-years of the older data when new and old values for the same year differ by more than 2 percentage points.

30 It is not unusual for a period of consolidation to follow periods of sustained progress and growth more generally, even in the absence of specifically identified constraints. Such periods of consolidation often serve as a plateau or "takeoff point" for a subsequent growth cycle.

4

Forecasting Education

Forecasting tools and models can be exploratory, normative, or both.

There are many ways to approach the discussion of tools and models for forecasting the expansion of global education. It is possible to consider them in terms of their coverage and aggregation—whether they are country-specific or multicountry; whether they focus on primary education or look also at other levels of education; whether they consider only enrollment levels or also the underlying intake and survival patterns; whether they attend to student flows and/or to adult education attainment; or whether they forecast for ten years, twenty-five years, or more.

It is also possible to talk about tools and models in terms of their concern with, and treatment of, related issue areas—whether they consider demographics and economics explicitly and dynamically in interaction with education, whether they consider primarily the impact of these other systems on education, or whether they also look to the implications of education for other aspects of human development. And it is possible to talk about tools and models in terms of their basic methodological characteristics—whether they are largely extrapolative of select variables or more broadly structural in their representation of multiple, interacting facets of educational systems; whether they tend primarily to be accounting systems with exogenously (externally) provided assumptions about change; or whether they more dynamically represent households, governments, and other potential agents in interaction.

As important as all such characteristics are, perhaps the most fundamental distinguishing characteristic is something else—namely, the purpose and desired outcome of the use of the tool or model. Most broadly, forecasting tools and models are organized around two purposes. *Exploratory* tools seek "simply" to understand the path of a system, whereas *normative* tools identify a desired future and then assess the likelihood of attaining that future and/or identify means by which the path toward the

desired outcome might be accelerated, redirected (if the current path is not congruent with the goal), or otherwise enhanced.[1]

This volume combines exploratory and normative purposes. As Chapter 1 indicated, the questions we seek to address are: (1) What path does the formal global education system, as a collection of countries, appear to be on as we look forward fifty years? (2) Is an aggressive but still reasonable acceleration of that path possible? (3) What might be the broader consequences of such a normative but attainable acceleration? Given those purposes and questions—and understanding that all models are simplifications of reality and therefore fall short of being ideal tools—what are some of the general characteristics of the "ideal" tool that we might want for such investigation?

Characteristics of Ideal Education Forecasting Models and Tools

There is a considerable distance between the characteristics of the simplest possible exploratory and normative education forecasting tools and the characteristics that would be found in an ideal model or tool for our purposes in this volume. Here, we list some desirable elements of a tool with a mid- to long-term temporal reach, beginning with the characteristics that an exploratory model would include:

- An *accounting system* that tracks student flows by education level across all levels and grades as well as education attainment in the adult population, with as much detail as possible regarding elements that vary from one component of a population to another (e.g., sex, age, rural-urban residence, income status, and ethnicity).
- Representation of the *dynamics* that are the immediate drivers of student flows (and hence ultimately of attainment levels), including separate representations of demand and supply dynamics and constraints.
  - With respect to demand, the ideal exploratory system represents the dynamics of enrollment patterns (intake and survival) in the context of family circumstances and demographic and economic trends.
  - With respect to supply, the ideal tool has the capability to estimate the costs and resource requirements associated with various enrollment dynamics and demographic patterns and to forecast the likely need for, and availability of, public, private, and international funds.
- Representation not only of demographic and economic impacts and constraints on education but also of education's impacts on demography and on economic systems, as well as bidirectional feedback loops between education and other aspects of human development systems, such as poverty reduction and the characteristics of sociopolitical systems.[2]
- Transparency of structures, equations, algorithms, and data; availability to others for use and analysis; flexibility and simplicity of use.

These same elements would characterize an ideal mid- to long-range normative forecasting model or tool. However, the ideal normative tool would also include the following:

- Specification of points of intervention and an assessment of their reasonableness.[3]
- Evaluation of the impacts of the interventions not just on education participation and attainment but also on broader systems (demographic, economic, and sociopolitical).
- At least some elements of a cost-benefit analysis.

This chapter describes the IFs modeling system, which can be used for both exploratory and normative analyses, and considers its particular strengths and limitations relative to the ideal. First, however, we briefly introduce significant global education modeling and forecasting approaches that others have developed in recent years.

Recent Education Modeling and Forecasting Approaches

Over the last several years, a number of models have been developed by others with similar interests in understanding the education transition and the transition's likely continued unfolding, requirements, and/or consequences. We identify the models or tools here that have informed our efforts and comment very briefly on some of their features that had special

Certain characteristics are associated with "ideal" models, even though no model can attain them all.

In recent years, a number of models have been developed to help in understanding, forecasting, and facilitating the education transition.

The IFs project has built upon features of other models and has also independently developed new features and modeling capabilities.

relevance for our own work; more information about these other models and approaches appears in the Appendix to this chapter. Later, in Chapter 5, we will consider forecasts from some of these tools in comparison with those from IFs.

McMahon (1999) focused heavily on exploring the social benefits of primary and secondary education, thus connecting education's expansion to economic, demographic, and sociopolitical change. He used a cross-sectional approach to drive much of the dynamic analysis in his econometric model and developed a base case as well as two normative scenarios to forecast the impact of specific education policy changes.[4]

Delamonica, Mehrotra, and Vandemoortele (2001), using an accounting-centric approach and UN population projections, conducted a normative analysis of the incremental costs of moving to universal primary education by 2015. Their estimates of costs included measures intended to enhance education quality as well as capital costs for needed increases in capacity. Bruns, Mingat, and Rakotomalala (2003) also explored the costs of meeting universal primary education by 2015. They extended previous analyses by developing "best practice" expenditure and resource mobilization guidelines based on the education policies and practices of low-income countries making the best progress toward universal primary education, and their framework included the normative concept of "minimum adequate cost."

Clemens (2004) used historical data to analyze transition paths in net primary enrollment rates and found an S-shaped curve that could be used to extrapolate the number of years countries and regions might need to reach 90 percent primary net enrollment. He also compared the earlier experience of currently high-income countries with the recent experience of low- and middle-income countries, and found that the speed of advance in enrollment rates has accelerated considerably. Wils, O'Connor, and Somerville, as reported in a paper authored by Wils, Carrol, and Barrow (2005), also found S-shaped patterns in the advance of primary education and used them to project growth in primary entry rates and completion rates separately (rather than aggregate enrollment rates). They also used data gathered in household surveys to provide more extensive and longer estimates of historical patterns of school participation.

Lutz, Goujon, and Wils (2005) built on the multistate demographic methodology of the International Institute for Applied Systems Analysis (IIASA) to explore the future across all levels of education, including tertiary. Moreover, the principal focus of their work was on adult attainment levels differentiated by age and sex, so as to build the foundation for looking at the relationship between those levels and characteristics and other aspects of global change. Similarly, Hilderink (2007) added attention to adult attainment to his forecasting of flows across all levels of formal education. Also of interest to us, his formulations, like ours, relate education demand and education supply to GDP per capita.

An EPDC paper (2007b) reported the work of Wils, Barrow, Oliver, Chaluda, Goodfriend, Kim, and Sylla in the development and early use of ProEnrol, a country-level, cohort-projection model for use at the primary and secondary levels. The paper described the model as the first effort to make cohort or grade-by-grade projections in an international, global series, including representations of promotion and repetition.

The IFs project, as will be seen in the discussion that follows, has both independently developed and also built upon many of the features of these other models: the cross-sectional analysis and attention to sociopolitical impacts of education found in McMahon (1999); the computation of costs required to meet goals of Delamonica, Mehrotra, and Vandemoortele (2001), as well as some of the attention to best practice that Bruns, Mingat, and Rakotomalala (2003) built into their analysis; the S-shaped expectations for education's advance that both Clemens (2004) and Wils, O'Connor, and Somerville cited in Wils, Carrol, and Barrow (2005) found and used, as well as their explicit recognition of country-specific circumstances; the attention to adult attainment of education by Lutz, Goujon, and Wils (2005); the use of GDP per capita to drive the formulation of education demand and supply made by Hilderink (2007); and the country-level, cohort analysis of Wils et al. (2007b). This is not to say, of course, that one model can do everything as fully or as well as more specialized studies and approaches, but

we do believe there is also value in our more comprehensive approach. We will return to a description of the IFs approach to modeling of education after providing an introduction to the larger IFs system.

Table 4.1 Human systems and issues of interest to the IFs project	
Humans as individuals	Personal development/freedom
Humans with each other	Peace and security/social fairness
Humans with the environment	Sustainable material well-being

The IFs Modeling System

As stated previously, the particular strengths of IFs derive from the combination of its extended time frame, its extensive geographic coverage with capability to flexibly group countries for analysis and display, and its dynamic integration of multiple human systems. In addition, its global education model is the only one we know of that represents all three levels of formal education in grade-by-grade student flows or cohorts, as well as the only one that represents lower and upper secondary education separately. IFs can be used both for exploratory analyses of dynamic trends and patterns and for the creation of normative scenarios and explorations of their respective impacts.

In the sections that follow, we will first provide a brief overview of the broader IFs forecasting system and then discuss the IFs education model in more detail. In the process of that discussion, we will attempt to identify the strengths and weaknesses of IFs in comparison with the characteristics of an ideal global education forecasting tool.

General design considerations

International Futures is a large-scale, long-term, integrated global modeling system. It represents demographic, economic, energy, agricultural, sociopolitical, and environmental subsystems for 183 countries interacting in the global system.[5] The central purpose of IFs is to facilitate exploration of global futures through alternative scenarios.

The issues of interest that motivated the design of IFs fall generally into three categories: human development, social fairness and security, and environmental sustainability (see Table 4.1). Across these domains, the project especially looks to Sen (1999) for his emphasis on freedom and individual development, Rawls (1971) for his emphasis on fairness within society, and Brundtland (UN 1987) for her seminal definition of sustainability. These emphases, in combination, provide a philosophical framework for the exploration of human beings as individuals, of human beings with each other, and of human beings with the environment.

The desire to explore issues of human development, social fairness and security, and environmental sustainability motivated the design of IFs.

Human systems fundamentally involve different types of agents (economists tend to focus on households and firms; political scientists add governments) interacting with each other in various structures (economists focus on markets; political scientists look to action-reaction systems and international regimes; sociologists add societies and demographic structures; anthropologists focus on cultures; and physical scientists extend the reach to ecosystems). In general, scientists seek to understand the complex cocreation and evolution of agent behavior and the structural characteristics of human and social systems.

IFs attempts to capture *some* of that complexity and richness by being rooted in the theory of various disciplines and subspecializations. It is a structure-based, agent-class-driven, dynamic modeling system. That is, it tries to represent typical behavior patterns of major agent classes (households, governments, firms) interacting in a variety of global structures (demographic, economic, social, and environmental) with extensive representation of underlying accounting systems.[6] IFs draws upon standard approaches to modeling specific issue areas whenever possible, and then, as necessary, it extends and integrates these. For instance, the IFs demographic model uses a typical "cohort-component" representation, tracking country-specific populations over time by age and sex, further differentiated in IFs by education. Within that structural or accounting framework, the model represents the fertility decisions of households (influenced by income and education) as well as mortality and migration patterns.

IFs draws upon standard modeling approaches to specific issue areas whenever possible and then, as needed, extends and integrates them.

The database underlying IFs (and integrated with the system so it can be used by others) includes a vast range of data for 183 countries, represented over as many years since 1960 as possible on a country-by-country basis.[7]

Extensive documentation of the IFs system of models is at www.ifs.du.edu, as is the model itself in both online and downloadable forms.

The model system itself runs in annual time steps from its initial year (currently 2005),[8] and the model interface facilitates user interventions flexibly across time, issue area, and geography.

The models of IFs

Figure 4.1 shows the major conceptual blocks. Full issue-specific models represent most of the blocks, including education. The elements of the technology block are actually dispersed throughout the system, and the named linkages between blocks (and the identified linkages themselves) are a small illustrative subset, by no means an exhaustive listing.

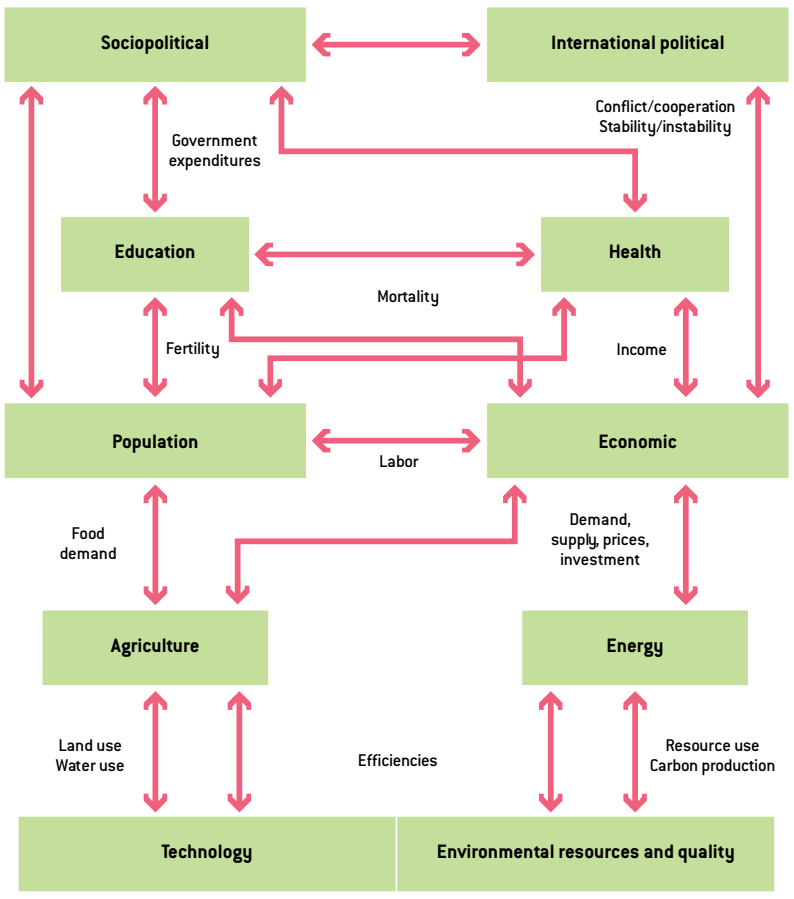
The two models within the IFs system that interact mostly closely with the education model are the population and economic models. In our representation of the human development system, the sociopolitical model also interacts quite closely with the education model (as well as with the economic and demographic models). We cannot here provide technical details of these or other models that collectively make up the IFs forecasting system that fully integrates those models. We do, however, provide certain summary information in the discussion ahead, which will be too much technical detail for some readers and far too little for others. Those who want more information about the IFs system (including the education model) will find extensive documentation at www.ifs.du.edu. In particular, see Hughes (2004b, 2006; Hughes et al. 2004) for a structural overview and for discussions of scenario analysis and validation. The model system is also freely available there in both online and downloadable forms.

The demographic model has the standard cohort-component structure that the UN and other institutions use in population forecasting, but it represents fertility and mortality as functions of other variables in IFs. Some of the key characteristics of the population model are that it

- Represents twenty-two age-sex categories to age 100+ in the cohort-component structure (but computationally spreads the five-year cohorts initially to one-year cohorts and calculates change in one-year time steps)
- Calculates change in cohort-specific fertility in response to income, income distribution, education levels, and contraception use
- Calculates change in mortality rates in response to income, income distribution, education, and assumptions about technological change's impact on mortality
- Separately represents the evolution of HIV infection rates and deaths from AIDS
- Computes literacy rates, average life expectancy at birth, and an overall measure of human development (the Human Development Index, or HDI)
- Represents migration and ties it to flows of remittances.

The economic model has the multisector equilibrium structure of models that most forecasters of development processes use, but it has extended representation of the production side so as to facilitate long-term analysis and to link productivity to other variables in IFs, including education. Some of the most important characteristics of the economic model are that it

Figure 4.1 The major models in the IFs modeling system and example connections



- Represents the economy in six sectors: agriculture, materials, energy, industry, services, and information/communications technology, or ICT; other sectors could also be configured because the system uses raw data from the Global Trade and Analysis Project (GTAP)
- Computes and uses input-output matrices that change dynamically with development level
- Is a general equilibrium-seeking model that does not assume exact equilibrium will exist in any given year; rather, it uses inventories as buffer stocks and to provide price signals so that the model chases equilibrium over time
- Contains a Cobb-Douglas production function that (following insights of Solow and Romer) endogenously represents contributions to growth in multifactor productivity from human capital (education and health), social capital and governance, physical and natural capital (infrastructure and energy prices), and knowledge development and diffusion (research and development and economic integration with the outside world)
- Uses a Linear Expenditure System to represent changing consumption patterns
- Utilizes a "pooled" rather than bilateral trade approach for international trade
- Is embedded in a social accounting matrix (SAM) envelope that ties economic production and consumption to representation of intra-actor financial flows (it represents, however, only the skilled and unskilled households from GTAP).

Few sociopolitical models exist except in the form of highly specialized representations (such as the forecasting of state failure). The model in IFs has a relatively extensive treatment of sociopolitical variables, including government budgeting, which is important in representing constraints upon expansion of education. Some of the sociopolitical model's relevant features are that it

- Represents fiscal balances through taxing and spending decisions
- Shows six categories of government spending: military, health, education, research and development, foreign aid, and a residual category (as well as representing transfer payments for pensions and social welfare)
- Represents changes in social conditions of individuals (such as fertility rates, literacy levels, or poverty), attitudes of individuals (such as the level of materialism/postmaterialism of a society from the World Values Survey), and the social organization of people (such as the status of women)
- Represents the evolution of democracy
- Represents (in very basic fashion) the prospects for state instability or failure.

The use of IFs

Although initially developed as an educational tool, IFs is increasingly used in research and policy analysis. For instance, it was a core component of the TERRA project sponsored by the European Commission to explore the New Economy. More recently, forecasts from IFs supported Project 2020 of the National Intelligence Council (NIC) (USNIC 2004) as well as NIC's subsequent study, *Global Trends 2025: A Transformed World* (USNIC 2008). IFs also provided driver forecasts and some integrating analysis for *Global Environment Outlook–4* of the United Nations Environment Programme (2008).

The menu-drive interface of the International Futures software system allows display (in tables and standard graphical formats) of historical data values since 1960, in combination with forecasts from the base case and from alternative scenarios over time horizons from 2005 through 2100. It includes a Geographic Information System (GIS), or mapping capability, and also provides specialized display formats, such as age/sex and age/sex/education cohort structures and social accounting matrices.

The system facilitates scenario development and policy analysis via a "scenario tree" that simplifies changes in framing assumptions and agent-class interventions. Users can save scenarios for development and refinement over time, including the normative education scenario developed and analyzed in Chapter 6 and Chapter 7. Standard framing scenarios, such as those from the United Nations Environment Programme's *Global Environmental Outlook–4*, are available with the model for users to explore and potentially to develop further.

The IFs system facilitates explorations of interventions and scenarios.

The Education Model

The education model of IFs simulates patterns of education participation and attainment in 183 countries over a long time horizon under alternative assumptions about uncertainties and interventions (Irfan 2008). Its purpose is to serve as a generalized thinking and analysis tool for educational futures within a broader human development context.

In Figure 4.2, we display the major variables and components that directly determine education demand, supply, and flows in the IFs system. We emphasize again the interconnectedness of the components and their relationship to the broader human development system. For example, during each year of simulation, the IFs cohort-specific demographic model provides the school-age population to the education model. In turn, the education model feeds its calculations of education attainment to the population model's determination of women's fertility. Similarly, the broader economic and sociopolitical systems provide funding for education, and levels of educational attainment affect economic productivity and growth and therefore also education spending.

Table 4.2 summarizes the most important aspects of the accounting system, the dominant relationships, and the key dynamics that our education model represents. At the *accounting* level, the major flows within the model are student and budgetary flows, and the major stock is that of gender-differentiated educational attainment of the adult population. The model structurally represents the formal education system from the primary through tertiary levels, and it further divides the secondary level into lower secondary and upper secondary levels and into general and vocational categories within each of the secondary levels. It tracks students by grade and by sex. Intake (or transition to a higher educational level) and persistence or survival rates are the two variables that most immediately determine the patterns of student participation and progression through the grades.

The *dominant relationships* in the model are those that determine the intake (or transition) and survival rates and the costs of education per student, all three of which are closely connected to per capita income. The model also takes into account the long-term nonincome drivers of education in an aggregate fashion. As the model simulates the gradual expansion of education, the intake and survival rates saturate following an S-shaped pattern.[9]

With respect to *key dynamics*, the processes of the demographic and economic models, as sketched earlier, significantly affect the forecasting of education. Similarly, the dynamics

Figure 4.2 Direct drivers of education demand and supply in IFs

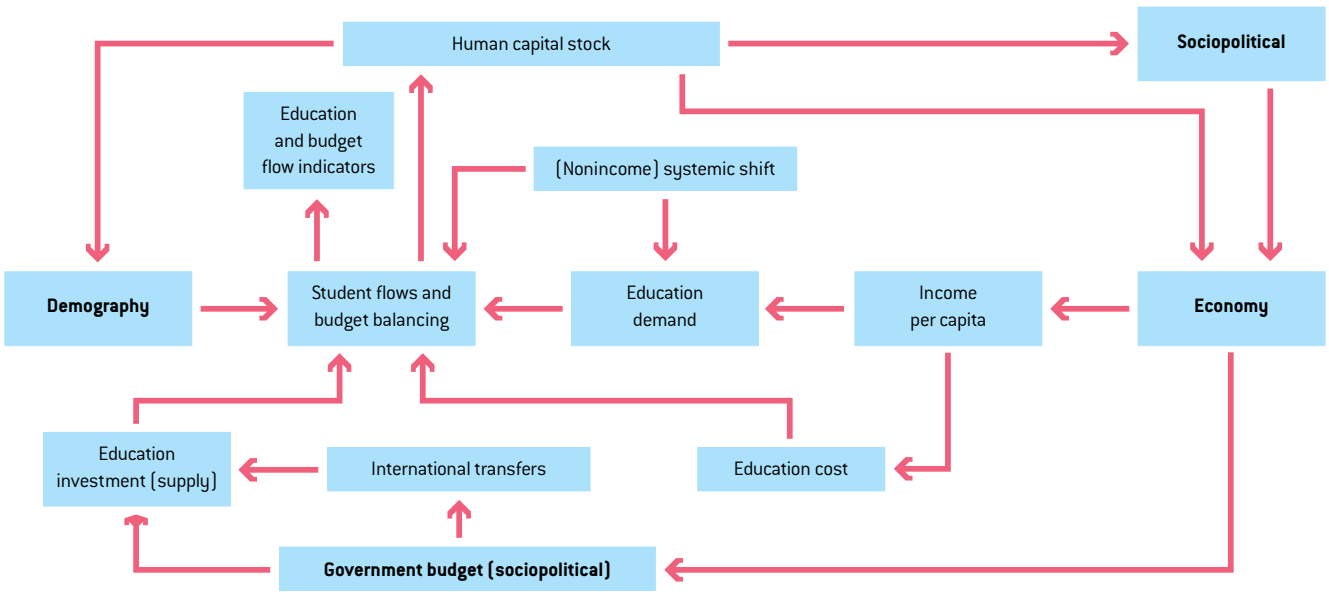


Table 4.2 Foundational elements of the IFs education model	
Education model aspect	**Key elements**
Accounting system	Flows of students into, through, and out of schools
	Flows of public spending into education system
	Stocks of adults with different levels of education attainment
Dominant relationships	Intake demand is driven by household income and nonincome systemic factors and follows an S-shaped pattern toward a saturation point
	Survival rate is driven by the same factors as intake with income being the most dominant
	Education cost is driven by per capita income with a different cost function at each level of education
Key dynamics	Demographic change
	Economic development
	Public education spending constrained by revenue receipts, government consumption, and demands from other public sectors
	Equilibration between the demand and supply of education funds

of the government budget process in the sociopolitical model produce a key variable for the education model, namely, the availability of funding for education. Within the education model itself, a central dynamic is finding the balance between the demand for education and its availability or supply and then adjusting growth in intake (or transition) and survival rates, as well as spending per student, to be consistent with that balance.

Modeling of complex, integrated, dynamic systems for long-term forecasting is seldom a matter simply of specifying equations. It generally requires development of *algorithmic structures* (logical procedures for integrating calculations and maintaining accounting systems), as well as equations. In the IFs educational model, one such algorithm manages student progression through the grades. On the budgetary side, another balances the forecasted funding demand and funding availability in order to shape the enrollment and spending levels. And still another addresses the flows of graduates into and through the adult population. Subsequent sections of this explication of the education model provide basic information on these processes.[10]

Accounting system

As Chapter 2 outlined, a conceptual description of student flows begins with entry in the first grade of primary school. At the end of each year, students either progress to the next grade, repeat the current grade, or drop out. Eventually, some proportion of the entering cohort reaches the beginning of the final grade; that proportion constitutes the "survival rate." Further, of those who persist to the beginning of the last grade of primary school, most subsequently graduate and become eligible to continue to the lower secondary level. The "transition rate" identifies the portion of those completing the primary level that actually continues into general programs at the lower secondary level,[11] following which a new pattern of grade-level progression, repetition, and dropout ensues. Conceptually, similar flows (albeit at different rates) take place at the upper secondary level and at the tertiary level.

IFs accounts for education participation by simulating gender-specific grade-by-grade student flows, using country-specific entry ages and years of schooling at each level to represent enrollments and to distinguish gross and net flow indicators. We dynamically forecast intake rates (or transition rates to general programs at the lower and upper secondary levels) and survival rates, and we calculate enrollment rates as the combined result of those flows, tracking students through grades. Clearly, this approach provides more useful information than a focus on enrollment rates alone would, as the same enrollment rate might result from different combinations of intake and survival rates. It also provides points for representing interventions that shape the actual dynamics of enrollment.

Long-term dynamic forecasting often requires development of algorithms as well as the specification of accounting structures and equations.

IFs simulates gender-specific grade-by-grade student flows, using country-specific entry ages and years of schooling.

Student flows

A truly full representation of student flows (see, again, Figure 2.3) would represent movement across grades over time with grade-by-grade and country-by-country specification of repetition rates, dropout rates, and rates of return and late entry by overage students. It would culminate with rates of completion and transition by some to higher levels. In addition to being very intensive with respect to initial data and ongoing computations, there is a limited basis for forecasting idiosyncratic patterns of repetition, dropout, and reentry by grade.

Our grade-by-grade student flow model therefore uses some simplifying assumptions in its calculations and forecasts. We combine the effects of grade-specific dropout, repetition, and reentry into an average cohort-specific grade-to-grade flow rate, calculated from the survival rate for the cohort. Each year, the number of new entrants is determined by the forecasts of the intake rate and the entrance age population. In successive years, these entrants are moved to the next higher grades, one grade each year, using the grade-to-grade flow rate. The simulated gradewise enrollments are then used to determine the total enrollment at the particular level of education.

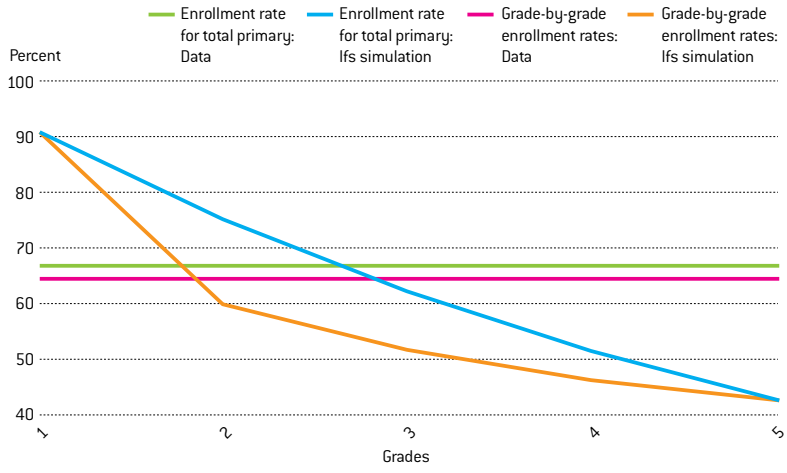
There are some obvious limitations to our simplified approach. Although our model effectively includes repeaters, we represent them implicitly (by including them in our grade progression) rather than representing them explicitly as a separate category. Moreover, by setting first-grade enrollments to school entrants, we exclude repeating students from the first-grade total. On the other hand, the assumption of the same grade-to-grade flow rate across all grades might somewhat overstate first-grade enrollment in a typical low-education country, where first-grade dropout rates are typically higher than the dropout rates in subsequent grades. Since our objective is to forecast enrollment, attainment, and associated costs by level rather than by grade, we do not lose much information by accounting for the approximate number of school places occupied by the cohorts as they proceed and by focusing on accurate representation of total enrollment.

Figure 4.3 juxtaposes the primary grade-by-grade enrollment data in Bangladesh in 1988 as constructed from UIS-reported intake and gradewise survival rates against the grade-by-grade pattern that IFs simulates. It illustrates that the net effect of our simplifying assumptions generally produces reasonable results with respect to overall enrollment rates, headcounts, and hence also resource requirements. The initialization of the model, discussed later, further protects initial data on enrollment. Even so, our approach results in an (usually small but occasionally quite significant) initial discrepancy between reported and calculated enrollment, as seen in Figure 4.3. IFs computes that differential as an additive factor so as to assure that our computation and the data are consistent; the model carries forward the additive factor but causes it to converge to zero over time.

A separate algorithmic structure helps represent gross enrollment patterns at the primary level. Specifically, the model tracks the pool of potential students who are above the entrance age (as a result of never enrolling or of having dropped out), and it brings some back as students (dependent on initial conditions with respect to gross versus net intake) for the dynamic calculation of total gross enrollments.

A generally similar grade-flow methodology models student flows at the lower and upper secondary levels, including country-specific entrance ages and durations at each level. Two adaptations were necessary. First, UIS provides only gross enrollment data for lower and upper

Figure 4.3 Example comparing primary grade flow data and IFs simulation: Bangladesh (1988)



Source: UIS data and authors' calculations.

secondary enrollment rates, so our core lower and upper secondary forecasts are also gross rates only (a relationship estimates total secondary net enrollment from the gross values). Second, although UIS provides transition rate data from the primary to the secondary level—which in effect is the transition rate into lower secondary—it does not provide transition rates from the lower secondary to the upper secondary level. However, UIS does provide grade-by-grade secondary headcount time-series, from which the IFs model calculates historical lower to upper secondary transition rates as the starting point for forecasts of future rates.

In the ISCED taxonomy of educational programs (see the Appendix of Chapter 2), tertiary education displays the greatest complexity. Not only are there two categories (programs that lead to an "advanced research qualification" and programs that do not), there are also two subcategories within the programs that do not lead to an advanced research qualification. One subcategory—itself quite broad—encompasses theoretically based programs and programs that prepare students for practice in high-skill professions; the second category includes programs that are practical, technical, and "occupationally specific."

To cut through some of this complexity, UIS in some treatment of data and IFs in its representation of student flows both make simplifying assumptions at the total tertiary level.[12] For example, rather than using country-specific and tertiary category-specific program durations to calculate flows, both UIS and IFs base calculations of tertiary flow rates on an assumed five-year program period. To initialize the model, we first use the total UIS headcount of graduates of all programs to calculate an overall gross tertiary graduation rate based on the assumed five-year program period. We then use our calculated overall graduation rate with the total tertiary gross enrollment rate from UIS to calculate an overall tertiary gross intake rate.[13]

Education attainment

The algorithm for the tracking of education attainment is very straightforward. The model maintains the structure of the population not only by age and sex categories but also by years and levels of completed education. In each year of the model's run, the youngest adults pick up the appropriate total years of education and specific levels of completed education. The model advances each cohort in one-year time steps after subtracting deaths. The primary weakness of the approach, common to many but not all other models, is that it does not represent differential mortality rates associated with different levels of education attainment (generally lower for the more educated).[14] This leads, other things being equal, to a modest underestimate of adult education attainment, growing with the length of the forecast horizon. The method that IFs uses to advance adults through the age/sex/education categories also slightly misrepresents the level of education attainment in each five-year category.[15]

Financial flows

In addition to student flows, and interacting closely with them, we want to track financial flows. In IFs, we conceptualize those flows as being the result of the interaction of demand- and supply-side forces, a dynamic to which the discussion will return. The accounting side is relatively simple. Given forecasts of spending per student by level of education and given enrollments by level, an estimate of the total "demand" for education funding is simply the sum across education levels of the products of spending per student and student numbers. This so-called demand for educational funding is, however, a crude conceptualization. The flow structure of the model does not truly represent a demand for education (see, again, Figure 4.2) because initial conditions clearly reflect historical financial constraints. As with any other collective good, societies tend to underprovide education relative to the point at which expenditures would truly equal their potential benefits.

Hence, a more accurate conceptualization is that IFs represents a demand-driven, supply-constrained system. In the future, the extent of supply constraint may wax or wane (sometimes even providing largesse), and the differing budget situations will affect both expenditures per student and enrollment levels.

Turning to the budget, governments provide most education funding. Public expenditures on education as a portion of GDP vary greatly across countries (see Figures 3.12 and 3.13),

IFs represents population structures by age, sex, and years and levels of completed education.

The government budget submodel of IFs determines the amount of funding available for education.

averaging around 5 percent in recent years and ranging from under 2 percent to over 13 percent. Although fewer than 25 percent of all countries report data on private funding, it appears that private funds account at most for about one-fourth of all education expenditures and that they are concentrated at the upper secondary and tertiary levels (see Chapter 3 for further discussion). Because of the scarcity of private funding data, IFs specifically represents public funding only, and our formulations of public funding implicitly assume that the public/private funding mix will not change over time. In reality, the picture is more complicated. At the primary level, and perhaps also at the lower secondary level, it is more likely that tuition fees charged for public education will be phased out over time. In fact, the targeted increases in our formulations of per student costs in those countries with low current per student expenditures may be a proxy for a shift to public support. However, at the upper secondary and tertiary levels, private funding in the form of tuition fees may increase in some countries in order to expand capacity.

Dominant relationships

Before turning to the formulations of the model for forecasting intake and survival, it is useful to note that two alternative methodologies frame effectively all long-term forecasting. The first is extrapolation, and the second is causal analysis. Each has a variety of advantages and disadvantages, and our earlier review showed that both have been used to forecast the spread of education.

A causal approach, such as that of IFs, allows development and analysis of a range of scenarios linked to drivers of change.

A key advantage of extrapolation is the relative simplicity involved in fundamentally univariate analysis, relying only upon the history of a variable in order to determine its future. It should be noted, though, that the frequent use of specialized formulations in extrapolations (such as the S-curve) implicitly builds in the effects of other variables, such as the constraint of bringing difficult-to-reach populations into school and the shift of resources to higher levels of education, which are both implicit in the slowing of growth as an enrollment rate approaches 100 percent.

The fact that it is univariate is also an important disadvantage of extrapolation. For instance, when historical series are short and especially when they are sparse, both of which tend to be true for intake or transition and survival rates, the basis for extrapolation is liable to weaken (although turning to household survey data can extend data series relative to purely administrative data).

Chapter 2 already reviewed some of the most significant issues associated with causal analysis, including problems in sorting out the direction of causality in bivariate analysis, the possibilities of spurious relationships and complex interaction effects in multivariate analysis, and complications introduced by long lag effects.

However, among the important advantages of a causal approach such as that in IFs is the ability to "play with" the driving variables in a causal analysis, allowing development of a range of scenarios linked to important drivers, some of which may in turn be linked to potential policy levers. In long-term analyses, causal approaches can sometimes more clearly represent the structure of a system, incorporating interaction effects and constraints such as that between the supply of funds and the demand for funds in the IFs education model. Education systems are, in fact, subject to a variety of such interactions and constraints. For instance, students cannot enter higher levels of education unless they complete lower ones. Moreover, there tend to be patterns of relationships between intake and survival rates, as well as between enrollment rates at different levels of education, that purely extrapolative formulations might, in long-term forecasting, not reproduce.

Even much of traditional causal analysis, if it were undertaken purely on the basis of independent formulations for intake and survival at different education levels, would strain to maintain such relationship patterns. Instead, causal analysis embedded in algorithmic (rule-representing) logic and attentive to the patterns of causal or dominant relationships across levels of education can be useful, and that is fundamentally the approach of the IFs education model.

Intake and survival

As the discussion of student flow accounting emphasized, the rates of intake of students into primary education (or the rates of transition of primary students to higher levels), the patterns

of grade-by-grade progression, and the rates of survival through the grade progression to the final grade (as well as rates of completion of that final grade) collectively determine enrollment rates and numbers. The relationships that underlie those forecasts of intake or transition and of survival are especially important or dominant ones.

The forecasting of adjusted primary net intake rates begins to illustrate the IFs causal approach (later in this chapter we explain the concept and use of adjusted primary net intake). It has several elements. The first is use of cross-sectional analysis to specify the relationship between gross domestic product per capita and adjusted net intake at the primary level (see Figure 4.4).[16] Such cross-sectional representations, looking at relationships between variables across countries at a given time point, help us understand something about the typical long-term developmental patterns of countries globally and thus give basic insight into likely longitudinal dynamics.[17] There is a clear tendency for primary intake rates to increase with GDP per capita, particularly at lower levels of GDP per capita (below about $5,000 at purchasing power parity). This relationship reflects, in part, changing economic structures and changing demand for the skills acquired through education, as well as the growing ability of richer societies to provide education. The specific basic function in Figure 4.4 is

$$ANIR_t = 41.8 + 5.77 * ln\ GDPPCP_t$$

where

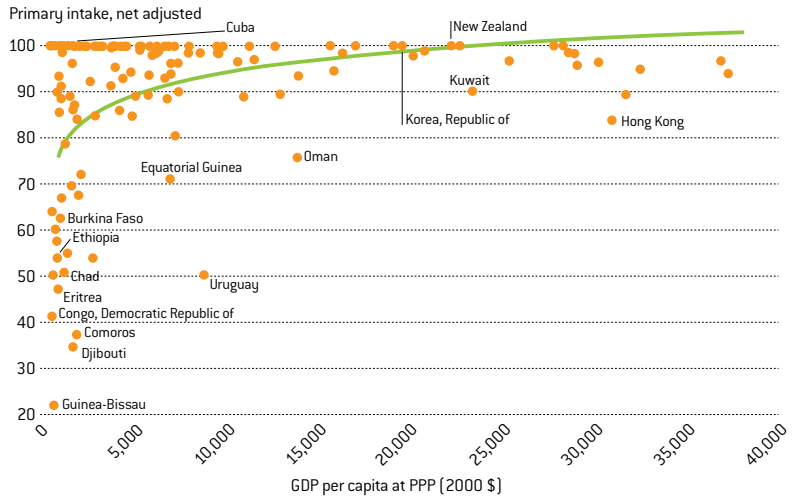
ANIR is adjusted primary net intake rate
GDPPCP is GDP per capita at purchasing power parity

Although GDP per capita is a powerful driver and/or correlate of a great many aspects of social change (Hughes 2001), the relatively low R-squared values in Figure 4.4 (and for most such relationships between GDP per capita and intake, transition, and survival rates, the R-squared values fall in the range of 0.15–0.35) suggest there is much room for extended analysis of potential dynamics of intake. We have explored the addition of other factors, such as the education of women as captured in the percentage of women fifteen and older who have completed secondary education. On the whole, that factor tends to be comparable in power to GDP per capita (and is highly correlated with it), but such factors tend not to add a great deal to the multiple R-squared. Still, we know from many empirical analyses that parents' education is a key determinant of intake rates (Clemens 2004: 4), and the omission of its explicit treatment from the IFs formulation for intake is almost certainly a weakness.

We estimated, and the IFs model uses, a full set of gender-specific, cross-sectional functions (see Figure 4.5) as the first step in forecasting the flow rates at different levels of education. The functions for intake rates show the expected progression with GDP per capita. That is, at lower levels of income, countries show higher typical rates of primary net intake than they do rates of lower secondary gross enrollment, which in turn exceeds rates of upper secondary gross enrollment. The patterns for survival rates are more complex, and it is, of course, possible that countries have higher survival rates at the secondary level than at the primary level. The functions also show the advantages that females tend to develop even in middle-income countries at the tertiary level, both in intake and survival rates.

Forecasting rates of intake or transition and of survival is foundational to IFs forecasts of enrollment.

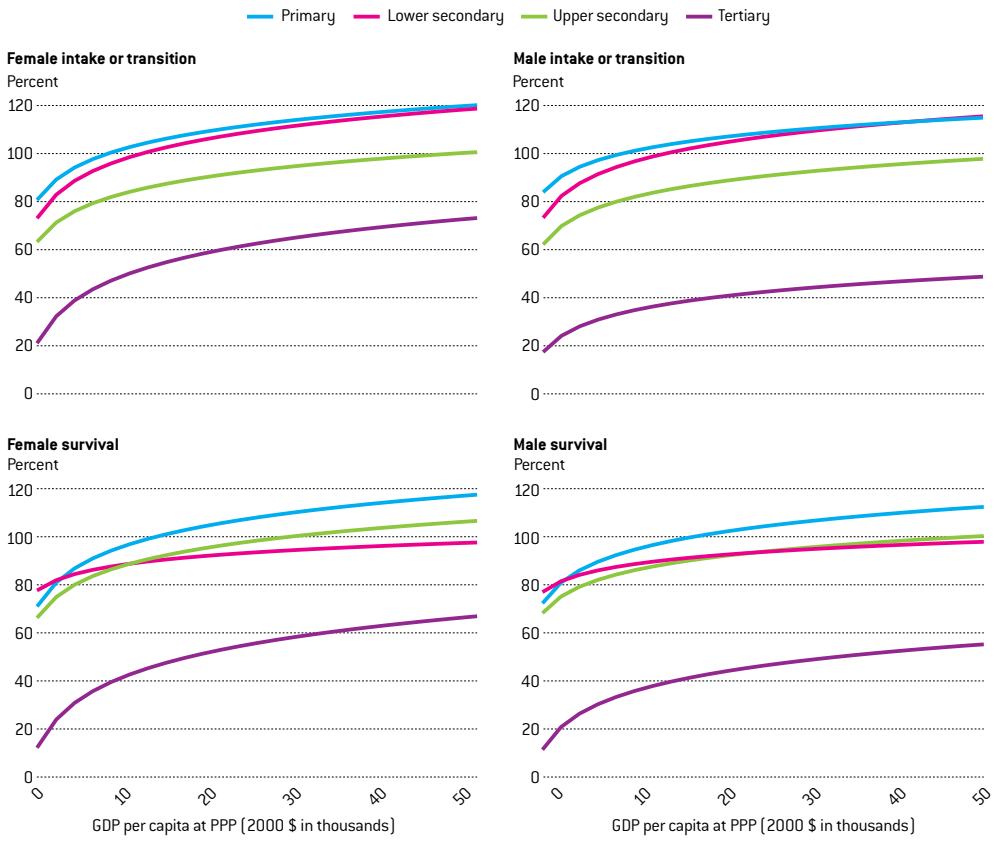
Figure 4.4 Relationship of female adjusted primary net intake and GDP per capita at PPP



*Note: Equation: y = 34.2401 + 6.5355 * log (x); R-squared = 0.19*

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Figure 4.5 Relationship of intake or transition and survival rates at different levels of education with GDP per capita at PPP



Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

This set of functions provides a fundamental group of expectations for intake and survival that provides an initial foundation for forecasts. In addition, these functions help maintain relational integrity of forecasts across education levels. Again, however, the great variation of countries around the functions makes clear the need for additional steps.

Instead of adding additional variables to the regression analysis, our formulation turns to other factors and approaches. First, considerable path dependency exists at the country level. Returning to Figure 4.4, note that Cuba is positioned well above the regression line, due to socialist policies that support universal education. Oman falls well below the line, as other Middle East countries often do. Geographic factors, ethnic and religious patterns, and cultural traditions influence intake rates, helping to create such country-specific and region-specific path dependencies. IFs partially protects those patterns by computing additive adjustment factors in the first forecast year that represent the position of empirical values relative to the relationship. As GDP per capita grows in forecasts, these adjustment factors continue to maintain the position of countries relative to the relationship.

At the same time, however, such differences can be idiosyncratic and temporary, and deviations from larger systemic patterns often erode. Thus, the model uses a convergence process to bring outliers gradually to the values of the function. We have estimated the duration of convergence periods subjectively based on model behavior, and these periods vary across levels of education. We generally anticipate convergence to be faster at lower levels of education, where emphasis is greater and enrollment rates on average are higher, than at higher levels.[18] We allow primary adjusted net intake to converge only in an upward direction

on the assumption that demand for education in countries will very seldom actually decline (extreme budget pressures, as we shall see, can sometimes force a decline).[19]

A general upward bias in convergence patterns is also consistent with another factor built into the formulation for adjusted primary net intake, namely, a "systemic shift." Figure 4.6 shows the upward systemic shift of intake rates for males in relation to GDP per capita during the 1990s, reflecting the additional emphasis that individuals and governments have placed on education in recent years regardless of income levels. Some of this shift may be due to a greater need for education in order to compete for jobs in an increasingly knowledge-based economy. Some, however, may also reflect simple competition for relative position by increasingly well-educated individuals—the "credentialism" or "sheepskin" effect (Hungerford and Solon 1987). It also seems reasonable to suspect that the greater emphasis on education in recent years has an ideational component, not solely material ones. We compute an ongoing systemic shift at the primary level based on the pattern of recent years, subject, of course, to saturation effects as levels move higher.

More generally, the education model uses this constellation of elements (GDP per capita, historic uniqueness of countries and their movement toward convergence over an extended time frame, and the representation of systemically shifting patterns) in its basic formulations for intake, transition, and survival rates. Illustratively, that for adjusted primary net intake is:

$$ANIR_t = F\ (GDPPCP,\ ANIR_{t=1},\ Converge,\ SS)$$

where

ANIR is adjusted net intake rate

GDPPCP is GDP per capita at purchasing power parity

Converge is a fractional movement toward the estimated function

SS is systemic shift (upward) of the function across time

On top of these formulations, used in exploratory analysis, the model also makes it possible for the user to target growth rates for more normative analysis—for instance, by replacing the function with specification of a 2 percentage point annual increase of intake rates across a forecast horizon (the 2 percentage points would be effective at the midlevel in the range of intake rates, tapering to zero as the intake rate approaches 100 percent, because of an S-shaped representation). Chapters 6, 7, and 8 reflect this type of normative use of the model.

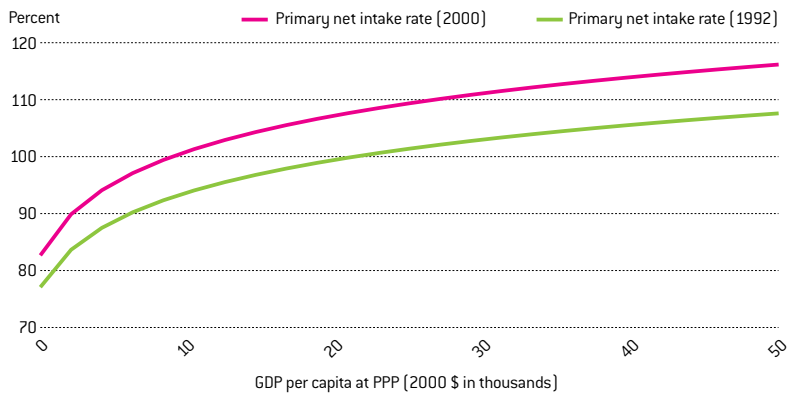
Costs of education and public spending

The education of each student has a cost, differing by level of education and generally rising across levels. Countries vary greatly, however, in what they spend per student at each level, and patterns also can change rather dramatically over time. Because spending per student is a key variable, its determination in forecasts is another relationship that greatly influences or dominates model behavior.

In the context of developing a normative scenario for education futures, Chapter 6 provides an extended discussion of spending on education, both per student and in the aggregate. With respect to spending per student, it attempts to tease reasonable target levels out of existing analyses of good practice and from cross-sectional patterns of spending by educational level as a function of GDP per capita (see Figures 6.5–6.7 for cross-sectional patterns). Typically, and especially at the upper secondary and tertiary levels, spending per student begins at quite high proportions of GDP per capita when income and enrollment levels are low, reflecting high cost structures. It falls as enrollment and

IFs reflects global patterns of change through gradual convergence of country-specific path dependencies to "typical" paths over long time frames.

Figure 4.6 The changing relationship of adjusted primary net intake and GDP per capita at PPP over recent years



Source: IFs Version 6.12 using most recent UIS and World Bank data available in IFs.

IFs uses analyses of good practice, cross-sectional patterns, and country-specific starting points to forecast per student spending at each education level.

income rise at higher levels of education, but it can rise with income at the primary level.

For the purposes of both exploratory (where we seem to be going) and normative (where we might like to go) forecasting, the IFs project draws upon these analyses of good practice and cross-sectional patterns to anticipate future levels of spending per student. For exploratory analysis, we assume that levels of spending per student will very gradually converge from empirical initial conditions to target levels. For normative analysis, we posit considerably more rapid convergence.

Key dynamics

Education and broader systems of human development interact closely over time. For that reason, the International Futures system integrates the education model with the detailed demographic, economic, and sociopolitical models. The dynamics of those other models or systems become, in essence, part of the dynamics in the education model. Earlier discussion sketched the structures and features that determine the dynamics in those other models. In this section, we return briefly to note some of the relationships across models.

With respect to important dynamics within the education model itself, sound accounting systems assure us that student flow patterns are internally consistent and connected well with tracking of adults' education attainment. They also help us to track government revenues and expenditures and to identify how much funding governments might direct to education. The key specifications of demand for education at all levels and of potential spending per student will, if resources are available, dominate the forecasting patterns and allow calculation of the funding required if societies were to meet that demand. In an integrated modeling system (and in the real world of competing demands for resources), however, initial calculations of supply and demand seldom do balance. Instead, there will be complex dynamics of interaction between the two at any point in time and across time, and this section sketches that process as well.

Linkages (backward and forward) of education to other systems

The discussion of the education model to this point has indicated the important linkages from the economic model to education demand and to spending per student, both involving GDP per capita (backward linkages from the perspective of the education model). Enrollment rates translate, of course, into student headcount only with the help of age-sex structures from the demographic model. This volume most often presents and discusses forecasts of enrollment rates, but the tracking in the IFs system of enrollment numbers is essential to analysis of the ability of societies to meet demand for education.

The government budget submodel of IFs determines the amount of funding for education. That submodel forecasts total government revenues and expenditures, using a social accounting matrix to embed them in the larger system of domestic and international financial flows and to maintain accounting consistency. Expenditures include both transfer payments and direct spending on the military, health, education, research and development, and other programs. Spending on education tends to increase as societies become wealthier, but so does other spending, including that on health. The government budget model balances competing demands.

In addition to these backward linkages to other systems, the IFs system represents a number of forward linkages from education to demographic variables (for example, fertility), economic variables (for example, productivity), and sociopolitical variables (for example, democracy level). Chapter 8 will return to these linkages. The existence of both backward linkages from education to drivers in other systems and of forward linkages from education to other systems creates important feedback loops (see, again, Figure 4.2), which Chapter 8 will also explore.

The reconciliation of budget demand and supply

What if spending demand from the education model and spending supply from the government budget submodel do not match? The reality is, of course, that they will not, which requires an algorithmic process of reconciliation. Imbalances between supply and demand for funding set up a multistage problem of allocation in the model, as in budgeting systems. Moreover, they set up both the need for immediate balancing and the need for incremental changes in longer-term

patterns. The theoretical framework for handling budget reconciliation is fundamentally that of incremental decisionmaking and budgeting.[20]

The first decision issue for immediate resolution is determination of the total public spending on education. Given the tendency for governments to spend on average just under 5 percent of GDP on education quite independently of GDP per capita (except for the poorest countries) and the persistence of that average level across time, it is clear that there is a substantial degree of top-down influence in determination of the ultimate budget. At the same time, however, the need for governments to be responsive to changing demographic patterns and enrollment growth is obvious. Thus, for exploratory analysis, we presume that the balance of forces is predominantly governmental but not exclusively so (with a roughly sixty-forty weighting). One immediate forecasting implication of this is that countries such as the Democratic Republic of Congo, which mobilize resources very poorly and direct very little of them to education, cannot be expected to have strong educational futures unless those patterns change.

A second-stage decision issue for resolution is the balance of spending across levels of education. The model does that (whether the budget is in deficit or surplus) proportional to the initial demand for funding (student numbers times cost per student). Thus, the forecasting of intake/transition and survival rates and the student numbers to which they give rise, in combination with the forecasting of costs per student, determine this allocation.

A third-stage decision issue is allocation of spending surpluses or deficits at each level of education between student numbers and costs per student. The algorithmic structure at this stage is somewhat complicated by the need to contend with imbalances already existing between enrollment and spending patterns and targets for them; for instance, if enrollment is already above the target and spending is below, it would make no sense to adjust both upward in case of a budget surplus. Some preliminary adjustments incrementally correct such imbalances, and then, on the whole, proportionally comparable adjustments change enrollment drivers (intake/transition and survival) and spending per student.[21]

Finally, in order to facilitate adjustments in future years, we compute moving average multipliers that carry forward the magnitude of adjustment to each term over time. These multipliers smooth the adjustment processes across time, allowing the overall system to chase equilibrium, even if it never completely finds it.

In normative analysis, the budgetary link between demand and supply sides can be turned off, and the demand can force the spending on the supply side. Chapters 6 through 8 explore this use of the model. Even in this situation, however, it is important that the required spending on the demand side be accounted for in the government budgeting model, thereby reducing funds available for expenditure in other areas and/or requiring additional government revenues. The social accounting matrix of the IFs economic and sociopolitical models makes it possible to do this and to trace the consequences (such as the impact on health spending) of higher or lower spending on education.

Reconciling demand for education with availability of funding is a multistage and incremental process.

Initializing the model

Initializing forecasts when data are scarce is hard work. But some algorithm ought to be able to do it. The historical series that constitute the IFs database begin with 1960, whereas the base year of the IFs education simulations (and those of the larger IFs system) is 2005. Data values from 2005 initialize the model for forecasting. The base year values of student and education financial flows come from the UIS, base year demographic data are primarily from the United Nations Population Division, economic data come heavily from the World Bank, and sociopolitical data are from many disparate sources.[22] Before the model can use these data, however, significant data extension, cleaning, and reconciliation are necessary, including the estimation of base year values when they are missing for a country.

When data are missing or are incongruent across related variables, algorithms help with data extension, estimation, and reconciliation.

Data extension

UIS provides student and financial flow rate data for many measures of education participation, particularly at the primary level. In some instances, we had to modify the data to make it meaningful for a long-term model. For example, our representation of net intake rates combines the very strictly of-age rates that the UIS reports with students one year over- and one year

Table 4.3 Primary intake rates by age categories (2005)

	Of-age	Overage 1 year	Underage 1 year	Overage or underage 2 or more years
Arab States	62.9	9.4	17.7	6.6
Central and Eastern Europe	73.9	12.0	9.0	1.5
Central Asia	67.0	17.1	19.7	6.3
East Asia and the Pacific (Poorer)	59.8	18.8	14.9	12.8
Latin America and the Caribbean	69.6	16.7	14.4	7.6
South and West Asia	72.2	23.3	1.6	17.4
Sub-Saharan Africa	49.0	25.2	10.6	18.5
East Asia and the Pacific (Richer)	88.8	14.3	0.8	1.4
North America and Western Europe	78.9	16.4	1.8	2.2
World	64.3	17.8	12.4	9.9

Source: Compiled from UIS data (unweighted country averages).

underage (also reported by the UIS) to create an adjusted net intake rate. Box 4.1 provides more detail on the concept and the rationale for our use of the adjusted net intake rate.[23]

In other instances—for example, with respect to the division between lower and upper secondary levels—UIS provides raw data (e.g., headcounts) but fewer flow rates than at the primary level. In the instances when UIS provides flow rates, we import them directly into the IFs historical series. When UIS provides only raw data (e.g., grade-by-grade headcounts or total expenditures and total number of students), we calculate rates from these series offline, using spreadsheet applications or auxiliary programs. We then enter the results into the IFs historical series. Examples of data series handled this way include the lower and upper secondary survival rates, the transition rate from the lower to the upper secondary level, the tertiary intake rate and the overall tertiary graduation rate, and differentiated per student costs at the lower and upper secondary levels. We also use such auxiliary processing to create the data series for the adjusted primary net intake rate.

Data cleaning and reconciliation

Whenever possible, we use an important automated subsystem of IFs that we call the *preprocessor* to help prepare initial conditions. The preprocessor uses algorithms that simplify the preparation of initial conditions from the raw data. Among other benefits, the preprocessor makes possible rapid recomputation of initial conditions when a new data update becomes available. The two major functions of the preprocessor are (1) filling missing base year values, and (2) reconciling incongruent data or estimates.

Filling missing base year values

When 2005 data are missing for a country, the IFs system estimates 2005 values rather than excluding the country from forecasts. We apply the following estimation techniques, normally in the order listed: (1) using the most recent data point for the country if it is temporally proximate; (2) calculating an imputed data point from a longitudinal temporal regression if a recent data point is not available but a longer historical series exists; and (3) estimating the data value from a cross-sectional relationship stored in the system, most often as a function of GDP per capita at PPP.

There are some specialized algorithms in the preprocessor or first model year to handle particular issues. For instance, one

Box 4.1 Adjusted primary net intake

In developing countries, the difference between gross and net intake rates is often great, particularly in early stages of the transition to broader education participation as "overage" students take advantage of an increased emphasis on education and growing opportunities to enroll. However, as is strikingly evident from Table 4.3, far more entering children are just one year over or under system-defined entry ages rather than two or more years older or younger. This entry pattern often persists indefinitely, even as the rates of children two or more years away from the system-defined entry age decline over time.

Were our focus only on the entry of students of precisely official entry age, we would, in our view, discount the progress countries are making with respect to the timely entry of "appropriate-age" students. Hence, in place of the conventional net intake measure, we simulate an "adjusted primary net intake rate," which is the intake rate of children at the official system-defined entry age plus the children one year above or below that age. The difference between the adjusted net intake rate and the gross intake rate then becomes the indicator of divergence from age-appropriate universal primary intake. In our model, simulated primary gross entry rates gradually converge toward the adjusted primary net intake rate as more students enter "on time" and the pool of potential late entrants diminishes.

segment of code computes the annual size of an "overage" pool of out-of-school children potentially available for primary intake. A particularly important specialized process takes the education attainment data (which are not provided from original sources by age) and spreads the attainment levels across age categories in order to initialize the ongoing calculation of attainment described earlier. This spread process takes into account the percentage of the adult population with a certain level of education, the current completion rates at that level of education, and the age structure of the adult population. Knowing that completion rates almost always exceed the average attainment levels (that is, education participation is increasing over time and therefore decreases across progressively older cohorts), a factor for age-related decline in attainment levels can be computed in an iterative process.[24]

Reconciling incongruent data or estimates

Incongruities among the base year primary flow rates (intake, survival, and enrollment) can arise either from reported data values that, in combination, do not make sense or from the use of "stand-alone" cross-sectional estimations to fill holes. Such incongruities might arise among flow rates within a single level of education (e.g., primary intake, survival, and enrollment rates that are incompatible) or between flow rates across two levels of education (e.g., primary completion rate and lower secondary intake rate).

The IFs education model uses algorithms to reconcile incongruent flow values. They work by (1) analyzing incongruities, (2) applying protocols that identify and retain the data or estimations that are probably of higher quality, and (3) substituting recomputed values for the data or estimations that are probably of lesser quality. For example, at the primary level, data on enrollment rates are more extensive and more straightforward than either intake or survival data; in turn, intake rates have fewer missing values and are arguably more reliable measures than survival rates.

Conclusion

The purposes of our modeling are to enhance understanding of where the global education transition appears to be taking education systems and to create and explore a normative scenario that might accelerate that transition. Past models and tools provide a strong basis for insights into how to structure such a model, and in building the education model in IFs, we have drawn upon them. In the process, we have created a model that is structurally based and agent-class-driven, that represents formal education at all levels, and that is integrated quite tightly with models of demographic, economic, and sociopolitical systems.

Although we believe our education model to be a strong one, it is imperfect. Modeling and forecasting systems simplify reality, in part to allow us to better understand its dominant structures and dynamics. In fact, this is the fundamental reason we do modeling. Simplified representations help us clarify and extend our own mental models of the system of interest to us. They also allow us to think about how systems might be unfolding and therefore to produce forecasts with and without modeled interventions. However, we should never confuse forecasting with prediction.

In this spirit, we will turn in succeeding chapters to the use of the IFs modeling system and to its forecasts of further advances in global education, including some comparison with forecasts produced by other tools and approaches. Chapter 5 and subsequent chapters will look explicitly to the future, presenting both the base case of IFs and alternative forecasts developed around it.

Our structurally based, agent-class-driven model represents formal education at all levels and is integrated with demographic, economic, and sociopolitical models.

Appendix to Chapter 4: Education Modeling and Forecasting Approaches

McMahon

Education and Development: Measuring the Social Benefits describes McMahon's development and implementation of an econometric "interactive macrodynamic model" (McMahon 2002: ix), the purpose of which was exploration of the social benefits of education (McMahon 2002: 179). Analyses of the social benefits of education included both direct and indirect impacts of primary and secondary education on economic development; on population growth via health and fertility; on democracy, human rights, and political stability; on poverty and inequality; on the environment; and on crime.

The book began with a "base case" or exploratory analysis that assumed the

continuation of past education policies and the associated unfolding of education and its impacts. Simulations of two specific normative education policy changes and how they might enhance the extension of education and its impacts moved beyond the base case. The first normative scenario was built on a 2 percentage point increase in public investment in education as a percentage of gross national product (GNP); the second normative scenario assumed a 20 percentage point increase in male and female secondary education enrollment rates (McMahon 2002: 185–186).

The analysis used historical data for the period from 1965 to 1995, and its forecasts extended to 2035; the countries included (78) were those for which consistent data were available on all key variables. The model incorporated empirically tested varying time lags between changes in primary and secondary education and changes in other components of development; it included bidirectional feedback loops; its mathematical equations incorporated the concept of long-run equilibrium relationships; and its parameters were estimated from cross-sectional analyses examining relationships between variables across many countries at one point in time. The major contributions of the model were (1) the inclusion of both primary and secondary education, (2) the placement of the broad direct and indirect social impacts of education at the center of analysis,[25] and (3) an effort to calculate a net return associated with extending education participation.[26]

Delamonica, Mehrotra, and Vandemoortele

In a study published by the United Nations International Children's Emergency Fund (UNICEF), Delamonica, Mehrotra, and Vandemortele (2001) projected the incremental costs associated with moving from the level of each developing country's net primary enrollment rate in 2000 to universal primary education for all developing countries (128) by 2015. The project was undertaken to update global and regional cost estimates for the period from 2000 to 2015, in distinction from cost estimates based on enrollment patterns in the early to mid-1990s (Delamonica, Mehrotra, and Vandemortele 2001: 2). The purpose and approach were normative.

Delamonica et al. used population projections from the UN Population Division as a basis for their cost projections. They then assumed the increases needed to bring each country's net enrollment rate to 100 percent by 2015 would occur in a linear fashion. They also made the uniform assumption that all countries would absorb any incremental costs arising from population trends at constant enrollment rates (i.e., that a country could find the resources to educate the then-current proportion of its population of school-age children, no matter what size that school-age population would be over the 2000–2015 period). Their methodology held GDP per capita constant for the period from 2000 to 2015.

Delamonica et al. estimated costs in four discrete categories: (1) recurrent expenditures related to net enrollment rate increases; (2) quality improvements, as reflected by an adjustment in unit costs to allow 15 percent of recurrent costs for nonwage items (e.g., instructional materials) without a reduction in teacher salaries; (3) reducing pupil-to-teacher ratios to an average of 40; and (4) capital costs for those countries where the increase in students from the expanded net enrollment ratio would be greater than the decrease in the school population from trends in the decline of expected births. Items (1) and (4) were added to the costs as increases in the net enrollment ratio brought new students into the school system, whereas items (2) and (3) were added across the school population in the first year of estimated costs (Delamonica, Mehrotra, and Vandemortele 2001: 12–13). Although the only dynamic element of the model was its use of school-age population projections as the basis for estimating costs of a linear increase to UPE, the model provided a framework for considering various cost components (including quality improvements and capital outlays) and overall resource requirements to be met domestically (through economic growth or reallocation of government funds) or by international donors.

Bruns, Mingat, and Rakotomalala

Bruns, Mingat, and Rakotomalala (2003) authored a seminal normative study entitled *Achieving Universal Primary Education by 2015: A Chance for Every Child*. The study utilized a simulation model developed by Ramahatra Rakotomalala and subsequently adopted for use by the countries selected to participate in the

Education for All Fast-Track Initiative sponsored by the World Bank, UNESCO, UNICEF, and the regional development banks.

The study provided a detailed analysis of the forty-seven low-income countries that were furthest in 2000 from the MDG goal of universal primary education, with an estimate added for Afghanistan (Bruns, Mingat, and Rakotomalala 2003: 20). The study focused on estimating, under certain normative targets or benchmarks, the following: (1) what it would cost to achieve the goal in terms of incremental funding between 2000 and 2015,[27] (2) the portion of that funding that developing countries could afford under the assumption of a 5 percent economic growth rate applied across all countries, and (3) where and how much international assistance would be needed.

World Bank task teams collected enrollment data for the then most recent year (usually 2000) directly from the education ministries of the forty-seven low-income countries included in the study. UNESCO-published data (usually for 1997) were used when more recent data were not available from the education ministries. Population data were from the United Nations/World Bank population database used by the World Bank (Bruns, Mingat, and Rakotomalala 2003: 39, 41).

The study began with an exploratory analysis of the characteristics of the low-income countries that were making accelerated progress toward UPE in 2000, compared to countries that were not (2003: 8). From this empirical analysis, a "best practices" or normative framework was created to provide guidelines for policy levers to achieve universal primary completion at "minimum adequate cost" (2003: 109). The framework included benchmarks or targets for quality improvements, for efficiency improvements, and for domestic resource mobilization (2003: 82). The financing benchmarks included a cap on the portion of educational expenditures from government revenues going to primary education in order to avoid stripping resources from secondary and tertiary education. The various benchmarks were combined in different ways to produce alternative scenarios, and incremental costs (including estimates of gaps in domestic funding capacity) were generated for each scenario. The approach connected education to broader systems via population projections, benchmarks for funding and resource mobilization, and the inclusion of an economic growth rate assumption (albeit a single assumption for all countries). The model also moved toward inclusion of enrollment dynamics by measuring costs associated with a targeted upper limit on repetition rates and a targeted completion rate rather than an overall enrollment rate alone.

Clemens

In 2004, Michael Clemens, through the Center for Global Development, authored a provocative background paper for the Millennium Project Task Force on Education and Gender Equality. His focus was on understanding if there is a typical primary schooling "transition pathway" in developing countries and also on the degree to which the transition to mass primary education can be accelerated by government policies.[28] Clemens raised these questions in the context of exploring the feasibility of meeting the MDG goal of universal primary education by 2015; his approach was primarily exploratory, but it included some elements of normative analysis.

To explore these questions, Clemens developed an aggregated flow model that focused on transition speeds as measured by overall net primary enrollment rates, using administrative data compiled by UNESCO field offices from school registers for the years from 1960 to 2000 for over 100 developing countries. Based on the typical developing country experience between 1960 and 2000, he produced S-curve extrapolations[29] of the number of years individual countries and multicountry regions might need in order to reach 90 percent net primary enrollment (Clemens 2004: 42, 52). He used the same UNESCO data to model a typical "gender transition speed" in primary and secondary enrollment.

Clemens explored three other dimensions in his evaluation of the feasibility of achieving UPE by 2015: (1) he compared the 1960–2000 transition rates in developing countries with the rates of today's rich countries during their earlier transitions to universal primary education; (2) he estimated the necessary transition speeds if today's developing countries are to meet the 2015 goal of universal primary education (Clemens 2004: 55); and (3) he used cross-country data from 1980 to explore

relationships between education transition rates and a number of social, economic, and education policy variables at that point in time (Clemens 2004: 45). He also reviewed an extensive body of literature on drivers of education participation, pointing out in particular the importance of the relationship between household income and parental level of education in family schooling decisions (that is, the role of demand factors).

Clemens's approach did not include costs or the specifics of enrollment dynamics (e.g., intake, repetition, or completion). Instead, it focused needed attention on a number of other critically important aspects of the education transition: (1) the importance of policy attention not just to education availability and supply but also to circumstances that influence demand for education, (2) the importance of placing the transition to mass primary education in developing countries in a longer historical context in order to set aggressive but realistic goals with respect to time frames, and (3) the need to take individual countries' circumstances into account in setting goals.

Wils, O'Connor, and Somerville

A model developed by Wils, O'Connor, and Somerville, and published in a 2005 paper by Wils, Carrol, and Barrow for the Education Policy and Data Center,[30] focused on the concept of growth paths toward universal primary education. The context, as it was with Clemens's study, was an exploration of the feasibility of meeting the MDG goal of universal primary education by 2015 (Wils, Carrol, and Barrow 2005).

The model dealt exclusively with student flows at the primary level, and it operated by extrapolation of flow rates without regard to population dynamics or resource requirements and availability. However, it advanced the conceptualization and implementation of flow dynamics in modeling by using and comparing two measures of primary education coverage—entry and completion—rather than using a single overall enrollment rate. Average entry and completion rate patterns were estimated for each of seventy low-income countries for the historical period from 1950 to 2000, and then they were projected forward in S-shaped extrapolations. The descriptor used by Wils et al. for the trajectories of the paths was the number of years it will take each country to go from a primary completion rate of 10 percent to a primary completion rate of 90 percent, represented as T10-90 (Wils, Carrol, and Barrow 2005: 10).

A significant difference between this and earlier models was its use of household surveys and population censuses (rather than administrative data) as preferred data sources (2005: 2).[31] Another difference was its use of a "backward-looking" lens to establish historical entry and completion rates. The authors divided the population of 15- to 65-year-olds participating in the household surveys between 1999 and 2001 into single-year age cohorts, and they used the percentage of the cohort that was 14 years old in each year from 1950 to 2000 and that reported having at least some primary schooling in order to estimate primary entry rates for each of those years. They applied a similar methodology, using 19 as the age, to estimate primary completion rates for the same historical period. The use of household data also allowed identification of out-of-school children by various subcategories (e.g., in subpopulations within the country) as well as analyses of inequality across groupings, such as entry and completion gaps between urban males and rural females (2005: 39).

Lutz, Goujon, and Wils

A paper by Lutz, Goujon, and Wils, also published by the Education Policy and Data Center in 2005, elaborated the application of what is described as a "multistate demographic method" to forecast the extent of education attainment among adult populations.[32] The model used in this paper was primarily exploratory but included some normative aspects, and it differed from the previously discussed models and tools in a number of important ways. First, its focus was not education system flows but rather the stock of human capital as reflected by the education attainments of a population by age and sex across four categories: no education, primary education, secondary education, and tertiary education.[33] Second, other than purely extrapolative enrollment trend projections produced by UNESCO in the 1980s and 1990s,[34] it was, so far as we know, the first model or tool to look across all levels of formal education. Third, by focusing on education levels in the adult population—and, further, on education levels by age and sex—it facilitated exploration of the relationships

between levels of education in a population and other human development systems (e.g., fertility, life expectancy, and economic growth).

The developers initialized the model with UN population data by age and sex extending back to 1937 and produced visual representations of population characteristics in three pilot countries (Guinea, Zambia, and Nicaragua) in 2000, in population pyramids by age and sex in five-year intervals. Education attainment levels from USAID Demographic and Health Surveys were superimposed upon the pyramids, as were estimated fertility levels and infant and child mortality levels by mothers' education from the Demographic and Health Surveys. Moving forward, projections of the population pyramids to 2030 reflected expected impacts of changes in education attainment, with both fertility and child mortality decreasing as education increases.

At the time the paper was written, the model used stylized rather than dynamically formulated assumptions to advance the pyramids to 2030 with respect to initial entry rates and transition rates between one level of education and the next. The authors created three scenarios, using differing stylized or normative assumptions as follows: (1) constant (current) entry and transition rates, (2) trend entry and transition rates, and (3) MDG goal fulfilling entry rates (with constant or trend transition rates).

The IIASA model and its pyramidal displays clearly illustrated that education is a long-term investment by showing the time lag between increases in education attainment among young members of a population and increases in the overall structure and pattern of "human capital stock" in the total population. Further, the authors pointed out that by using the distribution of educational attainment as an indicator of human capital (rather than a single population-wide measure of average years of schooling), it was possible to explore relationships between age, sex, levels of education, and other variables (e.g., health, poverty, and economic growth). They also pointed to the possibility of subnational forecasts, as the methodology can be applied to any population that is clearly defined and for which there is the necessary information by age, sex, and level of education (2005: 33). Work continues at IIASA to extend the model to a large number of countries and to further exploration of relationships between age, sex, levels of education, and other variables; one example is a backward-reconstruction of populations by age, sex, and level of educational attainment for 120 countries for the period from 1970 to 2000 (Lutz et al. 2007).

Hilderink

A 2007 working paper authored by Hilderink described an exploratory education module being developed and embedded in the established PHOENIX dynamic population and health model at the Netherlands Ministry of Health and Environment (Hilderink 2007). At the time the paper was prepared, the PHOENIX education module used enrollment rates as the single measure of education flows; however, the author stated the plan was to use intake and drop-out rates in a subsequent phase. Education attainment levels and literacy are other components of the model. Geographic regions are the unit of analysis, and the model extends across primary, secondary, and tertiary levels.

The model was initialized with education data from UIS and economic data from the World Bank's World Development Indicators. Simulations for the period from 1950 to 2000 were being used to calibrate and validate the model; the paper provided forecasts for the period from 2000 to 2025, but it mentioned a simulation period extending to 2050. The model includes bidirectional connections between education levels, mortality, and fertility. It also introduces the concept of education demand and education supply by dynamically connecting both enrollment rates and education expenditures to GDP per capita, with the assumption that demand and supply are equal. Although still in a developmental stage, the model is being designed as a comprehensive tool for forecasting education dynamics in conjunction with a number of connections to broader systems.

Wils, Barrow, Oliver, Chaluda, Goodfriend, Kim, and Sylla

An EPDC background paper prepared for the 2008 Education for All Global Monitoring Report described and presented initial results from ProEnrol, a country-level cohort-projection model being developed by the Education Policy and Data Center (EPDC 2007b). The measures of student flows forecast in the paper were

primary and secondary enrollment rates, student headcounts, and gender parity indices, under the exploratory assumption of each country's continuation of its current education policies.

Cohort-projection models focus on the grade-by-grade dynamics of student flows. Countries often use them to meet education system operational planning needs by projecting numbers of students by grade and level and the school resources therefore needed.[35] Individual countries may also use them to understand the dynamics of their student flows and to assess education system functioning with respect to these dynamics (entry, promotion, repetition, dropout, reentry, survival, and completion).

ProEnrol, however, is intended for a larger-scale use. As the background paper noted: "The Cohort projection model developed by the EPDC is the first effort to make cohort projections in an international, global series and is done here on an experimental basis. The intention of the GMR [Global Monitoring Report] at this point is to test this method" (2007b: 69). The background paper included projections of primary net enrollment rates and student headcounts for 60 countries using ProEnrol, projections of primary gross enrollment rates and student headcounts for 129 countries using ProEnrol, and projections of secondary net enrollment rates and student headcounts for 82 countries using ProEnrol (2007b: 70). The EPDC made projections for two points in time, 2015 and 2030, and calculated a gender parity index for each projected series.

ProEnrol was initialized with historical enrollment data (1999 forward) from UIS on pupils by grade (females and both sexes combined) at the primary and secondary levels. It used United Nations medium population projections for the period from 2000 to 2025 to calculate gross and net entering school populations (headcounts) by multiplying the projected population of school entry–age children by projected gross and net entry rates. Extrapolations from past trends in intake rates were used to project future intake rates, and country-specific constant values (equal to the most recent year data were available) were used for promotion and repetition rates.[36]

The model's only linkage with systems outside education at the time of the background paper was its use of UN population projections of school entry–age children as a foundation for projecting school enrollments. For example, it did not calculate resource requirements or compare potential enrollments with estimates of resource availability. However, it would seem those components might rather easily be added, since the model calculates student headcounts, and per student costs are widely available from UIS. Perhaps more important at this stage, a protocol needs to be developed for projecting reasonable changes in promotion and repetition rates over time, since they are flow components subject to dynamic changes. However, the existence of possible future improvements should not detract from the contribution ProEnrol has already made by developing and now testing significant aspects of a grade-by-grade cohort projection methodology on a global scale, including the first specific representations of promotion and repetition.

1 Either type of model might employ a simple or a sophisticated methodology. At its simplest, an exploratory tool might forecast future enrollment trends by the extrapolation of recent patterns. Likewise, at its simplest, a normative tool might consist of a basic mathematical exercise, such as the calculation of how much primary intake and survival rates need to increase each year between now and 2015 to meet the MDG goal of universal primary education at that time.

2 The time lag between initial changes in intake rates and the possibility of impacts from increased education attainment on other aspects of human development systems is the reason we stipulate that a forecasting tool with a mid- to long-range time frame is critical.

3 In an ideal system, the points of intervention are sufficiently "actionable" that policymakers can readily discern implications for policy choices and implementation strategies. However, even more abstractly defined interventions (e.g., "focusing on increasing survival rates") can be helpful in providing a course for improved outcomes.

4 McMahon (2009) extended his analysis to the tertiary level in a book focused on the social and private benefits of higher education.

5 For an introduction to the character and use of the IFs modeling system, see Hughes and Hillebrand (2006).

6 We emphasize that IFs is not an agent-based modeling system because it focuses on the aggregated behavior of *agent classes*, rather than on the behavior of individual agents as agent-based models do.

7 The various member organizations of the United Nations family are a primary data source, but other sources, such as the World Bank's World Development Indicators, are also used extensively.

8 More technically, the model structure is recursive (it computes equations sequentially in each time step without simultaneous solution). It combines features of systems dynamics (notably, the accounting structures with careful attention to both flows and stocks) and econometrics (using estimated equations for the dynamic behavior of the agent classes).

9 We have an explicit representation of the S-shaped path in our normative scenario only. The more implicit saturation behavior in our exploratory base case results from the integration of various dynamic drivers of education flows.

10 Again, the interested reader is referred to www.ifs.du.edu for further documentation.

11 The rate is calculated as the proportion of those in the last primary grade who enter general programs at the lower secondary level the following year. At the secondary level, UIS enrollment rates include students in both general secondary programs and vocational secondary programs. However, UIS transition rates to lower secondary are for general secondary programs only, and our model follows that convention in our calculations and forecasts of both lower and upper secondary transition and survival rates. We maintain country-level gender-specific vocational enrollment rates as a constant percentage of official lower and upper secondary school-age populations, reflect them in enrollment data, and use them to bound transition and survival rates in lower and upper secondary general programs.

12 A future volume in this series will focus on infrastructure and will include more differentiated analyses and forecasts of tertiary education, making use of program-specific UIS tertiary data to initialize the model.

13 UIS has a data series for tertiary entry rates. However, we developed the procedure described earlier because the UIS series has data for only about 30 percent of all countries and for very few developing countries.

14 The multistate demographic method developed and utilized by IIASA does include education-specific mortality rates.

15 The current IFs education model tracks adult age-sex-education categories by five-year intervals rather than one-year intervals. In a model with a one-year time step, as IFs is, this means that one-fifth of each cohort advances annually. In an environment of increasing education participation and attainment, the process creates some degree of numerical diffusion as a portion of the educational attainment assigned to the youngest cohort advances too rapidly to the next cohort (a process sometimes called numerical diffusion). This means also that some of the stock of educational attainment ages and dies too rapidly, slightly exacerbating the underestimate.

16 IFs generates all such relationships for males and females separately in order to capture sex-related variations in education participation patterns vis-à-vis GDP per capita.

17 See McMahon (1999: 13–14) on the manner in which cross-sectional analysis helps represent patterns of long-term change.

18 Convergence periods in IFs range from 20 to 100 years; most are between 40 and 70 years.

19 We do not apply a similar constraint to primary gross intake rates, as they in fact typically "overshoot" 100 percent during a rapid education transition and then either rapidly or slowly decrease to just above or below 100 percent as adjusted net intake rates approach 100 percent.

20 As early as 1940, V. O. Key drew attention to the central question: "On what basis shall it be decided to allocate *x* dollars to activity A instead of activity B?" (1940: 1138). Later experts in the field of public finance (for example, Wildavsky [1988]) helped establish incrementalism as the dominant paradigm to explain budgeting processes and decisions. As Lindblom (1959: 81) put it, political decisions are made more through "successive limited comparisons" than through any "square one" comparison among possible alternatives. Allison (1971) contrasted three decisionmaking models, and his models of organizational process and bureaucratic politics are closer to reality for social and budgetary policy than is the rational actor model.

21 Even an algorithmic representation of an incremental decisionmaking process requires parameter specification. In contrast to the statistical estimation procedures used for functions such as those driving intake/transition and survival, as well as those setting targets for per student spending and total government spending on education, that algorithmic parameterization is done via analysis of the behavior of the model, a process that modelers commonly call *tuning*.

22 The maintenance of the IFs database is an ongoing process, and data from major sources are updated at regular intervals. In the preparation of this volume using IFs Version 6.12, our most recent download of UNESCO data followed UIS's September 2008 update. We also used the 2008 version of the World Bank's World Development Indicators and the 2006 Population Updates from the UN Population Division. The model was initialized with 2005 values from those sources. Data from those sources for more recent years, as available, were used in cross-sectional analyses, where our convention is to use the most recent year's data available for each individual country.

23 At one extreme, in Indonesia about 60 percent of children one year below the official age enter every year, a higher entrance rate than for of-age children.

24 Weishuang Qu of the Millennium Institute provided information on that approach, used also in the T-21 model.

25 We note that McMahon chose not to follow economists' more frequent convention of referring to "market" and "nonmarket" returns. By instead referring to "social returns" and including economic development among them, McMahon applied econometric analysis within a human development framework.

26 The model used gross enrollment rates as the single student flow measure in the 1999 publication. In a subsequent paper reporting the use of the model to assess social outcomes of education in Africa, primary completion rates were added as a second student flow measure (Appiah and McMahon 2002).

27 Like the study undertaken by Delamonica et al., this study focused on costs associated with achieving a normative target. Unlike the Delamonica study, however, Bruns et al. focused on incremental costs associated both with enrollment rate changes and with population dynamics and then compared these total incremental costs within a resource framework that, although simple in its assumptions, considered an impact from economic growth.

28 *Transition* in this context refers to the change from low to high rates of participation in primary education.

29 S-curves fit broad-scale social changes because change processes often start slowly, then build rapidly in a middle range, and slow as they approach a limit (such as 100 percent).

30 The Education Policy and Data Center was established in 2004 to contribute to global education policy and planning through data and analysis, and it has rapidly become very important in these roles. It is part of the Academy for Educational Development (AED) and is funded primarily by USAID and AED (Wils et al. 2007b: 6).

31 Most typically, these were the USAID-sponsored Demographic and Health Surveys (DHS) and the UNICEF-sponsored Multiple Indicator Cluster Survey (MICS) (Wils, Carrol, and Barrow 2005: 2).

32 Demographic multistate projection models reflect and project the distribution of various characteristics or "states" (such as levels of educational attainment) across a population (or subpopulations) segmented by age and by sex. The paper stated that demographic multistate projection methods were first developed at the IIASA in the 1970s (Lutz, Goujon, and Wils 2005: 9).

33 The definition of levels of education attainment used by Lutz et al. (2005: 16) differs from the definitions used by many other systems. Lutz et al. define "no education" as never having gone to school or completing less than one year of primary education. They place people in the category of primary education if they complete at least one year of primary school, in the category of secondary education if they ever entered secondary school, and in the category of higher education if they ever entered tertiary education after completion of secondary school. The use of these definitions produces a higher profile of education attainment than the use of completion measures would, and it needs to be taken into account when comparing their results with those of some other models and analyses, including IFs.

34 Although purely extrapolative, these earlier UNESCO projections were important and ambitious projects, particularly because they included all levels of formal education. One study released in 1989 provided trends and projections of enrollment by level of education and by age for the period from 1960 to 2025 (UNESCO 1989), and another in 1993 provided updated trends and projections for the same span of years (UNESCO 1993).

35 Porta and Wils (2007) described and compared four such detailed education system planning tools in a 2006 EPDC paper: (1) the World Bank tool associated with the Bruns, Mingat, and Rakotomalala project described earlier in this chapter; (2) the UNESCO Education Policy and Strategy Simulation Model (EPSSim); (3) the Modelo de Necesidades de Financiamiento (MNF) model used by Nicaragua and Guatemala; and (4) the EPDC Demo Ed Model.

36 The report noted the model could also have used trend values or user-set values for promotion and repetition rates. However, the analysis did not use trend rates because of the extreme projected values they sometimes produced (EPDC 2007b: 77). The analysis used grade-by-grade specific repetition rates when they were available and otherwise applied the average repetition rate to each grade (EPDC 2007b: 77).

5

What Path Are We On?

This chapter explores a dynamic base case forecast of the next fifty years of global education as it now appears to be unfolding.

It has been fifty years since the large wave of independence from colonialism washed across Africa and around the world. Intensified efforts to boost levels of education followed quickly in lower-income countries. The competition of the Cold War and the emerging focus on knowledge foundations of economies had similarly energizing effects in middle- and upper-income countries. Chapter 3, using data that have become increasingly available over the past five decades, sketched the rapidly unfolding and, in fact, accelerating transition in global education.

Building on that historical context and using the IFs forecasting system, this chapter will explore a base case forecast of the next fifty years of global education as it now appears to be developing. We will consider the possible evolution of student enrollment rates and persistence at all levels of education, as well as of public education funding, and examine the implications of these patterns for the future of adult educational attainment. Unfortunately, of course, all forecasts are flawed and uncertain. Comparing the IFs forecasts with forecasts from other models will help us discuss the confidence that we have in the IFs forecasts and those of education forecasting more generally.

The base case forecast of global education, though it rests on recent trends, is not a simple extrapolation. Instead, the IFs system produces the base case using a dynamic representation of many interactions between education and other components of human development systems, notably, demographic, economic, and sociopolitical futures. For instance, the IFs base case forecasts of population, GDP per capita, and government spending interact closely with enrollment patterns and with adult educational attainment.[1] Because forecasts of such key interacting systems themselves can vary considerably, we will look in the final section of the chapter at alternative forecasts for key driving variables and consider how they might affect our base forecast of education futures.

The IFs Base Case Forecast

Many forces, not least of which is a significant economic advance in combination with public and international political will, have pushed global education forward in recent years. As we saw in Chapter 3, in spite of historically rapid and accelerating progress in global education over the last fifty years (and some shorter-term acceleration since the mid-1990s following earlier disruptions), there are certainly many countries and education levels where educational progress might accelerate further. It is important to emphasize also, however, that there are some brakes on and even limits to such expansion. For example:

- Demographic transitions tend to accompany and even to precede educational ones, in part because very rapid population growth greatly strains education resources; global demographic transitions to low fertility rates, especially in Africa, have far to go, and high birth rates will continue to challenge education systems for decades.
- More prosaically, increases in completion at lower levels must precede increases at higher levels, and the human resources needed for expansion at lower levels often come from higher ones, making the interactions across levels important constraints on each other.
- There are also financial constraints. We have seen that higher-income societies have not significantly increased the share of GDP that they devote to education for several decades (in fact, they have decreased it modestly); most low- and middle-income countries have raised the share of GDP spent on education close to that of the high-income countries, limiting the likelihood of a further increase from domestic resources.
- Constraints also arise from the demand side of the process; for instance, not everyone in poorer, heavily agriculture-based societies wants or needs higher education. In addition, social exclusion and identity issues limit demand from some population groups.

Where the historical trends take us in coming decades depends on the interaction of the forces that accelerate change and those that constrain it.

Student population flows: Expansion of education

As we have seen, rates of enrollment at all levels of education are rising around the world. Primary gross enrollment rates globally now exceed 105 percent and are likely to decline somewhat as the enrollment rates of of-age children continue to increase and those of overage children decline. Figure 5.1 shows this decline as well as the ongoing push upward for lower secondary (rapidly approaching 80 percent), upper secondary, and tertiary gross enrollment rates. By midcentury, the global lower secondary gross enrollment rate will likely be near or slightly above 90 percent, a remarkable achievement, and the upper secondary gross rate will likely be near 80 percent.

One of the reasons why rates will be able to increase so significantly is that demographic pressures on education systems are now waning almost everywhere. On a global basis, the number of students enrolled in primary programs will actually peak around 2022 and begin declining, in spite of continuing enrollment rate increases. In the IFs base case, primary student numbers fall from 675 million in 2005 to 653 million by 2060. At the lower secondary level, the peak numbers may occur around 2055, but the total number of students globally in 2060 (about 334 million) is likely to only slightly exceed that in 2005 (298 million) in spite of the movement to near-universal enrollment. This is a critical reason why our forecasts can show rapid enrollment rate increases. The large increases in absolute numbers will come at the upper secondary and tertiary levels.

Figure 5.1 explores regional variation as well, showing forecasts of the series that Figure 3.1 presented historically. Although we did not have the data needed to differentiate lower and upper secondary enrollment rates over a long historical period, we do differentiate them in our forecasts.[2] Gross enrollment rates overestimate the progress to universal education. Yet the quite high rates forecast at the lower secondary level in 2060, even in sub-Saharan Africa, suggest that well before midcentury the attention of the globe will have shifted to universal lower secondary education and to setting goals at higher levels.

The future of education's advance will be determined by the interaction of forces accelerating it and forces constraining it.

The further spread of education will be helped by changing demography; demographic pressures on education are waning almost everywhere.

Figure 5.1 Gross enrollment rates by region and education level

Note: The figure does not include historical values because of much missing data; see the regional historical values of relatively data-rich countries in Chapter 3.

Source: IFs Version 6.12 base case forecast.

Table 5.1 presents forecasts for primary and secondary net enrollment rates. The IFs base case clearly does not anticipate that the world will have reached universal primary education by 2015,[3] but Table 5.1 shows that all regions except sub-Saharan Africa will likely have reached or passed the 90 percent "nearing universal enrollment" marker by 2030 and that sub-Saharan Africa will essentially do so by 2045 (although in both cases, some individual countries may not yet have done so).

Student flows: Targeted country sets

The historical review of Chapter 3 noted that, except for Djibouti (and almost certainly Afghanistan, for which recent data are not available), all countries with primary net enrollment rates below 50 percent in 2005 were in sub-Saharan Africa. And in fact, all but three countries with primary net enrollment rates between 50 and 70 percent were in that region. Figure 5.2 therefore extends the historical pattern (see, again, Figure 3.8) for three sets of sub-Saharan African countries with the forecast of the IFs base case.[4] The 2060 horizon of this volume proves long enough to capture the anticipated movement of primary net enrollment rates to or near to universality in the sets of African countries with midrange and higher enrollment rates

The base case shows a continuation of the historically rapid transition of recent decades.

Even so, reaching the MDG of universal primary education by 2015 is not, and never was, a reasonable goal for all countries.

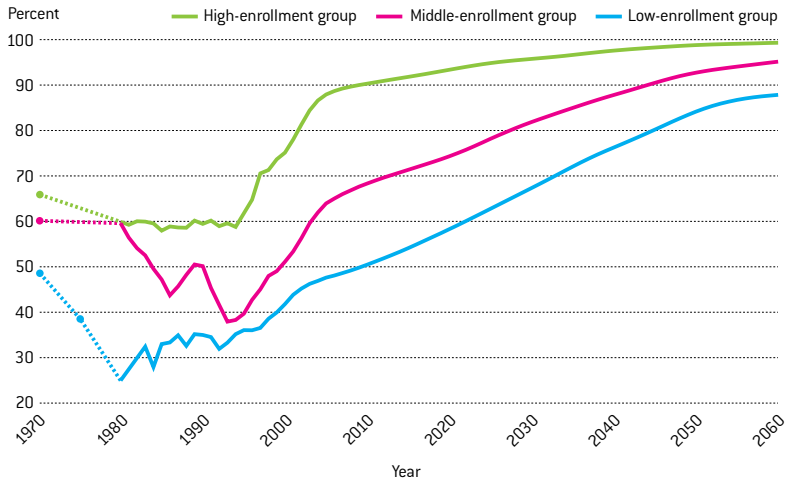
Table 5.1 Primary and secondary net enrollment rates by region

	Primary net enrollment				
	2005	2015	2030	2045	2060
Arab States	81.9	88.1	95.0	98.2	99.6
Central and Eastern Europe	89.9	98.8	100.0	100.0	100.0
Central Asia	84.4	91.8	98.5	100.0	100.0
East Asia and the Pacific (Poorer)	88.0	95.6	99.4	99.8	100.0
Latin America and the Caribbean	93.7	96.8	99.0	99.5	99.7
South and West Asia	85.5	88.3	94.0	97.9	98.6
Sub-Saharan Africa	67.7	72.2	81.4	89.3	93.8
East Asia and the Pacific (Richer)	97.7	100.0	100.0	100.0	100.0
North America and Western Europe	95.2	99.9	100.0	100.0	100.0
World	86.6	91.3	95.1	97.3	98.3
	Secondary net enrollment				
	2005	2015	2030	2045	2060
Arab States	58.7	65.7	73.7	82.3	86.7
Central and Eastern Europe	78.1	85.8	93.0	96.3	98.4
Central Asia	82.3	87.8	92.1	95.2	96.5
East Asia and the Pacific (Poorer)	63.9	71.3	83.7	89.8	93.3
Latin America and the Caribbean	68.7	77.4	85.1	89.3	93.1
South and West Asia	45.3	53.0	64.4	72.2	77.2
Sub-Saharan Africa	23.3	30.4	39.9	47.7	57.8
East Asia and the Pacific (Richer)	95.1	97.0	98.3	99.4	99.8
North America and Western Europe	90.9	93.5	97.3	99.1	99.6
World	60.4	66.2	74.0	78.5	82.1

Note: Compare with Table 3.1.

Source: IFs Version 6.12 base case forecast.

Figure 5.2 Primary net enrollment rates in sub-Saharan African country clusters: History and forecast



Note: Used 5-year moving averages after removing 1975 for high- and middle-enrollment groupings and 1981–1982 for the low-enrollment grouping.

Source: IFs Version 6.12 base case with UIS data.

Reaching universal lower secondary education will be challenging for many countries.

Table 5.2 indicates the difficult undertaking the world faces as it seeks to achieve universal basic education.

currently but not long enough for those with the lowest enrollment rates.

On the basis of pure extrapolation from very recent patterns, one could challenge our late-achievement forecast for the low-enrollment group and also expect more rapid achievement of universality for the other two groups. Continuation of the acceleration of growth in enrollment rates that began for its members in the early to mid-1990s would bring even the low-enrollment group to universal enrollment by about 2025. There are, however, reasons to believe that such an extrapolation would be in error:

- The low-enrollment group had a period of flat enrollment rate growth in the 1980s. Were one to trust the 1970 values and extrapolate all historical growth between then and 2004, the group would demonstrate only slow, if any, growth in enrollment rates over that extended period.
- The historical experience of the middle-enrollment grouping has demonstrated that reversal of gains is also quite possible, particularly in periods of "bust" in commodity price cycles or financial crises.
- Included in the low-enrollment group of countries are many that have had and/or are currently experiencing significant political turmoil. In fact, in 2008, the Fund for Peace and *Foreign Policy* placed eight of the fourteen countries in the group on their failed-state list at the "critical" level. From the most problematic end of that list,[5] those eight are Somalia (in the top position), the Democratic Republic of Congo, Côte d'Ivoire, Central African Republic, Niger, Burundi, Republic of Congo, and Guinea-Bissau.

As nearly all forecasts of education flows have concluded, reaching the MDG of universal primary education by 2015 was never a reasonable goal for all countries. The base case shows a continuation of the historically rapid transition of recent decades, but it also indicates that much time is likely still required to meet the goals that the global community has already set. Subsequent analysis (in Chapters 6 and 7) will consider whether, in a more aggressive scenario, a faster transition than that of the base case might be possible.

The challenge of reaching universal primary enrollment faces not only sub-Saharan Africa but other regions as well—indeed, eleven countries outside sub-Saharan Africa are unlikely to reach 90 percent primary net enrollment by 2015 (see Table 5.2). And the challenge of reaching universal lower secondary education is far more clearly a global one. Figure 5.3 helps us understand better the pattern that may be followed through midcentury by countries outside sub-Saharan Africa with low rates of lower secondary enrollment. The figure focuses on the fifteen countries outside sub-Saharan Africa that had lower secondary gross enrollment rates below 60 percent in 2005 (see Table 3.5 for this set). Most of these countries already have high levels of primary gross enrollment and significant levels of primary net enrollment; the IFs base case forecast is that they will reach the 90 percent primary net rate by about 2036. They may approach 80 percent lower secondary gross enrollment and 60 percent upper secondary gross enrollment by 2060.

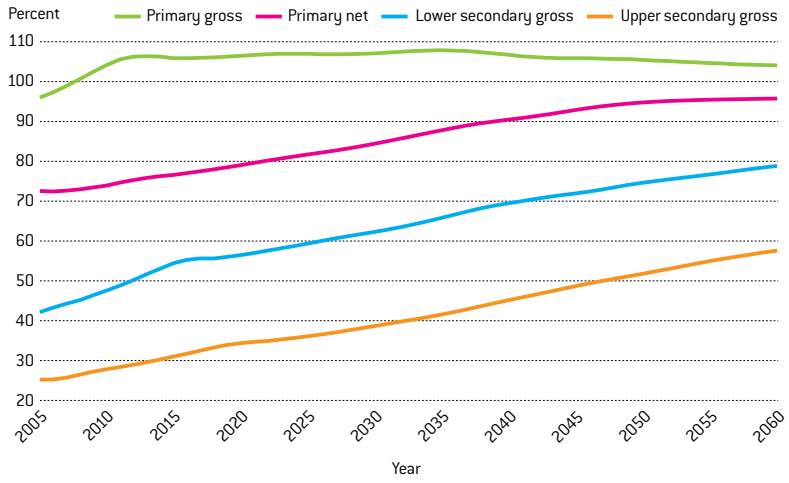
Student flows: Missing current goals

One aim of this study is to help consider reasonable goals for primary and secondary education enrollment rates for individual countries and across country sets as the world looks beyond 2015. Although most countries

will have achieved at least a 90 percent primary net enrollment rate by 2015, the IFs base case forecast identifies thirty-seven that may not reach that level (Table 5.2).[6] In fact, twenty-seven of those may not reach 90 percent by 2030, including some whose recent gains have been so rapid that we question whether they can be sustained. Nearly all countries are likely to reach the 90 percent level by 2060.

Looking beyond the current Millennium Development Goal for education must, however, involve elements other than the temporal. Increasingly, as we have noted, attention is moving to basic education, combining lower secondary years with primary ones. Table 5.2 therefore also identifies countries that may not have reached 90 percent lower secondary gross enrollment by 2015, 2030, 2045, and 2060. The two columns of Table 5.2 together indicate the extremely difficult undertaking that the world faces as it seeks to move to universal basic education.

Figure 5.3 Enrollment rates for countries outside sub-Saharan Africa with low lower secondary enrollment rates in 2005



Source: IFs Version 6.12 base case forecast.

Gender parity

Chapter 3 discussed the rapid movement toward parity in recent decades. Figure 5.4 shows again that gender enrollment ratios at all levels of education have, in the global aggregate, reached the 0.97 ratio that is often used as an indicator of parity. Yet many regions remain below that level, and the forecasts of the IFs base case suggest that many countries will remain below that level in 2015. Regionally, the gender parity ratios in sub-Saharan Africa are the lowest—in 2005, the IFs-calculated ratio exceeded 0.90 only for primary net enrollment (where it was 0.92), and progressively higher levels of education had progressively worse ratios. The regional value for primary gross gender parity was slightly lower than the primary net parity ratio—but only because males tend to repeat grades more often or otherwise enroll overage, suggesting an enrollment advantage for males that is really a disadvantage educationally. Hence, Figure 5.4 shows the net ratio at the primary level.

The base case forecast suggests slow but continued progress in reducing female disadvantage in sub-Saharan Africa, and by about 2030, the primary net gender parity ratio could reach 0.97. But even though the region

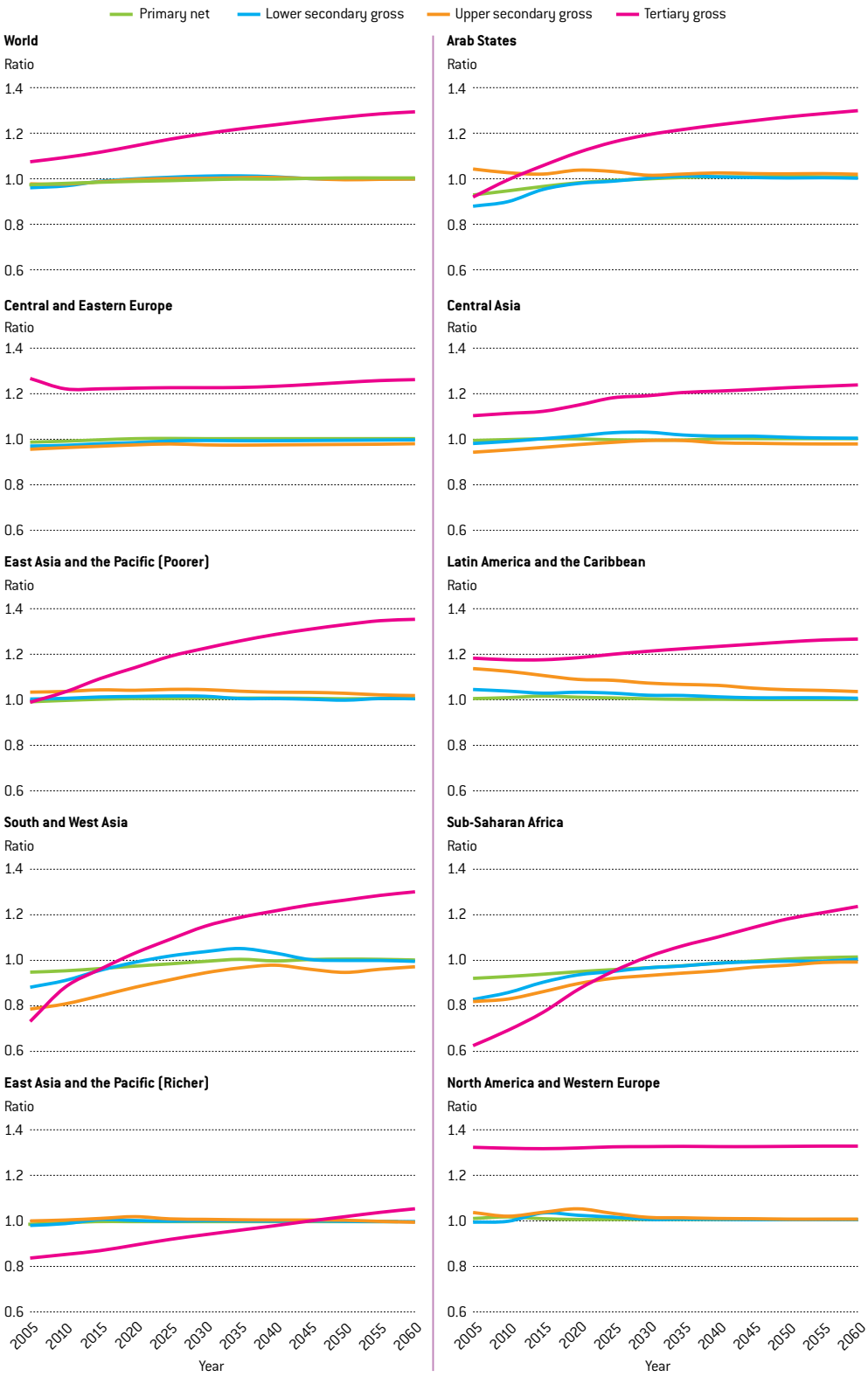
Despite much progress, the IFs base case suggests many countries will lack gender parity in one or more levels of education in 2015.

Table 5.2 Countries with primary and lower secondary enrollment rate forecasts below 90 percent in 2015

	Primary net	Lower secondary gross
May not reach 90% until between 2015 and 2029	Bhutan, Dominican Republic, Kenya, Lesotho, Nepal, Oman, Palestine, Rwanda, Swaziland, Yemen	Dominican Republic, Ecuador, Equatorial Guinea, Gabon, India, Indonesia, Israel, Morocco, Namibia
May not reach 90% until between 2030 and 2044	Benin, Côte d'Ivoire, Ethiopia, Ghana, Mauritania, Mozambique, Pakistan, Senegal, Togo	Bhutan, Honduras, Iraq, Lao PDR, Paraguay, Sudan, Swaziland, Yemen
May not reach 90% until between 2045 and 2059	Burkina Faso, Burundi, Rep. of Congo, Djibouti, Eritrea, Guinea, Mali, Niger, Nigeria, Solomon Islands, Sudan, Timor-Leste	Bangladesh, Cambodia, Comoros, Rep. of Congo, Djibouti, Ecuador, Eritrea, Ghana, Guatemala, Lesotho, Mali, Mozambique, Myanmar, Nepal, São Tomé and Principe, Senegal, Timor-Leste, Uganda, Vanuatu, Zimbabwe
May not reach 90% until 2060 or later	Central African Republic, Chad, Gambia, Guinea-Bissau, Liberia	Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Dem. Rep. of Congo, Côte d'Ivoire, Ethiopia, Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mauritania, Niger, Nigeria, Pakistan, Rwanda, Sierra Leone, Solomon Islands, Togo, Zambia

Source: IFs Version 6.12 base case.

Figure 5.4 Gender parity enrollment rate ratios by region and education level



Note: Primary is based on net enrollment rates and secondary and tertiary are based on gross enrollment rates.

Source: IFs Version 6.12 base case forecast.

may thus quite belatedly reach the global goal set for 2015, many countries will lag behind. By 2040, a dozen countries in the continent, including Chad, Guinea-Bissau, Somalia, Togo, Eritrea, and the Democratic Republic of Congo, may still fall short of the 0.97 goal.

South and West Asia is better positioned in terms of attaining gender parity. By 2005, it already had a primary net gender parity ratio of 0.95 and a lower secondary gross ratio of 0.89. By 2015, both of those ratios could near 0.97. Two of the forces beneath the forecast of rapidly improving ratios for many regions at the secondary level are survival rates that are often already higher for females and transition rates that are more nearly equal than enrollment rates. For instance, in South and West Asia as a whole, about 87 percent of girls who begin lower secondary education persist to the last grade, compared to about 83 percent of boys. And 81 percent of both girls and boys who recently completed primary school went on to general programs at the lower secondary level.

In Latin America, girls have advantages both in transition and especially in survival at the lower secondary level and even more pronounced ones in general programs at the upper secondary level. As systems continue to move toward universal primary education, substantially increasing the number of girls who complete primary education, these transition and survival patterns could well accelerate the movement toward female gender parity (and also increasing male parity gaps) at the lower secondary level. It is also possible, however, that increased participation of females at lower levels could eliminate their current advantage in those rates and slow down movement to parity (a dynamic that the model does not capture).

At the tertiary level, a reverse gender gap ratio of 1.08 has already appeared globally, and reverse gaps exist in several regions, including Latin America and the Caribbean. Our forecasts show reverse gender gaps at the tertiary level increasing around the world, in part again because gender gaps at lower levels are decreasing and are thus making steadily more females eligible for tertiary education. Tertiary forecasts are, however, among our least certain.

Education expenditures

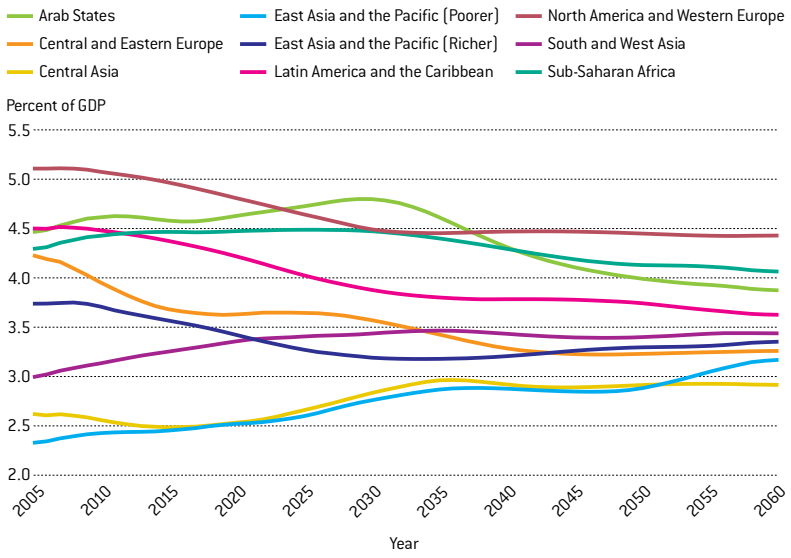
Expansions of education enrollment rates generally require expansions of education spending. Total public education spending as a share of GDP in low- and middle-income regions is still generally a little below that of high-income countries (see, again, Figure 3.13 and Table 3.6). Therefore, we would expect to see some continued rise in those spending shares over time. Figure 5.5 shows a possible evolution of education expenditures across developing regions of the world. Globally, spending may decline from about 4.5 percent of GDP in 2005 to 3.7 percent in 2060, heavily influenced by decreasing demographic burdens of younger populations and increasing demand from aging populations.[7] The declines will likely be overwhelmingly in North America and Western Europe, the richer countries of East Asia and the Pacific, and Central and Eastern Europe. The base case also anticipates, however, some decline in the Arab States and in Latin America and the Caribbean.

In contrast, low-income countries as a whole are likely to see expenditures rise from 2.7 to 3.5 percent of GDP, whereas spending in lower middle-income countries could rise from 2.7 to 3.3 percent of GDP. As in high-income countries, spending in upper middle-income ones may decline.

Girls often have lower primary entry rates than boys but higher survival rates and equal or higher transition rates to subsequent education levels.

Education spending will change over time in quite complex ways in response to multiple interacting forces.

Figure 5.5 Government spending on education as percent of GDP



Note: Used 5-year moving averages.

Source: IFs Version 6.12 base case forecast.

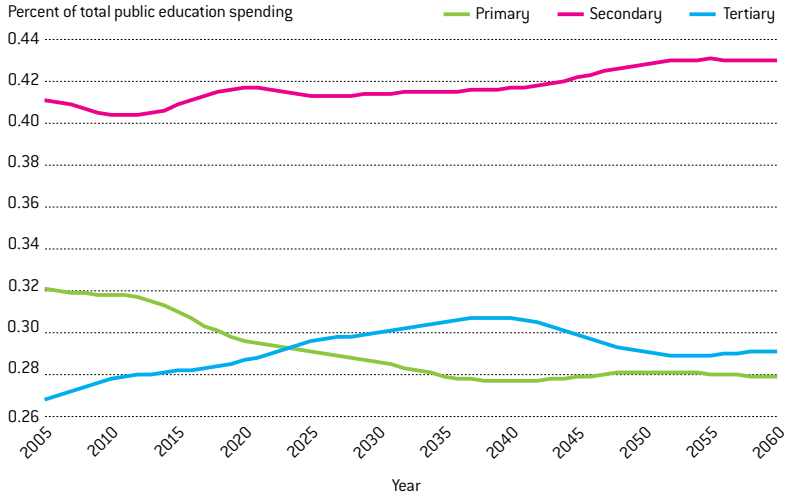
Spending patterns that characterize countries at earlier stages of education transitions will continue to differ from more typical global patterns.

The IFs base case anticipates that by 2060, adults globally will have completed, on average, ten years of education.

Rapid increases in government revenues as a result of high energy and materials prices cause temporary early-century rises for some groupings, especially the Arab States. The initial low values for the poorer East Asia and the Pacific countries heavily reflect China's spending in recent years and are uncertain—China's last reported value was 1.9 percent in 1999.[8]

Globally (and for countries in all income categories), the share of total education spending going to the primary level generally will decrease because the numbers of students at other levels are growing faster than those at the primary level. In contrast, secondary student numbers are rising as a share of the total global student population, and tertiary numbers, though low, are climbing even more rapidly. With increases in income, costs per student relative to GDP per capita tend to rise slightly at the primary level, to be fairly stable at the secondary level, and to fall at the tertiary level (Chapter 6 will explore this in more detail). Figure 5.6 shows the IFs base case global forecast of spending shares by level that results from these interacting patterns of changes in student numbers and changes in costs per student. The forecasts of increasing share for tertiary and declining share for primary expenditures suggest that total global tertiary expenditures will exceed primary expenditures within two decades.

Figure 5.6 Global education spending shares by education level



Note: Used 5-year moving averages.

Source: IFs Version 6.12 base case forecast.

Spending patterns that characterize and will continue to characterize countries at earlier stages in education transition differ significantly from the global patterns. For instance, in sub-Saharan Africa, more than half of the spending is now directed at the primary level. Yet the tertiary spending share will rise sharply because of the high cost of tertiary education per student in developing countries, not just because of rising student numbers. By 2060, sub-Saharan African countries are likely to direct roughly equal shares of their spending to each level of education.

Although the character of the education transitions under way significantly drives levels and patterns of spending on education, funding levels definitely have their own dynamics, quite separate from the demand side of the education picture. Governments have limited access to revenues and many claims upon those revenues for expenditures. The final section of this chapter will explore further the implications of different supply-side spending patterns, as well as look at other elements of forecasting uncertainty. Subsequent chapters will return to the financial side of education forecasting in the context of development and exploration of a normative education scenario.

Education attainment of adults

Education is about enhancing human capabilities. Although progressions to high levels of enrollment are important elements of the global education transition, the transition is ultimately about adults being able to live their lives as educated members of society. That element of the transition obviously lags the expansion of enrollment by many years. Figure 5.7 shows the pattern of adults' educational attainment, measured in terms of average years of education, in the IFs base case forecast as an extension of historical data. The forecast, which anticipates that adults in all regions of the world will have, on average, 7.3 years or more of education by midcentury, looks almost like an extrapolation of past growth patterns.

There are, however, some slowly occurring but important changes beneath the surface of roughly parallel lines. First, relative gaps in adult education levels are narrowing. For instance, in 1960, sub-Saharan Africa's 1.9 average years of education among those fifteen

and older was only 28 percent of the 7 years in North America and Western Europe. In the base case forecast, sub-Saharan Africa's 7.3 years in 2060 (in addition to slightly exceeding the education levels in the highest income region of the world in 1960) would be 50 percent of the 14.7 years forecast for North America and Western Europe.

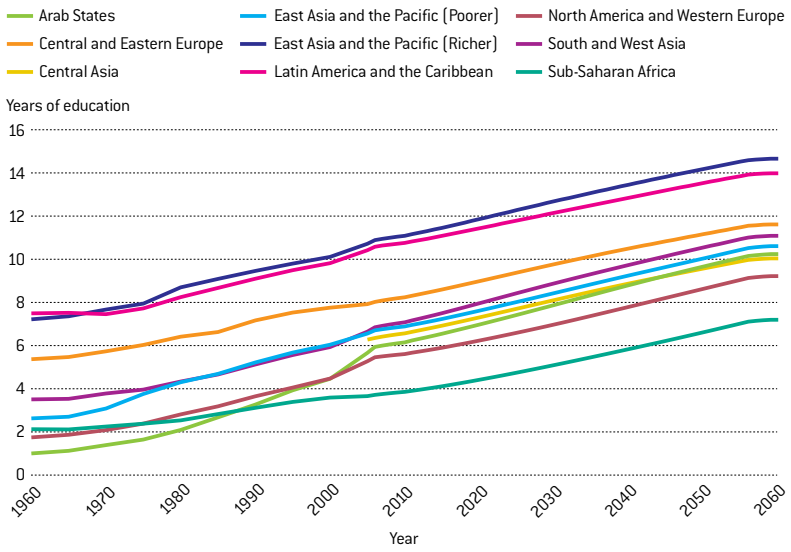
Second, there are some small but important relative changes in regional position over time. Sub-Saharan Africa is at risk in absolute terms of falling increasingly behind the "pack." In terms of the absolute difference in years of education between sub-Saharan Africa and North America and Western Europe, the gap increased from 5 years in 1960 to 7 in 2005, and it could be 7.5 years by 2060. This does not bode well for the competitiveness of the region in the global economy. In addition, Central and Eastern Europe looks likely to fall away from and behind the system leaders. Other regions are very slowly closing the absolute gap with those system leaders. In particular, the anticipated progress of the Arab States is notable. There is also likely to be a substantial closing of the gap between Western Europe and North America by midcentury (not shown in Figure 5.7 where the UNESCO region combines the two subregions), reflecting in part a continued expansion of tertiary education opportunities in Europe.

As levels of education among adults rise in the years ahead, younger adults will continue to achieve higher levels of education than older adults. Today, the pattern in many developing countries is one of numerous, increasingly well-educated young adults in combination with older adults, especially females, who have very few years of education. Figure 5.8 shows two important countries that exemplify this pattern, India and China.

The education pyramid of India in 2005 (upper left) shows that tertiary education is rare among men forty-five or older; even completed secondary education is rare among females. By 2060, both demographic and educational structures of the Indian population will most likely be dramatically different than they are today. In the upper right of the figure, one can see that for those aged thirty or younger, primary education will be essentially universal. In fact, through age sixty, the number of individuals with secondary and tertiary educations will each likely exceed those with only primary education. Thus, significant levels of secondary and tertiary education will characterize all cohorts through a working lifetime. The largest population cohorts will still be in the prime years of their careers, albeit nearing the end of them, which bodes well for continued economic dynamism through the first half of this century.

In China, the population patterns will change considerably less, but the patterns of educational attainment will evolve in much the same manner. By 2060, very few Chinese without at least a primary education will remain in the workforce. The greatest difference between China and India is apparent in the shape of the age/sex distribution of China in 2005, a pattern that looks more like those of Western European countries rather than India. By 2060, the distributional shape of both the Chinese and the Indian age structures (and educational structures) will look more like each other, in both cases coming to resemble those that we anticipate for Japan and Italy in the coming two decades. The largest population cohort that China may ever see will have already reached retirement age, and the largest cohort of India will not be far behind.

Figure 5.7 Average years of education of adults 15 years and older: History and forecast

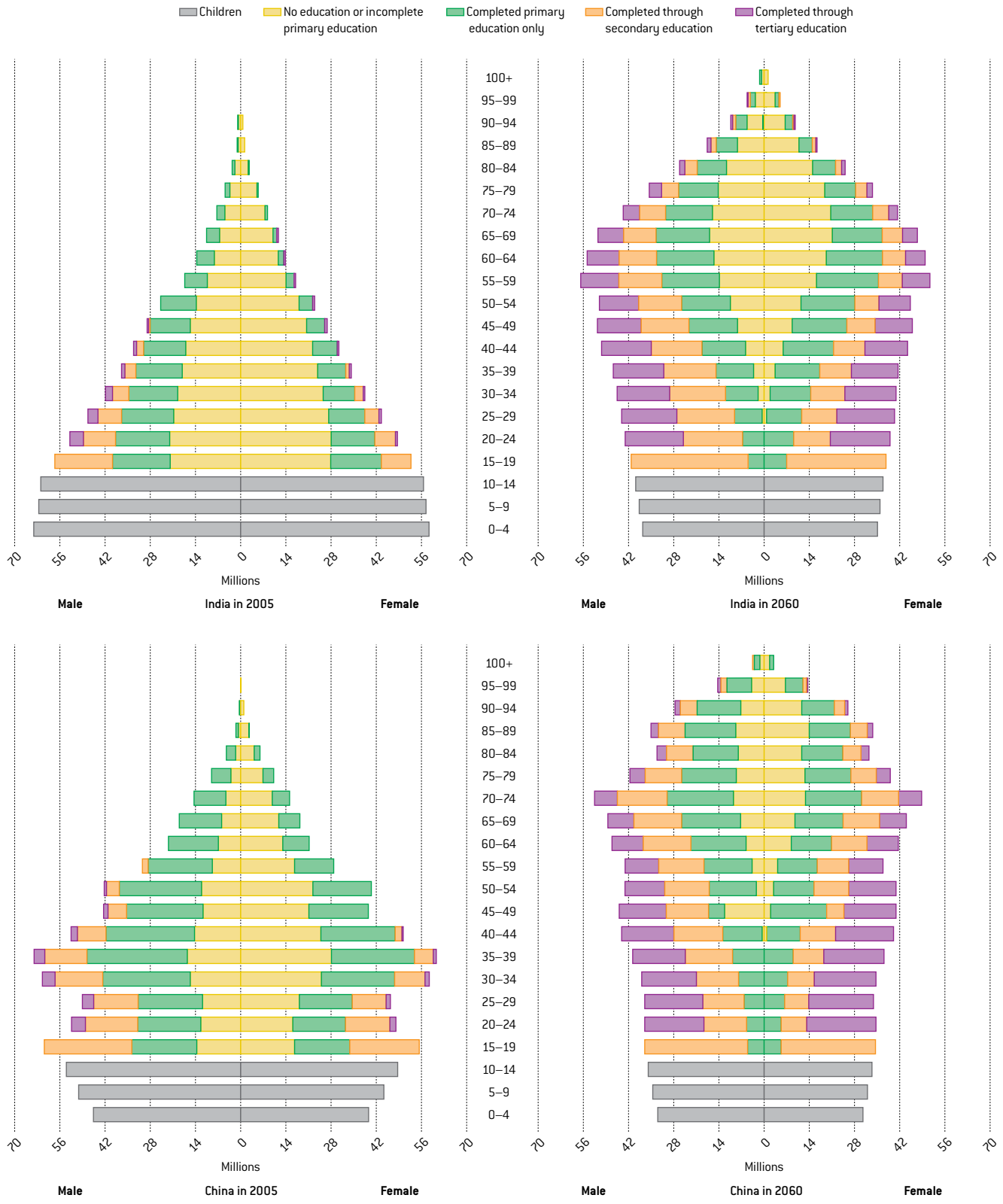


Note: Values are 5-year moving averages with 1990 for Central Asia removed for smoothing.

Source: IFs Version 6.12 base case with Barro and Lee (2001) data through 2000.

Relative gaps in adults' education levels are narrowing across all regions, but sub-Saharan Africa is at risk of falling further behind in absolute terms.

Figure 5.8 Population by age, sex, and level of completed education



Source: IFs Version 6.12 base case forecast.

Table 5.3 extends our look at the education levels of adults to the portions of various regional populations likely to have completed various levels of education in 2030 and 2060 in comparison with 1960 and 2000. We draw a number of insights from the table:

- With respect to primary education, the IFs base case suggests that for the least developed regions, the transition to universal primary education among adults will still be very much under way in 2060, reaching 90 percent only by about the end of the century (not shown). Yet it will also be quite far along even in the developing world. Only sub-Saharan Africa will likely have an adult population in 2060 with lower primary attainment rates than North America and Western Europe had in 1960.
- With respect to secondary education, not quite one-fourth of adults in sub-Saharan Africa and 40 percent of adults in South and West Asia will likely have attained a full secondary education in 2060. Yet it is also likely that only those two regions will have lower secondary attainment rates than North America and Western Europe had in 2000, and even that of sub-Saharan Africa will likely approximate that which the highest income regions experienced in 1960. However, a hundred-year lag is long, even when it reflects progress from a base of nearly nonexistent secondary education among adults across sub-Saharan Africa in 1960.
- With respect to tertiary education, it is quite possible that by 2060, only sub-Saharan Africa will not have reached levels of adult tertiary attainment comparable to those in North America and Western Europe in 2000. The advance of tertiary education globally is likely to be one of the most dramatic elements of education transition in the coming decades. Whereas in 1960, only 1.2 percent of adults globally had a tertiary education, that figure could potentially reach 25 percent by 2060.
- With respect to gender balance of education among adults, it will be too early to declare complete success even in 2060 because there will still be countries and even regions (such as South and West Asia at the secondary level) where the ratio of female-to-male adult attainment rates will fall somewhat below 97 percent. But clearly, the base case suggests that the battle for female parity, at least as reflected by education attainment rates, could be largely won. Global attainment rates for females are forecast to be 99 percent of males' rates at the primary level, 97 percent at the secondary level, and 104 percent at the tertiary level.

In coming decades, the global advance of tertiary education among adult populations is likely to be dramatic.

Because basic education generally confers literacy, it is not surprising that all major regions of the world will likely achieve almost 100 percent literacy by midcentury. The Gini coefficient is the most widely used measure of distribution for income and other quality-of-life measures. The smaller the Gini value, the more egalitarian a distribution is. In 2005, the IFs estimated global Gini of literacy was 0.116 (using population-weighted country data),[9] a considerably more egalitarian distribution than that for global income, which was 0.583.[10] Gini for literacy declines in the IFs base case to 0.062 in 2030, and with universal literacy, the value would be 0. The global Gini for years of education at age twenty-five (the least egalitarian of our education attainment measures) declines in the base case from 0.229 in 2005 to 0.172 in 2060. Such improvement in the global distribution of the ability to read and write and to participate in further education has considerable potential for increasing equality in other spheres.

The base case suggests that by 2060, the battle for female parity as reflected by the education attainment rates of adults will be largely won.

Comparison of Forecasts

So far, this chapter has put the IFs base case forecasts for global education in the context of historical trends. It is also important to consider them in the context of other forecasts, in order to determine whether results are comparable, and to consider the bases for differences when they exist.

Early forecasts

Before comparing IFs forecasts with others made quite recently, there is value in going back somewhat further and looking at UNESCO forecasts made across the years. Doing so helps us see whether forecasts have been successful more generally.

All major regions of the world will likely achieve almost 100 percent literacy by midcentury.

Table 5.3 Percentage of population age 15 and older completing various levels of education: History and forecast

	Completed primary education (percent)				
	1960	2000	2030	Total 2060	Females 2060
Arab States	6.4	42.2	64.6	82.3	81.1
Central and Eastern Europe	60.7	84.1	84.1	91.3	90.0
Central Asia			73.7	86.3	85.3
East Asia and the Pacific (Poorer)	24.4	59.3	74.1	86.8	84.7
Latin America and the Caribbean	27.4	49.9	70.0	84.9	84.4
South and West Asia	10.6	37.2	55.6	74.3	72.4
Sub-Saharan Africa	14.3	27.3	40.9	63.9	64.3
East Asia and the Pacific (Richer)	70.1	87.0	90.4	95.5	95.2
North America and Western Europe	73.3	85.5	92.4	97.3	97.2
World	39.0	55.9	66.2	79.6	78.5
	Completed secondary education (percent)				
	1960	2000	2030	Total 2060	Females 2060
Arab States	0.9	15.2	34.5	54.0	54.5
Central and Eastern Europe	13.0	28.8	49.3	66.8	66.9
Central Asia			46.1	64.0	63.7
East Asia and the Pacific (Poorer)	3.2	17.9	34.7	54.7	54.0
Latin America and the Caribbean	5.8	19.6	40.5	60.3	61.6
South and West Asia	0.8	11.2	22.9	40.5	36.2
Sub-Saharan Africa	1.8	4.5	10.9	23.5	22.4
East Asia and the Pacific (Richer)	28.2	44.8	62.6	77.9	78.0
North America and Western Europe	18.1	50.5	67.7	84.5	84.8
World	9.0	21.1	33.5	48.5	47.2
	Completed tertiary education (percent)				
	1960	2000	2030	Total 2060	Females 2060
Arab States	0.1	3.3	10.2	21.4	21.4
Central and Eastern Europe	1.8	8.7	24.2	39.3	40.0
Central Asia			13.9	24.0	25.7
East Asia and the Pacific (Poorer)	0.7	2.5	11.2	25.6	27.6
Latin America and the Caribbean	0.9	4.8	13.8	25.4	27.3
South and West Asia	0.1	2.0	8.0	18.7	18.2
Sub-Saharan Africa	0.2	0.9	3.5	10.0	10.2
East Asia and the Pacific (Richer)	2.6	12.0	29.7	49.7	46.4
North America and Western Europe	3.6	15.1	34.4	54.4	57.9
World	1.2	4.8	12.9	23.7	24.6

Source: IFs Version 6.12 base case with Barro and Lee (2001) data through 2000.

For instance, in 1983, UNESCO used extrapolative techniques to forecast gross enrollment rates at all education levels for countries and regions through 2000.[11] The UNESCO forecasts proved remarkably good at the primary level, although they somewhat overestimated African progress and underestimated that of Latin America. Across levels of education, the major weakness proved to be a significant underestimation of secondary education enrollment rates almost everywhere except Africa, where they again overestimated enrollment rates. At the tertiary level, the striking discrepancy was for the developed world, where enrollment rates for both secondary and tertiary students increased much faster than UNESCO anticipated.

In 1994, UNESCO made forecasts for literacy rates in 2000, with an extended horizon to 2010. These forecasts significantly underestimated progress on literacy for the Arab States and South Asia by 2000. They again overestimated progress in sub-Saharan Africa (in fact, even the base year data they used for 1990 subsequently proved to be too high).

Looking further ahead, UNESCO made other forecasts in both 1989 and 1993 for 2025, including the enrollment headcount forecasts shown in Table 5.4. Looking at those forecasts made just four years apart, it is clear that the enterprise of longer-term education forecasting was at an early stage, and the UNESCO Division of Statistics (1993: 2) appropriately urged that the forecasts for 2025 "*be used with the utmost caution*" (italics in the original). Even primary enrollment forecasts varied significantly between the studies, especially those for sub-Saharan Africa. The 1993 study brought down the anticipated number for 2025 because of a changing understanding of the demographic prospects of the region and especially because it had come to be understood that the earlier expansion of enrollment rates had faltered. At the secondary and tertiary levels, there was even greater uncertainty about prospects, and the 1993 study significantly reduced the forecast for secondary enrollment in sub-Saharan Africa relative to that of 1989.

It is important to consider the IFs base case forecasts of education's continued advance with those of other researchers and forecasters.

Table 5.4 UNESCO and IFs forecasts of student enrollment numbers in 2025 (millions)

	UNESCO forecasts made 1989			UNESCO forecasts made 1993		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
World	807	572	126	747	448	100
Developed	107	99	43	116	106	47
Developing	700	473	83	631	342	54
Sub-Saharan Africa	201	106	10	133	28	2
Arab States	57	45	9	53	33	6
Latin America and the Caribbean	100	51	20	81	33	12
East Asia	398	314	52	185	117	15
South Asia				173	124	16

	IFs forecasts made 2009		
	Primary	Secondary	Tertiary
World	703	573	182
Developed	78	87	50
Developing	626	485	132
Sub-Saharan Africa	185	63	11
Arab States	50	39	10
Latin America and the Caribbean	55	60	20
East Asia and the Pacific (Poorer)	152	148	45
South and West Asia	176	152	36

Note: In 1989, all of Asia was combined in a single UNESCO region, whereas by 1993, it was represented as two regions—East Asia and South Asia. In this table, "East Asia" in 1989 includes both East Asia and South Asia.

Source: UNESCO Division of Statistics (1989: 7; 1993: 7) and IFs Version 6.12 base case.

Early extrapolative forecasts appear to have underestimated the acceleration of enrollment growth at secondary and tertiary levels.

Except for sub-Saharan Africa, the current IFs forecasts in Table 5.4 for enrollment headcounts in 2025 at the primary level are lower than both UNESCO forecasts; African enrollment rate increases have accelerated in recent years, whereas more recent population forecasts have revised expected school-age populations substantially downward elsewhere. In contrast, at the secondary level, most IFs forecasts, again excepting sub-Saharan Africa, are closer to the higher 1989 UNESCO forecasts than to those of 1994. The major difference between IFs and UNESCO forecasts, however, is at the tertiary level, where IFs forecasts for developing regions are clearly higher than either UNESCO set.

Two lessons that might be drawn from these historical forecasts suggest (1) that short-term extrapolative forecasts have been reasonably accurate, although they have clearly shifted with the mood and understanding of the times; and (2) that extrapolative methods appear to have underestimated the ongoing acceleration of enrollment growth at secondary and tertiary levels.

More recent enrollment forecasts

How do the results from the IFs base case compare with those from other, more contemporary forecasting efforts?[12] There are a number of significant projects and forecast sets that we will consider more or less chronologically.

As stated previously, Clemens (2004) completed an extensive historical analysis of rates of enrollment change. He mapped primary net enrollment rates for more than 100 countries at five-year intervals from 1960 to 2000 and analyzed the speeds at which countries moved between benchmark enrollment rates (such as from 50 percent to 70 percent or from 90 percent to 97 percent). In his analysis of those rates, he affirmed that increases in enrollment rates have indeed followed an S-shaped pattern of growth (see the graphic in Clemens 2004: 42), in which the most rapid change occurs around a 50 percent enrollment rate and incremental change is slower when enrollment rates are very low or very high (thereby creating the S-shape).[13]

Table 5.5 summarizes what Clemens learned about transition speeds in primary enrollment rates across different intervals. Increases from a 75 percent to a 90 percent enrollment rate (15 percentage points) have taken an average of 28 years, demonstrating (consistent with the S-shaped pattern) slower progress than the 22.3 years typically needed to progress from a 50 percent to a 70 percent enrollment rate. Table 5.5 also shows the transition speeds calculated from IFs forecasts. On the whole, the speeds in the base case of IFs are faster.

Clemens (2004: 52) also used his S-curve approach to forecast primary enrollment rates for global regions in 2015 from a 2000 base. A comparison of the base case forecasts from IFs in 2015 with those developed by Clemens, using the complete, budget-constrained system of IFs, found differences that did not exceed 2 percentage points between now and 2015 (except for sub-Saharan Africa),[14] despite the faster transition speeds of IFs in Table 5.5.

Wils, Carrol, and Barrow (2005), of the Education Policy and Data Center, also used a fundamentally extrapolative methodology (with logistic or S-shaped curves) to forecast the years in which seventy poor countries would likely reach universal primary education entry and completion (displaying results graphically through 2050 but extrapolating even further for some countries). They tapped household survey data from Demographic and Health Surveys and the Multiple Indicator Cluster Survey[15] that included questions about current education attainment levels of different adult age cohorts

Table 5.5 Comparing the speed of transition in primary net enrollment rates

	Time needed for the growth interval (in years)	
Primary net enrollment rate growth interval	Clemens	IFs
50%–70%	22.3	19.8
50%–80%	36.4	30.8
50%–90%	57.7	43.3
75%–90%	28.0	20.3
90%–97%	not reported	12.3

Note: IFs speeds were calculated across all countries and entire forecast horizon in the base case.

Source: Clemens (2004: 15–16); IFs Version 6.12 base case forecast.

to reconstruct past education flow rates such as entry or completion. These rates represent the proportion of any single-year age cohort that entered (or completed) primary school, either at an appropriate age or later.

Although the forecasts made by Wils, Carrol, and Barrow (2005) are not directly comparable with those from IFs, we can again analyze the speeds of transition between rates and compare those with the forecasts of IFs. Wils, Carrol, and Barrow, unlike Clemens (2004), reported a range of transition speeds rather than a typical speed. For the purpose of comparison with IFs, we calculated an average of the speeds they reported for the transitions from 80 to 90 percent and from 90 to 95 percent in primary completion rates.[16] The figures in Table 5.6 compare their completion transition speeds with those for the same set of countries from IFs. Keeping in mind the differences between the ways these two models measure the completion rate,[17] the results are more similar than they might appear.

A recent report from the Education Policy and Data Center (EPDC 2007b) gives us an opportunity to more directly compare forecasts made using extrapolative methods with those from a cohort-based methodology and with those from the integrated and structural forecasting system of IFs. In support of the *Education for All 2008 Global Monitoring Report,* UNESCO and the EPDC prepared three different sets of forecasts of primary and secondary enrollment in 2015 and 2025.[18] The first two used S-curve extrapolations of enrollment rate trends from data since 1991 and 1999. The third used a cohort flow methodology that has some features in common with the annual student flow approach of the IFs education model. Table 5.7 summarizes the forecasts of primary net enrollment rates in 2025 for the sub-Saharan African countries for which all four methods provided forecasts.

The striking aspect of the forecast comparison in Table 5.7 is the significant range of variation across the methodologies, even for a horizon as relatively close as 2025. The differences between the extrapolations based on data available since 1991 compared to those based on data available since 1999 clearly reflect whether or not a country has experienced acceleration or deacceleration of enrollment gains in recent years. Acceleration is the case for countries including Burkina Faso, Burundi, and selected others, especially Namibia and Niger. Reduction in the speed of gains has characterized fewer countries, namely, Eritrea and especially Togo. In general, the cohort methodology, which was based on recent patterns, appears to somewhat amplify such turns. Burkina Faso and Namibia are examples on the upward side, and Togo illustrates the situation on the downward side.

The forecasts of IFs prove to be within the range of the others in many cases, but they tend more often than not to be at the

Table 5.6 Comparing the speed of transition in primary completion rates

Transition in completion rate	Wils, Carrol, and Barrow transition time	IFs transition time (average)
80%–90%	22.3	19.8
90%–95%	36.4	30.8

Source: Wils, Carrol, and Barrow (2005: 22); IFs Version 6.12 base case forecast.

The IFs base case forecasts a somewhat more rapid transition in primary enrollment rates than some other contemporary models and reports.

Table 5.7 Comparing forecasts of primary net enrollment rates for selected sub-Saharan African countries in 2025

	Trend from post-1991 data	Trend from post-1999 data	ProEnrol cohort method	IFs
Burkina Faso	64.8	74.3	100.0	61.5
Burundi	73.8	95.0	95.0	67.6
Eritrea	89.5	81.0	40.8	63.5
Ethiopia	96.7	99.2	66.7	74.8
Ghana	81.7	88.0	81.9	77.1
Guinea	95.3	98.3	99.4	76.3
Kenya	98.5	98.2	79.8	88.3
Lesotho	97.5	99.8	83.3	91.3
Mauritius	95.6	99.6	99.1	100.0
Mozambique	96.5	99.5	58.7	85.5
Namibia	45.9	65.0	86.4	97.7
Niger	71.6	92.0	89.3	57.3
Senegal	90.3	96.4	66.7	81.3
Tanzania	100.0	100.0	87.7	93.4
Togo	92.5	78.1	70.7	84.6
Zambia	97.4	100.0	99.2	91.4

Note: These countries are the subset of sub-Saharan African countries with results from each of the four forecast methods.

Source: Education Policy and Data Center (2007b: 84–87); IFs Version 6.12 base case.

However, IFs frequently generates more conservative forecasts than those that rely solely on extrapolations from very recent time periods.

low end or below the range of the other forecasts of Table 5.7. Burkina Faso and Niger offer the clearest examples. To understand why that might be the case, and to better understand the differences of the alternative methodologies, it is useful to explore in some detail the case of Burkina Faso.

Educationally, the strictly of-age primary net intake rate of Burkina Faso grew from 19.1 percent in 1999 to 29.5 in 2005. Its adjusted net intake rate (including children one year overage and one year underage) grew from 40 percent to 68.7 percent in the same period (the adjusted net intake rate of the country therefore grew by an average 5.5 percentage points each year between 2000 and 2005, an extraordinary rate). The country's primary survival rate has averaged just below 70 percent, with a very slight downward trend. Collectively, these changes led to a growth in primary net enrollment from 34.7 percent in 1999 to 44.1 percent in 2005, with an especially large jump from 2004 to 2005. On a purely extrapolative basis, forecasts for 2025 in the 65–75 percent range do not seem unreasonable.

However, as stated previously, the IFs model ties change in intake and survival (and therefore enrollment) to forces on both the demand and the supply sides of the education system. On the demand side, the per capita income level of Burkina Faso is sufficient to be consistent with considerably higher enrollment rates than it has. At very similar levels of income, the net enrollment rate of Rwanda is just under 79 percent, and Kenya's falls just below that level. In fact, on the basis of cross-sectional analysis of countries around the world, the "typical" country with a GDP per capita at the level of Burkina Faso would have a primary net enrollment rate approaching 75 percent.

In short, the demand-side specifications of the education model of IFs would not necessarily lead to a forecast that differs from that of the extrapolative analysis. The constraint in the enrollment forecast of IFs is rooted instead on the supply side. It lies in the assessment of the ability of the country to support in the future the kind of enrollment growth that it has experienced in recent years and that extrapolative forecasts implicitly presume will continue.

To provide some background,[19] Burkina Faso is a landlocked, resource-poor country in a region of northwestern Africa that overall suffers from high population densities and major environmental problems, especially a lack of available water. Demographically, the country has a total fertility rate of about 6.1 children per mother and a population growth rate of just over 3 percent. An Education Policy and Data Center analysis (EPDC 2005: 62–63) put Burkina Faso on a list of six countries where educational growth was likely to be overwhelmed by population growth. About 46 percent of its total population is fifteen years of age or younger, an extremely challenging child dependency ratio. Subsistence agriculture occupies nearly 90 percent of its population.[20] Economically, its GDP per capita in 2005 at PPP (2005 dollars) was only $1,079, but it was growing reasonably well until higher oil and food import costs affected the national economy in more recent years. The IFs base case anticipates a value of $1,438 in 2025.

Several important factors limit the country's ability to mobilize resources for a continuing expansion of education and to meet the growing demand of an increasing young population. In 2007, Burkina Faso had an international debt of about 21 percent of GDP and 165 percent of exports. Its deficit on current accounts in 2007 was nearly $700 million, or about 11 percent of GDP. Without foreign aid, its government budget deficit was about 7 percent of GDP. Household finances are also under pressure. Significant portions of the male population seek employment in neighboring countries, and unrest in Côte d'Ivoire and Ghana has disrupted flows. Governmental financial constraints have helped maintain school fees, typically suppressing household ability to send children to school (UNESCO 2007b: 112).

On the positive side, Burkina Faso received a Millennium Challenge Account grant to improve girls' education at the primary level, and it may receive more external funding for other purposes. Yet the country is already dependent on aid from the outside for about $500 million annually, and the potential for growth from such levels in coming years is not great. In fact, high-income countries have reduced aid as portions of their GDP in recent decades.

In addition to facing financial constraints, the country must cope with a demand for education spending that has grown significantly. One of the complications of extrapolative forecasting is that growth can be its own undoing if there is overshoot (that is, unsustainable increase), as in part the rapid growth of enrollments in sub-Saharan Africa during the 1960s and 1970s proved to be. That is true in many domains, of course, and is one of the reasons for the success of contrarian perspectives in financial markets.

With respect to complications for extrapolation of change in education participation rates, the rapid increases in intake have been recent enough that the government has not yet felt the full financial burden of the ongoing enrollment levels that will result from them. Moreover, growing pressure for secondary education of new primary graduates will increasingly compound the mounting burden at the primary level. In Burkina Faso, the transition rate to lower secondary education rose from 38 percent in 1999 to 44 percent in 2005, just as primary enrollments rose sharply.

Burkina Faso is likely to obtain some financial help from a more efficient use of its education spending. It now spends about 35 percent of GDP per capita on each primary student, almost 20 percentage points more than the typical low-income country. The IFs base case forecast does build in a reduction of per-student spending to 20 percent of GDP per capita in 2025 but nonetheless sees growing fiscal constraint.

We certainly do not wish misfortune on Burkina Faso with respect to future enrollment patterns so as to support our arguments for the merits of an integrated forecasting approach. Yet it is important to explain why the forecasts of IFs in Table 5.7 tend to suggest slower enrollment growth than do some important existing forecasts and to indicate bases for some conservatism of expectations.

Forecasts of educational attainment

In addition to forecasting enrollment rates and numbers, various projects have also forecast adult educational attainment. The objective has, of course, been the same as ours, namely, to understand changes in human capital levels and the broader societal implications of them. The Education Policy and Data Center, in projects under the leadership of Wils (EPDC 2005), and the International Institute for Applied Systems Analysis, in work led by Lutz (Lutz, Goujon, and Wils 2005), have used a population cohort–based methodology called multistate projection. That approach carries years of education forward in the model over time as part of (one of the states of) aging population cohorts, fundamentally as the IFs model does but with one key difference. The EPDC and IIASA models count (and forecast) anyone who has attended any portion of a level of education in the attainment data for that level. The IFs model, in distinction, counts and forecasts in attainment data only those who have completed a level.

The EPDC (2005) forecasted through at least 2025 the levels of educational attainment not just by youths and adults in eighty-three developing countries but also by subnational regions in four countries with significant interregional variation (Kenya, Madagascar, Nepal, and Nigeria). Lutz and colleagues have used the approach variously for 13 world regions and 120 countries. However, we do not compare our forecasts with theirs because of the significant differences in methodology as to what constitutes attainment. The IFs forecasts for 183 countries are included in the end tables in this volume, and earlier IFs forecasts were in the end tables of the first volume in the Patterns of Potential Human Progress series (Hughes et al. 2008).

With respect to a different measure of attainment, UNESCO (2007b) has published country-specific and regional forecasts of adult literacy in 2015. Table 5.8 compares those forecasts with ones of the IFs base case. Again, the methods of the two forecasts vary. The UNESCO forecasts use the UIS Global Age-Specific Literacy Projections model (UNESCO 2007b: 258), which is based on the work of Lutz;[21] the IFs model, by contrast, uses the cohort methodology to forecast the percentage of adults who have completed primary education and then uses a function and algorithm around that percentage to estimate literacy. The 2015 forecast horizon is so near that one would (correctly) not expect great differences between the two forecasts in any case.

UNESCO and IFs forecasts of adult literacy in 2015 are all but identical.

Table 5.8 Comparing forecasts of adult literacy rates in 2015

	UNESCO	IFs
World	86	85
Transition	100	99
Developed	99	99
Developing	83	82
Arab States	78	77
Central and Eastern Europe	98	98
Central Asia	99	98
East Asia and the Pacific	95	95
Latin America and the Caribbean	93	95
North America and Western Europe	99	100
South and West Asia	70	67
Sub-Saharan Africa	70	70

Source: UNESCO (2007b); IFs Version 6.12 base case.

By exploring some of the uncertainty in our base case, we can develop a sense of the extent of that uncertainty.

We look at uncertainty with respect to demography, economy, and education spending and explore their possible effects on future education patterns.

Comparing base case forecasts of IFs with other reference cases helps us understand the implications of different methodologies. As an enterprise, however, forecasting typically compares alternative forecasts or scenarios, often incorporating sensitivity analysis with respect to uncertainties. It is to that we now turn.

Uncertainties in Forecasting

Neither developers nor users of forecasts should ever forget Forecasting Rule 1: never trust a forecast. Nor should they ever believe that it is possible to put realistic confidence intervals around forecasts of complex systems.[22] What is possible, however, is to explore some of the sources of uncertainty in forecasts and thereby to build a basic mental map of the extent of uncertainty.

The greatest sources of uncertainty lie in the specification of the model itself, both its structure and its parameterization. The preceding section explored the IFs base case relative to a limited number of alternative forecasts, some of which use quite different and mostly extrapolative procedures. That analysis has given us a very rough sense of the magnitude of formulation-based uncertainty.

Much of the uncertainty about the future of global education relates to assumptions about key drivers of the variables of interest to us, namely, the flows of students through the education process and into adult years. We can identify at least three key driver sets for those flows: the size and age composition of school-age populations, the size and structure of the economy, and the level and character of spending on education. This section explores the possible effects on education futures of key elements within each set individually and together. In each case, we consider a reasonable range of uncertainty in the driver and then explore how variation across that range might affect education patterns.

Mapping the range of uncertainty

Population

In its biannual World Population Prospects series, the United Nations regularly updates forecasts of population growth by country. It develops four scenarios, or what it calls variants: low, medium, high, and constant fertility rates.[23] Analysis with the IFs model replicates the general differences of these UN scenarios through the introduction of multipliers on fertility rates. Overall, the IFs low-population scenario gradually, over a period of thirty years, reduces total fertility rates (TFRs) in developing countries by roughly 30 percent relative to the base case (subject to a minimum TFR of 1.6), and the high-population scenario increases fertility rates globally over fifty years by roughly 40 percent relative to the base case.

Figure 5.9 shows the resulting global population growth rates using the IFs model, as well as historical data. The IFs base case is very close to the UN medium variant, and the other two cases in IFs largely match the high and low UN variants. The resultant global populations in 2060 are 7.7 billion in the low-population scenario, 9.4 billion in the base case, and 11.3 billion in the high scenario. In the high-population scenario, total fertility rates in sub-Saharan Africa decline from 5.3 in 2005 to 3.7 in 2060; in the low-population scenario, rates drop to 1.6, whereas in the base case, they decline to 2.6. As a result, in sub-Saharan Africa, the population ranges from 1.4 to 2.6 billion across the scenarios; in South and West Asia, it ranges from 1.9 to 2.8 billion.

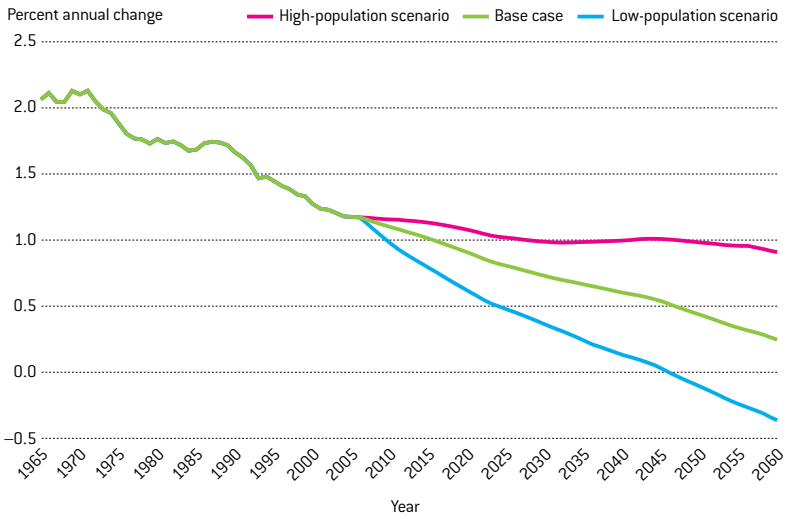
Economic growth

In spite of their importance in regard to almost every issue of public policy, there are few long-term forecasts of economic growth for the world or for multiple countries or global regions. Hughes et al. (2008: chap. 5) discussed the economic forecast of the IFs base case, comparing it with a number of the others that do exist—namely, those of the World Bank, Global Insight, and the International Energy Agency (World Bank 2007a: 3; United States Department of Energy 2006: 12; IEA 2007)—as well as evaluating the forecast in the context of historical growth. Figure 5.10 shows again the historical context for the economic growth of the IFs base case and also indicates global growth patterns in two alternative scenarios.

The interventions made in IFs to create the high and low economic forecasts for use in forecasting education futures were largely variants in assumptions concerning productivity growth. The interventions were scaled to create something close to rates of GDP growth 1 percent faster or slower than those of the base case. Because of greater uncertainty and somewhat higher growth in the base case, we increased or decreased the rates of growth in sub-Saharan Africa, South and West Asia, and Latin America and the Caribbean by about 1.5 percent. And because the historical pattern of economic growth (to which the base case is tied) has been so high for China, we increased China's high case by only 0.5 percent and decreased its low case by 2.0 percent. IFs produces forecasts for GDP at both purchasing power parity and market exchange rates (MERs). GDP at purchasing power parity is used in most education model calculations. However, Figure 5.10 shows GDP at market exchange rates because they are used in most comparative forecasts.

Some readers may argue that the low-growth scenario should be the base case and that other scenarios should be adjusted downward accordingly. The global financial crisis beginning in 2008 and the subsequent global downturn give weight to such an argument. So, too, does the general downward trend in global GDP growth since the "golden era" of the 1960s, a trend that Figure 5.10 shows. Nonetheless, the shorter upward trend from the late 1980s through 2007, related to the spread of new productivity-enhancing information and communications technology and to the accelerated growth of China, India, and other large emerging market countries, provides a basis for the argument that a higher-growth future could reemerge. (IFs is available for readers to create and explore alternative scenario sets.)

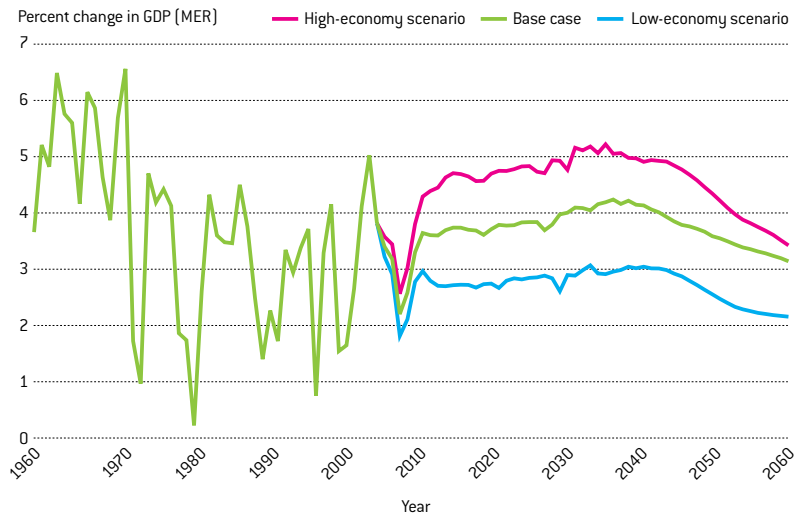
Figure 5.9 Global population growth rate scenarios: History and forecasts



Note: Removed apparently inconsistent data from 2003 and 2005.

Source: IFs Version 6.12 base case forecast and high- and low-population scenarios with WDI data through 2005.

Figure 5.10 Global economic growth rate scenarios: History and forecasts



Note: Irregularities in the economic forecasts reflect, in part, the impact of energy transition; slowing growth reflects decreasing population growth.

Source: IFs Version 6.12 base case forecast and high- and low-economy scenarios with WDI data through 2005.

The impact of the alternative population scenarios is, in the long run, greater than that of the alternative economic or education spending scenarios.

Public spending on education

A third variable of great importance for forecasts of education participation is the rate of spending on education. Much forecasting around education is normative and has looked at the costs of education to reach specific education goals (see, for example, Bruns, Mingat, and Rakotomalala 2003; for comparative discussion, see Gurria and Gershberg undated), and some analyses have explored relationships between varying levels of public spending and education participation levels (again, see Bruns, Mingat, and Rakotomalala 2003 and also Cuadra and Moreno 2005 and Binder 2006). We know, however, of no forecasts that explore the impact of alternative spending levels on education outcomes.

Given that public spending on education averages just below 4.5 percent of global GDP, a total variation of about 0.5 around the base case forecast provides a reasonable range across which to look at the possible reactivity of education futures. We introduced that magnitude of variation into IFs gradually over ten years, using upward and downward multipliers on endogenously generated spending.

Although it is often not true that all good things (or all bad things, for that matter) go together, it is possible to imagine a "highly optimistic" world of low population growth, high economic growth, and high education spending or to imagine a "highly pessimistic" world based on the reverse assumptions. We considered the impact of such extremes as well.

For the world as a whole, the low-population scenario allows near-universal enrollment at the lower secondary level by 2060.

Exploring uncertainty by driver

Figure 5.11 shows the separate impact of each set of alternative scenarios on gross enrollment rates at the lower secondary level. The impact at the primary level, which the next section will discuss, is considerably smaller because there is less "headroom" remaining there for upward movement when drivers vary.[24] And we show only sub-Saharan Africa and South and West Asia, again because those regions have the greatest room for potential upward movement at the lower secondary level.

Interestingly, the impact of the alternative population scenarios is, in the long run, greater than that of the alternative economic or budget scenarios. Upon reflection, this is not surprising when one considers that the population difference in 2060 across the low and high scenarios for sub-Saharan Africa is nearly a factor of two. The dependency ratio in 2060 for sub-Saharan Africa is 18.1 in the low-population scenario rather than 34.7 in the high-population case, and in South and West Asia, it is 12.0 rather than 23.4. Such differences have a huge impact on the ability to educate more students at higher levels. In contrast, much of higher GDP simply flows quite directly to higher spending per student, although it, too, has a significant impact on enrollment rates in the longer term.

It takes quite a while to accumulate significant differences in population or GDP across the scenarios because the underlying processes are related to stocks—of population, of capital, and of technology. Once set in motion, however, the impact of such changes tends to grow, in part because increasing education further reduces fertility and increases GDP in a positive feedback cycle. In contrast, diversion of government spending to or from education is a flow and has a quite immediate impact on enrollment. In the longer run, however, its impact does not grow.

The paths of population impact

Population growth or decline affects student flows most directly by changing the number of potential students of traditional age at each education level and the proportion of the total population they represent. For instance, were of-age children to decline in number without a drop in adult population numbers or income levels, societal resources would potentially be available either to support larger portions through school or to devote more resources to each student.

The differences in enrollment rates across the population scenarios would be quite substantial. At the higher end of such differences, the rate of lower secondary enrollment in sub-Saharan Africa in 2060 could be 11 percentage points higher in the low-population scenario than in the high-population scenario, and upper secondary enrollment could be 13 percentage points greater. For the world as a whole, the low-population scenario allows near-universal enrollment at the lower

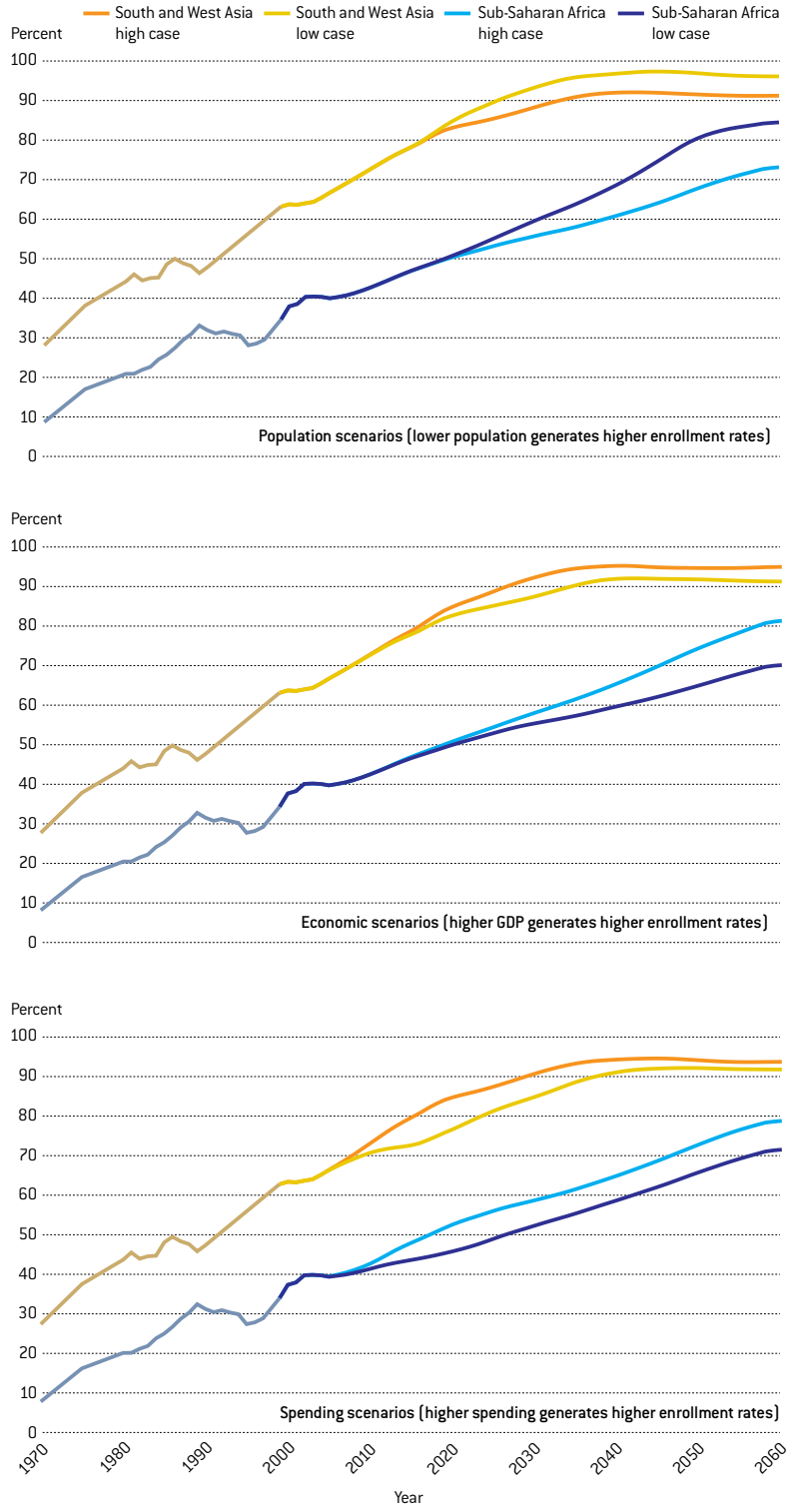
secondary level (a 96.8 percent gross enrollment rate) by 2060, 5.5 percent above that of the high-population scenario. Analysis of differences across population scenarios suggests both a constraint on countries struggling to enhance their prospects of advancing educational opportunities and a policy option for such enhancement, namely, the reduction of high fertility rates.

The differences in student numbers are even more dramatic across the scenarios than are enrollment rates. In sub-Saharan Africa, there were about 19 million students enrolled in lower secondary programs in 2005. In the high-population scenario, there would be 52 million enrolled in 2030 and 127 million in 2060. In the low-population scenario, there would be 44 million in 2030 and 49 million in 2060. In other words, there would be 78 million fewer students at that level in 2060 in spite of the increase of the gross enrollment rate from 74 percent in the high-population scenario to 85 percent in the low-population scenario. The students would also be better funded with lower population growth. In the low-population scenario, expenditures per lower secondary student would rise from 17.2 percent of GDP per capita to 18.2 percent, whereas in the high-population scenario, they would drop to 16.5 percent of GDP per capita. IFs further estimates that the GDP per capita for the region could be $7,149 in the low-population scenario, versus $5,577 in the high-population scenario.

The paths of GDP impact

Figure 5.11 also shows the implications of different assumptions about economic growth on lower secondary enrollment. Different GDP per capita levels affect student flows on both the demand side and the supply side. They change the demand for education because of changing economic structures and because of changing economic capabilities and educational benefit analyses within families. In 2030 in the fast-growth economic scenario, GDP per capita in sub-Saharan Africa is 31 percent higher than in the low-growth scenario; by 2060, the difference is over 260 percent. For South and West Asia, the differences are similar—36 percent in 2030 and 260 percent in 2060—and globally, they are 39 and 232 percent. The differences are so large because of the power of compounding growth

Figure 5.11 Impact of framing scenarios on lower secondary gross enrollment rates in South and West Asia and sub-Saharan Africa: History and forecasts



Notes: Used 5-year moving averages after removing 1991–1996 historical values for South and West Asia.

Source: IFs Version 6.12 base case with alternate framing scenarios with UIS and WDI data through 2005.

Different GDP per capita levels affect both the demand for education and its supply.

Different demographic scenarios have the greatest impact at the secondary level, whereas different economic scenarios have a greater impact at the tertiary level.

The impact of government spending on enrollment is significant but not as large as might be expected.

Figure 5.12 shows the impact in South and West Asia and sub-Saharan Africa of the range of uncertainties combined into highly optimistic and pessimistic scenarios.

rate differentials over fifty-five years, enhanced by positive feedback loops.

On the supply side, higher economic growth would enhance societal resources at least proportionately. In fact, government revenues actually tend to rise faster than GDP when average income is rising. Further, we have already seen that spending on education as a portion of GDP also tends to rise with income levels. Significantly offsetting these changes that function to increase education support (and thus enrollments), the costs per student will rise with GDP per capita (although in the poorest countries, spending per student as a portion of GDP per capita generally falls at the upper secondary and tertiary levels as GDP per capita rises). Thus, only a relatively small portion of the increased funding brought by higher GDP will be available to fund the higher enrollments desired from the demand side. Chapter 6 will, however, document that higher GDP per capita tends to correlate with higher quality of education as assessed with international testing.

At the highest end of the impacts, the tertiary gross enrollment rate (not shown in Figure 5.11) in sub-Saharan Africa could be 30 percent in 2060, or 1.7 times higher in the high-growth economic scenario than in the low-growth scenario. Similarly, in South and West Asia, tertiary enrollments could be 1.4 times higher than with low economic growth. More generally, whereas different demographic scenarios have the greatest impact at the secondary level, the economic scenarios have a proportionately somewhat greater impact at the tertiary level. Higher GDP and GDP per capita very significantly affect demand for tertiary education.

The paths of government spending impact

The impact of government spending on enrollment is significant, but it is not as large as might be expected. That is partly because additional spending can influence education forecasts in three different ways. It can increase enrollment levels, increase the quality of the education students receive (for example, via better teachers or school facilities or through improved materials), or increase expenditures per student without increasing quality. It is extremely difficult to know in any given situation how the impact of additional public expenditure might split across these categories. The education model of IFs contains an algorithm for balancing demand for expenditures and their supply in ways that reflect some additional funding going to each of these categories. In addition, the IFs model does not, except in the normative scenario, allow the government to push funds into education beyond those required by the demand side of the model; thus, the primary impact of our increased spending intervention here is felt in supply-side constrained regions such as sub-Saharan Africa. For the world as a whole, the supply-side constraint lowers enrollments, but supply push does not significantly change them.

It is well-known in policy analysis that higher spending often is like "pushing on a string," not always bringing the intended results. In Chapter 6, we will explore the possibility of a normative scenario that combines higher enrollment growth expectations and a commensurate expenditure increase with constraints that move spending per student to benchmark levels, thereby minimizing the diversion of extra funding to inefficient expenditures.

Exploring combined uncertainty by level of education

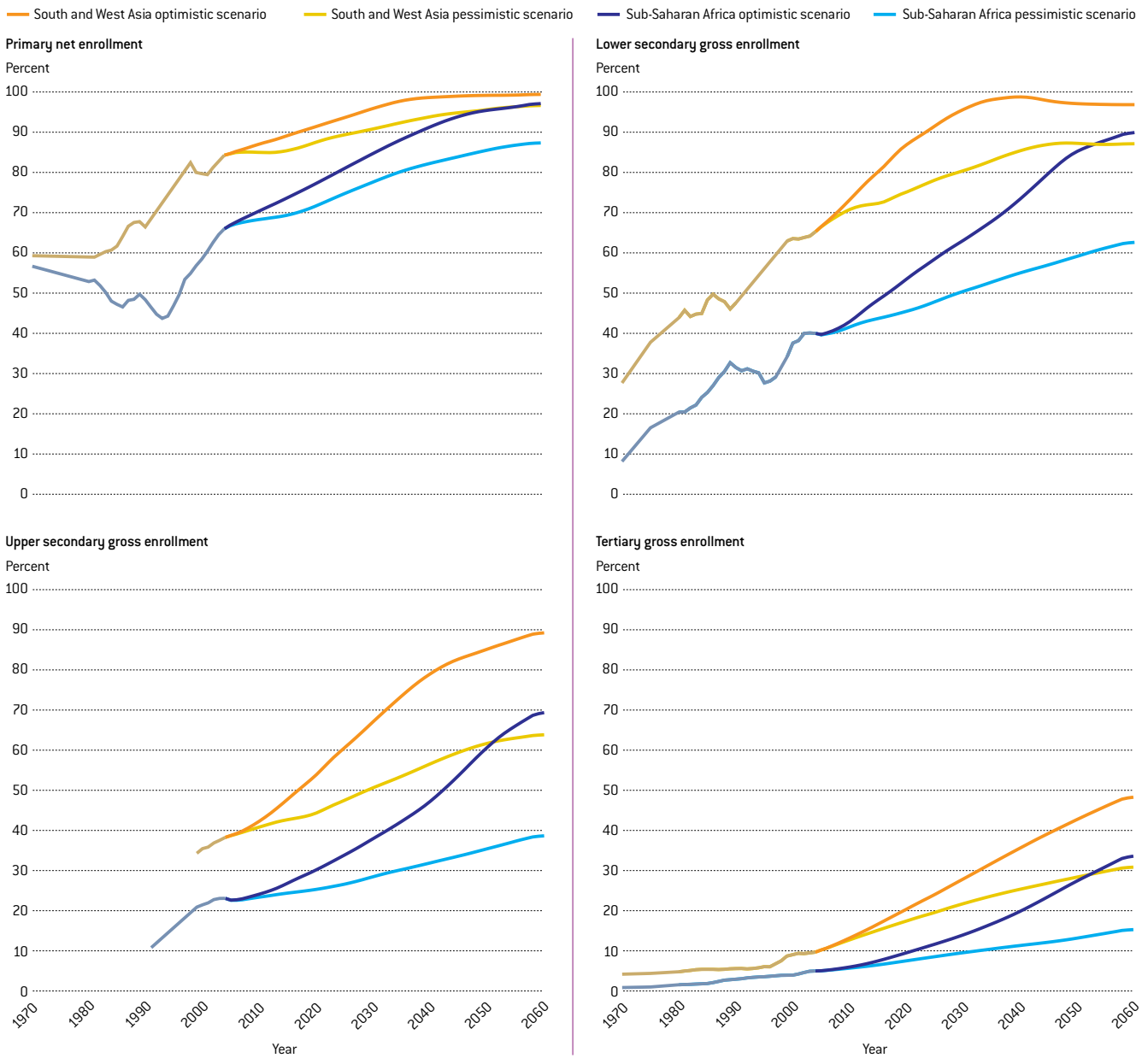
Figure 5.12 shows the impact on each level of education of the full range of uncertainties, combined into uniformly and therefore highly optimistic and pessimistic scenarios. The uncertainty increases by level of education. Upon reflection, this is not surprising because the lower levels of education have less headroom for expansion. At the extreme, South and West Asia could reach over 90 percent upper secondary enrollment (at the gross, not the net, level) by 2060 in the highly optimistic scenario, versus about 66 percent in the pessimistic scenario. The difference would be even greater for sub-Saharan Africa, 80 percent versus 40 percent.

Uncertainty in educational attainment

The variations between even the highly pessimistic and highly optimistic scenarios for education years at age fifteen and older are not especially great regionally or globally in 2060 because of the long lags in changing

the educational attainment levels of adult populations. The global educational attainment level varies only about 1 year between the scenarios by 2060—it varies about the same amount in South and West Asia and about 1.3 years in sub-Saharan Africa (as shown in Figure 5.13). Yet we should by no means disparage that impact. One year accounts for about 10 percent of the total average years of education across global adults in 2060 (and 1.3 years accounts for about 18 percent in sub-Saharan Africa), and furthermore, the impact of the different scenarios continues to grow over time.

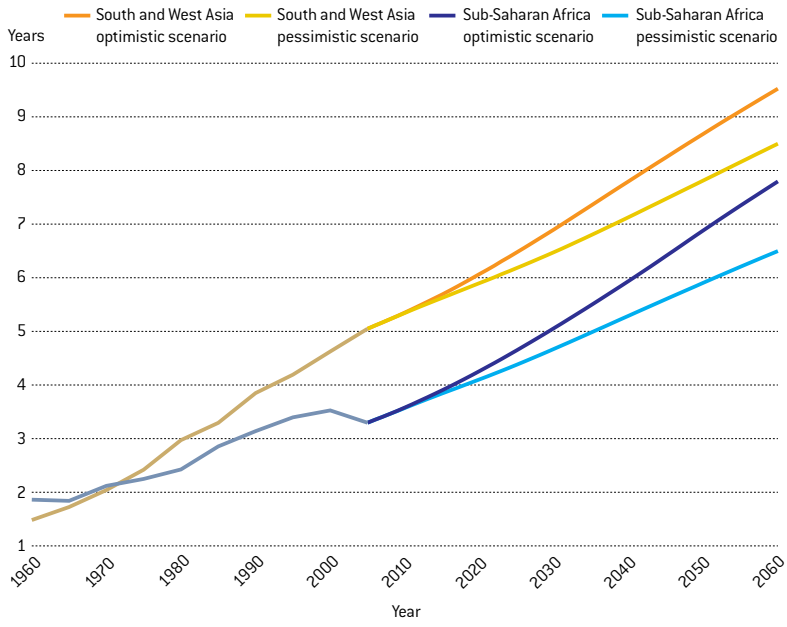
Figure 5.12 Highly optimistic and pessimistic framing scenarios for enrollment rates: History and forecasts



Note: Used 5-year moving averages after removing (1) 1980, 1982, 1991–1996 primary net historical values for South and West Asia and 1975 for sub-Saharan Africa, and (2) 1991–1996 lower secondary historical values for South and West Asia. UIS did not provide lower or upper secondary gross enrollment data until 1999; Irfan (2008) calculated estimated historical values for lower secondary enrollment rates for earlier years.

Source: IFs Version 6.12 base case with combined alternate framing scenarios with UIS data through 2005.

Figure 5.13 Education years of adults age 15 and older in South and West Asia and sub-Saharan Africa across optimistic and pessimistic framing scenarios



Note: The transient for sub-Saharan Africa reflects missing historical data mostly for low-education countries, so when missing country values are estimated by IFs, the average drops.

Source: IFs Version 6.12 framing scenarios with Barro and Lee (2001) data through 2000.

The IFs base case and alternative framing scenarios portray continued significant advance in education at all levels and across all regions.

A large portion of the uncertainty about education futures lies in alternative demographic and economic futures.

Conclusion

This chapter has explored the education forecasts of the IFs base case, putting them in the context of historical patterns and other forecasts. The IFs base case supports the likelihood of continued significant advance in education at all levels and across all regions, forecasts that appear generally quite reasonable in the historical context and relative to the forecasts of others. One interesting result with respect to the analysis of early forecasts by others is the tendency that extrapolative analysis has had to overestimate the progress of primary education in sub-Saharan Africa and to underestimate the progress of higher levels of education in many parts of the world. Both should serve as warnings to us.

This chapter has also considered the sensitivity of the IFs base case to alternative framing forecasts of population growth, economic growth, and education spending, in order to begin exploring the range of variation that may be possible in education futures. That analysis suggests some rather clear conclusions. First, it appears highly probable that education's advance will continue around the world. We see a significant advance in all the cases explored here, even the highly pessimistic scenario. There is great momentum behind the education transition. Second, the differences across varying driver assumptions may not be dramatic, but they are significant. Third, it appears that a very large portion of the uncertainty about education futures lies not in education policy and decisionmaking but rather in alternative demographic and economic futures. That conclusion has import for the analysis in subsequent chapters because it reinforces the consideration of normative-based policy in education within a broader human development context. It also has import, of course, for policy makers. For many countries, the surest routes to long-term education advance may be by attending to maternal health and family planning. We will proceed nonetheless to explore in the next three chapters the leverage that may exist within education policy, both because of the importance of education in and of itself and because of the contributions education makes to broader human development, which we will also consider.

1 Other documents provide information on the base case approach of IFs. See, for example, Chapter 5 of the first volume in the Patterns of Potential Human Progress series, *Reducing Global Poverty*.

2 The values for 2005 in Figures 3.1 and 5.1 are not identical and the series are not fully comparable because Figure 3.1 represents only those countries with extensive historical series. In contrast, the values in Figure 5.1 build on IFs estimations of values in 2005 for countries that do not report data, and they also include IFs adjustments made to reconcile inconsistencies in the enrollment data used to initialize the model.

3 As discussed in Chapter 3, we describe a 90 percent primary net enrollment rate as "nearing universal enrollment," and we treat a 97 percent primary net enrollment rate as the measure of universal enrollment. See the *Education for All 2008 Global Monitoring Report* (UNESCO 2007b: 180), which categorized country prospects for universality in 2015 based on a 97 percent rate.

4 Table 3.4 lists the member countries of the groups according to their primary net enrollment rates in 2005.

5 See www.fundforpeace.org for the most recent listing.

6 Thirteen other countries appear to be at risk with respect to primary net enrollment levels, but they are not listed in Table 5.2 because they lack recent data. The same is true of seven countries at the lower secondary level. Some of these are countries with the world's most seriously compromised education systems (such as Afghanistan, the Democratic Republic of Congo, Haiti, and Somalia), and they also appear to be at risk of not attaining 90 percent primary enrollment rates even by 2060.

7 Again, values for 2005 in IFs forecasts can differ from those for 2005 in historical analysis because the model estimates initial values for countries with missing data. In the case of education expenditures as a percentage of GDP, Chapter 3 reported a global historical value for 2005 of 4.8 percent, but the forecast value is 4.5 percent because nonreporting countries likely spend less. The disparity for sub-Saharan Africa is even greater (5.1 percent versus 4.3 percent).

8 In 2006, the Chinese minister of education announced plans to raise China's spending on education from 2.8 percent of GDP to 4.0 percent over five years; see *China Daily*, March 1, 2006, available at http://www.chinadaily.com.cn/english/doc/2006-03/01/content_524886.htm.

9 Milanovic (2005) clarified the distinctions between Gini calculated across countries without weighting, across countries using population weighting, and on the basis of individuals.

10 In fact, almost all quality-of-life measures are distributed more equally globally than is income. Moreover, developing countries are closing the gaps with developed countries on nearly all such measures. For instance, the global Gini for life expectancy was about 0.07 in 2005.

11 The extrapolations by UNESCO typically used logistic or S-shaped curves (UNESCO Division of Statistics 1993: 2). UNESCO subsequently revised data from 1980 used in the forecasts of 1983, complicating the evaluation of how well the forecasts did for 2000.

12 In addition to the more extensive forecasting projects considered here, other important education analyses make more limited forecasts. For instance, Cohen, Bloom, Malin, and Curry (2006: 1) forecasted that "an estimated 299 million school-aged children will be missing primary or secondary school in 2015; of these, an estimated 114 million will be missing primary school." Our forecasts for missing school-age children at the two levels in 2015 are 337 million worldwide, of which 66 million will be at the primary level.

13 Meyer et al. (1977) and Meyer, Ramirez, and Soysal (1992) previously identified such sigmoidal or S-shaped patterns of diffusion of mass education throughout the world for the extended period from 1870 to 1980.

14 IFs forecasted a 72.2 percent primary net enrollment rate for sub-Saharan Africa, whereas Clemens forecasted a 79.6 percent rate.

15 The U.S. Agency for International Development sponsors the DHS, and the United Nations International Children's Emergency Fund sponsors the MICS.

16 We estimated the data visually from bar graphs showing 80 percent, 90 percent, and 95 percent completion rates (see Wils, Carrol, and Barrow 2005: 22, fig. 3b).

17 Wils, Carrol, and Barrow (2005) included entrance up to the age of fourteen and completion up to the age of nineteen in their entry and completion rate calculations. Although this definition sounds close to the gross enrollment rates defined by UNESCO, the flow rates used by Wils, Carrol, and Barrow cannot exceed 100 percent by definition and thus are not exactly the gross intake or completion rates. The flow rates used by Wils, Carrol, and Barrow are thus quite different from the similarly titled rates used and forecasted by Clemens and IFs. Because IFs completion rates are gross rates, they can advance much more rapidly in the 90–95 percent range.

18 A fourth set of custom forecasts covered only a small set of countries.

19 IFs does not factor all the background information provided here into its forecasts for Burkina Faso, but it does represent the major demographic, economic, and financial variables.

20 Information given on Burkina Faso came primarily from the World Bank's World Development Indicators and the CIA's *World Factbook* (online).

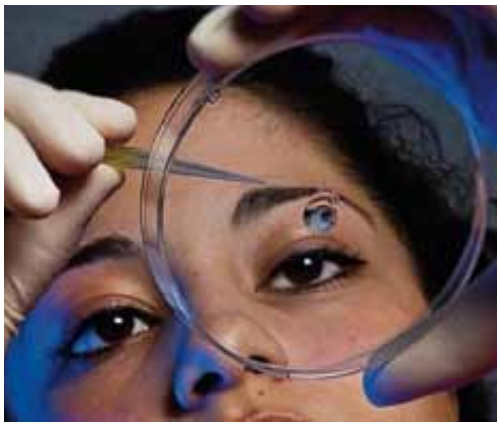
21 The Lutz methodology used the five-year age cohorts from fifteen to twenty-nine to estimate transition rates to literacy over time, extrapolated the growth in those rates, and built full age/sex pyramids of literate and illiterate populations through 2015.

22 Modelers can calculate and use confidence intervals with small, econometrically estimated models. Such intervals are not meaningful in large-scale models with significant structural components and algorithmic elements (such as budgeting rules).

23 Because global fertility rates have been dropping steadily for nearly forty years, and because there are many good reasons to believe they will continue to fall in most of the world, the UN constant fertility variant (based on fertility rates well above current ones) is only a reference point, not a reasonable forecast.

24 We do not display the base case in order to simplify the graphs; it would fall quite close to the middle of the alternative scenarios except in regard to education spending, where the base case would fall closer to the high-spending case.

6



Enhancing Educational Futures

To be useful, a normative scenario of human development involves a stretch toward one or more meaningful goals.

Successive global meetings have set education targets (and repeatedly identified the goal of universal primary education) without taking into account the great differences in education participation rates that various countries had attained and therefore the distance they needed to travel to reach the goal in a specific target year. That goal-setting practice reflects the normative value the global community places on advancing participation in primary education, a value we strongly share. Yet establishing a common target year has, in essence, set some countries up to fail, and devoting so much attention to a single level of education has often diminished the amount of attention paid to other important levels. Our aim in this chapter is to develop—as an alternative to universal, fixed-horizon, single-level quantitative goals and as an alternative to the base case reviewed in the preceding chapter—a normative global education scenario that advances quantity and quality in an aggressive but realistic manner across multiple levels of education.

To be useful, any normative scenario of human development must combine two characteristics. First, it must involve stretching toward a meaningful goal or goals.[1] In this context, rather than identifying target dates for the attainment of specified enrollment rates, we identify aggressive annual advance in rates of participation; we similarly identify aggressive rates for closing gender gaps. Second, a normative education scenario must be attentive to feasibility. We should therefore consider the resource requirements for the education of each student at high levels of quality and efficiency, resource needs that can differ significantly across education levels and with the ongoing development of education systems and achievement of higher incomes.

Public resources are, of course, not the only foundation of feasibility. Clemens (2004) emphasized that, although education policy such as funding is important in helping

countries increase enrollment, broader development policy can be even more critical. Without encouragement from parents and family, sufficient economic well-being to provide the freedom to attend school, basic supportive systems such as transportation, and employment prospects in which to use education, an expansion of enrollment opportunities may simply prove inadequate. Although our analysis cannot explore foundational elements for 183 countries in such detail, we must be cognizant of such factors and avoid a presumption that education's advance is always feasible if only resources become available.

Another approach to building a normative scenario could have sought to maximize, in monetary terms, private and/or social returns on incremental investments in education, perhaps even specifying a precise extent of acceleration in education participation that would return the most value per unit of additional investment. We have not taken that approach for two major reasons. First, we do not believe that we can appropriately put monetary values on all the benefits of education, including either the value of personal human capabilities and improved quality of life (independent of income) or the range of social impacts, such as social stability, to which education may contribute. Second, we do not feel fully comfortable with our ability (or the ability of others) to so precisely specify the impact that education actually has on key variables such as social change.

Nonetheless, as a step toward addressing the reasonable expectation of any policy process that analysis will explicitly consider benefits relative to costs, Chapter 8 will explore the broader socioeconomic consequences of the normative scenario relative to the base case. We can directly compare the incremental expenditure requirements of the normative scenario with estimates of the higher GDP levels that such spending might generate. We can also explore the impacts that more education may have on broader sociopolitical outcomes, even if we hesitate to put monetary values on them. In summary, we wish to be both convinced and convincing that our normative scenario would improve human well-being relative to the base case. Our objective is to sketch a scenario of a better (as opposed to optimal) education future in order to contribute to the dialogue about education and broader human development policy directions.

Building a Normative Scenario

Our construction of a normative scenario begins with a consideration of points of leverage, not with the final goals typically set for education, such as universal primary enrollment. We also direct some special attention to the issue of quality in education, an arena in which it is much more complicated to identify the goals, points of leverage—although well-prepared teachers are certainly key—and specific targets than it is to address the quantity of education.

At the same time, a useful normative scenario of human development is attentive to feasibility.

Points of leverage

Education goals often focus on enrollment rates, including the relative rates of females and males. Those actually seeking to increase enrollment rates, however, direct their attention to intake rates (or transition rates from lower levels of education) and to progress and persistence across grades, including survival to and completion of the final year of discrete levels of formal education. We do the same in the normative scenario.

Our normative scenario is built around points of leverage: namely, intake and transition rates, survival rates, and resources.

From the perspective of education policy, of course, increases in intake/transition and in survival are by no means the most immediate points of leverage. One could, instead, drill down and begin to explore the implications of school fees or of transportation systems available to bring students to school. However, because of our extensive geographic and temporal coverage, we need to keep our focus at a high level with respect to intervention points.

In addition to intake/transition and survival, it is important that we take into account, at least at a highly aggregated level, the issue of resources. Again, one could drill down with a discussion of teacher salaries, class sizes, and much else. For our purposes, though, we will focus on aggregate expenditures per student, relative to GDP per capita, looking again for reasonable target levels within and across levels of education.

Cutting across and interacting with leverage points on intake or transition, survival, and spending is leverage with respect to quality. Quality is difficult to define and to measure. It is even more difficult to forecast. For those reasons, we do not identify specific targets with

Target rates of growth need to be sustainable on an integrated basis across education levels over extended periods.

respect to quality for the normative scenario, although we do consider the relationship between quality and a key variable in our forecasts, namely, survival rates.

Putting targets in context 1: Change across levels of education

Those seeking to improve education understand that the object of our attention is a set of complex systems—that is, the various aspects of education, including the progression of students across levels of education as well as the relationship between the numbers of students entering a level and those completing it, are interrelated and interactive. Thus, goal- or target-setting should not ignore the systemic, interactive character of these elements.

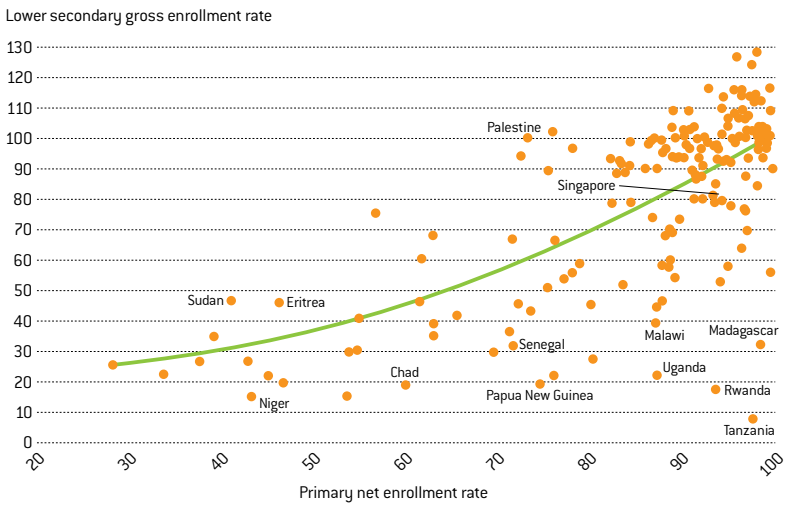
Somewhat in contrast to that perspective, Chapter 1 noted that the international community has set no global goals (with or without specific dates) for participation at postprimary levels, although we saw that there is substantial agreement on the importance of universal basic education (primary plus lower secondary), as well as having a "certain proportion" of a population completing the upper secondary level. And surely, some extent of tertiary education is essential for a country to have any chance of functioning as an equal partner in today's global, knowledge-based economy. We therefore extend our search for target rates of increase in intake/transition and survival through upper secondary education and want to take into account the interactions across levels, including tertiary education.

It is important that we look for patterns and specific targets that are sustainable on an integrated basis across education levels over the long haul, avoiding boom and bust cycles at any given level. Similarly, we need to take into account the natural relationships that exist across levels, including the pass-through of students from lower to higher levels. For example, increased numbers of primary graduates place great pressure on secondary systems. Given such pressure, should developing countries focus on completing the transition to universal primary education before addressing expansion of access to secondary education? What values, goals, and sets of circumstances should guide their decisions?

In fact, the balance of emphasis on primary and secondary education, and on lower and upper levels within secondary, varies considerably across countries. Figure 6.1 shows the global pattern of relationship between enrollments at the primary and lower secondary levels. Growth of lower secondary enrollment rates typically accelerates as primary enrollment moves toward universality. Figure 6.1 also identifies some of the countries that deviate considerably from the general pattern. Note, for example, that Uganda and Tanzania both have lower secondary gross enrollments near or below 20 percent in spite of primary net enrollments near 90 percent.

One could argue for the pattern of Uganda and Tanzania on the grounds of equity, emphasizing primary education for all rather than providing a path for a smaller number to achieve both primary and secondary education and thereby leaving many citizens behind (as might be argued is the case for Sudan and Eritrea in Figure 6.1). But it is important to recognize that moving toward universal primary enrollment without building a significant secondary system as well might be inefficient. For instance, good training for teachers and therefore a high quality of primary education requires that teachers have at least a secondary education. It is not a coincidence that many of

Figure 6.1 Balance: Relationship of lower secondary gross to primary net enrollment rates



Note: Republic of Congo was excluded as an extreme outlier. Equation: $y = 15.1713 + .00858\ x^2$; R-squared = 0.43

Source: IFs Version 6.12 using UIS data (most recent by country).

the countries below the line in Figure 6.1 suffer low survival rates relative to intake rates, as shown later in Figure 6.2. Students and their families may not continue the educational process if the quality of it does not provide benefits greater than the opportunity costs of the pursuit.

The reality is that multiple interaction and threshold effects link enrollments across levels of education. For example, Figure 6.1 suggests there is an accelerated takeoff in lower secondary gross enrollment rates when primary net enrollment exceeds about 80 percent. More generally, there is an upward-sloping relationship between enrollment rates across sequential levels of education. Part of this is simply a pass-through effect—enrollments at higher levels build on increasing numbers of graduates at lower levels. Part of it is an attention and resource availability effect—as enrollments begin to saturate at one level, growth accelerates at the next. For example, Cuadra and Moreno (2005) noted that global rates of growth at the secondary level now exceed those at the primary level. Mingat (2004: 7) similarly emphasized that the anticipated growth in number of those completing primary school from 7.8 million in 2001 to 20.7 million in 2015 will create great bottom-up pressure for growth at the secondary level.

Relevant to the issue of attention and resource availability—and seemingly contrary to the argument that there are trade-off and sequencing effects—Lewin (2004: 23) concluded that "enrolment rates at the secondary level in SSA are substantially independent of primary enrolment levels" and instead reflect policy preferences. Yet clearly, the pressures of Education for All and the MDG for universal primary education have been channeling especially large contemporary efforts to the primary level and, at least in some countries, therefore starving secondary education. Both trade-offs among levels and sequencing across them seem inevitable.

We argue, throughout this volume, that there is no one "right way" to proceed with the development of education systems across multiple levels of education. Still, the normative scenario that we elaborate must minimally be attentive to the relationships across the levels.

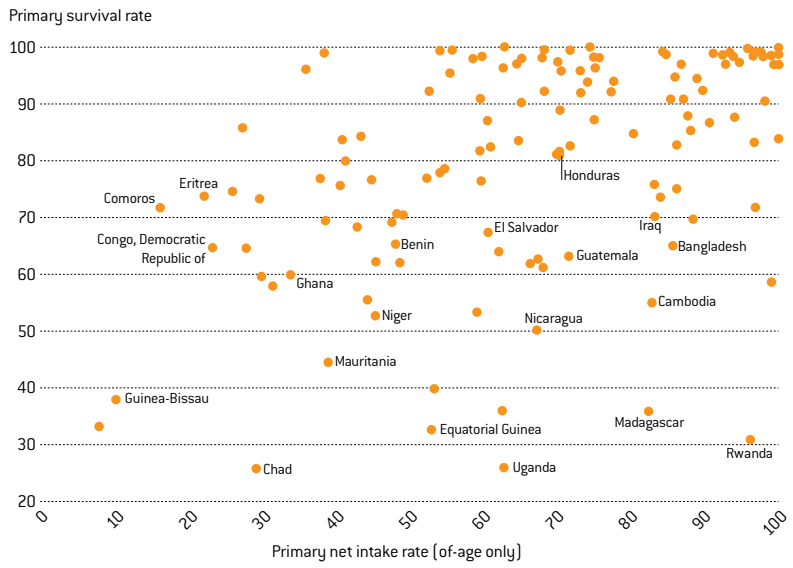
Putting targets in context 2: Change within levels of education

There are also interaction and threshold effects within each level of education. With respect to interaction effects, rapid growth in intake/transition often results in decreasing survival rates as the desire to educate more students overwhelms the ability to do so well or because additional entering students (for example, those who are in the first generation of family members attending school) face especially daunting challenges.

More generally, Figure 6.2 shows the global relationship of survival rate to intake rate. Different groupings of countries in the figure illustrate different challenges to education systems. For example, countries below 70–80 percent survival may be considered to suffer inefficiency because students who enter, and upon whom resources are spent, do not complete a full academic program. Countries in the lower right-hand quadrant of the figure, such as Equatorial Guinea, Madagascar, Rwanda, and Uganda, bring most of-age students into the system but advance relatively few of them to graduation.[2] A second set of countries in Figure 6.2, including Benin, Comoros, Eritrea, the Democratic Republic of Congo, and Ghana, illustrate a different kind of education system

Targets also need to be sustainable within levels; if targeted growth rates in intake are too high, survival rates are likely to decline.

Figure 6.2 Efficiency: Primary survival rate across levels of of-age intake rate



Source: IFs Version 6.12 using UIS data (most recent by country).

challenge. These countries have moderately high survival rates, but their intake rates are far from universal and are therefore inherently inequitable. In the lower left-hand quadrant of the figure, Guinea-Bissau, Chad, and Mauritania struggle with a double burden—low intake and low survival rates.

A critical question that emerges from this analysis is how developing countries deal with the twin and interacting challenges of equity and efficiency as they move toward universal primary education. Do they tend to deal with both challenges simultaneously, or is there a pattern of emphasizing first one target and then the other? What are the circumstances and consequences associated with the differing patterns, and are there implications for best practice?

Advancing global education requires a focus on quality, not just quantity.

Moving from the issue of challenges that countries face to the challenges of developing a normative scenario, the complex relationship between growth of intake (or transition) and survival must make us cautious about what is possible in the attempt to set generalized and basically independent target rates of growth for them. Setting such targets may be a significant step forward from setting universal enrollment goals with the same target date for all countries. Yet our approach of setting targets for growth in intake or transition and survival rates quite independently of each other has its own significant weaknesses, and we view our effort as a step in a longer and larger process. A better approach would be more algorithmic, specifying relationships (codifying interaction and threshold effects) as well as target rates. Such algorithms would take into account not just the immediate or direct relationship between intake or transition and survival; they would also be sensitive to the impact on both of system drivers such as demographic and economic change.

Unfortunately, only proxy measures are widely available as comparative indicators of quality.

An algorithmic approach, of course, is exactly what the IFs education model (see, again, Chapter 4) attempts to use more generally—for instance, as enrollments begin to saturate at the primary level, the model automatically shifts resources to the higher levels. Yet the model and our specification of normative targets have many remaining weaknesses in this respect, including this absence of a structure for handling interaction effects between intake and survival.

Beyond the combination of targets and more comprehensive algorithmic representations, a normative analysis would benefit as well from adding a more extensive country-specific analysis. Countries not only start from unique points determined by historical paths as represented in IFs but also vary in their philosophies and goals, including how to resolve issues related to the trade-off between the portion of the population to be educated and the extent of education provided for those who enter the system.

An elephant in the target-setting room: Assessing quality

The final goal of the Dakar Framework reminds us explicitly that extending the quantity of education, though essential, is not sufficient. In addition, advancing global education requires a focus on "improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy, and essential life skills" (UNESCO 2000: 2). To improve quality, it is necessary first to develop measures of it, second to assess performance by applying those measures, and third to analyze and implement approaches to its enhancement.

Many developed countries now participate in international learning assessments (see Box 6.1) that focus specifically on literacy, numeracy, and/or essential life skills.[3] Unfortunately, far from all middle-income countries and very few low-income countries have participated to date. For instance, in sub-Saharan Africa, only Botswana, Ghana, and South Africa took part in any of the standardized multinational assessments through 2007.[4]

Because relatively few developing countries have yet to participate in international standardized learning assessments, analyses often use more widely available proxy measures as comparative indicators of quality. The most frequently used measure is one of the official indicators for the universal primary education MDG, namely, the survival rate of an entering primary cohort to the beginning of the fifth or final grade (discussed earlier as a measure of efficiency but also having an equity component). The use of the survival rate as a quality proxy is based on the presumption that schools, in general, will not retain large proportions of students to the final grade unless the education

Box 6.1 The development of international educational assessment

The International Association for the Evaluation of Educational Achievement (IEA) and the OECD are each involved in significant efforts to measure educational quality across countries, and both focus on direct assessment of student learning outcomes rather than on proxy measures.

The two primary IEA assessments, conducted in conjunction with the International Study Center at Boston College's Lynch School of Education, are TIMSS (Trends in Math and Science Study) and PIRLS (Progress in International Reading Literacy Study). TIMSS was conducted in 1995, 1999, 2003, and 2007; all four assessments included eighth-grade students, and all but the 1999 assessment included fourth-grade students. The 1995 assessment also included students in the final grade of secondary school. PIRLS was conducted in 2001 and 2006, both times with fourth-grade students only. Every participating country's performance on each of the tests is reported relative to an international mean score across all participating countries. TIMSS and PIRLS reporting also includes the percentage of students in each country who performed at percentile levels of achievement relative to defined competency levels or targets.

The PISA assessment program—under the auspices of the OECD—focuses on fifteen-year-olds. PISA—the Programme for International Student Assessment—includes timed tests in reading, mathematics, and science literacy. It assesses student ability to apply knowledge and learning at the "typical" end of compulsory education. PISA was conducted in 2000, 2003, and 2006. PISA expresses performance scores as country-level means and standard errors, and it includes percentile distributions. Because many children in developing countries are no longer in the educational system by age fifteen, PISA cannot provide as broad an assessment of the quality of primary education as do TIMSS and PIRLS. Instead, its focus is on assessing preparation for assuming the roles and responsibilities of work, citizenship, and/or advanced study for those who are completing lower secondary or basic education.

experience has quality. Testifying further to the importance of survival rate, the Education Development Index (EDI), developed to measure overall progress toward a number of the goals in the Dakar Framework (UNESCO 2007b: 198–205), relies upon survival as the quality component.[5]

Analysis with the IFs modeling system directly compared the scores of countries on the various examinations and found high correlations across them (see the Appendix to this chapter). It also found that the survival rate correlated highly with assessment results across countries, even after controlling for levels of GDP per capita and of income distribution. Forecasting results on international assessments is not possible in the IFs system at this time because we currently have no structural foundation for it. It is, however, possible to analyze and forecast survival rates. In addition to its direct importance for both equity and efficiency, the normative scenario will therefore give survival attention as a possible measure of quality.

Identifying Targets: Intake/Transition and Survival

The normative scenario requires a quantitative specification of aggressive but reasonable intake rates at the primary level (or transition rates at higher levels of education) and survival rates to the end of studies. Here, we will consider how fast those rates can realistically grow at primary, lower secondary, and upper secondary levels before returning in the next section to the issue of appropriate expenditures per student. The focus here is on annual percentage point changes in rates—for example, a 2 percentage point increase in the primary intake rate might take it from 64 to 66 percent.[6] We are interested also, of course, in specifying how fast gender gaps can close.

We looked to many sources for help in quantifying aggressive but reasonable rates of growth in intake, transition, and survival.

Data and information streams for setting targets

Given the methodological complications of analysis concerning good practice in education's growth, variations in education systems, and the underlying societal value configurations they reflect, there is no completely satisfactory way in which to set general targets for rates of growth in intake/transition and survival. The fundamentally qualitative exercise needs to have elements of a Bayesian analysis that uses multiple streams of information to gradually shape and reshape judgments about reasonable targets.[7] The streams help us develop an understanding of typical and also of especially good experiences in educational growth.

Existing studies

Prior studies and analyses provide one stream of information. With respect to primary enrollment

rates, as discussed before, Clemens (2004: 15–16) found that in the last half of the twentieth century, countries on the average moved from 50 percent primary net enrollment to 70 percent in 22.3 years, increasing enrollment rates by nearly 1 percentage point each year; movement from 75 to 90 percent enrollment took 28 years on average, at a rate of approximately 0.5 percentage points each year. Similarly, Wils, Carrol, and Barrow (2005: 22) found that movement from 80 to 90 percent required 14.7 years, a gain of about 0.7 percentage points each year. (See, again, Chapter 5 for a comparison of the forecasts of IFs in the base case with these historical analyses.)

Data-rich countries

Another stream of information, particularly with respect to common experience if not necessarily best practice, comes from an analysis of the history of especially data-rich countries. In our supporting analysis, we examined the experience of the thirty-two countries globally with the most complete data since 1999 on intake/survival and transition rates across primary, lower secondary, and upper secondary levels. All are developing countries.

The collective examination of these countries helped us draw several conclusions. First, it is extremely difficult to make progress across intake/transition and survival rates at all levels of education simultaneously. Almost all countries have made progress in some areas while losing ground in others. Second, the recent attention to the primary level has been very aggressive, almost certainly at the expense of other levels. Third and relatedly, countries that have been attentive to the primary level but somewhat less aggressive with respect to it appear to have demonstrated greater progress at higher levels and more balanced progress overall. The general conclusion that we draw from this analysis is that we must be careful not to let very rapid progress on any single or small set of variables suggest target values for the normative scenario; instead, we looked for target values that would support a strategy of balanced educational advance.

High-growth countries

Still another evidence stream is the analysis of rapid-growth countries. With respect to primary completion rates, Bruns, Mingat, and Rakotomalala (2003) found that the twenty highest-performing low-income countries during the 1990s achieved, on average, a 2.38 percentage point annual increase in completion rates.[8] Completion rates (the portion of potential students who finish a level of education) climb as roughly the sum of increase in intake rates (the portion of potential students who enter) and survival rates to the last grade for those who enter. The IFs historical series indicates that intake increased 1.5 to 2.0 percentage points annually in that set of countries. Thus, the implicit gain in survival rates for those countries would have been about 0.38 to 0.88 points, or a less than 1 percentage point annual increase. Such evidence suggests that 1 percentage point in annual growth is an aggressive target for primary survival rate changes, especially on top of growing intake rates.

In our own analysis, we looked at the twelve countries with the most rapid growth in recent years (within the 1999–2005 range) for each of the target variables. Many of those countries have been experiencing catch-up or overshoot, so they need to be considered carefully, not simply used to set target rates. To put the analysis of fast growth in a longer historical context, Botswana appeared successful after 1970 in raising primary net enrollment rates from 46 to 76 percent in 10 years, an annual increase of nearly 3 percentage points. Those numbers may, however, have been overly ambitious or inaccurate and then corrected; over a full 35 years (1970–2005), the annual increase was only about 1 percentage point (46–84 percent). Similarly, Bangladesh appeared to have surged from 50 to 90 percent in 28 years (adding an average of 1.4 percentage points annually), but over a full 35 years, the annual increase averaged 1.1 percentage points.

In short, fast growth is very often not sustainable—and again, it may come at the expense of other education levels. Nonetheless, looking especially at the countries near the bottom of the set of twelve (and thereby eliminating the clear outliers at the upper end) gave us some additional sense of what good target rates might be. Moreover, looking within the sets of both data-rich and high-growth countries helped us identify the points on each variable at which growth appears most rapid. This is important because of the S-shaped pattern of such growth across the entire range of each variable.

We gave special attention to selected countries. For instance, Lesotho (both a data-rich and a high-growth country) experienced in recent years an annual growth of 4.2 percentage points in primary intake, 0.6 percentage point in primary survival, 2.6 percentage points in transition to lower secondary, –.1 percentage point in lower secondary survival, 1.5 percentage points in transition to upper secondary general programs, and 1.1 percentage points in survival in upper secondary general programs. Such a relatively balanced pattern of growth begins to suggest one integrated set of normative targets. Yet Lesotho, like all countries, is unique in many aspects. In addition to having experienced its own sociopolitical turmoil in 1998, just before this period of growth, its close ties to the economic and sociopolitical systems of South Africa have transmitted many beneficial effects to it from the dismantling of apartheid there in the 1990–1993 period. In short, its analysis provides more information but not conclusive suggestions for target rates.

We have similarly looked at a set of countries that experienced an especially rapid narrowing of gender gaps over the 1980–2005 period, including Benin, Burkina Faso, Ethiopia, Guinea, India, and Nepal (and also Botswana and Lesotho with the closure of male gender gaps). They have changed gender ratios toward parity by about 0.01 to 0.02 points (on a scale where 1.0 is exact parity) per year on average.

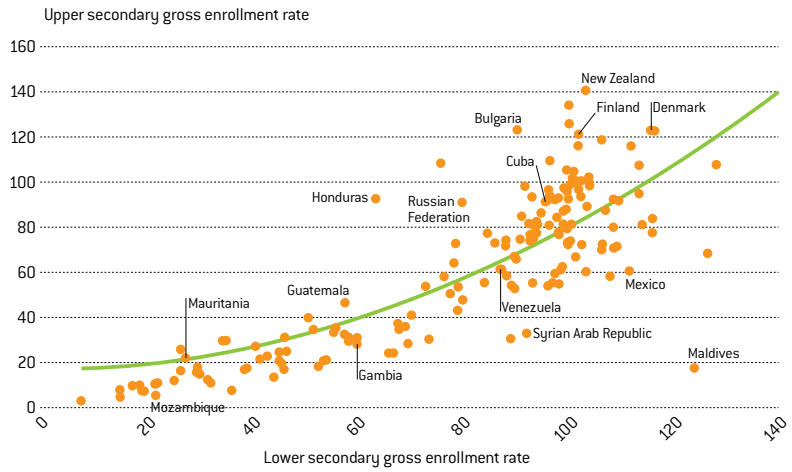
Problem countries

Another place to look for insight is in sets of problem countries. With respect to gender parity, Afghanistan is consistently among the absolute worst performers, although it is likely that data for the country have not caught up with some of the improvements in the society since 2001. Setting Afghanistan aside, other countries with primary gender parity ratios below 0.8 in 2005 were Burkina Faso, the Central African Republic, Chad, Guinea-Bissau, Liberia, Mali, Niger, Pakistan, Somalia, and Yemen. Additional countries below 0.9 were Benin, Comoros, Democratic Republic of Congo, Côte d'Ivoire, Djibouti, Eritrea, Guinea, Iraq, Nepal, Nigeria, Sierra Leone, Sudan, and Togo. Simply to name these countries is to recognize how difficult the process of change will be; many fall regularly on lists of conflict-ridden or failed states, and substantial numbers also have cultural traditions that have disadvantaged women. Creating a normative scenario for rates of change in such countries should not excuse slow growth with attention to such deeper problems, but we should recognize that rapid progress across the set is improbable and again temper our expectations accordingly.

Cross-sectional analysis

The analysis of relationships between normative target variables by using data from all reporting countries also can be helpful, especially with respect to thinking systemically about the normative scenario. Figure 6.1 showed the general pattern of progression from primary to lower secondary enrollments. Figure 6.3 similarly shows how countries tend to balance lower and upper secondary enrollment rates in general secondary programs and, generalizing from the cross-sectional pattern to longitudinal underpinnings, how increases at the upper secondary level accelerate with higher levels of lower secondary enrollment. As a variant on Figure 6.3, we also explored fairly extensively the relationships over time between average annual changes in the target variables (namely, transition rates and survival rates).

Figure 6.3 Upper secondary gross enrollment rate as function of lower secondary gross enrollment rate



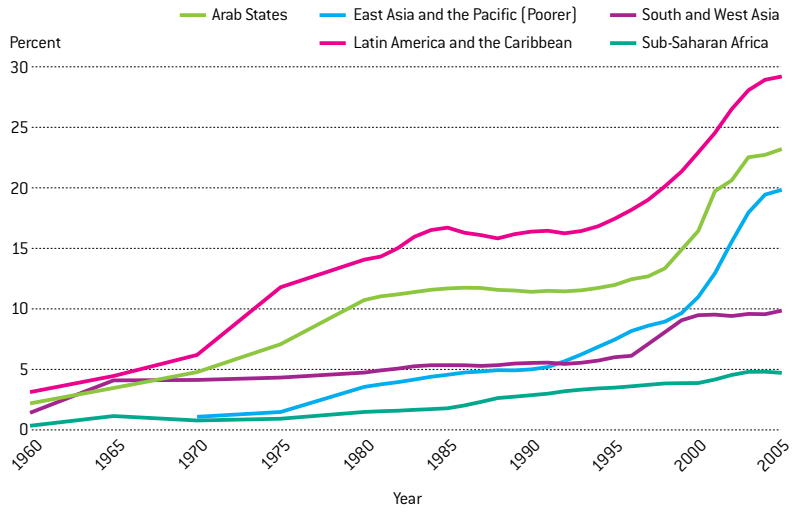
Note: Australia was excluded as an extreme outlier because it included large numbers of postsecondary students returning for adult vocational education. Equation: $y = 16.8549 + .00625\ x^2$; R-squared = 0.55

Source: IFs Version 6.12 using UIS data (most recent by country).

Regional and country grouping analysis

Still another stream of information comes from looking at regional patterns over time, allowing some aggregation and averaging of idiosyncratic country patterns. We looked, for instance, at the regional growth of enrollment rates at each level of education across time, to obtain a sense of periods in which enrollment grew especially rapidly and the rates it was able to reach and sustain. As an example, Figure 6.4 shows the pattern of growth in tertiary enrollment rates for selected developing regions. In the middle to late 1990s, three regions obviously reached thresholds or turning points, followed by much-accelerated tertiary enrollment growth. In the subperiod from 1998 through 2004, the enrollment rate in Latin America and the Caribbean and in the Arab States rose by about 1.6–1.8 percentage points annually. In that same subperiod, enrollments in developing East Asia and the Pacific rose just over 2.0 percentage points annually. All these regions had reached upper secondary gross enrollment rates of about 40 percent by the beginning of their recent tertiary rapid-growth spurts (Latin America had reached 63 percent), reinforcing the pattern found at lower education levels in regard to the need to build a foundation prior to making rapid gains at the next level. These levels are, however, lower than the 70–80 percent or so found in an analysis of thresholds for spillover at lower levels. It is possible that, with accelerated globalization, recognition of the importance of higher education for global knowledge economies and societies spread rapidly in the 1990s, giving an additional impetus to higher education everywhere.

Figure 6.4 Tertiary gross enrollment rates in selected developing regions (1960–2005)



Note: Values are 5-year moving averages because of transients in sets of countries with variable reporting across time. For the same reason, the following data were excluded: 1999 from the Arab States, 1960 and 1965 from East Asia and the Pacific, and 1998 from South and West Asia.

Source: IFs Version 6.12 using UIS data.

Analysis of dynamics across levels of education

Finally, we needed to devote special attention, especially for gender parity, to the dynamics of enrollment flows over time and to explore implications of the pass-through of students from one level of education to another. Chapter 3 discussed the fact that gender imbalances in favor of males tend progressively to become less pronounced and even to reverse at higher levels of education. Interestingly, situations can arise, such as those in Egypt or Morocco, in which the transition and survival rates in upper secondary general programs are both higher for females than for males despite the fact that the overall upper secondary enrollment ratios definitively favor males.

A major reason for this seeming anomaly is that males have higher primary entry and enrollment rates than females in these countries and consequently are more "available" to pass through to higher levels. Another is that males have higher participation rates in vocational secondary programs in these countries. Thus, even though a higher percentage of the females who complete the primary level and/or lower secondary levels go on to upper secondary general programs, and even though more females than males who begin upper secondary general programs complete them, there are more males enrolled at the upper secondary level overall. The leverage points of our normative scenario at secondary levels are transition and survival rates for general secondary programs, but it is not at all clear that simply moving those rates toward greater gender equality enhances true parity at the upper secondary level.

Overall, the most aggressive action with respect to gender parity needs to begin with intake rates at the lowest level and gradually push parity through to the higher levels, while

still not ignoring the disadvantaged gender (whichever that may be) at each step along the way. Thus, for normative targets, we set the highest annual percentage movements toward gender parity at the primary level (1 percentage point) and progressively lower ones at the secondary levels. Our normative scenario also moves secondary vocational enrollment rates toward parity. At the tertiary level, we slowly move gender ratios to 1.0 beyond the 2060 forecast horizon.

Conclusions for the normative scenario: Student flows

Despite our efforts to use data heavily, the process of creating the normative scenario was a significantly qualitative one. It had an iterative character, beginning with some initial estimates for reasonable targets that we gradually adjusted in light of new evidence streams. The scenario does not include target specifications at the tertiary level except for slow reductions of gender imbalances because we did not feel our basis for them was strong enough yet. Table 6.1 summarizes the target values for intake/transition, survival, and gender parity at all levels of education that we used in the normative scenario. The target values specify maximum growth rates that occur near the midrange of intake/transition and survival. Because of constraints on growth of those variables at the low end of ranges (related to difficulty in scaling up systems) and at the high end of ranges (related to complications in bringing in the last portions of populations), we applied S-curve patterns of growth around those maximum values.

The gender parity targets augment the targets for intake/transition and survival. Thus, for example, intake rates for the disadvantaged gender at the primary level, almost always girls, could conceivably be increased by as much as the sum of 2.2 percentage points for the intake effect itself plus 1.0 percentage point for the gender gap closure effect.

Throughout this volume, the discussion of change in patterns of student flows has made it clear that if one were creating a normative scenario for a particular region or country, the setting of targets for growth such as those in Table 6.1 would be helpful but ultimately inadequate and in need of further tailoring. Countries pursue such targets in very specific demographic, economic, and sociopolitical contexts. Normative scenarios, when taken to the level of planning, should recognize that countries begin at markedly different places, honor those differences, and not force cookie-cutter uniformity on countries. For this global analysis, however, the general specification of rates is necessary and reasonable.

In the IFs base case of Chapter 5, budgetary constraints were of great importance. Although we lift those constraints for purposes of analysis in the normative scenario, spending patterns remain a fundamental concern. Further elaboration of the normative scenario requires that we turn to a consideration of per-student spending.

Our normative student flow targets were developed iteratively as we reviewed data and applied qualitative judgments to the many evidence streams.

Table 6.1 Summary of target rates in the normative scenario

	Intake/transition	Survival	Gender parity
Primary	2.2 percentage point annual increase	1.2 percentage point annual increase (2 percentage points could be reasonable for some countries in catch-up mode, especially above 65 percent survival)	1.0 percentage point (0.01) annual closure in parity ratios for both intake and survival
Lower secondary	1.0 percentage point annual increase (has compounding effect on top of primary growth)	0.8 percentage point annual increase	0.8 percentage point (0.008) annual closure in parity ratios for both transition and survival
Upper secondary	0.5 percentage point annual increase (historically, this would ramp up with increased lower secondary enrollment)	0.3 percentage point annual increase (country or regional catch-up specifications could be as much as 2 points, e.g., in South and West Asia)	0.5 percentage point (0.005) annual closure in parity ratios for both transition and survival
Tertiary	Normative scenario does not change this (2 percentage points growth in gross enrollment would be aggressive)	Normative scenario does not change this (2 percentage points growth in gross enrollment would be aggressive)	Normative scenario slowly moves gender ratios to 1.0 (beyond forecast horizon)

Note: Maximum values are at 50 percent intake/transition and 65 percent survival with relative slowing at higher and lower levels, generating an S-shaped curve of growth.

Source: Compiled by the authors.

Similarly, we explored multiple sources of information about spending patterns in order to build normative spending targets at each education level.

Identifying Targets: Public Spending per Student

To establish a context for thinking about spending on education, Table 6.2 shows how public spending per student varies around the world and by level of education. As UNESCO (2007a: 19) pointed out, "By expressing expenditure [per student] as a percentage of GDP per capita, education budgets can be compared in relation to national income level, which is a proxy for a country's ability to generate education financing."

At the primary and lower secondary levels, low-income and lower middle-income countries spend considerably less per student as a percentage of GDP per capita than upper middle-income and high-income countries do. It may be reasonable to speculate that such levels for lower-income countries represent inadequate spending as a result of resource constraints and high child dependency ratios. In contrast, however, low-income countries spend much more per student at the upper secondary and especially at the tertiary level than do richer countries. That almost certainly reflects the great difficulty that the poorest countries have in obtaining educated faculty and other professionals to staff higher education, and it may also represent the start-up costs of developing facilities for universities and professional schools. In addition, on the basis of limited available data, it appears that in richer countries, private expenditures at the tertiary level facilitate lower public expenditure rates.[9] Also, education at the tertiary level is a more tradable good than education at lower levels (large numbers of students do study abroad), a fact that could lead to some degree of global convergence in actual costs and prices and therefore to continued disparity in spending relative to GDP per capita.

There is, however, tremendous variation in spending rates per student across countries within the categories of Table 6.2, especially those at lower income levels. To determine "reasonable" spending rates for a normative scenario, it would be most useful to identify benchmarks that represent spending consistent with the goals of both quality and efficiency. Two approaches can help us estimate such benchmarks for per-student costs relative to GDP per capita, appropriate to the economic development level of each country and variable across levels of education. The first is a bottom-up analysis of specific costs within developing countries that illustrate good practice in expanding education participation and attainment. The second is an aggregate, top-down analysis, looking comparatively at total spending across countries around the world to understand how patterns relate to quantity and quality of performance.

Good practice: A bottom-up look

Many analyses of global education have identified, at least conceptually, the kinds of specific inputs that quantity expansion and quality improvement require, including well-trained teachers, sufficient teaching materials, safe and accessible schools, and supporting infrastructure. The costs of such inputs vary greatly across countries, reflecting differing cost structures and expenditure capacities as well as historical paths and unique circumstances. Yet salaries, which constitute about 75 percent of total costs globally for preprimary through upper secondary education,[10] correlate highly around the world with GDP per capita. Other costs also covary with GDP per capita, which is why per-student spending as a percentage of GDP per capita is a useful focus of analysis.

The landmark study conducted by Bruns, Mingat, and Rakotomalala (2003) exemplifies useful bottom-up analysis at the primary level.[11] Their study grouped 47 of the low-income countries eligible to receive deeply concessional funds from the World Bank's International Development Association (IDA) into four categories, dependent on their success in expanding education participation.

Table 6.2 Public spending per student as percent of GDP per capita at PPP by country income level

	Country income level			
Education level	**Low**	**Lower middle**	**Upper middle**	**High**
Primary	11.2	8.5	15.3	19.8
Lower secondary	20.1	8.9	15.3	23.5
Upper secondary	50.1	21.3	16.2	25.9
Tertiary	225.9	64.8	31.4	28.7

Note: Countries are grouped by World Bank economy classifications.

Source: IFs Version 6.12 using UIS data (most recent by country).

- Group 1 (relative EFA success) countries: These 10 countries had gross primary enrollment rates of at least 85 percent and primary completion rates of 70 percent or more. They also had "healthy spending; reasonable unit costs, teacher salaries, and class size; and low repetition" (p. 63).
- Group 2 (high inefficiency) countries: These 8 countries had gross enrollment rates of at least 80 percent but completion rates of 60 percent or less. The report's stylized description of their education systems was "inadequate spending on quality and excessive repetition" (p. 64).
- Group 3 (low coverage) countries: These 7 had both gross enrollment and primary completion rates of 60 percent or less and were characterized by "low spending, high unit costs driven by extremely high teacher salaries, and relatively poor efficiency" (p. 64).
- Group 4 countries: These 24 countries fell outside the defined patterns of Groups 1–3.

By analyzing the system characteristics associated with success, notably in Group 1, Bruns, Mingat, and Rakotomalala (2003: 73) constructed stylized best-practice benchmarks related to quality, efficiency, and resource mobilization and use. Benchmarks included forty pupils per teacher, 33.3 percent spending on inputs other than teachers, a 3.5 multiple of GDP per capita for average teacher salaries, and a 10 percent repetition rate (reflected in a 110 percent target for the gross enrollment rate).[12] Guidelines (the Indicative Framework) for countries selected into the Fast Track Initiative use these benchmarks, with an addition for instructional hours per year.

Overall, the work of Bruns, Mingat, and Rakotomalala (2003) suggested that best-practice spending at the primary level is about 2 percent of GDP per capita more than the average spending levels of their Group 1 countries (that is, 14 percent of GDP per capita versus the average of 11.8 percent in Group 1). That is an important insight as we move to looking from a top-down instead of bottom-up perspective.[13]

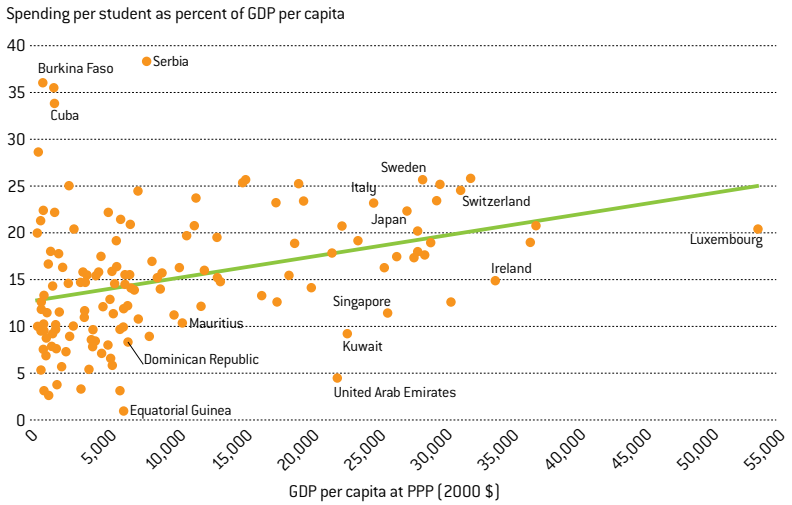
Good practice: Aggregate, top-down analysis

Aggregate, cross-sectional comparisons can provide a more detailed picture of spending per student as it relates to income levels (see, again, the summary picture in Table 6.2). They also show the extent of variability in spending patterns and serve as a takeoff point for an exploration of that variability. For these reasons, we use them to frame our top-down analysis.

Primary-level public spending

Figure 6.5 shows the global relationship for both developing and developed countries between GDP per capita and primary spending per student as a percent of GDP per capita. The range of spending practices around the central tendency in Figure 6.5 is dramatic for low-income countries. Some of the more extreme values are likely the result of data problems. Still, there are also many reasons for the substantial spread. Cuba, for instance, prides itself on its public investments in human capital. Some other countries well above the line have high cost structures because of teacher shortages—for example, Bruns, Mingat, and Rakotomalala (2003: 146) reported that teacher salaries in Burkina Faso were eight times GDP per capita. Other countries suffer from the disappearance of funds into many pockets as funds move from central authorities to local school officials; in fact, the addition of Transparency International's measure of corruption perception to the relationship in Figure 6.5 raises the adjusted R-squared from

Figure 6.5 Primary spending per student as function of GDP per capita at PPP



Note: Djibouti was excluded as an extreme outlier. Equation: y = 12.5430 + .000228 x; R-squared = 0.12

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

0.12 to 0.17. Some of the countries well below the line rely heavily on private spending; for example, in the Dominican Republic, private funding for primary education is about 0.5 percent of GDP. More generally, developing countries are going up steep learning curves as they structure, institutionalize, and in many cases reform their education systems.

The upward-sloping line of Figure 6.5 captures the same tendency that Table 6.2 showed—namely, that at the primary level, higher-income countries spend a greater portion of GDP per capita on each student. The central tendency of primary spending per student in countries with GDP per capita below $5,000 is in the general range of 13–14 percent (including capital expenditures).[14] Interestingly, the regression line in Figure 6.5 thus fits the benchmark values that Bruns, Mingat, and Rakotomalala (2003) identified from a bottom-up analysis. These analytical elements together suggest that our normative scenario might productively target spending levels at about those of the relationship in Figure 6.5.[15]

Total secondary-level public spending

Turning to spending at the aggregate secondary level, a similar cross-sectional analysis (not shown) produces a central tendency for global spending of about 22 percent of GDP per capita. Cuadra and Moreno (2005: xxii) argued that successful secondary systems have been spending 1.4 times as much per secondary student as they do per primary student (and 3 times as much per tertiary student). If good-practice spending at the primary level is in the range of 13–15 percent of GDP per capita, that would imply that secondary spending should be in the range of 18–21 percent, just slightly below the global average, a fact that reinforces our general approach of using global cross-sectional patterns as proxies for good practice.[16]

Binder (2006) considered the costs of good practice at the secondary level in an analysis of 144 developing countries. Using net enrollment rate as a measure of quality, she found that "the median high-performing country achieves better outcomes at a lower per unit cost than the average country" (Binder 2006: 473). We should certainly not interpret this result to mean that lower spending is always better, but it does suggest that some high-spending countries are inefficient and that factors beyond expenditure per student are critical to performance. In any case, it, too, adds support to our attention to central tendencies of spending rather than values above them.

Secondary-level public spending: Differentiating lower and upper levels

As we noted in earlier chapters, the main thrust of the distinction between lower and upper secondary education holds that lower secondary education is the completion of basic education whereas upper secondary education provides more specific and specialized preparation for work or advanced study. Elaboration of this distinction usually makes the point that the cost structure for lower secondary education is, or could be, quite similar to that of primary education, especially if teachers and physical facilities are shared. Meanwhile, upper secondary education, because of its more specialized and diversified nature, is—or is likely to be—more expensive.

Table 6.2 showed the general tendency for spending per student at the lower secondary level to rise with income. The table also showed spending per student at the upper secondary level to be especially high for low-income countries, lower in the middle range, and then rising somewhat with high GDP per capita (a U-shaped pattern). In extended cross-sectional analysis at the lower secondary level, the correlation of GDP per capita with per-student spending is nearly nonexistent, and the pattern is nearly flat, with a central tendency globally of around 20 percent.

The relationship between GDP per capita and per-student spending at the upper secondary level (see Figure 6.6) is downward-sloping from the low-income to middle-income range. As we move attention to the high-income end of the range, however, the spending per student as a portion of GDP per capita is generally flat, with a slight tendency (as shown in Table 6.2) for some upward movement.

Tertiary-level spending

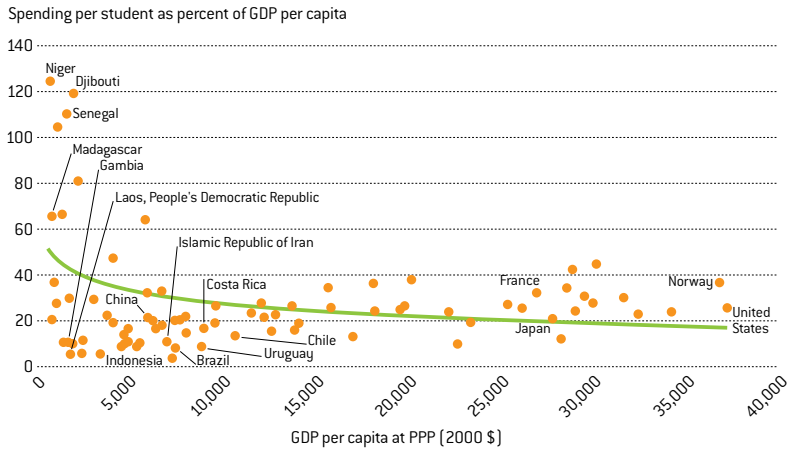
Turning to spending at the tertiary level, Figure 6.7 shows that the range across developing countries of spending per student relative to GDP per capita is far wider than at the secondary level.[17] Nonetheless, there is a

somewhat tighter fit to what proves a strongly downward-sloping relationship. Clearly, tertiary education is extremely expensive for many developing countries. One reason is that labor costs for the very highly educated personnel needed to staff universities and other tertiary institutions are exceptional in extremely poor countries. Those countries also are climbing new learning curves, building new models, and not yet reaping the economies of scale found in richer countries.

Given an absence of studies of good-practice spending at the tertiary level, it seems reasonable to carry forward the experience of more extensive analysis at the primary and secondary levels—namely, that the average-practice pattern, related to GDP per capita, is a reasonable target level.[18] Clearly, however, the right-hand tail of the curve must be kept positive (that is, countries must spend more than 0 percent of GDP on each student); Table 6.2 showed that 29 percent of GDP per capita is the average for high-income countries and thus approximates a realistic lower bound for the curve in Figure 6.7. Further, the high left-hand tail of the curve for the poorest countries, with expenditures per student at several hundred percent of GDP per capita, clearly identifies unreasonable levels for "best practice."

Although it cannot be seen in the cross-sectional analysis of Figure 6.7, tertiary spending per student has declined around the world since 1970, in high-income countries as well as in low- and middle-income countries (as the steeply downward-sloping curve would suggest for a world of rising income). In North America and Western Europe, it has dropped from more than 50 percent of GDP per capita to just below 30 percent on average.[19] In Latin America and the Caribbean, tertiary per-student spending has fallen from about 77 percent of GDP per capita to just over 30 percent, but it remains very high in most developing regions. South and West Asian countries still have costs above 65 percent of GDP per capita, and costs in sub-Saharan Africa average over 350 percent of GDP per capita (see Table 6.3 for regional per-student spending patterns). In these regions, both our base case and our normative scenario significantly reduce costs per student with continued income growth.

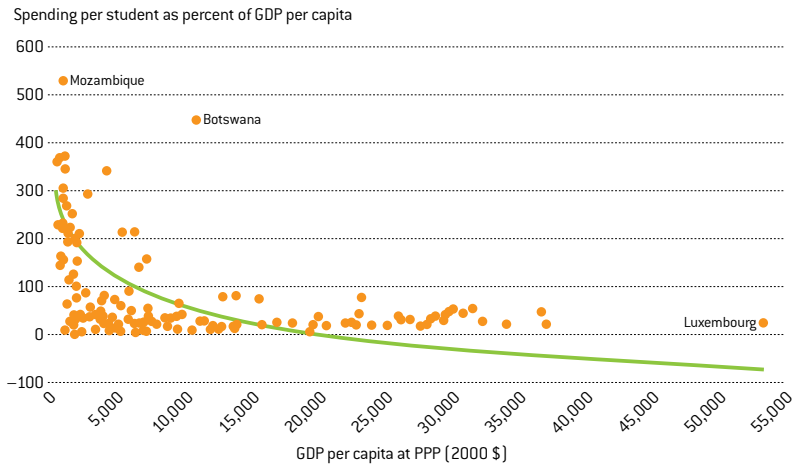
Figure 6.6 Upper secondary spending per student as a percentage of GDP per capita at PPP



Note: Vanuatu was excluded as an extreme outlier. Equation: y = 105.7639 – 8.4365 log (x); R-squared = 0.10

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Figure 6.7 Tertiary spending per student as a percentage of GDP per capita at PPP



Note: Equation: y = 821.1709 – 82.1476 log (x); R-squared = 0.22

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Geographic variations in spending per student

To what degree are there consistent regional variations from the global patterns of change in per-student spending as incomes rise? Table 6.3 shows spending across the UNESCO regions. Combined with the earlier enrollment analysis, the patterns in Table 6.3 suggest several geographically specific insights that are relevant to our normative scenario.

We expect that countries will tend to move toward typical levels and patterns of per-student spending over time.

First, per-student spending in sub-Saharan Africa is relatively high across all levels of education, including primary. Sub-Saharan African countries need to focus on cost structures as well as on increasing enrollment. As we have discussed before, low enrollment rates are often accompanied by higher than average per-student spending. This is noticeable at all levels above the primary level in Africa and to an extreme at the tertiary level, where it may result from the building of new and/or expanding tertiary education systems in countries with limited human and physical resources for that development.

Second, at the primary and lower secondary levels, it is low-income East Asia and the Pacific (demographically dominated by China) and South and West Asia (predominantly India) that exhibit especially low levels of per-student spending. China almost certainly will need higher public primary and lower secondary per-student spending in coming years.[20] In a society where wages and other costs are more and more market based, China is too far below average levels, even taking into account high efficiency and high private spending.

Third, even though costs per student are low at primary and lower secondary levels in South and West Asia (and we have seen that secondary enrollment itself is too low in the region), costs are too high at the tertiary level. Regional inequalities in access to education across India, combined with the colonial-like pattern of access by a few to education at all levels, have resulted in patterns quite different from broader global ones.

Table 6.3 Public spending per student as percent of GDP per capita at PPP by region

	Primary	Lower secondary	Upper secondary	Tertiary
Arab States	13.9	16.8	20.5	60.1
Central and Eastern Europe	17.6	18.6	21.9	24.0
Central Asia	8.7	14.1	10.5	13.8
East Asia and the Pacific (Poorer)	6.9	8.3	20.2	72.0
Latin America and the Caribbean	13.8	14.0	14.0	33.0
South and West Asia	9.2	9.9	26.3	65.9
Sub-Saharan Africa	14.4	23.5	60.3	356.6
East Asia and the Pacific (Richer)	20.6	23.9	20.2	17.7
North America and Western Europe	19.8	23.5	27.7	29.6

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Conclusions for the normative scenario: Financial targets

The analysis in this section has identified per-student spending levels that represent typical practice across countries, variable by level of income. We have found some evidence, notably in bottom-up analysis, that those same values, captured in cross-sectional relationships, also represent something close to "best" practice. However, one might draw that conclusion about central tendencies in any case, especially when the patterns in relationship to GDP per capita and to each other across levels of education appear to have an internal logic. Regardless of the per-student spending levels at which countries begin our forecasts, we expect that they will tend to move toward those typical levels over time. We represent that convergence as slow in the base case (generally fifty years or more) and more rapid in the normative scenario (twenty years to reach values on the target functions). The financial targets are described as follows:

- Primary level: The analytic, cross-sectionally estimated function of Figure 6.5 provides a generally reasonable pattern of change over time as income levels change. A number of studies suggest that low-income countries generally need to spend about 13–15 percent of GDP per capita on each student to attain good-practice levels. The regression line, with low-income levels somewhat above the low-income category average of Table 6.2, provides such a target.
- Lower secondary level: An analytic function with quite flat expenditures as a portion of GDP per capita across different income levels is a reasonable representation of practice today. Low- and middle-income countries need to spend about 20 percent of GDP per capita to be near central tendency spending levels and presumptive good practice.
- Upper secondary level: The analytic function in Figure 6.6 is a reasonable pattern for change with income and target for presumptive best practice. We bound the lower level of the target range in the normative scenario at 28 percent, slightly below the average spending level across the entire range of income.

- Tertiary level: The analytic function in Figure 6.7 falls too steeply (in fact, it falls below 0 percent) to represent change over time or best practice. Instead, attention to the income-category average values of Table 6.2 can serve as such a guideline. We bound decline in the function with income increases at 30 percent, keeping target levels for spending in the normative scenario at or above that level.

Conclusion

Values and goals always shape public policy. Thus, normative scenarios in comparison with base cases—considerations of the future with and without new interventions—are part of the public policy process. With respect to the global education transition, global goals have historically had the character of relatively simple absolute targets, stated independently of the starting points of different regions and countries. Such goals serve a critical motivating function, mobilizing action and resources on their behalf. They also are seldom met.

For the actual shaping of public policy and the efficient allocation of resources, a normative scenario that takes into account the starting points of change and moves closer to levers of action (specifically, to intake and survival rates rather than enrollment rates) has benefits. Such a scenario ideally should also take into account the dynamics of the larger system(s) in which its immediate targets are embedded. Thus, attention to education at all levels, not just primary and possibly lower secondary, adds value, as does attention to the relationships between education and broader sociopolitical systems. This chapter has sketched targets for key determinants of enrollment across levels of education, and it has identified them for spending per student as well. It has indicated that such targets are only part of the creation of a normative scenario and that the model into which we place them for forecasting is also an essential element.

Such an approach to normative scenario development has a downside. The normative scenario must strike a complicated balance among many factors on both the demand and supply sides. We cannot explain the more complex normative scenario as easily as we can a clearly stated goal. Both approaches have strengths and weaknesses. This volume continues to argue, however, that the gradual elaboration of a more complete scenario for education's advance in a larger context has significant value. The next two chapters turn to the exploration of the scenario discussed here for advancing education and for development more broadly.

Appendix to Chapter 6: Analysis of Underlying Determinants of Quality Measures

International assessments (see Box 6.1) correlate highly with each other, which simplifies the task of considering the broader correlates of the educational quality that the exams presumably help to measure. We look first at the cross-assessment correlations and then turn to the analysis of broader correlates and therefore of possible determinants.

Relationships between quality assessment measures

Country-level results on the various international assessments show remarkable country-level consistency, regardless of the assessment instrument, subject area, and student grade or age. Table 6A.1 shows that the lowest R-squared, a very respectable 0.48, links the TIMSS math test for fourth-graders with the PISA reading test for fifteen-year-olds; most other correlations are much higher. The persistent tendency for low- and middle-income countries to report much lower scores than do high-income countries contributes to the magnitude of the R-squared coefficients and suggests a relationship between income and scores, to which we will return.

There is an extremely high covariation between male and female scores across countries—on the PISA reading test, the cross-sectional correlation is 0.96. The correlations of male and female scores across countries for science and math are equally remarkable, with R-squared values of 0.97 and 0.98, respectively. At the same time, however, there are some quite consistent gender differences on reading examinations across countries. Even though both males and females in lower-income countries report much lower scores on all tests than do males and females in higher-income

Normative scenarios—considerations of the future with and without new interventions—are part of the public policy process.

A normative scenario that considers starting points of change and levers of action has benefits in that process.

Country-level results on the various international assessments show remarkable consistency in country scores and rankings.

There are quite consistent gender differences on reading and math scores across countries—but not on science scores.

countries, females around the world tend to score 30–40 points higher than males on reading. On mathematics, males outscore females by about 20 points on average. However, gender differences on the science exams are essentially nonexistent.

The high cross-country correlations across exams, topic areas, levels of education, sex, and age suggest two more general conclusions. First, the tests probably are capturing some underlying dimensions of education quality (test-taking ability, if nothing else) quite well and consistently, suggesting significant reliability and even validity of the tests. Second, cross-country differences are substantial and require our attention. Exploring them may help us identify some of the drivers or markers of quality differences in education around the world.

Table 6A.1 R-squared of country scores across quality tests

	Test (see rows for identification)						
TIMSS	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Math, 4th grade							
2. Science, 4th grade	0.92						
3. Math, 8th grade	0.86	0.76					
4. Science, 8th grade	0.81	0.86	0.91				
PIRLS							
5. Reading, 4th grade	0.80	0.94	0.77	0.81			
PISA							
6. Reading, 15-year-olds	0.48	0.59	0.58	0.62	0.61		
7. Science, 15-year-olds	0.62	0.59	0.68	0.67	0.67	0.94	
8. Math, 15-year-olds	0.66	0.67	0.77	0.64	0.65	0.87	0.92

Source: Compiled by the authors using the most recent test results in each case (years vary).

Table 6A.2 Adjusted R-squared of possible determinants of quality with PIRLS reading scores

	Relationship to PIRLS reading score		
	Bivariate	**Multivariate with GDP per capita**	**Multivariate with GDP per capita, Gini**
Female secondary education	0.28	0.25	0.25
Spending per student	0.15	0.16	0.16
Survival rate	0.31	0.30	0.65
Government effectiveness	0.23	0.30	0.46
Income equality (Gini)	0.29	0.47	
GDP per capita	0.19		

Note: Because of relatively small sample sizes and degrees of freedom, the addition of variables can reduce the adjusted R-squared.

Source: Various measures; compiled by the authors using the most recent assessment results (years vary).

Likely determinants of quality across countries

A great many factors almost certainly relate to the substantial and quite consistent differences in test scores across countries. Based on the literature and our own analysis, we selected six on which to focus:

1. Studies within countries often stress the importance of parental education levels, especially that of mothers, to the success of students (Birdsall, Levine, and Ibrahim 2005: 26).
2. Spending levels per student might also contribute generally, if not invariably, to quality.
3. As we saw previously, the survival rate is often used (as in the Education Development Index) as an available proxy for quality characteristics of education systems (characteristics potentially as diverse as teacher quality, class size, and transportation or other infrastructure systems).
4. Governance effectiveness and quality, including the absence of corruption, also may spill over into education quality. In Chapter 5, we looked at the relationship between education participation and corruption as measured by Transparency International. An even more powerful measure, however, proves to be the measure of government effectiveness from the World Bank's Governance Indicators project (Kaufmann, Kraay, and Mastruzzi 2007). That measure is intended to capture the "quality of public service delivery," so a correlation with quality of education should not be surprising.
5. Unequal income distribution could weaken the education performance of substantial numbers of students and lower average performance.
6. Not surprisingly, the income of countries, as either a proxy for some of these other factors or as a determinant in itself, is a strong candidate for helping to explain higher test scores.

In exploring the importance of each factor, we used the most recent PIRLS reading score (for most countries, that of 2006) as the summary measure. That test is administered at the fourth grade, a grade that large numbers of students are likely to reach even in low-income countries.

A reading test, with its obvious tie to literacy, is perhaps a more globally general measure of education than are mathematics and science examinations. And the country set participating in PIRLS is reasonably extensive and growing.

Table 6A.2 summarizes the relationships of the various factors with the level of PIRLS reading scores across countries. Interestingly, GDP per capita does not prove to have a very high bivariate relationship to PIRLS test scores. It is important to stress again, however, that such relationships can vary considerably as a result of only a few outliers or other changes to the country set. A correlation of GDP per capita to PISA test scores (not shown), for example, climbs to 0.60. Considerably more middle-income countries take the PISA examination.

Our analysis also looked at a full range of multivariate relationships with test scores. The most powerful combination of variables proved to be survival rate, GDP per capita, and an inverse relationship with the income Gini coefficient. This outcome reinforces our decision to include a focus on survival rates in the elaboration of our normative scenario.[21]

Analysis suggests some measurable comparative correlates of quality; the highest was survival rate in combination with GDP per capita and income equality.

1 Such an effort to develop a realistic normative scenario is in the tradition, for example, of the International Energy Agency's Alternative Policy Scenario for global energy futures. Each year, the IEA's World Energy Outlook (see, e.g., IEA 2007) refines that scenario, taking into account new data, new understandings of the global energy system and its demographic and economic drivers, changes in the actual policy environment, and insights concerning the types of policies that might achieve superior energy futures.

2 In some cases, of course, such as that of Chad or Uganda, political disruption is a significant factor in the failure of many students to complete their education.

3 Countries have come to take their relative positions on the PISA and other examinations seriously. For instance, Germany was very surprised that its relative position on the first PISA exam was not higher, which more detailed exploration suggested was in large part attributable to lower scores in its Turkish community than in the ethnically German population. The finding spurred a variety of initiatives to improve the education of the large minority population (*Economist*, April 5, 2008, 31).

4 Many developing countries participate in regional and country-specific assessments of learning outcomes that, although not necessarily comparable or widely disseminated, contribute to an understanding of quality outcomes. The *Education for All Global Monitoring Report 2008* notes that 50 percent of developing countries and 17 percent of transitional countries conducted at least one national learning assessment between 2000 and 2006, compared to 28 percent and 0 percent between 1995 and 1999 (UNESCO 2007b: 68–69).

5 In some sense, the EDI itself is a composite proxy measure of quality. Its components are (1) the primary net enrollment rate (a measure of the proportion of children of defined school age who are enrolled), (2) the adult literacy rate, (3) the survival rate, and (4) the gender-specific EFA index (a composite of the gender parity indices in primary and secondary education and the gender parity index for adult literacy). Analyzing progress on the EDI over recent years, the *Education for All Global Monitoring Report 2008* noted that whereas primary net enrollment was the component showing most improvement, "in most countries that saw low improvement or decline in the EDI, the weak point was the survival rate" (UNESCO 2007b: 95).

6 We recognize, of course, that a 2 percentage point rise from an intake rate of 30 to 32 percent is a greater relative increase than a 2 percentage point rise from 60 to 62 percent, requiring a greater percentage change in underlying resources and capabilities.

7 Bayesian analysis recognizes the value of having an expectation or "prior," which ongoing analysis adjusts iteratively.

8 The median was 1.96 percent per year, and the range was 1.39 to 7.63 percent.

9 Costs per student at higher levels of education have come down over time for countries at all income levels, including the high-income category. In 1970, high-income countries spent 50.4 percent of GDP per capita on each tertiary student (see also Coombs 1985: 158), but their tertiary spending per student has stabilized at around 28 percent of GDP per capita since about 1990.

10 We used UIS data for this analysis. The salary share is somewhat lower in Central and Eastern Europe and North America and Western Europe, and it is somewhat higher in most developing regions; cross-regional values range from 70–89 percent.

11 There have also been country-level studies, at all three levels of education, as part of the Fast Track Initiative. In addition, the Pôle de Dakar report for Africa (UNESCO 2005b) analyzed all three levels for each country.

12 With respect to aggregate spending associated with these specifics, the authors recommended that government revenues be 14, 16, or 18 percent of GDP, depending on the country's income; that 20 percent of government revenues be committed to education for recurrent expenditures; and that 50 percent of the recurrent spending be directed to six-year primary education programs and 42 percent to five-year programs (Bruns, Mingat, and Rakotomalala 2003: 73).

13 Their numbers are not strictly comparable to those in Table 6.2 for several reasons, among which is the inclusion in the table of capital expenditures that add about 10 percent on average to the base of recurrent expenditures.

14 The standard least-squares method of fitting a regression line to data weights variations from the line by the square of their size. Thus, the low-income countries significantly above the regression line shift it upward relative to the averages of Table 6.2.

15 Even when an R-squared value is very low, the slope and character of a relationship can help us understand and represent the general underlying pattern.

16 Cuadra and Moreno (2005: 142) show per-student spending in countries exhibiting fast enrollment growth to be 11, 18, and 55 percent of GDP per capita at the primary, secondary, and tertiary levels, respectively. But based on other evidence analyzed here, 11 percent at the primary level seems too low for best practice; overly rapid enrollment growth can squeeze spending per student.

17 In fact, we removed Malawi, with per-student expenditures of about 1,500 percent of GDP per capita, from the figure as an extreme outlier, as well as Ethiopia, Eritrea, and Lesotho, also with spending above 800 percent of GDP per capita.

18 Analysis of costs per student at the tertiary level are complicated by many factors, including the high variability across countries of public-private spending and of the types of education experiences aggregated into the tertiary category.

19 In the United States, the increasing use of part-time adjunct instructors has taken advantage of a pool of willing and qualified personnel who will work at much lower cost than full-time, tenured faculty will. In addition, the composition of tertiary education has changed; for instance, the expansion of community colleges has lowered cost structures.

20 Because spending data do not include China in recent years and China has announced plans to raise spending, this may already be well under way.

21 The apparently low level of relationship to test scores of public per student spending as a percentage of GDP per capita reinforces two conclusions that appear in much of the educational literature: first, education spending is obviously necessary, but many countries do not get a clear return from higher spending levels; second, quality is possible even at modest spending levels. These are important insights to take into account in considerations of appropriate spending levels. Still, the demonstrated instability of all of the relationships of possible drivers with test scores must make us very cautious about drawing conclusions.

7

Exploring an Accelerated Educational Future

Almost everywhere in the world, the advance in education continues. Depending on the region and country, the portions of population attending school, the numbers of students in school, and the average years of education—or, in some cases, all three of these measures—continue to grow rapidly. The normative scenario generally increases that rate of advance, relative to the base forecast of the path that countries already seem to be on, through the use of growth targets that our analysis suggests are simultaneously aggressive and reasonable. The purpose of this chapter and the next is to explore the possible consequences of pursuing those targets.

This chapter first addresses the enrollment implications of the normative scenario. How much faster might enrollment rates and student numbers grow in regions and countries with the assumptions of the scenario? What are the implications of such accelerated growth for the movement of the world to universal basic education and to higher participation in upper secondary and tertiary education?

The education transition obviously faces budgetary constraints, and the base case takes those into account. In the normative scenario, we removed the constraints in order to estimate the additional funds that would be needed relative to the base case. In some countries, those funds would be minimal because the base case already meets normative targets or the education systems below the tertiary level have already reached universal enrollment and benchmark spending levels. And in the case of countries that are spending above benchmark levels for per student costs in the base case, the normative scenario would result in lower total spending. However, for many countries, the normative scenario would require additional spending. The second set of questions in this chapter therefore addresses the budgetary implications of the normative scenario. How much increase in spending would be necessary to pursue the target growth patterns of the normative scenario? Might domestic

budgets fund such an increase? For the lowest-income countries, what is the magnitude of external assistance that might be desirable or even required?

Accelerating Education's Advance (If Budget Were No Constraint)

Chapter 6 provided both the foundations for the development of a normative scenario and the details of that scenario in terms of growth and parity in intake and transition rates and of survival rates. How different would the patterns of education's advance be for regions of the world (and specific countries) under the normative scenario, assuming for the moment that cost were no object?

Enrollment rates

Figure 7.1 shows the percentage point increases in enrollment rates that the normative scenario generates for each UNESCO region relative to the base case. There are some important global similarities across most or all of the regions and in the world totals.

Among the most clear-cut similarities is that over most of our time horizon, the greatest uncertainty concerning enrollment growth, and therefore also the greatest potential subject of debate in future global policy making, will likely be at the upper secondary level. Rates of enrollment at the lower secondary level vary less between the base case and the normative scenario, and rates of enrollment in primary education vary still less, reflecting the greater extent of progress already made in the education transition at these lower levels.

This rank ordering of education levels with respect to uncertainty is inversely related to the likely rank order of attention. The attention to completion of the transition to universal primary education reflects both its foundational character and the relative nearness of the goal. At the peak of difference between the normative scenario and the base case, efforts to speed progress might globally add just under 4 percentage points to primary net enrollment rates, although they could add nearly 15 percentage points to those in sub-Saharan Africa. Low levels of potential primary acceleration in most regions obviously reflect universality or nearing universality around the world.

Moving up the ladder of education levels, global rates at the lower secondary level might be as much as 6 percentage points higher in the normative scenario, and those at the upper secondary level could be 12 percentage points higher (about 14 percentage points higher in South and West Asia and 28 percentage points higher in sub-Saharan Africa). Gross lower secondary enrollment rates actually decline in Latin America and the Caribbean relative to the base case because the normative scenario decreases the overage portion of students (effectively increasing net enrollments).

Thinking forward to 2060, however, the potential policy leverage at the tertiary level may well be as great globally as that at the upper secondary level, and in the economically developed regions of the world, it is certainly greater than at other levels. Figure 7.1 does not show the considerable potential advance in tertiary education relative to the base case because of our decision not to set normative targets for growth at that level and only to pursue a modest narrowing of gender gaps relative to the base case. Tertiary enrollment increases in Figure 7.1 therefore reflect almost entirely the effect of higher GDP per capita in the normative scenario (related to an accelerated advance of education at lower levels) on tertiary intake rates. Volume 4 in the PPHP series will return to the broader potential for advance at the tertiary level.

In spite of global patterns of importance, regional variations across the normative scenario are clearly very great. The two regions that respond most overall to the normative scenario at all pretertiary levels are sub-Saharan Africa and South and West Asia. The Arab States and other regions also benefit considerably at the upper secondary level. The regions that respond the least are the higher-income ones.

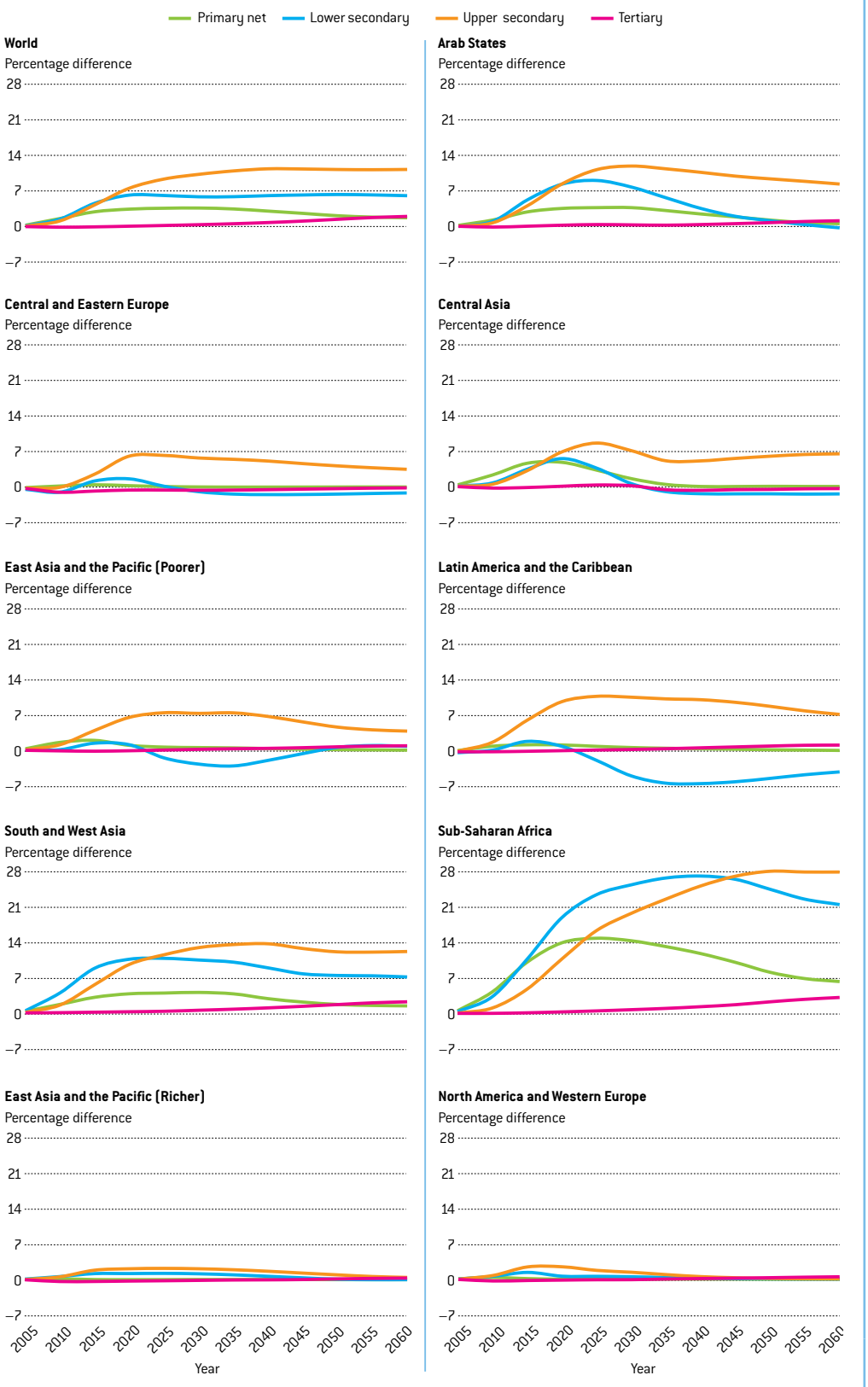
Enrollment numbers

Although enrollment rates have been the centerpiece of global goal-setting, school systems deal with students. For those school systems and the national governments that seek to expand them, the number of students is critical. We have seen repeatedly throughout this volume how important the demographic elements are in understanding the dynamics of education transitions.

For the time horizon to 2060, the greatest uncertainty about enrollment growth will likely be at the upper secondary level.

Regional variations in the implications of the normative scenario are very great.

Figure 7.1 Enrollment rate differences: Normative scenario relative to base case



Source: IFs Version 6.12.

Figure 7.2 Student headcount differences (millions): Normative scenario relative to base case

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Global enrollment increments peak in 2016, 2029, and 2037 across primary, lower, and upper secondary levels (at 21, 33, and 50 million students).

In the long term, the effect of the normative scenario on the education attainment levels of adults is extremely significant.

Figure 7.2 turns from enrollment rates to student headcounts and shows the differences between the numbers in the normative scenario and base case forecasts. On a global basis, the normative scenario adds as many as 21 million more students in primary school, 33 million more at the lower secondary level, and 50 million at the upper secondary level. (The normative scenario does not explicitly accelerate enrollments at the tertiary level.)

The peak increments relative to the base case are staggered over time, as the incremental students of the normative scenario build at one level, approach universal enrollment, and push growth to higher levels of education. The years of greatest difference between the scenarios are 2016 (very near the MDG target date), 2029, and 2037 for primary, lower secondary, and upper secondary levels, respectively.

When we look at headcounts, however, the story is not a global one with regional variations but very much a regional one. Sub-Saharan Africa is the home of by far the largest number of additional student numbers in the normative scenario. Most of the rest are in South and West Asia, reinforcing this volume's heavy attention to these two regions.

One interesting and important aspect of Figure 7.2 is the fact that in both sub-Saharan Africa and South and West Asia, the number of primary students in the normative scenario, although higher than in the base case for several years, eventually proves to be considerably smaller. By 2060, there are 40 million fewer primary students in sub-Saharan Africa and 12 million fewer in South and West Asia than in the base case. The explanation has two parts. First, Figure 7.2 shows primary gross enrollments and so includes overage students. In the normative scenario, higher net enrollment rates mean there are fewer overage students. Second and more important, the pushing up of education levels in sub-Saharan Africa and in South and West Asia brings down fertility rates in the IFs demographic model. The difference is not huge, but it is significant. By 2030, the total fertility rate in sub-Saharan Africa (where the trend in fertility is now clearly down) is 3.8 in the normative scenario, versus 4.1 in the base case. Clearly, long-term cost savings in the normative scenario from fewer students could potentially help pay for the additional costs of higher enrollments in the early years.

Education attainment

The differences in enrollment patterns between the base case and the normative scenario gradually manifest themselves as well in the education attainment levels of adults. Figure 7.3 shows the average years of education of adults fifteen and older in sub-Saharan Africa and South and West Asia. By 2060, the normative

Figure 7.3 Education attainment of adults age 15 and older in South and West Asia and in sub-Saharan Africa: Normative scenario relative to base case

Note: Values are 5-year moving averages. The transient for sub-Saharan Africa results from missing historical data for many countries that are especially low-income and have especially low attainment rates; IFs estimates values for those countries in 2005 and also forecasts for them.

Source: IFs Version 6.12.

scenario adds nearly 2 years of education to the base case value for sub-Saharan Africa and 0.7 years in South and West Asia. Other regions manifest smaller gains. Higher enrollments can only gradually reshape the education levels of the adult population, but in the long term, the effect is extremely significant.

Sub-Saharan Africa: Exploring the normative scenario

We have already noted that sub-Saharan Africa is the region for which the normative scenario makes by far the most difference in enrollment rates, student numbers, and adult attainment levels. Figure 7.4 shows the resultant pattern for primary net enrollment rates and for gross enrollment rates at the secondary and tertiary levels. In the normative scenario, sub-Saharan Africa surpasses 90 percent primary net enrollment in 2021 and 97 percent in 2034 (versus 2047 and beyond 2060 in the base case). Thus, even the extra impetus of the normative scenario does not allow achievement of the 2015 MDG for UPE.

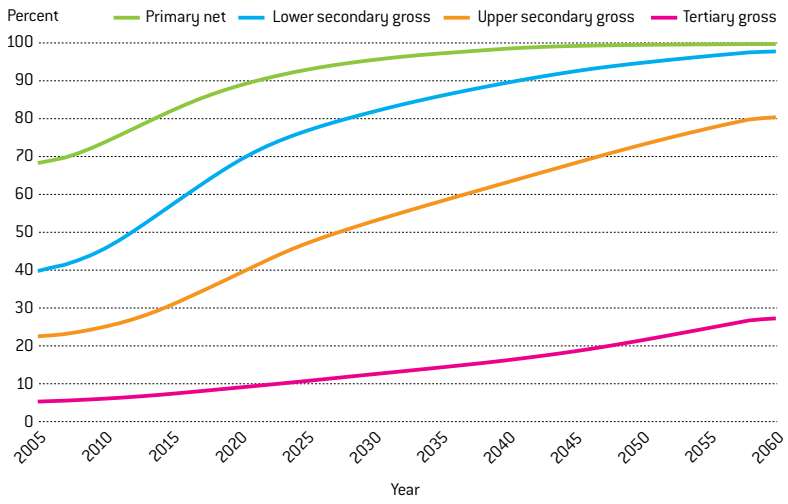
In the normative scenario, sub-Saharan Africa reaches 90 percent lower secondary gross enrollment in 2041 and 97 percent in 2056 (versus reaching only 77 percent in 2060 in the base case). Consequently, the normative scenario suggests the possibility of universal basic education for the continent before our 2060 horizon. Global targets for enrollment at the upper secondary level do not exist, but in the normative scenario, the continent reaches 80 percent upper secondary gross enrollment in 2059. Tertiary enrollment builds to 28 percent in 2060, also a remarkable advance on the 5 percent level of 2005, bringing the region to about the level of Latin America and the Caribbean in 2005.

The difference between the pattern of the normative scenario and that of the base case is quite striking. Table 7.1 compares the two scenarios directly. Although differences at the primary level are considerable, it is those at both the lower and upper secondary levels that prove most significant. The normative scenario greatly accelerates the movement to nearing universal basic education (90 percent).[1] Moreover, the normative scenario brings upper secondary enrollment of sub-Saharan Africa to the levels of current upper middle-income countries by 2060 (the GDP per capita at PPP of upper middle-income countries is now very nearly $9,000, and sub-Saharan Africa would achieve the same upper secondary rate at about $7,100 in the normative scenario).

The group of sub-Saharan African countries that currently have low primary enrollment rates needs until beyond the 2060 forecast horizon to reach 90 percent primary net enrollment in the base case, but it is able to achieve it more than 35 years earlier in the normative scenario (see

Sub-Saharan Africa is the region for which the normative scenario makes by far the most difference.

Figure 7.4 Enrollment rate forecasts for sub-Saharan Africa in the normative scenario



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Table 7.1 Enrollment rates in sub-Saharan Africa: Normative scenario relative to base case

	Base case				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	67.7	72.2	81.4	89.3	93.8
Lower secondary gross	38.6	46.8	56.6	66.2	77.2
Upper secondary gross	22.3	26.0	33.2	41.3	53.5
Tertiary gross	4.9	7.0	11.6	16.7	24.7
	Normative scenario				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	67.7	82.3	95.7	99.4	99.9
Lower secondary gross	38.6	57.3	82.0	92.7	98.3
Upper secondary gross	22.3	30.5	52.9	68.3	81.3
Tertiary gross	4.9	7.1	12.3	18.4	27.9

Source: IFs Version 6.12.

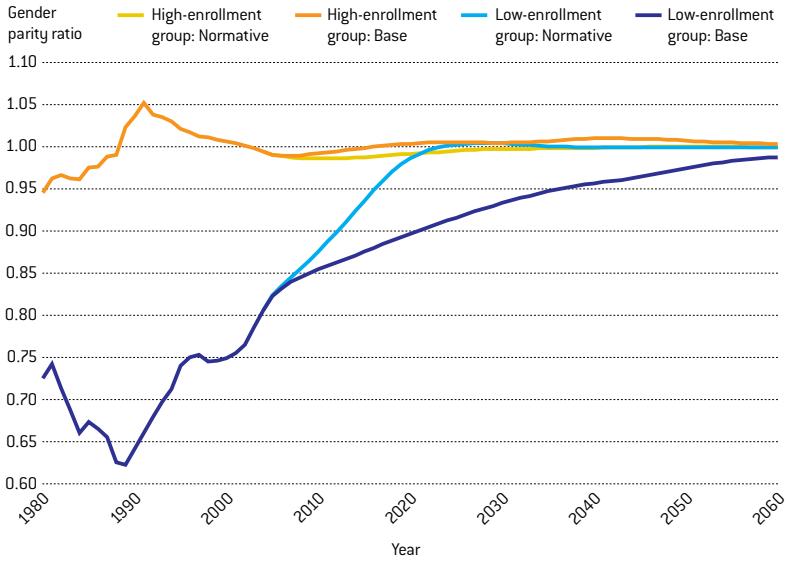
Table 7.2 Enrollment rates in the low primary enrollment countries of sub-Saharan Africa: Normative scenario relative to base case

	Base case				
	2005	2015	2030	2045	2060
Primary net	48.3	54.2	67.4	80.2	87.9
Lower secondary gross	26.3	33.8	45.7	58.1	69.7
Upper secondary gross	13.7	16.1	21.6	29.5	40.6
Tertiary gross	2.2	3.7	6.5	9.4	17.5
	Normative scenario				
	2005	2015	2030	2045	2060
Primary net	48.3	68.4	94.3	98.8	99.8
Lower secondary gross	26.3	41.9	78.5	89.5	96.3
Upper secondary gross	13.7	19.3	43.2	60.3	74.7
Tertiary gross	2.2	3.9	7.2	11.3	21.8

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Figure 7.5 Primary net gender parity ratio in high and low primary enrollment groups of sub-Saharan Africa: Normative scenario relative to base case



Note: Values are 5-year moving averages after removing 1991 for the low-enrollment group.

Source: IFs Version 6.12 using UIS data and IFs base case and normative scenario.

Table 7.2). Moreover, that group of countries can also reach 96 percent lower secondary gross enrollment levels by 2060, well above the expectation for the base case.

As a general rule, countries that are furthest from universal primary enrollment have the greatest gender imbalances. As a result, it is not surprising that sub-Saharan Africa, the region furthest from UPE, is also the furthest from gender parity at the primary level. Interestingly given popular images, gender imbalances at all levels in the education systems of Arab countries are not as great as in Africa and Asia, and among all regions, imbalances of enrollment have been closing most rapidly in the Arab States (see, again, Chapter 3 and Figure 3.2).[2]

Figure 7.5 shows the primary net gender parity ratio for countries of sub-Saharan Africa in the base case and in the normative scenario, distinguishing high- and low-enrollment country sets. Consistent with the general rule, the low-enrollment countries are further from parity, with a primary gender parity ratio in 2005 of only 0.82, compared to 0.97 in the high-enrollment countries of the continent. In the base case, the low-enrollment countries reach parity (defined as a ratio between 0.97 and 1.03) only in 2048, consistent with the slowing, S-shaped pattern that occurs in so much end-stage enrollment change. The normative scenario pushes their movement to parity considerably more aggressively, achieving it in 2018.

Much of the uncertainty about education futures in Africa is tied to developments in several of the demographic giants of the continent: Nigeria, Ethiopia, and the Democratic Republic of Congo (DRC). In each of these countries, sociopolitical disruptions have frequently reversed earlier gains. In the case of the DRC, a nearly uninterrupted history since decolonization of internal conflict and extreme elite corruption has greatly retarded economic and sociopolitical advance.

The reality is, therefore, that forecasts of education's advance to midcentury for these countries are exceptionally uncertain even in the base case. Nonetheless, Table 7.3 presents forecasts of the DRC's education enrollment patterns for the base case and the normative scenario. They are dramatically different, exhibiting among the most extreme differences in the continent. The normative scenario presents the possibility of the DRC not only catching up with the rest of Africa but also substantially closing gaps with the rest of the world. The scenario clearly would have substantial economic costs relative to the base case, and subsequent discussion in this chapter will return to the issue of whether those costs might reasonably be paid. The normative scenario would also require, however,

a resolution of the cycles of conflict that continue to plague the country, and the path to accomplishing that is not at all clear. Achieving resolution or the failure to do so is not something we can forecast with any confidence. Unfortunately, even the base case for the DRC currently looks like a substantial challenge, and in the current political context the normative scenario appears to be wishful thinking.

Returning to the education attainment of adults, Figure 7.6 shows how different the futures of sub-Saharan Africa in general and the DRC in particular could be in the normative scenario relative to the base case. In the normative scenario, noncompletion of primary education and illiteracy would be disappearing by 2060 across the continent. Substantial numbers of additional adults would have completed secondary education. The potential differences between the two scenarios are, of course, even more striking in the DRC than in sub-Saharan Africa as a whole, simply because of the much weaker starting point—in 2005, more than half of all people fifteen to twenty-four years of age had no education or only an incomplete primary education, an ongoing legacy of the Belgian colonial era and the turmoil that followed it.

Figure 7.6 also suggests the manner in which the normative scenario begins slowly to interact with demographic change. The youngest cohorts finally begin to decrease in size for the DRC and the region as a whole after 2050 in the normative scenario, but they do so only after 2070 in the base case.

For those who wish to explore the prospects for other countries, the tables at the end of this volume provide base case forecasts of many education variables across 183 countries. Those forecasts include enrollment rates, gender parity ratios, literacy, and education attainment. Those who wish to explore the normative scenario in detail will find a parallel set of forecasts at www.ifs.du.edu.

South and West Asia: The normative scenario

The UNESCO region of South and West Asia contains the three large South Asian countries (India, Bangladesh, and Pakistan) in addition to Iran and smaller countries (Afghanistan, Bhutan, the Maldives, Nepal, and Sri Lanka).

Table 7.3 Enrollment rates in the Democratic Republic of Congo: Normative scenario relative to base case

	Base case				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	55.5	57.7	64.7	75.1	81.5
Lower secondary gross	29.8	35.3	43.7	51.9	65.4
Upper secondary gross	17.6	19.4	22.6	26.8	36.1
Tertiary gross	1.3	1.3	1.6	2.3	11.4
	Normative scenario				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	55.5	75.4	98.2	100.0	100.0
Lower secondary gross	29.8	43.2	80.2	90.9	97.3
Upper secondary gross	17.6	23.3	47.7	64.5	78.4
Tertiary gross	1.3	1.4	1.8	3.5	16.5

Source: IFs Version 6.12.

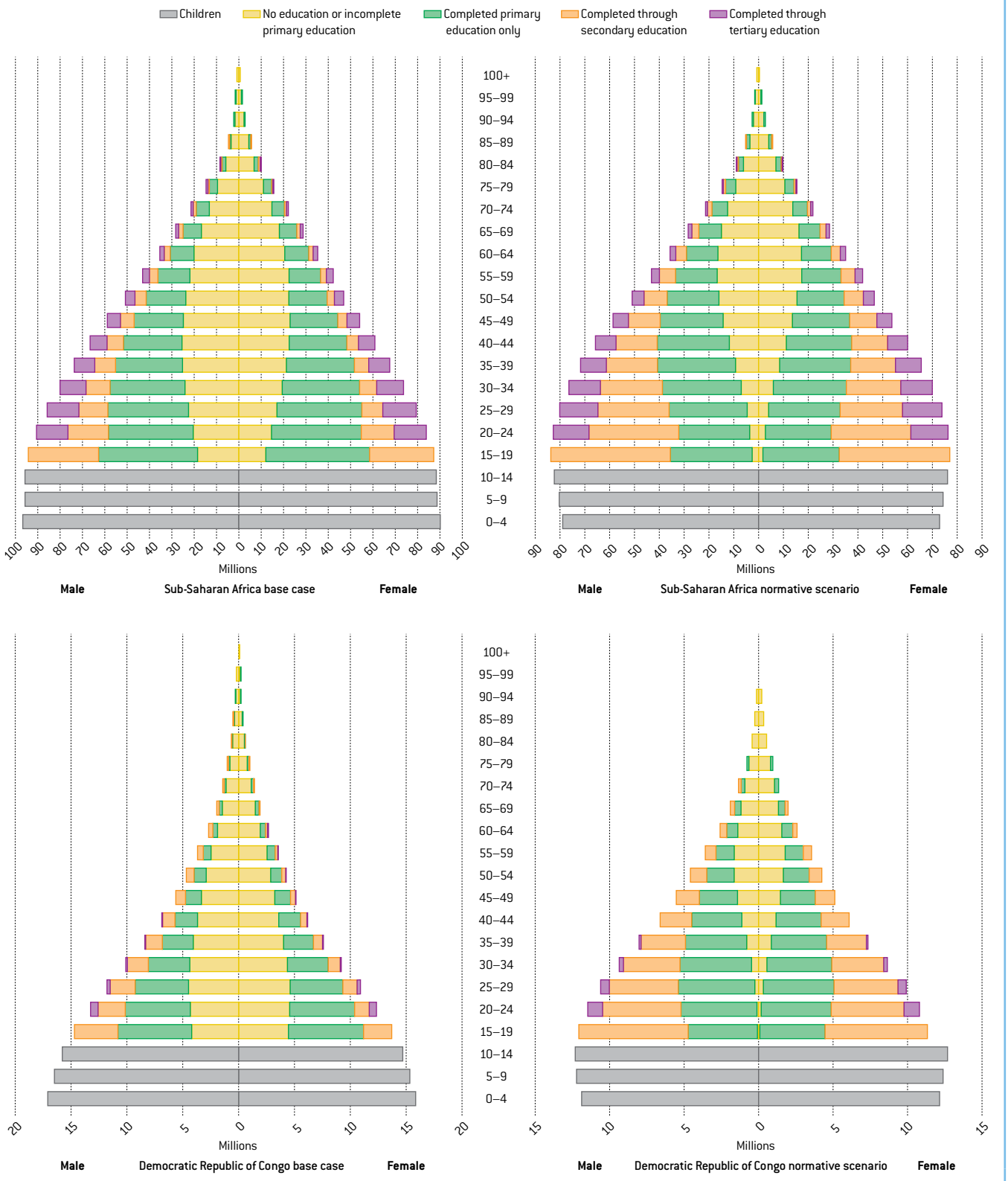
Figure 7.7 shows the potential growth of enrollment rates in the normative scenario. In that scenario, South and West Asia could reach universal primary net enrollment by 2028. The lower secondary gross enrollment rate was already at 66 percent in 2005 and climbing strongly, and it could reach 100 percent quite quickly thereafter (by about 2030).

Were it possible to advance this rapidly toward basic education (and obviously, not all countries in the region are likely to do so even with extra attention to the sector), the frontiers of education in South and West Asia would already be in upper secondary and tertiary education by 2025. In fact, both of those levels advance substantially even in the IFs base case. The normative scenario hints at the possibility of nearing 90 percent upper secondary gross enrollment by 2055.

The normative scenario also makes a substantial difference for South and West Asia.

Yet the possibility held out in the normative scenario of great potential for secondary education in South and West Asia should not detract from our recognition that these countries are quite far from having achieved their agenda with respect to primary education. Given the path they currently are on, as represented in the base case, they would not in the aggregate reach universal primary education until 2039. The key element of their remaining agenda is the need to bring primary survival rates up substantially. Most of the South and West Asian countries, including all three of the South Asian giants, had primary

Figure 7.6 Education attainment of adults 15 years of age and older in sub-Saharan Africa and the DRC in 2060: Normative scenario relative to base case forecasts



Source: IFs Version 6.12.

survival rates somewhat below 70 percent in 2005 (Bangladesh at 65 percent), at 70 percent (Pakistan), or only somewhat above 70 percent (India at 73 percent). Although that means they have reached levels where rates can increase quite rapidly, there is much distance yet to travel. Even in the normative scenario, with its aggressive assumption of 1.2 percent annual gains in survival rate, only India is likely to reach a 90 percent primary survival rate by 2020.

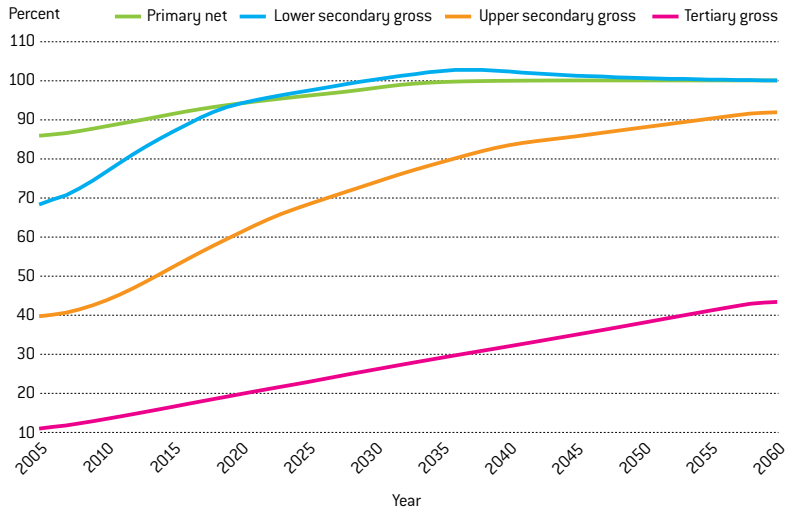
Iran stands out within this UNESCO region. It has reached about 90 percent primary survival, and it was already nearing universal primary enrollment in 2005. More generally, the regional totals conceal great differences across the big countries, as well as within the broader set. For instance, although the primary net enrollment rates in India and Bangladesh were both nearing 90 percent in 2005, enrollment rates in India at both the lower and upper secondary levels exceeded those of Bangladesh by about 10 percentage points. At the tertiary level, the difference between the two countries was about 5 percentage points.

Much more significantly, India and Pakistan displayed very different education participation patterns in 2005, and those differences are likely to persist for much of our forecast horizon. Figure 7.8 shows the extent to which Indian enrollment rates exceeded those of Pakistan at all levels. In 2005, primary net enrollment rates in India were about 20 percentage points higher, and lower secondary rates were more than 30 percentage points higher. Although these differences should disappear by about 2040 in the normative scenario, with both countries approaching universal basic education, the gap at the tertiary level would likely grow. (In the base case, the differences remain greater across the forecast horizon—even in 2060, the lower secondary enrollment rate in India could be 20 percentage points higher than in Pakistan.)

Middle-income countries: Latin America and the Caribbean

This volume has focused heavily on lower-income regions for reasons that Figures 7.1 and 7.2 made clear—the potential for acceleration of the education transition, both in terms of enrollment rates and absolute numbers of students, exists especially in those regions.

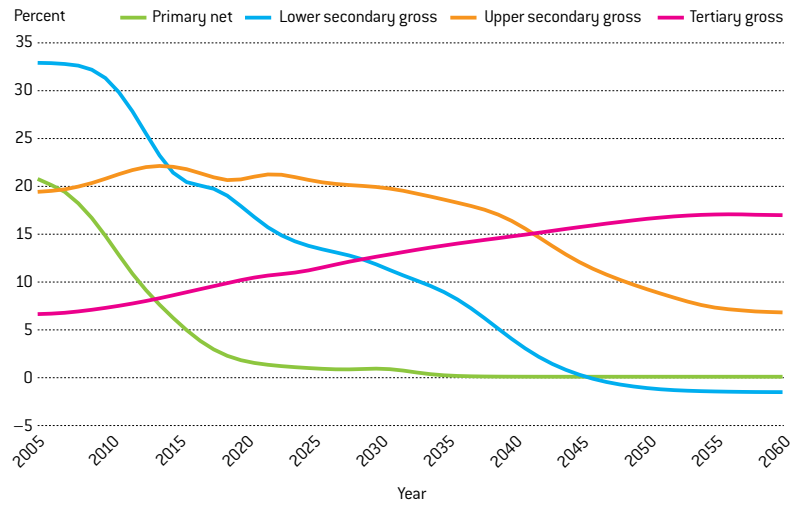
Figure 7.7 Enrollment rate forecasts for South and West Asia in the normative scenario



Note: Values are 5-year moving averages; the gross lower secondary rate can exceed the net primary rate because of overage students.

Source: IFs Version 6.12.

Figure 7.8 India's percentage point enrollment rate advantages over Pakistan in the forecasts of the normative scenario



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

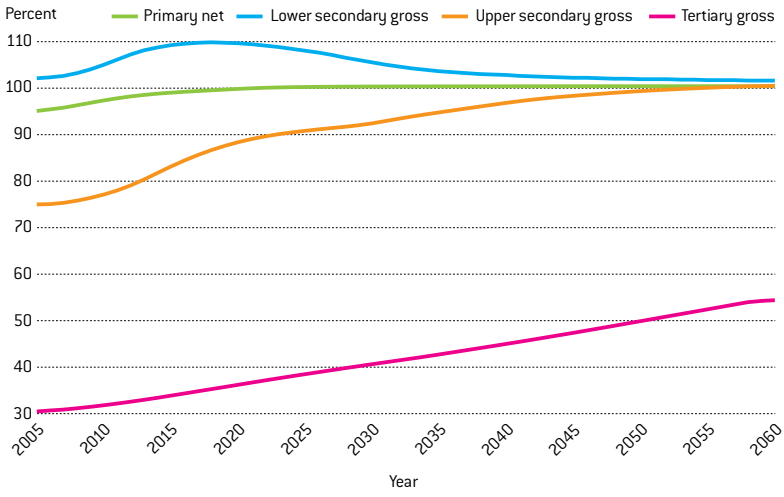
The middle-income countries of the world, essentially already at universal primary education and often at or near universal basic education, face a different set of issues.

The middle-income UNESCO region of Latin America and the Caribbean includes Mexico and all of Central America as well. Like the

Middle-income countries are often at or near universal basic education and face a different set of issues.

developing portion of East Asia and the Pacific, the continent has all but reached universal primary enrollment, with the exception of sometimes large pockets of population, especially among indigenous peoples. Figure 7.9 shows the current status of enrollment rates at all levels in the region and the possibilities of the normative scenario. There are, however, huge inequalities across the region, as well as within countries. In contrast to Figure 7.9, we estimate the primary net enrollment rate to be only about 60 percent in Haiti, and the lower secondary gross enrollment rate was still less than 60 percent in Guatemala in 2005. At the other extreme, the upper secondary gross enrollment rate was already 95 percent in Brazil, and the tertiary gross enrollment rate was 65 percent in Argentina.

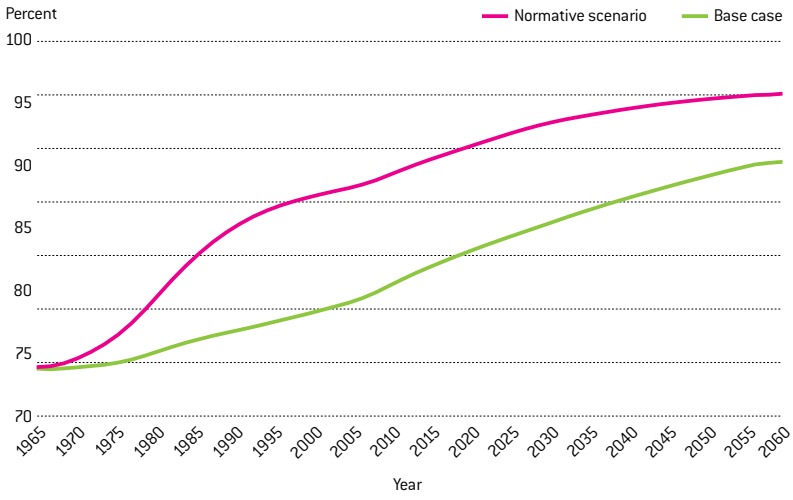
Figure 7.9 Enrollment rate forecasts for Latin America and the Caribbean in the normative scenario



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Figure 7.10 Upper secondary enrollment rates in Latin America and the Caribbean: Normative scenario relative to base case forecasts



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

In spite of problematic exceptions, the Latin American and Caribbean region as a whole is quite well positioned with respect to basic education. The region's attention in the coming decades will be mostly on upper secondary and tertiary education, and the greatest uncertainty in forecasting is therefore also at those levels. Figure 7.10 shows the difference between the base case and the normative scenario forecasts with respect to the upper secondary gross enrollment rate. Although the movement in the normative scenario from about 75 percent in 2005 to 90 percent over the following twenty years would be aggressive, it is quite possible (the region as a whole moved from 63 to 73 percent in just the five years between 1999 and 2004). In fact, the base case upper secondary forecast of 79 percent in 2025 may appear too conservative—yet we should remember that it reflects both budgetary constraints and a slowing rise in demand as enrollment rates grow higher.

Brazil is the demographic giant of Latin America. With a population of nearly 200 million, it is almost twice the size of Mexico, which in turn is about twice the size of third-ranked Colombia. Brazil is also one of the Goldman-Sachs BRICs (Brazil, Russia, India, and China), the first tier of large emerging market economies. Thus, its education future is of considerable importance not just to the region but also with respect to the concept of the continuing global emergence of large, middle-income countries. Perhaps the two most interesting aspects of the forecasts for Brazil are (1) the starting conditions, with very high rates of education through the upper secondary level already in place, and (2) the movement before 2060 to about a 50 percent tertiary gross enrollment rate even in the base case. More generally, in 2060, the education profile of today's lower middle-income and upper

middle-income countries could look much like that of Southern Europe in 2005.

Implications for future education targets

One of the central (and often repeated) arguments of this volume is that when it comes to education targets, one size does not fit all. Most of the world will reach the level we call "nearing UPE" (defined as a 90 percent net enrollment rate) before 2015. But in the IFs base case, sub-Saharan Africa as a whole (weighting member countries by population) needs until 2047 to reach that goal, and both the Arab States and South and West Asia need until about 2019 (see Figure 7.11). The normative scenario shortens those horizons to 2021, 2014, and 2013, respectively.

Yet the global community generally understands the first MDG to mean 97 percent primary net enrollment, and it could take a long time to acquire those extra 7 percentage points. In the base case, sub-Saharan Africa does not reach that level until 2076, and the region as a whole needs until 2034 even in the normative scenario. The normative scenario would facilitate the goal being met by 2026 in the Arab States and 2028 in South and West Asia, but without such acceleration, these regions would not meet the goal until 2038 and 2039, respectively.

Figure 7.11 also explores when the UNESCO regions might reach a 90 percent lower secondary gross enrollment rate and an 80 percent upper secondary gross enrollment rate in the two scenarios, as well as looking out to 60 percent tertiary gross enrollment. (These values do not, of course, constitute global goals. Neither are we proposing that they should become goals, but we find them useful as analytical benchmarks.) At the lower secondary level, sub-Saharan Africa does not reach the 90 percent level until 2041 even in the normative scenario. In short, universal basic education is a long time in the future for the region. South and West Asia would reach it in 2017 in the normative scenario, shortening the horizon by fourteen years relative to the base case.

At the upper secondary level, the horizons extend still further, although all regions except sub-Saharan Africa and South and West Asia reach 80 percent by 2027 in the normative scenario. South and West Asia reaches 80 percent in 2036, but even in the normative scenario, sub-Saharan Africa does not do so until 2059. The "benchmark" of 60 percent gross tertiary education, even though the rich countries of the world already have reached it, will likely elude all other regions except the transition region of Central and Eastern Europe through 2060, even in the normative scenario.

Despite the fact that they are not nearly as catchy or convenient as a goal of universality for all countries by a set year, target growth rates such as those of our normative scenario could serve the global community well as it begins to look beyond the current MDG set. How much pursuing growth targets might cost is the topic to which we next turn.

The normative scenario shortens the longest regional time horizon for "nearing UPE" from 2047 to 2021.

Paying for Education Acceleration: Costs and Possible Sources

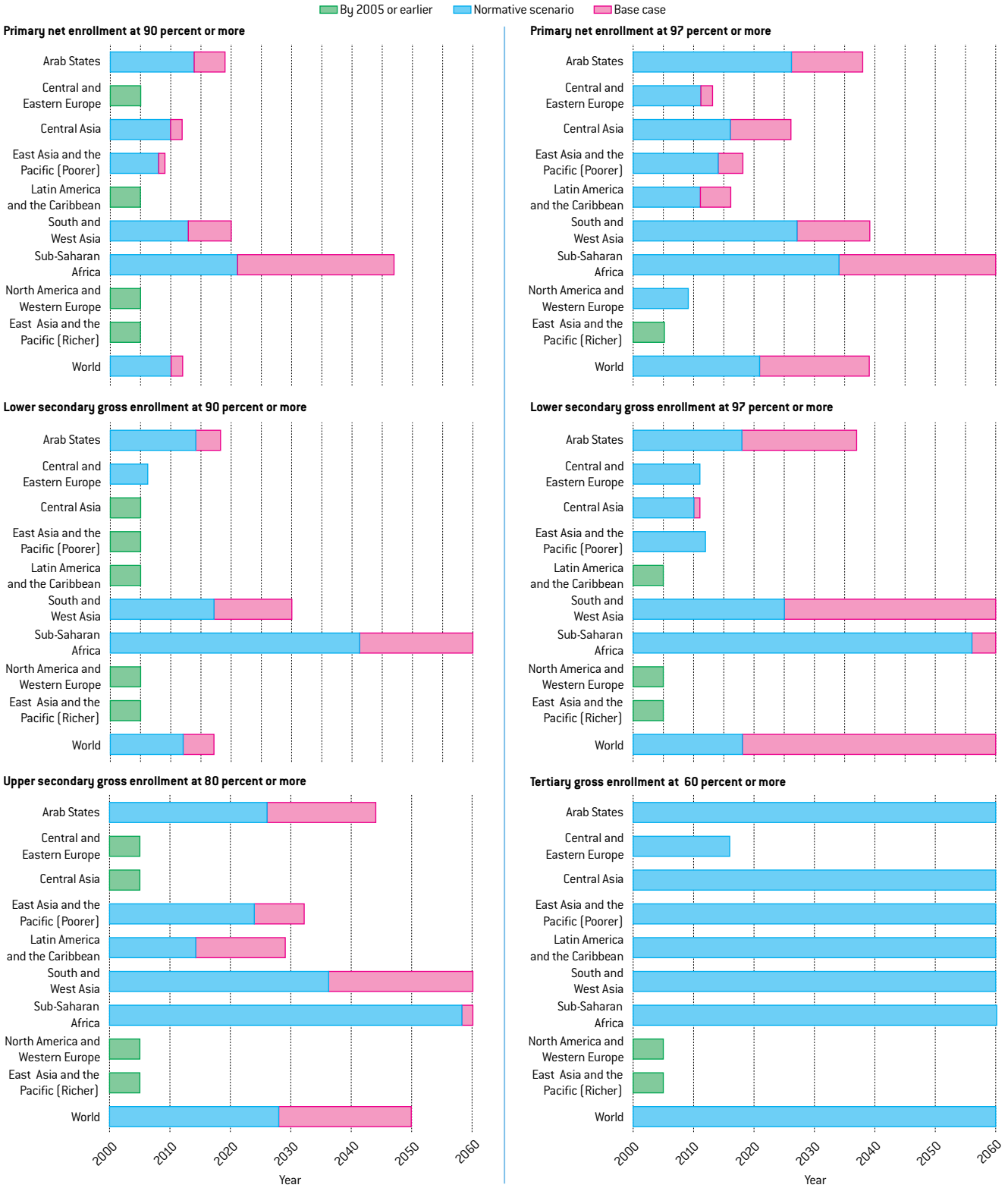
We saw in Chapter 3 that education funding as a portion of GDP tends to be fairly consistent over time, seemingly somewhat independent of the financial needs inherent in underlying changing demographic patterns and of efforts to push education enrollment rates forward aggressively. But as a general rule also, public expenditure on education as a portion of GDP tends to be highest in high-income countries and lowest in low- and lower middle-income countries. It has been decreasing slowly in the former and increasing slowly in the latter.

The base case of IFs generally reflects these patterns in its forecasts as well, responding to the changing broader context of education's advance. In particular, demographic pressures from young dependent populations are easing very considerably around most of the world, and by 2060, the world will likely approach zero population growth (the IFs forecasts show negative population growth by 2070 in both scenarios). At the same time, the pressure of older populations for both health care and pensions is increasing almost everywhere, and in the base case, those demands squeeze public budgets for education. Thus, there are both demand-side and supply-side forces that will work to reduce the share of GDP devoted to education somewhat over time. By the same token, however, the shift of societies to knowledge-based economies will put some upward pressure on that share.

In addition, the normative scenario explores acceleration in achievement of universal basic education.

Figure 7.11 also considers how long it might take for regions to reach an 80 percent "analytical benchmark" in upper secondary enrollment.

Figure 7.11 Years when global regions attain various enrollment rates: Normative scenario relative to base case



Note: Values of 2005 are 2005 or earlier; values of 2060 are 2060 or later; in cases where a benchmark is reached at a future time and only a blue line is shown, both the normative scenario and the base case are forecast to reach the benchmark within a year of each other.

Source: IFs Version 6.12.

We built the normative scenario on top of this base case. Financially, the questions of interest to us are how big the incremental costs of the normative scenario might be and how societies and the global community might pay those costs.

What the normative scenario would cost

The financial constraints that countries face interact with other forces to shape the forecasts of the base case. To assess its incremental costs, our analysis removed the budgetary constraint from government spending in the normative scenario. This allows us to see the difference between the desired spending of the normative scenario and the forecast spending of our exploratory base case. Figure 7.12 compares the costs of the base case and the normative scenario as a portion of the GDP for the world and each UNESCO region, and it suggests several conclusions.

First, the incremental costs appear challenging for some regions in some time periods—but not generally overwhelming. The average additional spending needs for regions tend to be 0.5 to 1.2 percent of GDP. We have tried to make the normative scenario reasonable and sustainable. Nonetheless, as we shall see, such financial costs would not be easy for some countries to bear. Moreover, the calculated increments in a number of cases can be significantly higher—for example, for the DRC, they reach 3.3 percent of GDP, and for Angola (which is well behind education enrollment norms because of long civil conflict), they exceed 4 percent.

Second, there is frequently an incremental "cost bubble" in the middle of our forecast horizon. The upward curve of that phenomenon is tied most fundamentally to acceleration in the increase of enrollment rates in the normative scenario. It also in part reflects the specification in the normative scenario that per student spending adjusts to benchmark levels over twenty years; for some countries and regions, this results in increased spending per student and hence also a substantial rise of total expenditures during the early period (although for other countries, per student spending decreases to the benchmark levels). Over time, however, other factors relieve the upward spending pressure of the normative scenario. One is the ongoing unwinding of demographic pressures in the first half of this century. Also, of course, enrollment rates move toward universality in the base case as well, so that by 2060, enrollments in the normative scenario are not always much or any higher than in the base case.

Third, the largest normative scenario bubbles in spending expressed as a percentage of GDP appear in Central Asia, Latin America and the Caribbean, South and West Asia, and sub-Saharan Africa. The difference for sub-Saharan Africa between education spending as a percentage of GDP in the normative scenario and the base case peaks at about 0.8 percent; the difference for South and West Asia peaks at 0.9 percent. The dubious distinction of having the highest peak incremental need belongs to Central Asia at 1.2 percent of GDP, partly because the collapse of spending rates since the demise of communism has led to expenditures that fall significantly below benchmark-based needs.

It is contrary to the expectations of many, perhaps, that the peak cost difference for sub-Saharan Africa is not the largest across regions in the normative scenario. Sub-Saharan Africa's spending per student is now often above benchmark levels, and in the normative scenario, it benefits from some decreases. The spending gap of sub-Saharan Africa is nonetheless the most persistent, remaining above 0.5 percent across the entire forecast horizon. These different incremental patterns across regions and over time reflect varying reasons for the spending gaps. For instance, enrollment rates in sub-Saharan Africa are currently often quite far from saturation levels, making the increments of the normative scenario more persistent.

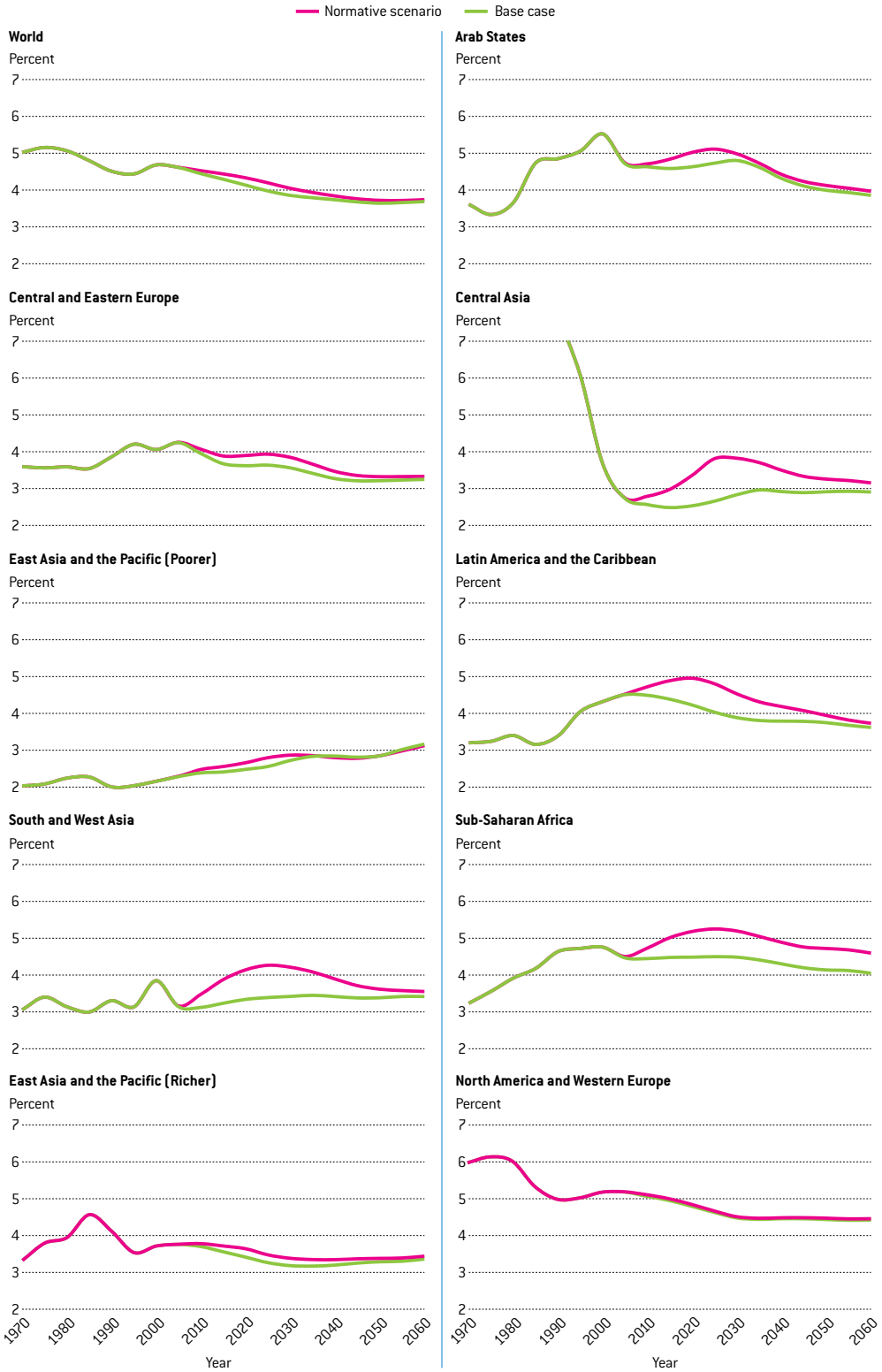
In absolute terms (rather than as a portion of GDP), the largest incremental spending needs of the normative scenario are in Latin America and the Caribbean in the early years of the forecast and in South and West Asia over time.[3] As is common in looking at cost or revenue streams spread over time, Figure 7.13 displays the annual increments with a 3 percent annual discount rate for future years (showing only the five regions with significant absolute increments relative to spending in the base case).[4] The region of East Asia and the Pacific (Poorer) also needs very substantial incremental funds early in the forecast, but the incremental

What are the incremental costs of the normative scenario, and how might they be paid?

Although there are exceptions, the incremental costs of the normative scenario appear challenging but not overwhelming.

There is frequently an incremental "cost bubble" in the middle of the forecast horizon.

Figure 7.12 Education costs as percent of GDP: Normative scenario relative to base case



Note: Used 5-year moving averages. Removed 2000–2004 data from East Asia and the Pacific (Poorer) because of China's nonreporting; data for Central Asia are missing for much of the historical period.

Source: IFs Version 6.12 using UIS and WDI data and IFs base case and normative scenario.

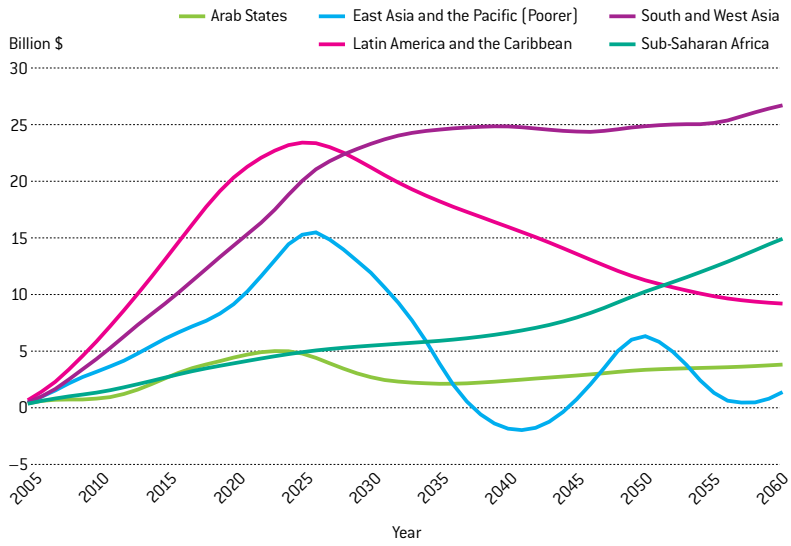
need disappears (and even turns slightly negative) later in the forecast horizon because the normative scenario brings down tertiary spending per student relative to the base case. Although incremental financial needs for sub-Saharan Africa continue to grow over time, the absolute values are not that high in early years, a topic to which we will return.

Over time and even with discounting, the cumulative incremental sums (see Table 7.4) are substantial. Through 2030, the world would spend an additional $1.5 trillion to meet the target intake/transition and survival growth rates of the normative scenario. Part of such incremental funding needs would be easy to meet because the normative scenario produces somewhat higher economic growth. Globally, if the same percentage of GDP were devoted to public education spending in the normative scenario as in the base case, $55 billion of that $1.5 trillion incremental need would be "automatically" covered. By 2060, the continued higher economic growth of the normative scenario would similarly cover more than one-fifth of the cumulative increment, or $760 billion of $3,300 billion. The portions of help from faster growth in sub-Saharan Africa are very similar. The difficulty for policy making, of course, is the substantial lag between the incremental expenditures and the greater resources from higher growth, an issue that will be addressed in Chapter 8.

It has been relatively common to calculate the additional resources required to meet specific education goals over the now especially short horizon of the MDGs. For instance, a broad purpose of the Bruns, Mingat, and Rakotomalala (2003) study was to estimate the financing gap between the cost of efficiently educating students at the target levels they explored for 2015 (95 percent primary completion) and the reasonable mobilization of domestic spending, given the benchmarks they established. Scaling up their analysis for rehabilitation of inadequate facilities, system expansion for new students, and extension of the analysis to all low-income and middle-income countries, they found that the annual average incremental cost between 2000 and 2015 of achieving the second MDG would be $33 billion to $38 billion, with the need for $5 billion to $7 billion from external resources after mobilizing domestic resources and improving efficiency of resource use (Bruns, Mingat, and Rakotomalala 2003: 111, table 4.15).

There are many differences between our approach and that of Bruns, Mingat, and Rakotomalala, starting with the fact that our cost forecasts do not posit universal primary

Figure 7.13 Incremental costs in $ (billions): Normative scenario relative to base case



Note: Values are 5-year moving averages with a 3 percent annual discount rate for future years.

Source: IFs Version 6.12.

Table 7.4 Cumulative incremental costs in $ (billions): Normative scenario relative to base case

	2030	2060
Arab States	77	143
Central and Eastern Europe	75	193
Central Asia	24	52
East Asia and the Pacific (Poorer)	250	–22
Latin America and the Caribbean	341	793
South and West Asia	298	1,042
Sub-Saharan Africa	87	341
East Asia and the Pacific (Richer)	168	361
North America and Western Europe	171	360
World	1,495	3,266

Note: Values reflect a 3 percent annual discount rate for future years.

Source: IFs Version 6.12.

education by 2015.[5] In addition, of course, our analysis of the normative scenario considers increments at secondary and tertiary levels, not just in primary education. Moreover, we calculate our incremental normative scenario resource needs relative to a base case in which spending has already increased with increases in GDP. Thus, our forecasts of incremental costs are not comparable to those of Bruns, Mingat, and Rakotomalala (2003) in either purposes or method. It is nonetheless interesting to consider the annual incremental costs of our normative scenario across all levels of education for the same set of low- and middle-income countries as in their study. For that country set, the total incremental costs between 2005 and 2015 of our normative scenario would be $219 billion (without discounting), or an average of $21 billion per year in constant 2000 dollars.

The funding of the incremental costs needs to be analyzed dynamically, taking into account the growth prospects of the underlying economies.

Such a calculation of totals over time and of annual averages is, however, very deceptive because the time profile is critical. The incremental costs per year of the normative scenario begin near zero and climb for many years. By 2015, incremental costs for the same subset of countries reach $45 billion annually and continue to climb, hitting $150 billion in 2030. In considering the funding of such incremental needs, it is critical to analyze them dynamically, taking into account the growth prospects of the underlying economies—which also differ in the normative scenario—and the prospects for mobilizing domestic or international resources on behalf of education.

Domestic sources

Although several of the UNESCO regions would need to mobilize additional resources to meet the target paths of the normative scenario (see, again, Figure 7.13), we return our focus to sub-Saharan Africa and South and West Asia, the regions to which we have devoted the most attention throughout this volume. Further exploration of the normative scenario must concentrate on two questions. First, can incremental resources be mobilized, especially in the countries of these regions? And second, does mobilizing them have value (and not just monetary return) that rather definitively outweighs the costs of doing so? The remainder of this chapter explores the first question, and Chapter 8 will address the second.

Calls for greater education funding abound in rich and poor countries alike. The UN Millennium Project (2005), under the leadership of Jeffrey Sachs, issued one of the strongest calls in recent years. As that study emphasized, it makes great sense to look for needed additional funding first from domestic sources. One of the key arguments for more public spending on education is that the spending generates, at least in part, socially beneficial externalities (positive impacts on others beyond those receiving more education), as well as private goods for those receiving the education. Some portion of broader social benefits (such as the creation of new knowledge flowing from tertiary education) are true public goods (goods such as knowledge, to which access is not easily restricted and from which individuals can benefit without diminishing benefits to others). Typically, societies do not recognize the full value of externalities, and when those are positive, they tend to underprovide such goods (Weimer and Vining 2004).

The Commission on Macroeconomics and Health (CMH), also directed by Jeffrey Sachs, built a normative scenario analysis around increased spending on health (CMH 2001: 60), somewhat similar to our education normative scenario, and it is instructive to compare and contrast our approach and conclusions with those of the commission. In their analysis, the authors (CMH 2001: 163) posited that low-income countries needed to increase spending on health by 2.7 percent of GNP within six years (by 2007) and 3.3 percent within fourteen years (by 2015). They also explored efficiency savings and concluded that those were unlikely to be more than 20 percent of current spending.

The study concluded that low-income countries should increase health spending by $40 billion in 2007 and $66 billion in 2015, needing $20.5 and $28.4 billion from external donors to do so, or about 0.1 percent of donor GNP (CMH 2001: 163 and 166). Africa was identified as having the largest need for external help.

The commission extended the analysis to benefits as well as costs. The authors concluded that a highly conservative estimate of the economic return in 2020 from the scaling up of health spending would be $180 billion, or about 10 percent of GDP (CMH 2001: 108). In short,

the incremental investment would more than pay for itself in a quite short period of time.

In contrast to the normative scenario of the CMH and to other analysts' estimations of funds needed to achieve universal primary education by 2015, our normative scenario is less a "big push" than a "steady slog." That is, we see acceleration of the advance in education as a process that requires growing incremental investments over a long period of time, allowing a buildup of enrollment rates and student headcounts across many levels of education at reasonable and sustainable rates. A steady slog has many benefits, including enabling institutions to grow steadily and to absorb expansion and the fact that with more time, countries are better able to ramp up incremental spending from domestic resources. Further, in the normative scenario, the growth of the GDP in response to education's advance increases the domestic resource base, and this growth of GDP has two benefits. The first is that for the world as a whole and for most regions, including South and West Asia and sub-Saharan Africa, it would cover about 25 percent of the incremental costs without requiring any increase in the proportion of GDP spent on education. Second, although shifting 1 to 2 percent of GDP into any social use over five to fifteen years in the face of many competing demands (as in the CMH scenario) would be exceptionally difficult, a movement of 0.5 to 1.0 percent over twenty to thirty years from a faster-growing economy may be more feasible.

The resulting incremental costs of our normative education scenario are therefore less than those of the normative scenario of the CMH in the early years. Specifically, for the World Bank's set of low-income countries, the incremental funds required in 2015 would be $14 billion—compared to the $66 billion estimated incremental health expenditures posited in the CMH study for 2015—and they would grow to $52 billion in 2030.[6] In the later years, larger economies and government revenues (bolstered in the normative scenario by greater productivity tied to the growth of education) would increasingly cover this incremental expenditure (Chapter 8 explores this issue).

We noted earlier that incremental peak-year spending needs on a regional basis in the normative scenario relative to the base case run between 0.5 and 1.2 percent of GDP, reaching about 0.8 to 0.9 percent in sub-Saharan Africa and in South and West Asia. These are levels of GDP per capita devoted to education beyond the levels of the base case. The logic of the Commission on Macroeconomics and Health would suggest that these regions in aggregate (although not, of course, every country in them) could bear the entire cost of such increments, especially with the considerably longer ramp-up period indicated by our analysis than in the shorter-term analysis of the CMH. The problem with such logic is that these countries face competing needs, not limited just to health and education but including much more, such as infrastructure, energy, and the environment.

In addition, low-income and Least Developed Countries (LDCs) face special problems with respect to revenue mobilization. Low-income countries mobilize only about 12 percent of GDP for all government consumption (military, health, education, and other), compared to about 18 percent in high-income countries. Even that level of resource mobilization in low-income countries is currently supported by foreign aid equivalent to about 5.5 percent of their GDP and to about 6.0 percent of the GDP in sub-Saharan Africa. Many low-income countries have very weak domestic taxing and revenue-raising capability.

International transfers

The purpose of this volume is neither to become very specific with respect to where funds for the normative scenario might be obtained nor to plead for an international commitment of assistance. Instead, the objective is to map the general character and expense of an accelerated advance of global education and to explore the implications of its pursuit. Nonetheless, we want to identify the general magnitude of incremental expenditures in the normative scenario that might not be possible to meet from domestic resources.

The United Nations defines its category of LDCs with an eye to those suffering from long-term handicaps to growth and therefore having the most limited ability to undertake new initiatives without external assistance. Those countries are, by definition, the least able to close the gap between current patterns of spending on education and the estimated

The "steady slog" of the normative education scenario begins fairly soon to pay for itself.

Low-income and Least Developed Countries face special problems with respect to revenue mobilization.

We estimate the external assistance that might be required to advance education more aggressively in the Least Developed Countries.

The broader argument for an increased commitment to education rests on the potential benefits of accelerating education's advance.

expense of the normative scenario. Most of the countries are in sub-Saharan Africa. Afghanistan, Bangladesh, Bhutan, Cambodia, Haiti, Kiribati, Laos, Mauritania, Myanmar, Nepal, Samoa, the Solomon Islands, Timor-Leste, Tuvalu, Vanuatu, and Yemen supplement the thirty-three countries from that region. Three criteria collectively keep countries on the list: GDP per capita below $900; human resource weakness such as inadequate nutritional levels or low life expectancy; and economic vulnerability, such as instability of agricultural production.

Table 7.5 shows the education spending of the least-developed country set in the base case and in the normative scenario. The gap is a very crude estimate of demand for funds in the normative scenario that cannot be met from domestic resources because many of the LDCs could realistically direct very little additional GDP to education (it would also, of course, be difficult for some other low- and lower middle-income countries to divert resources of the magnitude suggested in the normative scenario). The estimate of need for LDCs is fairly low by the standards of international assistance efforts and pledges. Total official foreign assistance is now about $60 billion annually, and in the base case, assuming constant rates of giving as portions of donor GDP, it would rise to $207 billion in 2060. For some additional context, at their meeting at Gleneagles, Scotland, in 2005, leaders of the G-8 agreed to basically double annual assistance flows, increasing aid to developing countries as a whole by $50 billion per year in 2010, including increased flows to Africa of at least $25 billion (the commitments also included debt relief for the Least Developed Countries and other supportive actions).[7] It appears nearly certain that the G-8 will fall decidedly short of that pledge, but the annual funds of the pledge would obviously have more than covered the unmet need that Table 7.5 identifies through 2045. Foreign assistance given by all OECD countries constitutes only a bit more than 0.2 percent of their GDP. An increase to somewhat more than 0.3 percent would nearly fill the gap identified in Table 7.5 for the entire horizon of the normative scenario.

Table 7.5 Education spending in the Least Developed Countries: Normative scenario relative to base case

	Education spending (billion 2000 dollars)			
Year	Base case	Normative scenario	Absolute gap	Percent of GDP gap
2005	8.1	8.1	0.0	0.0
2010	10.8	12.5	1.7	0.5
2015	14.4	18.9	4.5	1.0
2020	19.6	28.0	8.4	1.3
2025	27.1	40.5	13.4	1.6
2030	37.3	56.0	18.7	1.6
2035	50.7	75.1	24.4	1.5
2040	68.5	98.8	30.3	1.3
2045	93.7	132.2	38.5	1.1
2050	131.6	184.6	53.0	1.0
2055	188.5	261.9	73.4	0.9
2060	265.3	366.5	101.2	0.8

Source: IFs Version 6.12.

Again, it is important to emphasize that this study is not balancing the needs in education against those in health, in infrastructure, or elsewhere in low-income countries. Thus, this analysis does not support making an argument for such an increase in external assistance focused solely on education; rather, it estimates the amount that might be required in order to advance education more aggressively.

The broader argument for either an increase in domestic commitment to education or external help with increasing expenditures rests, of course, on the potential benefits of accelerating education's advance. Those benefits could be economic or noneconomic, and they could accrue only to the target countries or to the broader international community. For instance, an enhanced domestic stability of low-income countries and a lower spillover of threats to the international community could potentially constitute a partially noneconomic benefit for the global community from the normative scenario. It is to a broad consideration of such benefits that we will turn in Chapter 8.

Conclusion

Education's advance is already remarkably rapid around the world. It might be that the current emphasis placed on increasing participation in education (the pace of which is now much greater in low-income countries than it was in high-income countries at similar levels

of income) is very adequate. Perhaps global attention should simply focus on tracking and recognizing—on welcoming and even celebrating—such an advance. Yet a large community of analysts and advocates clearly believe that more rapid advance in education carries many personal and social rewards. The statement of global goals for universal primary completion and gender parity at all levels of education repeatedly demonstrates that belief.

This chapter has considered a normative scenario for education's advance globally, with special attention to low-income countries, that is simultaneously aggressive and solidly within the range of historical experience for well-performing countries. Such a future would cut about one generation off the period that the peoples in sub-Saharan Africa and also South and West Asia are otherwise likely to need in order to move to universal basic education and to high levels of upper secondary education (as well as accelerate such progressions across much of the rest of the developing world).

Achieving such an acceleration in educational advance would, however, be expensive, at its peak costing 0.5 to 1.1 percent of regional GDP for low- and middle-income UNESCO regions. Domestic resources could almost certainly support much or most of the acceleration in many countries, but the bubblelike patterns of needed funding, tied to the passing of demographic bubbles through the system as well as to increases in rates of enrollment and to bringing spending levels to benchmarks, suggest a pace of ramping up that would also require significant external help, especially in the LDCs.

Chapter 2 emphasized that those who support an acceleration of education's advance do so not only because of the economic returns that accrue to individuals and societies from it but also because of the capabilities it builds for the living of richer, freer, and more satisfying lives. The next chapter explores both types of returns.

1 A lower secondary gross enrollment rate of 100 percent often does not, of course, mean universal education at that level because large numbers of above-age entering and repeating students may be included in the enrolled student population.

2 However, the much greater enrollment of boys in religious schools complicates the assessment of gender balance in Arab States, as enrollments in a religious school are included in UIS statistics only when the school provides a full state-certified curriculum.

3 All discussions of absolute costs and benefits in this chapter and in Chapter 8 use constant 2000 dollars.

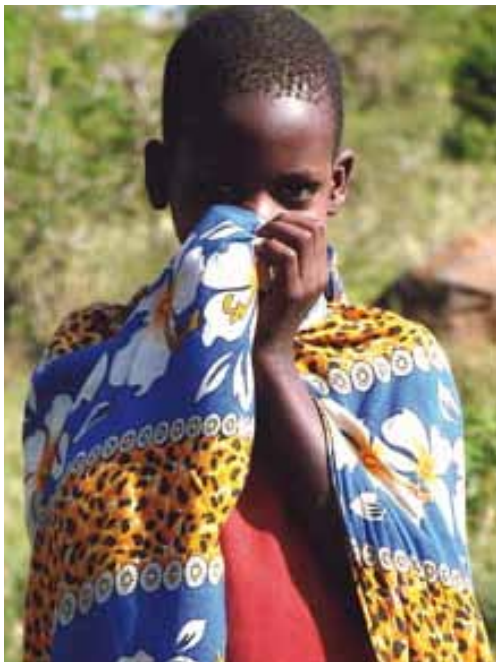
4 Discount rates are roughly linked to economic growth and therefore to real returns to investment. Because the economic growth rates of these regions have exceeded global averages in recent years, even a discount rate of 5 percent might be reasonable.

5 Recall that Bruns, Mingat, and Rakotomalala were estimating costs that would be required if UPE were to be attained by 2015.

6 In 2007, the World Bank moved India from its low-income category, where it was at the time of the CMH study, to its lower middle-income category. For this comparative analysis, we added it back into the low-income group.

7 For further context, UNESCO (2007a: 42) reported that the actual level of support via foreign assistance for education by the OECD and other international organizations doubled from $1.3 billion to $3.3 billion (in constant 2004 currency) between 1999 and 2004.

8



The Broader Impact of Advancing Education

Rising education levels provide many private and social benefits.[1] An analysis of policy choices that affect the speed of increase in education participation and attainment should address both private and social benefits. It is incumbent upon us to explore whether the benefits of an accelerated advance of education, like that of the normative scenario, appear to outweigh its costs.

Some social benefits, especially increased economic productivity, growth, and resultant tax revenues, can potentially repay the public investment in education over time, making possible a rather traditional cost-benefit analysis.[2] Lower youth dependency ratios and higher portions of the population in the workforce (the economic dividend of declining fertility) generally produce greater economic growth. Similarly, lower fertility rates generally accompany the education of women and allow them to enter the workforce much more easily. And smaller family sizes can enhance the ability of parents and societies to better educate and provide better health care for their children and therefore potentially again to increase economic productivity.

Moving beyond the strictly economic benefits of reduced fertility, analysts point to the greater ability of women to control their own lives (especially through increased "bargaining power" within households), to the way in which more educated and healthier youth provide greater social stability, and to the potentially positive environmental implications associated with the pressure of fewer people. Related to many of these implications of reduced fertility, children in smaller families generally have wider, freer life choices. Through all these paths, education affects the distribution of well-being in a society, not just its amount, and there are inevitably competing perspectives in societies concerning such social change. We should not underestimate, for example, the challenges that change of this type pose to the traditional dominance of men and therefore to cultural patterns of millennia.

Given the breadth and complexity of the impacts of education, as well as the differential valuation of such impacts, it is not possible to satisfactorily monetize the full range of costs and benefits of education's advance.[3] Nonetheless, an analysis that combines attention to a broad range of its economic and noneconomic implications is possible. The approach of this chapter will be to compare many different socioeconomic implications of the base case and the normative scenario, comparing some of the measurable economic consequences to the incremental costs of the normative scenario but also exploring beyond the easily measurable implications of accelerated education advance.

In this chapter, we explore some of the monetary and nonmonetary private and social impacts of education.

Education and Economic Development

The education attainment levels of adults, not enrollment patterns of school-age populations, drive most of the forward linkages from education to a host of economic and broader social impacts. We have seen how slowly those attainment levels percolate across the age-cohort structures of populations. Partly because of that slow speed of transformation, understanding the broader impact of education becomes very complex. Adding further complication, databases are not always sufficiently long to fully observe those transformations play out, and over such long horizons many other important contextual variables also change significantly. Among the advantages of exploration of the consequences of education's advance with the IFs model is its integration of many interacting global systems over the long run.[4] We begin our exploration by looking at one of the potentially most direct beneficiaries of accelerating education transitions—the economy. How much impact does the normative scenario have?

Productivity and growth

There is a very large literature on the relationship between advance in education and economic productivity, growth, and development (including income distribution). And there is agreement across the literature with respect to the microlevel returns to education: individuals who have more education earn more (UIS 2002: 34).

The preponderance of literature also supports the proposition that greater education attainment and/or education expenditure contributes to higher economic growth (Durlauf, Johnson, and Temple 2005). A significant literature has extended the discussion to consider the differential impact for economic growth of investment in various levels of formal education (for instance, see Psacharopoulos and Patrinos 2002).[5] There is, however, much uncertainty about the magnitude and character of the relationship between education and growth. Easterly (2001) questioned whether special efforts to push education forward have any positive impact on growth (which would suggest that individuals might acquire credentials and gain a larger share of the pie without increasing that pie), and Pritchett (1996) found no relationship between rising education attainment and growth; Pritchett (2004) further questioned the common use of aggregate cross-national data for analysis of the impact of education.

Still, the empirical literature generally finds that education contributes to higher GDP and GDP per capita.[6] That literature also tends to presume or argue that the impact of education on GDP exceeds the private returns that wages capture (which would be the case if advances in productivity spilled over to other workers). One widely cited study (OECD 2003: 76–78) found that an additional year of education (about a 10 percent rise in human capital in the countries of the analysis) raised GDP per capita in the long run by 4–7 percent. Cohen and Soto (2007: 71) found that an extra year of schooling in a country adds slightly more than 12 percent to income over the long term.

The empirical literature generally finds that education contributes to higher GDP and GDP per capita.

There is, of course, absolutely no uncertainty about the very strong cross-country correlation between higher education attainment levels and higher GDP per capita; the debate is only about the extent to which greater education explains higher GDP per capita. The strongest probable causal path in that direction is the impact of education on productivity and therefore on economic growth.

The IFs model represents that path and needs to specify its strength. Barro and Sala-i-Martin (1999: 431; see also Barro 1999: 19–20) reported that a 1 standard deviation increase in male secondary attainment (equivalent to 0.68 years) raised economic growth by 1.1 percentage points per year, and a 1 standard deviation or 0.091-year increase in male higher education raised it

by 0.5 percentage points.[7] More modestly, Chen and Dahlman (2004: 1) concluded that a rise of 20 percent in average years of schooling raises annual growth by 0.15 percentage points and that an increase in average years by one year raises growth by 0.11 percentage points, whereas Bosworth and Collins (2003: 17) determined that each year of additional education adds about 0.3 percentage points to annual growth. Baldacci et al. (2004: 22) found that "one year of additional primary and secondary education is associated with an increase in growth ranging between 0.4 and 0.8 percentage points per year, depending on the country group." The IFs base case and normative scenario both use the value of 0.2 percentage points of growth in multifactor productivity per incremental year of education, a conservative specification given these studies (the fact that there are other paths from education to growth in addition to that via productivity calls for a conservative approach).

Still another group of studies has looked at the impact of education spending on growth. Although one could argue that expenditures on education should generate no direct increase in productivity or growth and that the entire return to education should be expected through the increased education attainment of adults, there are more immediate returns to education spending. Especially at the tertiary level but also through agricultural institutes, vocational education, and other connections to lower levels of education, spending potentially contributes to relatively rapid returns from the generation and diffusion of knowledge. Education spending can also improve economic performance fairly quickly by targeting lifelong learning, an element of attainment not generally captured by average years of education. In addition, much education investment replaces workers who retire or die with new workers; the new workers may not add years of attainment to the population, but they do embody more recent knowledge and technology. Barro and Sala-i-Martin (1999: 432) concluded that increasing education spending as a portion of GDP by 1.5 points (one standard deviation) raised growth by 0.3 percentage points per year. Baldacci et al. (2004: 24) found that raising education spending in developing countries by 1 percent of GDP per year and keeping it higher added about 0.5 percent per year to growth rates and that sub-Saharan African countries and low-income countries benefited the most. The IFs base case and normative scenario both use the value of 0.2 percentage points of growth per additional percent of GDP directed to education. That is, again, a conservative parameterization, selected in part because we represent both the attainment and the spending effects.[8] The model is available for others to explore the implications of alternative parameters.

Relative to the base case, the normative scenario forecasts 4.2 percent greater GDP per capita in 2060 globally and 14.3 percent greater in sub-Saharan Africa.

The aggregate impact of the normative scenario on economic well-being

Table 8.1 compares GDP per capita for the UNESCO regions in the normative scenario with that of the base case. The results of the normative scenario, however, reflect more than the direct impact on economic productivity of education attainment and spending because the normative scenario affects population and other sociopolitical forecasts in ways that in turn have further positive economic impacts (as we shall see later in this chapter). For instance, Table 8.1 also reflects the effects of the normative scenario on fertility rates and population size (see McMahon 1999 for similar combined analysis).

The largest percentage changes are those in sub-Saharan Africa. The normative scenario gives rise to a GDP per capita nearly $900 higher in 2060 than that of the base case, resulting in a GDP per capita in 2060 that is 14 percent higher than the base case. The returns for other developing regions vary. In absolute terms, the GDP per capita (PPP) in South and West Asia is $1,450 higher in 2060 under the assumptions of the normative scenario. Because the base case forecast of GDP per capita for that region in 2060 is nearly three times that of sub-Saharan Africa, however, the relative gain is lower. The impact of the normative scenario is also positive, although considerably smaller, for all other UNESCO regions. At the country level, and especially through 2030, the normative scenario can actually reduce GDP—it is important to remember that the scenario leads to increased spending per student in many countries and that the shifts by governments of funds from other uses to education also have costs; the net result need not be economic gain.

The results in Table 8.1 for sub-Saharan Africa suggest a considerable return on the incremental

investment of the normative education scenario. In fact, the numbers are modest compared to some of the aggregate empirical analyses of the impact of education on growth discussed earlier. By 2030, the normative scenario adds 0.8 years of education to the average of those fifteen and older relative to the base case; by 2060, it adds nearly 2 years relative to the base case. The related increment to the economic growth rate in the normative scenario between 2030 and 2060 is only 0.15 percent, well within the range of the studies cited earlier. For South and West Asia, the normative scenario adds an average of 0.35 years of education for those fifteen and older by 2030 and 0.8 years by 2060. The increment to economic growth for the region in the normative scenario is 0.16 percent. The normative scenario's impact on GDP per capita for sub-Saharan Africa in Table 8.1 is greater than the impact for South and West Asia because of the greater reduction in fertility that the normative scenario generates in sub-Saharan Africa, not because the impact on GDP is greater.

Comparing economic costs and benefits

This report cannot provide a full cost-benefit analysis. Doing so would require monetizing not just the costs of potentially lower life expectancy were money for education diverted from health (which would generally be a poor idea) but also assigning monetary value to such factors as enhanced life opportunities for women and much more. It is, however, possible to examine the strictly economic streams of increased education spending and increased GDP in the normative scenario (see Table 8.2).

On a global basis and for half the regions, the cumulative incremental GDP stream from the normative scenario relative to the base case falls short of the cumulative incremental spending stream through 2030. Even by that year, however, East Asia and the Pacific (Poorer), South and West Asia, and sub-Saharan Africa experience net benefits from the normative scenario, and the Arab States break even.

By 2060, the world as a whole and most regions individually benefit considerably from the normative scenario. In the case of East Asia and the Pacific (Poorer), the ratio of benefits to costs is especially dramatic (the cumulative outlays of the region are not that high), yet the Arab States, South and West Asia, and sub-Saharan Africa all also post at least a fivefold return on the investment by 2060.

It takes a considerable time—about a full generation and sometimes more—for regions to reach a break-even point and begin to reap net returns to the investment. For East Asia and the Pacific (Poorer), it happens in 2025; for South and West Asia, it occurs in 2024; and for sub-Saharan Africa, the year is 2029. But for Latin America and the Caribbean, it takes

By 2060, incremental global GDP associated with the normative scenario is over five times the incremental education spending associated with it.

Table 8.1 GDP per capita at PPP: Normative scenario relative to base case

	GDP per capita at purchasing power parity					Normative scenario relative to base case	
		2030		2060			
	2005	Base	Normative	Base	Normative	2030	2060
Arab States	5,752	9,397	9,477	18,480	19,220	0.9%	4.0%
Central and Eastern Europe	9,310	20,090	20,110	39,060	39,190	0.1%	0.3%
Central Asia	3,383	8,658	8,696	12,310	12,480	0.4%	1.4%
East Asia and the Pacific (Poorer)	3,482	11,210	11,280	41,330	41,970	0.6%	1.5%
Latin America and the Caribbean	7,472	12,890	13,030	29,440	30,380	1.1%	3.2%
South and West Asia	2,122	5,608	5,726	17,820	19,270	2.1%	8.1%
Sub-Saharan Africa	1,521	2,401	2,460	6,255	7,150	2.5%	14.3%
East Asia and the Pacific (Richer)	25,430	43,480	43,590	90,760	90,980	0.3%	0.2%
North America and Western Europe	31,110	50,790	50,780	100,100	100,200	0.0%	0.1%
World	7,695	13,750	13,860	31,250	32,570	0.8%	4.2%

Source: IFs Version 6.12.

Table 8.2 Cumulative incremental education spending and GDP: Normative scenario relative to base case

	2030			2060		
	Incremental spending	Incremental GDP	GDP/spending	Incremental spending	Incremental GDP	GDP/spending
Arab States	72	75	1.0	156	865	5.5
Central and Eastern Europe	89	22	0.2	192	184	1.0
Central Asia	26	7	0.3	54	61	1.1
East Asia and the Pacific (Poorer)	206	333	1.6	279	5,150	18.4
Latin America and the Caribbean	378	298	0.8	790	2,844	3.6
South and West Asia	305	499	1.6	1,050	9,106	8.7
Sub-Saharan Africa	80	91	1.1	347	1,860	5.4
North America and Western Europe	206	–32	–0.2	377	–52	–0.1
East Asia and the Pacific (Richer)	216	95	0.4	376	320	0.9
World	1,579	1,389	0.9	3,625	20,367	5.6

Note: Both spending and GDP are in billions in 2000 dollars, discounted by 3 percent per year.

Source: IFs Version 6.12.

In some regions, it takes about a full generation to begin to reap net economic returns from the incremental education investment.

until 2034, and for East Asia and the Pacific (Richer), it is nearly reached only in 2060. North America and Western Europe actually have a small negative return to the normative scenario because it slightly raises the spending per student at the primary and secondary levels (the model does not calculate any potential gains that would come with that increase) and because the increment in education spending crowds out other economically valuable spending choices. The exclusion from the normative scenario of targets at the tertiary level explains much of the failure of high-income regions to recognize net gains from it (again, Volume 4 in this series will return to the issue).

For those regions that reap gains, the surplus of return relative to investment grows steadily and often rapidly after the break-even point. In fact, during the course of the normative scenario, the higher GDP becomes a significant force in pushing forward investment in education relative to the base case. The long delay in return to investment and the continued growth in the magnitude of that return help us understand the great difficulty that many nondynamic empirical studies have in estimating the growth benefits of investment in education—the patterns are highly nonlinear.

Higher GDP includes, of course, the private returns of education that workers obtain in wages. If those benefits are spread very widely, the GDP can be a general indicator of social return to the additional public investment in education. An alternative and more demanding measure of social return, however, and one less subject to capture by a subpopulation is increased government revenue itself. Whereas the cumulative discounted stream of incremental GDP in the normative case exceeds the cumulative discounted incremental stream of government spending in sub-Saharan Africa in 2029, the cumulative stream of incremental governmental revenue does so only in 2045. For South and West Asia, the delay is from 2024 to 2048; for the Arab States, from 2030 to 2043; for Latin America and the Caribbean, from 2034 to 2059; and for the poorer countries of East Asia and the Pacific, from 2025 to 2040. For the world as a whole, the delay in "payback" is from 2032 to 2050. Because of the compounding effects of economic growth and the positive feedback loops around it, the gaps between the GDPs in the normative scenario and those in the base case rapidly rise and generate increasingly high government revenues. Even with this more conservative measure of return, payback occurs in about two generations.

Uncertainties in analysis

Cost-benefit analysis is, of course, sensitive not just to discount rates but also and even more so to assumptions concerning the linkages between education's advance and economic growth. The discussion of literature explored to some extent the debates about those linkages. The preceding analysis, although we believe it to be conservative with respect to estimating break-even points, could either overestimate or underestimate the delays in returns to education investment and their ultimate magnitude. As a partial check on the danger of overestimating them (and therefore overselling the case for incremental investments in education), we did a sensitivity analysis in which we completely eliminated the direct linkage between education spending and economic growth, leaving only the modest linkage between years of adult education and growth. For sub-Saharan Africa, that pushes the break-even point out to 2047 (two generations), and for South and West Asia, it pushes the break-even point beyond 2060. Given the typically higher estimates for growth linkages in the empirical literature, we believe these to be unreasonably conservative values, but it is impossible to be certain.

Interim costs of diverting money to education

The long delay between investment in education and aggregate economic returns to it also raises the question of the interim costs of the diversion. Such costs would depend in part, of course, on the origin of the incremental domestic funds shifted into education. Looking again at sub-Saharan Africa, we can see that the governments of the continent already (according to data and IFs estimates) spend about 4.3 percent of GDP on education, as much as on the military (1.6 percent) and health (2.7 percent) combined, for a total of just over 8.6 percent of GDP on these three uses. Somewhat more than another 8 percent goes to other consumption and administrative expenses.

It is commonly argued that the moneys currently directed to military spending would be the appropriate source of additional investment in human capital and that they could, on average, provide the 0.5–1.1 percent of GDP required for the normative education scenario. Yet the need of sub-Saharan African countries to build competent and honest security forces makes clear that any suggestion of taking the funds from the military may be too simplistic. The Costa Rican model of spending 0.5 percent or less of GDP on the military certainly has many attractions, and it has contributed substantially to the country's investment in its human capital. But sociopolitical and geopolitical conditions (including ethnic fractionalization) are markedly different throughout most of Africa. Also, improved internal security and stability need to be in place before external donors find provision of support attractive (see Chapter 7 for a discussion of external funds). Similarly, although it would be manageable without substantial harm for some countries—most especially those rife with corruption—a diversion of funds from other consumption and administrative expenditure categories probably cannot be expected in support of higher spending on education.

For the purposes of the analysis here, however, incremental education costs were taken proportionately from all other categories, including health. Doing so offered an opportunity to make clear that almost any reallocation of funds has potential costs as well as benefits. What, for example, might be the health implications of such sharing in additional education funding? The analysis with IFs suggests that, even with outside donors paying for part of the increase, a proportional diversion of government funds from other uses to education in sub-Saharan Africa could cost, on average across the continent, up to 0.4 years of life expectancy for a period of about ten years, definitely a significant cost.[9] That reduction, however, probably overstates the impact of fund diversion because education itself has a significant impact on health improvement, which this strictly economic assessment does not include. A later section will correct this estimate by adding that direct beneficial impact of education for health back into the analysis.

Education and economic distribution within societies

Although education almost certainly enhances the economic well-being of the average individual attaining it and improves the overall performance of an economy, albeit with long lags, its impact on social inequality is less clear-cut (Hannum and

It takes longer (about two generations rather than one) for incremental government revenues to exceed the incremental investment in education.

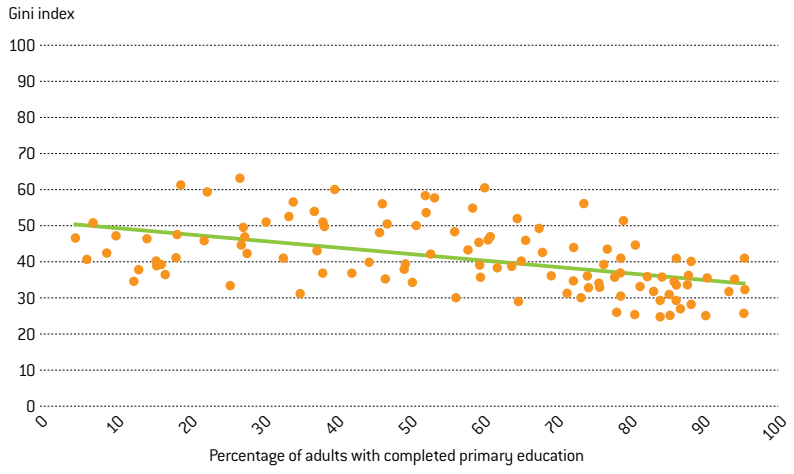
The expansion of education—and particularly the movement toward UPE—tends to spread education attainment more equally across society.

The accelerated advance of education appears to reduce income disparities across countries.

Buchmann 2006: 507–517). Logically, that impact depends heavily on the distribution of education attainment in the society as a whole. Perversely, raising education attainment could simply open new levels of advancement to an elite and further concentrate economic opportunities. For instance, it is reasonable to assume that, when starting from extremely low rates of participation in education at any level, expanding it to what are then a select few would actually increase inequality. Only above a threshold would further expansion decrease inequality of educational attainment again.

More often, the expansion of education, particularly the movement toward universal education, tends to spread education attainment more equally across society (leaving aside whether or not advances in education equality automatically improve social equality). Cross-nationally, the curve that relates average years of education to the Gini coefficient for education in societies (higher values of Gini being less egalitarian) is quite steeply downward-sloping (World Bank 2000: 60). Longitudinal analysis of select countries also shows decreases in inequality of education with expansion of education access. Thus, we can reasonably expect that, in almost all cases, the normative scenario will improve the distribution of education relative to the base case by increasing average attainment levels.

Figure 8.1 Relationship between extent of primary education and Gini index of income distribution



*Note: Equation: y = 51.1478 – 0.1821 * (x); R-squared = 0.26*

Source: IFs Version 6.12 using UIS and WDI data (most recent by country).

Does the distribution of education affect the distribution of income? Figure 8.1 suggests that it may, by showing the cross-sectional relationship between the portion of a society's adult population that has completed primary education (higher percentages again indicating greater equality of education) and the Gini coefficient for income of the country. As one might expect, income inequality declines most clearly with the approach of universality.

Because GDP per capita is highly correlated with the extent of primary education and significantly (and inversely) correlated with income inequality, the relationship in Figure 8.1 could be spurious (that is, higher income could lead to both greater education and greater equality). Controlling for GDP per capita suggests, however, that the relationship remains.

Greater education in a population has other social benefits that can either flow from improved income distribution or be more direct. For instance, Kunst and Mackenbach (1994) found that the inequalities in mortality of the United States, France, and Italy were about twice as large as those in the Netherlands, Sweden, Denmark, and Norway and that the inequality in access to education partially explained the differential. Taking the analysis still further, Woolf et al. (2007) found that elimination of education-associated mortality differences in the United States could avert about eight times as many deaths as medical advances did in the 1996–2002 period. The path between improved education and health, long recognized to be quite powerful, may run in part through the distribution of income or may be directly linked to healthier behavior patterns that are at least partially independent of income.

Education and economic distribution across societies

Education advance affects not only the domestic distribution of income but also its global distribution because of the relatively greater improvement it makes in the GDP per capita of low-income regions. Figure 8.2 shows for the base case the steady decline of global income inequality that logically follows from the forecasted continued economic growth per capita in China, India, and other large, emerging countries in excess of that in North America and Western Europe. The normative

scenario reduces global Gini in 2060 by an additional 0.02 points on the 0–1 scale used in Figure 8.2. The Gini displayed is across peoples, taking into account intracountry distributions, not just country averages.

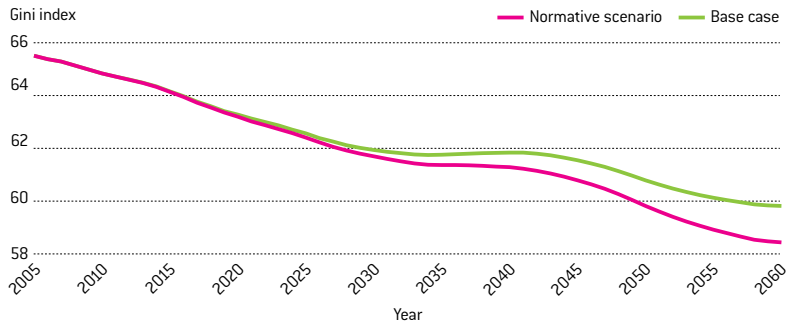
Even though the global Gini has begun to decline after years of advance, the income ratio between the very richest and very poorest peoples of the world has continued to grow for at least two centuries, and in the base case, it continues to grow until after 2040. Figure 8.3 shows that in the normative scenario, that ratio could begin to decline relative to the base case by about 2020 and more significantly by 2040. That relative pattern again reflects the approximately one- to two-generation time difference in many aspects of the base case and normative scenario because the normative scenario advances the education transition by roughly that amount of time.

Global poverty

The first volume in this series, *Reducing Global Poverty* (Hughes et al. 2008), explored the future of global poverty in detail. The portion of people in the world who live in extreme poverty (with an income of less than $1 per day) has been falling because incomes have been rising. The decline in extreme poverty in sub-Saharan Africa has been slower than targeted by the Millennium Development Goals, which called for cutting the poverty rate in half between 1990 and 2015—in fact, the absolute number of those living in poverty there has long increased. In contrast, the decline in China has significantly exceeded the target. The base case of IFs shows mostly similar worldwide patterns going forward, except that the numbers of poor in sub-Saharan Africa should actually decline because of growth expectations that exceed historical ones and slowing population growth. *Reducing Global Poverty* concluded that a faster advance in education attainment could increase the rate of poverty's reduction.

In 2060 in the normative education scenario of this volume, 50 million fewer people in the Least Developed Countries of the world suffer extreme poverty, defined as income of less than $1 per day, as compared to the base case (see Figure 8.4). Across sub-Saharan Africa, the reduction is about 70 million. Globally, nearly 200 million fewer individuals are living on less

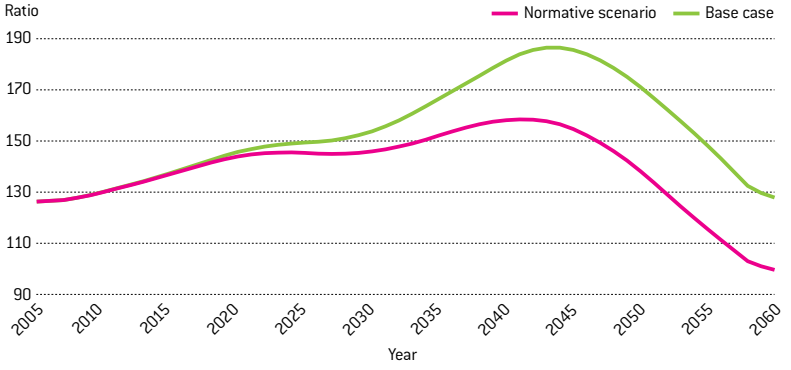
Figure 8.2 Global Gini index of income distribution: Normative scenario relative to base case



Note: Values are 5-year moving averages; the bulge in midyears reflects the impact of higher energy prices in the peak-oil years of the IFs energy model and resultant deterioration in global income distribution.

Source: IFs Version 6.12.

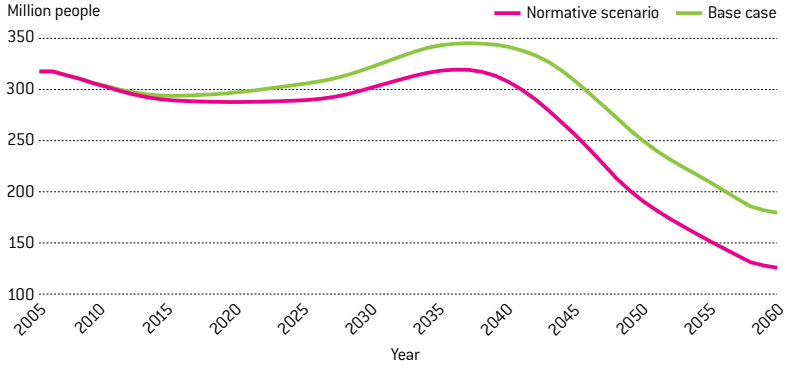
Figure 8.3 Global income ratio of the richest and poorest 10 percent of individuals: Normative scenario relative to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

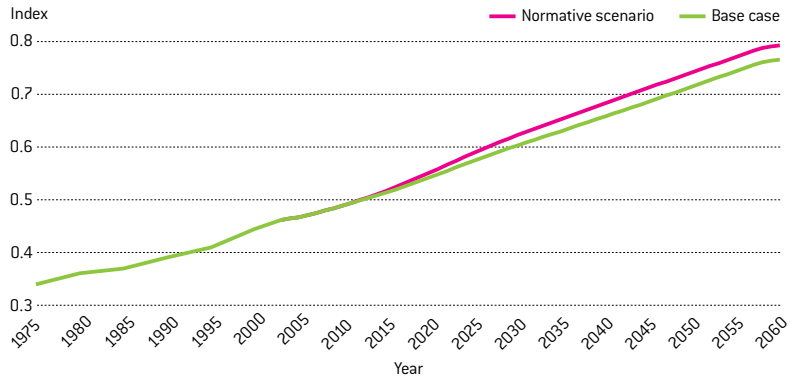
Figure 8.4 People (millions) in Least Developed Countries living on less than $1 per day: Normative scenario compared to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Figure 8.5 Path of the Human Development Index in Least Developed Countries: Normative scenario relative to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Relative to the base case, in the normative scenario 50 million fewer people in the Least Developed Countries of the world suffer extreme poverty in 2060.

than $2 per day, including 35 million in South and West Asia. (The tables at the back of this volume provide much more information on the future of poverty by region and country.)

Figure 8.5 compares the Human Development Index of the United Nations Development Program (UNDP) across the two scenarios. That measure of human capabilities combines data on education, health, and income. The normative scenario could provide a significant boost to its values in LDCs relative to an already rapidly improving pattern in the base case.

Education and Demographics

Just as education has a direct impact on economic productivity and growth, it also has a direct impact on fertility and life expectancy, the key drivers of demographic change. And just as education has an additional and indirect impact on economic growth via its links through demography, education's linkages to economic change further shape its longer-term impact on demography. In short, the complex relationships within human development across education, economic, and demographic systems are messy. In this section, we first review what we know about how education helps shape fertility and mortality. Then we will look at the overall impact of the normative scenario on population.

Fertility

Evidence of the existence of a strong relationship between increasing education, particularly of women, and lower fertility is incontrovertible. The fundamental logic of the relationship between education's advance and fertility reduction at the micro level seems powerful. Easterlin (1961) and Becker (1973 and 1974) emphasized economic arguments: as education increases and brings a variety of opportunities for individuals and households, the costs of childbearing rise relative to the benefits of limiting or foregoing it. Castro-Martín and Juárez (1994) elaborated the microlevel elements in terms of changes as a result of education in (1) knowledge, (2) opportunities, and (3) worldviews and values.

At the macro level, the cross-sectional and longitudinal evidence seems overwhelming. The identification and elaboration of that relationship go back at least to Notestein (1945), who provided the modern formulation of the demographic transition and saw its relationship to education, urbanization, industrialization, and other aspects of modernization more generally. Yet in spite of the long attention given to it, the exact nature of the relationship and the patterns of causality are extremely complex and by no means fully understood. Statistically, a key problem is multicolinearity—when multiple variables are highly correlated, small changes in the dataset can quickly shift the apparent ranking of their importance and the apparent direction of causality. More qualitatively and theoretically, the sequencing and causal patterns of such dynamic multivariate systems are likely to be subject to variation over time and space, making precise statements of cause and effect impossible.

What, then, can be said concretely about the patterns in the relationship between education and fertility that can help us in developing forecasting formulations? A very large literature, including a significant series of expert studies organized by the United Nations Population Division (2002), has teased out insights. Among them are:

- Secondary education seems particularly important. Hannum and Buchmann (2006: 516) found "that a 10 percent expansion in primary gross enrollment ratios leads to an average reduction in the total fertility rate of 0.1 children; the corresponding increase in secondary enrollment ratios is associated with a reduction of 0.2 children."

- Primary education has a less clear-cut relationship with fertility reduction, and studies seem mixed. The United Nations Population Division (2003: 21) reported that in some countries, early ages of marriage, sexual activity, and first birth have been higher in populations with some primary education, but are consistently and substantially lower in those with secondary education. Diamond, Newby, and Varle (1999) reviewed and explored the relationships of different education levels to fertility and found that earlier conclusions suggesting some primary education might actually increase fertility no longer hold up well.[10]
- Breadth of access to education, or the development of "mass education," appears especially important. John Caldwell (1980: 249) found that breadth of access is more important than extent of education. Even the advent of universal education requirements seems to begin a process of cultural change. The United Nations Population Division (2002: 143) found that in many countries, even when at a macro level more education is related to lower fertility, fertility "declined fastest among women with no education." Male education is important as well as female education (Castro-Martín and Juárez 1994).

Figure 8.6 shows the cross-sectional relationship between the average years of education of adult female populations fifteen years of age and older and fertility rate. As indicated earlier, other measures of education attainment, including the portion of women or men who have completed primary education or secondary education, also correlate strongly with reductions in fertility. The analysis of the IFs project found that other and more specific measures do not, however, enhance statistical explanatory power relative to average years of female education; moreover, average years has strong, long-term forecasting power because it encompasses transitions across primary, secondary, and even tertiary education. Hence, our analysis uses it.

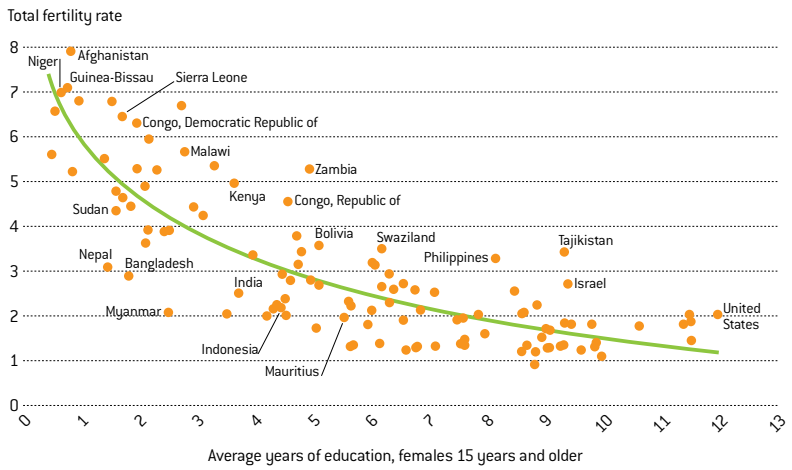
Figure 8.6 also suggests one of the complications of forecasting based on such a relationship. It is obvious that a significant number of sub-Saharan African countries, including the two Congos, Kenya, Rwanda, Sierra Leone, and Uganda, populate the upper left-hand corner of the distribution, falling above the regression line. It may be that cultural values and mores have slowed the pace of the fertility reduction transition relative to what education levels would suggest. Or it may be that the onset of rapid fertility change has been delayed, as has been the case in many other countries that subsequently experienced an especially rapid decline. The infant mortality levels of these countries, an important determinant of onset, are still the highest in the world, ranging from 80 to 160 deaths per thousand in 2005. The forecasting formulation, as is the general pattern in the IFs system of models, protects the initial conditions but assumes that there will be convergence of such countries toward the general tendency over time.

Many other variables clearly affect fertility. In formulating the relationship for IFs, it was found that GDP per capita at PPP did not add significantly to the power of education alone (although its correlation is not much lower). It was found that contraception use rates do, however, make an independent incremental contribution—in addition to the likely path from education to fertility reduction via contraception use—and raise the overall adjusted R-squared to 0.77. Because the literature also suggests the importance of the availability and use of modern

Evidence of the existence of a strong relationship between increasing education, particularly of women, and lower fertility is incontrovertible.

The nature of the education-fertility relationship is complex and by no means fully understood.

Figure 8.6 Total fertility rate as a function of average adult female education years



*Note: Equation: y = 5.9471 – 0.1821 * (x); R-squared = 0.71*

Source: IFs Version 6.12 using WDI and Barro and Lee (2001) data (most recent by country).

Analysis of the impact of education on mortality emphasizes different issues and paths in developed and developing countries.

contraceptive techniques among proximate factors, contraceptive use is included in the IFs formulation.

Figure 8.7 shows the resultant forecasts of total fertility rates in the three education subgroupings of sub-Saharan Africa, the region of clearly greatest impact, in the base case and normative scenario. The acceleration of decline in the normative scenario takes time to appear; a formulation driven only by the education attainment of women aged fifteen to forty-nine (instead of all women, as currently in IFs) would somewhat accelerate the onset of decline and would have a commonsense basis. The impact of the normative scenario is considerably greater in the low-education (and highest-fertility) grouping, but it also is clearly apparent in the middle-education grouping.

Health and mortality

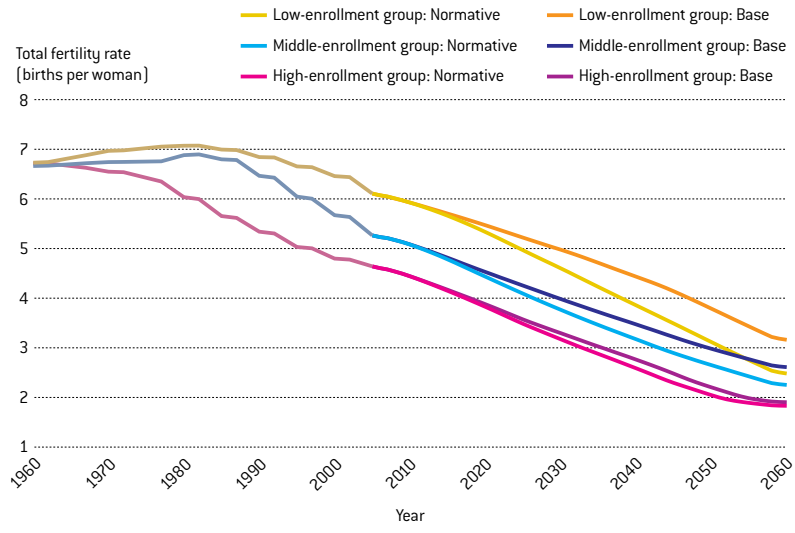
Mortality reduction is the other half of the demographic transition, complementing and, in terms of onset, typically preceding fertility reduction.[11] Elaborating the process of mortality reduction, Omran (2001) developed in 1971 the original explication of the epidemiological transition (the progression from high to low mortality rates in association with the movement from infectious to degenerative disease as the primary causes of death). He emphasized (2001: 167) that a "vast array of social, economic, and demographic" factors shape the transition, but he did not draw any special attention to education. Research since that time has substantiated the importance of education attainment in reducing mortality or, stated more positively, increasing life expectancy. Caldwell (1989) identified a range of micro evidence that individual parental education, especially of the mother, reduces infant and child mortality, as well as macro evidence on the impact of education on mortality.

An analysis of the impact of education on mortality emphasizes different issues and paths in developed and developing countries because their patterns of mortality are so different. In high-income countries generally, education differentials seem particularly important with respect to cardiovascular disease (United Nations Population Division 2003: 36). Case (2006: 272-273) reported findings that "each additional year of schooling for men in the United States is associated with an 8% reduction in mortality, a result consistent with those found in many European countries" and that "in 1960, an additional year of education increased life expectancy at age thirty-five by as much as 1.7 years."[12]

In developing countries, the focus of attention has been overwhelmingly on the impact of education on maternal and child mortality. Omran (2001: 165) emphasized, back in 1971, that maternal and child mortality are central to the epidemiological transition. Caldwell (1989: 103) made the strong assertion that "there is little doubt that mortality levels close to those of the industrialized countries can be achieved within two decades if nearly all children are educated through elementary school." He further argued (Caldwell 1990) that education usually has more impact on mortality than does access to medical services, income, or nutritional levels. And he cited a UN study finding that, after controlling for other variables, an additional year of education for a mother reduces child mortality by 3.4 percent (Caldwell 1993: 128).[13]

There are not only direct linkages of education to health (such as mothers being able to read informational materials and improve behavioral choices) but also important

Figure 8.7 Fertility in sub-Saharan Africa country groups by primary enrollment rates: Normative scenario relative to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12 using UIS and WDI data and IFs base case and normative scenario.

further linkages to economic growth and income, which in turn affect health in a positive feedback loop. Bloom and Canning (2005: 2) noted that "health improvements can influence the pace of income growth via their effects on labor market participation, worker productivity, investments in human capital, savings, fertility, and population age structure," and they pointed to a large literature on the positive impact of health on economic productivity and growth. E. Jamison, D. Jamison, and Hanushek (2006: 21) observed that "improved education levels and improved health conditions each account for perhaps 10–15 percent of economic growth in the later decades of the 20th century" (see also López-Casanovas, Rivera, and Currais 2005).

Much economic literature on the drivers of productivity growth emphasizes the importance of research and development to technological advance. That suggests still another path via which education might affect health, namely, the relationship between tertiary education and the advance of health-related knowledge and practices, including new technologies for treatment.

Given the research around the impacts of education, income, and technology on mortality, it is not surprising that three key distal or indirect factors drive the mortality forecasting model of the World Health Organization's Global Burden of Disease (GBD) project: "(1) average income per capita, measured as gross domestic product (GDP) per capita; (2) the average number of years of schooling in adults, referred to as 'human capital'; and (3) time, a proxy measure for the impact of technological change on health status" (Mathers and Loncar 2006: 2013).

The GBD analysts, though understanding that proximate or immediate factors (such as a bacterial infection and treatment for the infection) truly determine health outcomes, also found that the three distal drivers correlate highly with such proximate factors and thus the outcomes themselves. The GBD model represents the relationship between the three drivers and mortality for each age-cohort, sex, and cause group in their analysis.[14] The IFs project has completed the initial implementation of a health model that replicates the GBD distal-driver approach and that will be used for the third volume in this series. Because of the linkage of education to health in that distal-driver formulation, the IFs model can already estimate the mortality reduction or life expectancy expansion associated with the normative education scenario.

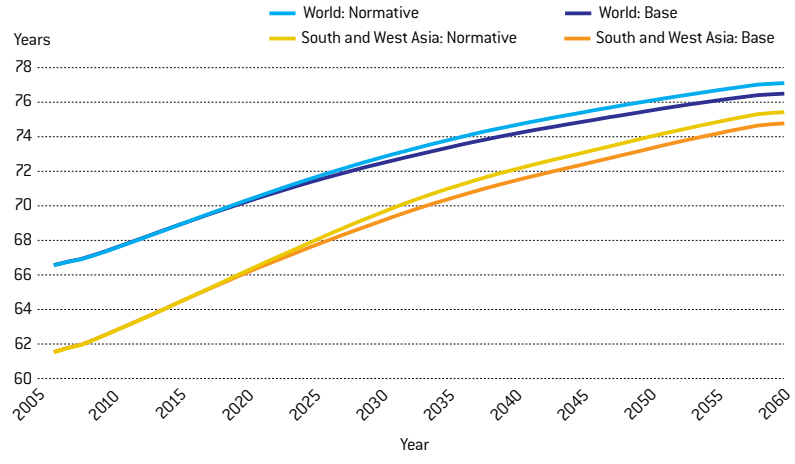
Figure 8.8 shows comparative forecasts of life expectancy in the world and in South and West Asia as an illustrative region across the base case and normative scenario.

Globally, the incremental life expectancy in the normative scenario is about 0.2 years already by 2030, and it grows to about 0.5 years by 2060. In South and West Asia, the increment is 0.3 years in 2030, increasing to more than 0.5 years in 2060. Focusing on this high-population region, it is possible to gain some sense of the monetary payoff of education in terms of improved health. A rough estimate of life-years saved in the region over the thirty years from 2030 through 2060 is 200 million (the numbers before 2030 are much smaller).[15] Following common practice in cost-benefit analysis and valuing those life-years at an embarrassingly low level of $10,000 (approximately the likely GDP per capita at PPP at the midpoint of the analysis range in 2045) yields a monetary value of $2,000 billion for the additional life-years in the normative scenario. The cumulative incremental spending of the region on education in the normative scenario through 2060 would

In developing countries, the focus of attention has been overwhelmingly on the impact of education on maternal and child health.

Incremental life expectancy in the normative scenario grows to about 0.5 years by 2060.

Figure 8.8 Life expectancy in world and in South and West Asia: Normative scenario relative to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

The population-reducing effects of fertility change are much larger than the population-increasing effects of mortality change.

The population of sub-Saharan Africa is 150 million lower in 2060 in the normative scenario, which is about 8 percent less than in the base case.

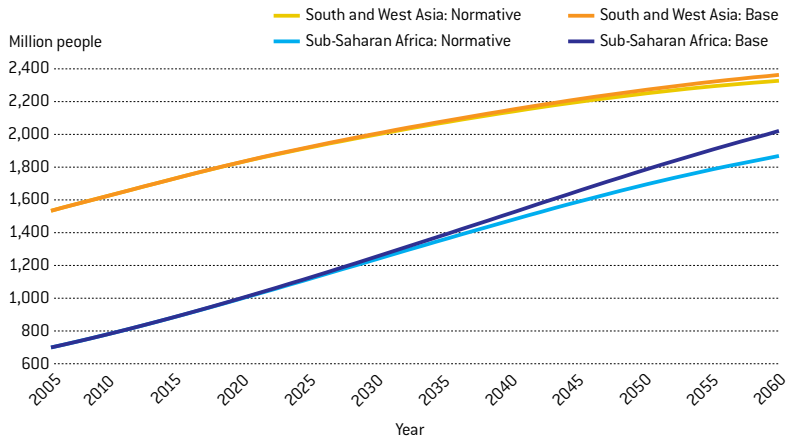
be $3,100 billion (without discounting). Thus, the payoff to investment in education in terms of reduced mortality from 2030 to 2060 alone (not even including the reduced mortality before 2030 or the reduced morbidity across the period) would seem to be close to 65 percent of the cost of the incremental investment of the normative scenario. That is a tidy bonus to put on top of the direct economic return calculated in Table 8.2.

The impact of the normative scenario is somewhat higher for sub-Saharan Africa, where the incremental life expectancy is 0.6 years by 2030 and 1.1 years by 2060. In general, there is some saturation in gains in life expectancy over time, so the higher the life expectancy of a region, the lower the impact. By 2060, the gain for Latin America is 0.2 years, and that for East Asia and the Pacific (Poorer) is 0.1 years.

Population effects in combination

The fertility and mortality effects of education's advance in the normative scenario relative to the base case affect total population in different directions, but the population-reducing effects of fertility change greatly overshadow the population-increasing effects of mortality change. Figure 8.9 shows the resultant population forecasts. The implications of the normative scenario are the greatest in sub-Saharan Africa and somewhat less pronounced in South and West Asia, and they are not significant in other regions.

Figure 8.9 Population in sub-Saharan Africa and South and West Asia: Normative scenario relative to base case



Source: IFs Version 6.12.

The population of sub-Saharan Africa is 150 million lower in 2060 in the normative scenario, or about 8 percent less than in the base case (1,873 million instead of 2,026 million). The reduction in the current low primary enrollment countries is 71 million, or 11 percent of the base case; the middle-education country set has a larger population, and the reduction there would be 66 million. In other words, population reduction itself would also further facilitate the process of educating African youth by reducing the overall demand for resources relative to constrained supply.

As discussed in Chapter 7, the normative scenario also affects the age distribution of the population, especially in sub-Saharan Africa. The portion of the population there under fifteen falls even in the base case from 44 percent in 2005 to 27.5 percent in 2060, a decline that will effectively move the continent past the demographic phase of greatest challenge to education systems. The acceleration of education in the normative scenario reduces the youth share another 2.5 percentage points by 2060, a positive feedback loop that further assists the demographic and education transitions. In combination with a relatively unchanged population share above age sixty-five in the normative scenario (up only about 0.6 percentage points), this reduction provides Africa with some further "demographic dividend" in the form of a proportionately larger working-age population.

A slightly different way of looking at dependency burdens involves considering the youth bulge. The threshold for a youth bulge is variously determined among scholars, but according to one common definition, such a bulge exists when the population between fifteen and twenty-nine years of age exceeds 40 percent of the total population (Cincotta, Engelman, and Anastasion 2003: 43). Such high proportions of young people can create many social problems, including difficulty in providing adequate employment for new entrants to the labor pool and the political and social instability often associated with large numbers of unemployed young males. Sub-Saharan Africa in the aggregate currently suffers a youth bulge that promises to persist well into the twenty-first century. South and West Asia has one that is likely to disappear formally by about 2013,

followed by a rapid drop in that age category through the forecast horizon. The normative scenario would likely eliminate the youth bulge of sub-Saharan Africa only slightly faster than does the base case.

Education and Sociopolitical Change

Although the preceding discussion stressed the marginal impacts of the normative scenario on economic and demographic change, we should not lose sight of the more fundamental and wide-ranging implications of the education transition that the base case itself represents. Neither the sustained and extraordinarily rapid global economic growth of the last two centuries nor the human demographic transition, with its rapid bulge of population growth in the face of mortality decline and now falling fertility, could have played out in the absence of a close interaction with the spread of mass basic education, adult literacy, and now increasingly advanced education.

The story is the same with respect to broader sociopolitical change. Education shapes an understanding of the world, affects values, and therefore alters human behavior. Such impacts cannot help but dramatically affect the ways in which humans interact with each other and organize their social institutions. Culture involves ideas, beliefs, and values as well as social practices and relationships and, most broadly, the informal and formal institutions that build upon and perpetuate these. Thus, education fundamentally shapes culture, even as culture shapes education.

In much of the high-income, Western world, this mutual shaping and reshaping may appear to mean the maintenance and transmission of relatively slowly evolving cultures (although reflection on even the last two generations of change in North America and Western Europe might call into question such a characterization). In much of the developing world, however, there is no doubt that education, in combination with economic and demographic change, is involved in a revolutionary reshaping of traditional cultures. Caldwell (1980) argued that the adoption of Western mass education throughout the world transforms cultures, beginning—when children are sent outside the home for education—with the restructuring of family relationships from those dependent on largely self-sufficient family production to those that integrate the family with an external economy and continuing with transformations of fertility and understandings of gender roles.

In this discussion, we do not seek to elaborate the depth and breadth of such transformative processes. Our focus is again on the marginal implications of the normative education scenario, not on the massive change already associated with the base case. We therefore consider a select few more easily measurable manifestations of the impact of education, including processes of democratization and other aspects of governance. Table 8.3 provides context for the discussion by showing the strength of cross-sectional relationships of assorted socioeconomic variables with both GDP per capita at purchasing power parity and years of education attainment by the adult population fifteen years of age and older.

The resulting age distribution of sub-Saharan Africa's population would provide a "demographic dividend" to the region.

Education shapes an understanding of the world, affects values, and therefore alters human behavior.

Democratization

Social scientists who have looked at the influence of education on sociopolitical systems have paid special attention to its role in support of democratization since at least the time when John Dewey (1916) wrote *Democracy and Education: An Introduction to the Philosophy of Education*. In another classic statement on the important relationship, Seymour Martin Lipset (1959: 80) wrote, "If we cannot say that a 'high' level of education is a sufficient condition for democracy, the available evidence does suggest that it comes close to being a necessary condition."[16]

Table 8.3 Relationships of sociopolitical variables with GDP per capita at PPP and years of education (R-squared)

	GDP per capita at PPP	Education years at age 15+	Together
Freedom (Freedom House)	0.30 (log)	0.33 (lin)	0.42
Democracy (Polity Project)	0.29 (log)	0.36 (lin)	0.42
Government effectiveness (World Bank)	0.72 (log)	0.58 (lin)	0.78
Corruption (World Bank)	0.75 (lin)	0.53 (lin)	0.83
Corruption (Transparency International)	0.82 (lin)	0.51 (lin)	0.83
State failure (Fund for Peace)	0.74 (lin)	0.57 (lin)	0.79

Note: Data analysis with IFs using most recent data from organizations indicated, with elaboration in the text; (log) refers to logarithmic relationships and (lin) to linear ones; the relationships in the table structure those in the model.

Source: IFs Version 6.12.

A cross-sectional relationship exists between the education attainment of societies and the extent of democracy, but the relationship appears especially complex.

Once again, however, the existence of a cross-sectional relationship between the education attainment levels of societies and the extent of democracy—a relationship that no one questions—does not prove causality. Much less does it help us understand the details of possible causal dynamics, including the level or type of education that might most enhance processes of democratization.

In the attempt to unravel the relationship and give it theoretical content, early studies tended to emphasize mass education and literacy (Lipset 1959; Cutright 1969), often in the spirit of modernization theory more generally. This is partially satisfying because educated individuals do tend to be better informed and more politically active. Yet mass education at lower levels also serves a socialization and homogenization function; Durkheim (1956), Green and Preston (2001), and Kornhauser (1959) documented well the potential downsides of politics in mass society, including the ability of elites to mobilize publics in support of Nazism and totalitarian communism.[17]

More contemporary analysis tends to take an institutional perspective in which education is seen as an integral part of a broad and complicated "social and political construction of society" (Hannum and Buchmann 2006: 518). For instance, variations in the manner in which the highly educated are brought (or not brought) into political systems can affect their support for existing systems. Glaeser, Ponzetto, and Shleifer (2007: 3–4) pointed to the vital role of universities and their students from Oxford, Bologna, Paris, and Wittenberg (where students supported Martin Luther) in the Middle Ages, through the overthrow of Juan Perón in Argentina and the Hungarian Revolution, to the widespread student riots in 1967 and the Tiananmen student uprising in the China of 1989. Still more recently, the pictures of Pakistani lawyers in their suits protesting in the streets from 2007 to 2009 impressed peoples around the world with the power of an educated and at least potential elite.

Just as the perspectives of general publics with primary or lower secondary education are not always democratic, the activism of the highly educated is, of course, not always supportive of democracy either, and the empirical work of Acemoglu et al. (2004) questioned the causality of the education-to-democracy relationship. In the literature that does support a primarily positive impact of education, some of the theoretical elaboration of the relationship emphasizes the importance of cognitive growth (Inglehart and Welzel 2005: 37) and therefore the greater understanding of the virtues of majority rule and of the protection of minorities.

Understanding that multiple factors determine social change, the IFs project looked not just to levels of education attainment in societies as a driver of change in democracy level but also to GDP per capita at PPP because that variable serves as a proxy for income level, which in turn strongly correlates with nearly all aspects of social change (Hughes 2001). Table 8.3 showed that GDP per capita by itself has a logarithmic relationship (R-squared of 0.30) with a measure of freedom/democracy built from the sum of the two individual measures of Freedom House (Gwartney et al. 2007).[18] The relationship using the Polity Project's measure of democracy is nearly identical. The variable for education years at age fifteen has a linear relationship with both measures of democracy. Income and education together are both significant and raise the R-squared.[19] The IFs formulations for forecasting build on these relationships.

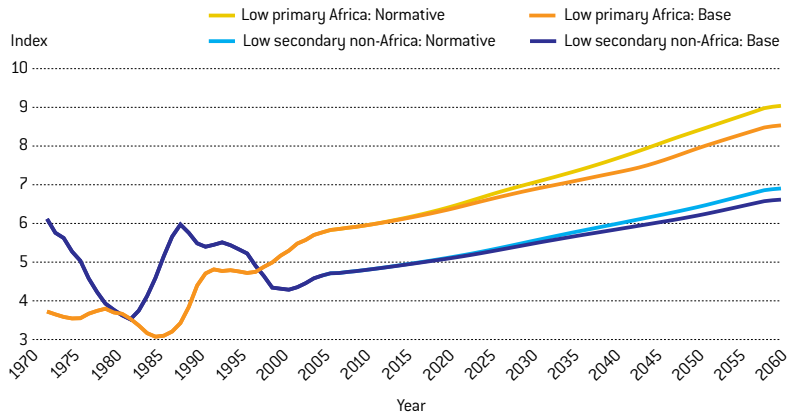
The countries where education advance in the base case and the normative scenario is likely to be the greatest are typically the countries with the lowest current levels of democracy. Figure 8.10 thus focuses on two groupings to which we have returned throughout this volume, namely, the countries of sub-Saharan Africa with the lowest levels of primary enrollment in 2005 and the countries outside Africa with the lowest levels of enrollment at the secondary level in 2005 (see Tables 3.4 and 3.5 for country groupings).

The historical series conveys the great fluctuations in level of democratization over time in the two sets of countries and thereby suggests the difficulty in forecasting future values. Countries with historically high political instability populate both of these country sets. Since the late 1970s, democracy has advanced somewhat in the low primary enrollment countries of Africa, but it has faltered in the

low secondary enrollment countries globally. Among the reasons for complex patterns historically are the domestic turmoil in many countries and also the regional and global waves of democratization (Huntington 1991); the recent wave of democratization in Africa is apparent in the 1990s.

Figure 8.10 therefore shows not so much a forecast of democracy ("freedom," in the terminology of Freedom House) in the base case and normative scenario but instead a crude general tendency based on the two driving variables. Upward movement of democracy is likely, on average, with continued education advance and income growth. For our purposes, it is especially important that the model formulations suggest that in 2060, the African set of countries could, again on average, be about 0.5 points more democratic in the normative scenario than in the base case (on a z14-point scale) and the non-African countries could be about 0.3 points more democratic (see also Appiah and McMahon 2002). These potential gains may be small, but they have real value that we cannot easily monetize—for example, democracies, with much else being equal, tend to be more peaceful and less likely to abuse their own citizenry (Oneal and Russett 1999).

Figure 8.10 Extent of freedom in selected regions: Normative scenario relative to base case



Note: Values are 5-year moving averages.

Source: IFs Version 6.12 using historical data from Freedom House and IFs base case and normative scenario.

Government effectiveness and corruption

The World Bank's Governance Indicators Project (Kaufmann, Kraay, and Mastruzzi 2007) emphasizes the richness of variation in governance by organizing data on six interacting and overlapping indices/dimensions. They are:[20]

1. Voice and accountability (similar to the measures of democracy and autocracy from the Polity Project and the measure of freedom from Freedom House)
2. Political instability and violence
3. Government effectiveness
4. Regulatory quality
5. Rule of law
6. Control of corruption (similar to the corruption perceptions index of Transparency International, to be discussed later)

Education attainment is quite strongly correlated with each of these aspects of governance quality. Moreover, the relationships persist after controlling for GDP per capita (see Table 8.3 for two examples). One of the strongest relationships of education attainment is with government effectiveness. As individuals become more educated, they at least have the potential to provide more effective governance, an insight that the Confucian tradition in China has perhaps carried forward into modern Chinese culture societies, even authoritarian ones. Moreover, as citizens become more educated, they should be in a position to, and be motivated to, demand more effective governance. The relationship is presumably bidirectional—more effective governments will provide more, and hopefully better, education and health care. Figure 8.11 shows the relationship between education attainment and government effectiveness and does, indeed, find it to be quite strong.

Generally, democracy is likely to increase with continued education advance and income growth.

The formulation in IFs for forecasting government effectiveness relies upon both GDP per capita at PPP and years of education attainment of those fifteen years of age and older. The combined R-squared for that relationship is a remarkable 0.78. Using the formulation and comparing the values of government effectiveness in sub-Saharan Africa in the base case and the normative education scenario, the aggregate difference for the region by 2060 is about 0.13 points on a 5-point scale. The increase for South and West Asia is 0.14 points, and in Latin America,

Education attainment has a strong relationship with governance quality and especially with government effectiveness.

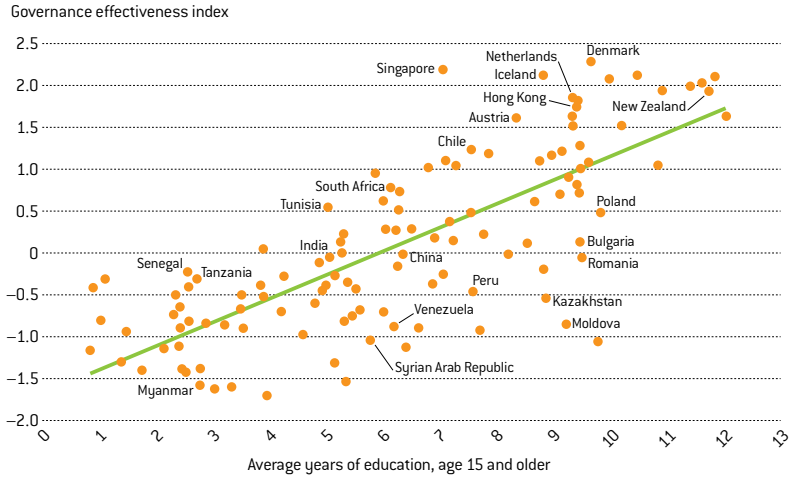
The acceleration of education's advance in the normative scenario is forecast to have a significant impact on government effectiveness.

it is 0.08 points. This is a significant impact of accelerated education in the normative scenario, the full value of which is again nearly impossible to monetize.

Although the World Bank includes a measure of corruption in its set of governance indicators, the Corruption Perceptions Index of Transparency International (Lambsdorff 2003) has become very well-known and is more widely used. Using the CPI, we see that education attainment is highly correlated with reduction in corruption (R-squared of 0.53). However, the correlation of the CPI with GDP per capita at PPP is exceptionally high (R-squared of 0.82), and combining the two drivers of corruption adds minimal additional explained variation (R-squared of 0.83). Thus, the IFs formulation for forecasting corruption relies only on GDP per capita at purchasing power parity.

Still, the importance of education for GDP growth means that education does indirectly influence corruption reduction. Relative to the base case, the normative scenario adds about 0.2 points in 2060 on a 10-point scale to values of transparency (the inverse of corruption) for sub-Saharan Africa, more than 0.3 points for South and West Asia, 0.2 points for Latin America, and nearly 0.1 point for the developing countries of East Asia and the Pacific.

Figure 8.11 Government effectiveness as a function of years of education attainment



*Note: Equation: y = –1.6678 + 0.2812 * (x); R-squared = 0.58*

Source: IFs Version 6.12 using World Bank Indicators and Barro and Lee (2001) data (most recent by country).

State failure

Foreign Policy magazine and the Fund for Peace constructed a failed-state index in terms of vulnerability to violent internal conflict and societal deterioration (a measure that overlaps with several of the World Bank's governance dimensions, including political instability and violence). The index builds on twelve social, economic, political, and military indicators.[21] Figure 8.12 shows the strong negative relationship between the education attainment of societies and their position on the index (that is, education is associated with less state failure). Although the R-squared here is very high, that linking the index and GDP per capita is even higher (0.74). Nonetheless, the combination of the two variables raises the combined adjusted R-squared to 0.79, and both independent variables are significant, suggesting an independent contribution of education attainment.

Some of the statistical outliers in Figure 8.12 (including Tajikistan and Singapore in different quadrants) are the same countries that were outliers in Figure 8.11. Clearly, there are historical path dependencies, reflecting strong elements such as local cultural patterns, ethnicity distributions and relationships, or simply unique historical events, that shape sociopolitical patterns in countries and that may make those patterns resistant to change driven by income, education, or other variables. Nonetheless, the cross-sectional relationships tend to be so strong that they suggest that key dynamic drivers, including education, probably push even outliers along over time (as well as regressing somewhat to the mean).

IFs does not forecast state failure using the Fund for Peace index. The statistical analysis, however, makes it seem highly likely that continued advance in education will contribute to a reduction in the rate of state failure and that the normative scenario would make an incremental difference. Since state failure has extremely painful consequences for citizens, reducing its probability or severity is of great importance.

Still broader impacts of education

Education potentially affects a vast range of other sociopolitical and even broader phenomena. For instance, it has some impact on environmental quality.[22] Smaller but richer

populations in the normative scenario could potentially consume more of many commodities, including energy, water, and food, thereby intensifying stress on the environment. In the IFs forecasts, global energy demand is 1.1 percent higher in 2060 in the normative scenario than in the base case. As usual, the biggest impacts are in sub-Saharan Africa and South and West Asia (up 5.3 percent). The increased energy use has a proportional impact on carbon emissions. The normative scenario does not significantly change the forecast of forest area relative to the base case (a smaller population largely cancels out the effects of the higher-calorie diets of a richer population).

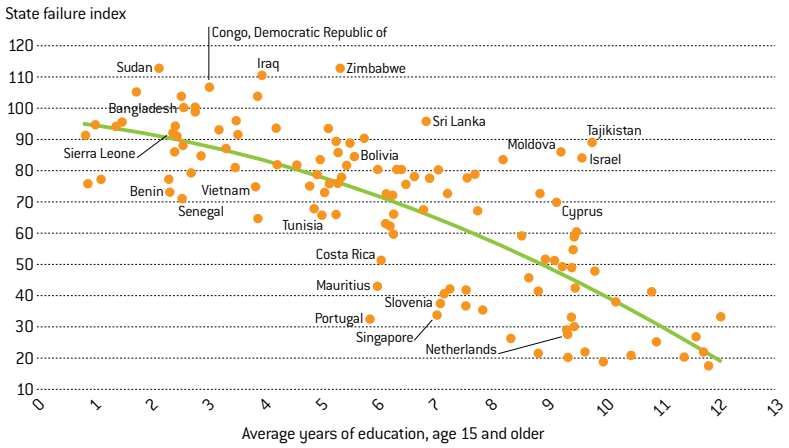
Other environmental variables move in an improved direction with higher education and income. Relative to the base case, access to household water connections in the normative scenario rises 6.5 percentage points in 2060 for sub-Saharan Africa, and access to household sanitation connections rises by 3.7 percentage points. More broadly, richer populations with more sophisticated technologies often find ways to lower their ecological footprints relative to poorer ones. For instance, urban air pollution and untreated waste streams almost always diminish after countries reach middle-income status. In general, we understand there to be indirect effects of education on the environment (especially through higher incomes) and more direct ones (through value change and the advance of technology). The costs and benefits of education's advance in the environmental arena alone would be very difficult to assess in the aggregate and would require extended issue-specific analysis beyond the scope of this volume.

Conclusion

Levels of education attainment in societies correlate strongly with a vast array of important variables in the human development process. It is difficult to know the extent to which those correlations indicate causality, but in a great many cases, good logical and theoretical reasons suggest that some significant part of the correlation does reflect the impact of education on other variables. Looking to the literature and to our own analyses, this chapter considered the magnitude of such potential causality in relationships involving a wide range of economic and sociopolitical variables—economic growth and GDP; fertility and mortality rates (with resultant changes in population size); and several aspects of governance, including democratization, corruption, and overall effectiveness.

We must clearly admit that the complexity of the development process makes understanding, much less modeling, the web of relationships in human development systems a very uncertain process. Yet by incorporating generally conservative estimates of the impact of education into the IFs system of models, we were able to explore a simulated dynamic unfolding of the impact of a normative scenario relative to the base case. With respect to direct economic costs, a fairly traditional cost-benefit analysis suggests that the incremental investment of the normative scenario would pay for itself in terms of higher GDP quite easily before 2060 but that it could take more than twenty to thirty years for some societies to reach the break-even point. Demographic analysis shows that the normative scenario, as well as reducing fertility, adds an increment to life expectancy that, conservatively valued, significantly supplements direct economic returns. Further, education and the higher GDP per capita with which it is associated probably improve performance on a number of key indicators of governance. All of this, of course, is on top of many of the very direct benefits of education to individuals, including the personal satisfaction and freedom of life

Figure 8.12 State failure as a function of education attainment



*Note: Equation: y = 97.0218 – 1.7723 * (x) – 0.3913 * (x^2); R-squared = 0.59 (the value in Table 8.3 differs because it used a linear relationship)*

Source: IFs Version 6.12 using Fund for Peace and Barro and Lee data (most recent country year).

The normative scenario would have a mixture of positive and negative environmental impacts over the time horizon to 2060.

choices that literacy and other educationally acquired capabilities confer.

Improvements as a result of the normative scenario may not appear large relative to an already rapidly advancing base case, but they are clearly significant in terms of enhancement of the human condition. In the case of sub-Saharan Africa and South and West Asia, a continued rapid and even accelerated advance in education offers some of the best hope for diminishing their disadvantage relative to the rest of the world. Our overall conclusion is therefore that societies should actively pursue accelerated education advance, via aggressive but historically reasonable and sustainable rates of enrollment rate growth.

1 Hannum and Buchmann (2006) surveyed research findings relative to various benefits of education for the project on Universal Basic and Secondary Education, and this chapter uses a similar typology. See also United Nations Population Division (2003). McMahon (1999, 2007, and 2009) cast a wide net in identifying and evaluating the impact of education, expanding the reach of cost-benefit analysis. UNESCO (2007a: 23–24) offered a brief introduction to the literature.

2 Hough (1993) reviewed an extensive development literature of such studies into the early 1990s. Woodhall (2004) provided an explication of the methodology and literature review.

3 See McMahon (1999, 2007, and 2009) for efforts to value a broad range of private and public benefits of education. In moving from education outputs to impact, his analysis looked to enrollment rates and education spending rather than years of education attainment. At least partially for that reason (because our lags would be longer), he tended to find somewhat larger, albeit generally comparable, benefits.

4 The analysis in support of this chapter used the integrated, recursive IFs modeling system. Thus, linkages from years of education to multifactor productivity, to fertility, and to the sociopolitical variables were active in both the base case and the normative scenario, as were the linkages from GDP per capita and population back to education (see Chapter 4). Both corruption and government effectiveness (but not level of democracy) also affect economic productivity, providing an additional indirect channel in both scenarios through which education affects economic growth. These linked systems introduce both delays (education attainment levels and demographic change unfold over very long periods) and positive feedbacks (education improves growth, which pushes forward demand for education). In the analysis of the impact of education on life expectancy, however, a new IFs health model was used as a satellite without linkage back to other models.

5 Mingat and Tan (1996) argued that primary education tends to provide the highest social returns to low-income countries, whereas for high-income countries, the greatest returns are to tertiary education. Krueger and Lindahl (2000) suggested differential impacts of investment in education depending on the society's overall current attainment level. Specifically, they argued that an inverted U-shaped curve structures that relationship, with the greatest impact of increments appearing when average levels of adults' education attainment are near 7.5 years.

6 Jamison, Jamison, and Hanushek (2006) also found a relationship between the quality of education and income growth, primarily via the path of technological progress.

7 Jamison, Lau, and Wang (2004: 4) used the Barro and Lee measure of average years of school for males between fifteen and sixty but concluded that the "effect was small." The UNESCO Institute for Statistics (2002: 8) found that each additional year of education in its World Education Indicators country set raised the long-term economic growth rate by 3.7 percent (this value is so high that it is hard to believe the study did not refer to impact on level of GDP instead of growth rate).

8 For detail on the specification within the IFs model system of linkages between education spending and attainment, on one hand, and economic productivity, on the other, see Hughes (2005 and 2007). The production function of IFs is of Cobb-Douglas form with a dynamic representation of the technology or multifactor productivity (MFP) term. Change in the growth of MFP over time is an additive function of four terms: human capital (which carries both education and health elements), social capital (which reflects governance effectiveness and transparency/lack of corruption), physical capital quality (which carries availability of infrastructure), and knowledge (which reflects R&D spending and the adoption of knowledge encouraged by international trade and financial flows). The human capital contributions link education spending and attainment to change in MFP with the parameterization indicated in the text, applying those to the difference between the forecast levels of spending and attainment and the levels expected (from cross-sectional analysis) at the GDP per capita of the country.

9 Modeling of the relationship between spending on health and health outcomes is exceptionally uncertain in IFs and more generally. The numbers here are very rough estimates.

10 This remains an uncertain, contested, and important issue. In private correspondence, McMahon indicated that up to about tenth grade, the health-of-mother effect decreases infant and child mortality and increases population. Our analysis, using years of attainment, does not include such an effect.

11 Attention to disability-adjusted life years (DALYs) and other measures of morbidity (ill health) would broaden this discussion and almost certainly increase the importance of enhanced education in the analysis of health. DALYs are, however, strongly correlated with mortality, and forecasting of them is much less developed, so we restrict the discussion here to mortality.

12 Studying a large Dutch survey, Groot and Maassen van den Brink (2007: 186) concluded that "the implied health returns to education are 1.3–5.8 percent." Shkolnikov et al. (1998) found that each year of additional education in Russia reduced male adult mortality by 9 percent and female mortality by 7 percent.

13 Other analyses have also generally found a clear relationship between education and mortality but qualified the conclusions. Barrera (1990) and Chandola et al. (2006) argued for the importance of public health programs and health policies in interaction with education. Desai and Alva (1998: 71) concluded that "the relationship between maternal education and child health is considerably weaker than is commonly believed" after introducing individual-level and community-level controls, including community of residence (urban versus rural) and various socioeconomic variables.

14 The three groups of causes are Group I (communicable, maternal, perinatal, and nutritional conditions), Group II (noncommunicable diseases), and Group III (injuries).

15 The estimate is an integration of regional deaths over the thirty years (about 500 million) times 0.4 years of foregone life per death. For simplicity, this economic analysis is done without time discounting.

16 Both Hannum and Buchmann (2006) and Acemoglu et al. (2004) provided useful reviews of the literature, explaining linkages between education and democracy.

17 Castelló-Climent (2006) argued that a more egalitarian distribution of education is supportive of democracy.

18 Details on that project and measure, under the direction of Monty G. Marshall, are available at http://www.systemicpeace.org/polity/polity4.htm.

19 There is much evidence that the relationship between income level and democracy is nonlinear and complex, involving an interim range of income across which democracy is often unstable or unconsolidated (Przeworski et al. 1996).

20 In fact, both the Freedom House and the Polity Project have also emphasized the variation in political regimes and used multiple measures.

21 A computerized Conflict Assessment System Tool (CAST) indexes and scans hundreds of thousands of articles and reports for data on the indicators by country. The 2008 overview of the methods and findings is available at http://www.foreignpolicy.com/story/cms.php?story_id=4350. The Fund for Peace describes the CAST system at http://www.fundforpeace.org/web/index.php?option=com_content&task=view&id=102&Itemid=327#2.

22 McMahon (1999) explored some of the complexity of that set of relationships, as well as the linkages to crime and social cohesion.

9

The Future of Global Education

Parents around the world want their children to have education. Overwhelmingly, their support and encouragement, as well as that of broader communities, help make that happen. The result over many generations and across almost all the world has been steadily climbing rates of enrollment and completion at all levels of education and gradually rising levels of adult education attainment, an ongoing global transition in formal education from low to high levels.

The global education transition does not unfold in a vacuum. Growth in global incomes and change in the broader sociopolitical environment have been necessary foundations for the transition; and the transition has, in turn, contributed greatly to change in those systems. Similarly, education and demographics have a close, interactive dynamic. In this volume and in the forecasting system that underlies it, we have attempted to map many of the complex, two-way relationships.

Although we have broken some new ground both in the long-term forecasting of global change in education and in considering that change within the broader context of human development, there is much that we would have liked to do in this volume that we did not. We have been able to give only minimal attention to quality of education, and we are unable to forecast it meaningfully. *Parents not only want their children to have education, they want them to have better education.* And we have focused throughout on transitions in enrollment patterns and not on transformations in education delivery systems or curriculum development and reform. Changing technology and the processes of globalization have laid foundations for potentially very significant changes in the ways education occurs and in its content.

This final chapter provides an opportunity to review what we have learned about the transition and its interaction with larger changes in the human condition, as well as to reflect on where further attention to the future of education might productively take us next.

The number of those in sub-Saharan Africa not completing a primary education will likely fall below 20 percent by 2030.

Female gender gaps at the primary level will have mostly disappeared by 2030, even as male gaps potentially become a growing issue at higher levels.

The Unfolding Enrollment and Attainment Transitions

It is difficult to consider the historical and prospective global sweep of education's advance without some sense of awe with respect to the process now under way. Figures 9.1 and 9.2 convey the possible, even quite likely, progression of education attainment for current students and adult populations. Figure 9.1 shows IFs base case estimations of the lifetime educational prospects of twelve-year-olds (roughly those of age to complete their primary education) in 2005, 2030, and 2060. It indicates first the portions likely not to complete even a primary education. In sub-Saharan Africa in 2005, that number still stood near 50 percent. Our base case forecasts,[1] which we have seen to be somewhat conservative relative to change in the most recent years and optimistic relative to the last fifty years, show that the portion in sub-Saharan Africa not completing primary education could drop to under 20 percent by 2030 and to about 5 percent by 2060. Similarly, the noncompletion rate in South and West Asia is near 30 percent and declining rapidly.

Figure 9.1 also shows explicitly the ongoing progress across the globe at the lower secondary level and therefore in basic education. Globally, in 2005, more than 60 percent of all twelve-year-olds could expect to complete both primary and lower secondary education. By 2030, we anticipate that number will grow to 80 percent globally, reaching 47 percent in sub-Saharan Africa and 85 percent in South and West Asia.

Gender gaps at the primary level will have mostly disappeared by 2030, and in fact, we expect reverse gender gaps to have emerged at both levels of secondary education even in South and West Asia by 2030. The fact that we draw attention in this volume to the likely spread of reverse gender gaps should not in any way suggest that we downplay the critical importance of eliminating the current gender gaps that cause female enrollments to fall below those of males. Given the historical dominance of males in societies around the world, the elimination of these gaps and even the development of some reverse gaps can only begin to address larger and persistent social imbalances. Nonetheless, such reverse gaps are already becoming an issue of importance to societies.

By 2060, it is quite likely that nearly 75 percent of all twelve-year-olds globally may expect to complete upper secondary education, and, in fact, 50 percent may ultimately (although perhaps as older adults) attain tertiary degrees. The tertiary number may be somewhat exaggerated because neither our data nor our forecasts distinguish those who complete multiple tertiary degrees from those who complete only one. Because of our weak understanding of saturation levels and processes (and the complex variations in tertiary degree formats), this volume has emphasized that our tertiary forecasts, even though they build on the experience of current high-income countries, are the most tentative of those that we present. Nonetheless, we have much reason to believe that the advance of higher education will be striking.

Figure 9.2 turns our attention to adults age fifteen and older. (Our database does not distinguish between lower and upper secondary attainment among adults, so our forecasts show only total—effectively upper secondary—attainment.) In contrast to the fewer than 15 percent of twelve-year-olds in 2005 who had not completed primary education globally, the number of adults who had not done so in 2005 is a discouraging 45 percent (and, disturbingly, almost 75 percent in sub-Saharan Africa). In fact, more than 50 percent of female adults worldwide in 2005 never were able to complete that first level. Nearly 80 percent of adults (and more than 80 percent of women) never completed secondary education.

The steady progression of more highly educated young adults into the adult population mix will mean, however, that globally by 2030, the number of individuals without a primary education will likely drop to under 35 percent of the total; the number will fall to 20 percent by 2060. In that year, more than 45 percent of adults globally are likely to have a complete secondary education or more (about 40 percent in South and West Asia and somewhat over 20 percent in sub-Saharan Africa).

We have been able to say much less about quality of education in this volume than we would have liked. We do know, however, that cross-country instruments and systems for assessment of education quality, on the global stage only since 1995, are spreading rapidly.

Figure 9.1 Base case forecast of highest level of education ever completed by those age 12 in 2005, 2030, and 2060

Note: Multiple degrees by some may inflate tertiary percentages; data on completion and graduation rates, used for 2005 values, are not of consistently high quality.

Source: IFs Version 6.12.

By 2060, it is quite likely that nearly 75 percent of all twelve-year-olds globally may expect to complete upper secondary education.

Figure 9.2 Base case forecast of education attainment levels of all adults age 15 and older

Note: Multiple degrees by some may inflate tertiary percentages; IFs does not forecast adult percentages with lower secondary education separately from total secondary.

Source: IFs Version 6.12.

And we know that both higher levels of income and rising levels of education completion tend to go hand in hand with improvements in quality. We thus have much reason to hope that quality enhancements will also progress steadily.

This volume has repeatedly emphasized that unless one-size-fits-all global education goals are set unreasonably low, many countries will inevitably fail to meet them. In truth, such goals essentially set up some countries to be ultimately identified as failures. We add our voices to those who argue that universal basic education should be clearly recognized as a global goal and pursued, but we disagree with the identification of specific target years for all countries. As the next section discusses, targets that focus on realistic rates of progression toward goals, taking into account the broader process of human development, can serve us better.

Education and Broader Human Development

Pestilence, famine, and war could disrupt the steady path of education's advance that the base case of IFs sketches, not just locally but even globally. Humanity has not fully confined to their barracks any of the horsemen of the apocalypse, and extreme consequences of environmental change or simple greed and mismanagement by human leaders and followers (although, as Mark Twain said, we repeat ourselves) could well unleash them.

Short of more catastrophic futures, we have seen that slower economic growth significantly affects societies' ability to advance education participation and attainment. At lower income levels, demand drops and supply is constrained. Across our forecast horizon, 1 percent differences in average economic growth rates have a considerable impact on patterns of transition, especially at the tertiary level.

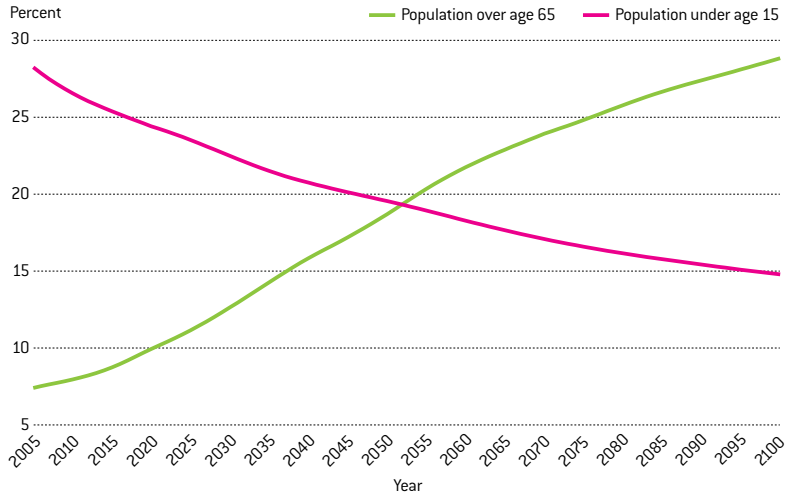
Nonetheless, barring an unfortunate and always very possible disruption of the paths of human advance in coming decades—and even in the face of some fairly significant reduction in global economic growth—many good things should continue to go together. This volume has consistently emphasized the extensive and complex relationships of educational, demographic, economic, and broader sociopolitical change (see, again, Figure 2.1), and we need not review them in detail here.

Although a great many of the relationships are strong, we have especially emphasized the subset between demographics and education. We have done so not just because sizes of population determine the numbers of potential students, because educational attainment levels shape fertility rates and thus population growth, and because the correlations among these forces are strong, but also because a massive global demographic transition has been reshaping the relationships and promises to continue doing so.

Figure 9.3 shows an important element of the worldwide demographic transition across the coming century. The share of population under fifteen years of age is falling steadily. That is true of every UNESCO region, including those with the lowest incomes. The last region to turn from growth to decline of that population segment's share was sub-Saharan Africa in the early 1990s. Although the subsequent decline of share in Africa has only been 2 percent and remains slow compared to that in South and West Asia (which passed its peak of youth population in the late 1960s and has reduced youth share in total population by more than 10 percent), an accelerating decline of youth share has become obvious in much of sub-Saharan Africa. The resultant "demographic dividend" for education (many have explored that concept for the economy as well) is great—the peak youth share of population in the two regions was

The spread of education is receiving a significant "demographic dividend" from a decrease in those fifteen and younger as a proportion of the population.

Figure 9.3 Base case forecast of dependent age categories as percent of total global population



Source: IFs Version 6.12.

However, at the same time, societies face a demographic challenge from an increase in their aging populations.

about 45 and 42 percent, respectively, and those very high levels all but prohibited them from rapid transition to universal primary and lower secondary education.

Figure 9.3 also shows, however, the growing demographic challenge of aging populations. Their share is increasing in all UNESCO regions, and on a global basis, the older population share is growing faster than the younger share is declining, creating a mounting combined level of dependency on working-age populations. But sub-Saharan Africa should benefit through about 2080 (that is, through most of the century) from a more rapid decline in the younger population than growth in the aging segment, as should South and West Asia through about 2040. The consequences of these interacting demographic forces will be felt everywhere, which will both allow education's expansion in many regions and simultaneously put downward pressure on total public education spending, especially in the high-income regions.

Our normative scenario is built on target rates of enrollment growth rather than common temporal targets.

This volume has also explored many other linkages of education to the larger human development system. In our modeling and analysis, GDP per capita as a proxy for income and economic structure has played a foundational role in forecasting education demand, and attainment of education has in turn helped determine the rate of economic productivity growth. In our forecasts, education attainment also clearly (if not always dramatically) affects broader sociopolitical change such as democratization.

Representation of the interaction of these elements of global change allowed elaboration and exploration of a normative scenario in comparison with the base case. Consistent with our belief that universal global goals are valuable but that common temporal targets are mistaken, we based the normative scenario on target rates in enrollment growth at all levels below tertiary, incorporating also the typically S-shaped growth patterns in those target patterns. We identified peak target growth rates for student intake (or transition to higher levels) and survival to final grades that appear, based on historical experience, to be aggressive yet reasonable. This approach, centered on target growth rates, has its own weaknesses, including nonrecognition of sharply different demographic and economic realities across countries, but it is a foundation on which analysts can build. Normative scenario analysis with IFs could also evaluate country-specific target growth rates.

We conclude that benefits of accelerated advance of education build steadily to high levels relative to the costs.

We explored the economic costs of the normative scenario, comparing them with some of the economic benefits of it, and we considered some of the much less easily monetized consequences of more rapid educational advance. Our first conclusion is that the benefits, economic and otherwise, are often quite slow to come, lagging (like adult education attainment) by a generation or two behind increases in enrollment rates. Our second conclusion is that those benefits build steadily to very high levels relative to the costs. We come away convinced that continuing efforts to increase education participation—subject, as always, to caveats concerning appropriate pace, reasonable per-student expenditures, and substantial attention to quality—have great merit. It is time, for instance, for the global community to clearly state the goal of universal basic education and suggest target rates of movement toward it, but without specifying a year by which all countries will achieve it. And it is by no means too early to begin considering the global future of upper secondary education.

Because of demographic pressures, which remain intense now but will continue to ameliorate well into and perhaps through the century, the needs of low-income societies for extra education funding and possible outside assistance will be greatest in the normative scenario over the coming two to three decades. We are now in a period, framed by the expansion of education and still high youth populations, when a "bubble" of incremental funding would be extremely helpful. Some payoffs, including a positive feedback process of further fertility reduction, would begin quite soon. Others, such as higher levels of income, would come more slowly but would be significant. Our estimate, for instance, is that for sub-Saharan Africa as a whole, GDP per capita at PPP could be more than $1,000 higher in 2060 in the normative scenario than the roughly $6,200 we would expect in the base case. Investment now can pay huge dividends.

More generally, we should not accept the credo of modernization theory—that all good things tend to go together—without raising important caveats and concerns. For example,

adults age twenty-five and older in sub-Saharan Africa now have acquired, on average, only 3 years of formal education, about 7 years fewer than adults in Western Europe and North America. In our base case forecast for 2060, adults in Africa will be nearing 7 years of education, but those in the richest countries may have reached 15, a gap of 8 years; even in our normative scenario, that gap will still exceed 6 years. The overall pattern of advance would be wonderful. The continued prospective disadvantage of sub-Saharan Africa and similarly of South and West Asia, however, raises significant concerns about the global distribution of opportunity and well-being. Another half century of such remarkable inequality is a very sad prospect.

Concerns in the high-income world may seem paltry by comparison, but they are nonetheless real. Reductions in per-student public spending on tertiary education as a portion of GDP per capita have largely ceased. Yet tuition fees, and thus private spending, have been increasing. For example, a recent report on higher education finance (SHEEO 2008: 1) found that in the United States, students and their families paid 36 percent of the costs of attending public higher education institutions in fiscal year 2008, compared to 24 percent in the early 1980s. Another report noted that in the 1999–2000 academic year, the net college costs of attendance at a public four-year college or university in the United States were 18 percent of the income of a family in the middle-income quartile; in 2007–2008, that figure had increased to 25 percent of such a family's income (National Center for Public Policy and Higher Education 2008: 8). Increased costs of attendance at private institutions have been even greater. Although education brings so much that is good, it remains expensive, even for the rich.

New Issues and Horizons

In ways we cannot yet fully grasp, information and communication technology is fundamentally reshaping teaching and learning. The transformation of education is coming.[2] Information and communication technology has clearly begun to reshape the foundational patterns of relationships between students and teachers and, more generally, between learners and teaching and learning resources and delivery systems. Can there be a single reader of this volume who has not experienced the power of searching the Web for information? Not just science fiction fans anticipate the day when we will turn to our ambient environment, say "Computer, tell me … ," and thereby initiate a conversation.

In spite of Moore's Law, asserting that ICT power doubles about every two years, the day of such conversations is some distance in the future. And it will be considerably longer still before that conversation partner understands and adapts to our current knowledge level and perhaps even our personality, things that a good teacher always does. Illustrating the gap between prospect and reality that exists even with current technology, a study on ICT in British schools in 2008 reported that only 18 percent of primary schools and 44 percent of secondary schools were connected to high-speed broadband.[3] The $100 personal computer, much less a proposed $20 version for Indian students, still has very low penetration levels in low-income countries. (The increasingly smart mobile phone is, however, advancing much more rapidly up the penetration curve.)

Still, the transformation is coming. Distance education and ICT-enhanced lifelong learning are powerful transformative forces, and they are only in their infancy. We certainly anticipate that education will look strikingly different by 2060 than it does today. Yet for the foreseeable future, quite probably for most or all of our forecast horizon, a significantly traditional formal education structure will likely remain in place, augmented by the rapidly advancing fruits of ICT rather than replaced by them. The strong need to support the quality and capabilities of teachers and formal education structures will remain and even grow. The availability of technologically enhanced education will certainly give ammunition for governments that seek to reduce spending on education and divert it to older populations or other purposes, rather than taking full advantage of technology's development. Those supporting education will need to press for experimentation and innovation.

Another related and powerful transformative force is the general advance of globalization. Higher education is becoming increasingly internationalized in a variety of ways, many

Sadly, despite tremendous absolute gain forecast for sub-Saharan Africa, there is continued prospective relative disadvantage for the region.

And globalization itself is transforming education.

of which have positive potential, such as more emphasis on developing intercultural and global competencies; the creation of new international networks and consortia; the cross-border delivery of collaborative academic programs; and the international movement of students, professors, and researchers (Knight 2008). However, as Knight further noted, there is also widespread concern about risks associated with these endeavors, depending on the motives of those participating in them, the manner in which they are implemented, and the standards to which they adhere.

This volume has not attempted to elaborate and forecast the implications of these transformational processes. The fourth volume in the Patterns of Potential Human Progress series, on building global infrastructure, will return to the development and expansion of knowledge creation and diffusion systems; it will look at their roots in ICT; at research and development; and at elements of education systems, particularly at the tertiary level.

More generally, there are a great many elements of the educational future that we cannot pretend to foresee. What we can be certain of is that the importance of education systems, through whatever transitions and transformations they may pass, will not diminish. Human development depends on them.

1 We have used the processes of data cleaning and filling that Chapter 4 described to make our initial estimates of completion rates and used the full IFs education model in the forecasts.

2 This phrase consciously echoes Kurzweil (2005), who has said that the singularity (a point of exceptionally rapid technological progress tied to the emergence of artificial intelligence) is near and that it will transform society in manifold and fundamental ways.

3 Report on "School's In: Learning for the Twenty-First Century," from the UK Department for Children, Schools, and Families' Beyond the Current Horizons program, available through www.sigmascan.org.

Appendix: Countries by UNESCO Regions

Arab States				
Algeria *	Iraq *	Libyan Arab Jamahiriya *	Palestine	Syrian Arab Republic *
Bahrain	Jordan *	Mauritania *	Qatar	Tunisia *
Djibouti	Kuwait *	Morocco	Saudi Arabia *	United Arab Emirates
Egypt *	Lebanon *	Oman	Sudan *	Yemen

Central and Eastern Europe				
Albania	Czech Republic *	Lithuania	Poland *	Slovakia
Belarus	Estonia	Macedonia, TFYR	Romania *	Slovenia
Bosnia and Herzegovina	Hungary *	Moldova, Rep. of	Russian Federation *	Turkey *
Bulgaria *	Latvia	Montenegro	Serbia	Ukraine
Croatia				

Central Asia				
Armenia	Georgia *	Kyrgyzstan *	Tajikistan	Uzbekistan
Azerbaijan *	Kazakhstan	Mongolia *	Turkmenistan	

East Asia and the Pacific (Poorer Countries)				
Brunei Darussalam	Indonesia *	Malaysia *	Papua New Guinea *	Timor-Leste
Cambodia	*Kiribati*	*Marshall Islands*	Philippines *	Tonga
China *	Korea, Dem. People's Rep. of	Micronesia, Fed. Sts.	Samoa	*Tuvalu*
Cook Islands	Lao PDR *	Myanmar	Solomon Islands	Vanuatu
Fiji *	*Macao*	*Nauru*	Thailand *	Vietnam

East Asia and the Pacific (Richer Countries)				
Australia *	Japan *	Korea, Rep. of	New Zealand *	Singapore *

Latin America and the Caribbean				
Anguilla	Brazil *	Dominican Republic *	Jamaica *	*St. Kitts and Nevis*
Antigua and Barbuda	*British Virgin Islands*	Ecuador *	Mexico *	St. Lucia
Argentina *	*Cayman islands*	El Salvador *	*Montserrat*	St. Vincent & the Grenadines
Aruba	Chile *	Grenada	*Netherlands Antilles*	Suriname
Bahamas	Colombia *	Guatemala *	Nicaragua *	Trinidad and Tobago *
Barbados *	Costa Rica *	Guyana *	Panama *	*Turks and Caicos Islands*
Belize	Cuba *	Haiti	Paraguay *	Uruguay *
Bermuda	*Dominica*	Honduras *	Peru *	Venezuela, RB *
Bolivia *				

North America and Western Europe				
Andorra	Finland *	Ireland *	*Monaco*	Spain *
Austria *	France *	Israel *	Netherlands *	Sweden *
Belgium *	Germany	Italy *	Norway *	Switzerland *
Canada	Greece *	Luxembourg *	Portugal *	United Kingdom
Cyprus	Iceland *	Malta *	*San Marino*	United States of America *
Denmark *				

South and West Asia				
Afghanistan *	Bhutan	Iran, Islamic Republic of	Nepal *	Sri Lanka *
Bangladesh *	India *	Maldives	Pakistan *	

Sub-Saharan Africa				
Angola	Comoros *	Ghana *	Mauritius *	Sierra Leone
Benin *	Congo, Dem. Rep. of	Guinea *	Mozambique *	Somalia
Botswana *	Congo, Rep. of	Guinea-Bissau	Namibia	South Africa *
Burkina Faso	Côte d'Ivoire	Kenya *	Niger *	Swaziland *
Burundi *	Equatorial Guinea	Lesotho *	Nigeria *	Tanzania, United Rep. of *
Cameroon *	Eritrea	Liberia	Rwanda *	Togo *
Cape Verde	Ethiopia *	Madagascar *	São Tomé and Príncipe	Uganda *
Central African Republlic	Gabon	Malawi *	Senegal *	Zambia *
Chad	Gambia	Mali *	*Seychelles*	Zimbabwe

** indicates this country is included in subset of countries with most data*

Italics indicate countries not included in IFs

Bibliography

Abu-Ghaida, Dina, and Stephan Klasen. 2004. "The Costs of Missing the Millennium Development Goal on Gender Equity." Discussion Paper No. 1031. Institute for the Study of Labor (IZA), Bonn, Germany. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=515945.

Acemoglu, Daron, Simon Johnson, James A. Robinson, and Pierre Yared. 2005. "From Education to Democracy?" *American Economic Review* 95(2): 44–49.

Allison, Graham T. 1971. *The Essence of Decision: Explaining the Cuban Missile Crisis*. Boston: Little, Brown.

Alvarez, Benjamin, John Gillies, and Monica Bradsher. 2003. *Beyond Basic Education: Secondary Education in the Developing World*. Academy for Educational Development and World Bank Institute. Washington, DC: World Bank. http://siteresources.worldbank.org/WBI/Resources?wbi37229AlvarezGilliesBradsher.pdf.

Appiah, Elizabeth N., and Walter W. McMahon. 2002. "The Social Outcomes of Education and Feedbacks on Growth in Africa." *Journal of Development Studies* 38(4): 27–68.

Baldacci, Emanuele, Benedict J. Clements, Sanjeev Gupta, and Qiang Cui. 2004. "Social Spending, Human Capital, and Growth in Developing Countries: Implications for Achieving the MDGs." IMF Working Paper No. 04/217. http://ssrn.com/abstract+879042.

Barrera, Albino. 1990. "The Role of Maternal Schooling and Its Interaction with Public Health Programs in Child Health Production." *Journal of Development Economics* 32(1): 69–91.

Barro, Robert J. 1999. *Determinants of Economic Growth: A Cross-country Empirical Study*. 2nd ed. Cambridge: Massachusetts Institute of Technology Press.

Barro, Robert J., and Jong-Wha Lee. 2000. "International Data on Educational Attainment: Updates and Implications." NBER Working Paper 7911. National Bureau of Economic Research, Cambridge, MA. http://www.nber.org/papers/w7911.

———. 2001. "International Data on Educational Attainment: Updates and Implications." Oxford Economic Papers 53, 541–563.

Barro, Robert J., and Xavier X. Sala-i-Martin. 1999. *Economic Growth*. Cambridge: Massachusetts Institute of Technology Press.

Bates, Robert H., David L. Epstein, Jack A. Goldstone, Ted Robert Gurr, Barbara Harff, Colin H. Kahl, Kristen Knight, Marc A. Levy, Michael Lustik, Monty G. Marshall, Thomas M. Parris, Jay Ulfelder, and Mark R. Woodward. 2003. *Political Instability Task Force Report: Phase IV Findings*. Science Applications International, McLean, VA. http://globalpolicy.gmu.edu/pitf/pitfp4.htm.

Becker, Gary S. 1973. "A Theory of Marriage: Part I." *Journal of Political Economy* 81(4): 813–846.

———. 1974. "A Theory of Marriage: Part II." *Journal of Political Economy* 82(2): S11–S26.

Binder, Melissa. 2006. "The Cost of Providing Universal Secondary Education in Developing Countries." In Joel E. Cohen, David E. Bloom, and Martin B. Malin, eds., *Educating All Children: A Global Agenda*. Cambridge, MA: American Academy of Arts and Sciences, 455–494.

Birdsall, Nancy, Ruth Levine, and Amina Ibrahim. 2005. *Toward Universal Primary Education: Investments, Incentives, and Institutions*. Report of the UN Millennium Project Task Force on Education and Gender Equality. London and Sterling, VA: Earthscan. http://www.unmillenniumproject.org/documents/Education-complete.pdf.

Bledsoe, Caroline H., Jennifer A. Johnson-Kuhn, and John G. Haaga. 1999. "Introduction." In Caroline H. Bledsoe, John B. Casterline, Jennifer A. Johnson-Kuhn, and John G. Haaga, eds., *Critical Perspectives on School and Fertility in the Developing World*. Washington, DC: National Research Council, 23–48.

Bloom, David E. 2006. "Measuring Global Educational Progress." In Joel E. Cohen, David E. Bloom, and Martin B. Malin,

eds., *Educating All Children: A Global Agenda*. Cambridge, MA: American Academy of Arts and Sciences, 33–122.

Bloom, David E., and David Canning. 2005. "Health and Economic Growth: Reconciling the Micro and Macro Evidence." Stanford Institute on International Studies: Center on Democracy, Development, and the Rule of Law. http://iis-db.stanford.edu/pubs/20924/BloomCanning_42.pdf.

Bosworth, Barry, and Susan M. Collins. 2003. "The Empirics of Growth: An Update." Economics of Developing Countries Paper, Brookings Institution, Washington, DC. http:www.brookings.edu/~/media/Files/rc/papers/2003/0922globaleconomics_bosworth/20030307.pdf.

Bruns, Barbara, Alain Mingat, and Ramahatra Rakotomalala. 2003. *Achieving Universal Primary Education by 2015: A Chance for Every Child*. Washington, DC: World Bank. http://siteresources.worldbank.org/EDUCATION/Resources/278200-1089739404514/frontmatter.pdf.

Caldwell, John C. 1980. "Mass Education as a Determinant of the Timing of Fertility Decline." *Population and Development Review* 6(2) (June): 225–255.

———. 1989. "Mass Education as a Determinant of Mortality Decline." In John C. Caldwell and G. Santow, eds., *Selected Readings in the Cultural, Social and Behavioural Determinants of Health*. Canberra: Australian National University, Health Transition Centre, 101–111.

———. 1990. "Cultural and Social Factors Influencing Mortality Levels in Developing Countries." *Annals AAPSS* 510 (July): 44–59.

———. 1993. "Health Transition: The Cultural, Social and Behavioural Determinants of Health in the Third World." *Social Science and Medicine* 36(2): 125–135.

Cameron, Laurie. 2004. *Indicator Handbook for Primary Education: Abridged*. Publication of EQUIP2, Educational Quality Improvement Program, funded by USAID. http://www.epdc.org/static/MissionHandbookV1_FINAL.pdf.

———. 2005. "Primary Completion Rates." Technical Paper WP-09-01. Education Policy and Data Center, Academy for Educational Development, Washington, DC. http://www.epdc.org/static/CompletionRates.pdf.

Case, Anne. 2006. "The Primacy of Education." In Abhijit Vinayak Banerjee, Roland Benabou, and Dilip Mookherjee, eds., *Understanding Poverty*. New York: Oxford University Press, 269–285.

Castro-Martín, Teresa, and Fátima Juárez. 1994. "Women's Education and Fertility in Latin America: Exploring the Significance of Education for Women's Lives." DHS Working Paper 10. Macro International, Calverton, MD.

Castelló-Climent, Amparo. 2006. "On the Distribution of Education and Democracy." Working Paper 0602. Institute of International Economics at the University of Valencia, Valencia, Spain. http://iei.uv.es/docs/wp_internos/RePEc/pdf/iei_0602.pdf.

Chandola, Tarani, Paul Clarke, J. N. Morris, and David Blane. 2006. "Pathways Between Education and Health: A Casual Modelling Approach." *Journal of the Royal Statistical Society,* Series A 169(2): 337–359.

Chen, Derek Hung Chiat, and Carl Johan Dahlman. 2004. "Knowledge and Development: A Cross-Sectional Approach." World Bank Policy Research Working Paper No. 3366. World Bank, Washington, DC. http://www.econ.worldbank.org/view.Php?type=5&id37702

Cincotta, Richard P., Robert Engelman, and Daniele Anastasion. 2003. *The Security Demographic: Population and Civil Conflict After the Cold War.* Washington, DC: Population Action International. http://www.populationaction.org/Publications/Reports?The_Security_Demographic?The_Security_Demographic_Population_and_Civil_Conflict_After_the_Cold_War.pdf.

Cleland, John. 2002. "Education and Future Fertility Trends, with Special Reference to Mid-transitional Countries." In United Nations Population Division, ed., *The Future of Fertility Decline in Intermediate-Fertility Countries.* New York: Population Division, 187–202. See paper archives at http://www.un.org/esa/population/publications/completingfertility.

Clemens, Michael A. 2004. "The Long Walk to School: International Educational Goals in Historical Perspective." Working Paper Number 37. Center for Global Development, Washington, DC. Originally prepared as a background paper for the Millennium Project Task Force on Education and Gender Equality. http://ideas.repec.org/p/wpa/wuwpdc/0403007.html.

Cohen, Daniel, and Marcelo Soto. 2001. "Growth and Human Capital: Good Data, Good Results." OECD Development Centre Working Paper 179. OECD, Paris. http://lysander.sourceoecd.org/vl=8459400/cl=13/nw=1/rpsv/workingpapers/18151949/wp.

———. 2007. "Growth and Human Capital: Good Data, Good Results." *Journal of Economic Growth* 12(1): 51–76.

Cohen, Joel E., David E. Bloom, and Martin B. Malin, eds. 2006. *Educating All Children: A Global Agenda*. Cambridge, MA: American Academy of Arts and Sciences.

Cohen, Joel E., David E. Bloom, Martin B. Malin, and Helen Anne Curry. 2006. "Introduction: Universal Basic and Secondary Education." In Joel E. Cohen, David E. Bloom, and Martin B. Malin, eds., *Educating All*

Children: A Global Agenda. Cambridge, MA: American Academy of Arts and Sciences, 1–32.

Commission on Macroeconomics and Health (CMH). 2001. *Macroeconomics and Health: Investing in Health for Economic Development*. Geneva: World Health Organization. http://whqlibdoc.who.int/publications/2001/924154550x.pdf.

Coombs, Philip H. 1985. *The World Crisis in Education: The View from the Eighties*. New York: Oxford University Press.

Crecine, John P. 1969. *Governmental Problem Solving*. Chicago: Rand McNally.

Crespo-Cuaresma, Jesús, and Wolfgang Lutz. 2007. "Human Capital, Age Structure and Economic Growth: Evidence from a New Dataset." Interim Report IR-07–011. International Institute for Applied Systems Analysis, Laxenburg, Austria. http://www.iiasa.ac.at/Admin/PUB/Documents/IR-07-011/pdf.

Cuadra, Ernesto, and Juan Manuel Moreno. 2005. *Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education*. Washington, DC: World Bank. http:siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079967208/Expanding_Opportunities_Secondary.pdf.

Cutright, Phillips. 1969. "National Political Development: Measurement and Analysis." In Max Eckstein and Harold Noah, eds., *Scientific Investigation in Comparative Education*. New York: Macmillan, 367–383.

Delamonica, Enrique, Santosh Mehrotra, and Jan Vandemoortele. 2001. "Is EFA Affordable? Estimating the Global Minimum Cost of 'Education for All.'" Innocenti Working Paper No. 87. UNICEF Innocenti Research Centre, Florence, Italy. http://www.untj.org/files/reports/UNICEF%20EFA%20COSTING/pdf.

Desai, Sonalde, and Soumya Alva. 1998. "Maternal Education and Child Health: Is There a Strong Causal Relationship?" *Demography* 35(1) (February): 71–81.

Dewey, John. 1916. *Democracy and Education: An Introduction to the Philosophy of Education*. New York: Macmillan.

Diamond, Ian, Margaret Newby, and Sarah Varle. 1999. "Female Education and Fertility: Examining the Links." In Caroline H. Bledsoe, John B. Casterline, Jennifer A. Johnson-Kuhn, and John G. Haaga, eds., *Critical Perspectives on School and Fertility in the Developing World*. Washington, DC: National Research Council, 23–48.

Durkheim, Emile. 1956. *Education and Sociology,* trans. S. D. Fox. Glencoe, England: Fole Press.

Durlauf, Steven N., Paul A. Johnson, and Jonathan R. W. Temple. 2005. "Growth Econometrics." In Philippe Aghion and Steven N. Durlauf, eds., *Handbook of Economic Growth,* vol. 1A. Amsterdam: Elsevier, 555–677.

Easterlin, Richard. 1961. "The American Baby-Boom in Historical Perspective." *American Economic Review* 51(5): 869–911.

Easterly, William. 2001. *The Elusive Quest for Growth*. Cambridge: Massachusetts Institute of Technology Press.

Education Policy and Data Center (EPDC). 2005. "Window on the Future: 2025." Education Policy and Data Center, Washington, DC. http://epdc.org/static/WindowOnTheFuture2025.pdf.

———. 2007a. "What Does History Teach Us in Achieving UPE and UPC for Education for All 2015?" Policy Brief. Education Policy and Data Center, Washington, DC. http://epdc.org/static/ProgressTowardsUPEandUPC.pdf.

———. 2007b. "School Attendance and Enrolment: Global Trends and Projections." Background paper prepared for the *Education for All Global Monitoring Report 2008—Education for All by 2015: Will We Make It?* http://epdc.org/static/GMR%20Report%20All%20071113.pdf.

Fredriksen, Birger. 1980. "Progress Towards Regional Targets for Universal Primary Education: A Statistical Review." UNESCO Office of Statistics (also published in *International Journal of Education Development* 1[1] [April 1983]).

Glaeser, Edward L., Giacomo A. M. Ponzetto, and Andrei Shleifer. 2007. "Why Does Democracy Need Education?" NBER Working Paper No. W12128. National Bureau of Economic Research, Cambridge, MA. http://www.nber.org/papers/212128.r.

Goldman, Charles A., Krishna B. Kumar, and Ying Liu. 2008. "Education and the Asian Surge: A Comparison of the Education Systems in India and China." International Programs at RAND Occasional Paper. RAND Center for Asia Pacific Policy. http://www.rand.org/pubs/occasional_papers/2008/RAND_OP218.pdf.

Goujon, Anne, and Annababette Wils. 1996. "The Importance of Education in Future Population: Global Trends and Case Studies on Cape Verde, Sudan, and Tunisia," Working Paper WP-96-138. International Institute for Applied Systems Analysis, Laxenburg, Austria. http://www.iiasa.ac.at/Admin/PUB/Documents/WP-96-138.pdf.

Green, Andy, and John Preston. 2001. "Education and Social Cohesion: Recentering the Debate." *Peabody Journal of Education* 76(3–4): 247–284.

Groot, Wim, and Henriëtte Maassen van den Brink. 2007. "The Health Effects of Education." *Economics of Education Review* 26(2): 186–200.

Grossman, Michael. 2005. "Education and Nonmarket Outcomes." NBER Working Paper 11582. National Bureau of Economic Research, Cambridge, MA. http://www.nber.org/papers/w11582.

Gurria, Martin, and Alec Ian Gershberg. Undated. "Costing the Education

MDGs: A Review of the Leading Methodologies." Paper commissioned by the World Bank on Behalf of the Finance Working Group of the Education for All Fast Track Initiative. http://www.education-fast-track.org/libraryCostingeducationMDG.pdf.

Gwartney, James, Robert Lawson, Russell S. Sobel, and Peter T. Leeson. 2007. *Economic Freedom of the World: 2007 Annual Report*. Washington, DC: Cato Institute.

Hannum, Emily, and Claudia Buchmann. 2006. "Global Educational Expansion and Socioeconomic Development: An Assessment of Findings from the Social Sciences." In Joel E. Cohen, David E. Bloom, and Martin B. Malin, eds., *Educating All Children: A Global Agenda*. Cambridge, MA: American Academy of Arts and Sciences, 495–534.

Hanushek, Eric A. 2004. "Some Simple Analytics of School Quality." NBER Working Paper 10229. National Bureau of Economic Research, Cambridge, MA. http://www.nber.org/papers/w10229.

Haveman, Robert H., and Barbara L. Wolfe. 1984. "Schooling and Economic Well-Being: The Role of Nonmarket Effects." *Journal of Human Resources* 19(3) (Summer): 377–407.

Hilderink, Henk. 2005. "Modeling Education Dynamics." Manuscript. Ministry of Health and Environment, Utrecht, Netherlands.

———. 2007. "Modelling Education Dynamics: Why, How, Implementation & Results." GISMO Working Paper No. 10. Ministry of Health and Environment, Utrecht, Netherlands.

Holsinger, Donald B., and Richard N. Cowell. 2000. *Positioning Secondary School Education in Developing Countries*. Paris: UNESCO International Institute for Educational Planning. http://unesdoc.unesco.org/images/0012/001224/122425e.pdf.

Hough, J. R. 1993. "Educational Cost-Benefit Analysis." Education Research Paper No. 02. Department for International Development, London, England.

Hughes, Barry B. 2001. "Global Social Transformation: The Sweet Spot, the Steady Slog, and the Systemic Shift." *Economic Development and Cultural Change* 49(2) (January): 423–458.

———. 2004a. "Forecasting the Human Development Index." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

———. 2004b. "International Futures (IFs): An Overview of Structural Design." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

———. 2004c. "Scenario Analysis with International Futures." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

———. 2005. "Forecasting Productivity and Growth with International Futures (IFs)." Pardee Center for International Futures Working Paper (pts. 1 and 2), Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

———. 2006. "Assessing the Credibility of Forecasts Using International Futures (IFs): Verification and Validation." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

———. 2007. "Forecasting Global Economic Growth with Endogenous Multifactor Productivity: The International Futures (IFs) Approach." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

Hughes, Barry B., and Evan E. Hillebrand. 2006. *Exploring and Shaping International Futures*. Boulder, CO: Paradigm Publishers.

Hughes, Barry B., with Anwar Hossain and Mohammod T. Irfan. 2004. "The Structure of IFs." Pardee Center for International Futures Working Paper, Denver, CO. http://www.ifs.du.edu/documents/reports.aspx.

Hughes, Barry B., Mohammod T. Irfan, Haider Khan, Krishna Kumar, Dale S. Rothman, and José Roberto Solórzano. 2008. *Reducing Global Poverty*. Vol. 1 of the Patterns of Potential Human Progress series. Boulder, CO, and New Delhi, India: Paradigm Publishers and Oxford University Press.

Hungerford, Thomas, and Gary Solon. 1987. "Sheepskin Effects in the Return to Education." *Review of Economics and Statistics* 69(1) (February): 175–177.

Huntington, Samuel P. 1991. *The Third Wave: Democratization in the Late Twentieth Century*. Norman: University of Oklahoma Press.

Inglehart, Ronald, and Christian Welzel. 2005. *Modernization, Cultural Change, and Democracy: The Human Development Sequence*. Cambridge: Cambridge University Press.

International Energy Agency (IEA). 2007. *World Energy Outlook 2007*. Paris: IEA. http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf.

Irfan, Mohammod T. 2008. "A Global Education Transition: Computer Simulation of Alternative Paths in Universal Basic Education." Ph.D. diss., Josef Korbel School of International Studies, University of Denver. http://www.ifs.du.edu/documents/reports.aspx.

Jamison, Dean T., Lawrence J. Lau, and Jia Wang. 2005. "Health's Contribution to Economic Growth in an Environment of Partially Endogenous Technical Progress." In G. López-Casanovas, B. Rivera, and L. Currais, eds., *Health and Economic Growth: Findings and Policy Implications*. Cambridge: Massachusetts Institute of Technology Press, 67–94.

Jamison, Eliot A., Dean T. Jamison, and Eric A. Hanushek. 2006. "The Effects of Education Quality on Income Growth and Mortality." NBER Working Paper 12652. National Bureau of Economic Research, Cambridge, MA. http://www.nber.org/papers/w12652.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2003. "Governance Matters III: Governance Indicators for 1996–2002." World Bank Policy Research Working Paper 3106. World Bank, Washington, DC. http://www.worldbank.org/wbi/governance/wp-governance.html.

———. 2007. "Governance Matters VI: Governance Indicators for 1996–2006." World Bank Policy Research Working Paper No. 4280. World Bank, Washington, DC. http://www.worldbank.org/wbi/governance/wp-governance.html.

Key, V. O. 1940. "The Lack of a Budgetary Theory." *American Political Science Review* 34(6) (December): 1137–1144.

King, Elizabeth M., and M. Anne Hill, eds. 1993. *Women's Education in Developing Countries: Barriers, Benefits, and Policies.* Baltimore, MD: Johns Hopkins University Press.

King, Kenneth. 2007. "Multilateral Agencies in the Construction of the Global Agenda on Education." *Comparative Education* 43(3) (August): 377–391.

Knight, Jane. 2008. "The Internationalization of Higher Education: Are We on the Right Track." *Academic Matters,* October–November 2008 (online and unpaginated). http://www.academicmatters.ca/current_issue.article.gk?catalog_item_id=1234&category+issues/OCT2008.

Kornhauser, William. 1959. *The Politics of Mass Society*. Glencoe, IL: Free Press.

Krueger, Alan B., and Mikael Lindahl. 2000. "Education for Growth: Why and for Whom?" NBER Working Paper No. 7591. National Bureau of Economic Research, Cambridge, MA. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=223589.

Kunst, A. E., and J. P. Machenbach. 1994. "The Size of the Mortality Difference Associated with Educational Level in Nine Industrialized Countries." *American Journal of Public Health* 84(6): 932–937.

Kurzweil, Raymond. 2005. *The Singularity Is Near.* New York: Viking.

Lambsdorff, Johann Graf. 2003. "Framework Document 2003: Background Paper to the 2003 Corruption Perceptions Index." Transparency International and University of Passau, Germany. http://www.transparency.org/policy_research/surveys_indices/cpi/2003.

———. 2008. "The Methodology of the Corruption Perceptions Index." Transparency International and University of Passau, Germany. http://www.transparency.org/policy_research/surveys_indices/cpi.

Lewin, Keith M. 2004. "Beyond Primary Education for All: Planning and Financing Secondary Education in Africa (SEIA)." Paper presented at the Donor Conference on Secondary Education in Africa (SEIA), Vrije Universiteit Amsterdam, October 15. http://siteresources.worldbank.org/INTAFRREGTOPSEIA/Resources/lewin_main.pdf.

Lewin, Keith, and Francoise Caillods. 2001. *Financing Secondary Education in Developing Countries: Strategies for Sustainable Growth.* Paris: International Institute for Educational Planning, UNESCO.

Lewis, Maureen, and Marlaine Lockheed. 2006. *Inexcusable Absence: Why 60 Million Girls Still Aren't in School and What to Do About It*. Washington, DC: Center for Global Development. http://www.cgdev.org/content/publications/detail/11898.

Lindblom, Charles E. 1959. "The Science of 'Muddling Through.'" *Public Administration Review* 19(2): 79–88.

Lipset, Seymour Martin. 1959. "Some Social Requisites of Democracy: Economic Development and Political Legitimacy." *American Political Science Review* 53(1): 69–105.

López-Casanovas, Guillem, Berta Rivera, and Luis Currais, eds. 2005. *Health and Economic Growth: Findings and Policy Implications*. Cambridge: Massachusetts Institute of Technology Press.

Lutz, Wolfgang, Anne Goujon, and Annababette Wils. 2005. "Forecasting Human Capital: Using Demographic Multi-state Methods by Age, Sex, and Education to Show the Long-Term Effects of Investments in Education." EPDC Working Paper WP-07-03. Education Policy and Data Center, Washington, DC. http://www.epdc.org/static/ForecastingHumanCapital.pdf.

Lutz, Wolfgang, Anne Goujon, Samir K. C. and Warren Sanderson. 2007. "Reconstruction of Populations by Age, Sex and Level of Educational Attainment for 120 Countries for 1970–2000." Interim Report IR-07-002. International Institute for Applied Systems Analysis, Laxenburg, Austria. http://www.iiasa.ac.at/Atmin/PUB/Documents/IR-07-002.pdf.

Maddox, Brian. 2008. "What Good Is Literacy? Insights and Implications of the Capabilities Approach." *Journal of Human Development* 9(2) (July): 185–206.

Mathers, Colin D., and Dejan Loncar. 2006. "Projections of Global Mortality and Burden of Disease from 2002 to 2030." *PLoS Medicine* 3(11) (November): 2011–2030.

McMahon, Walter W. 1999. *Education and Development: Measuring the Social Benefits*. Oxford: Oxford University Press.

McMahon, Walter W. 2002. *Education and Development: Measuring the Social Benefits*. Oxford: Oxford University Press.

———. 2007. "An Analysis of Education Externalities with Applications to Development in the Deep South."

Contemporary Economic Policy 25(3) (July): 459–482.

———. 2009. *Higher Learning, Greater Good: The Private and Social Benefits of Higher Education*. Baltimore, MD: Johns Hopkins University Press.

Meyer, John W., Francisco O. Ramirez, and Yasemin Nuhoglu Soysal. 1992. "World Expansion of Mass Education, 1870–1980." *Sociology of Education* 65(2) (April): 128–149.

Meyer, John W., Francisco O. Ramirez, Richard Rubinson, and John Boli-Bennett. 1977. "The World Educational Revolution, 1950–1970." *Sociology of Education* 50(4) (October): 242–258.

Milanovic, Branko. 2005. *Worlds Apart: Measuring International and Global Inequality*. Princeton, NJ: Princeton University Press.

Mingat, Alain. 2004. "Issues of Financial Sustainability in the Development of Secondary Education in Africa (SEIA)." Paper presented at the Donor Conference on Secondary Education in Africa (SEIA), Vrije Universiteit Amsterdam, October 15. http://siteresources.worldbank.org/INTAFFREGTOPSEIA/Resources/mingat_main.pdf.

Mingat, Alain, and Jee-Peng Tan. 1996. "The Full Social Returns to Education: Estimates Based on Countries' Economic Growth Performance." Human Capital Working Paper No. 16131. World Bank, Washington, DC.

National Center for Public Policy and Higher Education. 2008. *Measuring Up 2008: The National Report Card on Higher Education*. San Jose, CA: National Center for Public Policy and Higher Education. http://www.highereducation.org.

Notestein, Frank W. 1945. "Population—The Long View." In Theodore W. Schultz, ed., *Food for the World*. Chicago: University of Chicago Press, 36–57.

Nussbaum, Martha C. 2003. "Women's Education: A Global Challenge." *Signs: Journal of Women in Culture and Society* 29(2): 325–355.

Omran, Abdel R. 2001. "The Epidemiological Transition: A Theory of the Epidemiology of Population Change." Reprinted in *Bulletin of the World Health Organization* 79(2): 161–170. (Originally published in 1971 in *The Milbank Memorial Fund Quarterly* 49[4] Part 1: 509–538.)

Oneal, John R., and Bruce M. Russett. 1999. "The Kantian Peace: The Pacific Benefits of Democracy, Interdependence, and International Organizations, 1885–1992." *World Politics* 52(1) (October): 1–37.

Organization for Economic Cooperation and Development (OECD). 2003. *The Sources of Economic Growth in OECD Countries*. Paris: OECD.

Porta, Emilio, and Annababette Wils. 2007. "Review and Evaluation of Selected Education Projection Models in Use in 2006." EPDC Working Paper WP-02-07. Education Policy and Data Center, Washington, DC. http://epdc.org/static/EducationProjectionModels.pdf.

Pritchett, Lant. 1996. "Where Has All the Education Gone?" World Bank Policy Research Working Paper Series No. 1581. World Bank, Washington, DC.

———. 2004. "Does Learning to Add Up Add Up? The Returns to Schooling in Aggregate Data." BREAD Working Paper No. 053. Bureau for Research and Economic Analysis of Development, Duke University, Durham, NC. http://ipl.econ.duke.edu/bread/abstract.php?paper=053.

Przeworski, Adam, Michael Alvarez, Jose Antonio Cheibub, and Fernando Limongi. 1996. "What Makes Democracies Endure?" *Journal of Democracy* 7(1) (January): 39–55.

Psacharopoulos, George, and Harry Anthony Patrinos. 2002. "Returns to Investment in Education: A Further Update." World Bank Policy Research Working Paper Series No. 2881. World Bank Latin America and the Caribbean Region, Education Sector Unit, Washington, DC. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=367780.

Ranis, Gustav, Frances Stewart, and Alejandro Ramirez. 2003. "Economic Growth and Human Development." In Sakiko Fukada-Parr and A. K. Shiva Kumar, eds., *Readings in Human Development*, 2nd ed. United Nations Development Programme Human Development Report Office. New York: Oxford University Press, 61–84.

Rawls, John. 1971. *A Theory of Justice*. Cambridge, MA: Harvard University Press.

Robeyns, Ingrid. 2006. "Three Models of Education: Rights, Capabilities and Human Capital." *Theory and Research in Education* 4(1) (March): 69–84.

Schultz, Theodore W. 1961. "Investment in Human Capital." *American Economic Review* 51(1) (March): 1–17.

Sen, Amartya Kumar. 1999. *Development as Freedom*. New York: Knopf.

Shkolnikov, Vladimir M., David A. Leon, Sergey Adamets, Eugeniy Andreev, and Alexander Deev. 1998. "Educational Level and Adult Mortality in Russia: An Analysis of Routine Data, 1979–1994." *Social Science and Medicine* 47(3): 357–369.

Sperling, Gene. 2006. "The Way Forward for Universal Education." Foreword in Joel E. Cohen, David E. Bloom, and Martin B. Malin, eds., *Educating All Children: A Global Agenda*. Cambridge, MA: American Academy of Arts and Sciences, xi–xvi.

State Higher Education Executive Officers (SHEEO). n.d. *State Higher Education Finance: Early Release FY 2008*. http://www/sheeo.org/finance/shef/SHEF%20FY08%20Early%20Release%20.pdf.

Task Force on Higher Education and Society. 2000. *Higher Education in Developing Countries: Peril and Promise*. Report of the Task Force convened by

UNESCO and the World Bank. http://www.tfhe.net/index.htm.

Thomas, Vinod, Mansoor Dailami, Ashok Dhareshwar, Ramon E. López, Yan Wang, Nalin Kishor, and Daniel Kaufmann. 2000. *The Quality of Growth*. Washington, DC, and New York: World Bank and Oxford University Press.

ul Haq, Mahbub. 1990. "The Human Development Concept." http://hdr.undp.org/en/humandev.

———. 2003. "The Human Development Paradigm." In Sakiko Fukada-Parr and A. K. Shiva Kumar, eds., *Readings in Human Development*, 2nd ed. United Nations Development Programme Human Development Report Office. New York: Oxford University Press, 17–34.

UNESCO. 1990. *World Declaration on Education for All*. Text adopted by the World Conference on Education for All, Jomtien, Thailand, March 5–9. http://www.unesco.org/edution/efa/ed_for_all/background/jomtien_declaration.shtml.

———. 1994. *Statistics on Adult Illiteracy: Preliminary Results of the 1994 Estimations and Projections*. Document No. STE-16. Division of Statistics, United Nations Educational, Scientific, and Cultural Organization, Paris, France. http://unesdoc.unesco.org/images/0010/001055/105526E/pdf.

———. 1997. *International Standard Classification of Education: ISCED 1997*. http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm.

———. 2000. *Dakar Framework for Action*. Text adopted by the World Education Forum, Dakar, Senegal, April 26–28. http://www.unesco.org/education/wef/en-conf/dakframeng.shtm.

———. 2005a. *Education for All Global Monitoring Report 2006*: *Literacy for Life*. Paris: UNESCO Publishing. http://www.unesdoc.unesco.org/images/0014/001416/141639e.pdf.

———. 2005b. *EFA—Paving the Way for Action: Education for All in Africa*. Report of the Regional Office for Education in Africa (BREDA). Dakar: UNESCO Regional Office. http://www.poledakar.org/spip.php?article245.

———. 2007a. *Global Education Digest 2007: Comparing Education Statistics Across the World*. Montreal, Canada: UNESCO Institute for Statistics. http://www.uis.unesco.org/ev.php?ID=7167_201&ID2=DO_TOPIC.

———. 2007b. *Education for All Global Monitoring Report 2008*: *Education for All by 2015—Will We Make It?* London and Paris: Oxford University Press and UNESCO Publishing. http://www.unesco.org/en/efareport/reports/2008-mid-term-review.

———. 2008. *Education for All Global Monitoring Report 2009: Overcoming Inequality: Why Governance Matters*. London and Paris: Oxford University Press and UNESCO Publishing. http://www.unesco.org/en/efareport/reports/2009-governance.

UNESCO Division of Statistics. 1989. "Trends and Projections of Enrolment by Level of Education, by Age and by Sex, 1960–2025 (as Assessed in 1989)." Current Surveys and Research in Statistics Document No. CSR-E-60 (archived as ST/89/WS/13). UNESCO, Paris, France.

———. 1993. "Trends and Projections of Enrolment by Level of Education, by Age and by Sex, 1960–2025 (as Assessed in 1993)." Current Surveys and Research in Statistics Document No. CSR-E-63 (archived as BPE-94/WS.1). UNESCO, Paris, France. http://unesdoc.unesco.org/images/0009/000963/096348eb.pdf.

UNESCO Division of Statistics on Education. 1983. "Trends and Projections of Enrolment by Level of Education and by Age: 1960–2000 (as Assessed in 1983)." UNESCO (no publication location provided).

UNESCO Institute for Statistics (UIS). 2002. *Financing Education—Investments and Returns: Analysis of the World Education Indicators*. Paris: UNESCO-UIS/OECD. http://www.oecd.org/dataoecd/27/8/2494749.pdf.

———. 2005. *Education Trends in Perspective: Analysis of the World Education Indicators*. Paris: UNESCO-UIS/OECD. http://www.uis.unesco.org/TEMPLATE/pdf/wei/WEI2005.pdf.

———. 2006. *Education Counts: Benchmarking Progress in 19 WEI Countries*. World Education Indicators 2006. Montreal, Canada: UNESCO Institute for Statistics. http://www.uis.unesco.org/template/publications/wei2006/WEI2006-FINALwc.pdf.

United Nations. 1987. *Report of the World Commission on Environment and Development*. Oxford: Oxford University Press.

———. 2000. *United Nations Millennium Declaration*. Text adopted by the General Assembly at the Millennium Summit, New York, USA, September 6–8. http://www.un.org/millennium/declaration/ares552e.pdf.

United Nations Development Group. 2003. *Indicators for Monitoring the Millennium Development Goals: Definitions, Rationale, Concepts and Sources*. New York: United Nations. http://mdgs.un.org/unsd/mdg/Resources/Attach/Indicators/HandbookEnglish.pdf.

United Nations Environment Programme (UNEP). 2008. *Global Environment Outlook: Environment for Development (GEO-4)*. Nairobi: United Nations Environment Programme. (See especially Chapter 9, "The Future Today," to which IFs contributed.) http://www.unep.org/geo/geo4/report/GEO-4_Report_Full-en.pdf.

United Nations Millennium Project. 2005. *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals*. Jeffrey D. Sachs, series editor. New York: United Nations

Development Program and Earthscan. http://www.unmillenniumproject.org/reports/fullreport.htm.

United Nations Population Division, ed. 2002. "Fertility Levels and Trends in Countries with Intermediate Levels of Fertility." In United Nations Population Division, ed., *The Future of Fertility Decline in Intermediate-Fertility Countries*. New York: Population Division, 136–168. See paper archives at http://www.un.org/esa/population/publications/completingfertility.

———. 2003. *Population, Education, and Development: The Concise Report*. New York: United Nations. http://www.un.org.esa/population/publications/concise2003/Concisereport2003.pdf.

United States Department of Energy. 2006. *International Energy Outlook 2006*. Washington, DC: U.S. Department of Energy, Energy Information Administration. http://www.globaloilwatch.com/reports/EIA%20Outlook%202006.pdf.

United States National Intelligence Council (USNIC). 2004. *Mapping the Global Future: Report of the National Intelligence Council's 2020 Project*. Washington, DC: U.S. National Intelligence Council. http://www.dni.gov/nic/NIC_globaltrend2020.html.

———. 2008. *Global Trends 2025: A Transformed World*. Washington, DC: U.S. National Intelligence Council. http://www.dri.gov/nic/PDF_2025/2025_Global_Trends_Final_Report.pdf.

Unterhalter, Elaine, and Harry Brighouse. 2003. "Distribution of What? How Will We Know If We Have Achieved Education for All by 2015?" Paper delivered at the Third Conference on the Capabilities Approach (from Sustainable Development to Sustainable Freedom), University of Pavia, Italy, September 7–9.

Walker, Melanie. 2006. "Towards a Capability-Based Theory of Social Justice for Education Policy-Making." *Journal of Education Policy* 21(2) (March): 163–185.

Weimer, David, and Aidan R. Vining. 2004. *Policy Analysis: Concepts and Practice*, 4th ed. Englewood Cliffs, NY: Prentice-Hall.

Wildavsky, Aaron. 1988. *The New Politics of Budgetary Process*. Glenview, IL: Scott, Foresman.

Wils, Annababette. 2002. "On Accelerating the Global Literacy Transition." Belfer Center for Science and International Affairs Paper 2002-18. John F. Kennedy School of Government, Harvard University, Cambridge, MA. http://belfercenter.ksg.harvard.edu/publication/2916/on_accelerating_the_global_literacy_transition.html.

Wils, Annababette, and Anne Goujon. 1998. "Diffusion of Education in Six World Regions, 1960–90." *Population and Development Review* 24(2) (June): 357–368.

Wils, Annababette, and Raymond O'Connor. 2003. "The Causes and Dynamics of the Global Education Transition." Unpublished paper prepared for the Sustainability Trends and Transition Project, Harvard University, Cambridge, MA.

Wils, Annababette, Bidemi Carrol, and Karima Barrow. 2005. "Educating the World's Children: Patterns of Growth and Inequality." EPDC Working Paper. Education Policy and Data Center, Washington, DC. http://www.epdc.org/static/EducatingTheWorldsChildren.pdf.

Woodhall, Maureen. 2004. *Cost-Benefit Analysis in Educational Planning*, 4th ed. Paris: UNESCO International Institute for Educational Planning.

Woolf, S. H., R. E. Johnson, Robert L. Phillips, and Maike Philipsen. 2007. "Giving Everyone the Health of the Educated: An Examination of Whether Social Change Would Save More Lives Than Medical Advances." *American Journal of Public Health* 97(4): 679–783.

World Bank. 2007a. *Global Economic Prospects 2007: Managing the Next Wave of Globalization*. Washington, DC: World Bank. http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK+64165421&menuPK=64166322&entityID=000112742_20061206155022.

———. 2007b. "Quality Education for All Children: Meeting the Challenge." Fast Track Initiative Annual Report 2007. World Bank, Washington, DC. http://www.education-fast-track.org/library/AR2007_Eng_Full.pdf.

———. 2008a. "The Road to 2015: Reaching the Education Goals." Fast Track Initiative Annual Report 2008. World Bank, Washington, DC. http://www.education-fast-track.org/library/Annual_Report_2008_EFA_FTI.pdf.

———. 2008b. World Development Indicators (on CD). Washington, DC: World Bank.

Forecast Tables: Introduction and Glossary

Forecasts (or simulation results) from International Futures are dynamic calculations of the full modeling system, not extrapolations of series, results of isolated multiple regressions, or representations of the forecasts of others. To understand more about the forecasts of IFs and the specific formulations for the variables shown in output tables, see Chapter 4 and the documentation of the model.

Forecasts are seldom made for individual countries over a long period of time. There are good reasons for the reluctance to provide such forecasts. For example:

- Data in any series are seldom available for all countries, particularly for smaller ones or those that have undergone substantial sociopolitical transitions. IFs represents 183 countries and uses estimation procedures to fill data holes as necessary.
- Every country is decidedly unique. Formulating a large-scale dynamic model to behave reasonably in the face of such complexity is extremely challenging, and structures of the system will never be completely free of poor behavior for many countries, especially under extreme or new circumstances.
- Some variables, such as the future level of democracy, have especially weak bases for forecasting.

Most longer-term global forecasting reduces the severity of these problems in several ways, such as by relying on regional aggregations of countries and significantly limiting the forecast horizon. The accompanying tables obviously ignore such practical approaches and simply present the numbers that the model produces. This volume has repeatedly stressed that we should never treat any model results as predictions; we should instead use them for thinking about and exploring possible futures. That is the spirit behind these tables. With continuing development of the modeling system, results will change and presumably improve on average. The project will give regular attention, in particular, to results that are extreme relative to other countries or to expectations based on regional expertise or other forecasts.

These forecast tables are organized by geographic, substantive, and temporal attributes. Geographically, the first of multiple sets begins with global and four-continent totals (Africa, the Americas, Asia with Oceania, and Europe), followed by subregional divisions within each of the continents (see maps that precede tables). The subsequent six pages of each set provide forecasts for each of the country members of the subregional divisions within the four continents. Within the subregional divisions, countries appear in descending order by forecasted population levels in 2060.

The multiple sets cover six substantive issue areas. The first provides population and population density information, and an overall measure of human well-being. The remaining sets of forecasting variables are divided into five categories: poverty (accompanied by standard economic variables such as GDP and GDP per capita), health, education, infrastructure, and governance. These categories correspond to the topics that this five-volume series will cover, and forecasts in each category will therefore be developed across volumes. At this time many of the health and infrastructure forecasts are very

preliminary, as those parts of the IFs system of models are the most-recently developed.

Temporally, each series contains values for 2010, 2030, and 2060, thereby providing a forecast horizon of fifty years. Additional columns for many variables show the cumulative percentage change from 2010 through 2060 and the annualized rate of change over the period. The model is currently initialized in 2005, and it computes annual results recursively from 2005 through the simulation horizon. Thus, results in years after 2005 are computations rather than actual values, even when data are available. The only exception is that IFs imposes the actual GDP 2005–2006 data on the model calculations so as to obtain accurate values for this key series. We will post new forecast sets online periodically.

To facilitate the reading and interpretation of the hard-copy tables associated with this volume and of the electronic copies on the IFs Web site (www.ifs.du.edu), we provide the variable names used in the tables, the variable name used in IFs, and some basic commentary on the variables, such as the sources of initial conditions and/or the forecast approach.

Variables	IFs Name	Source and Notes
Population, Land Area, and Human Development Index		
Population	POP	Total number of people within a country. Total initialized from WDI data with cohort data on age/sex distribution, fertility, and mortality from UN Population Division.
Land area in 1,000 sq kilometers	LANDAREA	Total national land area in 1,000 square kilometers, initialized with data from FAO via WDI. Constant over time.
Land area in 1,000 sq miles	No variable name in model; calculated by converting square kilometers	Total national land area in 1,000 square miles. Constant over time.
Population density per sq kilometer	No variable name in model; calculated from LANDAREA and POP	Population per land area measured in square kilometers.
Population density per sq mile	No variable name in model; calculated by converting density per square kilometer	Population per land area measured in square miles.
Urban population	No variable name in model; calculated from others	Percentage of population living in urban areas. Initialized with WDI data.
Population growth rate	POPR	Annual percentage change. See population.
Population below 15 years of age	POPLT15	The total number of people in this age category, which is generally considered a period of economic dependence on others.
Population 65 years of age and above	POPGE65	The total number of people in this age category, which is generally considered a period of nonparticipation in the labor force.
Youth bulge	YTHBULGE	Although the youth bulge is always an indicator of the portion of a population that is young, specific definitions vary. In IFs the definition is population 15–29 as a percentage of all adults (15 and older). A bulge exists when this ratio is above a specified level, such as 50 percent.
Human Development Index	HDI	This corresponds very closely to the UNDP's HDI (see http://hdr.undp.org), which is an average of three components: long and healthy life, knowledge (literacy and education), and standard of living (GDP/capita). Computed in IFs population model from nearly identical drivers within IFs (see Hughes 2004a for specifics).
HDI with higher ceilings	HDI21STFIX	An IFs-specific measure. Computed in IFs population model from driver categories within IFs corresponding to the UNDP's HDI but with maximum values raised to levels that constitute better upper limits for the twenty-first century, notably life expectancy of 120 and GDP per capita of $100,000 (see Hughes 2004a).

Variables	IFs Name	Source and Notes
Poverty		
Poverty (below $1 per day)	INCOMELT1LN	Population living below $1.08 per day at 1993 international prices (purchasing power parity). Initialized from the World Bank's PovCalNet. The forecasting formulation is based on an assumption that income in a country is subject to log-normal (LN) distribution, also responsive to the Gini index of distribution. There are complexities in the conversion of values from 1993 dollars to contemporary currency levels; although changes in the global consumer price index suggest that $1.08 in 1993 dollars would be $1.98 in 2000 dollars and $2.82 in 2005 dollars, the problems converting different countries with different market baskets and inflation patterns preclude such simple translation.
Poverty gap index	POVGAP	Average (normalized) income shortfall expressed as the average shortfall relative to a poverty line ($1 per day in IFs). The further below the poverty line incomes are, the greater the gap.
Poverty (below $2 per day)	INCOMELT2LN	Population living below $2.15 per day at 1993 international prices (purchasing power parity). Initialized from the World Bank's PovCalNet. See poverty below $1 for information.
Poverty (below $5 per day)	No variable name in model; calculated from others	Population living below $5.40 per day at 1993 international prices (purchasing power parity). See poverty below $1 for interpretation. The forecasts of values at income poverty levels above $2 per day do not use survey data for initial conditions but rather use the log-normal formulation and survey data for $2 per day to estimate initial conditions.
Poverty (below $10 per day)	No variable name in model; calculated from others	Population living below $10.80 per day at 1993 international prices (purchasing power parity). See poverty below $1 for general interpretation and poverty below $5 for a note on initialization.
Poverty (below $20 per day)	No variable name in model; calculated from others	Population living below $21.60 per day at 1993 international prices (purchasing power parity). See poverty below $1 for general interpretation and poverty below $5 for a note on initialization.
GDP per capita at PPP	GDPPCP	Gross domestic product at purchasing power parity (using 2000 dollars) divided by total population. See GDP for explanation of gross domestic product and GDPP for explanation of PPP.
Gross domestic product	GDP	Gross domestic product is defined as either the sum of value added across all sectors of an economy or as the sum of goods and services delivered to meet final demand of an economy. Initialized from WDI data using 2005 dollars; forecasts use much other data including series from the GTAP.
GDP at PPP	GDPP	The application of purchasing power parity to GDP. As OECD describes them, "Purchasing Power Parities (PPPs) are currency conversion rates that both convert to a common currency and equalize the purchasing power of different currencies. In other words, they eliminate the differences in price levels between countries in the process of conversion." Initialized from WDI data using 2000 dollars at purchasing power parity; forecasts use much other data including series from the GTAP.
Health		
Life expectancy at birth	LIFEXP	The average number of years a newborn is expected to live. Initialized from WDI data.
Infant mortality	INFMOR	The death rate of infants in the first year of life per 1,000 births. Initialized from WDI data.
Total fertility rate	TFR	The average number of children a woman is expected to bear throughout her life. Initialized from WDI data; forecasts initialized with cohort data on fertility from UN Population Division.
Calories per capita	CLPC	Calorie consumption per day from all sources, measured in kilocalories. Initialized with data originally from the UN FAO.
Malnourished children	MALNCHP	As defined by the World Bank, "The percentage of children under five whose weight for age is more than two standard deviations below the median reference standard for their age as established by the World Health Organization" and other bodies. Individual countries may look at children at ages three, four, or five. Initialized from WDI data using weight-based malnutrition measure.
AIDS death rate	AIDSDRATE	Deaths per thousand population per year. Initialized with data from UN AIDS.
Death rate: Digestive diseases	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project.
Death rate: Respiratory diseases	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project.

Variables	IFs Name	Source and Notes
Death rate: Other communicable diseases	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project.
Death rate: Cardiovascular diseases	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project.
Death rate: Malignant neoplasms	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project.
Death rate: Other noncommunicable diseases	Not directly available in model; calculated as DEATHS by cause divided by population (POP)	Deaths per thousand population per year. Initialized with data from the WHO's Global Burden of Disease project. IFs forecasts do not include diabetes in the current tables.
Water safety	WATSAFE	Percentage of population with no access to improved drinking water. Initialized with data from WHO and UNICEF.
Sanitation	SANITATION	Percentage of population with no access to improved sanitation. Initialized with data from WHO and UNICEF.
Education		
Literacy	LIT	The basic definition is the ability of adults to read and write, but different countries use very different standards. IFs uses 15 and older as the definition of adult for this variable. Initialized from WDI data.
Years of education, Adults 25+	EDYRSAG25	Average number of years of education, presented separately for males and females 25 years of age and older. Initialized from the Barro and Lee dataset (Barro and Lee 2001).
Primary education enrollment rate, net	EDPRIENRN	The percentage of the official primary age group enrolled at the primary level. Contrast this with gross enrollment, which includes enrolled students from all age groups but maintains the base of the official age group and can therefore exceed 100 percent. Initialized with UNESCO data.
Primary education enrollment rate, gross	EDPRIENRG	All students of any age enrolled at the primary level as a percentage of those of the official age to enroll at the primary level. Contrast this with net enrollment, which considers only those enrolled who are of the official primary age. Initialized with UNESCO data.
Lower secondary enrollment rate, gross	EDSECLOWRENRG	All students of any age enrolled at the lower secondary level as a percentage of those of the official age to enroll at the lower secondary level. Lower secondary education for most countries is approximately grades 7–9. (See net primary enrollment for distinction between gross and net.) Initialized with UNESCO data.
Upper secondary enrollment rate, gross	EDSECUPPRENRG	All students of any age enrolled at the upper secondary level as a percentage of those of the official age to enroll at the upper secondary level. Upper secondary education for most countries is approximately grades 10–12. (See net primary enrollment for distinction between gross and net.) Initialized with UNESCO data.
Tertiary enrollment rate, gross	EDTERENRG	All students of any age enrolled at the tertiary level as a percentage of those of the official age (frequently considered to be 18–21) to enroll at the tertiary level. Initialized with UNESCO data.
Gender parity index: Primary education net enrollment	Not directly available in model; calculated as female enrollment rates over male enrollment rates	The ratio of the enrollment rate of females of official primary-level ages to the enrollment rate of males of official primary-level ages. Initialized with UNESCO data.
Gender parity index: Secondary education gross enrollment	Not directly available in model; calculated as female enrollment rates over male enrollment rates	The ratio of the secondary enrollment rate of females of all ages to the secondary enrollment rate of males of all ages. Initialized with UNESCO data.
Gender parity index: Tertiary education gross enrollment	Not directly available in model; calculated as female enrollment rates over male enrollment rates	The ratio of the tertiary enrollment rate of females of all ages to the tertiary enrollment rate of males of all ages. Initialized with UNESCO data.

Variables	IFs Name	Source and Notes
Infrastructure		
Water use per capita	WATUSEPC	Annual water withdrawals (all uses) divided by population. Initialized with data from FAO via WRI EarthTrends. Formulation in IFs is very basic and does not include feedback from water supply constraints.
Crop yield	YL	Annual agricultural crop production of all kinds divided by land area devoted to the production (metric tons per hectare). Initialized with production and land data ultimately from UN FAO.
Energy demand ratio to GDP	ENRGDP	Sometimes called energy intensity, and measured here as equivalent barrels of oil. The units of energy consumed per unit of GDP generally decrease as countries get richer. Initialized mostly using data from British Petroleum. A technology parameter heavily influences forecasts.
Carbon emissions	CARANN	Releases to the atmosphere of carbon from human activity (burning fossil fuels or deforestation) in billion tons or gigatons (1,000 million). Computed in IFs without initialization from a data source.
Road density	INFRAROAD	Defined as kilometers of road per 1,000 hectares. Initialized from WDI data.
Electricity use	INFRAELEC	Defined as kilowatt-hours per capita per year. Initialized from WDI data.
Telephone density	INFRATELE	Defined as telephone lines per 1,000 people. Initialized from WDI data and indirectly from ITU data.
Mobile phone usage	ICTMOBIL	Percentage access of population to mobile phones. Initialized from ITU data.
Internet usage	Not directly available in model; calculated from the number of networked people (NUMNWP) divided by POP	The percentage of the population with Internet access. Initialized mostly from ITU data.
Broadband usage	CTBROAD	Percentage access of population to broadband. Initialized from ITU data.
R&D expenditures	Not directly available in model; calculated as RANDDEXP over GDP	The OECD defines research and development to cover basic research, applied research, and experimental development; expenditures can be private or public. Initialized from OECD and WDI data and expressed here as a percentage of GDP.
Governance		
Freedom House Index (inverted)	FREEDOM	Freedom or democracy levels. This variable is based on and initialized from the well-known indicator from the Freedom House Freedom in the World series. Freedom House defines freedom as "the opportunity to act spontaneously in a variety of fields outside the control of government and other centers of potential domination." See www.freedomhouse.org. Coding of countries on separate civil and political liberty scales is done by experts. Inverted from Freedom House so that higher is more free (2–14).
Polity Democracy Index	DEMOCPOLITY	Democracy level, with attention to autocracy level. Based on and initialized from Polity Project data; see http://www.cidcm.umd.edu/polity. Historical values are coded by experts. Computed in IFs as the Polity measure of democracy (1–10 with highest most democratic) minus Polity autocracy (1–10 with highest most authoritarian) plus 10. This combined index measure is fairly widely used. See also FREEDOM.
Economic Freedom Index	ECONFREE	Initialized from Fraser International, which defines economic freedom as "the extent to which one can pursue economic activity without interference from government" and builds its index on several measures assessed by experts. Index range is 0–10, with higher values representing greater economic freedom. See http://www.freetheworld.com.
Government Corruption Perception Index	GOVCORRUPT	Based on and initialized from Transparency International's Corruption Perceptions Index. CPI is a composite index that draws on multiple polls and surveys. The index runs from 1–10, with higher values representing less corruption. See www.transparency.org.
Government Effectiveness Index	GOVEFFECT	Initialized from the World Bank's Governance Indicators Project Index, defined as "the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." Rescaled from the original to run from 0 to 5 (most effective).
Knowledge Society Index	KNOWSOC	Based on A. T. Kearney/*Foreign Policy* knowledge subindex. Range runs from 0–100, with higher values indicating greater knowledge. See Hughes 2005, part 2, for specification tied to R&D spending and tertiary graduation rate.

Variables	IFs Name	Source and Notes
Economic Integration Index	ECONINTEG	Based on A. T. Kearney/*Foreign Policy* globalization subindex, tied to trade and foreign direct investment flows. Values run from 0–100, with higher values representing greater economic integration. See Hughes 2005, part 2, for IFs specification.
Globalization Index	GLOBALIZ	Based on A. T. Kearney/*Foreign Policy* Globalization Index, built on four subindexes for economic integration, personal contact, technological connectivity, and political engagement. Index values extend from 0–100, with higher values representing greater globalization. See Hughes 2005, part 2, for specification in IFs.

Data Source Organization Abbreviations

FAO	Food and Agriculture Organization of the United Nations
GTAP	Global Trade Analysis Project
ITU	International Telecommunications Union
OECD	Organization for Economic Cooperation and Development
UNAIDS	United Nations Program on AIDS
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
WDI	World Development Indicators of the World Bank
WHO	World Health Organization
WRI	World Resources Institute

Forecast Tables: Maps of Continents and Subregions

African regions

Asian regions

American regions

European regions

Forecast Tables

Measures of Poverty, Health, Education, Infrastructure, and Governance

Population, Land Area, and Human Development Index

Base Case

Source: International Futures Version 6.12, March 2009

	Population					Land Area		Population Density					
	Million People					Sq Km	Sq Mi	Persons per Sq Km			Persons per Sq Mi		
	2010	2035	2060	% Chg	% An Chg	(000s)	(000s)	2010	2035	2060	2010	2035	2060
World	**6806**	**8419**	**9448**	**38.8%**	**0.7%**	**133588**	**51579**	**51**	**63**	**71**	**132**	**163**	**183**
Africa	**1009**	**1682**	**2354**	**133.3%**	**1.7%**	**30042**	**11599**	**34**	**56**	**78**	**87**	**145**	**203**
Americas	**937**	**1126**	**1212**	**29.3%**	**0.5%**	**40072**	**15472**	**23**	**28**	**30**	**61**	**73**	**78**
Asia with Oceania	**4130**	**4913**	**5266**	**27.5%**	**0.5%**	**40444**	**15615**	**102**	**121**	**130**	**264**	**315**	**337**
Europe	**720.9**	**689**	**608.8**	**-15.6%**	**-0.3%**	**22970**	**8869**	**31**	**30**	**27**	**81**	**78**	**69**
World	**6806**	**8419**	**9448**	**38.8%**	**0.7%**	**133588**	**51579**	**51**	**63**	**71**	**132**	**163**	**183**
Africa-Eastern	**320.2**	**568.6**	**792.6**	**147.5%**	**1.8%**	**6358**	**2455**	**50**	**89**	**125**	**130**	**232**	**323**
Africa-Middle	**126.9**	**249.1**	**424**	**234.1%**	**2.4%**	**6613**	**2553**	**19**	**38**	**64**	**50**	**98**	**166**
Africa-Northern	**206**	**275.2**	**317.9**	**54.3%**	**0.9%**	**8259**	**3189**	**25**	**33**	**38**	**65**	**86**	**100**
Africa-Southern	**56.8**	**68.56**	**73.63**	**29.6%**	**0.5%**	**2675**	**1033**	**21**	**26**	**28**	**55**	**66**	**71**
Africa-Western	**298.9**	**520.9**	**745.5**	**149.4%**	**1.8%**	**6138**	**2370**	**49**	**85**	**121**	**126**	**220**	**315**
Africa	**1009**	**1682**	**2354**	**133.3%**	**1.7%**	**30042**	**11599**	**34**	**56**	**78**	**87**	**145**	**203**
America-Caribbean	**39.52**	**46.94**	**50.47**	**27.7%**	**0.5%**	**228.1**	**88.06**	**173**	**206**	**221**	**449**	**533**	**573**
America-Central	**43.87**	**63.18**	**75.26**	**71.6%**	**1.1%**	**521.6**	**201.4**	**84**	**121**	**144**	**218**	**314**	**374**
America-North	**453.8**	**531.5**	**565**	**24.5%**	**0.4%**	**21558**	**8324**	**21**	**25**	**26**	**55**	**64**	**68**
America-South	**399.8**	**484.8**	**521.4**	**30.4%**	**0.5%**	**17764**	**6859**	**23**	**27**	**29**	**58**	**71**	**76**
Americas	**937**	**1126**	**1212**	**29.3%**	**0.5%**	**40072**	**15472**	**23**	**28**	**30**	**61**	**73**	**78**
Asia-East	**1576**	**1690**	**1667**	**5.8%**	**0.1%**	**11799**	**4556**	**134**	**143**	**141**	**346**	**371**	**366**
Asia-South Central	**1705**	**2162**	**2439**	**43.0%**	**0.7%**	**10791**	**4166**	**158**	**200**	**226**	**409**	**519**	**585**
Asia-South East	**585.5**	**692.1**	**719.1**	**22.8%**	**0.4%**	**4495**	**1735**	**130**	**154**	**160**	**337**	**399**	**414**
Asia-West	**229**	**325.7**	**391.9**	**71.1%**	**1.1%**	**4815**	**1859**	**48**	**68**	**81**	**123**	**175**	**211**
Oceania	**34.28**	**43.12**	**48.79**	**42.3%**	**0.7%**	**8543**	**3299**	**4**	**5**	**6**	**10**	**13**	**15**
Asia with Oceania	**4130**	**4913**	**5266**	**27.5%**	**0.5%**	**40444**	**15615**	**102**	**121**	**130**	**264**	**315**	**337**
Europe-East	**293.5**	**265.8**	**224.5**	**-23.5%**	**-0.5%**	**18852**	**7279**	**16**	**14**	**12**	**40**	**37**	**31**
Europe-North	**98.23**	**102.9**	**100.5**	**2.3%**	**0.0%**	**1746**	**674.2**	**56**	**59**	**58**	**146**	**153**	**149**
Europe-South	**149**	**140.8**	**119.9**	**-19.5%**	**-0.4%**	**1324**	**511.2**	**113**	**106**	**91**	**291**	**275**	**235**
Europe-West	**189**	**188.1**	**171.4**	**-9.3%**	**-0.2%**	**1108**	**427.9**	**171**	**170**	**155**	**442**	**440**	**401**
Europe	**720.9**	**689**	**608.8**	**-15.6%**	**-0.3%**	**22970**	**8869**	**31**	**30**	**27**	**81**	**78**	**69**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population (Million People)					Land Area		Population Density (Persons per Sq Km)			Population Density (Persons per Sq Mi)		
	2010	2035	2060	% Chg	% An Chg	Sq Km (000s)	Sq Mi (000s)	2010	2035	2060	2010	2035	2060
AFRICA													
Ethiopia	80.65	143.5	211	161.6%	1.9%	1104	426.4	73	130	191	189	337	495
Uganda	34.16	71.59	104.8	206.8%	2.3%	241	93.07	142	297	435	367	769	1126
Tanzania, United Rep. of	43.77	75.96	99.32	126.9%	1.7%	945.1	364.9	46	80	105	120	208	272
Kenya	39.25	66.38	83.5	112.7%	1.5%	580.4	224.1	68	114	144	175	296	373
Madagascar	21.1	36.58	51.45	143.8%	1.8%	587	226.7	36	62	88	93	161	227
Mozambique	22.43	37.65	48.86	117.8%	1.6%	801.6	309.5	28	47	61	72	122	158
Malawi	14.83	27.81	39.68	167.6%	2.0%	118.5	45.75	125	235	335	324	608	867
Zambia	13.21	23.79	32.22	143.9%	1.8%	752.6	290.6	18	32	43	45	82	111
Burundi	8.821	17.71	28.41	222.1%	2.4%	27.83	10.75	317	636	1021	821	1647	2643
Rwanda	10.44	19.35	28.13	169.4%	2.0%	26.34	10.17	396	735	1068	1027	1903	2766
Somalia	9.26	15.04	25.08	170.8%	2.0%	637.7	246.2	15	24	39	38	61	102
Zimbabwe	14.41	21.07	23.68	64.3%	1.0%	390.8	150.9	37	54	61	95	140	157
Eritrea	5.102	8.563	12.53	145.6%	1.8%	117.6	45.41	43	73	107	112	189	276
Mauritius	1.297	1.469	1.488	14.7%	0.3%	2.04	0.788	636	720	729	1646	1864	1888
Comoros	0.665	1.065	1.408	111.7%	1.5%	2.23	0.861	298	478	631	772	1237	1635
Djibouti	0.843	1.075	1.12	32.9%	0.6%	23.2	8.958	36	46	48	94	120	125
Africa-Eastern	**320.2**	**568.6**	**792.6**	**147.5%**	**1.8%**	**6358**	**2455**	**50**	**89**	**125**	**130**	**232**	**323**
Congo; Dem. Rep. of	67.7	142.3	261.7	286.6%	2.7%	2345	905.4	29	61	112	75	157	289
Angola	18.32	35.05	57.3	212.8%	2.3%	1247	481.4	15	28	46	38	73	119
Cameroon	18.29	30.26	40.69	122.5%	1.6%	475.4	183.6	38	64	86	100	165	222
Chad	11.35	22.72	38.34	237.8%	2.5%	1284	495.8	9	18	30	23	46	77
Central African Republic	4.488	7.769	11.45	155.1%	1.9%	623	240.5	7	12	18	19	32	48
Congo, Rep. of	4.52	7.626	10.3	127.9%	1.7%	342	132	13	22	30	34	58	78
Gabon	1.513	2.181	2.647	75.0%	1.1%	267.7	103.3	6	8	10	15	21	26
Equatorial Guinea	0.565	0.894	1.213	114.7%	1.5%	28.05	10.83	20	32	43	52	83	112
São Tomé and Príncipe	0.176	0.298	0.418	137.5%	1.7%	0.96	0.371	183	310	435	474	803	1127
Africa-Middle	**126.9**	**249.1**	**424**	**234.1%**	**2.4%**	**6613**	**2553**	**19**	**38**	**64**	**50**	**98**	**166**
Egypt	81.14	106.6	122.6	51.1%	0.8%	1001	386.7	81	106	122	210	276	317
Sudan	40.33	64.11	84.99	110.7%	1.5%	2506	967.5	16	26	34	42	66	88
Algeria	35.34	44.13	45.98	30.1%	0.5%	2382	919.6	15	19	19	38	48	50
Morocco	32.15	38.99	40.88	27.2%	0.5%	446.5	172.4	72	87	92	186	226	237
Tunisia	10.59	12.68	13.49	27.4%	0.5%	163.6	63.17	65	78	82	168	201	214
Libyan Arab Jamahiriya	6.456	8.713	9.873	52.9%	0.9%	1760	679.4	4	5	6	10	13	15
Africa-Northern	**206**	**275.2**	**317.9**	**54.3%**	**0.9%**	**8259**	**3189**	**25**	**33**	**38**	**65**	**86**	**100**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population (Million People)					Land Area		Population Density (Persons per Sq Km)			Population Density (Persons per Sq Mi)		
	2010	2035	2060	% Chg	% An Chg	Sq Km (000s)	Sq Mi (000s)	2010	2035	2060	2010	2035	2060
AFRICA continued													
South Africa	49.52	58.54	62.22	25.6%	0.5%	1221	471.4	41	48	51	105	124	132
Namibia	2.215	3.203	3.825	72.7%	1.1%	824.3	318.3	3	4	5	7	10	12
Lesotho	1.935	2.628	2.952	52.6%	0.8%	30.35	11.72	64	87	97	165	224	252
Botswana	1.898	2.428	2.618	37.9%	0.6%	581.7	224.6	3	4	5	8	11	12
Swaziland	1.227	1.762	2.017	64.4%	1.0%	17.36	6.703	71	101	116	183	263	301
Africa-Southern	**56.8**	**68.56**	**73.63**	**29.6%**	**0.5%**	**2675**	**1033**	**21**	**26**	**28**	**55**	**66**	**71**
Nigeria	149.3	255.9	358.6	140.2%	1.8%	923.8	356.7	162	277	388	419	717	1005
Niger	16.21	32.35	51.43	217.3%	2.3%	1267	489.2	13	26	41	33	66	105
Côte d'Ivoire	20.43	35.19	48.69	138.3%	1.8%	322.5	124.5	63	109	151	164	283	391
Ghana	24.41	37.02	46.17	89.1%	1.3%	238.5	92.1	102	155	194	265	402	501
Burkina Faso	15.17	28.7	43.61	187.5%	2.1%	274	105.8	55	105	159	143	271	412
Mali	15.54	29.04	43.4	179.3%	2.1%	1240	478.8	13	23	35	32	61	91
Senegal	13.22	23.63	34.96	164.4%	2.0%	196.7	75.95	67	120	178	174	311	460
Guinea	10.31	18.49	28	171.6%	2.0%	245.9	94.93	42	75	114	109	195	295
Benin	9.637	17.08	24.51	154.3%	1.9%	112.6	43.48	86	152	218	222	393	564
Togo	6.964	11.93	16.47	136.5%	1.7%	56.79	21.93	123	210	290	318	544	751
Sierra Leone	6.293	10.47	15.25	142.3%	1.8%	71.74	27.7	88	146	213	227	378	551
Liberia	3.86	7.916	14.76	282.4%	2.7%	111.4	43	35	71	132	90	184	343
Mauritania	3.437	5.807	8.363	143.3%	1.8%	1026	396	3	6	8	9	15	21
Guinea-Bissau	1.85	3.688	6.23	236.8%	2.5%	36.12	13.95	51	102	172	133	264	447
Gambia	1.694	2.804	4.011	136.8%	1.7%	11.3	4.363	150	248	355	388	643	919
Cape Verde	0.566	0.838	1.002	77.0%	1.1%	4.03	1.556	140	208	249	364	539	644
Africa-Western	**298.9**	**520.9**	**745.5**	**149.4%**	**1.8%**	**6138**	**2370**	**49**	**85**	**121**	**126**	**220**	**315**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population (Million People)					Land Area		Population Density (Persons per Sq Km)			Population Density (Persons per Sq Mi)		
	2010	2035	2060	% Chg	% An Chg	Sq Km (000s)	Sq Mi (000s)	2010	2035	2060	2010	2035	2060
AMERICAS													
Haiti	9.303	13.65	17.03	83.1%	1.2%	27.75	10.71	335	492	614	869	1275	1590
Dominican Republic	9.609	11.7	12.9	34.2%	0.6%	48.73	18.81	197	240	265	511	622	686
Cuba	11.43	11.29	10.24	-10.4%	-0.2%	110.9	42.8	103	102	92	267	264	239
Puerto Rico	4.063	4.647	4.757	17.1%	0.3%	8.95	3.456	454	519	532	1176	1345	1376
Jamaica	2.756	3.132	3.139	13.9%	0.3%	10.99	4.243	251	285	286	650	738	740
Trinidad and Tobago	1.339	1.367	1.244	-7.1%	-0.1%	5.13	1.981	261	266	242	676	690	628
Bahamas	0.34	0.398	0.412	21.2%	0.4%	13.88	5.359	24	29	30	63	74	77
Barbados	0.275	0.278	0.246	-10.5%	-0.2%	0.43	0.166	640	647	572	1657	1675	1482
St. Vincent & the Grenadines	0.127	0.159	0.176	38.6%	0.7%	0.39	0.151	326	408	451	841	1053	1166
Grenada	0.113	0.146	0.165	46.0%	0.8%	0.34	0.131	332	429	485	863	1115	1260
St. Lucia	0.17	0.176	0.16	-5.9%	-0.1%	0.62	0.239	274	284	258	711	736	669
America-Caribbean	**39.52**	**46.94**	**50.47**	**27.7%**	**0.5%**	**228.1**	**88.06**	**173**	**206**	**221**	**449**	**533**	**573**
Guatemala	14.33	24.25	31.95	123.0%	1.6%	108.9	42.04	132	223	293	341	577	760
Honduras	7.96	11.11	12.66	59.0%	0.9%	112.1	43.28	71	99	113	184	257	293
El Salvador	7.446	9.481	10.5	41.0%	0.7%	21.04	8.124	354	451	499	917	1167	1292
Nicaragua	5.67	7.75	8.56	51.0%	0.8%	130	50.19	44	60	66	113	154	171
Costa Rica	4.672	5.836	6.367	36.3%	0.6%	51.1	19.73	91	114	125	237	296	323
Panama	3.473	4.315	4.712	35.7%	0.6%	75.52	29.16	46	57	62	119	148	162
Belize	0.319	0.442	0.513	60.8%	1.0%	22.96	8.865	14	19	22	36	50	58
America-Central	**43.87**	**63.18**	**75.26**	**71.6%**	**1.1%**	**521.6**	**201.4**	**84**	**121**	**144**	**218**	**314**	**374**
United States of America	311.1	364.6	394.6	26.8%	0.5%	9629	3718	32	38	41	84	98	106
Mexico	109	128.3	130.2	19.4%	0.4%	1958	756.1	56	66	66	144	170	172
Canada	33.68	38.57	40.17	19.3%	0.4%	9971	3850	3	4	4	9	10	10
America-North	**453.8**	**531.5**	**565**	**24.5%**	**0.4%**	**21558**	**8324**	**21**	**25**	**26**	**55**	**64**	**68**
Brazil	198.6	236.3	251.4	26.6%	0.5%	8547	3300	23	28	29	60	72	76
Colombia	48.82	59.65	64.78	32.7%	0.6%	1139	439.7	43	52	57	111	136	147
Argentina	40.83	48.26	52.2	27.8%	0.5%	2780	1074	15	17	19	38	45	49
Venezuela, RB	28.87	37.17	41.04	42.2%	0.7%	912.1	352.1	32	41	45	82	106	117
Peru	29.98	37.08	40.25	34.3%	0.6%	1285	496.2	23	29	31	60	75	81
Chile	17.07	20.24	20.93	22.6%	0.4%	756.6	292.1	23	27	28	58	69	72
Ecuador	14.32	18.25	19.45	35.8%	0.6%	283.6	109.5	50	64	69	131	167	178
Bolivia	10.06	13.98	16.35	62.5%	1.0%	1099	424.2	9	13	15	24	33	39
Paraguay	6.484	8.854	10.01	54.4%	0.9%	406.7	157	16	22	25	41	56	64
Uruguay	3.553	3.823	3.922	10.4%	0.2%	176.2	68.04	20	22	22	52	56	58
Guyana	0.754	0.697	0.622	-17.5%	-0.4%	215	83	4	3	3	9	8	7
Suriname	0.464	0.483	0.439	-5.4%	-0.1%	163.3	63.04	3	3	3	7	8	7
America-South	**399.8**	**484.8**	**521.4**	**30.4%**	**0.5%**	**17764**	**6859**	**23**	**27**	**29**	**58**	**71**	**76**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population (Million People) 2010	2035	2060	% Chg	% An Chg	Land Area Sq Km (000s)	Sq Mi (000s)	Population Density Persons per Sq Km 2010	2035	2060	Persons per Sq Mi 2010	2035	2060
ASIA WITH OCEANIA													
China	1342	1465	1477	10.1%	0.2%	9598	3706	140	153	154	362	395	399
Japan	128.3	114.4	91.14	-29.0%	-0.7%	377.8	145.9	340	303	241	879	784	625
Korea, Rep. of	49.13	49.17	39.35	-19.9%	-0.4%	99.26	38.32	495	495	396	1282	1283	1027
Taiwan	23.78	26.94	26.34	10.8%	0.2%	35.98	13.89	661	749	732	1712	1940	1896
Korea, Dem. Rep. of	22.85	23.63	22.03	-3.6%	-0.1%	120.5	46.54	190	196	183	491	508	473
Hong Kong	7.312	8.376	8.374	14.5%	0.3%	1.07	0.413	6834	7828	7826	17705	20281	20276
Mongolia	2.728	3.292	3.476	27.4%	0.5%	1566	604.8	2	2	2	5	5	6
Asia-East	**1576**	**1690**	**1667**	**5.8%**	**0.1%**	**11799**	**4556**	**134**	**143**	**141**	**346**	**371**	**366**
India	1160	1398	1513	30.4%	0.5%	3287	1269	353	425	460	914	1102	1192
Pakistan	171.9	269.1	347.3	102.0%	1.4%	796.1	307.4	216	338	436	559	875	1130
Bangladesh	153.6	192.5	203.8	32.7%	0.6%	144	55.6	1067	1337	1415	2763	3462	3665
Afghanistan	35.65	74.92	137.1	284.6%	2.7%	652.1	251.8	55	115	210	142	298	544
Iran, Islamic Rep. of,	72.38	91.47	98.7	36.4%	0.6%	1648	636.4	44	56	60	114	144	155
Nepal	29.39	40.59	44.79	52.4%	0.8%	147.2	56.83	200	276	304	517	714	788
Uzbekistan	27.78	33.41	33.3	19.9%	0.4%	447.4	172.7	62	75	74	161	193	193
Sri Lanka	20.4	22.08	21.22	4.0%	0.1%	65.61	25.33	311	337	323	805	872	838
Kazakhstan	15.17	15.42	13.97	-7.9%	-0.2%	2725	1052	6	6	5	14	15	13
Tajikistan	6.957	9.798	10.8	55.2%	0.9%	143.1	55.25	49	68	75	126	177	195
Turkmenistan	5.158	6.523	7.099	37.6%	0.6%	488.1	188.5	11	13	15	27	35	38
Kyrgyzstan	5.471	6.441	6.312	15.4%	0.3%	199.9	77.18	27	32	32	71	83	82
Bhutan	0.676	0.896	1.034	53.0%	0.9%	47	18.15	14	19	22	37	49	57
Maldives	0.358	0.493	0.585	63.4%	1.0%	0.3	0.116	1193	1643	1950	3086	4250	5043
Asia-South Central	**1705**	**2162**	**2439**	**43.0%**	**0.7%**	**10791**	**4166**	**158**	**200**	**226**	**409**	**519**	**585**
Indonesia	232.4	265.6	267.2	15.0%	0.3%	1905	735.4	122	139	140	316	361	363
Philippines	91.21	121.9	134.7	47.7%	0.8%	300	115.8	304	406	449	788	1053	1163
Vietnam	87.49	104.1	110.3	26.1%	0.5%	331.7	128.1	264	314	333	683	813	861
Thailand	66.23	70.67	68.8	3.9%	0.1%	513.1	198.1	129	138	134	334	357	347
Myanmar	52.44	54.22	51.23	-2.3%	0.0%	676.6	261.2	78	80	76	201	208	196
Malaysia	27.49	35.89	40.27	46.5%	0.8%	329.7	127.3	83	109	122	216	282	316
Cambodia	15.36	22.15	26.23	70.8%	1.1%	181	69.9	85	122	145	220	317	375
Lao PDR	6.487	9.118	10.74	65.6%	1.0%	236.8	91.43	27	39	45	71	100	117
Singapore	4.658	5.317	5.109	9.7%	0.2%	0.62	0.239	7513	8576	8240	19490	22247	21377
Timor-Leste	1.283	2.516	3.826	198.2%	2.2%	14.87	5.741	86	169	257	223	438	666
Brunei Darussalam	0.414	0.579	0.675	63.0%	1.0%	5.77	2.228	72	100	117	186	260	303
Asia-South East	**585.5**	**692.1**	**719.1**	**22.8%**	**0.4%**	**4495**	**1735**	**130**	**154**	**160**	**337**	**399**	**414**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population					Land Area		Population Density					
	Million People					Sq Km	Sq Mi	Persons per Sq Km			Persons per Sq Mi		
	2010	2035	2060	% Chg	% An Chg	(000s)	(000s)	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA continued													
Turkey	76.35	91.8	98.3	28.7%	0.5%	774.8	299.2	99	118	127	255	307	329
Yemen	24.23	45.43	65.9	172.0%	2.0%	528	203.9	46	86	125	119	223	323
Iraq	29.95	50.27	65.58	119.0%	1.6%	438.3	169.2	68	115	150	177	297	388
Saudi Arabia	25.88	40.55	51.04	97.2%	1.4%	2150	830	12	19	24	31	49	61
Syria	21.41	32.63	39.31	83.6%	1.2%	185.2	71.5	116	176	212	299	456	550
Israel	7.639	10.05	11.64	52.4%	0.8%	21.06	8.131	363	477	553	939	1236	1432
Azerbaijan	8.933	10.43	10.24	14.6%	0.3%	86.6	33.44	103	120	118	267	312	306
Jordan	6.074	8.356	9.953	63.9%	1.0%	89.21	34.44	68	94	112	176	243	289
Palestine	4.181	7.216	9.363	123.9%	1.6%	0.38	0.147	11003	18989	24639	28442	49088	63694
United Arab Emirates	4.995	6.448	6.603	32.2%	0.6%	83.6	32.28	60	77	79	155	200	205
Oman	2.849	4.437	5.62	97.3%	1.4%	309.5	119.5	9	14	18	24	37	47
Kuwait	2.872	4.157	5.06	76.2%	1.1%	17.82	6.88	161	233	284	417	604	735
Lebanon	3.806	4.484	4.715	23.9%	0.4%	10.4	4.015	366	431	453	948	1117	1174
Georgia	4.344	3.538	2.899	-33.3%	-0.8%	69.7	26.91	62	51	42	161	131	108
Armenia	3.06	3.027	2.75	-10.1%	-0.2%	29.8	11.51	103	102	92	266	263	239
Bahrain	0.795	1.037	1.129	42.0%	0.7%	0.71	0.274	1120	1461	1590	2901	3785	4120
Qatar	0.876	1.058	1.049	19.7%	0.4%	11	4.247	80	96	95	206	249	247
Cyprus	0.781	0.818	0.733	-6.1%	-0.1%	9.25	3.571	84	88	79	219	229	205
Asia-West	**229**	**325.7**	**391.9**	**71.1%**	**1.1%**	**4815**	**1859**	**48**	**68**	**81**	**123**	**175**	**211**
Australia	21.41	25.41	27.69	29.3%	0.5%	7741	2989	3	3	4	7	9	9
Papua New Guniea	6.522	10.07	13.02	99.6%	1.4%	462.8	178.7	14	22	28	36	56	73
New Zealand	4.268	4.867	4.93	15.5%	0.3%	270.5	104.5	16	18	18	41	47	47
Solomon Islands	0.534	0.847	1.128	111.2%	1.5%	28.9	11.16	18	29	39	48	76	101
Fiji	0.885	0.959	0.891	0.7%	0.0%	18.27	7.054	48	52	49	125	136	126
Vanuatu	0.237	0.37	0.459	93.7%	1.3%	12.19	4.707	19	30	38	50	79	98
Micronesia	0.123	0.186	0.229	86.2%	1.3%	5.801	2.24	21	32	39	55	83	102
Tonga	0.113	0.178	0.225	99.1%	1.4%	0.75	0.29	151	237	300	390	614	776
Samoa	0.19	0.228	0.221	16.3%	0.3%	2.84	1.097	67	80	78	173	208	201
Oceania	**34.28**	**43.12**	**48.79**	**42.3%**	**0.7%**	**8543**	**3299**	**4**	**5**	**6**	**10**	**13**	**15**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population (Million People)					Land Area		Population Density (Persons per Sq Km)			Population Density (Persons per Sq Mi)		
	2010	2035	2060	% Chg	% An Chg	Sq Km (000s)	Sq Mi (000s)	2010	2035	2060	2010	2035	2060
EUROPE													
Russian Federation	141.1	130.1	110	-22.0%	-0.5%	17075	6593	8	8	6	21	20	17
Ukraine	45.5	37.21	30.9	-32.1%	-0.8%	603.7	233.1	75	62	51	195	160	133
Poland	38.29	36.3	30.65	-20.0%	-0.4%	312.7	120.7	122	116	98	317	301	254
Romania	21.49	19.53	16.63	-22.6%	-0.5%	238.4	92.04	90	82	70	233	212	181
Czech Republic	10.3	9.686	8.29	-19.5%	-0.4%	127.9	49.37	81	76	65	209	196	168
Belarus	9.688	9.037	7.938	-18.1%	-0.4%	207.6	80.15	47	44	38	121	113	99
Hungary	9.988	8.982	7.502	-24.9%	-0.6%	93.03	35.92	107	97	81	278	250	209
Bulgaria	7.496	6.037	4.962	-33.8%	-0.8%	110.9	42.82	68	54	45	175	141	116
Slovakia	5.44	5.231	4.486	-17.5%	-0.4%	49.01	18.92	111	107	92	288	276	237
Moldova, Rep. of	4.153	3.633	3.111	-25.1%	-0.6%	33.85	13.07	123	107	92	318	278	238
Europe-East	**293.5**	**265.8**	**224.5**	**-23.5%**	**-0.5%**	**18852**	**7279**	**16**	**14**	**12**	**40**	**37**	**31**
United Kingdom	61.74	65.33	64.37	4.3%	0.1%	242.9	93.79	254	269	265	658	697	686
Sweden	9.189	9.424	9.024	-1.8%	0.0%	450	173.7	20	21	20	53	54	52
Denmark	5.532	5.77	5.69	2.9%	0.1%	43.09	16.64	128	134	132	332	347	342
Ireland	4.389	5.148	5.434	23.8%	0.4%	70.27	27.13	62	73	77	162	190	200
Norway	4.765	5.227	5.307	11.4%	0.2%	323.9	125.1	15	16	16	38	42	42
Finland	5.339	5.388	5.044	-5.5%	-0.1%	338.1	130.6	16	16	15	41	41	39
Lithuania	3.383	3.108	2.636	-22.1%	-0.5%	65.2	25.17	52	48	40	134	123	105
Latvia	2.275	2.067	1.749	-23.1%	-0.5%	64.6	24.94	35	32	27	91	83	70
Estonia	1.308	1.092	0.917	-29.9%	-0.7%	45.1	17.41	29	24	20	75	63	53
Iceland	0.308	0.342	0.333	8.1%	0.2%	103	39.77	3	3	3	8	9	8
Europe-North	**98.23**	**102.9**	**100.5**	**2.3%**	**0.0%**	**1746**	**674.2**	**56**	**59**	**58**	**146**	**153**	**149**
Italy	58.86	54.07	44.77	-23.9%	-0.5%	301.3	116.3	195	179	149	506	465	385
Spain	44.14	42.74	36.32	-17.7%	-0.4%	506	195.4	87	84	72	226	219	186
Greece	11.23	10.72	9.287	-17.3%	-0.4%	132	50.95	85	81	70	220	210	182
Portugal	10.66	10.3	9.278	-13.0%	-0.3%	91.98	35.51	116	112	101	300	290	261
Serbia	7.373	6.833	6.129	-16.9%	-0.4%	102.2	39.45	72	67	60	187	173	155
Croatia	4.423	4.025	3.487	-21.2%	-0.5%	56.54	21.83	78	71	62	203	184	160
Bosnia and Herzegovina	4.071	3.81	3.208	-21.2%	-0.5%	51.2	19.77	80	74	63	206	193	162
Albania	3.181	3.375	3.19	0.3%	0.0%	28.75	11.1	111	117	111	287	304	287
Macedonia, TFYR	2.066	1.998	1.753	-15.2%	-0.3%	25.71	9.927	80	78	68	208	201	177
Slovenia	2.011	1.88	1.522	-24.3%	-0.6%	20.25	7.819	99	93	75	257	240	195
Montenegro	0.62	0.62	0.589	-5.0%	-0.1%	7.757	2.995	80	80	76	207	207	197
Malta	0.41	0.408	0.351	-14.4%	-0.3%	0.32	0.124	1281	1275	1097	3306	3290	2831
Europe-South	**149**	**140.8**	**119.9**	**-19.5%**	**-0.4%**	**1324**	**511.2**	**113**	**106**	**91**	**291**	**275**	**235**
Germany	82.96	79.16	68.86	-17.0%	-0.4%	357	137.8	232	222	193	602	574	500
France	62.3	64.67	61.8	-0.8%	0.0%	551.5	212.9	113	117	112	293	304	290
Netherlands	16.78	17.71	17.09	1.8%	0.0%	41.53	16.03	404	426	412	1047	1105	1066
Belgium	10.67	10.81	10.15	-4.9%	-0.1%	30.51	11.78	350	354	333	906	918	862
Austria	8.288	7.843	6.555	-20.9%	-0.5%	83.86	32.38	99	94	78	256	242	202
Switzerland	7.526	7.297	6.178	-17.9%	-0.4%	41.29	15.94	182	177	150	472	458	388
Luxembourg	0.487	0.616	0.742	52.4%	0.8%	2.59	1	188	238	286	487	616	742
Europe-West	**189**	**188.1**	**171.4**	**-9.3%**	**-0.2%**	**1108**	**1108**	**171**	**170**	**155**	**171**	**170**	**155**

Population, Land Area, and Human Development Index

Base Case
Source: International Futures
Version 6.12, March 2009

	Urban Population					Population Growth Rate			Population Below 15 Years				
	Percent					Percent			Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
World	**52.3**	**58.81**	**64.6**	**23.5%**	**0.4%**	**1.081**	**0.65**	**0.225**	**1805**	**1808**	**1724**	**-4.5%**	**-0.1%**
Africa	**41.92**	**46.31**	**51.84**	**23.7%**	**0.4%**	**2.367**	**1.702**	**0.952**	**404.5**	**567.5**	**616**	**52.3%**	**0.8%**
Americas	**80.65**	**83.13**	**84.95**	**5.3%**	**0.1%**	**1.044**	**0.491**	**0.157**	**231.1**	**209.6**	**189.6**	**-18.0%**	**-0.4%**
Asia with Oceania	**44.62**	**54.67**	**63.46**	**42.2%**	**0.7%**	**0.964**	**0.463**	**0.016**	**1059**	**942.4**	**841.4**	**-20.5%**	**-0.5%**
Europe	**73.99**	**79.04**	**83.21**	**12.5%**	**0.2%**	**0.009**	**-0.315**	**-0.627**	**109.1**	**87.86**	**75.78**	**-30.5%**	**-0.7%**
World	**52.3**	**58.81**	**64.6**	**23.5%**	**0.4%**	**1.081**	**0.65**	**0.225**	**1805**	**1808**	**1724**	**-4.5%**	**-0.1%**
Africa-Eastern	**24.85**	**31.78**	**41.2**	**65.8%**	**1.0%**	**2.664**	**1.821**	**0.888**	**138.5**	**202.2**	**196**	**41.5%**	**0.7%**
Africa-Middle	**42.97**	**46.43**	**50.69**	**18.0%**	**0.3%**	**2.919**	**2.508**	**1.658**	**57.6**	**103.8**	**144.6**	**151.0%**	**1.9%**
Africa-Northern	**53.65**	**59.13**	**64.78**	**20.7%**	**0.4%**	**1.643**	**0.806**	**0.299**	**64.14**	**61.79**	**56.8**	**-11.4%**	**-0.2%**
Africa-Southern	**61.43**	**67.99**	**73.82**	**20.2%**	**0.4%**	**1.138**	**0.505**	**-0.002**	**17.74**	**14.66**	**12.29**	**-30.7%**	**-0.7%**
Africa-Western	**47.98**	**52.48**	**56.13**	**17.0%**	**0.3%**	**2.548**	**1.817**	**0.991**	**126.5**	**185**	**206.3**	**63.1%**	**1.0%**
Africa	**41.92**	**46.31**	**51.84**	**23.7%**	**0.4%**	**2.367**	**1.702**	**0.952**	**404.5**	**567.5**	**616**	**52.3%**	**0.8%**
America-Caribbean	**67.33**	**69.97**	**72.56**	**7.8%**	**0.1%**	**0.958**	**0.433**	**0.072**	**10.53**	**10.1**	**9.076**	**-13.8%**	**-0.3%**
America-Central	**57.13**	**61.6**	**66.9**	**17.1%**	**0.3%**	**1.917**	**1.013**	**0.394**	**15.42**	**16.11**	**13.59**	**-11.9%**	**-0.3%**
America-North	**81.61**	**84.91**	**87.03**	**6.6%**	**0.1%**	**0.876**	**0.423**	**0.18**	**96.73**	**91.63**	**87.21**	**-9.8%**	**-0.2%**
America-South	**83.47**	**85.27**	**86.49**	**3.6%**	**0.1%**	**1.147**	**0.503**	**0.105**	**108.4**	**91.79**	**79.73**	**-26.4%**	**-0.6%**
Americas	**80.65**	**83.13**	**84.95**	**5.3%**	**0.1%**	**1.044**	**0.491**	**0.157**	**231.1**	**209.6**	**189.6**	**-18.0%**	**-0.4%**
Asia-East	**50.63**	**62.58**	**72.25**	**42.7%**	**0.7%**	**0.48**	**0.151**	**-0.436**	**300.4**	**251.3**	**222.2**	**-26.0%**	**-0.6%**
Asia-South Central	**33.9**	**44.61**	**55**	**62.2%**	**1.0%**	**1.272**	**0.655**	**0.271**	**520.1**	**466.3**	**425**	**-18.3%**	**-0.4%**
Asia-South East	**49.07**	**57.94**	**64.74**	**31.9%**	**0.6%**	**1.042**	**0.328**	**-0.04**	**159**	**136.3**	**114.8**	**-27.8%**	**-0.6%**
Asia-West	**67.61**	**70.96**	**75**	**10.9%**	**0.2%**	**1.782**	**1.067**	**0.421**	**71.68**	**79.69**	**70.83**	**-1.2%**	**0.0%**
Oceania	**71.98**	**72.98**	**75.14**	**4.4%**	**0.1%**	**1.164**	**0.699**	**0.347**	**7.998**	**8.774**	**8.589**	**7.4%**	**0.1%**
Asia with Oceania	**44.62**	**54.67**	**63.46**	**42.2%**	**0.7%**	**0.964**	**0.463**	**0.016**	**1059**	**942.4**	**841.4**	**-20.5%**	**-0.5%**
Europe-East	**69.72**	**75.14**	**80.3**	**15.2%**	**0.3%**	**-0.264**	**-0.472**	**-0.87**	**42.56**	**30.83**	**24.75**	**-41.8%**	**-1.1%**
Europe-North	**83.98**	**85.85**	**87.63**	**4.3%**	**0.1%**	**0.388**	**0.025**	**-0.161**	**16.76**	**15.87**	**14.95**	**-10.8%**	**-0.2%**
Europe-South	**68.93**	**75.09**	**80.14**	**16.3%**	**0.3%**	**0.069**	**-0.406**	**-0.859**	**21.76**	**16.33**	**13.64**	**-37.3%**	**-0.9%**
Europe-West	**78.43**	**82.98**	**86.01**	**9.7%**	**0.2%**	**0.196**	**-0.219**	**-0.424**	**29.39**	**25.87**	**23.27**	**-20.8%**	**-0.5%**
Europe	**73.99**	**79.04**	**83.21**	**12.5%**	**0.2%**	**0.009**	**-0.315**	**-0.627**	**109.1**	**87.86**	**75.78**	**-30.5%**	**-0.7%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA													
Ethiopia	18.91	24.96	33	74.5%	1.1%	2.539	1.946	1.042	34.1	52.8	59.27	73.8%	1.1%
Uganda	15.41	28.39	43	179.0%	2.1%	3.462	2.293	0.935	16.57	28.06	24.76	49.4%	0.8%
Tanzania, United Rep. of	26.76	34.51	46.92	75.3%	1.1%	2.628	1.64	0.834	19.15	25.67	19.8	3.4%	0.1%
Kenya	23.91	33.36	44.93	87.9%	1.3%	2.671	1.498	0.62	16.64	21.49	16.46	-1.1%	0.0%
Madagascar	28.58	32.59	39.25	37.3%	0.6%	2.536	1.768	0.921	8.846	12.99	13.78	55.8%	0.9%
Mozambique	41.37	49.87	61.04	47.5%	0.8%	2.46	1.589	0.749	9.733	12.73	9.827	1.0%	0.0%
Malawi	19.87	25.77	33.63	69.3%	1.1%	2.826	2.056	0.596	6.779	10.43	10.36	52.8%	0.9%
Zambia	33.6	37.29	45.97	36.8%	0.6%	2.598	1.905	0.529	5.876	8.715	7.461	27.0%	0.5%
Burundi	11.74	17.5	28.39	141.8%	1.8%	3.175	2.399	1.294	3.924	7.207	8.812	124.6%	1.6%
Rwanda	27.47	36.89	42.73	55.6%	0.9%	3.023	1.964	0.852	4.472	7.198	7.755	73.4%	1.1%
Somalia	33.78	36.58	43.28	28.1%	0.5%	1.916	1.715	2.042	4.004	5.543	8.589	114.5%	1.5%
Zimbabwe	38.49	44.28	52.05	35.2%	0.6%	2.113	0.787	-0.005	5.389	5.387	4.433	-17.7%	-0.4%
Eritrea	20.77	24.1	28.13	35.4%	0.6%	2.797	1.846	1.173	2.208	3.073	3.916	77.4%	1.2%
Mauritius	44.83	57.16	68.47	52.7%	0.9%	0.694	0.249	-0.181	0.289	0.252	0.218	-24.6%	-0.6%
Comoros	39.77	43.13	48.55	22.1%	0.4%	2.094	1.466	0.748	0.26	0.344	0.338	30.0%	0.5%
Djibouti	94.72	98.76	96.61	2.0%	0.0%	1.194	0.457	-0.308	0.301	0.329	0.246	-18.3%	-0.4%
Africa-Eastern	**24.85**	**31.78**	**41.2**	**65.8%**	**1.0%**	**2.664**	**1.821**	**0.888**	**138.5**	**202.2**	**196**	**41.5%**	**0.7%**
Congo; Dem. Rep. of	33.16	37.06	44.6	34.5%	0.6%	3.18	2.862	1.889	32.29	64.13	95.24	195.0%	2.2%
Angola	59.52	65.02	65.26	9.6%	0.2%	2.819	2.302	1.627	8.34	14.01	19.11	129.1%	1.7%
Cameroon	64.95	69.57	70.9	9.2%	0.2%	2.324	1.637	0.657	7.321	10.13	10.18	39.1%	0.7%
Chad	29.13	36.99	42.74	46.7%	0.8%	3.105	2.427	1.746	5.139	9.12	13.16	156.1%	1.9%
Central African Republic	40.67	44.35	50.13	23.3%	0.4%	2.268	1.926	1.06	1.855	2.872	3.377	82.0%	1.2%
Congo, Rep. of	56.4	59.71	61.99	9.9%	0.2%	2.462	1.674	0.704	1.846	2.551	2.58	39.8%	0.7%
Gabon	84.13	89.21	88.68	5.4%	0.1%	1.833	1.107	0.426	0.505	0.593	0.553	9.5%	0.2%
Equatorial Guinea	43.08	61.08	69.79	62.0%	1.0%	2.261	1.578	0.838	0.233	0.291	0.31	33.0%	0.6%
São Tomé and Príncipe	59.85	62.51	63.96	6.9%	0.1%	2.38	1.719	0.927	0.069	0.098	0.112	62.3%	1.0%
Africa-Middle	**42.97**	**46.43**	**50.69**	**18.0%**	**0.3%**	**2.919**	**2.508**	**1.658**	**57.6**	**103.8**	**144.6**	**151.0%**	**1.9%**
Egypt	43.24	51.6	62	43.4%	0.7%	1.717	0.758	0.346	25.91	21.91	19.42	-25.0%	-0.6%
Sudan	46.96	53.68	58.14	23.8%	0.4%	2.151	1.481	0.744	15.5	20.19	19.98	28.9%	0.5%
Algeria	67.18	70.21	71.54	6.5%	0.1%	1.421	0.456	-0.216	9.45	8.195	7.25	-23.3%	-0.5%
Morocco	62.01	65.47	69.35	11.8%	0.2%	1.224	0.348	-0.013	8.853	7.615	6.601	-25.4%	-0.6%
Tunisia	67.67	71.75	77.44	14.4%	0.3%	0.991	0.413	-0.053	2.481	2.238	1.953	-21.3%	-0.5%
Libyan Arab Jamahiriya	87.53	88.49	88.57	1.2%	0.0%	1.909	0.802	0.073	1.939	1.639	1.593	-17.8%	-0.4%
Africa-Northern	**53.65**	**59.13**	**64.78**	**20.7%**	**0.4%**	**1.643**	**0.806**	**0.299**	**64.14**	**61.79**	**56.8**	**-11.4%**	**-0.2%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA continued													
South Africa	64.43	70.69	76	18.0%	0.3%	1.065	0.449	-0.037	15.15	12.04	10.23	-32.5%	-0.8%
Namibia	40.59	53.09	64.31	58.4%	0.9%	1.812	0.979	0.494	0.773	0.855	0.697	-9.8%	-0.2%
Lesotho	22.97	33.1	44.99	95.9%	1.4%	1.529	0.779	0.099	0.737	0.752	0.55	-25.4%	-0.6%
Botswana	67.78	77.56	81.9	20.8%	0.4%	1.471	0.58	-0.124	0.628	0.516	0.429	-31.7%	-0.8%
Swaziland	28.97	44	56.39	94.6%	1.3%	1.755	0.974	0.139	0.447	0.503	0.377	-15.7%	-0.3%
Africa-Southern	**61.43**	**67.99**	**73.82**	**20.2%**	**0.4%**	**1.138**	**0.505**	**-0.002**	**17.74**	**14.66**	**12.29**	**-30.7%**	**-0.7%**
Nigeria	56.67	61.69	63.79	12.6%	0.2%	2.553	1.742	0.943	63.66	89.33	98.6	54.9%	0.9%
Niger	17.68	23.74	32.56	84.2%	1.2%	3.071	2.334	1.315	7.484	12.67	15.24	103.6%	1.4%
Côte d'Ivoire	48.47	52.03	56.23	16.0%	0.3%	2.483	1.759	0.785	8.088	12.02	12.55	55.2%	0.9%
Ghana	53.19	57.05	59.22	11.3%	0.2%	1.977	1.245	0.457	8.961	11.49	10.87	21.3%	0.4%
Burkina Faso	22.43	32.01	42.02	87.3%	1.3%	2.818	2.146	1.075	6.755	10.95	12.28	81.8%	1.2%
Mali	28.73	34.78	42.4	47.6%	0.8%	2.812	2.052	1.07	7.158	11.04	12.44	73.8%	1.1%
Senegal	43.15	46	51.31	18.9%	0.3%	2.59	1.929	1.128	5.406	8.454	9.684	79.1%	1.2%
Guinea	34.94	40.97	47.78	36.7%	0.6%	2.11	2.056	1.223	4.41	6.819	7.831	77.6%	1.2%
Benin	42.86	46.18	50.87	18.7%	0.3%	2.639	1.868	0.939	4.114	6.139	6.559	59.4%	0.9%
Togo	44.77	48.1	48.95	9.3%	0.2%	2.512	1.424	0.815	2.879	4.083	4.744	64.8%	1.0%
Sierra Leone	42.02	47.22	56.46	34.4%	0.6%	2.427	1.877	0.979	2.703	4.026	4.221	56.2%	0.9%
Liberia	66.93	72.11	74.14	10.8%	0.2%	3.196	2.435	2.045	1.815	3.305	5.422	198.7%	2.2%
Mauritania	40.34	43.46	47.94	18.8%	0.3%	2.338	1.756	1.171	1.327	1.944	2.315	74.5%	1.1%
Guinea-Bissau	30.18	32.66	37.36	23.8%	0.4%	3.035	2.469	1.655	0.876	1.555	2.209	152.2%	1.9%
Gambia	65.98	74.09	74.11	12.3%	0.2%	2.21	1.686	1.131	0.669	0.957	1.111	66.1%	1.0%
Cape Verde	61.55	66.6	73.79	19.9%	0.4%	2.155	0.909	0.46	0.21	0.22	0.181	-13.8%	-0.3%
Africa-Western	**47.98**	**52.48**	**56.13**	**17.0%**	**0.3%**	**2.548**	**1.817**	**0.991**	**126.5**	**185**	**206.3**	**63.1%**	**1.0%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AMERICAS													
Haiti	45.56	49.03	52.58	15.4%	0.3%	1.775	1.158	0.487	3.381	4.368	4.305	27.3%	0.5%
Dominican Republic	74.42	78.9	82.85	11.3%	0.2%	1.336	0.554	0.179	3.038	2.401	2.021	-33.5%	-0.8%
Cuba	76.4	79.12	83.16	8.8%	0.2%	0.198	-0.344	-0.493	1.984	1.534	1.22	-38.5%	-1.0%
Puerto Rico	100	99.69	99.3	-0.7%	0.0%	0.724	0.28	-0.068	0.814	0.757	0.695	-14.6%	-0.3%
Jamaica	55.17	60.45	65.38	18.5%	0.3%	0.724	0.207	-0.228	0.795	0.628	0.498	-37.4%	-0.9%
Trinidad and Tobago	19.99	46.97	63.67	218.5%	2.3%	0.411	-0.183	-0.507	0.277	0.215	0.17	-38.6%	-1.0%
Bahamas	93.87	96.24	95.63	1.9%	0.0%	0.89	0.359	-0.119	0.085	0.073	0.063	-25.9%	-0.6%
Barbados	60.99	69.18	76.39	25.3%	0.5%	0.31	-0.249	-0.818	0.047	0.036	0.029	-38.3%	-1.0%
St. Vincent & the Grenadines	47.6	55.85	64.96	36.5%	0.6%	1.27	0.634	0.21	0.035	0.03	0.027	-22.9%	-0.5%
Grenada	33.45	47.9	60.54	81.0%	1.2%	1.273	0.641	0.292	0.033	0.03	0.026	-21.2%	-0.5%
St. Lucia	31.79	47.98	61.09	92.2%	1.3%	0.447	-0.23	-0.503	0.043	0.032	0.022	-48.8%	-1.3%
America-Caribbean	**67.33**	**69.97**	**72.56**	**7.8%**	**0.1%**	**0.958**	**0.433**	**0.072**	**10.53**	**10.1**	**9.076**	**-13.8%**	**-0.3%**
Guatemala	49.77	55.77	62.36	25.3%	0.5%	2.533	1.579	0.74	5.912	7.748	6.52	10.3%	0.2%
Honduras	46.78	52.58	59.1	26.3%	0.5%	1.908	0.715	0.278	2.902	2.717	2.226	-23.3%	-0.5%
El Salvador	61.78	65.97	70.65	14.4%	0.3%	1.458	0.612	0.163	2.373	1.964	1.678	-29.3%	-0.7%
Nicaragua	64.49	67.09	71.57	11.0%	0.2%	1.877	0.68	0.095	1.932	1.722	1.466	-24.1%	-0.6%
Costa Rica	66.66	73.3	79.19	18.8%	0.3%	1.307	0.619	-0.021	1.189	1.048	0.923	-22.4%	-0.5%
Panama	76.84	82.31	84.72	10.3%	0.2%	1.281	0.641	-0.011	0.999	0.813	0.693	-30.6%	-0.7%
Belize	51.73	61.07	70.5	36.3%	0.6%	1.747	0.817	0.197	0.111	0.099	0.083	-25.2%	-0.6%
America-Central	**57.13**	**61.6**	**66.9**	**17.1%**	**0.3%**	**1.917**	**1.013**	**0.394**	**15.42**	**16.11**	**13.59**	**-11.9%**	**-0.3%**
United States of America	82.96	86.67	88.41	6.6%	0.1%	0.85	0.473	0.308	61.05	61.73	62.31	2.1%	0.0%
Mexico	77.63	79.57	82.48	6.2%	0.1%	0.97	0.312	-0.203	30.31	24.45	19.25	-36.5%	-0.9%
Canada	82.02	86.04	88.23	7.6%	0.1%	0.817	0.323	0.168	5.363	5.46	5.65	5.4%	0.1%
America-North	**81.61**	**84.91**	**87.03**	**6.6%**	**0.1%**	**0.876**	**0.423**	**0.18**	**96.73**	**91.63**	**87.21**	**-9.8%**	**-0.2%**
Brazil	86.84	88.67	88.98	2.5%	0.0%	1.073	0.443	0.11	52.68	43.9	38.01	-27.8%	-0.7%
Colombia	73.09	75.91	80.65	10.3%	0.2%	1.213	0.505	0.183	13.56	11.4	9.877	-27.2%	-0.6%
Argentina	90.7	90.67	90.26	-0.5%	0.0%	0.918	0.523	0.042	10.08	8.821	7.769	-22.9%	-0.5%
Venezuela, RB	96.68	98.34	97.59	0.9%	0.0%	1.534	0.688	0.129	8.475	7.206	6.399	-24.5%	-0.6%
Peru	71.93	75.01	79.74	10.9%	0.2%	1.258	0.58	0.105	8.654	7.187	6.202	-28.3%	-0.7%
Chile	90.01	91.79	91.16	1.3%	0.0%	0.845	0.458	-0.188	3.759	3.439	3.029	-19.4%	-0.4%
Ecuador	64.06	66.16	67.62	5.6%	0.1%	1.485	0.558	-0.04	4.305	3.643	3.149	-26.9%	-0.6%
Bolivia	67.4	71.79	76.85	14.0%	0.3%	1.792	0.801	0.397	3.578	3.253	2.823	-21.1%	-0.5%
Paraguay	61.85	64.49	67.74	9.5%	0.2%	1.808	0.666	0.275	2.161	2.029	1.739	-19.5%	-0.4%
Uruguay	88.31	88.96	89.01	0.8%	0.0%	0.39	0.22	-0.15	0.782	0.67	0.57	-27.1%	-0.6%
Guyana	29.94	41.59	53.87	79.9%	1.2%	-0.134	-0.506	-0.488	0.218	0.138	0.097	-55.5%	-1.6%
Suriname	76.2	78.08	81.54	7.0%	0.1%	0.505	-0.268	-0.508	0.132	0.095	0.067	-49.2%	-1.3%
America-South	**83.47**	**85.27**	**86.49**	**3.6%**	**0.1%**	**1.147**	**0.503**	**0.105**	**108.4**	**91.79**	**79.73**	**-26.4%**	**-0.6%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA													
China	46.64	59.95	70.86	51.9%	0.8%	0.532	0.246	-0.382	264.4	224	200	-24.4%	-0.6%
Japan	68.41	76.6	81.82	19.6%	0.4%	-0.059	-0.757	-1.012	17.13	12.26	9.71	-43.3%	-1.1%
Korea, Rep. of	84.4	87.81	88.11	4.4%	0.1%	0.287	-0.476	-1.301	7.612	5.143	3.716	-51.2%	-1.4%
Taiwan	78.35	81.29	84.33	7.6%	0.1%	0.797	0.238	-0.403	4.811	4.113	3.705	-23.0%	-0.5%
Korea, Dem. Rep. of	67.44	70.86	73.14	8.5%	0.2%	0.284	-0.252	-0.383	4.843	4.26	3.596	-25.7%	-0.6%
Hong Kong	99.34	100	100	0.7%	0.0%	0.959	0.302	-0.068	0.971	0.886	0.937	-3.5%	-0.1%
Mongolia	56.44	59.64	66.74	18.2%	0.3%	1.217	0.439	0.016	0.721	0.612	0.527	-26.9%	-0.6%
Asia-East	**50.63**	**62.58**	**72.25**	**42.7%**	**0.7%**	**0.48**	**0.151**	**-0.436**	**300.4**	**251.3**	**222.2**	**-26.0%**	**-0.6%**
India	32	44.45	57.52	79.8%	1.2%	1.087	0.477	0.144	344.3	264.8	223.7	-35.0%	-0.9%
Pakistan	37.9	45.32	52.06	37.4%	0.6%	2.076	1.318	0.565	58.85	80.59	78	32.5%	0.6%
Bangladesh	29.95	38.39	48.02	60.3%	0.9%	1.493	0.414	-0.013	50.18	41.95	33.52	-33.2%	-0.8%
Afghanistan	21.94	27.46	32.33	47.4%	0.8%	3.253	2.778	2.005	16.69	33.1	52.08	212.0%	2.3%
Iran, Islamic Rep. of	72.32	77.2	79.42	9.8%	0.2%	1.182	0.617	-0.085	18.08	16.49	14.62	-19.1%	-0.4%
Nepal	20.6	31.49	40.61	97.1%	1.4%	1.626	0.748	0.121	10.38	11.04	8.322	-19.8%	-0.4%
Uzbekistan	37.42	43.94	50.96	36.2%	0.6%	1.153	0.286	-0.278	7.889	6.457	5.167	-34.5%	-0.8%
Sri Lanka	18.39	35.88	51.95	182.5%	2.1%	0.668	-0.055	-0.256	4.518	3.913	3.246	-28.2%	-0.7%
Kazakhstan	58.58	67.35	74.76	27.6%	0.5%	0.025	-0.189	-0.508	3.409	2.626	2.01	-41.0%	-1.1%
Tajikistan	25.67	34.47	44.81	74.6%	1.1%	1.54	0.717	0.107	2.483	2.527	1.934	-22.1%	-0.5%
Turkmenistan	47.86	55.12	62	29.5%	0.5%	1.339	0.679	-0.115	1.444	1.254	1.116	-22.7%	-0.5%
Kyrgyzstan	35.42	39.63	46.39	31.0%	0.5%	1.172	0.188	-0.347	1.521	1.261	1.035	-32.0%	-0.8%
Bhutan	16.55	37.12	53.98	226.2%	2.4%	1.326	0.746	0.396	0.192	0.202	0.172	-10.4%	-0.2%
Maldives	31.03	46.91	62.6	101.7%	1.4%	1.748	0.879	0.239	0.106	0.099	0.091	-14.2%	-0.3%
Asia-South Central	**33.9**	**44.61**	**55**	**62.2%**	**1.0%**	**1.272**	**0.655**	**0.271**	**520.1**	**466.3**	**425**	**-18.3%**	**-0.4%**
Indonesia	54.49	61.09	64.53	18.4%	0.3%	0.909	0.249	-0.163	61.83	49.91	41.43	-33.0%	-0.8%
Philippines	68.32	72.28	76.63	12.2%	0.2%	1.749	0.542	0.134	31.18	28.53	23.48	-24.7%	-0.6%
Vietnam	30.56	43.93	56.38	84.5%	1.2%	0.918	0.357	0.026	22.45	19.77	17.14	-23.7%	-0.5%
Thailand	35.93	50.96	63.02	75.4%	1.1%	0.516	0.038	-0.182	13.73	11.78	10.29	-25.1%	-0.6%
Myanmar	31.19	37.81	45.93	47.3%	0.8%	0.579	-0.124	-0.343	12.99	9.827	7.922	-39.0%	-1.0%
Malaysia	75.6	82.21	84.31	11.5%	0.2%	1.53	0.762	0.127	8.011	6.844	6.156	-23.2%	-0.5%
Cambodia	24.77	39.21	51.9	109.5%	1.5%	1.825	0.945	0.422	5.157	5.761	4.727	-8.3%	-0.2%
Lao PDR	24.07	38.78	54.3	125.6%	1.6%	1.844	0.727	0.439	2.264	2.16	1.819	-19.7%	-0.4%
Singapore	100	99.83	100	0.0%	0.0%	1.161	0.088	-0.187	0.727	0.679	0.634	-12.8%	-0.3%
Timor-Leste	24.4	32.73	45.13	85.0%	1.2%	4.833	2.163	0.992	0.56	0.975	1.065	90.2%	1.3%
Brunei Darussalam	77.57	83.6	86.02	10.9%	0.2%	1.904	0.998	0.352	0.118	0.117	0.112	-5.1%	-0.1%
Asia-South East	**49.07**	**57.94**	**64.74**	**31.9%**	**0.6%**	**1.042**	**0.328**	**-0.04**	**159**	**136.3**	**114.8**	**-27.8%**	**-0.6%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued													
Turkey	70.69	74.98	79.9	13.0%	0.2%	1.015	0.51	-0.072	19.9	16.76	14.29	-28.2%	-0.7%
Yemen	32.12	42.95	51.61	60.7%	1.0%	2.955	1.973	0.93	10.47	16.03	15.96	52.4%	0.8%
Iraq	71.36	74.03	79.87	11.9%	0.2%	2.633	1.551	0.765	12.12	16.02	12.94	6.8%	0.1%
Saudi Arabia	82.37	83.88	85.58	3.9%	0.1%	2.249	1.336	0.584	8.419	10.29	9.327	10.8%	0.2%
Syria	51.48	55.58	61.65	19.8%	0.4%	2.306	1.108	0.497	7.425	8.244	7.081	-4.6%	-0.1%
Israel	92.54	92.35	92.34	-0.2%	0.0%	1.707	0.904	0.426	2.067	1.852	1.776	-14.1%	-0.3%
Azerbaijan	50.97	57.64	64.85	27.2%	0.5%	1.138	0.261	-0.369	1.994	1.702	1.439	-27.8%	-0.7%
Jordan	87.21	91.37	90.73	4.0%	0.1%	1.922	0.905	0.332	2.113	1.764	1.577	-25.4%	-0.6%
Palestine	75.94	79.23	82.67	8.9%	0.2%	2.795	1.392	0.823	1.797	2.106	1.798	0.1%	0.0%
United Arab Emirates	80.34	89.54	89.34	11.2%	0.2%	1.749	0.556	-0.346	1.03	0.991	0.96	-6.8%	-0.1%
Oman	73.72	78.86	81.46	10.5%	0.2%	2.177	1.246	0.522	0.881	1.116	1.107	25.7%	0.5%
Kuwait	100	100	100	0.0%	0.0%	2.284	1.186	0.583	0.684	0.696	0.796	16.4%	0.3%
Lebanon	100	99.56	98.7	-1.3%	0.0%	1.051	0.403	-0.031	1.004	0.842	0.709	-29.4%	-0.7%
Georgia	53.36	57.47	63.04	18.1%	0.3%	-0.72	-0.74	-0.866	0.705	0.437	0.339	-51.9%	-1.5%
Armenia	63.97	69.13	76.9	20.2%	0.4%	0.275	-0.221	-0.534	0.542	0.39	0.304	-43.9%	-1.1%
Bahrain	100	99.77	99.57	-0.4%	0.0%	1.562	0.682	0.158	0.192	0.182	0.177	-7.8%	-0.2%
Qatar	98.46	99.77	99.23	0.8%	0.0%	1.331	0.391	-0.237	0.191	0.164	0.155	-18.8%	-0.4%
Cyprus	73.54	80.48	83.94	14.1%	0.3%	0.504	-0.191	-0.682	0.135	0.109	0.088	-34.8%	-0.9%
Asia-West	**67.61**	**70.96**	**75**	**10.9%**	**0.2%**	**1.782**	**1.067**	**0.421**	**71.68**	**79.69**	**70.83**	**-1.2%**	**0.0%**
Australia	89.18	89.94	90.56	1.5%	0.0%	0.974	0.498	0.313	3.91	4.081	4.254	8.8%	0.2%
Papua New Guniea	16.93	30.7	42.79	152.7%	1.9%	2.027	1.399	0.593	2.522	3.135	2.96	17.4%	0.3%
New Zealand	87.3	88.32	88.93	1.9%	0.0%	0.685	0.287	-0.087	0.845	0.793	0.731	-13.5%	-0.3%
Solomon Islands	20.54	32.82	42.19	105.4%	1.5%	2.197	1.471	0.783	0.204	0.267	0.283	38.7%	0.7%
Fiji	52.81	57.34	63.06	19.4%	0.4%	0.698	-0.219	-0.488	0.274	0.219	0.147	-46.4%	-1.2%
Vanuatu	28.16	41.33	51.92	84.4%	1.2%	2.226	1.266	0.608	0.088	0.108	0.088	0.0%	0.0%
Micronesia	24.31	39.07	52.5	116.0%	1.6%	2.133	1.137	0.654	0.044	0.053	0.043	-2.3%	0.0%
Tonga	25.71	39.55	52.12	102.7%	1.4%	2.075	1.282	0.691	0.038	0.051	0.043	13.2%	0.2%
Samoa	26.42	41.84	54.54	106.4%	1.5%	0.473	0.18	-0.369	0.073	0.067	0.04	-45.2%	-1.2%
Oceania	**71.98**	**72.98**	**75.14**	**4.4%**	**0.1%**	**1.164**	**0.699**	**0.347**	**7.998**	**8.774**	**8.589**	**7.4%**	**0.1%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Urban Population Percent					Population Growth Rate Percent			Population Below 15 Years Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
EUROPE													
Russian Federation	74.34	79.32	83.28	12.0%	0.2%	-0.219	-0.412	-0.883	20.79	15.55	12.65	-39.2%	-1.0%
Ukraine	69.6	74.39	80.17	15.2%	0.3%	-0.743	-0.664	-0.865	6.129	3.972	3.082	-49.7%	-1.4%
Poland	63.34	70.37	77.61	22.5%	0.4%	0.025	-0.447	-0.931	5.605	4.061	3.213	-42.7%	-1.1%
Romania	55.44	63.35	70.99	28.0%	0.5%	-0.186	-0.485	-0.799	3.258	2.32	1.822	-44.1%	-1.2%
Czech Republic	73.58	76.89	81.35	10.6%	0.2%	0.049	-0.437	-0.809	1.413	1.088	0.917	-35.1%	-0.9%
Belarus	74.07	78.29	82.66	11.6%	0.2%	-0.151	-0.358	-0.747	1.394	1.032	0.85	-39.0%	-1.0%
Hungary	67.75	73.62	79.37	17.2%	0.3%	-0.264	-0.552	-0.891	1.46	1.083	0.859	-41.2%	-1.1%
Bulgaria	71.43	74.62	79.47	11.3%	0.2%	-0.762	-0.708	-0.924	0.988	0.647	0.511	-48.3%	-1.3%
Slovakia	58.11	66.73	74.24	27.8%	0.5%	0.149	-0.427	-0.822	0.818	0.608	0.486	-40.6%	-1.0%
Moldova, Rep. of	43.84	48.25	56.29	28.4%	0.5%	-0.278	-0.667	-0.641	0.704	0.473	0.356	-49.4%	-1.4%
Europe-East	**69.72**	**75.14**	**80.3**	**15.2%**	**0.3%**	**-0.264**	**-0.472**	**-0.87**	**42.56**	**30.83**	**24.75**	**-41.8%**	**-1.1%**
United Kingdom	89.05	88.87	89.43	0.4%	0.0%	0.436	0.065	-0.131	10.63	10.2	9.694	-8.8%	-0.2%
Sweden	84.31	86.2	87.79	4.1%	0.1%	0.288	-0.094	-0.218	1.467	1.421	1.326	-9.6%	-0.2%
Denmark	85.26	86.68	88.24	3.5%	0.1%	0.322	0.036	-0.033	0.98	0.933	0.872	-11.0%	-0.2%
Ireland	63.4	73.84	80.35	26.7%	0.5%	1.009	0.43	0.078	0.894	0.842	0.827	-7.5%	-0.2%
Norway	79.48	84.2	86.71	9.1%	0.2%	0.536	0.205	0.033	0.869	0.848	0.81	-6.8%	-0.1%
Finland	63.38	73.39	80.08	26.3%	0.5%	0.297	-0.213	-0.228	0.872	0.824	0.758	-13.1%	-0.3%
Lithuania	68.05	73.44	79.16	16.3%	0.3%	-0.188	-0.528	-0.93	0.49	0.373	0.297	-39.4%	-1.0%
Latvia	69.32	74.81	80.37	15.9%	0.3%	-0.233	-0.467	-0.958	0.305	0.239	0.198	-35.1%	-0.9%
Estonia	71.42	77.39	82.14	15.0%	0.3%	-0.661	-0.542	-0.878	0.193	0.13	0.115	-40.4%	-1.0%
Iceland	92.99	92.6	92.18	-0.9%	0.0%	0.629	0.129	-0.259	0.063	0.056	0.049	-22.2%	-0.5%
Europe-North	**83.98**	**85.85**	**87.63**	**4.3%**	**0.1%**	**0.388**	**0.025**	**-0.161**	**16.76**	**15.87**	**14.95**	**-10.8%**	**-0.2%**
Italy	68.77	75.26	80.8	17.5%	0.3%	-0.066	-0.504	-0.94	8.021	6.031	5.028	-37.3%	-0.9%
Spain	77.67	81.44	84.53	8.8%	0.2%	0.221	-0.324	-0.972	6.461	4.714	4.003	-38.0%	-1.0%
Greece	62.24	72.88	79.7	28.1%	0.5%	0.14	-0.367	-0.734	1.553	1.207	1.054	-32.1%	-0.8%
Portugal	62.36	71.92	78.29	25.5%	0.5%	0.1	-0.25	-0.659	1.649	1.272	1.088	-34.0%	-0.8%
Serbia	67.74	70.84	75.26	11.1%	0.2%	-0.202	-0.38	-0.514	1.263	0.939	0.738	-41.6%	-1.1%
Croatia	58.46	66.49	74.43	27.3%	0.5%	-0.179	-0.509	-0.741	0.645	0.502	0.41	-36.4%	-0.9%
Bosnia and Herzegovina	45.41	52.03	60.9	34.1%	0.6%	0.492	-0.593	-0.737	0.643	0.459	0.361	-43.9%	-1.1%
Albania	48.13	57.16	66.42	38.0%	0.6%	0.355	-0.141	-0.455	0.718	0.586	0.457	-36.4%	-0.9%
Macedonia, TFYR	72.08	74.35	75.78	5.1%	0.1%	0.233	-0.453	-0.594	0.362	0.281	0.226	-37.6%	-0.9%
Slovenia	53.74	66.2	75.41	40.3%	0.7%	0.037	-0.562	-1.071	0.269	0.197	0.161	-40.1%	-1.0%
Montenegro	66.19	69.46	74.53	12.6%	0.2%	0.276	-0.169	-0.207	0.114	0.093	0.079	-30.7%	-0.7%
Malta	97.98	99.46	98.77	0.8%	0.0%	0.266	-0.334	-0.801	0.064	0.05	0.04	-37.5%	-0.9%
Europe-South	**68.93**	**75.09**	**80.14**	**16.3%**	**0.3%**	**0.069**	**-0.406**	**-0.859**	**21.76**	**16.33**	**13.64**	**-37.3%**	**-0.9%**
Germany	76.81	81.92	85.33	11.1%	0.2%	0.041	-0.418	-0.607	11.1	9.522	8.52	-23.2%	-0.5%
France	77.36	81.51	84.83	9.7%	0.2%	0.342	-0.005	-0.249	11.21	10.05	9.088	-18.9%	-0.4%
Netherlands	83.61	87.61	88.75	6.1%	0.1%	0.453	0.002	-0.148	2.936	2.72	2.523	-14.1%	-0.3%
Belgium	96.58	95.61	95.57	-1.0%	0.0%	0.272	-0.12	-0.293	1.737	1.598	1.47	-15.4%	-0.3%
Austria	68.12	76.4	81.66	19.9%	0.4%	0.031	-0.494	-0.871	1.196	0.963	0.8	-33.1%	-0.8%
Switzerland	78.75	84.28	86.41	9.7%	0.2%	0.138	-0.438	-0.8	1.122	0.914	0.752	-33.0%	-0.8%
Luxembourg	83.55	86.77	89.2	6.8%	0.1%	1.21	0.883	0.83	0.086	0.1	0.118	37.2%	0.6%
Europe-West	**78.43**	**82.98**	**86.01**	**9.7%**	**0.2%**	**0.196**	**-0.219**	**-0.424**	**29.39**	**25.87**	**23.27**	**-20.8%**	**-0.5%**

Population, Land Area, and Human Development Index

Base Case

Source: International Futures Version 6.12, March 2009

	Population 65 Years and Above					Youth Bulge					Human Development Index				
	Million People					Ratio					Index				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**538.6**	**1198**	**2052**	**281.0%**	**2.7%**	**0.358**	**0.28**	**0.235**	**-34.4%**	**-0.8%**	**0.733**	**0.836**	**0.912**	**24.4%**	**0.4%**
Africa	**36.41**	**87.88**	**225.8**	**520.2%**	**3.7%**	**0.48**	**0.414**	**0.341**	**-29.0%**	**-0.7%**	**0.543**	**0.673**	**0.79**	**45.5%**	**0.8%**
Americas	**87.38**	**190.8**	**298.8**	**242.0%**	**2.5%**	**0.328**	**0.243**	**0.2**	**-39.0%**	**-1.0%**	**0.872**	**0.937**	**0.985**	**13.0%**	**0.2%**
Asia with Oceania	**292.2**	**730.2**	**1319**	**351.4%**	**3.1%**	**0.357**	**0.258**	**0.204**	**-42.9%**	**-1.1%**	**0.718**	**0.85**	**0.941**	**31.1%**	**0.5%**
Europe	**121.4**	**187.3**	**205.3**	**69.1%**	**1.1%**	**0.231**	**0.176**	**0.161**	**-30.3%**	**-0.7%**	**0.907**	**0.971**	**0.995**	**9.7%**	**0.2%**
World	**538.6**	**1198**	**2052**	**281.0%**	**2.7%**	**0.358**	**0.28**	**0.235**	**-34.4%**	**-0.8%**	**0.733**	**0.836**	**0.912**	**24.4%**	**0.4%**
Africa-Eastern	**9.817**	**24**	**69.15**	**604.4%**	**4.0%**	**0.506**	**0.436**	**0.341**	**-32.6%**	**-0.8%**	**0.501**	**0.661**	**0.81**	**61.7%**	**1.0%**
Africa-Middle	**3.853**	**8.72**	**21.88**	**467.9%**	**3.5%**	**0.505**	**0.487**	**0.427**	**-15.4%**	**-0.3%**	**0.454**	**0.585**	**0.725**	**59.7%**	**0.9%**
Africa-Northern	**10.16**	**26.22**	**62.8**	**518.1%**	**3.7%**	**0.423**	**0.311**	**0.231**	**-45.4%**	**-1.2%**	**0.689**	**0.815**	**0.923**	**34.0%**	**0.6%**
Africa-Southern	**2.773**	**6.481**	**13.44**	**384.7%**	**3.2%**	**0.419**	**0.315**	**0.224**	**-46.5%**	**-1.2%**	**0.711**	**0.846**	**0.935**	**31.5%**	**0.5%**
Africa-Western	**9.805**	**22.45**	**58.54**	**497.0%**	**3.6%**	**0.494**	**0.424**	**0.35**	**-29.1%**	**-0.7%**	**0.493**	**0.629**	**0.737**	**49.5%**	**0.8%**
Africa	**36.41**	**87.88**	**225.8**	**520.2%**	**3.7%**	**0.48**	**0.414**	**0.341**	**-29.0%**	**-0.7%**	**0.543**	**0.673**	**0.79**	**45.5%**	**0.8%**
America-Caribbean	**3.433**	**7.055**	**11.11**	**223.6%**	**2.4%**	**0.354**	**0.281**	**0.231**	**-34.7%**	**-0.9%**	**0.758**	**0.832**	**0.912**	**20.3%**	**0.4%**
America-Central	**2.204**	**5.362**	**12.96**	**488.0%**	**3.6%**	**0.444**	**0.34**	**0.244**	**-45.0%**	**-1.2%**	**0.75**	**0.837**	**0.932**	**24.3%**	**0.4%**
America-North	**53.24**	**107.2**	**144**	**170.5%**	**2.0%**	**0.286**	**0.219**	**0.196**	**-31.5%**	**-0.8%**	**0.937**	**0.982**	**0.999**	**6.6%**	**0.1%**
America-South	**28.51**	**71.14**	**130.7**	**358.4%**	**3.1%**	**0.36**	**0.253**	**0.196**	**-45.6%**	**-1.2%**	**0.823**	**0.91**	**0.985**	**19.7%**	**0.4%**
Americas	**87.38**	**190.8**	**298.8**	**242.0%**	**2.5%**	**0.328**	**0.243**	**0.2**	**-39.0%**	**-1.0%**	**0.872**	**0.937**	**0.985**	**13.0%**	**0.2%**
Asia-East	**154.4**	**380.1**	**562.4**	**264.2%**	**2.6%**	**0.283**	**0.2**	**0.165**	**-41.7%**	**-1.1%**	**0.808**	**0.948**	**0.998**	**23.5%**	**0.4%**
Asia-South Central	**88.02**	**222.1**	**508.8**	**478.1%**	**3.6%**	**0.415**	**0.291**	**0.223**	**-46.3%**	**-1.2%**	**0.615**	**0.775**	**0.906**	**47.3%**	**0.8%**
Asia-South East	**34.72**	**86.53**	**162.5**	**368.0%**	**3.1%**	**0.374**	**0.267**	**0.205**	**-45.2%**	**-1.2%**	**0.745**	**0.835**	**0.923**	**23.9%**	**0.4%**
Asia-West	**11.09**	**33.71**	**75.15**	**577.6%**	**3.9%**	**0.405**	**0.318**	**0.242**	**-40.2%**	**-1.0%**	**0.765**	**0.865**	**0.948**	**23.9%**	**0.4%**
Oceania	**3.938**	**7.793**	**10.45**	**165.4%**	**2.0%**	**0.302**	**0.255**	**0.227**	**-24.8%**	**-0.6%**	**0.868**	**0.914**	**0.937**	**7.9%**	**0.2%**
Asia with Oceania	**292.2**	**730.2**	**1319**	**351.4%**	**3.1%**	**0.357**	**0.258**	**0.204**	**-42.9%**	**-1.1%**	**0.718**	**0.85**	**0.941**	**31.1%**	**0.5%**
Europe-East	**41.87**	**67.08**	**84.02**	**100.7%**	**1.4%**	**0.26**	**0.174**	**0.145**	**-44.2%**	**-1.2%**	**0.848**	**0.944**	**0.988**	**16.5%**	**0.3%**
Europe-North	**16.9**	**26.04**	**28.35**	**67.8%**	**1.0%**	**0.233**	**0.198**	**0.187**	**-19.7%**	**-0.4%**	**0.954**	**0.997**	**1**	**4.8%**	**0.1%**
Europe-South	**28.23**	**41.79**	**43.22**	**53.1%**	**0.9%**	**0.199**	**0.162**	**0.151**	**-24.1%**	**-0.6%**	**0.929**	**0.972**	**0.996**	**7.2%**	**0.1%**
Europe-West	**35.63**	**54.35**	**52.51**	**47.4%**	**0.8%**	**0.211**	**0.176**	**0.173**	**-18.0%**	**-0.4%**	**0.955**	**0.994**	**1**	**4.7%**	**0.1%**
Europe	**121.4**	**187.3**	**205.3**	**69.1%**	**1.1%**	**0.231**	**0.176**	**0.161**	**-30.3%**	**-0.7%**	**0.907**	**0.971**	**0.995**	**9.7%**	**0.2%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population 65 Years and Above (Million People)					Youth Bulge (Ratio)					Human Development Index (Index)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	2.571	6.211	16.3	534.0%	3.8%	0.493	0.424	0.364	-26.2%	-0.6%	0.395	0.545	0.738	86.8%	1.3%
Uganda	0.866	2.163	7.71	790.3%	4.5%	0.544	0.484	0.36	-33.8%	-0.8%	0.578	0.75	0.892	54.3%	0.9%
Tanzania, United Rep. of	1.414	3.453	10.38	634.1%	4.1%	0.498	0.429	0.3	-39.8%	-1.0%	0.583	0.75	0.913	56.6%	0.9%
Kenya	1.062	3.158	9.197	766.0%	4.4%	0.509	0.425	0.293	-42.4%	-1.1%	0.602	0.74	0.868	44.2%	0.7%
Madagascar	0.701	1.641	3.971	466.5%	3.5%	0.478	0.418	0.35	-26.8%	-0.6%	0.545	0.652	0.767	40.7%	0.7%
Mozambique	0.769	1.812	5.084	561.1%	3.8%	0.485	0.425	0.306	-36.9%	-0.9%	0.41	0.68	0.909	121.7%	1.6%
Malawi	0.462	1.009	2.88	523.4%	3.7%	0.517	0.456	0.369	-28.6%	-0.7%	0.54	0.684	0.75	38.9%	0.7%
Zambia	0.41	0.837	2.679	553.4%	3.8%	0.529	0.451	0.35	-33.8%	-0.8%	0.54	0.688	0.798	47.8%	0.8%
Burundi	0.236	0.602	1.746	639.8%	4.1%	0.528	0.473	0.401	-24.1%	-0.5%	0.442	0.622	0.766	73.3%	1.1%
Rwanda	0.26	0.719	2.242	762.3%	4.4%	0.558	0.462	0.364	-34.8%	-0.9%	0.47	0.667	0.777	65.3%	1.0%
Somalia	0.259	0.627	1.923	642.5%	4.1%	0.463	0.407	0.372	-19.7%	-0.4%	0.231	0.399	0.656	184.0%	2.1%
Zimbabwe	0.528	1.139	3.688	598.5%	4.0%	0.541	0.387	0.243	-55.1%	-1.6%	0.628	0.782	0.821	30.7%	0.5%
Eritrea	0.133	0.229	0.659	395.5%	3.3%	0.503	0.458	0.392	-22.1%	-0.5%	0.419	0.457	0.561	33.9%	0.6%
Mauritius	0.098	0.287	0.427	335.7%	3.0%	0.302	0.22	0.184	-39.1%	-1.0%	0.82	0.927	1	22.0%	0.4%
Comoros	0.019	0.048	0.133	600.0%	4.0%	0.482	0.369	0.32	-33.6%	-0.8%	0.589	0.662	0.819	39.0%	0.7%
Djibouti	0.029	0.064	0.133	358.6%	3.1%	0.469	0.375	0.3	-36.0%	-0.9%	0.513	0.61	0.763	48.7%	0.8%
Africa-Eastern	**9.817**	**24**	**69.15**	**604.4%**	**4.0%**	**0.506**	**0.436**	**0.341**	**-32.6%**	**-0.8%**	**0.501**	**0.661**	**0.81**	**61.7%**	**1.0%**
Congo; Dem. Rep. of	1.902	4.244	10.44	448.9%	3.5%	0.513	0.523	0.46	-10.3%	-0.2%	0.389	0.52	0.72	85.1%	1.2%
Angola	0.477	1.264	3.332	598.5%	4.0%	0.511	0.467	0.398	-22.1%	-0.5%	0.542	0.732	0.766	41.3%	0.7%
Cameroon	0.689	1.502	3.867	461.2%	3.5%	0.489	0.406	0.334	-31.7%	-0.8%	0.568	0.671	0.762	34.2%	0.6%
Chad	0.345	0.774	1.976	472.8%	3.6%	0.496	0.46	0.403	-18.8%	-0.4%	0.402	0.573	0.641	59.5%	0.9%
Central African Republic	0.181	0.344	0.847	368.0%	3.1%	0.492	0.438	0.377	-23.4%	-0.5%	0.399	0.542	0.668	67.4%	1.0%
Congo, Rep. of	0.155	0.366	0.912	488.4%	3.6%	0.479	0.417	0.334	-30.3%	-0.7%	0.662	0.77	0.793	19.8%	0.4%
Gabon	0.072	0.166	0.364	405.6%	3.3%	0.445	0.346	0.28	-37.1%	-0.9%	0.748	0.822	0.875	17.0%	0.3%
Equatorial Guinea	0.025	0.049	0.108	332.0%	3.0%	0.46	0.415	0.33	-28.3%	-0.7%	0.74	0.853	0.864	16.8%	0.3%
São Tomé and Príncipe	0.006	0.011	0.035	483.3%	3.6%	0.512	0.39	0.337	-34.2%	-0.8%	0.652	0.701	0.767	17.6%	0.3%
Africa-Middle	**3.853**	**8.72**	**21.88**	**467.9%**	**3.5%**	**0.505**	**0.487**	**0.427**	**-15.4%**	**-0.3%**	**0.454**	**0.585**	**0.725**	**59.7%**	**0.9%**
Egypt	4.184	10.36	26.56	534.8%	3.8%	0.418	0.31	0.208	-50.2%	-1.4%	0.719	0.851	0.983	36.7%	0.6%
Sudan	1.586	3.828	9.564	503.0%	3.7%	0.464	0.381	0.306	-34.1%	-0.8%	0.58	0.732	0.843	45.3%	0.8%
Algeria	1.669	4.94	11.06	562.7%	3.9%	0.421	0.269	0.2	-52.5%	-1.5%	0.742	0.832	0.897	20.9%	0.4%
Morocco	1.744	4.214	9.168	425.7%	3.4%	0.406	0.275	0.203	-50.0%	-1.4%	0.637	0.78	0.898	41.0%	0.7%
Tunisia	0.685	1.887	4.162	507.6%	3.7%	0.376	0.236	0.177	-52.9%	-1.5%	0.769	0.888	1	30.0%	0.5%
Libyan Arab Jamahiriya	0.295	0.997	2.29	676.3%	4.2%	0.399	0.294	0.204	-48.9%	-1.3%	0.829	0.929	0.967	16.6%	0.3%
Africa-Northern	**10.16**	**26.22**	**62.8**	**518.1%**	**3.7%**	**0.423**	**0.311**	**0.231**	**-45.4%**	**-1.2%**	**0.689**	**0.815**	**0.923**	**34.0%**	**0.6%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population 65 Years and Above (Million People)					Youth Bulge (Ratio)					Human Development Index (Index)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	2.48	5.814	11.55	365.7%	3.1%	0.407	0.307	0.221	-45.7%	-1.2%	0.718	0.849	0.936	30.4%	0.5%
Namibia	0.085	0.223	0.624	634.1%	4.1%	0.495	0.356	0.239	-51.7%	-1.4%	0.702	0.84	0.964	37.3%	0.6%
Lesotho	0.092	0.142	0.448	387.0%	3.2%	0.526	0.391	0.252	-52.1%	-1.5%	0.581	0.765	0.88	51.5%	0.8%
Botswana	0.072	0.202	0.529	634.7%	4.1%	0.481	0.324	0.214	-55.5%	-1.6%	0.737	0.898	0.976	32.4%	0.6%
Swaziland	0.044	0.1	0.293	565.9%	3.9%	0.533	0.383	0.266	-50.1%	-1.4%	0.621	0.79	0.886	42.7%	0.7%
Africa-Southern	**2.773**	**6.481**	**13.44**	**384.7%**	**3.2%**	**0.419**	**0.315**	**0.224**	**-46.5%**	**-1.2%**	**0.711**	**0.846**	**0.935**	**31.5%**	**0.5%**
Nigeria	4.755	11.5	29.31	516.4%	3.7%	0.496	0.423	0.344	-30.6%	-0.7%	0.539	0.675	0.727	34.9%	0.6%
Niger	0.517	1.305	3.195	518.0%	3.7%	0.478	0.443	0.376	-21.3%	-0.5%	0.346	0.5	0.698	101.7%	1.4%
Côte d'Ivoire	0.719	1.597	4.365	507.1%	3.7%	0.502	0.412	0.341	-32.1%	-0.8%	0.486	0.653	0.761	56.6%	0.9%
Ghana	0.979	2.157	4.944	405.0%	3.3%	0.466	0.374	0.311	-33.3%	-0.8%	0.553	0.623	0.731	32.2%	0.6%
Burkina Faso	0.407	0.828	2.87	605.2%	4.0%	0.515	0.445	0.371	-28.0%	-0.7%	0.376	0.583	0.787	109.3%	1.5%
Mali	0.497	0.89	2.996	502.8%	3.7%	0.531	0.45	0.367	-30.9%	-0.7%	0.399	0.573	0.762	91.0%	1.3%
Senegal	0.503	0.889	2.683	433.4%	3.4%	0.488	0.422	0.35	-28.3%	-0.7%	0.504	0.639	0.789	56.5%	0.9%
Guinea	0.351	0.81	2.074	490.9%	3.6%	0.478	0.427	0.361	-24.5%	-0.6%	0.418	0.628	0.784	87.6%	1.3%
Benin	0.278	0.718	1.886	578.4%	3.9%	0.496	0.428	0.353	-28.8%	-0.7%	0.459	0.609	0.771	68.0%	1.0%
Togo	0.225	0.512	1.222	443.1%	3.4%	0.489	0.411	0.33	-32.5%	-0.8%	0.501	0.496	0.65	29.7%	0.5%
Sierra Leone	0.23	0.453	0.924	301.7%	2.8%	0.459	0.47	0.372	-19.0%	-0.4%	0.281	0.45	0.706	151.2%	1.9%
Liberia	0.091	0.242	0.697	665.9%	4.2%	0.512	0.491	0.429	-16.2%	-0.4%	0.354	0.4	0.661	86.7%	1.3%
Mauritania	0.11	0.245	0.617	460.9%	3.5%	0.459	0.39	0.344	-25.1%	-0.6%	0.56	0.697	0.788	40.7%	0.7%
Guinea-Bissau	0.057	0.119	0.288	405.3%	3.3%	0.495	0.482	0.425	-14.1%	-0.3%	0.451	0.58	0.667	47.9%	0.8%
Gambia	0.064	0.131	0.302	371.9%	3.2%	0.443	0.393	0.342	-22.8%	-0.5%	0.422	0.597	0.72	70.6%	1.1%
Cape Verde	0.021	0.053	0.175	733.3%	4.3%	0.498	0.361	0.226	-54.6%	-1.6%	0.729	0.841	0.979	34.3%	0.6%
Africa-Western	**9.805**	**22.45**	**58.54**	**497.0%**	**3.6%**	**0.494**	**0.424**	**0.35**	**-29.1%**	**-0.7%**	**0.493**	**0.629**	**0.737**	**49.5%**	**0.8%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060	Population 65 Years and Above					Youth Bulge					Human Development Index				
	Million People					Ratio					Index				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	0.392	0.696	1.626	314.8%	2.9%	0.475	0.392	0.326	-31.4%	-0.8%	0.534	0.629	0.753	41.0%	0.7%
Dominican Republic	0.599	1.47	2.867	378.6%	3.2%	0.387	0.297	0.205	-47.0%	-1.3%	0.775	0.907	1	29.0%	0.5%
Cuba	1.475	2.971	3.785	156.6%	1.9%	0.246	0.176	0.148	-39.8%	-1.0%	0.846	0.902	1	18.2%	0.3%
Puerto Rico	0.576	1.041	1.398	142.7%	1.8%	0.283	0.207	0.181	-36.0%	-0.9%	0.913	1	1	9.5%	0.2%
Jamaica	0.209	0.411	0.713	241.1%	2.5%	0.387	0.273	0.205	-47.0%	-1.3%	0.777	0.842	0.93	19.7%	0.4%
Trinidad and Tobago	0.099	0.26	0.392	296.0%	2.8%	0.358	0.225	0.175	-51.1%	-1.4%	0.864	0.955	0.999	15.6%	0.3%
Bahamas	0.026	0.068	0.105	303.8%	2.8%	0.342	0.236	0.195	-43.0%	-1.1%	0.877	0.943	1	14.0%	0.3%
Barbados	0.028	0.076	0.091	225.0%	2.4%	0.253	0.172	0.149	-41.1%	-1.1%	0.895	0.956	1	11.7%	0.2%
St. Vincent & the Grenadines	0.008	0.018	0.046	475.0%	3.6%	0.406	0.265	0.195	-52.0%	-1.5%	0.785	0.873	0.986	25.6%	0.5%
Grenada	0.008	0.016	0.039	387.5%	3.2%	0.44	0.271	0.198	-55.0%	-1.6%	0.816	0.886	0.983	20.5%	0.4%
St. Lucia	0.013	0.028	0.051	292.3%	2.8%	0.379	0.236	0.175	-53.8%	-1.5%	0.833	0.911	1	20.0%	0.4%
America-Caribbean	**3.433**	**7.055**	**11.11**	**223.6%**	**2.4%**	**0.354**	**0.281**	**0.231**	**-34.7%**	**-0.9%**	**0.758**	**0.832**	**0.912**	**20.3%**	**0.4%**
Guatemala	0.626	1.303	3.763	501.1%	3.7%	0.484	0.402	0.292	-39.7%	-1.0%	0.718	0.814	0.924	28.7%	0.5%
Honduras	0.343	0.825	2.132	521.6%	3.7%	0.478	0.342	0.224	-53.1%	-1.5%	0.718	0.802	0.904	25.9%	0.5%
El Salvador	0.436	0.95	2.273	421.3%	3.4%	0.398	0.297	0.206	-48.2%	-1.3%	0.754	0.857	0.972	28.9%	0.5%
Nicaragua	0.243	0.622	1.553	539.1%	3.8%	0.47	0.322	0.222	-52.8%	-1.5%	0.71	0.771	0.861	21.3%	0.4%
Costa Rica	0.308	0.971	1.876	509.1%	3.7%	0.372	0.232	0.181	-51.3%	-1.4%	0.873	0.971	1	14.5%	0.3%
Panama	0.235	0.652	1.249	431.5%	3.4%	0.355	0.257	0.191	-46.2%	-1.2%	0.845	0.951	1	18.3%	0.3%
Belize	0.013	0.04	0.113	769.2%	4.4%	0.448	0.313	0.201	-55.1%	-1.6%	0.765	0.9	1	30.7%	0.5%
America-Central	**2.204**	**5.362**	**12.96**	**488.0%**	**3.6%**	**0.444**	**0.34**	**0.244**	**-45.0%**	**-1.2%**	**0.75**	**0.837**	**0.932**	**24.3%**	**0.4%**
United States of America	41.12	78.8	97.12	136.2%	1.7%	0.262	0.214	0.201	-23.3%	-0.5%	0.964	1	1	3.7%	0.1%
Mexico	7.183	18.58	35.48	393.9%	3.2%	0.368	0.244	0.186	-49.5%	-1.4%	0.851	0.925	0.997	17.2%	0.3%
Canada	4.93	9.872	11.37	130.6%	1.7%	0.238	0.185	0.18	-24.4%	-0.6%	0.966	1	1	3.5%	0.1%
America-North	**53.24**	**107.2**	**144**	**170.5%**	**2.0%**	**0.286**	**0.219**	**0.196**	**-31.5%**	**-0.8%**	**0.937**	**0.982**	**0.999**	**6.6%**	**0.1%**
Brazil	13.79	35.91	64.41	367.1%	3.1%	0.353	0.245	0.193	-45.3%	-1.2%	0.817	0.91	0.998	22.2%	0.4%
Colombia	2.834	8.541	16.32	475.9%	3.6%	0.37	0.252	0.195	-47.3%	-1.3%	0.81	0.886	0.989	22.1%	0.4%
Argentina	4.432	7.841	14.18	219.9%	2.4%	0.328	0.237	0.189	-42.4%	-1.1%	0.872	0.961	1	14.7%	0.3%
Venezuela, RB	1.671	4.987	9.604	474.7%	3.6%	0.383	0.275	0.203	-47.0%	-1.3%	0.849	0.926	0.971	14.4%	0.3%
Peru	1.829	4.545	9.706	430.7%	3.4%	0.395	0.263	0.2	-49.4%	-1.4%	0.789	0.88	0.965	22.3%	0.4%
Chile	1.624	4.236	6.361	291.7%	2.8%	0.319	0.213	0.178	-44.2%	-1.2%	0.893	0.995	1	12.0%	0.2%
Ecuador	0.93	2.237	4.078	338.5%	3.0%	0.392	0.28	0.211	-46.2%	-1.2%	0.824	0.864	0.888	7.8%	0.1%
Bolivia	0.477	1.143	2.893	506.5%	3.7%	0.438	0.333	0.216	-50.7%	-1.4%	0.741	0.856	0.942	27.1%	0.5%
Paraguay	0.337	0.796	1.784	429.4%	3.4%	0.437	0.322	0.219	-49.9%	-1.4%	0.778	0.821	0.9	15.7%	0.3%
Uruguay	0.504	0.72	1.135	125.2%	1.6%	0.287	0.218	0.181	-36.9%	-0.9%	0.868	0.946	1	15.2%	0.3%
Guyana	0.047	0.11	0.141	200.0%	2.2%	0.355	0.26	0.196	-44.8%	-1.2%	0.755	0.837	0.935	23.8%	0.4%
Suriname	0.032	0.073	0.112	250.0%	2.5%	0.373	0.272	0.19	-49.1%	-1.3%	0.793	0.887	0.97	22.3%	0.4%
America-South	**28.51**	**71.14**	**130.7**	**358.4%**	**3.1%**	**0.36**	**0.253**	**0.196**	**-45.6%**	**-1.2%**	**0.823**	**0.91**	**0.985**	**19.7%**	**0.4%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population 65 Years and Above (Million People)					Youth Bulge (Ratio)					Human Development Index (Index)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	113.8	315.1	493.8	333.9%	3.0%	0.293	0.206	0.168	-42.7%	-1.1%	0.788	0.945	1	26.9%	0.5%
Japan	29.31	37.26	34.83	18.8%	0.3%	0.181	0.146	0.14	-22.7%	-0.5%	0.968	1	1	3.3%	0.1%
Korea, Rep. of	5.779	14.8	16.73	189.5%	2.1%	0.251	0.134	0.119	-52.6%	-1.5%	0.94	1	1	6.4%	0.1%
Taiwan	2.098	6.139	8.216	291.6%	2.8%	0.291	0.209	0.177	-39.2%	-1.0%	0.902	0.986	1	10.9%	0.2%
Korea, Dem. Rep. of	2.393	3.971	5.065	111.7%	1.5%	0.303	0.221	0.194	-36.0%	-0.9%	0.68	0.749	0.829	21.9%	0.4%
Hong Kong	0.931	2.447	2.81	201.8%	2.2%	0.22	0.151	0.151	-31.4%	-0.7%	0.979	1	1	2.1%	0.0%
Mongolia	0.119	0.361	0.865	626.9%	4.0%	0.422	0.271	0.2	-52.6%	-1.5%	0.748	0.813	0.925	23.7%	0.4%
Asia-East	**154.4**	**380.1**	**562.4**	**264.2%**	**2.6%**	**0.283**	**0.2**	**0.165**	**-41.7%**	**-1.1%**	**0.808**	**0.948**	**0.998**	**23.5%**	**0.4%**
India	64.44	162.4	368.2	471.4%	3.5%	0.399	0.264	0.19	-52.4%	-1.5%	0.624	0.809	0.962	54.2%	0.9%
Pakistan	7.117	16.66	43.95	517.5%	3.7%	0.474	0.369	0.291	-38.6%	-1.0%	0.566	0.702	0.828	46.3%	0.8%
Bangladesh	6.213	15.49	35.45	470.6%	3.5%	0.429	0.317	0.215	-49.9%	-1.4%	0.535	0.695	0.831	55.3%	0.9%
Afghanistan	0.847	2.013	5.185	512.2%	3.7%	0.508	0.498	0.45	-11.4%	-0.2%	0.292	0.44	0.6	105.5%	1.5%
Iran, Islamic Rep. of	3.338	10.57	28.03	739.7%	4.3%	0.456	0.256	0.189	-58.6%	-1.7%	0.798	0.912	0.964	20.8%	0.4%
Nepal	1.188	2.482	5.736	382.8%	3.2%	0.456	0.343	0.264	-42.1%	-1.1%	0.52	0.629	0.77	48.1%	0.8%
Uzbekistan	1.253	3.44	7.395	490.2%	3.6%	0.44	0.26	0.202	-54.1%	-1.5%	0.728	0.788	0.846	16.2%	0.3%
Sri Lanka	1.606	4.097	5.769	259.2%	2.6%	0.333	0.228	0.19	-42.9%	-1.1%	0.785	0.863	0.962	22.5%	0.4%
Kazakhstan	1.205	2.852	4.245	252.3%	2.6%	0.349	0.234	0.186	-46.7%	-1.3%	0.834	0.956	0.977	17.1%	0.3%
Tajikistan	0.251	0.653	1.644	555.0%	3.8%	0.496	0.347	0.235	-52.6%	-1.5%	0.713	0.752	0.842	18.1%	0.3%
Turkmenistan	0.225	0.711	1.651	633.8%	4.1%	0.431	0.283	0.205	-52.4%	-1.5%	0.738	0.889	0.887	20.2%	0.4%
Kyrgyzstan	0.285	0.627	1.19	317.5%	2.9%	0.418	0.286	0.219	-47.6%	-1.3%	0.724	0.751	0.805	11.2%	0.2%
Bhutan	0.035	0.082	0.236	574.3%	3.9%	0.456	0.287	0.211	-53.7%	-1.5%	0.614	0.784	0.953	55.2%	0.9%
Maldives	0.014	0.047	0.15	971.4%	4.9%	0.484	0.298	0.193	-60.1%	-1.8%	0.783	0.928	1	27.7%	0.5%
Asia-South Central	**88.02**	**222.1**	**508.8**	**478.1%**	**3.6%**	**0.415**	**0.291**	**0.223**	**-46.3%**	**-1.2%**	**0.615**	**0.775**	**0.906**	**47.3%**	**0.8%**
Indonesia	14.09	33	61.59	337.1%	3.0%	0.362	0.253	0.202	-44.2%	-1.2%	0.744	0.83	0.906	21.8%	0.4%
Philippines	3.933	10.2	23.89	507.4%	3.7%	0.427	0.331	0.218	-48.9%	-1.3%	0.755	0.821	0.919	21.7%	0.4%
Vietnam	4.817	12.5	28.2	485.4%	3.6%	0.399	0.245	0.194	-51.4%	-1.4%	0.746	0.847	0.947	26.9%	0.5%
Thailand	6.029	14.69	18.78	211.5%	2.3%	0.283	0.219	0.191	-32.5%	-0.8%	0.809	0.902	0.979	21.0%	0.4%
Myanmar	3.115	7.083	11.52	269.8%	2.7%	0.366	0.253	0.202	-44.8%	-1.2%	0.629	0.723	0.83	32.0%	0.6%
Malaysia	1.408	5.118	10.02	611.6%	4.0%	0.382	0.267	0.199	-47.9%	-1.3%	0.854	0.957	1	17.1%	0.3%
Cambodia	0.562	1.608	4.417	685.9%	4.2%	0.501	0.349	0.235	-53.1%	-1.5%	0.605	0.774	0.906	49.8%	0.8%
Lao PDR	0.248	0.709	2.143	764.1%	4.4%	0.487	0.328	0.206	-57.7%	-1.7%	0.626	0.799	0.964	54.0%	0.9%
Singapore	0.471	1.479	1.629	245.9%	2.5%	0.249	0.156	0.156	-37.3%	-0.9%	0.96	1	1	4.2%	0.1%
Timor-Leste	0.038	0.073	0.209	450.0%	3.5%	0.486	0.491	0.388	-20.2%	-0.4%	0.58	0.641	0.821	41.6%	0.7%
Brunei Darussalam	0.015	0.079	0.145	866.7%	4.6%	0.346	0.267	0.222	-35.8%	-0.9%	0.944	0.986	1	5.9%	0.1%
Asia-South East	**34.72**	**86.53**	**162.5**	**368.0%**	**3.1%**	**0.374**	**0.267**	**0.205**	**-45.2%**	**-1.2%**	**0.745**	**0.835**	**0.923**	**23.9%**	**0.4%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population 65 Years and Above (Million People)					Youth Bulge (Ratio)					Human Development Index (Index)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	4.644	13.63	28.15	506.2%	3.7%	0.357	0.238	0.183	-48.7%	-1.3%	0.803	0.92	1	24.5%	0.4%
Yemen	0.597	1.692	5.999	904.9%	4.7%	0.533	0.432	0.329	-38.3%	-1.0%	0.571	0.738	0.86	50.6%	0.8%
Iraq	0.912	2.65	7.792	754.4%	4.4%	0.471	0.414	0.285	-39.5%	-1.0%	0.633	0.792	0.918	45.0%	0.7%
Saudi Arabia	0.779	3.981	9.07	1064.3%	5.0%	0.393	0.322	0.247	-37.2%	-0.9%	0.841	0.922	0.985	17.1%	0.3%
Syria	0.728	2.218	6.644	812.6%	4.5%	0.472	0.342	0.237	-49.8%	-1.4%	0.752	0.813	0.917	21.9%	0.4%
Israel	0.78	1.704	2.834	263.3%	2.6%	0.318	0.244	0.203	-36.2%	-0.9%	0.931	1	1	7.4%	0.1%
Azerbaijan	0.65	1.821	2.966	356.3%	3.1%	0.375	0.245	0.184	-50.9%	-1.4%	0.823	0.898	0.935	13.6%	0.3%
Jordan	0.228	0.743	2.222	874.6%	4.7%	0.438	0.31	0.204	-53.4%	-1.5%	0.782	0.897	1	27.9%	0.5%
Palestine	0.13	0.374	1.177	805.4%	4.5%	0.487	0.38	0.245	-49.7%	-1.4%	0.78	0.836	0.932	19.5%	0.4%
United Arab Emirates	0.077	1.133	1.978	2468.8%	6.7%	0.263	0.21	0.185	-29.7%	-0.7%	0.952	0.987	1	5.0%	0.1%
Oman	0.092	0.42	1.067	1059.8%	5.0%	0.43	0.313	0.244	-43.3%	-1.1%	0.854	0.941	0.99	15.9%	0.3%
Kuwait	0.073	0.664	1.201	1545.2%	5.8%	0.287	0.237	0.209	-27.2%	-0.6%	0.945	1	1	5.8%	0.1%
Lebanon	0.288	0.646	1.241	330.9%	3.0%	0.354	0.246	0.191	-46.0%	-1.2%	0.782	0.887	0.991	26.7%	0.5%
Georgia	0.616	0.809	0.962	56.2%	0.9%	0.285	0.183	0.154	-46.0%	-1.2%	0.724	0.836	0.91	25.7%	0.5%
Armenia	0.343	0.624	1.036	202.0%	2.2%	0.343	0.201	0.146	-57.4%	-1.7%	0.808	0.919	0.993	22.9%	0.4%
Bahrain	0.028	0.174	0.273	875.0%	4.7%	0.31	0.227	0.202	-34.8%	-0.9%	0.9	0.951	0.998	10.9%	0.2%
Qatar	0.02	0.22	0.281	1305.0%	5.4%	0.246	0.212	0.198	-19.5%	-0.4%	0.946	1	1	5.7%	0.1%
Cyprus	0.108	0.213	0.261	141.7%	1.8%	0.273	0.174	0.15	-45.1%	-1.2%	0.936	0.991	1	6.8%	0.1%
Asia-West	**11.09**	**33.71**	**75.15**	**577.6%**	**3.9%**	**0.405**	**0.318**	**0.242**	**-40.2%**	**-1.0%**	**0.765**	**0.865**	**0.948**	**23.9%**	**0.4%**
Australia	3.1	5.867	7.251	133.9%	1.7%	0.25	0.205	0.194	-22.4%	-0.5%	0.968	1	1	3.3%	0.1%
Papua New Guniea	0.171	0.538	1.329	677.2%	4.2%	0.454	0.382	0.303	-33.3%	-0.8%	0.537	0.695	0.796	48.2%	0.8%
New Zealand	0.575	1.18	1.405	144.3%	1.8%	0.264	0.202	0.186	-29.5%	-0.7%	0.945	0.996	1	5.8%	0.1%
Solomon Islands	0.017	0.04	0.105	517.6%	3.7%	0.467	0.378	0.323	-30.8%	-0.7%	0.602	0.661	0.757	25.7%	0.5%
Fiji	0.045	0.103	0.196	335.6%	3.0%	0.403	0.31	0.203	-49.6%	-1.4%	0.773	0.838	0.954	23.4%	0.4%
Vanuatu	0.008	0.023	0.062	675.0%	4.2%	0.464	0.367	0.271	-41.6%	-1.1%	0.707	0.783	0.901	27.4%	0.5%
Micronesia	0.004	0.01	0.032	700.0%	4.2%	0.495	0.368	0.26	-47.5%	-1.3%	0.735	0.779	0.912	24.1%	0.4%
Tonga	0.007	0.011	0.034	385.7%	3.2%	0.475	0.356	0.26	-45.3%	-1.2%	0.812	0.835	0.926	14.0%	0.3%
Samoa	0.009	0.02	0.035	288.9%	2.8%	0.44	0.345	0.238	-45.9%	-1.2%	0.803	0.853	0.963	19.9%	0.4%
Oceania	**3.938**	**7.793**	**10.45**	**165.4%**	**2.0%**	**0.302**	**0.255**	**0.227**	**-24.8%**	**-0.6%**	**0.868**	**0.914**	**0.937**	**7.9%**	**0.2%**

Population, Land Area, and Human Development Index

Base Case: Countries in Year 2060 Descending Population Sequence	Population 65 Years and Above (Million People)					Youth Bulge (Ratio)					Human Development Index (Index)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	18.6	32.22	39.32	111.4%	1.5%	0.268	0.18	0.153	-42.9%	-1.1%	0.843	0.953	0.981	16.4%	0.3%
Ukraine	7.401	9.727	12.58	70.0%	1.1%	0.254	0.166	0.132	-48.0%	-1.3%	0.807	0.91	1	23.9%	0.4%
Poland	5.348	9.735	12.39	131.7%	1.7%	0.264	0.164	0.133	-49.6%	-1.4%	0.891	0.974	1	12.2%	0.2%
Romania	3.257	4.687	6.197	90.3%	1.3%	0.246	0.172	0.143	-41.9%	-1.1%	0.847	0.921	0.983	16.1%	0.3%
Czech Republic	1.671	2.591	3.108	86.0%	1.2%	0.221	0.165	0.145	-34.4%	-0.8%	0.916	0.963	1	9.2%	0.2%
Belarus	1.36	2.213	2.999	120.5%	1.6%	0.268	0.172	0.141	-47.4%	-1.3%	0.839	0.928	0.993	18.4%	0.3%
Hungary	1.679	2.312	2.704	61.0%	1.0%	0.221	0.169	0.148	-33.0%	-0.8%	0.888	0.951	1	12.6%	0.2%
Bulgaria	1.376	1.7	2.005	45.7%	0.8%	0.218	0.16	0.136	-37.6%	-0.9%	0.851	0.925	1	17.5%	0.3%
Slovakia	0.702	1.272	1.699	142.0%	1.8%	0.262	0.17	0.14	-46.6%	-1.2%	0.894	0.941	0.992	11.0%	0.2%
Moldova, Rep. of	0.471	0.622	1.021	116.8%	1.6%	0.337	0.194	0.151	-55.2%	-1.6%	0.746	0.799	0.911	22.1%	0.4%
Europe-East	**41.87**	**67.08**	**84.02**	**100.7%**	**1.4%**	**0.26**	**0.174**	**0.145**	**-44.2%**	**-1.2%**	**0.848**	**0.944**	**0.988**	**16.5%**	**0.3%**
United Kingdom	10.67	16.51	17.85	67.3%	1.0%	0.231	0.2	0.19	-17.7%	-0.4%	0.956	0.999	1	4.6%	0.1%
Sweden	1.775	2.518	2.667	50.3%	0.8%	0.225	0.193	0.183	-18.7%	-0.4%	0.968	1	1	3.3%	0.1%
Denmark	0.956	1.454	1.492	56.1%	0.9%	0.212	0.195	0.194	-8.5%	-0.2%	0.951	0.997	1	5.2%	0.1%
Ireland	0.54	1.045	1.416	162.2%	1.9%	0.268	0.217	0.197	-26.5%	-0.6%	0.972	1	1	2.9%	0.1%
Norway	0.762	1.287	1.428	87.4%	1.3%	0.232	0.197	0.191	-17.7%	-0.4%	0.985	1	1	1.5%	0.0%
Finland	0.946	1.471	1.424	50.5%	0.8%	0.221	0.194	0.187	-15.4%	-0.3%	0.959	1	1	4.3%	0.1%
Lithuania	0.562	0.809	0.989	76.0%	1.1%	0.263	0.171	0.141	-46.4%	-1.2%	0.878	0.947	1	13.9%	0.3%
Latvia	0.414	0.555	0.67	61.8%	1.0%	0.251	0.174	0.144	-42.6%	-1.1%	0.878	0.966	1	13.9%	0.3%
Estonia	0.237	0.318	0.322	35.9%	0.6%	0.244	0.184	0.161	-34.0%	-0.8%	0.899	0.972	1	11.2%	0.2%
Iceland	0.04	0.079	0.096	140.0%	1.8%	0.27	0.204	0.184	-31.9%	-0.8%	0.974	1	1	2.7%	0.1%
Europe-North	**16.9**	**26.04**	**28.35**	**67.8%**	**1.0%**	**0.233**	**0.198**	**0.187**	**-19.7%**	**-0.4%**	**0.954**	**0.997**	**1**	**4.8%**	**0.1%**
Italy	12.57	17.74	16.26	29.4%	0.5%	0.174	0.151	0.15	-13.8%	-0.3%	0.95	0.982	1	5.3%	0.1%
Spain	7.978	12.79	13.54	69.7%	1.1%	0.196	0.164	0.149	-24.0%	-0.5%	0.948	0.993	1	5.5%	0.1%
Greece	2.176	3.122	3.31	52.1%	0.8%	0.2	0.158	0.15	-25.0%	-0.6%	0.943	0.984	1	6.0%	0.1%
Portugal	1.921	2.81	3.28	70.7%	1.1%	0.21	0.172	0.154	-26.7%	-0.6%	0.904	0.963	1	10.6%	0.2%
Serbia	1.096	1.522	2.098	91.4%	1.3%	0.256	0.184	0.154	-39.8%	-1.0%	0.817	0.894	0.991	21.3%	0.4%
Croatia	0.794	1.112	1.265	59.3%	0.9%	0.221	0.172	0.149	-32.6%	-0.8%	0.886	0.944	1	12.9%	0.2%
Bosnia and Herzegovina	0.626	0.856	1.059	69.2%	1.1%	0.244	0.164	0.145	-40.6%	-1.0%	0.824	0.862	0.932	13.1%	0.2%
Albania	0.317	0.615	0.978	208.5%	2.3%	0.348	0.22	0.172	-50.6%	-1.4%	0.841	0.908	0.987	17.4%	0.3%
Macedonia, TFYR	0.254	0.396	0.525	106.7%	1.5%	0.28	0.196	0.168	-40.0%	-1.0%	0.837	0.856	0.922	10.2%	0.2%
Slovenia	0.345	0.587	0.598	73.3%	1.1%	0.213	0.151	0.137	-35.7%	-0.9%	0.933	0.985	1	7.2%	0.1%
Montenegro	0.09	0.132	0.183	103.3%	1.4%	0.276	0.202	0.169	-38.8%	-1.0%	0.809	0.888	0.999	23.5%	0.4%
Malta	0.063	0.114	0.132	109.5%	1.5%	0.247	0.165	0.142	-42.5%	-1.1%	0.909	0.979	1	10.0%	0.2%
Europe-South	**28.23**	**41.79**	**43.22**	**53.1%**	**0.9%**	**0.199**	**0.162**	**0.151**	**-24.1%**	**-0.6%**	**0.929**	**0.972**	**0.996**	**7.2%**	**0.1%**
Germany	17.46	24.96	22.76	30.4%	0.5%	0.199	0.158	0.158	-20.6%	-0.5%	0.95	0.992	1	5.3%	0.1%
France	10.64	16.91	17.57	65.1%	1.0%	0.225	0.196	0.187	-16.9%	-0.4%	0.958	0.996	1	4.4%	0.1%
Netherlands	2.646	4.698	4.668	76.4%	1.1%	0.217	0.189	0.188	-13.4%	-0.3%	0.959	0.992	1	4.3%	0.1%
Belgium	1.941	2.947	2.939	51.4%	0.8%	0.214	0.189	0.183	-14.5%	-0.3%	0.955	0.989	1	4.7%	0.1%
Austria	1.519	2.413	2.253	48.3%	0.8%	0.209	0.16	0.155	-25.8%	-0.6%	0.958	0.997	1	4.4%	0.1%
Switzerland	1.341	2.292	2.147	60.1%	0.9%	0.213	0.158	0.153	-28.2%	-0.7%	0.972	1	1	2.9%	0.1%
Luxembourg	0.073	0.139	0.17	132.9%	1.7%	0.222	0.204	0.206	-7.2%	-0.1%	1	1	1	0.0%	0.0%
Europe-West	**35.63**	**54.35**	**52.51**	**47.4%**	**0.8%**	**0.211**	**0.176**	**0.173**	**-18.0%**	**-0.4%**	**0.955**	**0.994**	**1**	**4.7%**	**0.1%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case
Source: International Futures
Version 6.12, March 2009

	HDI with Higher Ceilings					Poverty (below $1 per Day)								Poverty (below $2 per Day)				
	Index					Million People					Poverty Gap Index			Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
World	**0.616**	**0.701**	**0.772**	**25.3%**	**0.5%**	**841.8**	**454**	**298.9**	**-64.5%**	**-2.0%**	**4.288**	**2.088**	**1.171**	**2402**	**1431**	**912.5**	**-62.0%**	**-1.9%**
Africa	**0.459**	**0.571**	**0.668**	**45.5%**	**0.8%**	**304**	**326**	**235.5**	**-22.5%**	**-0.5%**	**12.58**	**8.004**	**3.659**	**612.9**	**730.7**	**683.9**	**11.6%**	**0.2%**
Americas	**0.733**	**0.788**	**0.839**	**14.5%**	**0.3%**	**39.63**	**25.64**	**11.98**	**-69.8%**	**-2.4%**	**1.52**	**0.86**	**0.368**	**115.9**	**73.88**	**34.97**	**-69.8%**	**-2.4%**
Asia with Oceania	**0.601**	**0.71**	**0.794**	**32.1%**	**0.6%**	**497.3**	**101.7**	**51.38**	**-89.7%**	**-4.4%**	**3.643**	**0.636**	**0.38**	**1665**	**623**	**193.2**	**-88.4%**	**-4.2%**
Europe	**0.763**	**0.813**	**0.852**	**11.7%**	**0.2%**	**1.007**	**0.806**	**0.08**	**-92.1%**	**-4.9%**	**0.034**	**0.034**	**0.003**	**6.503**	**2.396**	**0.344**	**-94.7%**	**-5.7%**
World	**0.616**	**0.701**	**0.772**	**25.3%**	**0.5%**	**841.8**	**454**	**298.9**	**-64.5%**	**-2.0%**	**4.288**	**2.088**	**1.171**	**2402**	**1431**	**912.5**	**-62.0%**	**-1.9%**
Africa-Eastern	**0.425**	**0.562**	**0.683**	**60.7%**	**1.0%**	**123.9**	**157.8**	**50.88**	**-58.9%**	**-1.8%**	**17.13**	**11.63**	**2.526**	**238.2**	**335.5**	**136**	**-42.9%**	**-1.1%**
Africa-Middle	**0.394**	**0.505**	**0.618**	**56.9%**	**0.9%**	**44.47**	**78.17**	**47.96**	**7.8%**	**0.2%**	**15.1**	**14.15**	**3.878**	**82.96**	**155**	**221.4**	**166.9%**	**2.0%**
Africa-Northern	**0.571**	**0.681**	**0.77**	**34.9%**	**0.6%**	**8.864**	**1.947**	**1.621**	**-81.7%**	**-3.3%**	**1.23**	**0.159**	**0.108**	**53.78**	**21.24**	**10.52**	**-80.4%**	**-3.2%**
Africa-Southern	**0.615**	**0.719**	**0.789**	**28.3%**	**0.5%**	**5.94**	**2.772**	**0.619**	**-89.6%**	**-4.4%**	**3.933**	**1.383**	**0.24**	**16.56**	**9.873**	**3.333**	**-79.9%**	**-3.2%**
Africa-Western	**0.416**	**0.535**	**0.626**	**50.5%**	**0.8%**	**120.8**	**85.32**	**134.4**	**11.3%**	**0.2%**	**16.11**	**6.12**	**6.592**	**221.4**	**209.1**	**312.7**	**41.2%**	**0.7%**
Africa	**0.459**	**0.571**	**0.668**	**45.5%**	**0.8%**	**304**	**326**	**235.5**	**-22.5%**	**-0.5%**	**12.58**	**8.004**	**3.659**	**612.9**	**730.7**	**683.9**	**11.6%**	**0.2%**
America-Caribbean	**0.636**	**0.696**	**0.771**	**21.2%**	**0.4%**	**6.602**	**6.818**	**4.915**	**-25.6%**	**-0.6%**	**7.88**	**7.229**	**4.374**	**12.29**	**12.12**	**9.881**	**-19.6%**	**-0.4%**
America-Central	**0.626**	**0.701**	**0.783**	**25.1%**	**0.4%**	**7.381**	**8.693**	**4.486**	**-39.2%**	**-1.0%**	**6.301**	**5.3**	**2.082**	**15.81**	**18.51**	**11.55**	**-26.9%**	**-0.6%**
America-North	**0.787**	**0.83**	**0.867**	**10.2%**	**0.2%**	**1.233**	**0.322**	**0.054**	**-95.6%**	**-6.1%**	**0.063**	**0.012**	**0.002**	**17.41**	**8.41**	**2.581**	**-85.2%**	**-3.7%**
America-South	**0.692**	**0.762**	**0.822**	**18.8%**	**0.3%**	**24.42**	**9.806**	**2.53**	**-89.6%**	**-4.4%**	**2.021**	**0.594**	**0.13**	**70.36**	**34.85**	**10.96**	**-84.4%**	**-3.7%**
Americas	**0.733**	**0.788**	**0.839**	**14.5%**	**0.3%**	**39.63**	**25.64**	**11.98**	**-69.8%**	**-2.4%**	**1.52**	**0.86**	**0.368**	**115.9**	**73.88**	**34.97**	**-69.8%**	**-2.4%**
Asia-East	**0.68**	**0.791**	**0.861**	**26.6%**	**0.5%**	**59.48**	**2.923**	**0.427**	**-99.3%**	**-9.4%**	**1.03**	**0.041**	**0.006**	**326.7**	**29.1**	**2.605**	**-99.2%**	**-9.2%**
Asia-South Central	**0.511**	**0.647**	**0.754**	**47.6%**	**0.8%**	**374.4**	**80.04**	**48.01**	**-87.2%**	**-4.0%**	**6.627**	**1.185**	**0.787**	**1044**	**447.8**	**160.3**	**-84.6%**	**-3.7%**
Asia-South East	**0.63**	**0.704**	**0.771**	**22.4%**	**0.4%**	**49.11**	**12.95**	**1.349**	**-97.3%**	**-6.9%**	**2.861**	**0.489**	**0.041**	**246.9**	**121.9**	**22.25**	**-91.0%**	**-4.7%**
Asia-West	**0.641**	**0.725**	**0.798**	**24.5%**	**0.4%**	**12.52**	**5.02**	**1.186**	**-90.5%**	**-4.6%**	**1.672**	**0.415**	**0.073**	**42.67**	**21.71**	**6.62**	**-84.5%**	**-3.7%**
Oceania	**0.727**	**0.768**	**0.811**	**11.6%**	**0.2%**	**1.767**	**0.74**	**0.403**	**-77.2%**	**-2.9%**	**1.864**	**0.525**	**0.269**	**4.19**	**2.558**	**1.445**	**-65.5%**	**-2.1%**
Asia with Oceania	**0.601**	**0.71**	**0.794**	**32.1%**	**0.6%**	**497.3**	**101.7**	**51.38**	**-89.7%**	**-4.4%**	**3.643**	**0.636**	**0.38**	**1665**	**623**	**193.2**	**-88.4%**	**-4.2%**
Europe-East	**0.72**	**0.791**	**0.826**	**14.7%**	**0.3%**	**0.035**	**0.003**	**0**	**-100.0%**		**0.002**	**0**	**0**	**5.416**	**1.443**	**0.099**	**-98.2%**	**-7.7%**
Europe-North	**0.8**	**0.836**	**0.876**	**9.5%**	**0.2%**	**0.002**	**0**	**0**	**-100.0%**		**0**	**0**	**0**	**0.111**	**0.022**	**0.002**	**-98.2%**	**-7.7%**
Europe-South	**0.777**	**0.81**	**0.848**	**9.1%**	**0.2%**	**0.865**	**0.775**	**0.077**	**-91.1%**	**-4.7%**	**0.143**	**0.162**	**0.016**	**2.727**	**1.84**	**0.264**	**-90.3%**	**-4.6%**
Europe-West	**0.8**	**0.831**	**0.873**	**9.1%**	**0.2%**	**0**	**0**	**0**			**0**	**0**	**0**	**0**	**0**	**0**		
Europe	**0.763**	**0.813**	**0.852**	**11.7%**	**0.2%**	**1.007**	**0.806**	**0.08**	**-92.1%**	**-4.9%**	**0.034**	**0.034**	**0.003**	**6.503**	**2.396**	**0.344**	**-94.7%**	**-5.7%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings Index					Poverty (below $1 per day) Million People					Poverty Gap Index			Poverty (below $2 per day) Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA																		
Ethiopia	0.322	0.458	0.622	93.2%	1.3%	13.24	24.79	0.888	-93.3%	-5.3%	3.87	4.322	0.072	55.38	95.72	17.53	-68.3%	-2.3%
Uganda	0.492	0.638	0.751	52.6%	0.8%	26.27	42.67	7.502	-71.4%	-2.5%	41.17	29.29	2.188	29.88	52.14	13.99	-53.2%	-1.5%
Tanzania, United Rep. of	0.5	0.639	0.764	52.8%	0.9%	20.28	7.702	0.004	-100.0%	-15.7%	16.2	2.625	0	34.35	24.11	0.094	-99.7%	-11.1%
Kenya	0.512	0.628	0.73	42.6%	0.7%	4.542	2.896	0.072	-98.4%	-8.0%	3.319	1.144	0.016	22.42	22.36	2.593	-88.4%	-4.2%
Madagascar	0.462	0.562	0.653	41.3%	0.7%	12.8	22.94	12.25	-4.3%	-0.1%	29.75	32.39	9.391	18.08	31.38	25.52	41.2%	0.7%
Mozambique	0.346	0.571	0.76	119.7%	1.6%	5.398	0.491	0	-100.0%		8.777	0.327	0	11.65	2.551	0	-100.0%	
Malawi	0.462	0.584	0.64	38.5%	0.7%	2.877	5.761	0.885	-69.2%	-2.3%	5.735	6.089	0.515	11.03	21.46	10.67	-3.3%	-0.1%
Zambia	0.474	0.587	0.682	43.9%	0.7%	9.421	11.35	2.5	-73.5%	-2.6%	39.64	22.31	2.441	11.83	17.41	7.456	-37.0%	-0.9%
Burundi	0.378	0.539	0.651	72.2%	1.1%	4.296	7.053	0.169	-96.1%	-6.3%	16.85	13.49	0.11	7.6	13.84	1.832	-75.9%	-2.8%
Rwanda	0.408	0.578	0.663	62.5%	1.0%	5.853	9.075	3.772	-35.6%	-0.9%	26.25	21.27	4.766	8.164	13.44	8.033	-1.6%	0.0%
Somalia	0.209	0.353	0.55	163.2%	2.0%	7.241	8.138	11.06	52.7%	0.9%	50.84	24.06	20.56	8.797	14.29	21.69	146.6%	1.8%
Zimbabwe	0.548	0.663	0.699	27.6%	0.5%	8.765	9.208	5.301	-39.5%	-1.0%	33.45	21.34	9.352	13.27	17.56	15.05	13.4%	0.3%
Eritrea	0.352	0.401	0.492	39.8%	0.7%	2.328	5.042	6.283	169.9%	2.0%	18.68	27.86	23.38	4.518	7.942	10.91	141.5%	1.8%
Mauritius	0.687	0.773	0.835	21.5%	0.4%	0.033	0.004	0	-100.0%		0.529	0.046	0.003	0.188	0.042	0.005	-97.3%	-7.0%
Comoros	0.496	0.563	0.691	39.3%	0.7%	0.293	0.395	0.154	-47.4%	-1.3%	18.06	15.59	3.788	0.525	0.739	0.451	-14.1%	-0.3%
Djibouti	0.428	0.515	0.644	50.5%	0.8%	0.27	0.228	0.042	-84.4%	-3.7%	11.85	7.455	0.988	0.525	0.509	0.166	-68.4%	-2.3%
Africa-Eastern	**0.425**	**0.562**	**0.683**	**60.7%**	**1.0%**	**123.9**	**157.8**	**50.88**	**-58.9%**	**-1.8%**	**17.13**	**11.63**	**2.526**	**238.2**	**335.5**	**136**	**-42.9%**	**-1.1%**
Congo; Dem. Rep. of	0.343	0.453	0.614	79.0%	1.2%	36.73	69.1	38.67	5.3%	0.1%	23.65	21.99	5.079	64.32	135.1	194.2	201.9%	2.2%
Angola	0.477	0.639	0.66	38.4%	0.7%	0.467	0.071	0.092	-80.3%	-3.2%	0.592	0.038	0.03	1.925	0.528	0.671	-65.1%	-2.1%
Cameroon	0.483	0.567	0.645	33.5%	0.6%	3.155	4.211	1.427	-54.8%	-1.6%	5.554	4.485	0.969	8.406	11.69	5.93	-29.5%	-0.7%
Chad	0.324	0.48	0.545	68.2%	1.0%	0.884	0.09	4.567	416.6%	3.3%	2.009	0.078	3.544	3.635	0.933	14.38	295.6%	2.8%
Central African Republic	0.337	0.455	0.564	67.4%	1.0%	2.931	4.449	2.977	1.6%	0.0%	38.26	31.64	11.44	3.766	6.078	5.514	46.4%	0.8%
Congo, Rep. of	0.568	0.658	0.676	19.0%	0.3%	0.212	0.064	0.112	-47.2%	-1.3%	1.197	0.189	0.27	0.74	0.313	0.458	-38.1%	-1.0%
Gabon	0.64	0.699	0.743	16.1%	0.3%	0.007	0.01	0	-100.0%		0.118	0.122	0.003	0.031	0.046	0.003	-90.3%	-4.6%
Equatorial Guinea	0.648	0.736	0.738	13.9%	0.3%	0	0	0			0	0	0	0	0	0		
São Tomé and Príncipe	0.555	0.601	0.653	17.7%	0.3%	0.078	0.173	0.119	52.6%	0.8%	18.25	27.61	11.31	0.135	0.252	0.236	74.8%	1.1%
Africa-Middle	**0.394**	**0.505**	**0.618**	**56.9%**	**0.9%**	**44.47**	**78.17**	**47.96**	**7.8%**	**0.2%**	**15.1**	**14.15**	**3.878**	**82.96**	**155**	**221.4**	**166.9%**	**2.0%**
Egypt	0.596	0.712	0.816	36.9%	0.6%	0.622	0.068	0.001	-99.8%	-12.1%	0.133	0.01	0	29.6	10.48	0.81	-97.3%	-6.9%
Sudan	0.486	0.615	0.71	46.1%	0.8%	8.205	1.872	1.617	-80.3%	-3.2%	6.001	0.665	0.404	20.34	8.78	8.967	-55.9%	-1.6%
Algeria	0.615	0.695	0.75	22.0%	0.4%	0.002	0	0.002	0.0%	0.0%	0.001	0	0	0.476	0.003	0.419	-12.0%	-0.3%
Morocco	0.518	0.651	0.748	44.4%	0.7%	0.011	0.007	0	-100.0%		0.005	0.003	0	2.882	1.952	0.293	-89.8%	-4.5%
Tunisia	0.637	0.737	0.837	31.4%	0.5%	0.002	0	0	-100.0%		0.003	0	0	0.148	0.022	0.001	-99.3%	-9.5%
Libyan Arab Jamahiriya	0.692	0.773	0.805	16.3%	0.3%	0.022	0	0.001	-95.5%	-6.0%	0.061	0	0.001	0.328	0.001	0.033	-89.9%	-4.5%
Africa-Northern	**0.571**	**0.681**	**0.77**	**34.9%**	**0.6%**	**8.864**	**1.947**	**1.621**	**-81.7%**	**-3.3%**	**1.23**	**0.159**	**0.108**	**53.78**	**21.24**	**10.52**	**-80.4%**	**-3.2%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings Index					Poverty (below $1 per Day) Million People					Poverty (below $1 per Day) Poverty Gap Index			Poverty (below $2 per Day) Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA continued																		
South Africa	0.621	0.722	0.79	27.2%	0.5%	4.201	1.542	0.345	-91.8%	-4.9%	2.964	0.79	0.146	13.5	7.303	2.461	-81.8%	-3.3%
Namibia	0.602	0.711	0.808	34.2%	0.6%	0.385	0.217	0.02	-94.8%	-5.7%	7.063	2.393	0.146	0.811	0.593	0.095	-88.3%	-4.2%
Lesotho	0.505	0.649	0.739	46.3%	0.8%	0.599	0.48	0.087	-85.5%	-3.8%	14.16	7.496	0.948	0.953	0.88	0.233	-75.6%	-2.8%
Botswana	0.63	0.758	0.823	30.6%	0.5%	0.161	0.034	0.007	-95.7%	-6.1%	3.08	0.424	0.076	0.359	0.108	0.03	-91.6%	-4.8%
Swaziland	0.541	0.669	0.75	38.6%	0.7%	0.594	0.499	0.159	-73.2%	-2.6%	22.59	11.45	2.475	0.933	0.989	0.513	-45.0%	-1.2%
Africa-Southern	**0.615**	**0.719**	**0.789**	**28.3%**	**0.5%**	**5.94**	**2.772**	**0.619**	**-89.6%**	**-4.4%**	**3.933**	**1.383**	**0.24**	**16.56**	**9.873**	**3.333**	**-79.9%**	**-3.2%**
Nigeria	0.466	0.577	0.622	33.5%	0.6%	71.24	11.16	100.7	41.4%	0.7%	19.78	1.122	10.3	113.7	43.99	199.7	75.6%	1.1%
Niger	0.27	0.417	0.586	117.0%	1.6%	8.749	17.22	6.603	-24.5%	-0.6%	26.19	26.04	4.705	13.8	27.21	19.77	43.3%	0.7%
Côte d'Ivoire	0.405	0.551	0.648	60.0%	0.9%	3.096	2.44	1.462	-52.8%	-1.5%	4.79	2.012	0.801	9.678	10.06	7.875	-18.6%	-0.4%
Ghana	0.462	0.526	0.618	33.8%	0.6%	9.331	13.64	9.772	4.7%	0.1%	13.84	13.88	7.604	18.96	27.44	24.12	27.2%	0.5%
Burkina Faso	0.301	0.489	0.66	119.3%	1.6%	4.083	5.575	0.128	-96.9%	-6.7%	8.828	5.966	0.057	10.43	16.93	1.913	-81.7%	-3.3%
Mali	0.322	0.482	0.642	99.4%	1.4%	4.925	8.531	1.598	-67.6%	-2.2%	10.86	10.26	0.987	12.31	21.79	10.46	-15.0%	-0.3%
Senegal	0.408	0.534	0.662	62.3%	1.0%	2.153	2.215	0.758	-64.8%	-2.1%	4.883	2.689	0.537	7.749	9.962	5.966	-23.0%	-0.5%
Guinea	0.336	0.527	0.658	95.8%	1.4%	3.726	2.388	0.186	-95.0%	-5.8%	12.33	3.624	0.135	7.651	7.893	1.663	-78.3%	-3.0%
Benin	0.376	0.513	0.648	72.3%	1.1%	3.014	6.148	1.54	-48.9%	-1.3%	9.988	12.45	1.69	7.081	12.94	6.686	-5.6%	-0.1%
Togo	0.416	0.436	0.555	33.4%	0.6%	3.314	6.483	6.578	98.5%	1.4%	19.45	24.49	17.64	6.184	10.78	12.83	107.5%	1.5%
Sierra Leone	0.247	0.39	0.593	140.1%	1.8%	3.111	1.767	0.241	-92.3%	-5.0%	19.65	5.582	0.386	4.391	3.212	0.68	-84.5%	-3.7%
Liberia	0.305	0.355	0.553	81.3%	1.2%	1.633	3.926	1.97	20.6%	0.4%	15.76	20.45	4.091	3.667	7.52	12.05	228.6%	2.4%
Mauritania	0.461	0.594	0.669	45.1%	0.7%	1.038	1.429	0.277	-73.3%	-2.6%	9.611	7.549	0.781	2.371	3.6	1.487	-37.3%	-0.9%
Guinea-Bissau	0.394	0.512	0.578	46.7%	0.8%	0.948	1.784	2.314	144.1%	1.8%	23.26	22.21	17.15	1.758	3.504	5.765	227.9%	2.4%
Gambia	0.336	0.504	0.605	80.1%	1.2%	0.416	0.613	0.269	-35.3%	-0.9%	8.753	8.124	2.131	1.351	2.035	1.699	25.8%	0.5%
Cape Verde	0.612	0.709	0.813	32.8%	0.6%	0.001	0.001	0	-100.0%		0.053	0.015	0	0.298	0.241	0.054	-81.9%	-3.4%
Africa-Western	**0.416**	**0.535**	**0.626**	**50.5%**	**0.8%**	**120.8**	**85.32**	**134.4**	**11.3%**	**0.2%**	**16.11**	**6.12**	**6.592**	**221.4**	**209.1**	**312.7**	**41.2%**	**0.7%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings Index					Poverty (below $1 per Day) Million People					Poverty Gap Index			Poverty (below $2 per Day) Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AMERICAS																		
Haiti	0.444	0.53	0.636	43.2%	0.7%	4.97	6.426	4.901	-1.4%	0.0%	28.56	24.21	12.94	7.377	10.13	9.618	30.4%	0.5%
Dominican Republic	0.653	0.76	0.832	27.4%	0.5%	0.114	0.021	0.002	-98.2%	-7.8%	0.301	0.041	0.003	0.678	0.186	0.027	-96.0%	-6.2%
Cuba	0.709	0.753	0.851	20.0%	0.4%	1.481	0.343	0	-100.0%		3.671	0.682	0	3.763	1.385	0.002	-99.9%	-14.0%
Puerto Rico	0.763	0.831	0.881	15.5%	0.3%	0	0	0			0	0	0	0	0	0		
Jamaica	0.652	0.706	0.776	19.0%	0.3%	0.007	0.012	0.011	57.1%	0.9%	0.051	0.083	0.086	0.296	0.342	0.225	-24.0%	-0.5%
Trinidad and Tobago	0.735	0.802	0.834	13.5%	0.3%	0	0	0			0.005	0	0	0.064	0.011	0	-100.0%	
Bahamas	0.739	0.791	0.835	13.0%	0.2%	0	0	0			0	0	0	0	0	0		
Barbados	0.752	0.797	0.859	14.2%	0.3%	0.002	0	0	-100.0%		0.134	0.027	0	0.019	0.006	0	-100.0%	
St. Vincent & the Grenadines	0.659	0.731	0.818	24.1%	0.4%	0.015	0.009	0	-100.0%		3.283	1.365	0.046	0.041	0.029	0.003	-92.7%	-5.1%
Grenada	0.685	0.744	0.817	19.3%	0.4%	0.006	0.005	0.001	-83.3%	-3.5%	1.309	0.877	0.077	0.025	0.023	0.004	-84.0%	-3.6%
St. Lucia	0.698	0.761	0.829	18.8%	0.3%	0.006	0.001	0	-100.0%		0.93	0.173	0.004	0.029	0.01	0.001	-96.6%	-6.5%
America-Caribbean	**0.636**	**0.696**	**0.771**	**21.2%**	**0.4%**	**6.602**	**6.818**	**4.915**	**-25.6%**	**-0.6%**	**7.88**	**7.229**	**4.374**	**12.29**	**12.12**	**9.881**	**-19.6%**	**-0.4%**
Guatemala	0.597	0.683	0.772	29.3%	0.5%	2.068	2.727	1.808	-12.6%	-0.3%	4.898	3.954	1.901	4.654	6.086	4.487	-3.6%	-0.1%
Honduras	0.603	0.676	0.756	25.4%	0.5%	1.026	1.365	0.426	-58.5%	-1.7%	4.646	4.694	1.097	3.168	3.948	1.871	-40.9%	-1.0%
El Salvador	0.629	0.717	0.808	28.5%	0.5%	1.512	1.368	0.557	-63.2%	-2.0%	7.761	5.518	1.823	2.964	2.787	1.38	-53.4%	-1.5%
Nicaragua	0.59	0.646	0.721	22.2%	0.4%	2.618	3.209	1.693	-35.3%	-0.9%	18.87	17.27	7.346	4.417	5.55	3.8	-14.0%	-0.3%
Costa Rica	0.73	0.807	0.872	19.5%	0.4%	0.03	0.001	0	-100.0%		0.148	0.004	0	0.173	0.015	0	-100.0%	
Panama	0.707	0.791	0.857	21.2%	0.4%	0.105	0.019	0.001	-99.0%	-8.9%	0.92	0.112	0.005	0.363	0.096	0.009	-97.5%	-7.1%
Belize	0.636	0.748	0.838	31.8%	0.6%	0.021	0.006	0	-100.0%		1.715	0.29	0.016	0.068	0.024	0.003	-95.6%	-6.1%
America-Central	**0.626**	**0.701**	**0.783**	**25.1%**	**0.4%**	**7.381**	**8.693**	**4.486**	**-39.2%**	**-1.0%**	**6.301**	**5.3**	**2.082**	**15.81**	**18.51**	**11.55**	**-26.9%**	**-0.6%**
United States of America	0.811	0.849	0.88	8.5%	0.2%	0	0	0			0	0	0	0	0	0		
Mexico	0.714	0.772	0.827	15.8%	0.3%	1.233	0.322	0.054	-95.6%	-6.1%	0.261	0.051	0.008	17.41	8.41	2.581	-85.2%	-3.7%
Canada	0.809	0.843	0.875	8.2%	0.2%	0	0	0			0	0	0	0	0	0		
America-North	**0.787**	**0.83**	**0.867**	**10.2%**	**0.2%**	**1.233**	**0.322**	**0.054**	**-95.6%**	**-6.1%**	**0.063**	**0.012**	**0.002**	**17.41**	**8.41**	**2.581**	**-85.2%**	**-3.7%**
Brazil	0.687	0.763	0.829	20.7%	0.4%	12.23	3.656	0.689	-94.4%	-5.6%	2.026	0.43	0.067	34.89	14.95	4.008	-88.5%	-4.2%
Colombia	0.681	0.743	0.821	20.6%	0.4%	2.818	1.506	0.238	-91.6%	-4.8%	1.909	0.771	0.097	6.993	4.344	0.928	-86.7%	-4.0%
Argentina	0.733	0.801	0.853	16.4%	0.3%	0.388	0.036	0.001	-99.7%	-11.2%	0.239	0.015	0	5.822	1.471	0.133	-97.7%	-7.3%
Venezuela, RB	0.713	0.774	0.807	13.2%	0.2%	2.649	0.943	0.201	-92.4%	-5.0%	2.828	0.661	0.115	5.199	2.327	0.592	-88.6%	-4.3%
Peru	0.663	0.736	0.803	21.1%	0.4%	2.16	0.922	0.258	-88.1%	-4.2%	2.281	0.708	0.168	7.37	4.208	1.552	-78.9%	-3.1%
Chile	0.747	0.826	0.871	16.6%	0.3%	0.004	0	0	-100.0%		0.005	0	0	0.554	0.026	0	-100.0%	
Ecuador	0.691	0.726	0.744	7.7%	0.1%	1.275	1.192	0.705	-44.7%	-1.2%	2.497	1.834	1.012	3.61	3.489	2.191	-39.3%	-1.0%
Bolivia	0.629	0.722	0.785	24.8%	0.4%	1.95	0.701	0.184	-90.6%	-4.6%	8.039	1.712	0.333	3.605	1.77	0.614	-83.0%	-3.5%
Paraguay	0.656	0.693	0.753	14.8%	0.3%	0.889	0.831	0.251	-71.8%	-2.5%	5.281	3.464	0.795	2.127	2.186	0.926	-56.5%	-1.6%
Uruguay	0.73	0.789	0.85	16.4%	0.3%	0.001	0	0	-100.0%		0.005	0	0	0.027	0.002	0	-100.0%	
Guyana	0.643	0.706	0.781	21.5%	0.4%	0.012	0.002	0	-100.0%		0.361	0.06	0.003	0.034	0.007	0	-100.0%	
Suriname	0.668	0.743	0.807	20.8%	0.4%	0.044	0.018	0.003	-93.2%	-5.2%	2.531	0.866	0.117	0.13	0.067	0.014	-89.2%	-4.4%
America-South	**0.692**	**0.762**	**0.822**	**18.8%**	**0.3%**	**24.42**	**9.806**	**2.53**	**-89.6%**	**-4.4%**	**2.021**	**0.594**	**0.13**	**70.36**	**34.85**	**10.96**	**-84.4%**	**-3.7%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings (Index)					Poverty (below $1 per Day) (Million People)					Poverty Gap Index			Poverty (below $2 per Day) (Million People)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA																		
China	0.663	0.787	0.862	30.0%	0.5%	57.07	1.172	0.015	-100.0%	-15.2%	1.161	0.016	0	318.4	22.65	0.789	-99.8%	-11.3%
Japan	0.808	0.84	0.878	8.7%	0.2%	0	0	0			0	0	0	0	0	0		
Korea, Rep. of	0.787	0.844	0.88	11.8%	0.2%	0	0	0			0	0	0	0.05	0	0	-100.0%	
Taiwan	0.758	0.822	0.873	15.2%	0.3%	0	0	0			0	0	0	0	0	0		
Korea, Dem. Rep. of	0.568	0.628	0.694	22.2%	0.4%	2.312	1.733	0.412	-82.2%	-3.4%	2.773	1.915	0.443	6.841	5.69	1.807	-73.6%	-2.6%
Hong Kong	0.819	0.842	0.86	5.0%	0.1%	0	0	0			0	0	0	0	0	0		
Mongolia	0.638	0.687	0.772	21.0%	0.4%	0.091	0.018	0	-100.0%		0.644	0.094	0	1.443	0.756	0.01	-99.3%	-9.5%
Asia-East	**0.68**	**0.791**	**0.861**	**26.6%**	**0.5%**	**59.48**	**2.923**	**0.427**	**-99.3%**	**-9.4%**	**1.03**	**0.041**	**0.006**	**326.7**	**29.1**	**2.605**	**-99.2%**	**-9.2%**
India	0.518	0.674	0.797	53.9%	0.9%	290.9	21.33	0.125	-100.0%	-14.4%	7.535	0.306	0.001	744.8	175.3	5.157	-99.3%	-9.5%
Pakistan	0.462	0.585	0.692	49.8%	0.8%	11.56	7.231	0.387	-96.7%	-6.6%	1.362	0.504	0.017	115.4	125.6	33.64	-70.8%	-2.4%
Bangladesh	0.439	0.584	0.696	58.5%	0.9%	45.91	7.559	0.319	-99.3%	-9.5%	8.683	0.819	0.025	108.1	43.85	4.813	-95.5%	-6.0%
Afghanistan	0.244	0.378	0.517	111.9%	1.5%	16.78	36.76	45.01	168.2%	2.0%	19.44	21.38	13.42	31.28	65.41	99.75	218.9%	2.3%
Iran, Islamic Rep. of	0.668	0.76	0.803	20.2%	0.4%	0.002	0	0	-100.0%		0	0	0	0.084	0	0	-100.0%	
Nepal	0.426	0.529	0.649	52.3%	0.8%	6.7	6.42	2.134	-68.1%	-2.3%	8.119	5.502	1.498	23.2	27.18	15.95	-31.3%	-0.7%
Uzbekistan	0.619	0.668	0.711	14.9%	0.3%	1.233	0.252	0.001	-99.9%	-13.3%	0.97	0.134	0	9.76	4.738	0.141	-98.6%	-8.1%
Sri Lanka	0.657	0.724	0.8	21.8%	0.4%	0.563	0.084	0.004	-99.3%	-9.4%	0.626	0.075	0.004	6.791	2.326	0.311	-95.4%	-6.0%
Kazakhstan	0.71	0.801	0.815	14.8%	0.3%	0	0	0			0	0	0	0.118	0	0	-100.0%	
Tajikistan	0.609	0.641	0.709	16.4%	0.3%	0.243	0.366	0.024	-90.1%	-4.5%	0.706	0.825	0.041	2.295	2.875	0.475	-79.3%	-3.1%
Turkmenistan	0.633	0.747	0.743	17.4%	0.3%	0.401	0	0	-100.0%		2.037	0	0	1.235	0.001	0	-100.0%	
Kyrgyzstan	0.616	0.639	0.681	10.6%	0.2%	0.003	0	0	-100.0%		0.007	0	0	1.12	0.412	0.05	-95.5%	-6.0%
Bhutan	0.502	0.648	0.787	56.8%	0.9%	0.114	0.037	0.006	-94.7%	-5.7%	5.186	1.102	0.128	0.264	0.117	0.025	-90.5%	-4.6%
Maldives	0.664	0.774	0.862	29.8%	0.5%	0.025	0.001	0	-100.0%		1.818	0.045	0	0.076	0.007	0	-100.0%	
Asia-South Central	**0.511**	**0.647**	**0.754**	**47.6%**	**0.8%**	**374.4**	**80.04**	**48.01**	**-87.2%**	**-4.0%**	**6.627**	**1.185**	**0.787**	**1044**	**447.8**	**160.3**	**-84.6%**	**-3.7%**
Indonesia	0.63	0.7	0.758	20.3%	0.4%	9.433	1.992	0.07	-99.3%	-9.3%	0.942	0.144	0.004	97.91	52.81	7.242	-92.6%	-5.1%
Philippines	0.636	0.691	0.768	20.8%	0.4%	9.181	3.747	0.539	-94.1%	-5.5%	2.949	0.796	0.089	35.81	22.25	5.798	-83.8%	-3.6%
Vietnam	0.63	0.714	0.789	25.2%	0.5%	0.029	0.001	0	-100.0%		0.005	0	0	40.58	11.14	0.684	-98.3%	-7.8%
Thailand	0.683	0.757	0.814	19.2%	0.4%	0.034	0.001	0	-100.0%		0.009	0	0	11.08	2.77	0.549	-95.0%	-5.8%
Myanmar	0.545	0.621	0.699	28.3%	0.5%	20.36	3.522	0.329	-98.4%	-7.9%	14.7	1.618	0.128	42.71	21.88	5.363	-87.4%	-4.1%
Malaysia	0.716	0.798	0.843	17.7%	0.3%	0.003	0	0	-100.0%		0.002	0	0	1.132	0.246	0.099	-91.3%	-4.8%
Cambodia	0.512	0.65	0.758	48.0%	0.8%	8.485	3.047	0.301	-96.5%	-6.5%	24	4.22	0.256	13	9	2.098	-83.9%	-3.6%
Lao PDR	0.525	0.667	0.798	52.0%	0.8%	1.272	0.034	0	-100.0%		5.497	0.066	0	3.987	0.545	0.001	-100.0%	-15.3%
Singapore	0.803	0.844	0.859	7.0%	0.1%	0	0	0			0	0	0	0	0	0		
Timor-Leste	0.496	0.553	0.693	39.7%	0.7%	0.313	0.604	0.109	-65.2%	-2.1%	8.503	8.424	0.77	0.661	1.268	0.412	-37.7%	-0.9%
Brunei Darussalam	0.792	0.826	0.849	7.2%	0.1%	0	0	0			0	0	0	0	0	0		
Asia-South East	**0.63**	**0.704**	**0.771**	**22.4%**	**0.4%**	**49.11**	**12.95**	**1.349**	**-97.3%**	**-6.9%**	**2.861**	**0.489**	**0.041**	**246.9**	**121.9**	**22.25**	**-91.0%**	**-4.7%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings Index					Poverty (below $1 per Day) Million People					Poverty Gap Index			Poverty (below $2 per Day) Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued																		
Turkey	0.674	0.766	0.85	26.1%	0.5%	0.377	0.041	0.001	-99.7%	-11.2%	0.098	0.008	0	9.459	2.286	0.17	-98.2%	-7.7%
Yemen	0.473	0.619	0.721	52.4%	0.8%	1.136	0.986	0.308	-72.9%	-2.6%	1.111	0.496	0.099	6.816	7.287	3.302	-51.6%	-1.4%
Iraq	0.537	0.668	0.767	42.8%	0.7%	6.409	0.343	0.001	-100.0%	-16.1%	6.993	0.139	0	14.41	2.281	0.023	-99.8%	-12.1%
Saudi Arabia	0.703	0.769	0.821	16.8%	0.3%	0	0	0			0	0	0	0	0	0		
Syria	0.626	0.681	0.764	22.0%	0.4%	3.082	2.828	0.707	-77.1%	-2.9%	4.344	2.584	0.465	7.419	7.336	2.5	-66.3%	-2.2%
Israel	0.777	0.851	0.892	14.8%	0.3%	0	0	0			0	0	0	0	0	0		
Azerbaijan	0.695	0.752	0.779	12.1%	0.2%	0	0	0			0	0	0	0	0	0		
Jordan	0.658	0.752	0.851	29.3%	0.5%	0.001	0	0	-100.0%		0.002	0	0	0.276	0.011	0	-100.0%	
Palestine	0.656	0.705	0.778	18.6%	0.3%	1.307	0.73	0.162	-87.6%	-4.1%	9.924	2.577	0.389	2.305	1.805	0.528	-77.1%	-2.9%
United Arab Emirates	0.799	0.826	0.85	6.4%	0.1%	0	0	0			0	0	0	0	0	0		
Oman	0.711	0.785	0.824	15.9%	0.3%	0	0	0			0	0	0	0	0	0		
Kuwait	0.793	0.844	0.845	6.6%	0.1%	0	0	0			0	0	0	0	0	0		
Lebanon	0.653	0.739	0.822	25.9%	0.5%	0.087	0.062	0.006	-93.1%	-5.2%	0.474	0.297	0.024	0.51	0.364	0.058	-88.6%	-4.3%
Georgia	0.602	0.704	0.76	26.2%	0.5%	0.112	0.03	0.002	-98.2%	-7.7%	0.588	0.172	0.014	0.724	0.279	0.035	-95.2%	-5.9%
Armenia	0.683	0.768	0.823	20.5%	0.4%	0.01	0	0	-100.0%		0.056	0	0	0.755	0.059	0.003	-99.6%	-10.5%
Bahrain	0.753	0.796	0.835	10.9%	0.2%	0	0	0			0	0	0	0	0	0		
Qatar	0.793	0.85	0.86	8.4%	0.2%	0	0	0			0	0	0	0	0	0		
Cyprus	0.783	0.825	0.858	9.6%	0.2%	0	0	0			0	0	0	0	0	0		
Asia-West	**0.641**	**0.725**	**0.798**	**24.5%**	**0.4%**	**12.52**	**5.02**	**1.186**	**-90.5%**	**-4.6%**	**1.672**	**0.415**	**0.073**	**42.67**	**21.71**	**6.62**	**-84.5%**	**-3.7%**
Australia	0.81	0.841	0.875	8.0%	0.2%	0	0	0			0	0	0	0	0	0		
Papua New Guniea	0.45	0.585	0.67	48.9%	0.8%	1.372	0.378	0.136	-90.1%	-4.5%	7.872	1.093	0.277	3.286	1.667	0.821	-75.0%	-2.7%
New Zealand	0.791	0.829	0.874	10.5%	0.2%	0	0	0			0	0	0	0	0	0		
Solomon Islands	0.503	0.556	0.636	26.4%	0.5%	0.127	0.177	0.229	80.3%	1.2%	8.089	7.268	7.499	0.288	0.404	0.497	72.6%	1.1%
Fiji	0.656	0.707	0.793	20.9%	0.4%	0.158	0.058	0.003	-98.1%	-7.6%	5.405	1.537	0.066	0.363	0.189	0.019	-94.8%	-5.7%
Vanuatu	0.591	0.658	0.752	27.2%	0.5%	0.049	0.061	0.011	-77.6%	-2.9%	6.767	5.368	0.615	0.105	0.137	0.041	-61.0%	-1.9%
Micronesia	0.62	0.658	0.762	22.9%	0.4%	0.011	0.019	0.007	-36.4%	-0.9%	2.452	2.906	0.838	0.032	0.048	0.021	-34.4%	-0.8%
Tonga	0.686	0.705	0.773	12.7%	0.2%	0.021	0.029	0.016	-23.8%	-0.5%	5.525	5.315	2.208	0.046	0.062	0.04	-13.0%	-0.3%
Samoa	0.681	0.719	0.801	17.6%	0.3%	0.03	0.018	0.001	-96.7%	-6.6%	4.766	2.256	0.116	0.07	0.05	0.006	-91.4%	-4.8%
Oceania	**0.727**	**0.768**	**0.811**	**11.6%**	**0.2%**	**1.767**	**0.74**	**0.403**	**-77.2%**	**-2.9%**	**1.864**	**0.525**	**0.269**	**4.19**	**2.558**	**1.445**	**-65.5%**	**-2.1%**

Pop., Land Area, & Hum. Dev. Ind.

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	HDI with Higher Ceilings Index					Poverty (below $1 per Day) Million People					Poverty Gap Index			Poverty (below $2 per Day) Million People				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
EUROPE																		
Russian Federation	0.719	0.799	0.82	14.0%	0.3%	0.005	0	0	-100.0%		0.001	0	0	1.3	0	0	-100.0%	
Ukraine	0.686	0.762	0.829	20.8%	0.4%	0.002	0	0	-100.0%		0	0	0	0.078	0	0	-100.0%	
Poland	0.75	0.811	0.853	13.7%	0.3%	0.001	0	0	-100.0%		0	0	0	0.028	0	0	-100.0%	
Romania	0.715	0.771	0.817	14.3%	0.3%	0.011	0.001	0	-100.0%		0.007	0.001	0	1.418	0.248	0.041	-97.1%	-6.8%
Czech Republic	0.77	0.805	0.834	8.3%	0.2%	0	0	0			0	0	0	0.006	0.002	0	-100.0%	
Belarus	0.712	0.778	0.826	16.0%	0.3%	0	0	0			0	0	0	0.014	0.002	0.001	-92.9%	-5.1%
Hungary	0.75	0.797	0.836	11.5%	0.2%	0.001	0	0	-100.0%		0.001	0	0	0.011	0.002	0	-100.0%	
Bulgaria	0.718	0.774	0.833	16.0%	0.3%	0.007	0	0	-100.0%		0.013	0	0	0.092	0.003	0	-100.0%	
Slovakia	0.754	0.788	0.826	9.5%	0.2%	0.001	0	0	-100.0%		0.001	0.001	0.001	0.006	0.002	0.001	-83.3%	-3.5%
Moldova, Rep. of	0.634	0.676	0.761	20.0%	0.4%	0.006	0.001	0	-100.0%		0.023	0.004	0	2.462	1.184	0.055	-97.8%	-7.3%
Europe-East	**0.72**	**0.791**	**0.826**	**14.7%**	**0.3%**	**0.035**	**0.003**	**0**	**-100.0%**		**0.002**	**0**	**0**	**5.416**	**1.443**	**0.099**	**-98.2%**	**-7.7%**
United Kingdom	0.801	0.835	0.877	9.5%	0.2%	0	0	0			0	0	0	0	0	0		
Sweden	0.81	0.849	0.887	9.5%	0.2%	0	0	0			0	0	0	0	0	0		
Denmark	0.799	0.835	0.877	9.8%	0.2%	0	0	0			0	0	0	0	0	0		
Ireland	0.815	0.85	0.872	7.0%	0.1%	0	0	0			0	0	0	0	0	0		
Norway	0.825	0.855	0.884	7.2%	0.1%	0	0	0			0	0	0	0	0	0		
Finland	0.803	0.836	0.876	9.1%	0.2%	0	0	0			0	0	0	0	0	0		
Lithuania	0.742	0.793	0.837	12.8%	0.2%	0.001	0	0	-100.0%		0.005	0.001	0	0.088	0.019	0.002	-97.7%	-7.3%
Latvia	0.742	0.807	0.852	14.8%	0.3%	0.001	0	0	-100.0%		0.004	0	0	0.007	0.001	0	-100.0%	
Estonia	0.759	0.813	0.853	12.4%	0.2%	0	0	0			0.005	0	0	0.016	0.002	0	-100.0%	
Iceland	0.815	0.851	0.887	8.8%	0.2%	0	0	0			0	0	0	0	0	0		
Europe-North	**0.8**	**0.836**	**0.876**	**9.5%**	**0.2%**	**0.002**	**0**	**0**	**-100.0%**		**0**	**0**	**0**	**0.111**	**0.022**	**0.002**	**-98.2%**	**-7.7%**
Italy	0.795	0.818	0.852	7.2%	0.1%	0	0	0			0	0	0	0	0	0		
Spain	0.792	0.827	0.859	8.5%	0.2%	0	0	0			0	0	0	0	0	0		
Greece	0.789	0.822	0.848	7.5%	0.1%	0	0	0			0	0	0	0	0	0		
Portugal	0.756	0.803	0.851	12.6%	0.2%	0.001	0.001	0	-100.0%		0.001	0.002	0	0.025	0.029	0.007	-72.0%	-2.5%
Serbia	0.685	0.747	0.823	20.1%	0.4%	0.215	0.027	0.002	-99.1%	-8.9%	0.516	0.06	0.004	0.946	0.178	0.015	-98.4%	-8.0%
Croatia	0.745	0.788	0.841	12.9%	0.2%	0	0	0			0	0	0	0.008	0.001	0	-100.0%	
Bosnia and Herzegovina	0.693	0.724	0.778	12.3%	0.2%	0.596	0.725	0.074	-87.6%	-4.1%	3.963	5.753	0.563	1.387	1.48	0.229	-83.5%	-3.5%
Albania	0.707	0.76	0.819	15.8%	0.3%	0.001	0	0	-100.0%		0.003	0.001	0	0.2	0.066	0.004	-98.0%	-7.5%
Macedonia, TFYR	0.706	0.72	0.77	9.1%	0.2%	0	0.001	0			0.003	0.005	0	0.004	0.006	0.001	-75.0%	-2.7%
Slovenia	0.782	0.821	0.863	10.4%	0.2%	0	0	0			0	0	0	0.002	0	0	-100.0%	
Montenegro	0.675	0.741	0.828	22.7%	0.4%	0.052	0.021	0.001	-98.1%	-7.6%	2.212	0.81	0.044	0.155	0.079	0.008	-94.8%	-5.8%
Malta	0.756	0.812	0.861	13.9%	0.3%	0	0	0			0	0	0	0	0	0		
Europe-South	**0.777**	**0.81**	**0.848**	**9.1%**	**0.2%**	**0.865**	**0.775**	**0.077**	**-91.1%**	**-4.7%**	**0.143**	**0.162**	**0.016**	**2.727**	**1.84**	**0.264**	**-90.3%**	**-4.6%**
Germany	0.797	0.829	0.873	9.5%	0.2%	0	0	0			0	0	0	0	0	0		
France	0.802	0.831	0.875	9.1%	0.2%	0	0	0			0	0	0	0	0	0		
Netherlands	0.804	0.83	0.863	7.3%	0.1%	0	0	0			0	0	0	0	0	0		
Belgium	0.801	0.826	0.866	8.1%	0.2%	0	0	0			0	0	0	0	0	0		
Austria	0.803	0.833	0.87	8.3%	0.2%	0	0	0			0	0	0	0	0	0		
Switzerland	0.813	0.842	0.879	8.1%	0.2%	0	0	0			0	0	0	0	0	0		
Luxembourg	0.84	0.855	0.874	4.0%	0.1%	0	0	0			0	0	0	0	0	0		
Europe-West	**0.8**	**0.831**	**0.873**	**9.1%**	**0.2%**	**0**	**0**	**0**			**0**	**0**	**0**	**0**	**0**	**0**		

Poverty

Base Case

Source: International Futures Version 6.12, March 2009

	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
World	4224	3477	2218	62.1%	41.3%	23.5%	5112	5066	3882	75.1%	60.2%	41.1%	5697	6240	5669	83.7%	74.1%	60.0%
Africa	869.7	1195	1302	86.2%	71.0%	55.3%	953.2	1450	1770	94.5%	86.2%	75.2%	987.4	1588	2093	97.9%	94.4%	88.9%
Americas	297.3	230.2	122.5	31.7%	20.4%	10.1%	443.2	406.6	261.2	47.3%	36.1%	21.6%	562.1	570.7	443	60.0%	50.7%	36.6%
Asia with Oceania	2996	2034	788.4	72.5%	41.4%	15.0%	3540	3153	1831	85.7%	64.2%	34.8%	3815	3933	3073	92.4%	80.1%	58.4%
Europe	58.04	15.78	4.092	8.1%	2.3%	0.7%	168.7	51.04	18.21	23.4%	7.4%	3.0%	322.8	139.2	54.55	44.8%	20.2%	9.0%
World	4224	3477	2218	62.1%	41.3%	23.5%	5112	5066	3882	75.1%	60.2%	41.1%	5697	6240	5669	83.7%	74.1%	60.0%
Africa-Eastern	308.7	495.5	351.8	96.4%	87.1%	44.4%	316.3	541.3	544.1	98.8%	95.2%	68.6%	317	556.9	676	99.0%	97.9%	85.3%
Africa-Middle	107	186.2	315.7	84.3%	74.7%	74.5%	118.8	212.6	364.7	93.6%	85.3%	86.0%	123.6	234.1	396	97.4%	94.0%	93.4%
Africa-Northern	133.5	105.1	69.22	64.8%	38.2%	21.8%	177.1	180.3	162	86.0%	65.5%	51.0%	198.1	230.8	252.6	96.2%	83.9%	79.5%
Africa-Southern	33.97	27.11	13.73	59.8%	39.5%	18.6%	45.65	43.52	28.64	80.4%	63.5%	38.9%	52.72	56.94	46.29	92.8%	83.1%	62.9%
Africa-Western	286.6	381.4	551.7	95.9%	73.2%	74.0%	295.4	472.7	670.4	98.8%	90.7%	89.9%	295.9	509.4	722.4	99.0%	97.8%	96.9%
Africa	869.7	1195	1302	86.2%	71.0%	55.3%	953.2	1450	1770	94.5%	86.2%	75.2%	987.4	1588	2093	97.9%	94.4%	88.9%
America-Caribbean	22.85	21.72	15.48	57.8%	46.3%	30.7%	30.01	29.96	20.61	75.9%	63.8%	40.8%	34.81	36.61	28.55	88.1%	78.0%	56.6%
America-Central	29.12	35.19	28.13	66.4%	55.7%	37.4%	36.87	46.54	42.77	84.0%	73.7%	56.8%	41.29	54.67	55.25	94.1%	86.5%	73.4%
America-North	57.96	42.85	21.17	12.8%	8.1%	3.7%	92.08	83.97	56.29	20.3%	15.8%	10.0%	133.7	120.4	97.52	29.5%	22.7%	17.3%
America-South	187.4	130.5	57.71	46.9%	26.9%	11.1%	284.3	246.1	141.5	71.1%	50.8%	27.1%	352.3	358.9	261.7	88.1%	74.0%	50.2%
Americas	297.3	230.2	122.5	31.7%	20.4%	10.1%	443.2	406.6	261.2	47.3%	36.1%	21.6%	562.1	570.7	443	60.0%	50.7%	36.6%
Asia-East	856.9	204.1	26.45	54.4%	12.1%	1.6%	1201	546.3	117.4	76.2%	32.3%	7.0%	1385	1006	373.2	87.9%	59.5%	22.4%
Asia-South Central	1552	1343	563.2	91.0%	62.1%	23.1%	1625	1859	1246	95.3%	86.0%	51.1%	1657	2024	1949	97.2%	93.6%	79.9%
Asia-South East	466.7	389.3	154.7	79.7%	56.2%	21.5%	544.9	566.8	363	93.1%	81.9%	50.5%	567.4	648	561.5	96.9%	93.6%	78.1%
Asia-West	114	90.7	39.2	49.8%	27.8%	10.0%	161.6	170.6	95.67	70.6%	52.4%	24.4%	193.5	242	175.7	84.5%	74.3%	44.8%
Oceania	7.151	6.833	4.862	20.9%	15.8%	10.0%	8.691	10.11	8.92	25.4%	23.4%	18.3%	12.4	13.26	12.95	36.2%	30.8%	26.5%
Asia with Oceania	2996	2034	788.4	72.5%	41.4%	15.0%	3540	3153	1831	85.7%	64.2%	34.8%	3815	3933	3073	92.4%	80.1%	58.4%
Europe-East	46.98	9.507	2.328	16.0%	3.6%	1.0%	143.8	33.94	12	49.0%	12.8%	5.3%	241.3	88.03	34.77	82.2%	33.1%	15.5%
Europe-North	1.499	0.527	0.086	1.5%	0.5%	0.1%	4.982	2.322	0.612	5.1%	2.3%	0.6%	15.91	7.45	2.309	16.2%	7.2%	2.3%
Europe-South	12.35	7.866	2.141	8.3%	5.6%	1.8%	25.13	19.09	7.663	16.9%	13.6%	6.4%	54.08	43.15	21.41	36.3%	30.6%	17.9%
Europe-West	0.033	0.017	0.001	0.0%	0.0%	0.0%	1.432	0.618	0.056	0.8%	0.3%	0.0%	20.78	8.9	1.198	11.0%	4.7%	0.7%
Europe	58.04	15.78	4.092	8.1%	2.3%	0.7%	168.7	51.04	18.21	23.4%	7.4%	3.0%	322.8	139.2	54.55	44.8%	20.2%	9.0%

Poverty

Base Case: Countries in Year 2060	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
Descending Population Sequence	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA																		
Ethiopia	79.27	139.9	106.3	98.3%	97.5%	50.4%	79.84	142.1	180.6	99.0%	99.0%	85.6%	79.84	142.1	207.3	99.0%	99.0%	98.2%
Uganda	33.76	67.64	46.2	98.8%	94.5%	44.1%	33.82	70.88	75.28	99.0%	99.0%	71.8%	33.82	70.88	94.72	99.0%	99.0%	90.4%
Tanzania, United Rep. of	43.18	60.19	4.362	98.7%	79.2%	4.4%	43.34	73.17	25.65	99.0%	96.3%	25.8%	43.34	75.2	65.44	99.0%	99.0%	65.9%
Kenya	35.7	49.57	17.78	91.0%	74.7%	21.3%	38.72	61.82	42.17	98.6%	93.1%	50.5%	38.86	65.68	66.32	99.0%	98.9%	79.4%
Madagascar	20.7	35.78	41.71	98.1%	97.8%	81.1%	20.89	36.22	48.36	99.0%	99.0%	94.0%	20.89	36.22	50.78	99.0%	99.0%	98.7%
Mozambique	19.17	11.43	0.029	85.5%	30.4%	0.1%	21.65	22.2	0.44	96.5%	59.0%	0.9%	22.21	31.37	3.325	99.0%	83.3%	6.8%
Malawi	14.43	27.25	28.08	97.3%	98.0%	70.8%	14.68	27.53	36.63	99.0%	99.0%	92.3%	14.68	27.53	39.26	99.0%	99.0%	98.9%
Zambia	13.03	22.32	18.7	98.6%	93.8%	58.0%	13.08	23.49	26.39	99.0%	98.7%	81.9%	13.08	23.55	30.53	99.0%	99.0%	94.8%
Burundi	8.733	17.43	12	99.0%	98.4%	42.2%	8.733	17.53	22.43	99.0%	99.0%	79.0%	8.733	17.53	27.4	99.0%	99.0%	96.4%
Rwanda	10.07	17.97	17.58	96.5%	92.9%	62.5%	10.33	19.08	23.58	98.9%	98.6%	83.8%	10.33	19.16	26.76	98.9%	99.0%	95.1%
Somalia	9.168	14.89	24.49	99.0%	99.0%	97.6%	9.168	14.89	24.83	99.0%	99.0%	99.0%	9.168	14.89	24.83	99.0%	99.0%	99.0%
Zimbabwe	14.22	20.27	20.68	98.7%	96.2%	87.3%	14.26	20.86	22.72	99.0%	99.0%	95.9%	14.26	20.86	23.44	99.0%	99.0%	99.0%
Eritrea	5.05	8.477	12.3	99.0%	99.0%	98.2%	5.051	8.477	12.41	99.0%	99.0%	99.0%	5.051	8.477	12.41	99.0%	99.0%	99.0%
Mauritius	0.805	0.426	0.126	62.1%	29.0%	8.5%	1.181	1	0.522	91.1%	68.1%	35.1%	1.284	1.37	1.084	99.0%	93.3%	72.8%
Comoros	0.646	0.989	0.928	97.1%	92.9%	65.9%	0.658	1.05	1.208	98.9%	98.6%	85.8%	0.658	1.054	1.35	98.9%	99.0%	95.9%
Djibouti	0.776	0.893	0.559	92.1%	83.1%	49.9%	0.832	1.03	0.877	98.7%	95.8%	78.3%	0.835	1.064	1.055	99.1%	99.0%	94.2%
Africa-Eastern	**308.7**	**495.5**	**351.8**	**96.4%**	**87.1%**	**44.4%**	**316.3**	**541.3**	**544.1**	**98.8%**	**95.2%**	**68.6%**	**317**	**556.9**	**676**	**99.0%**	**97.9%**	**85.3%**
Congo; Dem. Rep. of	67.03	140.8	247.4	99.0%	98.9%	94.5%	67.03	140.8	259	99.0%	98.9%	99.0%	67.03	140.8	259.1	99.0%	98.9%	99.0%
Angola	8.589	5.716	7.503	46.9%	16.3%	13.1%	14.49	16.35	22.86	79.1%	46.6%	39.9%	17.5	27.76	41.77	95.5%	79.2%	72.9%
Cameroon	15.34	23.32	19.11	83.9%	77.1%	47.0%	17.65	28.31	30.38	96.5%	93.6%	74.7%	18.1	29.93	37.43	99.0%	98.9%	92.0%
Chad	8.816	6.56	30.11	77.7%	28.9%	78.5%	10.84	14.35	36.36	95.5%	63.2%	94.8%	11.24	20.23	37.95	99.0%	89.0%	99.0%
Central African Republic	4.312	7.299	8.763	96.1%	94.0%	76.5%	4.443	7.641	10.35	99.0%	98.4%	90.4%	4.443	7.691	11.11	99.0%	99.0%	97.0%
Congo, Rep. of	2.547	1.919	2.396	56.3%	25.2%	23.3%	3.826	4.236	5.168	84.6%	55.5%	50.2%	4.385	6.319	7.93	97.0%	82.9%	77.0%
Gabon	0.153	0.224	0.026	10.1%	10.3%	1.0%	0.37	0.539	0.106	24.5%	24.7%	4.0%	0.69	1.003	0.322	45.6%	46.0%	12.2%
Equatorial Guinea	0	0	0	0.0%	0.0%	0.0%	0.005	0.002	0.003	0.9%	0.2%	0.2%	0.083	0.041	0.042	14.7%	4.6%	3.5%
São Tomé and Príncipe	0.17	0.292	0.361	96.6%	98.0%	86.4%	0.174	0.295	0.403	98.9%	99.0%	96.4%	0.174	0.295	0.414	98.9%	99.0%	99.0%
Africa-Middle	**107**	**186.2**	**315.7**	**84.3%**	**74.7%**	**74.5%**	**118.8**	**212.6**	**364.7**	**93.6%**	**85.3%**	**86.0%**	**123.6**	**234.1**	**396**	**97.4%**	**94.0%**	**93.4%**
Egypt	70.43	56.17	14.82	86.8%	52.7%	12.1%	80.07	92.02	52.48	98.7%	86.3%	42.8%	80.32	104.8	96.92	99.0%	98.3%	79.1%
Sudan	36.44	35.44	42.98	90.4%	55.3%	50.6%	39.88	54.86	70.9	98.9%	85.6%	83.4%	39.93	62.62	82.7	99.0%	97.7%	97.3%
Algeria	7.417	0.363	7.081	21.0%	0.8%	15.4%	21.25	4.305	22.91	60.1%	9.8%	49.8%	32.04	18.69	38.8	90.7%	42.4%	84.4%
Morocco	15.09	12.52	3.589	46.9%	32.1%	8.8%	26.06	25.95	12.23	81.1%	66.6%	29.9%	31.09	35.34	25.27	96.7%	90.6%	61.8%
Tunisia	1.769	0.506	0.058	16.7%	4.0%	0.4%	5.153	2.432	0.515	48.7%	19.2%	3.8%	8.637	6.386	2.415	81.6%	50.4%	17.9%
Libyan Arab Jamahiriya	2.314	0.075	0.699	35.8%	0.9%	7.1%	4.69	0.712	2.951	72.6%	8.2%	29.9%	6.078	2.978	6.524	94.1%	34.2%	66.1%
Africa-Northern	**133.5**	**105.1**	**69.22**	**64.8%**	**38.2%**	**21.8%**	**177.1**	**180.3**	**162**	**86.0%**	**65.5%**	**51.0%**	**198.1**	**230.8**	**252.6**	**96.2%**	**83.9%**	**79.5%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA continued																		
South Africa	28.97	22.06	11.11	58.5%	37.7%	17.9%	39.51	36.62	24.04	79.8%	62.6%	38.6%	45.91	48.58	39.46	92.7%	83.0%	63.4%
Namibia	1.474	1.441	0.446	66.5%	45.0%	11.7%	1.869	2.165	1.036	84.4%	67.6%	27.1%	2.092	2.724	1.87	94.4%	85.0%	48.9%
Lesotho	1.497	1.667	0.769	77.4%	63.4%	26.1%	1.759	2.162	1.406	90.9%	82.3%	47.6%	1.882	2.455	2.065	97.3%	93.4%	70.0%
Botswana	0.865	0.427	0.175	45.6%	17.6%	6.7%	1.293	0.883	0.47	68.1%	36.4%	18.0%	1.621	1.438	0.965	85.4%	59.2%	36.9%
Swaziland	1.165	1.509	1.229	94.9%	85.6%	60.9%	1.215	1.692	1.692	99.0%	96.0%	83.9%	1.215	1.744	1.927	99.0%	99.0%	95.5%
Africa-Southern	**33.97**	**27.11**	**13.73**	**59.8%**	**39.5%**	**18.6%**	**45.65**	**43.52**	**28.64**	**80.4%**	**63.5%**	**38.9%**	**52.72**	**56.94**	**46.29**	**92.8%**	**83.1%**	**62.9%**
Nigeria	144.3	144.8	317.2	96.7%	56.6%	88.5%	147.8	215.8	350.4	99.0%	84.3%	97.7%	147.8	247.7	355.1	99.0%	96.8%	99.0%
Niger	15.82	31.45	36.32	97.6%	97.2%	70.6%	16.05	32.02	45.26	99.0%	99.0%	88.0%	16.05	32.02	49.61	99.0%	99.0%	96.5%
Côte d'Ivoire	17.26	23.85	24.62	84.5%	67.8%	50.6%	19.75	31.39	37.97	96.7%	89.2%	78.0%	20.22	34.41	45.62	99.0%	97.8%	93.7%
Ghana	23.83	35.63	39.33	97.6%	96.2%	85.2%	24.16	36.65	44.48	99.0%	99.0%	96.3%	24.16	36.65	45.71	99.0%	99.0%	99.0%
Burkina Faso	14.51	26.52	12.73	95.6%	92.4%	29.2%	15.01	28.41	27.43	98.9%	99.0%	62.9%	15.01	28.41	38.65	98.9%	99.0%	88.6%
Mali	15.22	28.06	27.21	97.9%	96.6%	62.7%	15.39	28.75	37.52	99.0%	99.0%	86.5%	15.39	28.75	42.09	99.0%	99.0%	97.0%
Senegal	12.16	19.33	18.92	92.0%	81.8%	54.1%	13.08	22.67	28.54	98.9%	95.9%	81.6%	13.09	23.39	33.4	99.0%	99.0%	95.5%
Guinea	10.05	15.73	9.902	97.5%	85.1%	35.4%	10.21	18.04	19.56	99.0%	97.6%	69.9%	10.21	18.31	25.81	99.0%	99.0%	92.2%
Benin	9.401	16.67	17.04	97.6%	97.6%	69.5%	9.541	16.91	22.36	99.0%	99.0%	91.2%	9.541	16.91	24.17	99.0%	99.0%	98.6%
Togo	6.895	11.82	15.71	99.0%	99.1%	95.4%	6.895	11.82	16.3	99.0%	99.1%	99.0%	6.895	11.82	16.3	99.0%	99.1%	99.0%
Sierra Leone	6.035	7.378	3.846	95.9%	70.5%	25.2%	6.23	9.505	8.312	99.0%	90.8%	54.5%	6.23	10.29	12.42	99.0%	98.3%	81.4%
Liberia	3.822	7.837	14.42	99.0%	99.0%	97.7%	3.822	7.837	14.61	99.0%	99.0%	99.0%	3.822	7.837	14.61	99.0%	99.0%	99.0%
Mauritania	3.32	5.493	5.08	96.6%	94.6%	60.7%	3.403	5.749	7.363	99.0%	99.0%	88.0%	3.403	5.749	8.207	99.0%	99.0%	98.1%
Guinea-Bissau	1.832	3.652	6.156	99.0%	99.0%	98.8%	1.832	3.652	6.167	99.0%	99.0%	99.0%	1.832	3.652	6.167	99.0%	99.0%	99.0%
Gambia	1.643	2.634	3.049	97.0%	93.9%	76.0%	1.677	2.771	3.68	99.0%	98.8%	91.7%	1.677	2.776	3.934	99.0%	99.0%	98.1%
Cape Verde	0.474	0.512	0.221	83.7%	61.1%	22.1%	0.54	0.688	0.448	95.4%	82.1%	44.7%	0.561	0.788	0.694	99.1%	94.0%	69.3%
Africa-Western	**286.6**	**381.4**	**551.7**	**95.9%**	**73.2%**	**74.0%**	**295.4**	**472.7**	**670.4**	**98.8%**	**90.7%**	**89.9%**	**295.9**	**509.4**	**722.4**	**99.0%**	**97.8%**	**96.9%**

Poverty

Base Case: Countries in Year 2060	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
Descending Population Sequence	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AMERICAS																		
Haiti	8.789	12.59	14.04	94.5%	92.2%	82.4%	9.169	13.34	15.93	98.6%	97.7%	93.5%	9.21	13.51	16.73	99.0%	99.0%	98.2%
Dominican Republic	2.884	1.265	0.318	30.0%	10.8%	2.5%	5.539	3.419	1.281	57.6%	29.2%	9.9%	7.865	6.513	3.518	81.9%	55.7%	27.3%
Cuba	8.896	6.073	0.174	77.8%	53.8%	1.7%	10.9	9.623	1.432	95.4%	85.2%	14.0%	11.31	11.03	4.953	99.0%	97.7%	48.4%
Puerto Rico	0.25	0.051	0.007	6.2%	1.1%	0.1%	0.83	0.272	0.056	20.4%	5.9%	1.2%	1.851	0.924	0.289	45.6%	19.9%	6.1%
Jamaica	1.202	1.276	0.854	43.6%	40.7%	27.2%	2.051	2.187	1.621	74.4%	69.8%	51.6%	2.563	2.815	2.368	93.0%	89.9%	75.4%
Trinidad and Tobago	0.437	0.168	0.003	32.6%	12.3%	0.2%	0.912	0.559	0.033	68.1%	40.9%	2.7%	1.229	1.036	0.181	91.8%	75.8%	14.5%
Bahamas	0.002	0	0	0.6%	0.0%	0.0%	0.025	0.009	0.001	7.4%	2.3%	0.2%	0.116	0.069	0.019	34.1%	17.3%	4.6%
Barbados	0.115	0.062	0.007	41.8%	22.3%	2.8%	0.214	0.16	0.04	77.8%	57.6%	16.3%	0.263	0.243	0.117	95.6%	87.4%	47.6%
St. Vincent & the Grenadines	0.1	0.097	0.03	78.7%	61.0%	17.0%	0.122	0.14	0.084	96.1%	88.1%	47.7%	0.126	0.156	0.14	99.2%	98.1%	79.5%
Grenada	0.079	0.083	0.034	69.9%	56.8%	20.6%	0.105	0.125	0.084	92.9%	85.6%	50.9%	0.112	0.142	0.133	99.1%	97.3%	80.6%
St. Lucia	0.1	0.062	0.013	58.8%	35.2%	8.1%	0.147	0.122	0.051	86.5%	69.3%	31.9%	0.166	0.162	0.107	97.6%	92.0%	66.9%
America-Caribbean	**22.85**	**21.72**	**15.48**	**57.8%**	**46.3%**	**30.7%**	**30.01**	**29.96**	**20.61**	**75.9%**	**63.8%**	**40.8%**	**34.81**	**36.61**	**28.55**	**88.1%**	**78.0%**	**56.6%**
Guatemala	9.962	13.96	12.53	69.5%	57.6%	39.2%	12.79	19.41	20.16	89.3%	80.0%	63.1%	13.98	22.61	26.43	97.6%	93.2%	82.7%
Honduras	5.775	7.302	4.953	72.6%	65.7%	39.1%	7.116	9.325	7.854	89.4%	83.9%	62.0%	7.73	10.47	10.29	97.1%	94.2%	81.3%
El Salvador	5.477	5.729	3.814	73.6%	60.4%	36.3%	6.728	7.67	6.215	90.4%	80.9%	59.2%	7.266	8.828	8.32	97.6%	93.1%	79.2%
Nicaragua	5.504	7.322	6.695	97.1%	94.5%	78.2%	5.613	7.673	7.961	99.0%	99.0%	93.0%	5.613	7.673	8.432	99.0%	99.0%	98.5%
Costa Rica	1.014	0.218	0.007	21.7%	3.7%	0.1%	2.295	0.911	0.076	49.1%	15.6%	1.2%	3.596	2.37	0.454	77.0%	40.6%	7.1%
Panama	1.178	0.52	0.096	33.9%	12.1%	2.0%	2.041	1.273	0.373	58.8%	29.5%	7.9%	2.795	2.319	1.034	80.5%	53.7%	21.9%
Belize	0.211	0.137	0.038	66.1%	31.0%	7.4%	0.29	0.28	0.133	90.9%	63.3%	25.9%	0.315	0.389	0.289	98.7%	88.0%	56.3%
America-Central	**29.12**	**35.19**	**28.13**	**66.4%**	**55.7%**	**37.4%**	**36.87**	**46.54**	**42.77**	**84.0%**	**73.7%**	**56.8%**	**41.29**	**54.67**	**55.25**	**94.1%**	**86.5%**	**73.4%**
United States of America	0.202	0.013	0.001	0.1%	0.0%	0.0%	3.39	0.422	0.051	1.1%	0.1%	0.0%	26.5	6.158	1.234	8.5%	1.7%	0.3%
Mexico	57.75	42.83	21.17	53.0%	33.4%	16.3%	88.49	83.53	56.24	81.2%	65.1%	43.2%	104.1	113.7	96.25	95.5%	88.6%	73.9%
Canada	0.004	0	0	0.0%	0.0%	0.0%	0.2	0.016	0	0.6%	0.0%	0.0%	3.083	0.603	0.029	9.2%	1.6%	0.1%
America-North	**57.96**	**42.85**	**21.17**	**12.8%**	**8.1%**	**3.7%**	**92.08**	**83.97**	**56.29**	**20.3%**	**15.8%**	**10.0%**	**133.7**	**120.4**	**97.52**	**29.5%**	**22.7%**	**17.3%**
Brazil	92.09	60.2	25.41	46.4%	25.5%	10.1%	140.4	117.9	67.52	70.7%	49.9%	26.9%	175	175.7	129.8	88.1%	74.4%	51.6%
Colombia	19.77	15.53	5.353	40.5%	26.0%	8.3%	31.71	29.18	14.06	65.0%	48.9%	21.7%	41.17	43.05	27.86	84.3%	72.2%	43.0%
Argentina	18.32	8.692	1.741	44.9%	18.0%	3.3%	29.38	20.5	7.059	72.0%	42.5%	13.5%	36.82	33.97	18.56	90.2%	70.4%	35.6%
Venezuela, RB	15.39	11.17	4.508	53.3%	30.1%	11.0%	23.06	22.13	12.62	79.9%	59.5%	30.8%	27.26	31.32	24.12	94.4%	84.3%	58.8%
Peru	17.69	13.96	7.261	59.0%	37.6%	18.0%	24.62	23.76	15.87	82.1%	64.1%	39.4%	28.38	31.52	26.05	94.7%	85.0%	64.7%
Chile	2.803	0.365	0.011	16.4%	1.8%	0.1%	6.39	1.638	0.114	37.4%	8.1%	0.5%	10.78	4.889	0.733	63.2%	24.2%	3.5%
Ecuador	9.7	10.48	7.857	67.7%	57.4%	40.4%	12.97	15.31	13.38	90.6%	83.9%	68.8%	14.1	17.59	17.3	98.5%	96.4%	88.9%
Bolivia	6.619	4.959	2.554	65.8%	35.5%	15.6%	8.438	8.151	5.468	83.9%	58.3%	33.4%	9.476	10.99	9.18	94.2%	78.6%	56.1%
Paraguay	4.11	4.728	2.896	63.4%	53.4%	28.9%	5.355	6.621	5.114	82.6%	74.8%	51.1%	6.078	7.918	7.298	93.7%	89.4%	72.9%
Uruguay	0.315	0.054	0.002	8.9%	1.4%	0.1%	1.052	0.328	0.031	29.6%	8.6%	0.8%	2.165	1.125	0.228	60.9%	29.4%	5.8%
Guyana	0.206	0.065	0.007	27.3%	9.3%	1.1%	0.445	0.205	0.036	59.0%	29.4%	5.8%	0.644	0.413	0.121	85.4%	59.3%	19.5%
Suriname	0.345	0.264	0.108	74.4%	54.7%	24.6%	0.438	0.41	0.253	94.4%	84.9%	57.6%	0.459	0.47	0.377	98.9%	97.3%	85.9%
America-South	**187.4**	**130.5**	**57.71**	**46.9%**	**26.9%**	**11.1%**	**284.3**	**246.1**	**141.5**	**71.1%**	**50.8%**	**27.1%**	**352.3**	**358.9**	**261.7**	**88.1%**	**74.0%**	**50.2%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA																		
China	833.7	185.2	17.65	62.1%	12.6%	1.2%	1155	517.7	100.2	86.1%	35.3%	6.8%	1300	955.4	345.6	96.9%	65.2%	23.4%
Japan	0	0	0	0.0%	0.0%	0.0%	0.132	0.006	0	0.1%	0.0%	0.0%	8.334	1.031	0.016	6.5%	0.9%	0.0%
Korea, Rep. of	3.117	0.158	0.008	6.3%	0.3%	0.0%	17.92	3.061	0.319	36.5%	6.2%	0.8%	39.21	17.92	4.09	79.8%	36.4%	10.4%
Taiwan	0.369	0.021	0	1.6%	0.1%	0.0%	3.168	0.512	0.013	13.3%	1.9%	0.0%	11.27	4.364	0.34	47.4%	16.2%	1.3%
Korea, Dem. Rep. of	17.1	16.26	8.493	74.8%	68.8%	38.6%	21.53	21.7	15.55	94.2%	91.8%	70.6%	22.62	23.38	20.16	99.0%	98.9%	91.5%
Hong Kong	0.025	0.003	0.002	0.3%	0.0%	0.0%	0.239	0.057	0.035	3.3%	0.7%	0.4%	1.186	0.473	0.296	16.2%	5.6%	3.5%
Mongolia	2.581	2.509	0.298	94.6%	76.2%	8.6%	2.7	3.177	1.312	99.0%	96.5%	37.7%	2.7	3.259	2.682	99.0%	99.0%	77.2%
Asia-East	**856.9**	**204.1**	**26.45**	**54.4%**	**12.1%**	**1.6%**	**1201**	**546.3**	**117.4**	**76.2%**	**32.3%**	**7.0%**	**1385**	**1006**	**373.2**	**87.9%**	**59.5%**	**22.4%**
India	1109	793.5	139.8	95.6%	56.8%	9.2%	1148	1228	588.3	99.0%	87.8%	38.9%	1148	1377	1175	99.0%	98.5%	77.7%
Pakistan	168.6	249.7	197.3	98.1%	92.8%	56.8%	170.2	266.4	312.7	99.0%	99.0%	90.0%	170.2	266.4	343.9	99.0%	99.0%	99.0%
Bangladesh	150.4	145.1	55.01	97.9%	75.4%	27.0%	152.1	185.1	135.4	99.0%	96.2%	66.4%	152.1	190.6	189.1	99.0%	99.0%	92.8%
Afghanistan	35.25	73.86	128.9	98.9%	98.6%	94.0%	35.3	74.17	135.5	99.0%	99.0%	98.8%	35.3	74.17	135.7	99.0%	99.0%	99.0%
Iran, Islamic Rep. of	2.858	0.001	0.003	3.9%	0.0%	0.0%	15.71	0.042	0.111	21.7%	0.0%	0.1%	41.71	1.027	1.866	57.6%	1.1%	1.9%
Nepal	28.4	37.26	30.81	96.6%	91.8%	68.8%	29.1	39.89	39.09	99.0%	98.3%	87.3%	29.1	40.19	43.14	99.0%	99.0%	96.3%
Uzbekistan	23.34	21.22	3.719	84.0%	63.5%	11.2%	27.2	30.8	14.7	97.9%	92.2%	44.1%	27.5	33.08	27.37	99.0%	99.0%	82.2%
Sri Lanka	16.03	10.31	3.024	78.6%	46.7%	14.3%	19.52	17.41	8.684	95.7%	78.8%	40.9%	20.19	21.07	15.47	99.0%	95.4%	72.9%
Kazakhstan	2.851	0.001	0	18.8%	0.0%	0.0%	9.229	0.069	0.001	60.8%	0.4%	0.0%	14.02	1.414	0.072	92.4%	9.2%	0.5%
Tajikistan	5.887	7.654	3.337	84.6%	78.1%	30.9%	6.84	9.425	7.138	98.3%	96.2%	66.1%	6.887	9.7	9.807	99.0%	99.0%	90.8%
Turkmenistan	3.556	0.068	0.014	68.9%	1.0%	0.2%	4.745	0.594	0.177	92.0%	9.1%	2.5%	5.105	2.352	1.056	99.0%	36.1%	14.9%
Kyrgyzstan	4.282	3.48	1.208	78.3%	54.0%	19.1%	5.346	5.849	3.887	97.7%	90.8%	61.6%	5.416	6.376	5.858	99.0%	99.0%	92.8%
Bhutan	0.546	0.416	0.157	80.8%	46.4%	15.2%	0.649	0.678	0.391	96.0%	75.7%	37.8%	0.67	0.834	0.681	99.1%	93.1%	65.9%
Maldives	0.229	0.073	0	64.0%	14.8%	0.0%	0.319	0.21	0.004	89.1%	42.6%	0.7%	0.352	0.368	0.032	98.3%	74.6%	5.5%
Asia-South Central	**1552**	**1343**	**563.2**	**91.0%**	**62.1%**	**23.1%**	**1625**	**1859**	**1246**	**95.3%**	**86.0%**	**51.1%**	**1657**	**2024**	**1949**	**97.2%**	**93.6%**	**79.9%**
Indonesia	198.8	178.5	67.16	85.5%	67.2%	25.1%	227.3	245	163	97.8%	92.2%	61.0%	230.1	262.9	237.9	99.0%	99.0%	89.0%
Philippines	72.37	67.76	32.53	79.3%	55.6%	24.1%	86.64	100.5	70.91	95.0%	82.4%	52.6%	90.3	116.8	107.5	99.0%	95.8%	79.8%
Vietnam	77.38	50.56	10.06	88.4%	48.6%	9.1%	86.18	84.29	35.98	98.5%	81.0%	32.6%	86.61	100.3	73.61	99.0%	96.3%	66.7%
Thailand	38.49	20.69	7.291	58.1%	29.3%	10.6%	57.1	45.64	24.49	86.2%	64.6%	35.6%	64.63	63.74	47.8	97.6%	90.2%	69.5%
Myanmar	51.38	45.6	24.62	98.0%	84.1%	48.1%	51.92	52.8	41.3	99.0%	97.4%	80.6%	51.92	53.68	49.3	99.0%	99.0%	96.2%
Malaysia	5.84	2.376	1.227	21.2%	6.6%	3.0%	12.79	7.832	4.932	46.5%	21.8%	12.2%	20.16	17.21	13.12	73.3%	48.0%	32.6%
Cambodia	15.13	17.85	10.16	98.5%	80.6%	38.7%	15.2	21.16	18.68	99.0%	95.5%	71.2%	15.2	21.93	24.13	99.0%	99.0%	92.0%
Lao PDR	6.172	3.754	0.093	95.1%	41.2%	0.9%	6.422	7.147	1.073	99.0%	78.4%	10.0%	6.422	8.786	4.575	99.0%	96.4%	42.6%
Singapore	0.013	0	0.001	0.3%	0.0%	0.0%	0.14	0.015	0.014	3.0%	0.3%	0.3%	0.758	0.196	0.169	16.3%	3.7%	3.3%
Timor-Leste	1.115	2.16	1.529	86.9%	85.9%	40.0%	1.25	2.44	2.633	97.4%	97.0%	68.8%	1.27	2.491	3.411	99.0%	99.0%	89.2%
Brunei Darussalam	0	0	0	0.0%	0.0%	0.0%	0	0	0	0.0%	0.0%	0.0%	0.016	0	0	3.9%	0.0%	0.0%
Asia-South East	**466.7**	**389.3**	**154.7**	**79.7%**	**56.2%**	**21.5%**	**544.9**	**566.8**	**363**	**93.1%**	**81.9%**	**50.5%**	**567.4**	**648**	**561.5**	**96.9%**	**93.6%**	**78.1%**

Poverty

Base Case: Countries in Year 2060	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
Descending Population Sequence	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA continued																		
Turkey	39.36	18.89	3.398	51.6%	20.6%	3.5%	63.15	47.43	16.06	82.7%	51.7%	16.3%	73.87	75.01	43.52	96.8%	81.7%	44.3%
Yemen	18.17	25.96	19.14	75.0%	57.1%	29.0%	22.96	38.94	40.06	94.8%	85.7%	60.8%	23.99	44.28	56.95	99.0%	97.5%	86.4%
Iraq	25.82	15.37	0.938	86.2%	30.6%	1.4%	29.18	32.7	6.558	97.4%	65.0%	10.0%	29.65	45.24	23.22	99.0%	90.0%	35.4%
Saudi Arabia	0.816	0.798	0.014	3.2%	2.0%	0.0%	5.423	6.372	0.309	21.0%	15.7%	0.6%	15.42	21.05	2.974	59.6%	51.9%	5.8%
Syria	16.52	19.87	11.45	77.2%	60.9%	29.1%	20.25	27.89	22.58	94.6%	85.5%	57.4%	21.19	31.55	32.34	99.0%	96.7%	82.3%
Israel	0.109	0.004	0	1.4%	0.0%	0.0%	0.853	0.084	0.006	11.2%	0.8%	0.1%	3.084	0.793	0.121	40.4%	7.9%	1.0%
Azerbaijan	0.04	0	0	0.4%	0.0%	0.0%	0.559	0	0	6.3%	0.0%	0.0%	2.906	0.004	0	32.5%	0.0%	0.0%
Jordan	2.153	0.397	0	35.4%	4.8%	0.0%	4.455	2.156	0.019	73.3%	25.8%	0.2%	5.755	5.386	0.395	94.7%	64.5%	4.0%
Palestine	3.892	5.339	3.132	93.1%	74.0%	33.5%	4.14	6.85	6.302	99.0%	94.9%	67.3%	4.14	7.143	8.495	99.0%	99.0%	90.7%
United Arab Emirates	0.001	0	0	0.0%	0.0%	0.0%	0.038	0.001	0	0.8%	0.0%	0.0%	0.612	0.058	0.004	12.3%	0.9%	0.1%
Oman	0.052	0.014	0.001	1.8%	0.3%	0.0%	0.436	0.199	0.028	15.3%	4.5%	0.5%	1.475	1.119	0.283	51.8%	25.2%	5.0%
Kuwait	0	0	0	0.0%	0.0%	0.0%	0.002	0	0	0.1%	0.0%	0.0%	0.132	0	0	4.6%	0.0%	0.0%
Lebanon	2.232	1.89	0.638	58.6%	42.1%	13.5%	3.384	3.411	1.916	88.9%	76.1%	40.6%	3.757	4.246	3.466	98.7%	94.7%	73.5%
Georgia	2.584	1.477	0.375	59.5%	41.7%	12.9%	3.804	2.685	1.131	87.6%	75.9%	39.0%	4.26	3.35	2.076	98.1%	94.7%	71.6%
Armenia	2.289	0.694	0.12	74.8%	22.9%	4.4%	2.921	1.825	0.7	95.5%	60.3%	25.5%	3.029	2.715	1.793	99.0%	89.7%	65.2%
Bahrain	0	0	0	0.0%	0.0%	0.0%	0.003	0.001	0.001	0.4%	0.1%	0.1%	0.06	0.038	0.027	7.5%	3.7%	2.4%
Qatar	0	0	0	0.0%	0.0%	0.0%	0	0	0	0.0%	0.0%	0.0%	0.003	0	0	0.3%	0.0%	0.0%
Cyprus	0	0	0	0.0%	0.0%	0.0%	0.013	0.004	0	1.7%	0.5%	0.0%	0.124	0.055	0.01	15.9%	6.7%	1.4%
Asia-West	**114**	**90.7**	**39.2**	**49.8%**	**27.8%**	**10.0%**	**161.6**	**170.6**	**95.67**	**70.6%**	**52.4%**	**24.4%**	**193.5**	**242**	**175.7**	**84.5%**	**74.3%**	**44.8%**
Australia	0.011	0.001	0	0.1%	0.0%	0.0%	0.298	0.049	0.007	1.4%	0.2%	0.0%	2.831	0.853	0.2	13.2%	3.4%	0.7%
Papua New Guniea	5.384	4.826	3.387	82.6%	47.9%	26.0%	6.192	7.452	6.656	94.9%	74.0%	51.1%	6.457	9.161	9.867	99.0%	91.0%	75.8%
New Zealand	0.014	0.003	0	0.3%	0.1%	0.0%	0.186	0.059	0.002	4.4%	1.2%	0.0%	1.047	0.519	0.044	24.5%	10.7%	0.9%
Solomon Islands	0.474	0.707	0.884	88.8%	83.5%	78.4%	0.523	0.813	1.051	97.9%	96.0%	93.2%	0.529	0.838	1.112	99.1%	98.9%	98.6%
Fiji	0.738	0.609	0.178	83.4%	63.5%	20.0%	0.858	0.858	0.464	96.9%	89.5%	52.1%	0.876	0.944	0.737	99.0%	98.4%	82.7%
Vanuatu	0.198	0.285	0.177	83.5%	77.0%	38.6%	0.229	0.348	0.317	96.6%	94.1%	69.1%	0.234	0.367	0.414	98.7%	99.2%	90.2%
Micronesia	0.087	0.125	0.079	70.7%	67.2%	34.5%	0.114	0.168	0.143	92.7%	90.3%	62.4%	0.121	0.183	0.195	98.4%	98.4%	85.2%
Tonga	0.094	0.133	0.114	83.2%	74.7%	50.7%	0.11	0.165	0.172	97.3%	92.7%	76.4%	0.112	0.176	0.208	99.1%	98.9%	92.4%
Samoa	0.151	0.144	0.044	79.5%	63.2%	19.9%	0.182	0.201	0.108	95.8%	88.2%	48.9%	0.188	0.223	0.173	98.9%	97.8%	78.3%
Oceania	**7.151**	**6.833**	**4.862**	**20.9%**	**15.8%**	**10.0%**	**8.691**	**10.11**	**8.92**	**25.4%**	**23.4%**	**18.3%**	**12.4**	**13.26**	**12.95**	**36.2%**	**30.8%**	**26.5%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	Poverty (below $5 per Day)						Poverty (below $10 per Day)						Poverty (below $20 per Day)					
	Million People			Percent			Million People			Percent			Million People			Percent		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
EUROPE																		
Russian Federation	17.78	0.08	0.001	12.6%	0.1%	0.0%	57.77	1.733	0.072	40.9%	1.3%	0.1%	106.4	14.94	1.477	75.4%	11.5%	1.3%
Ukraine	5.363	0.011	0	11.8%	0.0%	0.0%	25.12	0.772	0.003	55.2%	2.1%	0.0%	42.14	9.707	0.323	92.6%	26.1%	1.0%
Poland	1.668	0.078	0.002	4.4%	0.2%	0.0%	10.5	1.62	0.103	27.4%	4.5%	0.3%	26.63	10.67	1.736	69.5%	29.4%	5.7%
Romania	11.74	4.633	1.257	54.6%	23.7%	7.6%	19.57	13.05	5.747	91.1%	66.8%	34.6%	21.28	18.43	12.29	99.0%	94.4%	73.9%
Czech Republic	1.286	0.475	0.104	12.5%	4.9%	1.3%	6.821	4.136	1.378	66.2%	42.7%	16.6%	10.06	8.725	5.127	97.7%	90.1%	61.8%
Belarus	1.086	0.197	0.075	11.2%	2.2%	0.9%	5.321	1.817	0.764	54.9%	20.1%	9.6%	8.993	5.73	3.162	92.8%	63.4%	39.8%
Hungary	0.897	0.223	0.05	9.0%	2.5%	0.7%	4.804	2.062	0.61	48.1%	23.0%	8.1%	8.926	6.153	2.816	89.4%	68.5%	37.5%
Bulgaria	2.324	0.384	0.011	31.0%	6.4%	0.2%	5.972	2.507	0.273	79.7%	41.5%	5.5%	7.38	5.215	1.783	98.5%	86.4%	35.9%
Slovakia	0.852	0.416	0.146	15.7%	8.0%	3.3%	3.85	2.695	1.209	70.8%	51.5%	27.0%	5.343	4.871	3.278	98.2%	93.1%	73.1%
Moldova, Rep. of	3.981	3.01	0.681	95.9%	82.9%	21.9%	4.111	3.551	1.839	99.0%	97.7%	59.1%	4.111	3.596	2.775	99.0%	99.0%	89.2%
Europe-East	**46.98**	**9.507**	**2.328**	**16.0%**	**3.6%**	**1.0%**	**143.8**	**33.94**	**12**	**49.0%**	**12.8%**	**5.3%**	**241.3**	**88.03**	**34.77**	**82.2%**	**33.1%**	**15.5%**
United Kingdom	0.036	0.005	0	0.1%	0.0%	0.0%	0.876	0.189	0.007	1.4%	0.3%	0.0%	7.876	2.83	0.224	12.8%	4.3%	0.3%
Sweden	0	0	0	0.0%	0.0%	0.0%	0.01	0	0	0.1%	0.0%	0.0%	0.601	0.019	0	6.5%	0.2%	0.0%
Denmark	0	0	0	0.0%	0.0%	0.0%	0.005	0	0	0.1%	0.0%	0.0%	0.306	0.031	0	5.5%	0.5%	0.0%
Ireland	0.001	0	0	0.0%	0.0%	0.0%	0.041	0.003	0.002	0.9%	0.1%	0.0%	0.475	0.073	0.043	10.8%	1.4%	0.8%
Norway	0	0	0	0.0%	0.0%	0.0%	0	0	0	0.0%	0.0%	0.0%	0.041	0.009	0	0.9%	0.2%	0.0%
Finland	0	0	0	0.0%	0.0%	0.0%	0.013	0.001	0	0.2%	0.0%	0.0%	0.413	0.065	0.004	7.7%	1.2%	0.1%
Lithuania	0.989	0.409	0.068	29.2%	13.2%	2.6%	2.349	1.465	0.447	69.4%	47.1%	17.0%	3.184	2.597	1.351	94.1%	83.6%	51.3%
Latvia	0.212	0.037	0.004	9.3%	1.8%	0.2%	0.921	0.302	0.053	40.5%	14.6%	3.0%	1.818	1.029	0.319	79.9%	49.8%	18.2%
Estonia	0.261	0.077	0.014	20.0%	7.1%	1.5%	0.767	0.362	0.104	58.6%	33.2%	11.3%	1.177	0.793	0.367	90.0%	72.6%	40.0%
Iceland	0	0	0	0.0%	0.0%	0.0%	0.001	0	0	0.3%	0.0%	0.0%	0.017	0.003	0	5.5%	0.9%	0.0%
Europe-North	**1.499**	**0.527**	**0.086**	**1.5%**	**0.5%**	**0.1%**	**4.982**	**2.322**	**0.612**	**5.1%**	**2.3%**	**0.6%**	**15.91**	**7.45**	**2.309**	**16.2%**	**7.2%**	**2.3%**
Italy	0.099	0.072	0.022	0.2%	0.1%	0.0%	1.889	1.335	0.414	3.2%	2.5%	0.9%	12.99	9.581	3.495	22.1%	17.7%	7.8%
Spain	0.06	0.028	0.005	0.1%	0.1%	0.0%	1.343	0.702	0.153	3.0%	1.6%	0.4%	9.987	6.233	1.821	22.6%	14.6%	5.0%
Greece	0.005	0.003	0.003	0.0%	0.0%	0.0%	0.137	0.094	0.061	1.2%	0.9%	0.7%	1.399	0.963	0.597	12.5%	9.0%	6.4%
Portugal	0.69	0.614	0.178	6.5%	6.0%	1.9%	3.203	2.671	0.998	30.0%	25.9%	10.8%	7.257	6.234	3.171	68.1%	60.5%	34.2%
Serbia	5.203	2.452	0.548	70.6%	35.9%	8.9%	7.113	5.453	2.488	96.5%	79.8%	40.6%	7.299	6.689	4.949	99.0%	97.9%	80.7%
Croatia	0.567	0.184	0.012	12.8%	4.6%	0.3%	2.591	1.377	0.206	58.6%	34.2%	5.9%	4.165	3.257	1.167	94.2%	80.9%	33.5%
Bosnia and Herzegovina	3.336	3.15	1.135	81.9%	82.7%	35.4%	3.958	3.692	2.16	97.2%	96.9%	67.3%	4.031	3.771	2.883	99.0%	99.0%	89.9%
Albania	1.672	0.849	0.126	52.6%	25.2%	3.9%	2.857	2.19	0.686	89.8%	64.9%	21.5%	3.15	3.119	1.822	99.0%	92.4%	57.1%
Macedonia, TFYR	0.111	0.149	0.026	5.4%	7.5%	1.5%	0.552	0.653	0.183	26.7%	32.7%	10.4%	1.327	1.414	0.646	64.2%	70.8%	36.9%
Slovenia	0.162	0.047	0.005	8.1%	2.5%	0.3%	0.886	0.409	0.073	44.1%	21.8%	4.8%	1.739	1.232	0.42	86.5%	65.5%	27.6%
Montenegro	0.437	0.318	0.083	70.5%	51.3%	14.1%	0.575	0.509	0.24	92.7%	82.1%	40.7%	0.614	0.598	0.429	99.0%	96.5%	72.8%
Malta	0.002	0	0	0.5%	0.0%	0.0%	0.023	0.007	0	5.6%	1.7%	0.0%	0.128	0.062	0.007	31.2%	15.2%	2.0%
Europe-South	**12.35**	**7.866**	**2.141**	**8.3%**	**5.6%**	**1.8%**	**25.13**	**19.09**	**7.663**	**16.9%**	**13.6%**	**6.4%**	**54.08**	**43.15**	**21.41**	**36.3%**	**30.6%**	**17.9%**
Germany	0.001	0	0	0.0%	0.0%	0.0%	0.209	0.018	0	0.3%	0.0%	0.0%	6.484	1.277	0.031	7.8%	1.6%	0.0%
France	0.026	0.016	0.001	0.0%	0.0%	0.0%	0.932	0.517	0.045	1.5%	0.8%	0.1%	9.793	5.878	0.851	15.7%	9.1%	1.4%
Netherlands	0.002	0	0	0.0%	0.0%	0.0%	0.119	0.033	0.006	0.7%	0.2%	0.0%	1.985	0.813	0.191	11.8%	4.6%	1.1%
Belgium	0.003	0.001	0	0.0%	0.0%	0.0%	0.123	0.046	0.004	1.2%	0.4%	0.0%	1.467	0.735	0.107	13.7%	6.8%	1.1%
Austria	0	0	0	0.0%	0.0%	0.0%	0.02	0.003	0	0.2%	0.0%	0.0%	0.545	0.129	0.015	6.6%	1.6%	0.2%
Switzerland	0	0	0	0.0%	0.0%	0.0%	0.029	0.001	0	0.4%	0.0%	0.0%	0.502	0.069	0.003	6.7%	0.9%	0.0%
Luxembourg	0	0	0	0.0%	0.0%	0.0%	0	0	0	0.0%	0.0%	0.0%	0.001	0	0	0.2%	0.0%	0.0%
Europe-West	**0.033**	**0.017**	**0.001**	**0.0%**	**0.0%**	**0.0%**	**1.432**	**0.618**	**0.056**	**0.8%**	**0.3%**	**0.0%**	**20.78**	**8.9**	**1.198**	**11.0%**	**4.7%**	**0.7%**

Poverty

Base Case
Source: International Futures
Version 6.12, March 2009

	GDP per Capita at PPP					Gross Domestic Product					GDP at PPP				
	Thousands in 2005 Dollars					Billions in 2000 Dollars					Billions in 2005 Dollars				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**8.408**	**15.85**	**31.25**	**271.7%**	**2.7%**	**42257**	**106371**	**262977**	**522.3%**	**3.7%**	**57222**	**133466**	**295223**	**415.9%**	**3.3%**
Africa	**2.144**	**3.53**	**7.654**	**257.0%**	**2.6%**	**887.6**	**3079**	**12287**	**1284.3%**	**5.4%**	**2163**	**5939**	**18014**	**732.8%**	**4.3%**
Americas	**19.97**	**34.94**	**59.6**	**198.4%**	**2.2%**	**16553**	**36454**	**69567**	**320.3%**	**2.9%**	**18716**	**39360**	**72248**	**286.0%**	**2.7%**
Asia with Oceania	**5.137**	**12.96**	**31.31**	**509.5%**	**3.7%**	**13587**	**46570**	**144324**	**962.2%**	**4.8%**	**21216**	**63671**	**164883**	**677.2%**	**4.2%**
Europe	**20.82**	**35.33**	**65.42**	**214.2%**	**2.3%**	**11187**	**20190**	**36608**	**227.2%**	**2.4%**	**15011**	**24341**	**39827**	**165.3%**	**2.0%**
World	**8.408**	**15.85**	**31.25**	**271.7%**	**2.7%**	**42257**	**106371**	**262977**	**522.3%**	**3.7%**	**57222**	**133466**	**295223**	**415.9%**	**3.3%**
Africa-Eastern	**0.879**	**1.886**	**7.673**	**772.9%**	**4.4%**	**96.59**	**469.8**	**4119**	**4164.4%**	**7.8%**	**281.6**	**1072**	**6081**	**2059.4%**	**6.3%**
Africa-Middle	**1.492**	**2.11**	**2.952**	**97.9%**	**1.4%**	**63.4**	**205**	**537.3**	**747.5%**	**4.4%**	**189.4**	**525.6**	**1252**	**561.0%**	**3.8%**
Africa-Northern	**4.262**	**7.82**	**16.67**	**291.1%**	**2.8%**	**391**	**1256**	**4104**	**949.6%**	**4.8%**	**878.1**	**2152**	**5299**	**503.5%**	**3.7%**
Africa-Southern	**7.802**	**14.83**	**33.46**	**328.9%**	**3.0%**	**210.9**	**675.6**	**2154**	**921.3%**	**4.8%**	**443.2**	**1017**	**2464**	**456.0%**	**3.5%**
Africa-Western	**1.24**	**2.25**	**3.915**	**215.7%**	**2.3%**	**125.7**	**472.6**	**1372**	**991.5%**	**4.9%**	**370.7**	**1172**	**2918**	**687.2%**	**4.2%**
Africa	**2.144**	**3.53**	**7.654**	**257.0%**	**2.6%**	**887.6**	**3079**	**12287**	**1284.3%**	**5.4%**	**2163**	**5939**	**18014**	**732.8%**	**4.3%**
America-Caribbean	**6.483**	**12.47**	**27.71**	**327.4%**	**2.9%**	**178.5**	**484.9**	**1282**	**618.2%**	**4.0%**	**256.2**	**585.5**	**1399**	**446.1%**	**3.5%**
America-Central	**4.956**	**9.338**	**21.53**	**334.4%**	**3.0%**	**104.5**	**379.8**	**1329**	**1171.8%**	**5.2%**	**217.4**	**590**	**1620**	**645.2%**	**4.1%**
America-North	**33.17**	**58.29**	**93.73**	**182.6%**	**2.1%**	**14451**	**30286**	**52421**	**262.7%**	**2.6%**	**15051**	**30981**	**52958**	**251.9%**	**2.5%**
America-South	**7.981**	**14.86**	**31.21**	**291.1%**	**2.8%**	**1819**	**5303**	**14535**	**699.1%**	**4.2%**	**3191**	**7204**	**16271**	**409.9%**	**3.3%**
Americas	**19.97**	**34.94**	**59.6**	**198.4%**	**2.2%**	**16553**	**36454**	**69567**	**320.3%**	**2.9%**	**18716**	**39360**	**72248**	**286.0%**	**2.7%**
Asia-East	**7.463**	**21.51**	**57.19**	**666.3%**	**4.2%**	**9413**	**30342**	**89121**	**846.8%**	**4.6%**	**11765**	**36359**	**95362**	**710.6%**	**4.3%**
Asia-South Central	**2.55**	**6.942**	**17.62**	**591.0%**	**3.9%**	**1395**	**7914**	**33267**	**2284.7%**	**6.5%**	**4347**	**15006**	**42984**	**888.8%**	**4.7%**
Asia-South East	**3.901**	**7.932**	**16.27**	**317.1%**	**2.9%**	**1025**	**3185**	**9001**	**778.1%**	**4.4%**	**2284**	**5490**	**11702**	**412.3%**	**3.3%**
Asia-West	**8.79**	**16.07**	**29.99**	**241.2%**	**2.5%**	**1124**	**3751**	**10123**	**800.6%**	**4.5%**	**2013**	**5234**	**11753**	**483.9%**	**3.6%**
Oceania	**23.52**	**36.68**	**63.18**	**168.6%**	**2.0%**	**630.6**	**1378**	**2812**	**345.9%**	**3.0%**	**806.4**	**1582**	**3083**	**282.3%**	**2.7%**
Asia with Oceania	**5.137**	**12.96**	**31.31**	**509.5%**	**3.7%**	**13587**	**46570**	**144324**	**962.2%**	**4.8%**	**21216**	**63671**	**164883**	**677.2%**	**4.2%**
Europe-East	**11.55**	**25.1**	**36.59**	**216.8%**	**2.3%**	**1064**	**3447**	**5907**	**455.2%**	**3.5%**	**3389**	**6671**	**8213**	**142.3%**	**1.8%**
Europe-North	**30.43**	**51.95**	**99.9**	**228.3%**	**2.4%**	**2892**	**5273**	**10001**	**245.8%**	**2.5%**	**2989**	**5345**	**10040**	**235.9%**	**2.5%**
Europe-South	**21.99**	**30.06**	**52.05**	**136.7%**	**1.7%**	**2336**	**3606**	**5683**	**143.3%**	**1.8%**	**3277**	**4232**	**6241**	**90.4%**	**1.3%**
Europe-West	**28.96**	**43.85**	**90.93**	**214.0%**	**2.3%**	**4937**	**7942**	**15209**	**208.1%**	**2.3%**	**5473**	**8248**	**15584**	**184.7%**	**2.1%**
Europe	**20.82**	**35.33**	**65.42**	**214.2%**	**2.3%**	**11187**	**20190**	**36608**	**227.2%**	**2.4%**	**15011**	**24341**	**39827**	**165.3%**	**2.0%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP (Thousands in 2005 Dollars)					Gross Domestic Product (Billions in 2000 Dollars)					GDP at PPP (Billions in 2005 Dollars)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	0.571	0.803	2.855	400.0%	3.3%	13.08	31.41	252.3	1828.9%	6.1%	46.04	115.3	602.3	1208.2%	5.3%
Uganda	1.116	2.929	13.44	1104.3%	5.1%	9.936	80.02	900.7	8965.0%	9.4%	38.12	209.7	1408	3593.6%	7.5%
Tanzania, United Rep. of	0.898	2.44	13.66	1421.2%	5.6%	15.41	91.73	1048	6700.8%	8.8%	39.29	185.3	1356	3351.3%	7.3%
Kenya	1.305	2.629	9.07	595.0%	4.0%	18.57	76.12	516.5	2681.4%	6.9%	51.21	174.5	757.3	1378.8%	5.5%
Madagascar	0.768	1.166	3.208	317.7%	2.9%	5.057	13.36	71.59	1315.7%	5.4%	16.2	42.64	165	918.5%	4.8%
Mozambique	0.729	3.098	20	2643.5%	6.8%	8.705	82.04	875	9951.7%	9.7%	16.36	116.6	977.3	5873.7%	8.5%
Malawi	0.599	0.911	2.788	365.4%	3.1%	2.196	6.546	42.98	1857.2%	6.1%	8.88	25.34	110.7	1146.6%	5.2%
Zambia	1.123	2.189	6.836	508.7%	3.7%	5.007	20.84	132.8	2552.3%	6.8%	14.84	52.09	220.3	1384.5%	5.5%
Burundi	0.305	0.627	3.085	911.5%	4.7%	0.938	3.614	44.77	4672.9%	8.0%	2.693	11.11	87.64	3154.4%	7.2%
Rwanda	0.66	1.314	4.188	534.5%	3.8%	2.796	10.42	65.27	2234.4%	6.5%	6.891	25.43	117.8	1609.5%	5.8%
Somalia	0.105	0.181	0.358	241.0%	2.5%	0.096	0.309	1.269	1221.9%	5.3%	0.972	2.716	8.969	822.7%	4.5%
Zimbabwe	1.563	3.533	8.059	415.6%	3.3%	6.522	29.93	108.7	1566.7%	5.8%	22.53	74.43	190.8	746.9%	4.4%
Eritrea	0.594	0.598	0.906	52.5%	0.8%	0.805	1.153	2.663	230.8%	2.4%	3.033	5.122	11.35	274.2%	2.7%
Mauritius	9.503	18.66	36.31	282.1%	2.7%	6.499	20.14	49.12	655.8%	4.1%	12.33	27.41	54.03	338.2%	3.0%
Comoros	1.037	1.651	5.1	391.8%	3.2%	0.259	0.672	3.963	1430.1%	5.6%	0.689	1.758	7.18	942.1%	4.8%
Djibouti	1.76	2.767	6.015	241.8%	2.5%	0.723	1.464	4.027	457.0%	3.5%	1.484	2.975	6.734	353.8%	3.1%
Africa-Eastern	**0.879**	**1.886**	**7.673**	**772.9%**	**4.4%**	**96.59**	**469.8**	**4119**	**4164.4%**	**7.8%**	**281.6**	**1072**	**6081**	**2059.4%**	**6.3%**
Congo; Dem. Rep. of	0.267	0.504	1.664	523.2%	3.7%	6.434	22.26	170.6	2551.5%	6.8%	18.05	71.64	435.4	2312.2%	6.6%
Angola	3.954	6.141	5.972	51.0%	0.8%	22.59	87.01	143.1	533.5%	3.8%	72.43	215.3	342.2	372.5%	3.2%
Cameroon	1.877	2.861	5.639	200.4%	2.2%	14.25	38.46	124.3	772.3%	4.4%	34.32	86.57	229.5	568.7%	3.9%
Chad	1.302	2.126	2.309	77.3%	1.2%	3.225	13.36	25.57	692.9%	4.2%	14.79	48.29	88.53	498.6%	3.6%
Central African Republic	0.618	1.095	2.78	349.8%	3.1%	1.048	3.117	14.31	1265.5%	5.4%	2.775	8.507	31.83	1047.0%	5.0%
Congo, Rep. of	3.019	4.924	5.439	80.2%	1.2%	4.797	16.42	25.23	426.0%	3.4%	13.64	37.55	56	310.6%	2.9%
Gabon	11.99	14.7	16.43	37.0%	0.6%	6.043	13.63	22.97	280.1%	2.7%	18.15	32.06	43.49	139.6%	1.8%
Equatorial Guinea	26.56	28.27	19.51	-26.5%	-0.6%	4.95	10.62	10.69	116.0%	1.6%	15.01	25.26	23.66	57.6%	0.9%
São Tomé and Príncipe	1.258	1.452	3.162	151.4%	1.9%	0.063	0.123	0.502	696.8%	4.2%	0.221	0.433	1.322	498.2%	3.6%
Africa-Middle	**1.492**	**2.11**	**2.952**	**97.9%**	**1.4%**	**63.4**	**205**	**537.3**	**747.5%**	**4.4%**	**189.4**	**525.6**	**1252**	**561.0%**	**3.8%**
Egypt	4.468	8.844	24.13	440.1%	3.4%	150.8	541.5	2439	1517.4%	5.7%	362.6	942.5	2959	716.1%	4.3%
Sudan	1.817	4.165	7.425	308.6%	2.9%	24.17	123.1	357.1	1377.5%	5.5%	73.3	267.1	631.1	761.0%	4.4%
Algeria	5.525	8.331	11.21	102.9%	1.4%	78.47	186.1	304.9	288.6%	2.8%	195.3	367.7	515.3	163.9%	2.0%
Morocco	3.438	5.746	12.27	256.9%	2.6%	56.12	130.6	379	575.3%	3.9%	110.5	224	501.8	354.1%	3.1%
Tunisia	6.391	13.93	34.5	439.8%	3.4%	30.64	117.3	408.4	1232.9%	5.3%	67.67	176.5	465.6	588.0%	3.9%
Libyan Arab Jamahiriya	10.65	20.01	22.94	115.4%	1.5%	50.81	157.9	215.6	324.3%	2.9%	68.76	174.3	226.5	229.4%	2.4%
Africa-Northern	**4.262**	**7.82**	**16.67**	**291.1%**	**2.8%**	**391**	**1256**	**4104**	**949.6%**	**4.8%**	**878.1**	**2152**	**5299**	**503.5%**	**3.7%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP Thousands in 2005 Dollars					Gross Domestic Product Billions in 2000 Dollars					GDP at PPP Billions in 2005 Dollars				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	8.146	15.17	33.92	316.4%	2.9%	192.3	586.3	1846	860.0%	4.6%	403.4	888.2	2110	423.1%	3.4%
Namibia	4.492	9.835	33.39	643.3%	4.1%	5.311	22.43	114.8	2061.6%	6.3%	9.949	31.5	127.7	1183.5%	5.2%
Lesotho	1.295	2.788	9.857	661.2%	4.1%	1.18	3.877	22.07	1770.3%	6.0%	2.506	7.327	29.1	1061.2%	5.0%
Botswana	11.75	31.08	59.98	410.5%	3.3%	10.24	55.81	140.8	1275.0%	5.4%	22.31	75.45	157	603.7%	4.0%
Swaziland	4.074	8.119	19.61	381.3%	3.2%	1.786	7.155	30.19	1590.4%	5.8%	4.999	14.31	39.56	691.4%	4.2%
Africa-Southern	**7.802**	**14.83**	**33.46**	**328.9%**	**3.0%**	**210.9**	**675.6**	**2154**	**921.3%**	**4.8%**	**443.2**	**1017**	**2464**	**456.0%**	**3.5%**
Nigeria	1.44	2.812	3.448	139.4%	1.8%	73.57	304	515.9	601.2%	4.0%	214.9	719.6	1237	475.6%	3.6%
Niger	0.55	0.865	2.834	415.3%	3.3%	2.579	8.022	61.43	2281.9%	6.5%	8.912	27.98	145.7	1534.9%	5.7%
Côte d'Ivoire	1.49	2.58	4.866	226.6%	2.4%	11.95	39.71	122.2	922.6%	4.8%	30.44	90.77	236.9	678.3%	4.2%
Ghana	1.117	1.491	2.969	165.8%	2.0%	7.769	16.44	51.84	567.3%	3.9%	27.26	55.2	137.1	402.9%	3.3%
Burkina Faso	1.005	1.964	6.557	552.4%	3.8%	4.419	19.79	158.6	3489.0%	7.4%	15.25	56.37	286	1775.4%	6.0%
Mali	0.93	1.597	4.738	409.5%	3.3%	4.001	14.67	98.97	2373.6%	6.6%	14.45	46.38	205.6	1322.8%	5.5%
Senegal	1.429	2.29	5.384	276.8%	2.7%	6.926	21.58	99.78	1340.7%	5.5%	18.89	54.09	188.2	896.3%	4.7%
Guinea	1.034	2.126	5.663	447.7%	3.5%	4.147	17.26	92.88	2139.7%	6.4%	10.66	39.31	158.6	1387.8%	5.5%
Benin	1.148	1.734	4.782	316.6%	2.9%	3.333	9.772	56.72	1601.8%	5.8%	11.06	29.62	117.2	959.7%	4.8%
Togo	0.685	0.741	1.332	94.5%	1.3%	1.703	2.539	6.711	294.1%	2.8%	4.772	8.843	21.94	359.8%	3.1%
Sierra Leone	0.584	1.586	5.477	837.8%	4.6%	1.515	7.768	53.81	3451.8%	7.4%	3.674	16.61	83.53	2173.5%	6.4%
Liberia	0.297	0.432	1.429	381.1%	3.2%	0.505	1.068	7.987	1481.6%	5.7%	1.148	3.423	21.09	1737.1%	6.0%
Mauritania	1.567	1.998	3.998	155.1%	1.9%	1.589	3.606	13.73	764.1%	4.4%	5.386	11.61	33.43	520.7%	3.7%
Guinea-Bissau	0.431	0.577	1.348	212.8%	2.3%	0.253	0.576	2.676	957.7%	4.8%	0.798	2.128	8.399	952.5%	4.8%
Gambia	0.997	1.474	3.44	245.0%	2.5%	0.586	1.434	6.152	949.8%	4.8%	1.689	4.132	13.8	717.1%	4.3%
Cape Verde	2.541	6.733	24.07	847.3%	4.6%	0.878	4.355	22.28	2437.6%	6.7%	1.439	5.645	24.11	1575.5%	5.8%
Africa-Western	**1.24**	**2.25**	**3.915**	**215.7%**	**2.3%**	**125.7**	**472.6**	**1372**	**991.5%**	**4.9%**	**370.7**	**1172**	**2918**	**687.2%**	**4.2%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP (Thousands in 2005 Dollars)					Gross Domestic Product (Billions in 2000 Dollars)					GDP at PPP (Billions in 2005 Dollars)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	1.108	1.674	3.509	216.7%	2.3%	4.226	9.162	28.17	566.6%	3.9%	10.31	22.85	59.77	479.7%	3.6%
Dominican Republic	5.46	13.49	30.15	452.2%	3.5%	31.83	129.8	366.9	1052.7%	5.0%	52.47	157.8	388.8	641.0%	4.1%
Cuba	5.197	10.22	36.17	596.0%	4.0%	30.26	77.76	325.4	975.3%	4.9%	59.39	115.5	370.5	523.8%	3.7%
Puerto Rico	20.04	42.13	90.11	349.7%	3.1%	76.46	192.3	426.5	457.8%	3.5%	81.43	195.8	428.7	426.5%	3.4%
Jamaica	6.47	8.423	15.26	135.9%	1.7%	9.357	15.28	35.66	281.1%	2.7%	17.83	26.38	47.89	168.6%	2.0%
Trinidad and Tobago	16.33	33.08	45.64	179.5%	2.1%	16.24	41.24	55.3	240.5%	2.5%	21.87	45.2	56.78	159.6%	1.9%
Bahamas	17.85	25.7	46.33	159.6%	1.9%	5.532	9.963	18.92	242.0%	2.5%	6.068	10.24	19.07	214.3%	2.3%
Barbados	13.01	21.27	55.03	323.0%	2.9%	2.809	5.38	13.17	368.9%	3.1%	3.577	5.918	13.54	278.5%	2.7%
St. Vincent & the Grenadines	6.383	10.39	25.42	298.2%	2.8%	0.452	1.103	3.916	766.4%	4.4%	0.813	1.65	4.482	451.3%	3.5%
Grenada	8.509	11.56	26.43	210.6%	2.3%	0.509	1.04	3.659	618.9%	4.0%	0.964	1.688	4.351	351.3%	3.1%
St. Lucia	8.889	14.23	29.35	230.2%	2.4%	0.876	1.798	4.229	382.8%	3.2%	1.511	2.509	4.705	211.4%	2.3%
America-Caribbean	**6.483**	**12.47**	**27.71**	**327.4%**	**2.9%**	**178.5**	**484.9**	**1282**	**618.2%**	**4.0%**	**256.2**	**585.5**	**1399**	**446.1%**	**3.5%**
Guatemala	4.584	7.283	14.99	227.0%	2.4%	26.7	89.46	341.6	1179.4%	5.2%	65.67	176.6	478.9	629.3%	4.1%
Honduras	3.135	5.313	11.68	272.6%	2.7%	8.714	26.24	94.66	986.3%	4.9%	24.95	59.03	147.9	492.8%	3.6%
El Salvador	5.241	9.984	23.04	339.6%	3.0%	17.88	58.04	203.5	1038.1%	5.0%	39.03	94.66	242	520.0%	3.7%
Nicaragua	2.504	4.176	8.865	254.0%	2.6%	5.52	14.98	46.87	749.1%	4.4%	14.19	32.36	75.88	434.7%	3.4%
Costa Rica	8.908	22.79	65.53	635.6%	4.1%	25.77	111.5	396	1436.7%	5.6%	41.62	133	417.2	902.4%	4.7%
Panama	8.539	20.21	50.62	492.8%	3.6%	18.6	73.79	227.1	1121.0%	5.1%	29.66	87.18	238.5	704.1%	4.3%
Belize	7.169	16.29	39.13	445.8%	3.5%	1.367	5.808	18.83	1277.5%	5.4%	2.29	7.199	20.08	776.9%	4.4%
America-Central	**4.956**	**9.338**	**21.53**	**334.4%**	**3.0%**	**104.5**	**379.8**	**1329**	**1171.8%**	**5.2%**	**217.4**	**590**	**1620**	**645.2%**	**4.1%**
United States of America	40.95	73.01	114.6	179.9%	2.1%	12739	26624	45199	254.8%	2.6%	12739	26624	45199	254.8%	2.6%
Mexico	10.91	17.03	29.83	173.4%	2.0%	751.5	1693	3586	377.2%	3.2%	1190	2186	3886	226.6%	2.4%
Canada	33.31	56.28	96.39	189.4%	2.1%	959.7	1970	3636	278.9%	2.7%	1122	2171	3873	245.2%	2.5%
America-North	**33.17**	**58.29**	**93.73**	**182.6%**	**2.1%**	**14451**	**30286**	**52421**	**262.7%**	**2.6%**	**15051**	**30981**	**52958**	**251.9%**	**2.5%**
Brazil	8.05	14.47	31.19	287.5%	2.7%	868.4	2440	7024	708.8%	4.3%	1599	3419	7842	390.4%	3.2%
Colombia	5.708	10.1	25.88	353.4%	3.1%	121.5	347.7	1376	1032.5%	5.0%	278.7	602.8	1676	501.4%	3.7%
Argentina	11	23.41	51.58	368.9%	3.1%	390.8	1085	2661	580.9%	3.9%	449.3	1130	2692	499.2%	3.6%
Venezuela, RB	9.484	16.26	23.32	145.9%	1.8%	161.9	458.1	854	427.5%	3.4%	273.8	604.4	957.1	249.6%	2.5%
Peru	6.415	12.04	21.98	242.6%	2.5%	83.36	267.5	717.2	760.4%	4.4%	192.3	446.4	884.7	360.1%	3.1%
Chile	12.36	30.12	68.09	450.9%	3.5%	119.1	497.7	1341	1025.9%	5.0%	211	609.5	1425	575.4%	3.9%
Ecuador	6.168	7.899	9.857	59.8%	0.9%	24.2	50.81	85.04	251.4%	2.5%	88.3	144.2	191.7	117.1%	1.6%
Bolivia	3.686	8.415	17.62	378.0%	3.2%	12.64	61.21	209.7	1559.0%	5.8%	37.08	117.6	288.1	677.0%	4.2%
Paraguay	3.562	5.156	10.84	204.3%	2.3%	9.402	21.4	70.1	645.6%	4.1%	23.09	45.65	108.5	369.9%	3.1%
Uruguay	9.247	19.42	47.1	409.4%	3.3%	25.81	68.57	180.6	599.7%	4.0%	32.85	74.24	184.7	462.3%	3.5%
Guyana	3.19	6.378	16.77	425.7%	3.4%	0.852	2.154	7.753	810.0%	4.5%	2.405	4.443	10.43	333.7%	3.0%
Suriname	7.171	12.7	23.72	230.8%	2.4%	1.404	3.537	8.374	496.4%	3.6%	3.327	6.13	10.41	212.9%	2.3%
America-South	**7.981**	**14.86**	**31.21**	**291.1%**	**2.8%**	**1819**	**5303**	**14535**	**699.1%**	**4.2%**	**3191**	**7204**	**16271**	**409.9%**	**3.3%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP Thousands in 2005 Dollars					Gross Domestic Product Billions in 2000 Dollars					GDP at PPP Billions in 2005 Dollars				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	4.705	18.47	54.53	1059.0%	5.0%	2844	19894	73213	2474.3%	6.7%	6316	27053	80521	1174.9%	5.2%
Japan	28.22	46.82	91.51	224.3%	2.4%	5111	6817	9659	89.0%	1.3%	3620	5357	8340	130.4%	1.7%
Korea, Rep. of	22.03	50.46	91.6	315.8%	2.9%	814.2	2273	3472	326.4%	2.9%	1082	2481	3604	233.1%	2.4%
Taiwan	17.08	34.13	82.63	383.8%	3.2%	362.2	889.7	2156	495.3%	3.6%	406.2	919.7	2176	435.7%	3.4%
Korea, Dem. Rep. of	2.873	4.149	6.366	121.6%	1.6%	24.99	43.25	71.35	185.5%	2.1%	65.65	98.04	140.2	113.6%	1.5%
Hong Kong	36.67	51.76	63.59	73.4%	1.1%	255.5	418.4	520.5	103.7%	1.4%	268.1	433.5	532.5	98.6%	1.4%
Mongolia	2.589	4.883	13.46	419.9%	3.4%	1.895	6.048	29.22	1442.0%	5.6%	7.061	16.08	46.78	562.5%	3.9%
Asia-East	**7.463**	**21.51**	**57.19**	**666.3%**	**4.2%**	**9413**	**30342**	**89121**	**846.8%**	**4.6%**	**11765**	**36359**	**95362**	**710.6%**	**4.3%**
India	2.403	7.669	23.15	863.4%	4.6%	911.8	5932	28538	3029.9%	7.1%	2787	10721	35025	1156.7%	5.2%
Pakistan	2.157	3.537	7.065	227.5%	2.4%	120.8	377.6	1301	977.0%	4.9%	370.9	951.8	2454	561.6%	3.9%
Bangladesh	1.134	2.989	7.292	543.0%	3.8%	80.75	326.8	1035	1181.7%	5.2%	174.2	575.4	1486	753.0%	4.4%
Afghanistan	0.657	0.799	1.453	121.2%	1.6%	4.461	11.8	50	1020.8%	5.0%	23.42	59.84	199.2	750.6%	4.4%
Iran, Islamic Rep. of	8.938	19.17	23.7	165.2%	2.0%	164	762.8	1362	730.5%	4.3%	647	1754	2339	261.5%	2.6%
Nepal	0.923	1.715	4.222	357.4%	3.1%	7.773	23.55	87.81	1029.7%	5.0%	27.12	69.62	189.1	597.3%	4.0%
Uzbekistan	2.042	3.67	6.323	209.6%	2.3%	22.63	58.35	116.7	415.7%	3.3%	56.71	122.6	210.6	271.4%	2.7%
Sri Lanka	3.481	8.154	20.16	479.1%	3.6%	25.35	96.35	339.6	1239.6%	5.3%	71.01	180.1	427.8	502.5%	3.7%
Kazakhstan	9.988	28.51	30.42	204.6%	2.3%	45.44	253	298.3	556.5%	3.8%	151.5	439.5	425	180.5%	2.1%
Tajikistan	1.502	2.638	6.44	328.8%	3.0%	2.026	6.916	29.97	1379.3%	5.5%	10.45	25.84	69.56	565.6%	3.9%
Turkmenistan	2.912	11.61	9.698	233.0%	2.4%	5.754	49.43	42.83	644.4%	4.1%	15.02	75.71	68.84	358.3%	3.1%
Kyrgyzstan	1.632	2.448	4.444	172.3%	2.0%	1.932	4.28	10.48	442.4%	3.4%	8.931	15.76	28.05	214.1%	2.3%
Bhutan	3.837	9.477	26.12	580.7%	3.9%	0.892	4.585	21.78	2341.7%	6.6%	2.595	8.492	27.02	941.2%	4.8%
Maldives	4.24	14.47	58.51	1280.0%	5.4%	1.078	6.336	33.07	2967.7%	7.1%	1.517	7.132	34.22	2155.8%	6.4%
Asia-South Central	**2.55**	**6.942**	**17.62**	**591.0%**	**3.9%**	**1395**	**7914**	**33267**	**2284.7%**	**6.5%**	**4347**	**15006**	**42984**	**888.8%**	**4.7%**
Indonesia	3.184	5.953	11.76	269.3%	2.6%	257.9	737.6	2014	680.9%	4.2%	740.1	1581	3142	324.5%	2.9%
Philippines	2.895	5.944	13.57	368.7%	3.1%	117.7	416.6	1424	1109.9%	5.1%	264.1	724.8	1828	592.2%	3.9%
Vietnam	2.325	6.993	17.55	654.8%	4.1%	63.19	376.4	1526	2314.9%	6.6%	203.4	728	1936	851.8%	4.6%
Thailand	6.887	13.29	26.46	284.2%	2.7%	189.9	559.5	1502	690.9%	4.2%	456.1	939.3	1820	299.0%	2.8%
Myanmar	0.991	2.323	5.258	430.6%	3.4%	84.69	124.1	222.9	163.2%	2.0%	51.98	125.9	269.4	418.3%	3.3%
Malaysia	11.66	23.78	41.59	256.7%	2.6%	147.1	598.9	1498	918.4%	4.8%	320.6	853.4	1675	422.5%	3.4%
Cambodia	1.545	5.162	12.89	734.3%	4.3%	8.132	62.11	259.4	3089.9%	7.2%	23.73	114.4	338	1324.4%	5.5%
Lao PDR	1.836	6.615	24.23	1219.7%	5.3%	3.18	28.99	200.2	6195.6%	8.6%	11.91	60.31	260.2	2084.7%	6.4%
Singapore	41.22	60.53	69.01	67.4%	1.0%	144.6	259.6	305.8	111.5%	1.5%	192	321.9	352.6	83.6%	1.2%
Timor-Leste	1.964	3.4	10.22	420.4%	3.4%	0.458	2.191	18.54	3948.0%	7.7%	2.52	8.556	39.1	1451.6%	5.6%
Brunei Darussalam	42.44	55.59	62.54	47.4%	0.8%	7.911	19.32	29.61	274.3%	2.7%	17.59	32.19	42.19	139.9%	1.8%
Asia-South East	**3.901**	**7.932**	**16.27**	**317.1%**	**2.9%**	**1025**	**3185**	**9001**	**778.1%**	**4.4%**	**2284**	**5490**	**11702**	**412.3%**	**3.3%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP (Thousands in 2005 Dollars)					Gross Domestic Product (Billions in 2000 Dollars)					GDP at PPP (Billions in 2005 Dollars)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	7.691	17.48	45.82	495.8%	3.6%	307.4	1211	4131	1243.9%	5.3%	587.2	1605	4504	667.0%	4.2%
Yemen	1.969	4.248	8.527	333.1%	3.0%	13.52	77.94	312.3	2209.9%	6.5%	47.7	193	561.9	1078.0%	5.1%
Iraq	2.287	5.936	14.17	519.6%	3.7%	23.38	153.5	685.9	2833.7%	7.0%	68.49	298.4	929.4	1257.0%	5.4%
Saudi Arabia	18.97	27.63	36.51	92.5%	1.3%	263.8	792.2	1619	513.7%	3.7%	490.8	1120	1863	279.6%	2.7%
Syria	3.727	5.961	13.33	257.7%	2.6%	28.73	88.49	349.6	1116.8%	5.1%	79.8	194.5	524	556.6%	3.8%
Israel	21.78	54.21	113.9	423.0%	3.4%	161.1	540.2	1322	720.6%	4.3%	166.3	545.1	1325	696.8%	4.2%
Azerbaijan	5.343	11.37	15.5	190.1%	2.2%	16.08	61.58	101.3	530.0%	3.7%	47.73	118.6	158.7	232.5%	2.4%
Jordan	4.313	11.47	43.88	917.4%	4.7%	14.66	72.82	401.5	2638.7%	6.8%	26.2	95.86	436.7	1566.8%	5.8%
Palestine	3.256	6.235	15.76	384.0%	3.2%	4.586	20.52	105	2189.6%	6.5%	13.61	44.99	147.6	984.5%	4.9%
United Arab Emirates	30.32	43.28	58.79	93.9%	1.3%	119.9	248.5	360	200.3%	2.2%	151.5	279.1	388.2	156.2%	1.9%
Oman	18.37	25.57	33.48	82.3%	1.2%	28.92	80.57	159.1	450.1%	3.5%	52.34	113.4	188.2	259.6%	2.6%
Kuwait	39.7	66.85	54.76	37.9%	0.6%	63.73	191.7	215.4	238.0%	2.5%	114	277.9	277.1	143.1%	1.8%
Lebanon	8.71	15.95	31.16	257.7%	2.6%	22.73	61.27	140.4	517.7%	3.7%	33.15	71.54	146.9	343.1%	3.0%
Georgia	3.716	6.702	12.28	230.5%	2.4%	5.485	11	22.23	305.3%	2.8%	16.14	23.71	35.61	120.6%	1.6%
Armenia	4.485	14.35	27.5	513.2%	3.7%	4.685	26.58	64.32	1272.9%	5.4%	13.72	43.43	75.63	451.2%	3.5%
Bahrain	31.28	38.31	49.46	58.1%	0.9%	13.09	26.71	44.35	238.8%	2.5%	24.86	39.74	55.86	124.7%	1.6%
Qatar	70.04	132	87.7	25.2%	0.5%	19.53	59.46	49.49	153.4%	1.9%	61.39	139.6	92.01	49.9%	0.8%
Cyprus	23.2	36.63	59.35	155.8%	1.9%	12.77	26.59	40.23	215.0%	2.3%	18.11	29.96	43.48	140.1%	1.8%
Asia-West	**8.79**	**16.07**	**29.99**	**241.2%**	**2.5%**	**1124**	**3751**	**10123**	**800.6%**	**4.5%**	**2013**	**5234**	**11753**	**483.9%**	**3.6%**
Australia	32.24	53.21	92.74	187.7%	2.1%	551.2	1192	2364	328.9%	3.0%	690.1	1352	2568	272.1%	2.7%
Papua New Guniea	1.588	3.604	5.784	264.2%	2.6%	4.069	18.27	41.71	925.1%	4.8%	10.36	36.29	75.33	627.1%	4.0%
New Zealand	23.12	36.69	81.49	252.5%	2.6%	71.7	160.1	378.1	427.3%	3.4%	98.68	178.6	401.7	307.1%	2.8%
Solomon Islands	1.641	2.433	4.298	161.9%	1.9%	0.387	0.916	2.414	523.8%	3.7%	0.876	2.06	4.848	453.4%	3.5%
Fiji	4.015	6.652	18.13	351.6%	3.1%	2.101	4.206	13.94	563.5%	3.9%	3.552	6.382	16.16	355.0%	3.1%
Vanuatu	3.29	5.05	11.33	244.4%	2.5%	0.312	0.878	3.452	1006.4%	4.9%	0.779	1.871	5.199	567.4%	3.9%
Micronesia	5.039	6.99	16.56	228.6%	2.4%	0.254	0.627	2.699	962.6%	4.8%	0.618	1.299	3.79	513.3%	3.7%
Tonga	4.626	6.229	14.41	211.5%	2.3%	0.188	0.473	2.116	1025.5%	5.0%	0.523	1.111	3.239	519.3%	3.7%
Samoa	4.661	7.887	20.68	343.7%	3.0%	0.328	0.874	3.433	946.6%	4.8%	0.886	1.797	4.57	415.8%	3.3%
Oceania	**23.52**	**36.68**	**63.18**	**168.6%**	**2.0%**	**630.6**	**1378**	**2812**	**345.9%**	**3.0%**	**806.4**	**1582**	**3083**	**282.3%**	**2.7%**

Poverty

Base Case: Countries in Year 2060 Descending Population Sequence	GDP per Capita at PPP Thousands in 2005 Dollars					Gross Domestic Product Billions in 2000 Dollars					GDP at PPP Billions in 2005 Dollars				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	12.57	30.14	35.73	184.2%	2.1%	468.3	1906	2585	452.0%	3.5%	1774	3922	3930	121.5%	1.6%
Ukraine	5.904	14.36	30.68	419.6%	3.4%	58.88	210.6	638	983.6%	4.9%	268.6	534.4	947.9	252.9%	2.6%
Poland	13.83	27.48	51.97	275.8%	2.7%	251.7	715.3	1409	459.8%	3.5%	529.6	997.8	1593	200.8%	2.2%
Romania	9.386	16.61	27.35	191.4%	2.2%	60.05	146.8	307.2	411.6%	3.3%	201.7	324.3	454.8	125.5%	1.6%
Czech Republic	19.41	27.08	40.04	106.3%	1.5%	79.7	143.4	255.2	220.2%	2.4%	200	262.3	331.9	66.0%	1.0%
Belarus	8.983	18.56	32.84	265.6%	2.6%	24.13	77.49	186.5	672.9%	4.2%	87.03	167.7	260.7	199.6%	2.2%
Hungary	16.37	26.04	45.25	176.4%	2.1%	68.44	141	277.5	305.5%	2.8%	163.5	233.9	339.4	107.6%	1.5%
Bulgaria	9.322	16.62	33.79	262.5%	2.6%	19.51	43.25	117.8	503.8%	3.7%	69.88	100.3	167.6	139.8%	1.8%
Slovakia	15.64	21.77	33.4	113.6%	1.5%	31.28	57.98	108.9	248.1%	2.5%	85.08	113.9	149.8	76.1%	1.1%
Moldova, Rep. of	2.202	4.077	12.11	450.0%	3.5%	2.183	4.993	22.17	915.6%	4.7%	9.146	14.81	37.68	312.0%	2.9%
Europe-East	**11.55**	**25.1**	**36.59**	**216.8%**	**2.3%**	**1064**	**3447**	**5907**	**455.2%**	**3.5%**	**3389**	**6671**	**8213**	**142.3%**	**1.8%**
United Kingdom	29.81	49.91	100.3	236.5%	2.5%	1799	3240	6448	258.4%	2.6%	1840	3260	6459	251.0%	2.5%
Sweden	32.02	61.2	116.1	262.6%	2.6%	312.4	602.6	1077	244.8%	2.5%	294.2	576.8	1048	256.2%	2.6%
Denmark	32.09	53.37	105.7	229.4%	2.4%	187.3	320.1	616.3	229.0%	2.4%	177.5	307.9	601.3	238.8%	2.5%
Ireland	40.44	69.8	94.99	134.9%	1.7%	159.9	332.4	490.9	207.0%	2.3%	177.5	359.3	516.2	190.8%	2.2%
Norway	46.56	72.41	112.5	141.6%	1.8%	214	368.6	586.9	174.3%	2.0%	221.9	378.5	596.9	169.0%	2.0%
Finland	30.67	50.4	100	226.1%	2.4%	160.4	270	503.8	214.1%	2.3%	163.7	271.6	504.6	208.2%	2.3%
Lithuania	14.32	24.26	44.18	208.5%	2.3%	20.73	47.11	98.48	375.1%	3.2%	48.44	75.4	116.5	140.5%	1.8%
Latvia	13.76	28.48	58.3	323.7%	2.9%	14.98	42.84	90.21	502.2%	3.7%	31.29	58.87	102	226.0%	2.4%
Estonia	17.64	32.23	61.99	251.4%	2.5%	11.03	25.43	48.27	337.6%	3.0%	23.08	35.2	56.84	146.3%	1.8%
Iceland	35.56	63.69	115.4	224.5%	2.4%	12.43	23.83	40.67	227.2%	2.4%	10.97	21.77	38.43	250.3%	2.5%
Europe-North	**30.43**	**51.95**	**99.9**	**228.3%**	**2.4%**	**2892**	**5273**	**10001**	**245.8%**	**2.5%**	**2989**	**5345**	**10040**	**235.9%**	**2.5%**
Italy	24.62	31.19	54.77	122.5%	1.6%	1168	1561	2353	101.5%	1.4%	1449	1687	2453	69.3%	1.1%
Spain	24.9	36.23	60.95	144.8%	1.8%	752.2	1330	2004	166.4%	2.0%	1099	1548	2214	101.5%	1.4%
Greece	27.46	36.68	53.51	94.9%	1.3%	202.3	322.5	436.9	116.0%	1.6%	308.4	393.4	496.9	61.1%	1.0%
Portugal	17.76	24.75	49.4	178.2%	2.1%	122.1	202.4	427.2	249.9%	2.5%	189.2	255	458.3	142.2%	1.8%
Serbia	8.586	13.91	28.07	226.9%	2.4%	13.51	31.11	98.83	631.5%	4.1%	63.3	95.02	172	171.7%	2.0%
Croatia	12.84	20.09	40.77	217.5%	2.3%	27	52.05	122.8	354.8%	3.1%	56.77	80.85	142.2	150.5%	1.9%
Bosnia and Herzegovina	5.626	7.926	16.11	186.3%	2.1%	7.927	13.23	33.58	323.6%	2.9%	22.91	30.19	51.69	125.6%	1.6%
Albania	5.563	12.59	25.93	366.1%	3.1%	6.075	23.02	66.32	991.7%	4.9%	17.7	42.51	82.72	367.3%	3.1%
Macedonia, TFYR	6.808	7.883	14.54	113.6%	1.5%	4.231	5.799	13.97	230.2%	2.4%	14.06	15.75	25.49	81.3%	1.2%
Slovenia	21.87	34.11	69.53	217.9%	2.3%	26.9	52.47	94.6	251.7%	2.5%	43.97	64.13	105.8	140.6%	1.8%
Montenegro	7.179	12.48	30.51	325.0%	2.9%	1.27	3.266	12.75	903.9%	4.7%	4.45	7.741	17.98	304.0%	2.8%
Malta	19.47	30.42	60.58	211.1%	2.3%	4.667	9.735	19.09	309.0%	2.9%	7.983	12.41	21.29	166.7%	2.0%
Europe-South	**21.99**	**30.06**	**52.05**	**136.7%**	**1.7%**	**2336**	**3606**	**5683**	**143.3%**	**1.8%**	**3277**	**4232**	**6241**	**90.4%**	**1.3%**
Germany	27.9	43.83	95.1	240.9%	2.5%	2099	3370	6428	206.2%	2.3%	2314	3470	6549	183.0%	2.1%
France	28.28	41.9	90.96	221.6%	2.4%	1573	2609	5487	248.8%	2.5%	1762	2709	5621	219.0%	2.3%
Netherlands	32.3	46.08	78.38	142.7%	1.8%	460.1	741.2	1259	173.6%	2.0%	542.1	816.1	1340	147.2%	1.8%
Belgium	28.87	40.86	80.39	178.5%	2.1%	269.2	416.2	785.5	191.8%	2.2%	308.1	441.8	816.3	164.9%	2.0%
Austria	31.46	48.44	89.34	184.0%	2.1%	226.5	350.1	555.5	145.3%	1.8%	260.8	379.9	585.6	124.5%	1.6%
Switzerland	33.62	52.36	96.69	187.6%	2.1%	280.9	412.2	626.4	123.0%	1.6%	253	382.1	597.3	136.1%	1.7%
Luxembourg	68.23	79.15	101.1	48.2%	0.8%	27.97	42.84	68.96	146.5%	1.8%	33.23	48.75	75.02	125.8%	1.6%
Europe-West	**28.96**	**43.85**	**90.93**	**214.0%**	**2.3%**	**4937**	**7942**	**15209**	**208.1%**	**2.3%**	**5473**	**8248**	**15584**	**184.7%**	**2.1%**

Health

Base Case

Source: International Futures Version 6.12, March 2009

	Life Expectancy at Birth					Infant Mortality					Total Fertility Rate				
	Years					Per Thousand Births					Births per Woman				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**68.81**	**75.1**	**80.85**	**17.5%**	**0.3%**	**40.46**	**30.11**	**18.93**	**-53.2%**	**-1.5%**	**2.512**	**2.232**	**2.005**	**-20.2%**	**-0.4%**
Africa	**56.59**	**63.32**	**70.64**	**24.8%**	**0.4%**	**81.79**	**67.68**	**45.11**	**-44.8%**	**-1.2%**	**4.665**	**3.542**	**2.489**	**-46.6%**	**-1.2%**
Americas	**75.3**	**79.99**	**85.17**	**13.1%**	**0.2%**	**16.93**	**10.81**	**4.999**	**-70.5%**	**-2.4%**	**2.054**	**1.829**	**1.802**	**-12.3%**	**-0.3%**
Asia with Oceania	**68.99**	**77.04**	**83.92**	**21.6%**	**0.4%**	**41.43**	**25.2**	**12.19**	**-70.6%**	**-2.4%**	**2.278**	**1.973**	**1.876**	**-17.6%**	**-0.4%**
Europe	**76.34**	**81.96**	**85.07**	**11.4%**	**0.2%**	**8.244**	**5.335**	**3.943**	**-52.2%**	**-1.5%**	**1.451**	**1.553**	**1.649**	**13.6%**	**0.3%**
World	**68.81**	**75.1**	**80.85**	**17.5%**	**0.3%**	**40.46**	**30.11**	**18.93**	**-53.2%**	**-1.5%**	**2.512**	**2.232**	**2.005**	**-20.2%**	**-0.4%**
Africa-Eastern	**54.84**	**63.63**	**72.48**	**32.2%**	**0.6%**	**87.28**	**70.73**	**38.64**	**-55.7%**	**-1.6%**	**5.158**	**3.602**	**2.204**	**-57.3%**	**-1.7%**
Africa-Middle	**47.38**	**55.19**	**65.76**	**38.8%**	**0.7%**	**88.26**	**70.67**	**50.47**	**-42.8%**	**-1.1%**	**5.751**	**4.689**	**3.212**	**-44.1%**	**-1.2%**
Africa-Northern	**69.51**	**74.76**	**81.96**	**17.9%**	**0.3%**	**41.01**	**28.58**	**14.18**	**-65.4%**	**-2.1%**	**2.866**	**2.112**	**1.904**	**-33.6%**	**-0.8%**
Africa-Southern	**56.54**	**69.04**	**75.42**	**33.4%**	**0.6%**	**50.86**	**35.36**	**19.66**	**-61.3%**	**-1.9%**	**2.652**	**1.853**	**1.8**	**-32.1%**	**-0.8%**
Africa-Western	**53.48**	**60.09**	**66.16**	**23.7%**	**0.4%**	**107.1**	**87.84**	**64.64**	**-39.6%**	**-1.0%**	**5.298**	**3.905**	**2.698**	**-49.1%**	**-1.3%**
Africa	**56.59**	**63.32**	**70.64**	**24.8%**	**0.4%**	**81.79**	**67.68**	**45.11**	**-44.8%**	**-1.2%**	**4.665**	**3.542**	**2.489**	**-46.6%**	**-1.2%**
America-Caribbean	**71.15**	**75.37**	**82.04**	**15.3%**	**0.3%**	**26**	**21.39**	**14.56**	**-44.0%**	**-1.2%**	**2.432**	**2.174**	**1.938**	**-20.3%**	**-0.5%**
America-Central	**71.83**	**75.63**	**82.35**	**14.6%**	**0.3%**	**28.64**	**21.52**	**10.37**	**-63.8%**	**-2.0%**	**3.074**	**2.16**	**1.8**	**-41.4%**	**-1.1%**
America-North	**77.8**	**81.38**	**84.77**	**9.0%**	**0.2%**	**9.384**	**6.416**	**3.948**	**-57.9%**	**-1.7%**	**1.831**	**1.785**	**1.791**	**-2.2%**	**0.0%**
America-South	**73.25**	**79.48**	**86.31**	**17.8%**	**0.3%**	**23.3**	**13.2**	**4.437**	**-81.0%**	**-3.3%**	**2.158**	**1.8**	**1.8**	**-16.6%**	**-0.4%**
Americas	**75.3**	**79.99**	**85.17**	**13.1%**	**0.2%**	**16.93**	**10.81**	**4.999**	**-70.5%**	**-2.4%**	**2.054**	**1.829**	**1.802**	**-12.3%**	**-0.3%**
Asia-East	**73.17**	**83.41**	**88.63**	**21.1%**	**0.4%**	**23.28**	**7.424**	**3.525**	**-84.9%**	**-3.7%**	**1.736**	**1.758**	**1.778**	**2.4%**	**0.0%**
Asia-South Central	**64.9**	**73.03**	**81.54**	**25.6%**	**0.5%**	**62.17**	**39.87**	**18.27**	**-70.6%**	**-2.4%**	**2.681**	**2.135**	**1.975**	**-26.3%**	**-0.6%**
Asia-South East	**68.63**	**73.91**	**81.56**	**18.8%**	**0.3%**	**32.42**	**23.99**	**11.85**	**-63.4%**	**-2.0%**	**2.236**	**1.821**	**1.8**	**-19.5%**	**-0.4%**
Asia-West	**70.6**	**77.04**	**83.33**	**18.0%**	**0.3%**	**38.52**	**24.02**	**11.83**	**-69.3%**	**-2.3%**	**3.12**	**2.325**	**1.828**	**-41.4%**	**-1.1%**
Oceania	**75.96**	**78.75**	**81.55**	**7.4%**	**0.1%**	**17.61**	**15.48**	**12.38**	**-29.7%**	**-0.7%**	**2.269**	**2.065**	**1.838**	**-19.0%**	**-0.4%**
Asia with Oceania	**68.99**	**77.04**	**83.92**	**21.6%**	**0.4%**	**41.43**	**25.2**	**12.19**	**-70.6%**	**-2.4%**	**2.278**	**1.973**	**1.876**	**-17.6%**	**-0.4%**
Europe-East	**70.87**	**80.04**	**84.61**	**19.4%**	**0.4%**	**12.46**	**6.891**	**4.505**	**-63.8%**	**-2.0%**	**1.3**	**1.434**	**1.567**	**20.5%**	**0.4%**
Europe-North	**79.66**	**82.59**	**84.82**	**6.5%**	**0.1%**	**4.961**	**4.127**	**3.603**	**-27.4%**	**-0.6%**	**1.766**	**1.778**	**1.788**	**1.2%**	**0.0%**
Europe-South	**79.85**	**83.46**	**86.23**	**8.0%**	**0.2%**	**6.209**	**4.836**	**3.533**	**-43.1%**	**-1.1%**	**1.371**	**1.486**	**1.601**	**16.8%**	**0.3%**
Europe-West	**80.23**	**83.06**	**85.03**	**6.0%**	**0.1%**	**4.397**	**3.845**	**3.515**	**-20.1%**	**-0.4%**	**1.578**	**1.643**	**1.704**	**8.0%**	**0.2%**
Europe	**76.34**	**81.96**	**85.07**	**11.4%**	**0.2%**	**8.244**	**5.335**	**3.943**	**-52.2%**	**-1.5%**	**1.451**	**1.553**	**1.649**	**13.6%**	**0.3%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth Years					Infant Mortality Per Thousand Births					Total Fertility Rate Births per Woman				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	54.3	60.08	69.82	28.6%	0.5%	94.29	81.27	48.49	-48.6%	-1.3%	5.215	4.16	2.512	-51.8%	-1.5%
Uganda	58.35	67.71	76.56	31.2%	0.5%	82.64	61.09	25.66	-68.9%	-2.3%	6.318	3.77	1.8	-71.5%	-2.5%
Tanzania, United Rep. of	57.34	68.06	80.08	39.7%	0.7%	76.83	53.84	17.82	-76.8%	-2.9%	4.987	2.98	1.8	-63.9%	-2.0%
Kenya	59.71	68.33	76.09	27.4%	0.5%	68.02	51.33	25.35	-62.7%	-2.0%	4.642	2.792	1.8	-61.2%	-1.9%
Madagascar	58.49	60.01	68.34	16.8%	0.3%	74.71	72.36	48.77	-34.7%	-0.8%	4.823	3.732	2.388	-50.5%	-1.4%
Mozambique	49.08	65.65	78.55	60.0%	0.9%	105	70.98	23.27	-77.8%	-3.0%	4.995	3.123	1.8	-64.0%	-2.0%
Malawi	56.47	65.93	66.73	18.2%	0.3%	101.9	87.3	59.37	-41.7%	-1.1%	5.415	3.743	1.957	-63.9%	-2.0%
Zambia	48.29	63.13	66.73	38.2%	0.6%	98.86	82.15	53.07	-46.3%	-1.2%	5.079	3.479	1.8	-64.6%	-2.1%
Burundi	52.63	59.21	68.49	30.1%	0.5%	106.4	92.47	53.03	-50.2%	-1.4%	6.613	5.182	2.868	-56.6%	-1.7%
Rwanda	48.51	59.35	67.52	39.2%	0.7%	116.9	91.19	57.3	-51.0%	-1.4%	5.769	4.177	2.365	-59.0%	-1.8%
Somalia	35.42	45.58	72.62	105.0%	1.4%	132.2	126.9	53.9	-59.2%	-1.8%	5.406	4.646	4.345	-19.6%	-0.4%
Zimbabwe	54.07	70.06	68.77	27.2%	0.5%	62.92	47.02	33.86	-46.2%	-1.2%	3.509	1.8	1.8	-48.7%	-1.3%
Eritrea	51.37	45.67	50.51	-1.7%	0.0%	62.11	60.78	57.86	-6.8%	-0.1%	5.15	4.505	3.64	-29.3%	-0.7%
Mauritius	73.51	81.18	87.02	18.4%	0.3%	14.36	7.317	3.262	-77.3%	-2.9%	1.816	1.8	1.8	-0.9%	0.0%
Comoros	62.47	63.48	72.98	16.8%	0.3%	57.37	54.58	32.5	-43.4%	-1.1%	3.733	3.216	2.014	-46.0%	-1.2%
Djibouti	56.16	59.61	68.67	22.3%	0.4%	93.26	84.42	53.34	-42.8%	-1.1%	4.08	3.207	1.909	-53.2%	-1.5%
Africa-Eastern	**54.84**	**63.63**	**72.48**	**32.2%**	**0.6%**	**87.28**	**70.73**	**38.64**	**-55.7%**	**-1.6%**	**5.158**	**3.602**	**2.204**	**-57.3%**	**-1.7%**
Congo; Dem. Rep. of	43.79	51.57	66.99	53.0%	0.9%	72.1	57.72	37.59	-47.9%	-1.3%	6.144	5.123	3.264	-46.9%	-1.3%
Angola	43.51	55.57	61.97	42.4%	0.7%	132	102.5	81.16	-38.5%	-1.0%	6.215	4.674	3.618	-41.8%	-1.1%
Cameroon	56.09	63.82	67.56	20.4%	0.4%	87.07	71.16	49.83	-42.8%	-1.1%	4.389	3.365	2.19	-50.1%	-1.4%
Chad	53.87	59.41	60.71	12.7%	0.2%	121.5	104.6	92.45	-23.9%	-0.5%	6.22	4.84	3.899	-37.3%	-0.9%
Central African Republic	48.61	58.68	63.79	31.2%	0.5%	100.2	84.8	60.65	-39.5%	-1.0%	4.649	3.812	2.626	-43.5%	-1.1%
Congo, Rep. of	58.64	66.02	67.77	15.6%	0.3%	71.97	55.59	45.47	-36.8%	-0.9%	4.436	3.161	2.21	-50.2%	-1.4%
Gabon	60.69	66.99	71.46	17.7%	0.3%	58.71	45.74	32.63	-44.4%	-1.2%	3.153	2.567	1.962	-37.8%	-0.9%
Equatorial Guinea	49.87	62.03	67.73	35.8%	0.6%	94.11	70.53	54.21	-42.4%	-1.1%	5.045	3.329	2.512	-50.2%	-1.4%
São Tomé and Príncipe	63.54	64.39	68.47	7.8%	0.1%	78.1	74.45	63.36	-18.9%	-0.4%	3.995	3.543	2.602	-34.9%	-0.9%
Africa-Middle	**47.38**	**55.19**	**65.76**	**38.8%**	**0.7%**	**88.26**	**70.67**	**50.47**	**-42.8%**	**-1.1%**	**5.751**	**4.689**	**3.212**	**-44.1%**	**-1.2%**
Egypt	71.36	76.98	87.06	22.0%	0.4%	35.46	21.84	3.112	-91.2%	-4.7%	2.801	1.8	1.8	-35.7%	-0.9%
Sudan	60.33	68.76	74.74	23.9%	0.4%	67.76	46.65	30.77	-54.6%	-1.6%	4.282	3.14	2.189	-48.9%	-1.3%
Algeria	72.47	75.95	79.72	10.0%	0.2%	36.51	25.82	18.12	-50.4%	-1.4%	2.27	1.8	1.8	-20.7%	-0.5%
Morocco	70.43	73.5	81.04	15.1%	0.3%	37.17	30.74	14.27	-61.6%	-1.9%	2.287	1.8	1.8	-21.3%	-0.5%
Tunisia	74.18	81.04	89.56	20.7%	0.4%	22.15	10.52	3.062	-86.2%	-3.9%	1.861	1.8	1.8	-3.3%	-0.1%
Libyan Arab Jamahiriya	75.11	82.1	84.59	12.6%	0.2%	18.44	8.665	5.386	-70.8%	-2.4%	2.629	1.8	1.8	-31.5%	-0.8%
Africa-Northern	**69.51**	**74.76**	**81.96**	**17.9%**	**0.3%**	**41.01**	**28.58**	**14.18**	**-65.4%**	**-2.1%**	**2.866**	**2.112**	**1.904**	**-33.6%**	**-0.8%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth					Infant Mortality					Total Fertility Rate				
	Years					Per Thousand Births					Births per Woman				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	56.53	68.77	75.07	32.8%	0.6%	48.99	34.18	19.33	-60.5%	-1.8%	2.57	1.8	1.8	-30.0%	-0.7%
Namibia	60.19	71.25	80.42	33.6%	0.6%	52.57	34.43	14.27	-72.9%	-2.6%	3.22	2.187	1.8	-44.1%	-1.2%
Lesotho	52.84	69.56	77.47	46.6%	0.8%	70.85	47.02	22.12	-68.8%	-2.3%	3.376	2.27	1.8	-46.7%	-1.2%
Botswana	59.98	72.76	76.57	27.7%	0.5%	55.7	33.47	20.99	-62.3%	-1.9%	2.818	1.8	1.8	-36.1%	-0.9%
Swaziland	50.81	68.12	72.26	42.2%	0.7%	84.26	61.46	34.68	-58.8%	-1.8%	3.53	2.47	1.8	-49.0%	-1.3%
Africa-Southern	**56.54**	**69.04**	**75.42**	**33.4%**	**0.6%**	**50.86**	**35.36**	**19.66**	**-61.3%**	**-1.9%**	**2.652**	**1.853**	**1.8**	**-32.1%**	**-0.8%**
Nigeria	50.91	60.6	63.29	24.3%	0.4%	110.7	85.26	70.29	-36.5%	-0.9%	5.255	3.676	2.804	-46.6%	-1.2%
Niger	56.26	57.94	67.44	19.9%	0.4%	118.4	114.5	73.92	-37.6%	-0.9%	6.77	5.095	2.949	-56.4%	-1.6%
Côte d'Ivoire	55.03	63.3	66.4	20.7%	0.4%	118.4	95.33	67.74	-42.8%	-1.1%	4.608	3.558	2.342	-49.2%	-1.3%
Ghana	60.72	62.81	67.79	11.6%	0.2%	62.99	59.19	44.48	-29.4%	-0.7%	3.905	3.153	2.141	-45.2%	-1.2%
Burkina Faso	52.97	59.92	71.62	35.2%	0.6%	108.5	86.31	46.85	-56.8%	-1.7%	5.968	4.432	2.362	-60.4%	-1.8%
Mali	54.23	59.45	69.79	28.7%	0.5%	136.7	114.7	68.67	-49.8%	-1.4%	6.222	4.468	2.719	-56.3%	-1.6%
Senegal	62.32	65.05	72.69	16.6%	0.3%	68.76	61.97	39.19	-43.0%	-1.1%	5.166	4.038	2.613	-49.4%	-1.4%
Guinea	56.52	63.29	72.11	27.6%	0.5%	110.5	85.82	51.33	-53.5%	-1.5%	5.53	4.139	2.582	-53.3%	-1.5%
Benin	57.04	61.83	71.03	24.5%	0.4%	104.2	88.1	52.91	-49.2%	-1.3%	5.315	3.923	2.332	-56.1%	-1.6%
Togo	59.87	47.42	61.84	3.3%	0.1%	93.39	91.24	84.2	-9.8%	-0.2%	4.8	3.912	2.824	-41.2%	-1.1%
Sierra Leone	35.56	43.99	65.55	84.3%	1.2%	161.6	128	78.4	-51.5%	-1.4%	6.232	4.468	2.459	-60.5%	-1.8%
Liberia	45.21	41.61	68.1	50.6%	0.8%	136.9	110.3	66.33	-51.5%	-1.4%	6.577	5.536	3.799	-42.2%	-1.1%
Mauritania	63.48	64.54	69.98	10.2%	0.2%	67.43	65.65	48.09	-28.7%	-0.7%	4.476	3.749	2.782	-37.8%	-0.9%
Guinea-Bissau	47.63	51.86	59.1	24.1%	0.4%	119.9	109.9	84.74	-29.3%	-0.7%	6.775	5.249	3.748	-44.7%	-1.2%
Gambia	59.11	61.04	68.64	16.1%	0.3%	79.71	73.97	51.36	-35.6%	-0.9%	4.706	3.833	2.793	-40.7%	-1.0%
Cape Verde	70.59	74.18	86.4	22.4%	0.4%	29.81	24.13	3.283	-89.0%	-4.3%	3.302	1.992	1.8	-45.5%	-1.2%
Africa-Western	**53.48**	**60.09**	**66.16**	**23.7%**	**0.4%**	**107.1**	**87.84**	**64.64**	**-39.6%**	**-1.0%**	**5.298**	**3.905**	**2.698**	**-49.1%**	**-1.3%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth (Years)					Infant Mortality (Per Thousand Births)					Total Fertility Rate (Births per Woman)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	60.59	63.22	69.48	14.7%	0.3%	56.14	51.01	36.51	-35.0%	-0.9%	3.854	3.253	2.287	-40.7%	-1.0%
Dominican Republic	69.96	79.09	88.56	26.6%	0.5%	34.58	15.27	3.297	-90.5%	-4.6%	2.597	1.8	1.8	-30.7%	-0.7%
Cuba	77.7	81.06	91.52	17.8%	0.3%	6.066	4.885	2.464	-59.4%	-1.8%	1.561	1.625	1.688	8.1%	0.2%
Puerto Rico	79.52	85.62	87.57	10.1%	0.2%	7.115	3.457	3.009	-57.7%	-1.7%	1.776	1.782	1.789	0.7%	0.0%
Jamaica	70.84	75.48	82.1	15.9%	0.3%	14.19	11.13	6.207	-56.3%	-1.6%	2.232	1.8	1.8	-19.4%	-0.4%
Trinidad and Tobago	69.74	78.77	83.52	19.8%	0.4%	13.31	7.74	5.42	-59.3%	-1.8%	1.636	1.679	1.723	5.3%	0.1%
Bahamas	73.73	79.72	83.6	13.4%	0.3%	14.45	9.155	5.682	-60.7%	-1.8%	1.872	1.8	1.8	-3.8%	-0.1%
Barbados	77.33	83.36	87.97	13.8%	0.3%	11.38	5.451	3.08	-72.9%	-2.6%	1.518	1.593	1.668	9.9%	0.2%
St. Vincent & the Grenadines	71.68	77.59	87.11	21.5%	0.4%	25.45	15.1	3.01	-88.2%	-4.2%	2.089	1.8	1.8	-13.8%	-0.3%
Grenada	73.32	77.07	86.02	17.3%	0.3%	36.45	25.12	3.289	-91.0%	-4.7%	2.295	1.8	1.8	-21.6%	-0.5%
St. Lucia	74.7	80.36	88.22	18.1%	0.3%	13.83	8.171	3.15	-77.2%	-2.9%	1.903	1.8	1.8	-5.4%	-0.1%
America-Caribbean	**71.15**	**75.37**	**82.04**	**15.3%**	**0.3%**	**26**	**21.39**	**14.56**	**-44.0%**	**-1.2%**	**2.432**	**2.174**	**1.938**	**-20.3%**	**-0.5%**
Guatemala	70.31	73.87	81.22	15.5%	0.3%	37.53	26.93	11.73	-68.7%	-2.3%	4.068	2.721	1.8	-55.8%	-1.6%
Honduras	68.61	72.18	80.08	16.7%	0.3%	31.47	27.1	13.91	-55.8%	-1.6%	3.043	1.838	1.8	-40.8%	-1.0%
El Salvador	71.92	76.89	85.47	18.8%	0.3%	26.23	16.18	3.668	-86.0%	-3.9%	2.586	1.8	1.8	-30.4%	-0.7%
Nicaragua	71.9	72.24	77.04	7.1%	0.1%	26.34	25.61	18.09	-31.3%	-0.7%	2.664	1.8	1.8	-32.4%	-0.8%
Costa Rica	78.51	85.47	89.33	13.8%	0.3%	10.36	3.999	3.118	-69.9%	-2.4%	1.893	1.8	1.8	-4.9%	-0.1%
Panama	76.05	83.88	88.73	16.7%	0.3%	20.08	6.284	3.209	-84.0%	-3.6%	2.369	1.8	1.8	-24.0%	-0.5%
Belize	72.7	81.15	88.16	21.3%	0.4%	17.42	8.059	3.154	-81.9%	-3.4%	2.797	1.8	1.8	-35.6%	-0.9%
America-Central	**71.83**	**75.63**	**82.35**	**14.6%**	**0.3%**	**28.64**	**21.52**	**10.37**	**-63.8%**	**-2.0%**	**3.074**	**2.16**	**1.8**	**-41.4%**	**-1.1%**
United States of America	78.33	81.31	83.9	7.1%	0.1%	6.543	5.303	4.219	-35.5%	-0.9%	1.8	1.8	1.8	0.0%	0.0%
Mexico	75.39	81.08	87.33	15.8%	0.3%	18.87	10.25	3.222	-82.9%	-3.5%	2.012	1.8	1.8	-10.5%	-0.2%
Canada	80.71	83.08	85.02	5.3%	0.1%	4.921	4.193	3.639	-26.1%	-0.6%	1.526	1.599	1.672	9.6%	0.2%
America-North	**77.8**	**81.38**	**84.77**	**9.0%**	**0.2%**	**9.384**	**6.416**	**3.948**	**-57.9%**	**-1.7%**	**1.831**	**1.785**	**1.791**	**-2.2%**	**0.0%**
Brazil	72.46	79.04	87.15	20.3%	0.4%	25.81	13.76	3.208	-87.6%	-4.1%	2.05	1.8	1.8	-12.2%	-0.3%
Colombia	73.26	78.34	87.46	19.4%	0.4%	20.12	12.4	3.02	-85.0%	-3.7%	2.144	1.8	1.8	-16.0%	-0.3%
Argentina	75.86	83.34	87.14	14.9%	0.3%	13.37	4.791	3.277	-75.5%	-2.8%	2.039	1.8	1.8	-11.7%	-0.2%
Venezuela, RB	74.99	80.68	85.13	13.5%	0.3%	17.15	9.178	3.891	-77.3%	-2.9%	2.431	1.8	1.8	-26.0%	-0.6%
Peru	71.6	78.18	84.78	18.4%	0.3%	28.11	15.78	4.698	-83.3%	-3.5%	2.303	1.8	1.8	-21.8%	-0.5%
Chile	78.94	86.91	88.53	12.1%	0.2%	7.694	3.424	3.167	-58.8%	-1.8%	1.8	1.8	1.8	0.0%	0.0%
Ecuador	74.99	76.75	78.9	5.2%	0.1%	24.67	22.89	17.7	-28.3%	-0.7%	2.476	1.8	1.8	-27.3%	-0.6%
Bolivia	66.71	74.74	82.69	24.0%	0.4%	50.81	30.09	11.25	-77.9%	-3.0%	3.369	1.8	1.8	-46.6%	-1.2%
Paraguay	71.45	73.32	80.07	12.1%	0.2%	35.23	33.12	17.48	-50.4%	-1.4%	2.977	1.8	1.8	-39.5%	-1.0%
Uruguay	76.43	82.51	87.71	14.8%	0.3%	13.8	5.801	3.311	-76.0%	-2.8%	1.852	1.8	1.8	-2.8%	-0.1%
Guyana	66.99	74.12	82.06	22.5%	0.4%	47.33	29.59	10.16	-78.5%	-3.0%	2.273	1.8	1.8	-20.8%	-0.5%
Suriname	70.56	77.79	84.76	20.1%	0.4%	32.49	19.03	5.821	-82.1%	-3.4%	2.381	1.8	1.8	-24.4%	-0.6%
America-South	**73.25**	**79.48**	**86.31**	**17.8%**	**0.3%**	**23.3**	**13.2**	**4.437**	**-81.0%**	**-3.3%**	**2.158**	**1.8**	**1.8**	**-16.6%**	**-0.4%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth (Years)					Infant Mortality (Per Thousand Births)					Total Fertility Rate (Births per Woman)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	72	83.45	89.07	23.7%	0.4%	25.59	7.366	3.182	-87.6%	-4.1%	1.8	1.8	1.8	0.0%	0.0%
Japan	82.72	84.89	86.49	4.6%	0.1%	3.323	3.436	3.412	2.7%	0.1%	1.292	1.427	1.562	20.9%	0.4%
Korea, Rep. of	80.15	85.01	86.89	8.4%	0.2%	4.423	3.536	3.243	-26.7%	-0.6%	1.123	1.303	1.483	32.1%	0.6%
Taiwan	76.72	84.07	86.36	12.6%	0.2%	23.19	7.671	4.323	-81.4%	-3.3%	1.868	1.8	1.8	-3.6%	-0.1%
Korea, Dem. Rep. of	67.51	70.63	75.9	12.4%	0.2%	44.62	36.11	25.3	-43.3%	-1.1%	1.8	1.8	1.8	0.0%	0.0%
Hong Kong	82.1	84.15	86.19	5.0%	0.1%	3.76	3.512	3.308	-12.0%	-0.3%	1.048	1.248	1.448	38.2%	0.6%
Mongolia	67.05	72.38	82.47	23.0%	0.4%	43.92	32.1	11.99	-72.7%	-2.6%	2.063	1.8	1.8	-12.7%	-0.3%
Asia-East	**73.17**	**83.41**	**88.63**	**21.1%**	**0.4%**	**23.28**	**7.424**	**3.525**	**-84.9%**	**-3.7%**	**1.736**	**1.758**	**1.778**	**2.4%**	**0.0%**
India	65.15	75.72	86.26	32.4%	0.6%	60.56	30.28	3.513	-94.2%	-5.5%	2.401	1.8	1.8	-25.0%	-0.6%
Pakistan	64.95	68.96	75.86	16.8%	0.3%	74.7	60.68	37.19	-50.2%	-1.4%	3.996	3.145	2.017	-49.5%	-1.4%
Bangladesh	63.15	67.25	75.65	19.8%	0.4%	60.73	50.04	28.92	-52.4%	-1.5%	2.795	1.8	1.8	-35.6%	-0.9%
Afghanistan	41.57	47.51	55.92	34.5%	0.6%	165	143.6	113.7	-31.1%	-0.7%	7.741	6.245	4.369	-43.6%	-1.1%
Iran, Islamic Rep. of	72.05	80.28	84	16.6%	0.3%	33.11	15.36	8.31	-74.9%	-2.7%	1.833	1.8	1.8	-1.8%	0.0%
Nepal	62.68	63.53	70.85	13.0%	0.2%	64	61.43	41.95	-34.5%	-0.8%	3.066	2.42	1.8	-41.3%	-1.1%
Uzbekistan	67.47	70.74	75.73	12.2%	0.2%	57.12	50.21	33.58	-41.2%	-1.1%	2.035	1.8	1.8	-11.5%	-0.2%
Sri Lanka	74.53	77.05	85.02	14.1%	0.3%	12.27	11.16	4.428	-63.9%	-2.0%	1.8	1.8	1.8	0.0%	0.0%
Kazakhstan	69.02	80.46	83.66	21.2%	0.4%	27.65	11.22	7.054	-74.5%	-2.7%	1.8	1.8	1.8	0.0%	0.0%
Tajikistan	66.29	67.59	74.83	12.9%	0.2%	62.49	60.02	37.35	-40.2%	-1.0%	3.28	2.165	1.8	-45.1%	-1.2%
Turkmenistan	64.24	77.41	78.92	22.9%	0.4%	70.6	27.16	24.04	-65.9%	-2.1%	2.485	1.8	1.8	-27.6%	-0.6%
Kyrgyzstan	67.58	68.2	71.9	6.4%	0.1%	54.66	52.58	43.79	-19.9%	-0.4%	2.245	1.8	1.8	-19.8%	-0.4%
Bhutan	66.43	75.06	86.09	29.6%	0.5%	48.66	28.04	3.332	-93.2%	-5.2%	2.466	2.07	1.8	-27.0%	-0.6%
Maldives	69.5	82.24	87.96	26.6%	0.5%	39.95	12.29	3.495	-91.3%	-4.8%	2.554	1.8	1.8	-29.5%	-0.7%
Asia-South Central	**64.9**	**73.03**	**81.54**	**25.6%**	**0.5%**	**62.17**	**39.87**	**18.27**	**-70.6%**	**-2.4%**	**2.681**	**2.135**	**1.975**	**-26.3%**	**-0.6%**
Indonesia	68.4	73.41	80.36	17.5%	0.3%	33.87	24.15	12.94	-61.8%	-1.9%	2.095	1.8	1.8	-14.1%	-0.3%
Philippines	70.99	73.72	81.27	14.5%	0.3%	27.6	23.84	10.85	-60.7%	-1.8%	3.12	1.8	1.8	-42.3%	-1.1%
Vietnam	70.62	74.94	83.76	18.6%	0.3%	22.1	17.01	6.399	-71.0%	-2.4%	1.8	1.8	1.8	0.0%	0.0%
Thailand	71.15	78.41	85.37	20.0%	0.4%	11.26	7.181	3.372	-70.1%	-2.4%	1.8	1.8	1.8	0.0%	0.0%
Myanmar	57.8	63.65	74.65	29.2%	0.5%	73.93	60.23	36.9	-50.1%	-1.4%	2.017	1.8	1.8	-10.8%	-0.2%
Malaysia	75.14	83.28	87.21	16.1%	0.3%	9.248	4.829	3.211	-65.3%	-2.1%	2.476	1.8	1.8	-27.3%	-0.6%
Cambodia	60.47	71.44	79.91	32.1%	0.6%	67.87	39.07	16.48	-75.7%	-2.8%	3.275	2.209	1.8	-45.0%	-1.2%
Lao PDR	63.74	74.21	86.01	34.9%	0.6%	95.68	51.52	3.422	-96.4%	-6.4%	3.194	1.831	1.8	-43.6%	-1.1%
Singapore	80.16	82.68	85.04	6.1%	0.1%	2.998	3.078	3.129	4.4%	0.1%	1.274	1.414	1.554	22.0%	0.4%
Timor-Leste	55.3	55.35	70.84	28.1%	0.5%	79.73	83.57	41.37	-48.1%	-1.3%	7.089	4.685	2.08	-70.7%	-2.4%
Brunei Darussalam	77.62	80.45	83.3	7.3%	0.1%	5.823	4.93	4.105	-29.5%	-0.7%	2.291	1.978	1.8	-21.4%	-0.5%
Asia-South East	**68.63**	**73.91**	**81.56**	**18.8%**	**0.3%**	**32.42**	**23.99**	**11.85**	**-63.4%**	**-2.0%**	**2.236**	**1.821**	**1.8**	**-19.5%**	**-0.4%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth Years					Infant Mortality Per Thousand Births					Total Fertility Rate Births per Woman				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	72.36	81.6	88.03	21.7%	0.4%	29	11.06	3.035	-89.5%	-4.4%	2.015	1.8	1.8	-10.7%	-0.2%
Yemen	62.18	69.42	77.15	24.1%	0.4%	67.12	46.47	25.24	-62.4%	-1.9%	5.442	3.495	1.978	-63.7%	-2.0%
Iraq	60.6	71.09	80.94	33.6%	0.6%	87.93	51.92	21.87	-75.1%	-2.7%	5.045	2.907	1.8	-64.3%	-2.0%
Saudi Arabia	73.46	79.61	83.99	14.3%	0.3%	20.77	12.13	7.126	-65.7%	-2.1%	3.418	2.37	1.8	-47.3%	-1.3%
Syria	73.55	74.76	81.8	11.2%	0.2%	18.37	17.04	8.494	-53.8%	-1.5%	3.088	2.171	1.8	-41.7%	-1.1%
Israel	80.79	85.98	87.53	8.3%	0.2%	4.808	3.402	3.121	-35.1%	-0.9%	2.43	1.8	1.8	-25.9%	-0.6%
Azerbaijan	73.34	79.24	82.77	12.9%	0.2%	74.7	39.36	21.82	-70.8%	-2.4%	2.049	1.8	1.8	-12.2%	-0.3%
Jordan	71.98	79.03	88.91	23.5%	0.4%	23.02	13.06	3.221	-86.0%	-3.9%	2.96	1.8	1.8	-39.2%	-1.0%
Palestine	73.06	74.08	82.01	12.3%	0.2%	20.86	20.56	8.61	-58.7%	-1.8%	4.203	2.135	1.8	-57.2%	-1.7%
United Arab Emirates	79.14	81.88	84.56	6.8%	0.1%	8.411	6.494	4.75	-43.5%	-1.1%	2.319	1.8	1.8	-22.4%	-0.5%
Oman	75.92	81.08	84.94	11.9%	0.2%	14.14	8.619	4.886	-65.4%	-2.1%	3.194	2.463	1.867	-41.5%	-1.1%
Kuwait	77.86	81.13	84.22	8.2%	0.2%	8.133	6.287	4.63	-43.1%	-1.1%	2.303	1.8	1.8	-21.8%	-0.5%
Lebanon	72.16	79.06	86.62	20.0%	0.4%	24.41	13.47	3.306	-86.5%	-3.9%	2.113	1.8	1.8	-14.8%	-0.3%
Georgia	71.51	74.77	80.56	12.7%	0.2%	40	31.59	16.64	-58.4%	-1.7%	1.377	1.489	1.602	16.3%	0.3%
Armenia	72.58	80.66	87.43	20.5%	0.4%	29.83	12.79	3.394	-88.6%	-4.3%	1.424	1.524	1.624	14.0%	0.3%
Bahrain	76.11	79.38	82.55	8.5%	0.2%	11.9	8.971	6.417	-46.1%	-1.2%	2.072	1.8	1.8	-13.1%	-0.3%
Qatar	75.81	79.51	83.17	9.7%	0.2%	9.223	7.114	5.123	-44.5%	-1.2%	2.578	1.8	1.8	-30.2%	-0.7%
Cyprus	80.32	84.65	86.73	8.0%	0.2%	5.503	3.845	3.191	-42.0%	-1.1%	1.443	1.538	1.633	13.2%	0.2%
Asia-West	**70.6**	**77.04**	**83.33**	**18.0%**	**0.3%**	**38.52**	**24.02**	**11.83**	**-69.3%**	**-2.3%**	**3.12**	**2.325**	**1.828**	**-41.4%**	**-1.1%**
Australia	81.33	83.49	85.44	5.1%	0.1%	4.693	4.038	3.532	-24.7%	-0.6%	1.768	1.777	1.785	1.0%	0.0%
Papua New Guniea	57.91	65.99	72.06	24.4%	0.4%	62.93	45.63	32.77	-47.9%	-1.3%	3.879	2.802	1.93	-50.2%	-1.4%
New Zealand	80.64	85.15	86.8	7.6%	0.1%	5.265	3.677	3.228	-38.7%	-1.0%	1.8	1.8	1.8	0.0%	0.0%
Solomon Islands	62.99	64.53	70.32	11.6%	0.2%	59.79	56.17	41.16	-31.2%	-0.7%	3.93	3.212	2.329	-40.7%	-1.0%
Fiji	68.72	73.72	84.57	23.1%	0.4%	20.88	14.94	5.1	-75.6%	-2.8%	2.705	1.872	1.8	-33.5%	-0.8%
Vanuatu	69.42	71.86	80.5	16.0%	0.3%	34.09	29.59	13.91	-59.2%	-1.8%	3.706	2.563	1.8	-51.4%	-1.4%
Micronesia	67.44	68.49	80.09	18.8%	0.3%	38.51	37.72	13.81	-64.1%	-2.0%	3.701	2.506	1.8	-51.4%	-1.4%
Tonga	72.68	74	81.86	12.6%	0.2%	20.6	19.41	8.744	-57.6%	-1.7%	3.636	2.614	1.8	-50.5%	-1.4%
Samoa	71.15	74.76	84.86	19.3%	0.4%	25.61	18.58	4.985	-80.5%	-3.2%	3.844	2.376	1.8	-53.2%	-1.5%
Oceania	**75.96**	**78.75**	**81.55**	**7.4%**	**0.1%**	**17.61**	**15.48**	**12.38**	**-29.7%**	**-0.7%**	**2.269**	**2.065**	**1.838**	**-19.0%**	**-0.4%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Life Expectancy at Birth (Years)					Infant Mortality (Per Thousand Births)					Total Fertility Rate (Births per Woman)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	68.59	79.33	82.76	20.7%	0.4%	15.18	8.009	5.718	-62.3%	-1.9%	1.321	1.448	1.576	19.3%	0.4%
Ukraine	69.49	78.98	87.61	26.1%	0.5%	12.01	6.138	2.902	-75.8%	-2.8%	1.236	1.386	1.536	24.3%	0.4%
Poland	76.24	84.03	87.1	14.2%	0.3%	6.616	3.78	3.133	-52.6%	-1.5%	1.274	1.414	1.554	22.0%	0.4%
Romania	73.12	79.56	85.66	17.1%	0.3%	15.32	8.961	3.598	-76.5%	-2.9%	1.349	1.469	1.589	17.8%	0.3%
Czech Republic	77.09	82.31	85.3	10.6%	0.2%	3.843	3.564	3.314	-13.8%	-0.3%	1.313	1.442	1.572	19.7%	0.4%
Belarus	70.94	79.81	85.76	20.9%	0.4%	8.819	5.47	3.385	-61.6%	-1.9%	1.245	1.393	1.54	23.7%	0.4%
Hungary	74.01	80.57	84.14	13.7%	0.3%	6.805	4.866	3.804	-44.1%	-1.2%	1.349	1.469	1.589	17.8%	0.3%
Bulgaria	73.5	80.24	87.42	18.9%	0.3%	11.52	6.693	3.123	-72.9%	-2.6%	1.339	1.462	1.584	18.3%	0.3%
Slovakia	75.33	80.41	85.35	13.3%	0.3%	6.936	5.177	3.587	-48.3%	-1.3%	1.283	1.421	1.558	21.4%	0.4%
Moldova, Rep. of	68.47	71.62	81	18.3%	0.3%	16.5	14.7	7.129	-56.8%	-1.7%	1.254	1.399	1.544	23.1%	0.4%
Europe-East	**70.87**	**80.04**	**84.61**	**19.4%**	**0.4%**	**12.46**	**6.891**	**4.505**	**-63.8%**	**-2.0%**	**1.3**	**1.434**	**1.567**	**20.5%**	**0.4%**
United Kingdom	80.02	82.6	84.77	5.9%	0.1%	4.973	4.218	3.655	-26.5%	-0.6%	1.8	1.8	1.8	0.0%	0.0%
Sweden	81.44	83.71	85.71	5.2%	0.1%	3.359	3.274	3.266	-2.8%	-0.1%	1.772	1.779	1.787	0.8%	0.0%
Denmark	78.39	81.63	84.15	7.3%	0.1%	4.532	3.933	3.519	-22.4%	-0.5%	1.8	1.8	1.8	0.0%	0.0%
Ireland	79.85	82.09	84.2	5.4%	0.1%	5.243	4.547	3.91	-25.4%	-0.6%	1.8	1.8	1.8	0.0%	0.0%
Norway	80.76	83.12	85.26	5.6%	0.1%	3.72	3.476	3.28	-11.8%	-0.3%	1.8	1.8	1.8	0.0%	0.0%
Finland	80.22	82.76	84.77	5.7%	0.1%	3.839	3.552	3.378	-12.0%	-0.3%	1.8	1.8	1.8	0.0%	0.0%
Lithuania	73.32	80.52	84.78	15.6%	0.3%	8.754	5.672	3.9	-55.4%	-1.6%	1.302	1.434	1.567	20.4%	0.4%
Latvia	73.65	82.3	85.22	15.7%	0.3%	10.47	5.419	3.903	-62.7%	-2.0%	1.339	1.462	1.584	18.3%	0.3%
Estonia	75.06	82.19	84.56	12.7%	0.2%	6.687	4.489	3.731	-44.2%	-1.2%	1.518	1.593	1.668	9.9%	0.2%
Iceland	81.48	83.8	85.84	5.4%	0.1%	3.133	3.163	3.22	2.8%	0.1%	1.8	1.8	1.8	0.0%	0.0%
Europe-North	**79.66**	**82.59**	**84.82**	**6.5%**	**0.1%**	**4.961**	**4.127**	**3.603**	**-27.4%**	**-0.6%**	**1.766**	**1.778**	**1.788**	**1.2%**	**0.0%**
Italy	80.87	84.29	86.23	6.6%	0.1%	5.047	3.92	3.362	-33.4%	-0.8%	1.349	1.469	1.589	17.8%	0.3%
Spain	81.35	84.72	86.53	6.4%	0.1%	4.31	3.658	3.358	-22.1%	-0.5%	1.358	1.476	1.593	17.3%	0.3%
Greece	80	83.06	85.25	6.6%	0.1%	7.071	5.161	3.908	-44.7%	-1.2%	1.311	1.441	1.571	19.8%	0.4%
Portugal	78.63	83.27	87.14	10.8%	0.2%	5.382	4.026	3.189	-40.7%	-1.0%	1.424	1.524	1.624	14.0%	0.3%
Serbia	73.5	79.13	87.09	18.5%	0.3%	11.97	7.69	3.172	-73.5%	-2.6%	1.471	1.559	1.646	11.9%	0.2%
Croatia	76.05	81.76	87.15	14.6%	0.3%	6.555	4.6	3.201	-51.2%	-1.4%	1.443	1.538	1.633	13.2%	0.2%
Bosnia and Herzegovina	74.47	76.33	81.94	10.0%	0.2%	13.37	12.48	6.72	-49.7%	-1.4%	1.236	1.386	1.536	24.3%	0.4%
Albania	76.09	80	86.92	14.2%	0.3%	21.5	14.94	3.368	-84.3%	-3.6%	1.781	1.786	1.791	0.6%	0.0%
Macedonia, TFYR	73.99	75.26	81.1	9.6%	0.2%	16.43	14.71	7.96	-51.6%	-1.4%	1.499	1.579	1.659	10.7%	0.2%
Slovenia	78.91	83.91	86.08	9.1%	0.2%	5.029	3.815	3.334	-33.7%	-0.8%	1.264	1.407	1.549	22.5%	0.4%
Montenegro	74.83	79.56	87.72	17.2%	0.3%	23.34	14.02	3.545	-84.8%	-3.7%	1.612	1.662	1.712	6.2%	0.1%
Malta	80.35	85.9	87.27	8.6%	0.2%	6.453	3.499	3.301	-48.8%	-1.3%	1.396	1.503	1.611	15.4%	0.3%
Europe-South	**79.85**	**83.46**	**86.23**	**8.0%**	**0.2%**	**6.209**	**4.836**	**3.533**	**-43.1%**	**-1.1%**	**1.371**	**1.486**	**1.601**	**16.8%**	**0.3%**
Germany	79.63	82.71	84.59	6.2%	0.1%	4.373	3.847	3.57	-18.4%	-0.4%	1.386	1.496	1.606	15.9%	0.3%
France	81	83.74	85.71	5.8%	0.1%	4.303	3.724	3.399	-21.0%	-0.5%	1.8	1.8	1.8	0.0%	0.0%
Netherlands	79.8	82.22	84.41	5.8%	0.1%	4.92	4.262	3.736	-24.1%	-0.5%	1.734	1.752	1.769	2.0%	0.0%
Belgium	80.25	82.85	84.86	5.7%	0.1%	4.275	3.81	3.504	-18.0%	-0.4%	1.725	1.745	1.765	2.3%	0.0%
Austria	79.86	82.49	84.51	5.8%	0.1%	4.527	3.967	3.579	-20.9%	-0.5%	1.433	1.531	1.628	13.6%	0.3%
Switzerland	81.7	83.87	85.9	5.1%	0.1%	4.294	3.761	3.376	-21.4%	-0.5%	1.443	1.538	1.633	13.2%	0.2%
Luxembourg	79.59	81.8	83.93	5.5%	0.1%	4.627	4.214	3.788	-18.1%	-0.4%	1.706	1.731	1.756	2.9%	0.1%
Europe-West	**80.23**	**83.06**	**85.03**	**6.0%**	**0.1%**	**4.397**	**3.845**	**3.515**	**-20.1%**	**-0.4%**	**1.578**	**1.643**	**1.704**	**8.0%**	**0.2%**

Health

Base Case
Source: International Futures
Version 6.12, March 2009

	Calories per Capita					Malnourished Children					AIDS Death Rate		
	Per Person Daily					Percent					Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
World	**2853**	**3064**	**3185**	**11.6%**	**0.2%**	**14.57**	**7.143**	**4.185**	**-71.3%**	**-2.5%**	**0.026**	**0.011**	**0.001**
Africa	**2443**	**2574**	**2762**	**13.1%**	**0.2%**	**22.59**	**16.97**	**11.97**	**-47.0%**	**-1.3%**	**0.136**	**0.04**	**0.002**
Americas	**3228**	**3359**	**3416**	**5.8%**	**0.1%**	**3.29**	**1.581**	**0.45**	**-86.3%**	**-3.9%**	**0.009**	**0.005**	**0**
Asia with Oceania	**2775**	**3102**	**3285**	**18.4%**	**0.3%**	**17.7**	**6.061**	**2.054**	**-88.4%**	**-4.2%**	**0.006**	**0.003**	**0**
Europe	**3380**	**3505**	**3481**	**3.0%**	**0.1%**	**0.295**	**0.065**	**0.021**	**-92.9%**	**-5.1%**	**0.007**	**0.003**	**0**
World	**2853**	**3064**	**3185**	**11.6%**	**0.2%**	**14.57**	**7.143**	**4.185**	**-71.3%**	**-2.5%**	**0.026**	**0.011**	**0.001**
Africa-Eastern	**2046**	**2317**	**2738**	**33.8%**	**0.6%**	**26.69**	**20.81**	**10.52**	**-60.6%**	**-1.8%**	**0.199**	**0.046**	**0.002**
Africa-Middle	**1930**	**2164**	**2430**	**25.9%**	**0.5%**	**27.37**	**22.77**	**17.19**	**-37.2%**	**-0.9%**	**0.125**	**0.072**	**0.005**
Africa-Northern	**3046**	**3151**	**3224**	**5.8%**	**0.1%**	**12.38**	**5.53**	**2.901**	**-76.6%**	**-2.9%**	**0.011**	**0.005**	**0**
Africa-Southern	**2926**	**3171**	**3440**	**17.6%**	**0.3%**	**10.83**	**1.039**	**0**	**-100.0%**		**0.52**	**0.177**	**0.009**
Africa-Western	**2580**	**2668**	**2714**	**5.2%**	**0.1%**	**25.43**	**18.14**	**15.59**	**-38.7%**	**-1.0%**	**0.085**	**0.021**	**0.001**
Africa	**2443**	**2574**	**2762**	**13.1%**	**0.2%**	**22.59**	**16.97**	**11.97**	**-47.0%**	**-1.3%**	**0.136**	**0.04**	**0.002**
America-Caribbean	**2713**	**2902**	**3118**	**14.9%**	**0.3%**	**10.45**	**8.278**	**4.697**	**-55.1%**	**-1.6%**	**0.063**	**0.04**	**0.003**
America-Central	**2461**	**2761**	**3095**	**25.8%**	**0.5%**	**12.16**	**7.783**	**2.203**	**-81.9%**	**-3.4%**	**0.027**	**0.016**	**0.001**
America-North	**3635**	**3673**	**3556**	**-2.2%**	**0.0%**	**1.626**	**0.554**	**0**	**-100.0%**		**0.005**	**0.003**	**0**
America-South	**2901**	**3137**	**3340**	**15.1%**	**0.3%**	**3.497**	**1.251**	**0.274**	**-92.2%**	**-5.0%**	**0.007**	**0.003**	**0**
Americas	**3228**	**3359**	**3416**	**5.8%**	**0.1%**	**3.29**	**1.581**	**0.45**	**-86.3%**	**-3.9%**	**0.009**	**0.005**	**0**
Asia-East	**3028**	**3453**	**3613**	**19.3%**	**0.4%**	**2.448**	**0.221**	**0.139**	**-94.3%**	**-5.6%**	**0.004**	**0.003**	**0**
Asia-South Central	**2521**	**2858**	**3105**	**23.2%**	**0.4%**	**32.39**	**11.07**	**3.705**	**-88.6%**	**-4.2%**	**0.001**	**0.001**	**0**
Asia-South East	**2762**	**2998**	**3164**	**14.6%**	**0.3%**	**19.33**	**5.158**	**0.899**	**-95.3%**	**-6.0%**	**0.025**	**0.013**	**0.001**
Asia-West	**2945**	**3114**	**3245**	**10.2%**	**0.2%**	**10.95**	**5.297**	**1.928**	**-82.4%**	**-3.4%**	**0.001**	**0**	**0**
Oceania	**2936**	**3155**	**3244**	**10.5%**	**0.2%**	**5.813**	**3.92**	**2.999**	**-48.4%**	**-1.3%**	**0.006**	**0.003**	**0**
Asia with Oceania	**2775**	**3102**	**3285**	**18.4%**	**0.3%**	**17.7**	**6.061**	**2.054**	**-88.4%**	**-4.2%**	**0.006**	**0.003**	**0**
Europe-East	**3204**	**3422**	**3402**	**6.2%**	**0.1%**	**0.423**	**0.035**	**0**	**-100.0%**		**0.016**	**0.007**	**0**
Europe-North	**3412**	**3556**	**3527**	**3.4%**	**0.1%**	**0.071**	**0**	**0**	**-100.0%**		**0.002**	**0.001**	**0**
Europe-South	**3457**	**3471**	**3479**	**0.6%**	**0.0%**	**0.541**	**0.16**	**0.023**	**-95.7%**	**-6.1%**	**0.002**	**0.001**	**0**
Europe-West	**3561**	**3602**	**3552**	**-0.3%**	**0.0%**	**0**	**0**	**0**			**0.001**	**0.001**	**0**
Europe	**3380**	**3505**	**3481**	**3.0%**	**0.1%**	**0.295**	**0.065**	**0.021**	**-92.9%**	**-5.1%**	**0.007**	**0.003**	**0**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita					Malnourished Children					AIDS Death Rate		
	Per Person Daily					Percent					Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
AFRICA													
Ethiopia	1917	2056	2504	30.6%	0.5%	35.56	31.18	16.83	-52.7%	-1.5%	**0.081**	**0.016**	**0**
Uganda	2431	2732	3139	29.1%	0.5%	22.31	11.54	0	-100.0%		**0.203**	**0.014**	**0**
Tanzania, United Rep. of	2030	2435	3050	50.2%	0.8%	19.3	13.43	1.466	-92.4%	-5.0%	**0.229**	**0.054**	**0.002**
Kenya	2142	2451	2903	35.5%	0.6%	19.22	14.18	4.799	-75.0%	-2.7%	**0.299**	**0.105**	**0.005**
Madagascar	2040	2225	2553	25.1%	0.4%	35.67	28.01	16.39	-54.1%	-1.5%	**0.004**	**0.002**	**0**
Mozambique	2164	2676	3259	50.6%	0.8%	21.53	9.886	0	-100.0%		**0.299**	**0.105**	**0.005**
Malawi	2176	2255	2571	18.2%	0.3%	19.84	19.97	13.19	-33.5%	-0.8%	**0.403**	**0.094**	**0.003**
Zambia	1990	2314	2761	38.7%	0.7%	24.26	18.15	8.282	-65.9%	-2.1%	**0.484**	**0.156**	**0.007**
Burundi	1698	1963	2518	48.3%	0.8%	45.97	35.51	16.67	-63.7%	-2.0%	**0.109**	**0.005**	**0**
Rwanda	2121	2356	2675	26.1%	0.5%	18.79	15.98	10.03	-46.6%	-1.2%	**0.099**	**0.005**	**0**
Somalia	1500	1727	1714	14.3%	0.3%	41.85	37.31	41.35	-1.2%	0.0%	**0.013**	**0.006**	**0**
Zimbabwe	1997	2402	2782	39.3%	0.7%	15.14	12.05	6.69	-55.8%	-1.6%	**0.449**	**0.014**	**0**
Eritrea	1500	1500	1500	0.0%	0.0%	40.77	45.41	50.04	22.7%	0.4%	**0.145**	**0.086**	**0.005**
Mauritius	3000	3241	3402	13.4%	0.3%	10.33	0	0	-100.0%		**0.022**	**0.011**	**0.001**
Comoros	1813	2115	2600	43.4%	0.7%	30.04	24.02	12.45	-58.6%	-1.7%	**0.001**	**0**	**0**
Djibouti	2272	2481	2748	21.0%	0.4%	23.3	17.2	9.765	-58.1%	-1.7%	**0.096**	**0.034**	**0.002**
Africa-Eastern	**2046**	**2317**	**2738**	**33.8%**	**0.6%**	**26.69**	**20.81**	**10.52**	**-60.6%**	**-1.8%**	**0.199**	**0.046**	**0.002**
Congo; Dem. Rep. of	1662	1928	2321	39.7%	0.7%	28.45	26.15	18.77	-34.0%	-0.8%	**0.119**	**0.102**	**0.008**
Angola	2193	2510	2624	19.7%	0.4%	34.59	20.28	15.3	-55.8%	-1.6%	**0.086**	**0.034**	**0.002**
Cameroon	2320	2511	2732	17.8%	0.3%	19.29	14.99	9.685	-49.8%	-1.4%	**0.187**	**0.032**	**0.001**
Chad	2142	2377	2414	12.7%	0.2%	32.84	23.19	21.37	-34.9%	-0.9%	**0.09**	**0.022**	**0.001**
Central African Republic	2022	2250	2533	25.3%	0.5%	24.86	20.67	14.42	-42.0%	-1.1%	**0.221**	**0.064**	**0.003**
Congo, Rep. of	2224	2521	2638	18.6%	0.3%	10.8	9.502	9.618	-10.9%	-0.2%	**0.126**	**0.016**	**0**
Gabon	2679	2879	2979	11.2%	0.2%	10.85	5.921	3.532	-67.4%	-2.2%	**0.103**	**0.01**	**0**
Equatorial Guinea	3398	3377	3136	-7.7%	-0.2%	17.08	10.9	7.97	-53.3%	-1.5%	**0.154**	**0.083**	**0.005**
São Tomé and Príncipe	2468	2468	2632	6.6%	0.1%	11.86	13.66	11.22	-5.4%	-0.1%	**0.001**	**0**	**0**
Africa-Middle	**1930**	**2164**	**2430**	**25.9%**	**0.5%**	**27.37**	**22.77**	**17.19**	**-37.2%**	**-0.9%**	**0.125**	**0.072**	**0.005**
Egypt	3351	3415	3508	4.7%	0.1%	6.038	2.463	0	-100.0%		**0.001**	**0**	**0**
Sudan	2317	2656	2848	22.9%	0.4%	39.28	19.03	9.507	-75.8%	-2.8%	**0.05**	**0.018**	**0.001**
Algeria	3032	3108	3075	1.4%	0.0%	7.679	0.891	2.482	-67.7%	-2.2%	**0.002**	**0.001**	**0**
Morocco	3073	3134	3201	4.2%	0.1%	6.098	0	0	-100.0%		**0.003**	**0.001**	**0**
Tunisia	3274	3431	3538	8.1%	0.2%	0.778	0	0	-100.0%		**0.002**	**0.001**	**0**
Libyan Arab Jamahiriya	3352	3458	3294	-1.7%	0.0%	0	0	0			**0.001**	**0**	**0**
Africa-Northern	**3046**	**3151**	**3224**	**5.8%**	**0.1%**	**12.38**	**5.53**	**2.901**	**-76.6%**	**-2.9%**	**0.011**	**0.005**	**0**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita Per Person Daily					Malnourished Children Percent					AIDS Death Rate Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
AFRICA continued													
South Africa	3001	3234	3479	15.9%	0.3%	10.35	0	0	-100.0%		**0.535**	**0.187**	**0.009**
Namibia	2356	2768	3309	40.4%	0.7%	20.31	8.901	0	-100.0%		**0.341**	**0.11**	**0.005**
Lesotho	2673	2856	3144	17.6%	0.3%	15.52	8.408	0	-100.0%		**0.41**	**0.122**	**0.005**
Botswana	2261	2839	3271	44.7%	0.7%	6.935	3.498	0	-100.0%		**0.441**	**0.089**	**0.002**
Swaziland	2376	2736	3136	32.0%	0.6%	11.62	6.897	0	-100.0%		**0.537**	**0.163**	**0.007**
Africa-Southern	**2926**	**3171**	**3440**	**17.6%**	**0.3%**	**10.83**	**1.039**	**0**	**-100.0%**		0.52	0.177	0.009
Nigeria	2739	2859	2704	-1.3%	0.0%	25.55	14.46	19.2	-24.9%	-0.6%	**0.1**	**0.024**	**0.001**
Niger	2146	2276	2593	20.8%	0.4%	39.49	31.13	16.99	-57.0%	-1.7%	**0.019**	**0.008**	**0.001**
Côte d'Ivoire	2641	2750	2806	6.2%	0.1%	20.24	13.92	10.53	-48.0%	-1.3%	**0.167**	**0.007**	**0**
Ghana	2686	2637	2669	-0.6%	0.0%	20.58	20.53	16.66	-19.0%	-0.4%	**0.071**	**0.014**	**0**
Burkina Faso	2485	2659	2949	18.7%	0.3%	35.51	21.73	6.532	-81.6%	-3.3%	**0.052**	**0.009**	**0**
Mali	2205	2406	2735	24.0%	0.4%	30.03	21.99	10.91	-63.7%	-2.0%	**0.031**	**0.011**	**0.001**
Senegal	2314	2499	2755	19.1%	0.3%	17.42	14.21	8.671	-50.2%	-1.4%	**0.013**	**0.006**	**0**
Guinea	2431	2638	2852	17.3%	0.3%	24	15.41	7.864	-67.2%	-2.2%	**0.033**	**0.012**	**0.001**
Benin	2567	2616	2796	8.9%	0.2%	19.37	16.57	9.757	-49.6%	-1.4%	**0.03**	**0.004**	**0**
Togo	2357	1701	2357	0.0%	0.0%	20.83	45.85	21.6	3.7%	0.1%	**0.103**	**0.025**	**0.001**
Sierra Leone	1998	2374	2767	38.5%	0.7%	25.92	17.44	8.371	-67.7%	-2.2%	**0.242**	**0.188**	**0.011**
Liberia	1933	1585	2357	21.9%	0.4%	28.75	44.16	19.76	-31.3%	-0.7%	**0.088**	**0.035**	**0.002**
Mauritania	2778	2742	2793	0.5%	0.0%	21.41	20.2	14.25	-33.4%	-0.8%	**0.025**	**0.011**	**0.001**
Guinea-Bissau	2054	2127	2329	13.4%	0.3%	27.3	26.45	21.31	-21.9%	-0.5%	**0.053**	**0.018**	**0.001**
Gambia	2298	2418	2631	14.5%	0.3%	6.855	9.59	9.001	31.3%	0.5%	**0.025**	**0.009**	**0**
Cape Verde	3265	3447	3653	11.9%	0.2%	12.48	6.87	0	-100.0%		**0.001**	**0**	**0**
Africa-Western	**2580**	**2668**	**2714**	**5.2%**	**0.1%**	**25.43**	**18.14**	**15.59**	**-38.7%**	**-1.0%**	0.085	0.021	0.001

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita Per Person Daily					Malnourished Children Percent					AIDS Death Rate Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
AMERICAS													
Haiti	2132	2322	2568	20.5%	0.4%	17.85	16.42	12.52	-29.9%	-0.7%	**0.066**	**0.023**	**0.001**
Dominican Republic	2447	2904	3288	34.4%	0.6%	3.289	2.241	0	-100.0%		**0.143**	**0.107**	**0.007**
Cuba	3168	3297	3564	12.5%	0.2%	17.01	11.19	2.097	-87.7%	-4.1%	**0.001**	**0**	**0**
Puerto Rico	3296	3522	3567	8.2%	0.2%	0	0	0			**0.001**	**0**	**0**
Jamaica	2720	2875	3080	13.2%	0.2%	3.655	3.335	0.733	-79.9%	-3.2%	**0.079**	**0.039**	**0.002**
Trinidad and Tobago	2834	3190	3335	17.7%	0.3%	4.268	0	0	-100.0%		**0.174**	**0.119**	**0.008**
Bahamas	2818	3076	3363	19.3%	0.4%	8.119	1.164	0	-100.0%		**0.047**	**0.016**	**0.001**
Barbados	3133	3317	3579	14.2%	0.3%	0	0	0			**0.028**	**0.012**	**0.001**
St. Vincent & the Grenadines	2654	2906	3239	22.0%	0.4%	12.22	5.467	0	-100.0%		**0.001**	**0**	**0**
Grenada	2966	3095	3370	13.6%	0.3%	4.052	0.668	0	-100.0%		**0.001**	**0**	**0**
St. Lucia	3029	3193	3417	12.8%	0.2%	2.373	0	0	-100.0%		**0.001**	**0**	**0**
America-Caribbean	**2713**	**2902**	**3118**	**14.9%**	**0.3%**	**10.45**	**8.278**	**4.697**	**-55.1%**	**-1.6%**	0.063	0.04	0.003
Guatemala	2289	2613	2994	30.8%	0.5%	18.67	11.61	2.921	-84.4%	-3.6%	**0.025**	**0.011**	**0.001**
Honduras	2412	2679	2993	24.1%	0.4%	12.36	8.61	2.72	-78.0%	-3.0%	**0.063**	**0.05**	**0.003**
El Salvador	2643	2936	3267	23.6%	0.4%	8.613	3.611	0	-100.0%		**0.019**	**0.008**	**0.001**
Nicaragua	2353	2604	2894	23.0%	0.4%	9.954	8.507	4.445	-55.3%	-1.6%	**0.007**	**0.003**	**0**
Costa Rica	2949	3325	3583	21.5%	0.4%	3.595	0	0	-100.0%		**0.006**	**0.003**	**0**
Panama	2377	2885	3341	40.6%	0.7%	7.832	3.32	0	-100.0%		**0.024**	**0.01**	**0.001**
Belize	2921	3219	3417	17.0%	0.3%	8.954	0	0	-100.0%		**0.052**	**0.018**	**0.001**
America-Central	**2461**	**2761**	**3095**	**25.8%**	**0.5%**	**12.16**	**7.783**	**2.203**	**-81.9%**	**-3.4%**	0.027	0.016	0.001
United States of America	3796	3800	3605	-5.0%	-0.1%	0.642	0	0	-100.0%		**0.005**	**0.003**	**0**
Mexico	3182	3304	3402	6.9%	0.1%	4.939	2.295	0	-100.0%		**0.008**	**0.004**	**0**
Canada	3611	3697	3581	-0.8%	0.0%	0	0	0			**0.001**	**0**	**0**
America-North	**3635**	**3673**	**3556**	**-2.2%**	**0.0%**	**1.626**	**0.554**	**0**	**-100.0%**		0.005	0.003	0
Brazil	3084	3269	3427	11.1%	0.2%	2.83	0	0	-100.0%		**0.004**	**0.001**	**0**
Colombia	2649	2927	3295	24.4%	0.4%	4.859	2.757	0	-100.0%		**0.016**	**0.007**	**0**
Argentina	3061	3337	3523	15.1%	0.3%	1.259	0	0	-100.0%		**0.01**	**0.004**	**0**
Venezuela, RB	2425	2818	3092	27.5%	0.5%	4.632	3.539	0.479	-89.7%	-4.4%	**0.001**	**0**	**0**
Peru	2646	2957	3184	20.3%	0.4%	4.38	2.198	0	-100.0%		**0.008**	**0.004**	**0**
Chile	2938	3292	3476	18.3%	0.3%	0.507	0	0	-100.0%		**0.006**	**0.002**	**0**
Ecuador	2789	2918	2967	6.4%	0.1%	9.926	5.775	4.239	-57.3%	-1.7%	**0.008**	**0.003**	**0**
Bolivia	2317	2736	3082	33.0%	0.6%	7.297	5.144	0.683	-90.6%	-4.6%	**0.004**	**0.002**	**0**
Paraguay	2605	2754	2962	13.7%	0.3%	5.446	5.404	2.955	-45.7%	-1.2%	**0.024**	**0.012**	**0.001**
Uruguay	2897	3193	3429	18.4%	0.3%	3.558	0	0	-100.0%		**0.011**	**0.005**	**0**
Guyana	2736	2980	3257	19.0%	0.3%	7.765	2.982	0	-100.0%		**0.101**	**0.035**	**0.002**
Suriname	2721	2985	3196	17.5%	0.3%	9.455	3.197	0	-100.0%		**0.062**	**0.031**	**0.002**
America-South	**2901**	**3137**	**3340**	**15.1%**	**0.3%**	**3.497**	**1.251**	**0.274**	**-92.2%**	**-5.0%**	0.007	0.003	**0**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita Per Person Daily					Malnourished Children Percent					AIDS Death Rate Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
ASIA WITH OCEANIA													
China	3052	3495	3651	19.6%	0.4%	1.783	0	0	-100.0%		**0.005**	**0.003**	**0**
Japan	2832	3145	3343	18.0%	0.3%	7.733	0	0	-100.0%		**0.001**	**0**	**0**
Korea, Rep. of	3137	3435	3457	10.2%	0.2%	0	0	0			**0.001**	**0**	**0**
Taiwan	3239	3473	3554	9.7%	0.2%	0	0	0			**0.001**	**0**	**0**
Korea, Dem. Rep. of	2221	2471	2689	21.1%	0.4%	19.26	14.64	10.26	-46.7%	-1.3%	**0.001**	**0**	**0**
Hong Kong	3274	3432	3426	4.6%	0.1%	0	0	0			**0.001**	**0**	**0**
Mongolia	2322	2642	3040	30.9%	0.5%	12.3	8.62	1.634	-86.7%	-4.0%	**0.001**	**0**	**0**
Asia-East	**3028**	**3453**	**3613**	**19.3%**	**0.4%**	**2.448**	**0.221**	**0.139**	**-94.3%**	**-5.6%**	**0.004**	**0.003**	**0**
India	2548	2961	3277	28.6%	0.5%	34.93	7.781	0	-100.0%		**0.001**	**0**	**0**
Pakistan	2476	2662	2865	15.7%	0.3%	29.27	18.1	8.672	-70.4%	-2.4%	**0.002**	**0.001**	**0**
Bangladesh	2278	2637	2890	26.9%	0.5%	39.98	19.28	7.811	-80.5%	-3.2%	**0.001**	**0**	**0**
Afghanistan	1788	1823	2214	23.8%	0.4%	36.17	37	24.94	-31.0%	-0.7%	**0.001**	**0**	**0**
Iran, Islamic Rep. of	3122	3341	3272	4.8%	0.1%	0	0	0			**0.003**	**0.001**	**0**
Nepal	2480	2623	2779	12.1%	0.2%	38.38	25	13.97	-63.6%	-2.0%	**0.013**	**0.006**	**0**
Uzbekistan	2317	2586	2781	20.0%	0.4%	3.492	5.596	5.514	57.9%	0.9%	**0.001**	**0**	**0**
Sri Lanka	2464	2832	3183	29.2%	0.5%	24.09	9.318	0	-100.0%		**0.001**	**0**	**0**
Kazakhstan	2800	3227	3231	15.4%	0.3%	10.27	0	0	-100.0%		**0.001**	**0**	**0**
Tajikistan	1919	2259	2677	39.5%	0.7%	38.64	25.68	12.19	-68.5%	-2.3%	**0.002**	**0.001**	**0**
Turkmenistan	2778	3246	3011	8.4%	0.2%	8.572	0	2.755	-67.9%	-2.2%	**0.001**	**0**	**0**
Kyrgyzstan	2997	2955	2887	-3.7%	-0.1%	5.796	6.898	8.537	47.3%	0.8%	**0.001**	**0.001**	**0**
Bhutan	2693	3021	3344	24.2%	0.4%	7.13	1.847	0	-100.0%		**0.001**	**0**	**0**
Maldives	2636	3124	3556	34.9%	0.6%	23.74	0	0	-100.0%		**0.001**	**0**	**0**
Asia-South Central	**2521**	**2858**	**3105**	**23.2%**	**0.4%**	**32.39**	**11.07**	**3.705**	**-88.6%**	**-4.2%**	**0.001**	**0.001**	**0**
Indonesia	2942	3078	3156	7.3%	0.1%	18.43	3.48	0	-100.0%		**0.002**	**0.001**	**0**
Philippines	2443	2763	3064	25.4%	0.5%	24.95	11.7	1.676	-93.3%	-5.3%	**0.001**	**0**	**0**
Vietnam	2651	3030	3244	22.4%	0.4%	23.39	3.735	0	-100.0%		**0.016**	**0.007**	**0**
Thailand	2544	2901	3208	26.1%	0.5%	15.36	5.571	0	-100.0%		**0.048**	**0.007**	**0**
Myanmar	3036	3134	3050	0.5%	0.0%	14.77	0	6.821	-53.8%	-1.5%	**0.159**	**0.133**	**0.009**
Malaysia	2951	3260	3420	15.9%	0.3%	6.235	0	0	-100.0%		**0.014**	**0.007**	**0**
Cambodia	2143	2649	3014	40.6%	0.7%	28.38	12.55	2.723	-90.4%	-4.6%	**0.044**	**0.001**	**0**
Lao PDR	2380	2865	3294	38.4%	0.7%	34.02	9.703	0	-100.0%		**0.001**	**0.001**	**0**
Singapore	3555	3609	3513	-1.2%	0.0%	2.575	0	0	-100.0%		**0.006**	**0.003**	**0**
Timor-Leste	2741	2891	3136	14.4%	0.3%	60.47	27.79	0	-100.0%		**0.001**	**0**	**0**
Brunei Darussalam	2919	3182	3336	14.3%	0.3%	5.311	0	0	-100.0%		**0.001**	**0**	**0**
Asia-South East	**2762**	**2998**	**3164**	**14.6%**	**0.3%**	**19.33**	**5.158**	**0.899**	**-95.3%**	**-6.0%**	**0.025**	**0.013**	**0.001**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita Per Person Daily					Malnourished Children Percent					AIDS Death Rate Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
ASIA WITH OCEANIA continued													
Turkey	3384	3530	3601	6.4%	0.1%	2.375	0	0	-100.0%		**0.001**	**0**	**0**
Yemen	2088	2474	2801	34.1%	0.6%	46.4	24.59	10.42	-77.5%	-2.9%	**0.001**	**0**	**0**
Iraq	2483	2834	3110	25.3%	0.5%	20.24	8.294	0.293	-98.6%	-8.1%	**0.001**	**0**	**0**
Saudi Arabia	2889	3108	3231	11.8%	0.2%	11.56	0.547	0	-100.0%		**0.001**	**0**	**0**
Syria	3046	3102	3220	5.7%	0.1%	2.779	0.651	0	-100.0%		**0.001**	**0**	**0**
Israel	3679	3800	3611	-1.8%	0.0%	0	0	0			**0.001**	**0**	**0**
Azerbaijan	2698	2997	3070	13.8%	0.3%	8.724	2.637	1.164	-86.7%	-3.9%	**0.002**	**0.001**	**0**
Jordan	2732	3082	3461	26.7%	0.5%	3.832	0.539	0	-100.0%		**0.001**	**0**	**0**
Palestine	2236	2598	3028	35.4%	0.6%	5.959	6.287	1.544	-74.1%	-2.7%	**0.001**	**0**	**0**
United Arab Emirates	3254	3371	3387	4.1%	0.1%	0	0	0			**0.001**	**0**	**0**
Oman	3265	3352	3348	2.5%	0.1%	11.61	6.93	2.42	-79.2%	-3.1%	**0.001**	**0**	**0**
Kuwait	3063	3326	3292	7.5%	0.1%	0.09	0	0	-100.0%		**0.001**	**0**	**0**
Lebanon	3207	3338	3392	5.8%	0.1%	3.643	1.115	0	-100.0%		**0.004**	**0.002**	**0**
Georgia	2448	2727	2950	20.5%	0.4%	9.385	6.69	3.405	-63.7%	-2.0%	**0.001**	**0**	**0**
Armenia	2376	2893	3177	33.7%	0.6%	4.412	2.51	0	-100.0%		**0.005**	**0.002**	**0**
Bahrain	3456	3486	3505	1.4%	0.0%	7.692	3.282	0	-100.0%		**0.001**	**0**	**0**
Qatar	3746	3681	3522	-6.0%	-0.1%	4.301	0	0	-100.0%		**0.001**	**0**	**0**
Cyprus	3291	3417	3455	5.0%	0.1%	0	0	0			**0.001**	**0**	**0**
Asia-West	**2945**	**3114**	**3245**	**10.2%**	**0.2%**	**10.95**	**5.297**	**1.928**	**-82.4%**	**-3.4%**	**0.001**	**0**	**0**
Australia	3111	3364	3450	10.9%	0.2%	0.259	0	0	-100.0%		**0.001**	**0.001**	**0**
Papua New Guniea	2222	2587	2746	23.6%	0.4%	26.98	14.9	10.17	-62.3%	-1.9%	**0.024**	**0.012**	**0.001**
New Zealand	3257	3424	3547	8.9%	0.2%	0	0	0			**0.002**	**0.001**	**0**
Solomon Islands	2313	2487	2662	15.1%	0.3%	19.95	15.9	11.68	-41.5%	-1.1%	**0.001**	**0**	**0**
Fiji	2917	3044	3283	12.5%	0.2%	1.121	0.833	0	-100.0%		**0.001**	**0**	**0**
Vanuatu	2627	2796	3052	16.2%	0.3%	9.711	6.872	1.536	-84.2%	-3.6%	**0.001**	**0**	**0**
Micronesia	2794	2922	3188	14.1%	0.3%	8.787	5.249	0	-100.0%		**0.001**	**0**	**0**
Tonga	2763	2875	3120	12.9%	0.2%	9.69	6.542	0.039	-99.6%	-10.4%	**0.001**	**0**	**0**
Samoa	2972	3116	3379	13.7%	0.3%	8.609	0.249	0	-100.0%		**0.001**	**0**	**0**
Oceania	**2936**	**3155**	**3244**	**10.5%**	**0.2%**	**5.813**	**3.92**	**2.999**	**-48.4%**	**-1.3%**	**0.006**	**0.003**	**0**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Calories per Capita Per Person Daily					Malnourished Children Percent					AIDS Death Rate Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060
EUROPE													
Russian Federation	3151	3437	3369	6.9%	0.1%	0	0	0			**0.019**	**0.008**	**0**
Ukraine	3120	3350	3419	9.6%	0.2%	0.167	0	0	-100.0%		**0.039**	**0.019**	**0.001**
Poland	3424	3563	3554	3.8%	0.1%	0	0	0			**0.001**	**0**	**0**
Romania	3486	3514	3407	-2.3%	0.0%	1.337	0	0	-100.0%		**0.002**	**0.001**	**0**
Czech Republic	3215	3322	3373	4.9%	0.1%	0	0	0			**0.001**	**0**	**0**
Belarus	3076	3295	3354	9.0%	0.2%	1.167	0	0	-100.0%		**0.008**	**0.003**	**0**
Hungary	3504	3530	3488	-0.5%	0.0%	0	0	0			**0.001**	**0**	**0**
Bulgaria	2915	3135	3324	14.0%	0.3%	5.426	0	0	-100.0%		**0.001**	**0**	**0**
Slovakia	2957	3127	3274	10.7%	0.2%	4.297	0	0	-100.0%		**0.001**	**0**	**0**
Moldova, Rep. of	2848	2952	3133	10.0%	0.2%	3.029	2.525	0	-100.0%		**0.003**	**0.002**	**0**
Europe-East	**3204**	**3422**	**3402**	**6.2%**	**0.1%**	**0.423**	**0.035**	**0**	**-100.0%**		**0.016**	**0.007**	**0**
United Kingdom	3444	3566	3533	2.6%	0.1%	0	0	0			**0.001**	**0**	**0**
Sweden	3251	3492	3477	7.0%	0.1%	0	0	0			**0.001**	**0**	**0**
Denmark	3472	3599	3572	2.9%	0.1%	0	0	0			**0.003**	**0.001**	**0**
Ireland	3718	3785	3588	-3.5%	-0.1%	0	0	0			**0.002**	**0.001**	**0**
Norway	3529	3658	3571	1.2%	0.0%	0	0	0			**0.002**	**0.001**	**0**
Finland	3173	3384	3443	8.5%	0.2%	0	0	0			**0.001**	**0**	**0**
Lithuania	3375	3472	3485	3.3%	0.1%	0	0	0			**0.002**	**0.001**	**0**
Latvia	3019	3300	3461	14.6%	0.3%	2.637	0	0	-100.0%		**0.012**	**0.006**	**0**
Estonia	3093	3322	3469	12.2%	0.2%	0.718	0	0	-100.0%		**0.021**	**0.01**	**0.001**
Iceland	3313	3523	3496	5.5%	0.1%	0	0	0			**0.001**	**0**	**0**
Europe-North	**3412**	**3556**	**3527**	**3.4%**	**0.1%**	**0.071**	**0**	**0**	**-100.0%**		**0.002**	**0.001**	**0**
Italy	3654	3579	3531	-3.4%	-0.1%	0	0	0			**0.002**	**0.001**	**0**
Spain	3389	3471	3507	3.5%	0.1%	0	0	0			**0.003**	**0.001**	**0**
Greece	3724	3647	3511	-5.7%	-0.1%	0	0	0			**0.001**	**0**	**0**
Portugal	3714	3634	3586	-3.4%	-0.1%	0	0	0			**0.004**	**0.002**	**0**
Serbia	2753	2996	3223	17.1%	0.3%	2.355	1.425	0	-100.0%		**0.001**	**0**	**0**
Croatia	2865	3075	3292	14.9%	0.3%	0.853	0.429	0	-100.0%		**0.001**	**0**	**0**
Bosnia and Herzegovina	2927	3008	3149	7.6%	0.1%	1.066	1.227	0	-100.0%		**0.001**	**0**	**0**
Albania	2910	3175	3317	14.0%	0.3%	14.16	0	0	-100.0%		**0.001**	**0**	**0**
Macedonia, TFYR	2700	2813	3021	11.9%	0.2%	1.894	3.19	1.579	-16.6%	-0.4%	**0.001**	**0**	**0**
Slovenia	3063	3269	3430	12.0%	0.2%	1.486	0	0	-100.0%		**0.004**	**0.002**	**0**
Montenegro	2924	3122	3384	15.7%	0.3%	5.173	0	0	-100.0%		**0.001**	**0**	**0**
Malta	3599	3647	3700	2.8%	0.1%	0	0	0			**0.001**	**0**	**0**
Europe-South	**3457**	**3471**	**3479**	**0.6%**	**0.0%**	**0.541**	**0.16**	**0.023**	**-95.7%**	**-6.1%**	**0.002**	**0.001**	**0**
Germany	3507	3580	3543	1.0%	0.0%	0	0	0			**0.001**	**0**	**0**
France	3657	3657	3583	-2.0%	0.0%	0	0	0			**0.002**	**0.001**	**0**
Netherlands	3393	3467	3465	2.1%	0.0%	0	0	0			**0.001**	**0**	**0**
Belgium	3586	3584	3535	-1.4%	0.0%	0	0	0			**0.001**	**0**	**0**
Austria	3676	3692	3583	-2.5%	-0.1%	0	0	0			**0.001**	**0**	**0**
Switzerland	3553	3620	3558	0.1%	0.0%	0	0	0			**0.005**	**0.002**	**0**
Luxembourg	3738	3718	3598	-3.7%	-0.1%	0	0	0			**0.001**	**0**	**0**
Europe-West	**3561**	**3602**	**3552**	**-0.3%**	**0.0%**	**0**	**0**	**0**			**0.001**	**0.001**	**0**

Health

Base Case

Source: International Futures Version 6.12, Mar 2009

	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
World	0.317	0.35	0.431	0.168	0.302	0.636	3.151	1.639	0.967	2.777	3.782	5.114	1.247	1.811	2.491	0.482	0.61	0.862
Africa	0.217	0.221	0.265	0.161	0.17	0.253	8.912	4.154	1.901	1.499	1.931	2.877	0.53	0.799	1.525	0.424	0.432	0.568
Americas	0.342	0.433	0.565	0.195	0.397	0.866	0.85	0.44	0.339	2.253	3.027	3.727	1.354	1.801	2.283	0.63	0.838	1.12
Asia with Oceania	0.313	0.348	0.451	0.16	0.312	0.733	2.742	1.24	0.779	2.681	4.07	6.018	1.212	2.009	2.891	0.441	0.584	0.91
Europe	0.445	0.529	0.62	0.187	0.408	0.83	0.456	0.321	0.246	5.769	7.415	8.612	2.298	2.875	3.158	0.609	0.854	1.072
World	0.317	0.35	0.431	0.168	0.302	0.636	3.151	1.639	0.967	2.777	3.782	5.114	1.247	1.811	2.491	0.482	0.61	0.862
Africa-Eastern	0.149	0.144	0.161	0.131	0.105	0.114	8.932	3.628	1.111	1.102	1.497	2.422	0.426	0.707	1.641	0.368	0.345	0.44
Africa-Middle	0.207	0.221	0.258	0.155	0.133	0.131	11.62	6.435	3.122	1.263	1.441	1.893	0.538	0.762	1.348	0.354	0.357	0.416
Africa-Northern	0.375	0.441	0.63	0.162	0.3	0.766	2.341	0.834	0.493	2.372	3.526	5.681	0.59	0.877	1.385	0.589	0.73	1.153
Africa-Southern	0.164	0.211	0.296	0.194	0.372	0.849	2.5	0.733	0.512	1.743	2.67	3.725	0.729	1.14	2.068	0.338	0.433	0.7
Africa-Western	0.196	0.189	0.222	0.189	0.162	0.193	13.49	5.842	2.785	1.378	1.7	2.64	0.558	0.832	1.506	0.416	0.407	0.527
Africa	0.217	0.221	0.265	0.161	0.17	0.253	8.912	4.154	1.901	1.499	1.931	2.877	0.53	0.799	1.525	0.424	0.432	0.568
America-Caribbean	0.305	0.373	0.454	0.139	0.237	0.451	2.302	1.496	0.855	2.291	3.064	4.021	1.027	1.409	2.164	0.655	0.879	1.165
America-Central	0.322	0.346	0.456	0.101	0.152	0.346	1.949	0.562	0.319	1.234	1.671	2.643	0.653	0.909	1.461	0.525	0.575	0.81
America-North	0.355	0.481	0.625	0.171	0.357	0.74	0.476	0.349	0.289	2.587	3.199	3.496	1.681	2.096	2.331	0.822	1.136	1.444
America-South	0.333	0.397	0.527	0.24	0.487	1.118	1.011	0.422	0.345	1.981	3.012	4.105	1.092	1.632	2.363	0.422	0.541	0.809
Americas	0.342	0.433	0.565	0.195	0.397	0.866	0.85	0.44	0.339	2.253	3.027	3.727	1.354	1.801	2.283	0.63	0.838	1.12
Asia-East	0.34	0.438	0.689	0.194	0.542	1.462	0.789	0.493	0.488	3.006	4.653	5.983	1.894	3.341	4.834	0.405	0.627	1.026
Asia-South Central	0.314	0.3	0.315	0.12	0.131	0.219	4.837	2.049	1.117	2.537	3.779	6.076	0.731	1.266	2.014	0.428	0.504	0.764
Asia-South East	0.286	0.337	0.429	0.195	0.366	0.946	2.223	0.84	0.568	2.231	3.662	5.945	0.948	1.526	2.135	0.539	0.725	1.146
Asia-West	0.197	0.236	0.337	0.13	0.207	0.466	2.108	0.67	0.335	2.683	3.917	6.196	0.699	1.047	1.552	0.498	0.551	0.858
Oceania	0.25	0.317	0.391	0.166	0.286	0.488	1.477	0.718	0.464	2.591	3.514	3.978	1.67	2.01	2.242	0.704	0.96	1.151
Asia with Oceania	0.313	0.348	0.451	0.16	0.312	0.733	2.742	1.24	0.779	2.681	4.07	6.018	1.212	2.009	2.891	0.441	0.584	0.91
Europe-East	0.481	0.527	0.612	0.125	0.25	0.553	0.36	0.178	0.126	8.098	10.32	13.8	2.036	2.755	3.155	0.336	0.339	0.391
Europe-North	0.407	0.484	0.568	0.19	0.329	0.574	0.814	0.629	0.475	3.924	4.694	4.239	2.349	2.515	2.612	0.77	1.034	1.17
Europe-South	0.41	0.527	0.667	0.335	0.829	1.888	0.381	0.273	0.226	4.522	6.725	8.25	2.434	3.072	3.543	0.757	1.188	1.734
Europe-West	0.457	0.575	0.644	0.157	0.338	0.566	0.463	0.385	0.278	4.067	5.371	4.794	2.584	3.105	3.244	0.825	1.219	1.428
Europe	0.445	0.529	0.62	0.187	0.408	0.83	0.456	0.321	0.246	5.769	7.415	8.612	2.298	2.875	3.158	0.609	0.854	1.072

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA																		
Ethiopia	0.207	0.2	0.188	0.187	0.15	0.106	11.45	5.663	1.397	1.293	1.889	2.773	0.529	0.845	1.984	0.583	0.51	0.482
Uganda	0.102	0.089	0.105	0.11	0.078	0.118	8.512	2.564	0.588	0.85	0.95	1.6	0.327	0.513	1.178	0.248	0.213	0.308
Tanzania, United Rep. of	0.118	0.107	0.12	0.075	0.05	0.069	7.044	1.903	0.561	1.03	1.4	2.249	0.39	0.704	1.711	0.301	0.32	0.512
Kenya	0.105	0.125	0.179	0.084	0.082	0.13	5.758	2.201	0.928	0.879	1.369	2.612	0.333	0.63	1.625	0.247	0.276	0.468
Madagascar	0.23	0.23	0.236	0.208	0.19	0.163	10.78	5.415	1.868	1.47	1.931	2.66	0.603	0.919	1.664	0.407	0.428	0.515
Mozambique	0.121	0.096	0.084	0.114	0.06	0.083	10.17	2.107	0.556	0.956	1.173	1.841	0.386	0.779	1.6	0.288	0.244	0.327
Malawi	0.066	0.059	0.104	0.089	0.069	0.08	6.632	2.951	0.961	0.89	1.099	1.916	0.286	0.411	1.176	0.175	0.172	0.289
Zambia	0.076	0.071	0.116	0.109	0.087	0.137	8.32	3.891	1.591	0.762	0.859	1.6	0.278	0.4	1.1	0.227	0.199	0.3
Burundi	0.139	0.14	0.132	0.115	0.072	0.041	13.93	5.262	0.986	1.05	1.296	1.758	0.419	0.716	1.737	0.303	0.287	0.321
Rwanda	0.185	0.207	0.212	0.13	0.108	0.101	13.06	5.617	1.76	1.079	1.433	2.281	0.47	0.815	1.813	0.355	0.366	0.454
Somalia	0.251	0.21	0.271	0.097	0.048	0.039	9.132	2.389	0.729	1.798	2.802	5.174	0.602	1.022	1.936	0.624	0.534	0.69
Zimbabwe	0.092	0.099	0.204	0.128	0.12	0.278	3.609	1.43	1.66	0.914	1.306	3.09	0.306	0.527	1.585	0.25	0.245	0.532
Eritrea	0.214	0.215	0.245	0.168	0.175	0.173	7.829	5.403	3.098	1.34	1.763	2.714	0.554	0.725	1.172	0.369	0.4	0.503
Mauritius	0.335	0.378	0.392	0.377	1.003	2.302	0.454	0.298	0.256	3.432	5.665	6.917	0.644	1.071	1.443	0.419	0.608	0.843
Comoros	0.232	0.283	0.295	0.216	0.233	0.233	6.541	4.121	1.598	1.486	2.092	3.278	0.621	1.052	2.094	0.417	0.497	0.662
Djibouti	0.375	0.501	0.544	0.115	0.143	0.169	8.641	4.43	1.414	2.031	3.037	4.802	0.698	0.954	1.306	0.568	0.705	0.917
Africa-Eastern	**0.149**	**0.144**	**0.161**	**0.131**	**0.105**	**0.114**	**8.932**	**3.628**	**1.111**	**1.102**	**1.497**	**2.422**	**0.426**	**0.707**	**1.641**	**0.368**	**0.345**	**0.44**
Congo; Dem. Rep. of	0.217	0.234	0.266	0.126	0.088	0.058	10.36	5.702	1.961	1.202	1.322	1.516	0.527	0.764	1.445	0.329	0.325	0.354
Angola	0.21	0.213	0.263	0.199	0.204	0.264	16.58	8.853	6.507	1.182	1.449	2.357	0.533	0.723	1.052	0.44	0.434	0.536
Cameroon	0.179	0.191	0.233	0.182	0.189	0.246	9.006	4.903	2.292	1.386	1.778	2.852	0.549	0.794	1.448	0.34	0.381	0.538
Chad	0.17	0.17	0.196	0.177	0.16	0.189	18.91	10.76	7.169	1.245	1.358	2.024	0.492	0.658	0.935	0.359	0.347	0.417
Central African Republic	0.211	0.22	0.233	0.166	0.138	0.119	9.993	5.589	2.178	1.544	1.727	2.314	0.627	0.898	1.604	0.342	0.358	0.446
Congo, Rep. of	0.207	0.234	0.317	0.17	0.194	0.284	6.606	4.038	3.035	1.417	1.84	3.312	0.576	0.845	1.404	0.366	0.419	0.624
Gabon	0.298	0.386	0.475	0.271	0.53	1.14	5.23	2.114	0.879	2.06	2.493	3.937	0.881	1.051	1.314	0.552	0.616	0.846
Equatorial Guinea	0.253	0.307	0.469	0.255	0.335	0.526	11.33	8.646	8.291	1.727	2.232	4.277	0.733	0.971	1.42	0.495	0.561	0.819
São Tomé and Príncipe	0.187	0.2	0.248	0.222	0.212	0.242	8.454	6.101	2.935	1.711	1.783	3.004	0.608	0.717	1.431	0.363	0.345	0.448
Africa-Middle	**0.207**	**0.221**	**0.258**	**0.155**	**0.133**	**0.131**	**11.62**	**6.435**	**3.122**	**1.263**	**1.441**	**1.893**	**0.538**	**0.762**	**1.348**	**0.354**	**0.357**	**0.416**
Egypt	0.454	0.504	0.788	0.162	0.294	0.725	1.2	0.278	0.202	2.68	3.951	6.074	0.532	0.722	1.123	0.695	0.832	1.321
Sudan	0.345	0.32	0.349	0.133	0.107	0.133	6.67	2.372	1.08	1.949	2.597	4.252	0.65	0.935	1.43	0.675	0.654	0.847
Algeria	0.204	0.299	0.461	0.223	0.578	1.878	1.705	0.653	0.582	1.679	2.977	5.699	0.619	1.108	1.899	0.339	0.571	1.133
Morocco	0.447	0.654	0.903	0.154	0.344	0.938	1.485	0.393	0.23	2.794	4.077	6.222	0.64	0.895	1.379	0.571	0.805	1.269
Tunisia	0.33	0.433	0.757	0.139	0.296	0.927	0.41	0.161	0.171	2.958	4.895	8.443	0.633	1.054	1.927	0.505	0.719	1.374
Libyan Arab Jamahiriya	0.212	0.334	0.567	0.075	0.191	0.607	0.537	0.195	0.169	1.862	3.483	7.014	0.47	0.826	1.155	0.328	0.541	1.01
Africa-Northern	**0.375**	**0.441**	**0.63**	**0.162**	**0.3**	**0.766**	**2.341**	**0.834**	**0.493**	**2.372**	**3.526**	**5.681**	**0.59**	**0.877**	**1.385**	**0.589**	**0.73**	**1.153**

Health

	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
Base Case: Countries in Year 2060	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
Descending Population Sequence	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA continued																		
South Africa	0.171	0.225	0.307	0.204	0.408	0.939	2.355	0.633	0.416	1.805	2.812	3.785	0.759	1.179	1.993	0.343	0.445	0.698
Namibia	0.087	0.101	0.141	0.138	0.181	0.27	3.162	1.369	1.203	1.299	2.027	3.367	0.551	1.083	2.914	0.283	0.371	0.675
Lesotho	0.164	0.134	0.256	0.153	0.11	0.221	4.603	1.73	1.067	1.651	1.806	3.605	0.602	0.837	2.462	0.338	0.323	0.678
Botswana	0.12	0.169	0.333	0.11	0.244	0.76	1.866	0.427	0.364	1.177	1.798	3.311	0.487	0.929	1.988	0.265	0.391	0.848
Swaziland	0.105	0.122	0.252	0.099	0.107	0.207	4.833	1.849	1.54	1.082	1.624	3.272	0.422	0.711	2.311	0.315	0.343	0.642
Africa-Southern	**0.164**	**0.211**	**0.296**	**0.194**	**0.372**	**0.849**	**2.5**	**0.733**	**0.512**	**1.743**	**2.67**	**3.725**	**0.729**	**1.14**	**2.068**	**0.338**	**0.433**	**0.7**
Nigeria	0.201	0.192	0.244	0.194	0.168	0.23	13.2	5.167	3.449	1.33	1.725	2.799	0.542	0.855	1.49	0.441	0.429	0.577
Niger	0.143	0.127	0.119	0.162	0.109	0.069	21.16	9.237	2.085	1.115	1.323	1.721	0.445	0.62	1.165	0.394	0.341	0.334
Côte d'Ivoire	0.203	0.213	0.241	0.147	0.138	0.159	11.09	5.636	2.442	1.371	1.738	2.862	0.571	0.83	1.485	0.356	0.39	0.536
Ghana	0.229	0.266	0.312	0.212	0.244	0.285	6.864	4.439	2.314	1.576	2.246	3.415	0.649	1.033	2.003	0.413	0.499	0.673
Burkina Faso	0.181	0.187	0.198	0.181	0.145	0.16	18.38	8.098	1.997	1.399	1.422	2.288	0.55	0.774	1.676	0.369	0.35	0.474
Mali	0.15	0.107	0.115	0.173	0.096	0.098	18.53	5.81	1.508	1.308	1.288	2.194	0.485	0.597	1.275	0.441	0.316	0.385
Senegal	0.219	0.185	0.208	0.232	0.173	0.2	11.46	5.55	2.011	1.821	1.695	2.831	0.706	0.815	1.55	0.449	0.388	0.529
Guinea	0.206	0.198	0.197	0.197	0.158	0.155	14.54	6.204	2.062	1.446	1.71	2.337	0.607	0.905	1.509	0.366	0.38	0.47
Benin	0.187	0.186	0.198	0.178	0.17	0.172	12.01	5.656	1.931	1.295	1.808	2.593	0.532	0.831	1.526	0.371	0.395	0.497
Togo	0.17	0.186	0.245	0.172	0.187	0.194	10.2	7.236	3.475	1.341	1.806	2.752	0.519	0.71	1.3	0.344	0.387	0.513
Sierra Leone	0.207	0.197	0.179	0.19	0.125	0.099	20.21	7.674	1.97	1.509	1.615	1.814	0.633	1.045	1.703	0.38	0.367	0.4
Liberia	0.187	0.201	0.242	0.17	0.149	0.099	16.79	9.89	3.11	1.158	1.45	1.813	0.508	0.765	1.588	0.369	0.378	0.422
Mauritania	0.206	0.214	0.232	0.212	0.229	0.247	8.615	5.08	2.241	1.753	2.197	3.306	0.674	0.989	1.666	0.373	0.413	0.566
Guinea-Bissau	0.174	0.131	0.138	0.166	0.117	0.085	15.42	6.673	2.476	1.309	1.526	1.896	0.534	0.664	1.123	0.353	0.312	0.342
Gambia	0.227	0.216	0.244	0.231	0.196	0.193	9.937	5.566	2.591	1.842	2.155	2.93	0.744	0.992	1.683	0.459	0.462	0.57
Cape Verde	0.161	0.171	0.269	0.188	0.212	0.567	1.912	0.68	0.492	1.61	2.019	4.537	0.675	1.209	2.835	0.312	0.325	0.687
Africa-Western	**0.196**	**0.189**	**0.222**	**0.189**	**0.162**	**0.193**	**13.49**	**5.842**	**2.785**	**1.378**	**1.7**	**2.64**	**0.558**	**0.832**	**1.506**	**0.416**	**0.407**	**0.527**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
AMERICAS																		
Haiti	0.449	0.472	0.478	0.196	0.199	0.245	7.119	4.11	1.746	1.875	2.187	3.418	0.599	0.809	1.53	0.526	0.546	0.7
Dominican Republic	0.297	0.355	0.454	0.149	0.288	0.658	1.278	0.354	0.196	1.837	2.473	3.431	0.741	1.113	1.726	0.209	0.255	0.366
Cuba	0.281	0.389	0.569	0.061	0.119	0.231	0.723	0.669	0.877	3.158	4.872	6.018	1.694	2.556	4.249	0.456	0.711	1.219
Puerto Rico	0.121	0.155	0.192	0.202	0.448	0.851	0.117	0.08	0.058	1.314	1.743	1.626	0.534	0.735	0.899	2.73	4.062	4.958
Jamaica	0.237	0.265	0.311	0.14	0.251	0.553	0.81	0.33	0.226	2.786	3.541	5.121	1.328	1.59	2.061	0.541	0.644	0.978
Trinidad and Tobago	0.265	0.367	0.504	0.141	0.347	0.891	0.602	0.427	0.405	2.883	4.616	7.031	1.103	1.858	2.496	0.441	0.632	1.05
Bahamas	0.357	0.446	0.489	0.12	0.217	0.414	0.5	0.324	0.284	2.093	3.543	4.514	1.174	1.779	2.314	0.613	0.878	1.221
Barbados	0.274	0.487	0.829	0.196	0.523	1.299	0.497	0.502	0.595	2.778	5.46	6.559	1.454	3.166	5.38	0.743	1.503	2.687
St. Vincent & the Grenadines	0.258	0.309	0.437	0.126	0.233	0.921	1.024	0.36	0.346	2.5	3.272	5.95	1.13	1.59	2.828	0.467	0.504	0.865
Grenada	0.242	0.28	0.274	0.141	0.207	0.381	1.264	0.493	0.404	2.5	2.948	4.668	0.985	1.196	2.046	0.471	0.56	0.967
St. Lucia	0.242	0.279	0.303	0.133	0.338	0.979	0.573	0.284	0.28	2.388	3.774	6.164	0.972	1.523	2.575	0.522	0.74	1.329
America-Caribbean	**0.305**	**0.373**	**0.454**	**0.139**	**0.237**	**0.451**	**2.302**	**1.496**	**0.855**	**2.291**	**3.064**	**4.021**	**1.027**	**1.409**	**2.164**	**0.655**	**0.879**	**1.165**
Guatemala	0.3	0.24	0.281	0.095	0.122	0.26	3.275	0.75	0.357	0.846	0.911	1.328	0.448	0.481	0.73	0.412	0.37	0.459
Honduras	0.374	0.39	0.484	0.093	0.094	0.163	1.926	0.609	0.301	1.47	2.207	4.054	0.704	1.002	1.661	0.644	0.719	1.017
El Salvador	0.372	0.435	0.56	0.152	0.265	0.663	1.531	0.552	0.428	1.407	1.83	3.088	0.686	0.898	1.456	0.84	1.003	1.525
Nicaragua	0.32	0.425	0.542	0.071	0.114	0.245	1.223	0.326	0.123	1.345	2.207	3.877	0.604	0.865	1.193	0.477	0.61	0.881
Costa Rica	0.312	0.468	0.835	0.091	0.204	0.527	0.26	0.161	0.188	1.331	2.177	3.019	0.941	1.859	3.506	0.328	0.463	0.819
Panama	0.219	0.351	0.673	0.091	0.217	0.616	0.947	0.383	0.368	1.597	2.556	3.965	1.009	1.872	3.521	0.403	0.53	0.913
Belize	0.135	0.203	0.401	0.138	0.281	0.715	1.225	0.482	0.642	1.303	1.742	3.214	0.632	1.12	2.355	0.323	0.344	0.736
America-Central	**0.322**	**0.346**	**0.456**	**0.101**	**0.152**	**0.346**	**1.949**	**0.562**	**0.319**	**1.234**	**1.671**	**2.643**	**0.653**	**0.909**	**1.461**	**0.525**	**0.575**	**0.81**
United States of America	0.297	0.378	0.449	0.197	0.389	0.723	0.412	0.334	0.25	3.026	3.476	3.357	1.956	2.328	2.391	0.924	1.256	1.492
Mexico	0.541	0.787	1.178	0.109	0.281	0.848	0.706	0.406	0.423	1.336	2.292	3.929	0.747	1.204	1.947	0.501	0.696	1.196
Canada	0.286	0.439	0.553	0.129	0.303	0.56	0.313	0.302	0.238	2.588	3.598	3.455	2.17	2.87	2.98	0.912	1.465	1.783
America-North	**0.355**	**0.481**	**0.625**	**0.171**	**0.357**	**0.74**	**0.476**	**0.349**	**0.289**	**2.587**	**3.199**	**3.496**	**1.681**	**2.096**	**2.331**	**0.822**	**1.136**	**1.444**
Brazil	0.338	0.37	0.434	0.231	0.475	1.069	0.942	0.33	0.227	2.177	3.348	4.343	0.993	1.44	1.966	0.403	0.515	0.725
Colombia	0.234	0.347	0.533	0.101	0.224	0.528	0.823	0.315	0.243	1.796	3.277	4.735	0.929	1.617	2.591	0.292	0.392	0.626
Argentina	0.311	0.371	0.532	0.657	1.34	3.067	0.785	0.533	0.528	2.461	2.85	3.408	1.644	2.199	3.113	0.52	0.64	0.948
Venezuela, RB	0.226	0.312	0.462	0.066	0.145	0.384	0.582	0.251	0.21	1.718	3.035	5.041	0.876	1.398	1.985	0.327	0.407	0.637
Peru	0.489	0.623	0.884	0.24	0.502	1.3	1.744	0.869	0.835	1.137	1.706	2.717	1.208	1.84	2.736	0.551	0.713	1.178
Chile	0.39	0.523	0.738	0.157	0.43	0.999	0.442	0.421	0.457	1.583	2.468	3.077	1.38	2.555	3.724	0.469	0.769	1.259
Ecuador	0.328	0.453	0.647	0.132	0.277	0.681	1.27	0.559	0.402	1.489	2.415	3.786	0.814	1.137	1.497	0.42	0.558	0.818
Bolivia	0.582	0.596	0.849	0.272	0.31	0.517	3.596	1.163	0.998	1.309	1.822	3.167	1.516	2.402	4.541	0.714	0.78	1.28
Paraguay	0.228	0.265	0.373	0.124	0.23	0.552	1.507	0.413	0.225	1.666	2.397	3.454	0.897	1.147	1.729	0.342	0.352	0.477
Uruguay	0.394	0.409	0.574	0.232	0.376	0.811	0.56	0.283	0.254	3.395	3.518	4.054	2.388	2.776	3.935	0.973	1.135	1.715
Guyana	0.373	0.46	0.479	0.103	0.206	0.426	1.887	0.655	0.266	3.166	5.882	7.768	0.587	0.973	1.137	0.506	0.662	0.9
Suriname	0.348	0.523	0.707	0.085	0.205	0.483	1.372	0.677	0.541	2.446	3.789	5.5	0.856	1.394	2.12	0.532	0.735	1.163
America-South	**0.333**	**0.397**	**0.527**	**0.24**	**0.487**	**1.118**	**1.011**	**0.422**	**0.345**	**1.981**	**3.012**	**4.105**	**1.092**	**1.632**	**2.363**	**0.422**	**0.541**	**0.809**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA																		
China	0.34	0.42	0.682	0.17	0.474	1.392	0.752	0.411	0.442	3.082	4.72	6.168	1.854	3.352	4.963	0.344	0.486	0.859
Japan	0.364	0.581	0.701	0.381	1.072	1.858	1.056	1.19	0.888	3.075	4.858	4.369	2.86	4.059	4.423	0.522	0.909	1.029
Korea, Rep. of	0.359	0.771	1.379	0.285	1.342	3.906	0.307	0.581	0.71	1.704	3.636	4.832	1.716	3.994	5.839	0.519	1.46	2.688
Taiwan	0.111	0.163	0.243	0.161	0.491	1.088	0.173	0.094	0.079	1.016	1.862	2.103	0.45	0.771	1.083	2.253	4.295	6.296
Korea, Dem. Rep. of	0.477	0.582	0.606	0.403	0.645	0.934	3.226	2.595	2.145	3.747	5.936	7.99	1.17	1.707	2.013	0.573	0.818	1.083
Hong Kong	0.098	0.184	0.265	0.162	0.517	1.188	0.087	0.107	0.089	0.941	1.607	2.3	0.528	0.842	1.004	2.227	4.19	6.245
Mongolia	0.433	0.405	0.503	0.082	0.094	0.24	1.522	0.474	0.258	2.207	4.273	7.959	1.476	3.002	4.946	0.297	0.334	0.47
Asia-East	**0.34**	**0.438**	**0.689**	**0.194**	**0.542**	**1.462**	**0.789**	**0.493**	**0.488**	**3.006**	**4.653**	**5.983**	**1.894**	**3.341**	**4.834**	**0.405**	**0.627**	**1.026**
India	0.322	0.297	0.316	0.115	0.118	0.199	4.334	1.49	1.022	2.623	4.013	6.461	0.759	1.39	2.261	0.407	0.506	0.83
Pakistan	0.276	0.276	0.245	0.098	0.101	0.105	7.599	3.607	1.297	1.997	2.627	4.223	0.57	0.816	1.291	0.442	0.437	0.534
Bangladesh	0.316	0.3	0.311	0.137	0.123	0.17	4.918	1.51	0.881	2.215	3.443	6.036	0.694	1.301	2.305	0.426	0.455	0.718
Afghanistan	0.424	0.38	0.323	0.199	0.16	0.102	22.14	11.85	3.292	2.33	2.474	2.876	0.712	0.749	0.902	1.056	0.91	0.764
Iran, Islamic Rep. of	0.142	0.197	0.392	0.103	0.221	0.87	0.589	0.149	0.124	2.596	4.466	9.605	0.755	1.314	2.315	0.438	0.508	0.94
Nepal	0.308	0.348	0.333	0.188	0.19	0.21	6.413	2.97	1.117	2.05	2.716	4.375	0.669	1.016	1.753	0.404	0.435	0.58
Uzbekistan	0.361	0.413	0.445	0.129	0.177	0.295	1.647	0.606	0.304	3.218	5.683	10.51	0.496	0.808	1.169	0.425	0.38	0.396
Sri Lanka	0.431	0.463	0.449	0.277	0.626	1.223	0.705	0.457	0.346	2.096	3.73	4.393	0.87	1.375	1.865	0.484	0.816	1.117
Kazakhstan	0.378	0.389	0.507	0.14	0.258	0.62	0.792	0.176	0.11	4.946	6.705	11.07	1.271	1.941	2.256	0.376	0.299	0.354
Tajikistan	0.271	0.346	0.433	0.108	0.13	0.209	4.83	1.952	0.936	2.339	3.395	5.879	0.405	0.616	1.03	0.418	0.418	0.474
Turkmenistan	0.461	0.492	0.637	0.182	0.321	0.796	3.423	0.491	0.251	4.071	5.371	11.63	0.578	0.763	0.956	0.352	0.295	0.375
Kyrgyzstan	0.394	0.435	0.489	0.053	0.061	0.086	1.686	0.638	0.326	3.811	5.765	9.259	0.685	1.072	1.615	0.395	0.375	0.417
Bhutan	0.313	0.312	0.375	0.117	0.13	0.162	4.172	1.998	1.917	2.316	3.131	5.048	0.675	1.219	2.69	0.395	0.444	0.775
Maldives	0.274	0.313	0.444	0.188	0.381	0.996	3.066	0.985	0.995	1.817	2.431	3.4	0.578	1.026	2.057	0.4	0.446	0.802
Asia-South Central	**0.314**	**0.3**	**0.315**	**0.12**	**0.131**	**0.219**	**4.837**	**2.049**	**1.117**	**2.537**	**3.779**	**6.076**	**0.731**	**1.266**	**2.014**	**0.428**	**0.504**	**0.764**
Indonesia	0.302	0.361	0.457	0.193	0.369	0.959	2.27	0.801	0.464	2.587	4.449	7.351	0.995	1.537	1.989	0.551	0.77	1.299
Philippines	0.234	0.324	0.482	0.234	0.485	1.578	2.082	0.862	0.595	1.529	2.342	4.126	0.496	0.66	0.889	0.36	0.434	0.742
Vietnam	0.243	0.223	0.3	0.119	0.139	0.337	1.499	0.563	0.542	2.251	3.643	7.207	0.944	1.876	3.348	0.437	0.551	1.06
Thailand	0.362	0.492	0.562	0.265	0.641	1.23	1.189	0.69	0.455	2.186	3.619	4.108	1.591	2.479	2.937	0.925	1.44	1.818
Myanmar	0.345	0.333	0.326	0.198	0.19	0.253	3.878	1.19	0.871	2.643	4.364	6.384	0.865	1.649	2.469	0.514	0.616	0.858
Malaysia	0.19	0.308	0.486	0.158	0.493	1.47	0.803	0.696	0.71	1.391	2.692	3.981	0.784	1.466	2.28	0.364	0.65	1.105
Cambodia	0.31	0.313	0.341	0.24	0.243	0.429	5.966	1.848	1.038	1.724	2.365	4.088	0.829	1.333	2.142	0.702	0.693	0.951
Lao PDR	0.247	0.186	0.197	0.086	0.076	0.164	6.417	1.31	0.59	1.586	2.371	4.404	0.582	1.055	1.89	0.382	0.365	0.584
Singapore	0.096	0.219	0.285	0.07	0.229	0.509	0.593	0.973	0.813	1.859	4.019	5.504	1.465	2.664	2.951	0.304	0.709	1.061
Timor-Leste	0.382	0.273	0.211	0.523	0.285	0.226	9.491	3.321	0.47	0.98	0.87	0.963	0.257	0.263	0.332	2.854	2.259	2.341
Brunei Darussalam	0.074	0.199	0.369	0.103	0.479	1.53	0.246	0.238	0.238	1.09	2.674	5.252	0.648	1.413	1.951	0.308	0.632	1.05
Asia-South East	**0.286**	**0.337**	**0.429**	**0.195**	**0.366**	**0.946**	**2.223**	**0.84**	**0.568**	**2.231**	**3.662**	**5.945**	**0.948**	**1.526**	**2.135**	**0.539**	**0.725**	**1.146**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA continued																		
Turkey	0.166	0.194	0.261	0.154	0.303	0.727	0.729	0.179	0.14	3.784	6.348	9.815	0.787	1.233	1.849	0.234	0.245	0.321
Yemen	0.323	0.292	0.367	0.152	0.11	0.148	6.583	1.838	0.569	1.957	2.352	4.21	0.612	0.781	1.137	0.823	0.671	0.822
Iraq	0.303	0.268	0.336	0.174	0.12	0.196	6.807	1.602	0.54	2.266	2.748	4.925	0.826	1.072	1.61	0.956	0.691	0.824
Saudi Arabia	0.12	0.239	0.379	0.059	0.216	0.556	0.663	0.342	0.404	1.589	3.07	5.627	0.482	0.981	1.468	0.455	0.532	0.829
Syria	0.096	0.139	0.252	0.081	0.155	0.465	0.595	0.179	0.134	1.494	2.235	4.003	0.338	0.494	0.874	0.62	0.864	1.729
Israel	0.183	0.292	0.454	0.14	0.27	0.529	0.298	0.241	0.205	1.755	2.024	2.051	1.533	2.173	2.887	0.674	1.015	1.395
Azerbaijan	0.309	0.42	0.607	0.138	0.1	0.159	1.55	0.447	0.343	3.207	5.748	9.696	0.706	1.224	1.758	0.304	0.308	0.429
Jordan	0.101	0.147	0.342	0.081	0.175	0.498	0.641	0.138	0.137	1.361	2.156	3.533	0.667	1.201	2.387	0.472	0.54	1.078
Palestine	0.124	0.113	0.155	0.145	0.138	0.267	0.753	0.215	0.137	0.532	0.701	1.281	0.144	0.206	0.44	1.152	1.378	2.623
United Arab Emirates	0.054	0.201	0.397	0.021	0.183	0.664	0.184	0.417	0.653	0.661	3.156	7.307	0.185	0.952	2.088	0.17	0.55	1.467
Oman	0.103	0.228	0.405	0.051	0.207	0.628	0.419	0.127	0.066	1.397	3.037	5.558	0.427	0.938	1.544	0.277	0.446	0.825
Kuwait	0.062	0.195	0.382	0.037	0.232	0.882	0.184	0.291	0.43	1.013	3.176	7.345	0.296	1.052	1.447	0.164	0.324	0.762
Lebanon	0.395	0.522	0.812	0.176	0.348	0.927	0.626	0.249	0.209	3.609	5.202	8.21	0.828	1.134	1.701	0.603	0.745	1.187
Georgia	0.377	0.413	0.432	0.117	0.149	0.196	0.854	0.37	0.242	8.808	12.35	16.08	1.344	1.862	2.289	0.157	0.148	0.135
Armenia	0.306	0.318	0.424	0.116	0.203	0.502	0.406	0.071	0.039	5.593	6.832	9.812	1.486	1.985	2.667	0.368	0.339	0.447
Bahrain	0.146	0.438	0.714	0.137	0.804	2.564	0.265	0.339	0.395	1.229	3.199	4.921	0.535	1.501	1.892	0.474	1.242	2.564
Qatar	0.08	0.183	0.317	0.069	0.605	1.878	0.241	0.434	0.6	1.313	3.314	6.845	0.294	1.155	1.551	0.291	0.923	1.764
Cyprus	0.14	0.235	0.325	0.57	1.697	4.003	0.506	0.556	0.512	4.076	6.979	8.751	1.119	1.632	2.015	0.179	0.307	0.428
Asia-West	**0.197**	**0.236**	**0.337**	**0.13**	**0.207**	**0.466**	**2.108**	**0.67**	**0.335**	**2.683**	**3.917**	**6.196**	**0.699**	**1.047**	**1.552**	**0.498**	**0.551**	**0.858**
Australia	0.234	0.327	0.415	0.153	0.313	0.566	0.269	0.218	0.166	2.696	3.615	3.553	2.007	2.413	2.546	0.758	1.114	1.328
Papua New Guniea	0.351	0.312	0.334	0.194	0.181	0.257	6.089	2.115	1.127	2.078	2.865	4.665	0.72	1.066	1.559	0.504	0.482	0.629
New Zealand	0.166	0.273	0.386	0.127	0.288	0.523	0.202	0.186	0.161	2.911	4.456	4.273	1.962	2.561	3.014	0.733	1.239	1.594
Solomon Islands	0.338	0.351	0.404	0.322	0.214	0.151	3.996	2.15	1.171	2.339	3.066	4.284	0.721	0.948	1.275	0.953	0.904	1.011
Fiji	0.223	0.319	0.484	0.382	0.862	2.024	1.169	0.686	0.601	2.831	4.292	5.586	0.571	0.797	1.293	0.662	0.906	1.391
Vanuatu	0.243	0.275	0.403	0.162	0.116	0.119	1.953	1.087	0.957	1.91	2.671	4.153	0.507	0.707	1.256	0.589	0.629	0.912
Micronesia	0.287	0.279	0.44	0.199	0.167	0.238	2.065	0.712	0.446	2.203	2.362	3.449	0.577	0.591	0.911	0.683	0.606	0.851
Tonga	0.282	0.275	0.398	0.114	0.125	0.205	1.388	0.595	0.42	2.225	2.134	2.933	0.499	0.482	0.74	0.519	0.481	0.708
Samoa	0.258	0.29	0.419	0.12	0.126	0.223	1.306	0.532	0.406	2.092	2.586	3.339	0.477	0.59	0.965	0.51	0.572	0.857
Oceania	**0.25**	**0.317**	**0.391**	**0.166**	**0.286**	**0.488**	**1.477**	**0.718**	**0.464**	**2.591**	**3.514**	**3.978**	**1.67**	**2.01**	**2.242**	**0.704**	**0.96**	**1.151**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Death Rate: Communicable Diseases									Death Rate: Non-Communicable Diseases								
	Digestive			Respiratory			Other Communicable			Cardiovascular			Malignant Neoplasm			Other Non-Communicable		
	Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year			Per Thousand Pop per Year		
	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060	2010	2035	2060
EUROPE																		
Russian Federation	0.466	0.483	0.576	0.175	0.348	0.792	0.44	0.179	0.112	8.671	10.55	14.68	1.849	2.536	2.736	0.354	0.301	0.328
Ukraine	0.424	0.42	0.398	0.073	0.122	0.23	0.269	0.101	0.051	9.917	11.84	14.88	1.904	2.403	2.77	0.31	0.266	0.241
Poland	0.41	0.589	0.822	0.082	0.197	0.423	0.264	0.245	0.226	4.977	7.828	9.541	2.518	3.719	4.727	0.338	0.466	0.616
Romania	0.689	0.742	0.792	0.089	0.171	0.385	0.44	0.217	0.164	7.943	10.64	15.13	2.022	2.478	2.862	0.258	0.274	0.337
Czech Republic	0.415	0.529	0.622	0.06	0.125	0.242	0.255	0.221	0.182	5.58	9.535	12.35	2.728	3.591	4.112	0.345	0.521	0.691
Belarus	0.309	0.344	0.393	0.088	0.179	0.372	0.178	0.083	0.053	8.653	10.62	13.74	1.936	2.654	3.237	0.324	0.341	0.396
Hungary	0.812	0.835	0.832	0.066	0.122	0.22	0.171	0.105	0.076	6.538	9.494	11.02	3.074	3.751	4.214	0.429	0.58	0.732
Bulgaria	0.349	0.394	0.439	0.078	0.154	0.306	0.315	0.186	0.154	10.05	13.27	16.25	1.987	2.404	2.724	0.3	0.348	0.434
Slovakia	0.477	0.586	0.669	0.088	0.208	0.457	0.307	0.247	0.225	5.313	9.338	13.42	2.179	3.042	3.653	0.295	0.397	0.514
Moldova, Rep. of	1.161	1.266	1.214	0.062	0.068	0.088	0.437	0.269	0.143	7.156	9.801	13.7	1.392	1.787	2.491	0.287	0.297	0.307
Europe-East	**0.481**	**0.527**	**0.612**	**0.125**	**0.25**	**0.553**	**0.36**	**0.178**	**0.126**	**8.098**	**10.32**	**13.8**	**2.036**	**2.755**	**3.155**	**0.336**	**0.339**	**0.391**
United Kingdom	0.433	0.503	0.591	0.242	0.398	0.681	1.035	0.773	0.578	3.652	4.352	3.81	2.38	2.412	2.512	0.746	0.975	1.116
Sweden	0.31	0.413	0.497	0.097	0.168	0.275	0.426	0.369	0.269	4.284	4.571	3.874	2.325	2.497	2.542	1.03	1.414	1.562
Denmark	0.553	0.643	0.692	0.127	0.259	0.39	0.361	0.297	0.208	3.618	4.57	3.762	2.932	3.479	3.372	0.926	1.238	1.295
Ireland	0.221	0.319	0.447	0.174	0.402	0.918	0.585	0.534	0.478	2.443	3.104	3.81	1.639	2.151	2.404	0.513	0.72	0.988
Norway	0.298	0.405	0.516	0.113	0.218	0.394	0.59	0.51	0.416	3.542	4.246	4.289	2.208	2.515	2.57	0.737	0.947	1.107
Finland	0.387	0.491	0.506	0.078	0.154	0.222	0.528	0.505	0.326	4.062	5.318	4.108	2.135	2.546	2.469	1.201	1.968	1.99
Lithuania	0.425	0.452	0.509	0.044	0.075	0.133	0.235	0.119	0.074	6.83	9.179	11.24	2.473	3.08	3.628	0.326	0.351	0.403
Latvia	0.398	0.43	0.516	0.08	0.12	0.196	0.303	0.131	0.079	7.962	10.2	11.3	2.322	2.956	3.559	0.457	0.485	0.547
Estonia	0.411	0.491	0.514	0.072	0.128	0.194	0.281	0.148	0.08	7.116	10.68	10.46	2.17	2.901	3.043	0.373	0.474	0.504
Iceland	0.15	0.235	0.344	0.063	0.133	0.271	0.323	0.294	0.266	2.482	3.388	3.697	1.813	2.384	2.761	0.685	1.115	1.545
Europe-North	**0.407**	**0.484**	**0.568**	**0.19**	**0.329**	**0.574**	**0.814**	**0.629**	**0.475**	**3.924**	**4.694**	**4.239**	**2.349**	**2.515**	**2.612**	**0.77**	**1.034**	**1.17**
Italy	0.437	0.547	0.634	0.197	0.468	0.932	0.35	0.244	0.18	4.746	7.379	8.47	2.719	3.34	3.599	0.756	1.184	1.574
Spain	0.458	0.649	0.938	0.558	1.424	3.452	0.376	0.305	0.285	3.148	4.542	6.016	2.358	3.231	3.964	1.079	1.781	2.893
Greece	0.234	0.319	0.4	0.5	1.237	2.736	0.353	0.299	0.255	5.474	8.122	10.14	2.382	2.951	3.272	0.336	0.457	0.582
Portugal	0.423	0.479	0.571	0.441	1.032	2.353	0.711	0.469	0.383	4.61	6.797	8.438	2.435	2.954	3.733	0.561	0.825	1.214
Serbia	0.335	0.368	0.435	0.18	0.331	0.657	0.302	0.148	0.11	7.708	9.827	12.79	1.983	2.185	2.559	0.418	0.475	0.596
Croatia	0.502	0.52	0.541	0.065	0.124	0.231	0.321	0.203	0.149	6.629	9.834	11.6	2.675	3.101	3.663	0.417	0.57	0.728
Bosnia and Herzegovina	0.244	0.295	0.308	0.208	0.444	0.872	0.203	0.108	0.068	6.13	9.317	11.54	1.529	1.752	2.036	0.312	0.402	0.484
Albania	0.142	0.178	0.27	0.122	0.267	0.651	0.562	0.193	0.168	3.539	5.313	7.864	1.145	1.608	2.324	0.345	0.441	0.692
Macedonia, TFYR	0.172	0.195	0.205	0.117	0.258	0.539	0.261	0.105	0.054	5.631	9.169	12.15	1.646	1.901	2.151	0.258	0.332	0.422
Slovenia	0.637	0.81	0.934	0.077	0.184	0.344	0.383	0.352	0.283	4.204	7.534	8.463	2.556	3.658	4.497	0.4	0.644	0.803
Montenegro	0.199	0.203	0.209	0.3	0.583	1.05	0.309	0.112	0.066	1.826	2.351	2.435	0.499	0.588	0.705	3.4	4.477	5.464
Malta	0.252	0.492	0.665	0.114	0.34	0.663	0.637	0.876	0.731	3.421	6.171	6.485	1.854	2.773	3.403	0.563	1.155	1.523
Europe-South	**0.41**	**0.527**	**0.667**	**0.335**	**0.829**	**1.888**	**0.381**	**0.273**	**0.226**	**4.522**	**6.725**	**8.25**	**2.434**	**3.072**	**3.543**	**0.757**	**1.188**	**1.734**
Germany	0.518	0.667	0.734	0.139	0.302	0.485	0.412	0.365	0.26	5.189	6.949	6.12	2.747	3.386	3.543	0.543	0.765	0.838
France	0.426	0.494	0.552	0.194	0.405	0.671	0.512	0.364	0.257	2.918	3.746	3.282	2.482	2.807	2.959	1.183	1.693	1.939
Netherlands	0.347	0.534	0.639	0.078	0.185	0.312	0.588	0.58	0.417	3.037	4.294	4.082	2.48	3.152	3.14	0.909	1.483	1.781
Belgium	0.46	0.541	0.609	0.287	0.608	1.038	0.605	0.457	0.331	3.676	4.81	4.399	2.594	3.001	3.103	1.03	1.507	1.779
Austria	0.411	0.503	0.579	0.079	0.173	0.343	0.203	0.158	0.125	4.919	6.754	7.417	2.367	3.013	3.386	0.39	0.554	0.703
Switzerland	0.325	0.517	0.694	0.11	0.283	0.55	0.428	0.456	0.391	3.191	4.723	5.023	2.105	2.909	3.258	0.975	1.63	2.154
Luxembourg	0.419	0.544	0.604	0.207	0.463	0.859	0.366	0.303	0.22	3.15	4.047	4.345	2.11	2.362	2.213	0.613	0.861	1.044
Europe-West	**0.457**	**0.575**	**0.644**	**0.157**	**0.338**	**0.566**	**0.463**	**0.385**	**0.278**	**4.067**	**5.371**	**4.794**	**2.584**	**3.105**	**3.244**	**0.825**	**1.219**	**1.428**

Health

Education

Base Case

Source: International Futures

Version 6.12, Mar 2009

	Water Safety					Sanitation					Literacy				
	No Improvement					No Improvement					Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**15.25**	**10.69**	**6.665**	**-56.3%**	**-1.6%**	**36.78**	**23.73**	**13.98**	**-62.0%**	**-1.9%**	**83.36**	**92.39**	**97.45**	**16.9%**	**0.3%**
Africa	**35.82**	**27.28**	**16.83**	**-53.0%**	**-1.5%**	**52.66**	**42.59**	**31.45**	**-40.3%**	**-1.0%**	**66.53**	**85.72**	**95.61**	**43.7%**	**0.7%**
Americas	**4.669**	**2.35**	**1.12**	**-76.0%**	**-2.8%**	**12.07**	**6.487**	**3.348**	**-72.3%**	**-2.5%**	**95.25**	**98.99**	**99.86**	**4.8%**	**0.1%**
Asia with Oceania	**14.95**	**8.341**	**4.152**	**-72.2%**	**-2.5%**	**44.31**	**24.43**	**10.19**	**-77.0%**	**-2.9%**	**81.91**	**92.09**	**97.41**	**18.9%**	**0.3%**
Europe	**2.191**	**0.728**	**0.241**	**-89.0%**	**-4.3%**	**3.85**	**1.068**	**0.486**	**-87.4%**	**-4.1%**	**99.37**	**99.93**	**100**	**0.6%**	**0.0%**
World	**15.25**	**10.69**	**6.665**	**-56.3%**	**-1.6%**	**36.78**	**23.73**	**13.98**	**-62.0%**	**-1.9%**	**83.36**	**92.39**	**97.45**	**16.9%**	**0.3%**
Africa-Eastern	**46.88**	**34.02**	**17.41**	**-62.9%**	**-2.0%**	**62.09**	**49.03**	**31.49**	**-49.3%**	**-1.3%**	**66.6**	**88.46**	**96.92**	**45.5%**	**0.8%**
Africa-Middle	**46.29**	**36.8**	**24.63**	**-46.8%**	**-1.3%**	**65.63**	**56.33**	**43.63**	**-33.5%**	**-0.8%**	**65.98**	**84.36**	**96.3**	**46.0%**	**0.8%**
Africa-Northern	**11.58**	**7.223**	**3.787**	**-67.3%**	**-2.2%**	**27.77**	**19.84**	**12.77**	**-54.0%**	**-1.5%**	**71.32**	**89.95**	**98.76**	**38.5%**	**0.7%**
Africa-Southern	**10.01**	**4.089**	**0.899**	**-91.0%**	**-4.7%**	**30.16**	**12.63**	**3.088**	**-89.8%**	**-4.5%**	**88.78**	**97.74**	**99.97**	**12.6%**	**0.2%**
Africa-Western	**41.15**	**29.03**	**18.91**	**-54.0%**	**-1.5%**	**58.47**	**44.94**	**35.24**	**-39.7%**	**-1.0%**	**59.16**	**79.55**	**92.04**	**55.6%**	**0.9%**
Africa	**35.82**	**27.28**	**16.83**	**-53.0%**	**-1.5%**	**52.66**	**42.59**	**31.45**	**-40.3%**	**-1.0%**	**66.53**	**85.72**	**95.61**	**43.7%**	**0.7%**
America-Caribbean	**14.74**	**12.45**	**9.403**	**-36.2%**	**-0.9%**	**23.61**	**23.02**	**21.06**	**-10.8%**	**-0.2%**	**86.92**	**92.98**	**97.44**	**12.1%**	**0.2%**
America-Central	**9.423**	**6.226**	**3.342**	**-64.5%**	**-2.1%**	**24.89**	**19.38**	**12.43**	**-50.1%**	**-1.4%**	**83.08**	**93.55**	**99.51**	**19.8%**	**0.4%**
America-North	**0.619**	**0.331**	**0.122**	**-80.3%**	**-3.2%**	**4.07**	**1.731**	**0.511**	**-87.4%**	**-4.1%**	**98.34**	**99.56**	**100**	**1.7%**	**0.0%**
America-South	**7.75**	**3.081**	**1.079**	**-86.1%**	**-3.9%**	**18.6**	**8.421**	**3.396**	**-81.7%**	**-3.3%**	**93.91**	**99.65**	**100**	**6.5%**	**0.1%**
Americas	**4.669**	**2.35**	**1.12**	**-76.0%**	**-2.8%**	**12.07**	**6.487**	**3.348**	**-72.3%**	**-2.5%**	**95.25**	**98.99**	**99.86**	**4.8%**	**0.1%**
Asia-East	**15.04**	**3.599**	**0.743**	**-95.1%**	**-5.8%**	**41.56**	**14.31**	**3.155**	**-92.4%**	**-5.0%**	**94.31**	**98.93**	**99.93**	**6.0%**	**0.1%**
Asia-South Central	**15.12**	**11.67**	**6.387**	**-57.8%**	**-1.7%**	**55.91**	**35.4**	**14.87**	**-73.4%**	**-2.6%**	**65.95**	**84.33**	**94.68**	**43.6%**	**0.7%**
Asia-South East	**16.61**	**10.91**	**5.288**	**-68.2%**	**-2.3%**	**31.3**	**22.57**	**13.33**	**-57.4%**	**-1.7%**	**93.36**	**98.79**	**99.87**	**7.0%**	**0.1%**
Asia-West	**9.103**	**5.147**	**2.386**	**-73.8%**	**-2.6%**	**14.94**	**9.702**	**5.217**	**-65.1%**	**-2.1%**	**84.7**	**93.48**	**99.11**	**17.0%**	**0.3%**
Oceania	**13**	**10.41**	**6.346**	**-51.2%**	**-1.4%**	**12.7**	**12.49**	**10.62**	**-16.4%**	**-0.4%**	**91.71**	**94.91**	**97.75**	**6.6%**	**0.1%**
Asia with Oceania	**14.95**	**8.341**	**4.152**	**-72.2%**	**-2.5%**	**44.31**	**24.43**	**10.19**	**-77.0%**	**-2.9%**	**81.91**	**92.09**	**97.41**	**18.9%**	**0.3%**
Europe-East	**4.585**	**1.515**	**0.477**	**-89.6%**	**-4.4%**	**7.288**	**1.889**	**0.741**	**-89.8%**	**-4.5%**	**99.64**	**100**	**100**	**0.4%**	**0.0%**
Europe-North	**0.127**	**0.044**	**0.021**	**-83.5%**	**-3.5%**	**1.852**	**0.657**	**0.401**	**-78.3%**	**-3.0%**	**100**	**100**	**100**	**0.0%**	**0.0%**
Europe-South	**1.163**	**0.545**	**0.234**	**-79.9%**	**-3.2%**	**2.726**	**1.204**	**0.56**	**-79.5%**	**-3.1%**	**98.27**	**99.73**	**99.99**	**1.8%**	**0.0%**
Europe-West	**0.05**	**0.019**	**0.014**	**-72.0%**	**-2.5%**	**0.755**	**0.217**	**0.159**	**-78.9%**	**-3.1%**	**100**	**100**	**100**	**0.0%**	**0.0%**
Europe	**2.191**	**0.728**	**0.241**	**-89.0%**	**-4.3%**	**3.85**	**1.068**	**0.486**	**-87.4%**	**-4.1%**	**99.37**	**99.93**	**100**	**0.6%**	**0.0%**

Health

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety: No Improvement					Sanitation: No Improvement					Literacy: Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	74.73	53.78	29.2	-60.9%	-1.9%	84.88	66.88	46.17	-45.6%	-1.2%	40.56	70.26	90.85	124.0%	1.6%
Uganda	38.45	31.98	15.46	-59.8%	-1.8%	52.97	45.8	29.07	-45.1%	-1.2%	77.6	97.49	100	28.9%	0.5%
Tanzania, United Rep. of	34.68	22.21	6.672	-80.8%	-3.2%	49.23	36.2	14.73	-70.1%	-2.4%	84.23	100	100	18.7%	0.3%
Kenya	35.64	22.87	9.568	-73.2%	-2.6%	53.87	42.05	24.11	-55.2%	-1.6%	79.84	95.36	100	25.3%	0.5%
Madagascar	52.06	41.73	30.11	-42.2%	-1.1%	66.61	58.18	49.42	-25.8%	-0.6%	73.78	96.23	100	35.5%	0.6%
Mozambique	52.98	30.86	4.971	-90.6%	-4.6%	64.7	45.33	11.38	-82.4%	-3.4%	49.72	78.87	94.99	91.0%	1.3%
Malawi	25.94	19.92	14.09	-45.7%	-1.2%	37.06	26.19	21.42	-42.2%	-1.1%	79.66	100	100	25.5%	0.5%
Zambia	40.53	32.83	19.03	-53.0%	-1.5%	44.57	41.64	30.23	-32.2%	-0.8%	82.68	91.43	99.44	20.3%	0.4%
Burundi	21.48	21.3	17.52	-18.4%	-0.4%	62.86	51.35	35.76	-43.1%	-1.1%	68.01	99.01	100	47.0%	0.8%
Rwanda	26.03	22.06	16.08	-38.2%	-1.0%	57.47	49.27	42.76	-25.6%	-0.6%	70.35	100	100	42.1%	0.7%
Somalia	65	46.47	1.416	-97.8%	-7.4%	70.95	41.14	1.583	-97.8%	-7.3%	51.08	75.58	96.28	88.5%	1.3%
Zimbabwe	17.9	13.24	9.548	-46.7%	-1.2%	43.86	31.6	25.74	-41.3%	-1.1%	94.13	100	100	6.2%	0.1%
Eritrea	38.8	33.8	28.54	-26.4%	-0.6%	88.7	78.3	65.51	-26.1%	-0.6%	51.91	72.67	88.89	71.2%	1.1%
Mauritius	0	0	0			6.072	3.494	1.119	-81.6%	-3.3%	88.99	97.14	100	12.4%	0.2%
Comoros	15.08	17.52	14.31	-5.1%	-0.1%	66.89	62.58	51.99	-22.3%	-0.5%	75.36	87.71	100	32.7%	0.6%
Djibouti	23.95	16.07	6.354	-73.5%	-2.6%	18.07	16.5	8.403	-53.5%	-1.5%	54.17	69.93	87.77	62.0%	1.0%
Africa-Eastern	**46.88**	**34.02**	**17.41**	**-62.9%**	**-2.0%**	**62.09**	**49.03**	**31.49**	**-49.3%**	**-1.3%**	**66.6**	**88.46**	**96.92**	**45.5%**	**0.8%**
Congo; Dem. Rep. of	51.93	42.14	27.59	-46.9%	-1.3%	67.93	60.63	46.6	-31.4%	-0.8%	68.93	84.61	99.23	44.0%	0.7%
Angola	44.13	28.75	16.22	-63.2%	-2.0%	62.23	42.36	28.42	-54.3%	-1.6%	70.39	100	100	42.1%	0.7%
Cameroon	31.75	22.75	13.56	-57.3%	-1.7%	45.71	37.36	28.12	-38.5%	-1.0%	69.78	80.68	90.44	29.6%	0.5%
Chad	55.58	44.85	32.86	-40.9%	-1.0%	87.28	73.86	58.51	-33.0%	-0.8%	29.62	63.53	80.48	171.7%	2.0%
Central African Republic	25.58	26.48	23.84	-6.8%	-0.1%	72	67.55	60.39	-16.1%	-0.4%	49.92	66.54	80.12	60.5%	1.0%
Congo, Rep. of	39.05	27.63	17.83	-54.3%	-1.6%	70.03	57.8	44.51	-36.4%	-0.9%	85.69	97.74	100	16.7%	0.3%
Gabon	9.704	5.665	3.044	-68.6%	-2.3%	59.37	51.78	41.37	-30.3%	-0.7%	85.06	93.25	100	17.6%	0.3%
Equatorial Guinea	51.26	23.72	10.87	-78.8%	-3.1%	38.15	19.29	12.52	-67.2%	-2.2%	87.46	100	100	14.3%	0.3%
São Tomé and Príncipe	20.62	15.68	10.2	-50.5%	-1.4%	73.25	55.08	36.35	-50.4%	-1.4%	89.26	100	100	12.0%	0.2%
Africa-Middle	**46.29**	**36.8**	**24.63**	**-46.8%**	**-1.3%**	**65.63**	**56.33**	**43.63**	**-33.5%**	**-0.8%**	**65.98**	**84.36**	**96.3**	**46.0%**	**0.8%**
Egypt	2.255	1.951	0.684	-69.7%	-2.4%	25.52	12.44	2.961	-88.4%	-4.2%	74.95	93.98	100	33.4%	0.6%
Sudan	26.79	16.12	8.57	-68.0%	-2.3%	62.64	49.69	36.15	-42.3%	-1.1%	66.69	84.5	98.17	47.2%	0.8%
Algeria	10.8	5.691	3.65	-66.2%	-2.1%	5.856	4.431	4.53	-22.6%	-0.5%	76.54	90.89	99.07	29.4%	0.5%
Morocco	16.78	10.43	4.583	-72.7%	-2.6%	24	17.23	9.389	-60.9%	-1.9%	56.4	85.49	95.67	69.6%	1.1%
Tunisia	5.638	2.226	0.445	-92.1%	-5.0%	12.27	5.352	1.128	-90.8%	-4.7%	79.29	90.63	98.59	24.3%	0.4%
Libyan Arab Jamahiriya	21.71	6.905	3.076	-85.8%	-3.8%	2.453	1.593	1.555	-36.6%	-0.9%	87.16	95.14	100	14.7%	0.3%
Africa-Northern	**11.58**	**7.223**	**3.787**	**-67.3%**	**-2.2%**	**27.77**	**19.84**	**12.77**	**-54.0%**	**-1.5%**	**71.32**	**89.95**	**98.76**	**38.5%**	**0.7%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety — No Improvement					Sanitation — No Improvement				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued										
South Africa	9.24	3.388	0.695	-92.5%	-5.0%	26.95	10.52	2.377	-91.2%	-4.7%
Namibia	9.925	4.867	0.7	-92.9%	-5.2%	53.55	23.34	2.883	-94.6%	-5.7%
Lesotho	19.93	12.89	4.081	-79.5%	-3.1%	57.81	38.04	15.03	-74.0%	-2.7%
Botswana	3.896	0.753	0.345	-91.1%	-4.7%	45.57	8.568	2.508	-94.5%	-5.6%
Swaziland	35.23	17.42	3.63	-89.7%	-4.4%	49.84	30.97	8.699	-82.5%	-3.4%
Africa-Southern	**10.01**	**4.089**	**0.899**	**-91.0%**	**-4.7%**	**30.16**	**12.63**	**3.088**	**-89.8%**	**-4.5%**
Nigeria	47.94	30.57	19.15	-60.1%	-1.8%	49.55	33.51	27.87	-43.8%	-1.1%
Niger	52.2	41.24	28.65	-45.1%	-1.2%	85.81	76.42	64.61	-24.7%	-0.6%
Côte d'Ivoire	16.36	15.28	10.75	-34.3%	-0.8%	61.29	50.7	34.34	-44.0%	-1.2%
Ghana	23.61	18.87	14.2	-39.9%	-1.0%	77.39	61.69	47.76	-38.3%	-1.0%
Burkina Faso	38.5	31.18	16.62	-56.8%	-1.7%	84.85	67.87	39.25	-53.7%	-1.5%
Mali	45.65	30.7	18.37	-59.8%	-1.8%	49.65	38.31	31.3	-37.0%	-0.9%
Senegal	23.36	18.11	11.1	-52.5%	-1.5%	42.61	37.35	27.68	-35.0%	-0.9%
Guinea	47.46	35.9	20.97	-55.8%	-1.6%	79.4	67.82	51.5	-35.1%	-0.9%
Benin	31.16	23.09	14.69	-52.9%	-1.5%	64.24	52.36	43.01	-33.0%	-0.8%
Togo	45.77	37.49	29.58	-35.4%	-0.9%	61.56	55	51.04	-17.1%	-0.4%
Sierra Leone	41.75	34.69	19.35	-53.7%	-1.5%	60.08	56.51	39.55	-34.2%	-0.8%
Liberia	38.38	37.42	36.79	-4.1%	-0.1%	65.43	43.27	21.96	-66.4%	-2.2%
Mauritania	43.88	30.64	19.41	-55.8%	-1.6%	62.26	48.48	36.44	-41.5%	-1.1%
Guinea-Bissau	39.42	33.19	29.73	-24.6%	-0.6%	62.77	54.82	55.81	-11.1%	-0.2%
Gambia	16.84	13.59	10.63	-36.9%	-0.9%	41.02	34	29.08	-29.1%	-0.7%
Cape Verde	18.1	10.98	2.276	-87.4%	-4.1%	51.33	35.01	8.368	-83.7%	-3.6%
Africa-Western	**41.15**	**29.03**	**18.91**	**-54.0%**	**-1.5%**	**58.47**	**44.94**	**35.24**	**-39.7%**	**-1.0%**

Education

	Literacy — Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg
AFRICA continued					
South Africa	89.33	97.96	100	11.9%	0.2%
Namibia	88.53	98.29	100	13.0%	0.2%
Lesotho	85.11	99.57	100	17.5%	0.3%
Botswana	83.14	94.15	100	20.3%	0.4%
Swaziland	81.42	91.7	98.96	21.5%	0.4%
Africa-Southern	**88.78**	**97.74**	**99.97**	**12.6%**	**0.2%**
Nigeria	74.02	87.38	95.18	28.6%	0.5%
Niger	23.38	59.16	82.84	254.3%	2.6%
Côte d'Ivoire	50.82	77.91	94.55	86.0%	1.2%
Ghana	65.95	78.73	91.34	38.5%	0.7%
Burkina Faso	27.52	66.93	88.48	221.5%	2.4%
Mali	33.63	68.1	89.49	166.1%	2.0%
Senegal	44.74	72.58	90.83	103.0%	1.4%
Guinea	33.94	73.48	89.42	163.5%	2.0%
Benin	43.63	73.84	89.92	106.1%	1.5%
Togo	60.15	78.16	90.27	50.1%	0.8%
Sierra Leone	37.38	57.1	77.35	106.9%	1.5%
Liberia	54.39	67.95	82.11	51.0%	0.8%
Mauritania	57.94	93.14	100	72.6%	1.1%
Guinea-Bissau	73.24	100	100	36.5%	0.6%
Gambia	31.48	74.23	84.34	167.9%	2.0%
Cape Verde	88.7	100	100	12.7%	0.2%
Africa-Western	**59.16**	**79.55**	**92.04**	**55.6%**	**0.9%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety — No Improvement					Sanitation — No Improvement				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS										
Haiti	45.11	37.63	26.51	-41.2%	-1.1%	70.26	65.45	57.21	-18.6%	-0.4%
Dominican Republic	4.533	2.433	0.759	-83.3%	-3.5%	19.53	10.37	3.257	-83.3%	-3.5%
Cuba	7.454	2.009	0.138	-98.1%	-7.7%	1.966	0.824	0.063	-96.8%	-6.6%
Puerto Rico	1.347	0.271	0.182	-86.5%	-3.9%	3.044	0.545	0.379	-87.5%	-4.1%
Jamaica	6.513	4.884	3.192	-51.0%	-1.4%	18.99	16.22	13.63	-28.2%	-0.7%
Trinidad and Tobago	5.826	0.953	0.382	-93.4%	-5.3%	0	0	0		
Bahamas	2.459	1.033	0.397	-83.9%	-3.6%	0	0	0		
Barbados	0	0	0			0	0	0		
St. Vincent & the Grenadines	7.946	3.46	0.778	-90.2%	-4.5%	17.38	7.98	1.735	-90.0%	-4.5%
Grenada	4.645	2.691	0.786	-83.1%	-3.5%	4.627	5.841	2.692	-41.8%	-1.1%
St. Lucia	2.218	1.615	0.52	-76.6%	-2.9%	10.64	7.679	2.308	-78.3%	-3.0%
America-Caribbean	**14.74**	**12.45**	**9.403**	**-36.2%**	**-0.9%**	**23.61**	**23.02**	**21.06**	**-10.8%**	**-0.2%**
Guatemala	5.217	5.112	3.349	-35.8%	-0.9%	14.04	15.07	11.95	-14.9%	-0.3%
Honduras	11.32	8.077	4.647	-58.9%	-1.8%	28.72	25.13	16.92	-41.1%	-1.1%
El Salvador	13.96	7.803	2.562	-81.6%	-3.3%	34.59	24.73	10.81	-68.7%	-2.3%
Nicaragua	18.75	11.85	6.4	-65.9%	-2.1%	49.65	37.3	24.67	-50.3%	-1.4%
Costa Rica	2.317	0.641	0.237	-89.8%	-4.5%	6.911	2.265	0.73	-89.4%	-4.4%
Panama	7.185	2.024	0.461	-93.6%	-5.3%	21.74	7.602	1.78	-91.8%	-4.9%
Belize	7.715	3.123	0.534	-93.1%	-5.2%	47.58	23.99	3.64	-92.3%	-5.0%
America-Central	**9.423**	**6.226**	**3.342**	**-64.5%**	**-2.1%**	**24.89**	**19.38**	**12.43**	**-50.1%**	**-1.4%**
United States of America	0	0	0			0	0	0		
Mexico	2.577	1.371	0.527	-79.5%	-3.1%	16.95	7.169	2.219	-86.9%	-4.0%
Canada	0	0	0			0	0	0		
America-North	**0.619**	**0.331**	**0.122**	**-80.3%**	**-3.2%**	**4.07**	**1.731**	**0.511**	**-87.4%**	**-4.1%**
Brazil	7.827	2.69	0.648	-91.7%	-4.9%	20.39	7.84	2.104	-89.7%	-4.4%
Colombia	5.627	2.496	0.619	-89.0%	-4.3%	11.37	5.612	1.565	-86.2%	-3.9%
Argentina	3.304	1.099	0.303	-90.8%	-4.7%	7.63	2.9	0.865	-88.7%	-4.3%
Venezuela, RB	12.09	3.975	1.636	-86.5%	-3.9%	23.54	8.768	4.373	-81.4%	-3.3%
Peru	14.47	6.615	2.375	-83.6%	-3.5%	32.43	17.62	7.949	-75.5%	-2.8%
Chile	3.794	0.826	0.48	-87.3%	-4.1%	6.831	1.502	0.931	-86.4%	-3.9%
Ecuador	5.461	4.996	4.6	-15.8%	-0.3%	9.995	11.1	12.42	24.3%	0.4%
Bolivia	11.45	5.182	1.927	-83.2%	-3.5%	45.29	24.91	9.974	-78.0%	-3.0%
Paraguay	12.06	8.433	4.697	-61.1%	-1.9%	19.72	19.91	15.98	-19.0%	-0.4%
Uruguay	0	0	0			0	0	0		
Guyana	15.79	9.035	3.881	-75.4%	-2.8%	28.72	20.92	13.1	-54.4%	-1.6%
Suriname	6.896	3.495	1.151	-83.3%	-3.5%	6.293	7.451	7.872	25.1%	0.4%
America-South	**7.75**	**3.081**	**1.079**	**-86.1%**	**-3.9%**	**18.6**	**8.421**	**3.396**	**-81.7%**	**-3.3%**

Education

	Literacy — Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg
AMERICAS					
Haiti	60.82	77.91	92.4	51.9%	0.8%
Dominican Republic	90.73	100	100	10.2%	0.2%
Cuba	100	100	100	0.0%	0.0%
Puerto Rico	94.65	98.03	100	5.7%	0.1%
Jamaica	87.07	94.37	100	14.9%	0.3%
Trinidad and Tobago	99.71	100	100	0.3%	0.0%
Bahamas	95.35	99.22	100	4.9%	0.1%
Barbados	100	100	100	0.0%	0.0%
St. Vincent & the Grenadines	88.47	96.69	100	13.0%	0.2%
Grenada	90.21	99.63	100	10.9%	0.2%
St. Lucia	92.12	98.36	100	8.6%	0.2%
America-Caribbean	**86.92**	**92.98**	**97.44**	**12.1%**	**0.2%**
Guatemala	75.96	91.25	99.79	31.4%	0.5%
Honduras	85.16	95.6	100	17.4%	0.3%
El Salvador	81.98	93.73	100	22.0%	0.4%
Nicaragua	80.98	90.13	96.57	19.3%	0.4%
Costa Rica	97.76	100	100	2.3%	0.0%
Panama	94.11	98.41	100	6.3%	0.1%
Belize	78.82	91.5	98.59	25.1%	0.4%
America-Central	**83.08**	**93.55**	**99.51**	**19.8%**	**0.4%**
United States of America	100	100	100	0.0%	0.0%
Mexico	93.1	98.17	100	7.4%	0.1%
Canada	100	100	100	0.0%	0.0%
America-North	**98.34**	**99.56**	**100**	**1.7%**	**0.0%**
Brazil	92.66	100	100	7.9%	0.2%
Colombia	95.04	100	100	5.2%	0.1%
Argentina	98.39	100	100	1.6%	0.0%
Venezuela, RB	95.27	100	100	5.0%	0.1%
Peru	89.48	95.45	100	11.8%	0.2%
Chile	97.73	100	100	2.3%	0.0%
Ecuador	94.95	100	100	5.3%	0.1%
Bolivia	92.55	100	100	8.0%	0.2%
Paraguay	96.27	100	100	3.9%	0.1%
Uruguay	99.19	100	100	0.8%	0.0%
Guyana	98.69	100	100	1.3%	0.0%
Suriname	90.53	97.35	100	10.5%	0.2%
America-South	**93.91**	**99.65**	**100**	**6.5%**	**0.1%**

Health

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety — No Improvement					Sanitation — No Improvement				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA										
China	17.36	4.071	0.804	-95.4%	-6.0%	47.93	16.02	3.253	-93.2%	-5.2%
Japan	0	0	0			0	0	0		
Korea, Rep. of	5.568	1.203	0.737	-86.8%	-4.0%	2.758	0.676	0.498	-81.9%	-3.4%
Taiwan	1.819	0.388	0.245	-86.5%	-3.9%	4.119	0.744	0.44	-89.3%	-4.4%
Korea, Dem. Rep. of	0	0	0			36.86	25.99	18.31	-50.3%	-1.4%
Hong Kong	0.566	0.301	0.247	-56.4%	-1.6%	1.244	0.638	0.597	-52.0%	-1.5%
Mongolia	32.11	15.08	4.277	-86.7%	-4.0%	32.86	15.63	5.084	-84.5%	-3.7%
Asia-East	**15.04**	**3.599**	**0.743**	**-95.1%**	**-5.8%**	**41.56**	**14.31**	**3.155**	**-92.4%**	**-5.0%**
India	13.7	9.107	2.324	-83.0%	-3.5%	62.4	36.3	8.418	-86.5%	-3.9%
Pakistan	9.637	10.41	7.781	-19.3%	-0.4%	39.29	30.65	19.05	-51.5%	-1.4%
Bangladesh	25.59	21.59	13.85	-45.9%	-1.2%	58.06	44.56	29.16	-49.8%	-1.4%
Afghanistan	59.55	49.92	38.54	-35.3%	-0.9%	65.95	60.32	54.41	-17.5%	-0.4%
Iran, Islamic Rep. of	3.943	1.352	0.883	-77.6%	-2.9%	13.28	5.377	3.125	-76.5%	-2.9%
Nepal	11.28	14.09	13.26	17.6%	0.3%	63.87	55.96	45.81	-28.3%	-0.7%
Uzbekistan	16.05	10.06	6.22	-61.2%	-1.9%	29.53	20.39	13.54	-54.1%	-1.5%
Sri Lanka	20.44	13.77	4.556	-77.7%	-3.0%	10.04	11.55	8.364	-16.7%	-0.4%
Kazakhstan	10.49	1.827	0.866	-91.7%	-4.9%	20.26	3.29	1.609	-92.1%	-4.9%
Tajikistan	38.43	26.76	14.74	-61.6%	-1.9%	46.93	38.85	27.7	-41.0%	-1.0%
Turkmenistan	23.88	8.423	4.718	-80.2%	-3.2%	33.53	15.03	9.422	-71.9%	-2.5%
Kyrgyzstan	21.31	14.32	9.721	-54.4%	-1.6%	38.62	27.87	20.36	-47.3%	-1.3%
Bhutan	33.28	14.24	2.549	-92.3%	-5.0%	28.49	18.86	5.406	-81.0%	-3.3%
Maldives	15.36	4.249	0.714	-95.4%	-6.0%	32.38	6.095	1.25	-96.1%	-6.3%
Asia-South Central	**15.12**	**11.67**	**6.387**	**-57.8%**	**-1.7%**	**55.91**	**35.4**	**14.87**	**-73.4%**	**-2.6%**
Indonesia	20.78	12.53	6.284	-69.8%	-2.4%	41.21	26.98	15.61	-62.1%	-1.9%
Philippines	13.19	8.587	3.974	-69.9%	-2.4%	26.4	20.67	12.02	-54.5%	-1.6%
Vietnam	13.93	8.673	3.459	-75.2%	-2.7%	35.86	24.61	12.2	-66.0%	-2.1%
Thailand	1.665	2.048	0.928	-44.3%	-1.2%	2.574	6.434	8.342	224.1%	2.4%
Myanmar	21.46	17.81	12.27	-42.8%	-1.1%	21.68	17.09	14.7	-32.2%	-0.8%
Malaysia	0.845	0.463	0.298	-64.7%	-2.1%	5.409	2.706	1.505	-72.2%	-2.5%
Cambodia	56.08	37.22	14.94	-73.4%	-2.6%	79.82	59.31	29.95	-62.5%	-1.9%
Lao PDR	45.83	26.48	5.413	-88.2%	-4.2%	67.51	48.52	15.56	-77.0%	-2.9%
Singapore	0	0	0			0	0	0		
Timor-Leste	41.14	32.53	13.71	-66.7%	-2.2%	65.52	56.33	29.36	-55.2%	-1.6%
Brunei Darussalam	0.373	0.157	0.168	-55.0%	-1.6%	0.659	0.232	0.28	-57.5%	-1.7%
Asia-South East	**16.61**	**10.91**	**5.288**	**-68.2%**	**-2.3%**	**31.3**	**22.57**	**13.33**	**-57.4%**	**-1.7%**

Education

	Literacy — Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA					
China	93.73	98.98	100	6.7%	0.1%
Japan	100	100	100	0.0%	0.0%
Korea, Rep. of	100	100	100	0.0%	0.0%
Taiwan	98.57	100	100	1.5%	0.0%
Korea, Dem. Rep. of	77.03	86.43	94.53	22.7%	0.4%
Hong Kong	100	100	100	0.0%	0.0%
Mongolia	100	100	100	0.0%	0.0%
Asia-East	**94.31**	**98.93**	**99.93**	**6.0%**	**0.1%**
India	67.23	85.88	95.75	42.4%	0.7%
Pakistan	52.06	77.67	92.55	77.8%	1.2%
Bangladesh	56.39	81.46	93.43	65.7%	1.0%
Afghanistan	28.63	59.66	83.83	192.8%	2.2%
Iran, Islamic Rep. of	85.86	93.86	99.59	16.0%	0.3%
Nepal	56.01	77.01	92.25	64.7%	1.0%
Uzbekistan	97.38	100	100	2.7%	0.1%
Sri Lanka	93.56	98.83	100	6.9%	0.1%
Kazakhstan	100	100	100	0.0%	0.0%
Tajikistan	99.94	100	100	0.1%	0.0%
Turkmenistan	99.8	100	100	0.2%	0.0%
Kyrgyzstan	99.63	100	100	0.4%	0.0%
Bhutan	54.31	75.86	91.25	68.0%	1.0%
Maldives	98.08	100	100	2.0%	0.0%
Asia-South Central	**65.95**	**84.33**	**94.68**	**43.6%**	**0.7%**
Indonesia	93.21	100	100	7.3%	0.1%
Philippines	93.55	96.81	100	6.9%	0.1%
Vietnam	95.34	100	100	4.9%	0.1%
Thailand	95.16	100	100	5.1%	0.1%
Myanmar	95.65	100	100	4.5%	0.1%
Malaysia	93.23	98.72	100	7.3%	0.1%
Cambodia	76.63	88.97	99.15	29.4%	0.5%
Lao PDR	74.72	87.6	95.8	28.2%	0.5%
Singapore	95.53	99.76	100	4.7%	0.1%
Timor-Leste	73.9	82.92	92.78	25.5%	0.5%
Brunei Darussalam	94.66	97.82	100	5.6%	0.1%
Asia-South East	**93.36**	**98.79**	**99.87**	**7.0%**	**0.1%**

Health

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety No Improvement					Sanitation No Improvement					Literacy Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	3.083	1.062	0.236	-92.3%	-5.0%	8.786	2.865	0.571	-93.5%	-5.3%	89.45	95.41	100	11.8%	0.2%
Yemen	30.01	18.09	8.598	-71.3%	-2.5%	52.11	34.28	18.72	-64.1%	-2.0%	59.54	84.71	96.93	62.8%	1.0%
Iraq	15.55	6.156	1.774	-88.6%	-4.2%	18.92	11.32	4.09	-78.4%	-3.0%	78.47	92.65	99.54	26.9%	0.5%
Saudi Arabia	6.128	1.814	0.527	-91.4%	-4.8%	3.262	1.312	0.573	-82.4%	-3.4%	84.05	91.82	98.86	17.6%	0.3%
Syria	6.718	5.57	2.952	-56.1%	-1.6%	10.06	10.46	6.496	-35.4%	-0.9%	84.19	92.88	98.72	17.3%	0.3%
Israel	0	0	0			2.828	0.544	0.34	-88.0%	-4.1%	96.47	100	100	3.7%	0.1%
Azerbaijan	19.56	8.103	3.757	-80.8%	-3.2%	38.47	16.07	8.207	-78.7%	-3.0%	100	100	100	0.0%	0.0%
Jordan	2.086	0.82	0.153	-92.7%	-5.1%	4.842	1.813	0.266	-94.5%	-5.6%	93.56	100	100	6.9%	0.1%
Palestine	6.609	3.685	1.61	-75.6%	-2.8%	25.41	15.51	7.22	-71.6%	-2.5%	95.68	100	100	4.5%	0.1%
United Arab Emirates	0	0	0			1.042	0.279	0.284	-72.7%	-2.6%	100	100	100	0.0%	0.0%
Oman	15.46	6.608	2.167	-86.0%	-3.9%	8.36	3.565	1.758	-79.0%	-3.1%	84.31	96.33	100	18.6%	0.3%
Kuwait	0.505	0.11	0.113	-77.6%	-2.9%	0.979	0.158	0.173	-82.3%	-3.4%	95.48	100	100	4.7%	0.1%
Lebanon	0	0	0			1.534	1.109	0.48	-68.7%	-2.3%	81.54	91.43	98.69	21.0%	0.4%
Georgia	16.11	10.02	5.418	-66.4%	-2.2%	6.871	8.364	7.706	12.2%	0.2%	79.26	97.8	100	26.2%	0.5%
Armenia	7.503	3.042	0.921	-87.7%	-4.1%	17.29	7.7	2.12	-87.7%	-4.1%	99.66	100	100	0.3%	0.0%
Bahrain	0.607	0.271	0.144	-76.3%	-2.8%	1.207	0.483	0.27	-77.6%	-3.0%	88.8	95.36	100	12.6%	0.2%
Qatar	0	0	0			0	0	0			89.72	93.73	98.73	10.0%	0.2%
Cyprus	0	0	0			0	0	0			97.71	99.23	100	2.3%	0.0%
Asia-West	**9.103**	**5.147**	**2.386**	**-73.8%**	**-2.6%**	**14.94**	**9.702**	**5.217**	**-65.1%**	**-2.1%**	**84.7**	**93.48**	**99.11**	**17.0%**	**0.3%**
Australia	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Papua New Guniea	57.01	38.71	21.26	-62.7%	-2.0%	53.43	44.47	34.33	-35.7%	-0.9%	60.24	80.46	92.65	53.8%	0.9%
New Zealand	1.097	0.456	0.289	-73.7%	-2.6%	2.413	0.905	0.567	-76.5%	-2.9%	100	100	100	0.0%	0.0%
Solomon Islands	29.35	25.68	19.09	-35.0%	-0.9%	67.16	59.08	46.81	-30.3%	-0.7%	70.47	79.11	88.79	26.0%	0.5%
Fiji	47.72	26.69	6.482	-86.4%	-3.9%	24.19	14.93	5.039	-79.2%	-3.1%	97.31	100	100	2.8%	0.1%
Vanuatu	35.86	19.62	6.736	-81.2%	-3.3%	46.84	30.81	12.66	-73.0%	-2.6%	79.83	91.22	98.83	23.8%	0.4%
Micronesia	6.166	5.244	1.889	-69.4%	-2.3%	61.56	47.8	15.41	-75.0%	-2.7%	84.46	90.28	96.64	14.4%	0.3%
Tonga	0	0	0			5.521	9.646	7.762	40.6%	0.7%	100	100	100	0.0%	0.0%
Samoa	10.96	6.393	2.06	-81.2%	-3.3%	0	0	0			100	100	100	0.0%	0.0%
Oceania	**13**	**10.41**	**6.346**	**-51.2%**	**-1.4%**	**12.7**	**12.49**	**10.62**	**-16.4%**	**-0.4%**	**91.71**	**94.91**	**97.75**	**6.6%**	**0.1%**

Health

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Water Safety — No Improvement					Sanitation — No Improvement					Literacy — Percent of Pop 15 and Older				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	2.262	0.56	0.304	-86.6%	-3.9%	8.828	1.535	0.702	-92.0%	-4.9%	99.69	100	100	0.3%	0.0%
Ukraine	3.294	1.159	0.265	-92.0%	-4.9%	3.387	1.201	0.265	-92.2%	-5.0%	100	100	100	0.0%	0.0%
Poland	1.572	0.419	0.173	-89.0%	-4.3%	5.698	1.268	0.409	-92.8%	-5.1%	99.74	100	100	0.3%	0.0%
Romania	35.8	12.49	2.996	-91.6%	-4.8%	10.05	4.304	1.619	-83.9%	-3.6%	98.19	100	100	1.8%	0.0%
Czech Republic	0	0	0			1.548	0.565	0.214	-86.2%	-3.9%	100	100	100	0.0%	0.0%
Belarus	0	0	0			12	3.575	0.913	-92.4%	-5.0%	100	100	100	0.0%	0.0%
Hungary	0.866	0.36	0.167	-80.7%	-3.2%	4.096	1.397	0.536	-86.9%	-4.0%	99.68	100	100	0.3%	0.0%
Bulgaria	0.898	0.525	0.159	-82.3%	-3.4%	0.94	0.635	0.203	-78.4%	-3.0%	98.79	100	100	1.2%	0.0%
Slovakia	0	0	0			0.867	0.522	0.273	-68.5%	-2.3%	100	100	100	0.0%	0.0%
Moldova, Rep. of	7.579	5.791	2.631	-65.3%	-2.1%	28.85	19.43	8.369	-71.0%	-2.4%	99.76	100	100	0.2%	0.0%
Europe-East	**4.585**	**1.515**	**0.477**	**-89.6%**	**-4.4%**	**7.288**	**1.889**	**0.741**	**-89.8%**	**-4.5%**	**99.64**	**100**	**100**	**0.4%**	**0.0%**
United Kingdom	0	0	0			1.746	0.713	0.475	-72.8%	-2.6%	100	100	100	0.0%	0.0%
Sweden	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Denmark	0	0	0			1.543	0.65	0.385	-75.0%	-2.7%	100	100	100	0.0%	0.0%
Ireland	0.442	0.224	0.195	-55.9%	-1.6%	1.016	0.479	0.414	-59.3%	-1.8%	100	100	100	0.0%	0.0%
Norway	0	0	0			0.518	0.324	0.246	-52.5%	-1.5%	100	100	100	0.0%	0.0%
Finland	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Lithuania	2.549	0.875	0.289	-88.7%	-4.3%	5.752	1.791	0.591	-89.7%	-4.4%	100	100	100	0.0%	0.0%
Latvia	0.848	0.304	0.169	-80.1%	-3.2%	16	3.336	1.127	-93.0%	-5.2%	100	100	100	0.0%	0.0%
Estonia	0	0	0			2.116	0.616	0.448	-78.8%	-3.1%	100	100	100	0.0%	0.0%
Iceland	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Europe-North	**0.127**	**0.044**	**0.021**	**-83.5%**	**-3.5%**	**1.852**	**0.657**	**0.401**	**-78.3%**	**-3.0%**	**100**	**100**	**100**	**0.0%**	**0.0%**
Italy	0.917	0.361	0.147	-84.0%	-3.6%	2.667	0.899	0.352	-86.8%	-4.0%	99.91	100	100	0.1%	0.0%
Spain	0	0	0			0	0	0			98.27	100	100	1.8%	0.0%
Greece	0.928	0.353	0.207	-77.7%	-3.0%	2.121	0.816	0.484	-77.2%	-2.9%	97.57	100	100	2.5%	0.0%
Portugal	1.946	0.632	0.21	-89.2%	-4.4%	4.759	1.47	0.483	-89.9%	-4.5%	95.29	99.72	100	4.9%	0.1%
Serbia	5.576	2.312	0.549	-90.2%	-4.5%	10.48	4.569	1.063	-89.9%	-4.5%	89.92	95.6	99.82	11.0%	0.2%
Croatia	0	0	0			0	0	0			99.58	100	100	0.4%	0.0%
Bosnia and Herzegovina	3.558	3.388	2.258	-36.5%	-0.9%	6.237	6.803	6.009	-3.7%	-0.1%	97.63	100	100	2.4%	0.0%
Albania	3.886	2.544	1.011	-74.0%	-2.7%	8.252	5.341	2.284	-72.3%	-2.5%	100	100	100	0.0%	0.0%
Macedonia, TFYR	6.767	3.705	1.727	-74.5%	-2.7%	15.38	8.488	4.284	-72.1%	-2.5%	99.03	100	100	1.0%	0.0%
Slovenia	1.324	0.303	0.162	-87.8%	-4.1%	2.983	0.563	0.292	-90.2%	-4.5%	100	100	100	0.0%	0.0%
Montenegro	5.719	2.557	0.734	-87.2%	-4.0%	10.94	5.52	2.006	-81.7%	-3.3%	88.27	94.92	99.65	12.9%	0.2%
Malta	0	0	0			3.256	0.965	0.401	-87.7%	-4.1%	92.36	96.66	100	8.3%	0.2%
Europe-South	**1.163**	**0.545**	**0.234**	**-79.9%**	**-3.2%**	**2.726**	**1.204**	**0.56**	**-79.5%**	**-3.1%**	**98.27**	**99.73**	**99.99**	**1.8%**	**0.0%**
Germany	0	0	0			0	0	0			100	100	100	0.0%	0.0%
France	0	0	0			1.956	0.513	0.352	-82.0%	-3.4%	100	100	100	0.0%	0.0%
Netherlands	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Belgium	0.877	0.326	0.23	-73.8%	-2.6%	1.942	0.696	0.523	-73.1%	-2.6%	100	100	100	0.0%	0.0%
Austria	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Switzerland	0	0	0			0	0	0			100	100	100	0.0%	0.0%
Luxembourg	0	0	0			0.297	0.202	0.175	-41.1%	-1.1%	100	100	100	0.0%	0.0%
Europe-West	**0.05**	**0.019**	**0.014**	**-72.0%**	**-2.5%**	**0.755**	**0.217**	**0.159**	**-78.9%**	**-3.1%**	**100**	**100**	**100**	**0.0%**	**0.0%**

Education

Base Case

Source: International Futures Version 6.12, March 2009

	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
	Years					Years					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	7.168	8.622	10.19	42.2%	0.7%	5.723	7.542	9.555	67.0%	1.0%	88.8	95.94	98.26	10.7%	0.2%
Africa	4.47	5.866	7.564	69.2%	1.1%	3.161	4.863	6.942	119.6%	1.6%	73.11	86.01	94.54	29.3%	0.5%
Americas	8.794	10.62	12.4	41.0%	0.7%	8.72	11.01	13.05	49.7%	0.8%	95.53	99.49	99.83	4.5%	0.1%
Asia with Oceania	6.929	8.526	10.31	48.8%	0.8%	4.94	6.985	9.318	88.6%	1.3%	89.5	97.95	99.36	11.0%	0.2%
Europe	10.15	12.69	14.82	46.0%	0.8%	9.845	12.31	14.65	48.8%	0.8%	97.88	99.99	99.98	2.1%	0.0%
World	7.168	8.622	10.19	42.2%	0.7%	5.723	7.542	9.555	67.0%	1.0%	88.8	95.94	98.26	10.7%	0.2%
Africa-Eastern	3.221	4.743	6.702	108.1%	1.5%	2.262	4.214	6.672	195.0%	2.2%	76.49	89.51	96.59	26.3%	0.5%
Africa-Middle	4.756	5.489	6.974	46.6%	0.8%	2.871	3.674	5.202	81.2%	1.2%	57.05	74	85.86	50.5%	0.8%
Africa-Northern	6.289	8.399	10.3	63.8%	1.0%	4.518	7.312	9.891	118.9%	1.6%	86.85	95.01	99.37	14.4%	0.3%
Africa-Southern	8.082	10.85	13.52	67.3%	1.0%	7.569	10.04	12.59	66.3%	1.0%	88.61	99.82	99.99	12.8%	0.2%
Africa-Western	3.747	5.278	7.061	88.4%	1.3%	2.474	4.164	6.403	158.8%	1.9%	63.9	81.37	94.71	48.2%	0.8%
Africa	4.47	5.866	7.564	69.2%	1.1%	3.161	4.863	6.942	119.6%	1.6%	73.11	86.01	94.54	29.3%	0.5%
America-Caribbean	6.225	7.482	9.015	44.8%	0.7%	6.592	8.039	9.822	49.0%	0.8%	84.31	93.03	96.28	14.2%	0.3%
America-Central	5.163	7.058	9.008	74.5%	1.1%	5.03	7.412	9.776	94.4%	1.3%	92.23	97.63	99.87	8.3%	0.2%
America-North	11.35	12.7	14.11	24.3%	0.4%	11.26	13.05	14.72	30.7%	0.5%	96.63	99.94	99.99	3.5%	0.1%
America-South	6.541	9.116	11.36	73.7%	1.1%	6.452	9.522	12.03	86.5%	1.3%	95.76	99.86	99.98	4.4%	0.1%
Americas	8.794	10.62	12.4	41.0%	0.7%	8.72	11.01	13.05	49.7%	0.8%	95.53	99.49	99.83	4.5%	0.1%
Asia-East	7.785	9.329	11.13	43.0%	0.7%	5.831	8.062	10.52	80.4%	1.2%	90.71	99.91	99.99	10.2%	0.2%
Asia-South Central	6.286	7.805	9.607	52.8%	0.9%	3.702	5.468	7.817	111.2%	1.5%	86.55	95.99	98.66	14.0%	0.3%
Asia-South East	6.32	8.461	10.34	63.6%	1.0%	5.577	8.211	10.51	88.5%	1.3%	95.46	98.93	99.94	4.7%	0.1%
Asia-West	6.952	8.881	10.91	56.9%	0.9%	5.745	8.271	10.88	89.4%	1.3%	87.87	99.14	99.98	13.8%	0.3%
Oceania	9.808	11.53	12.82	30.7%	0.5%	9.284	11.42	13.23	42.5%	0.7%	90.19	94.5	99.09	9.9%	0.2%
Asia with Oceania	6.929	8.526	10.31	48.8%	0.8%	4.94	6.985	9.318	88.6%	1.3%	89.5	97.95	99.36	11.0%	0.2%
Europe-East	10.83	13.29	15.26	40.9%	0.7%	10.97	13.04	14.99	36.6%	0.6%	95.88	100	99.97	4.3%	0.1%
Europe-North	10.63	13.22	15.11	42.1%	0.7%	10.4	13.21	15.45	48.6%	0.8%	99.1	99.99	99.99	0.9%	0.0%
Europe-South	8.368	11.12	13.46	60.9%	1.0%	7.685	10.7	13.44	74.9%	1.1%	98.87	99.96	99.96	1.1%	0.0%
Europe-West	10.3	12.82	15.12	46.8%	0.8%	9.533	12.06	14.69	54.1%	0.9%	99.55	100	100	0.5%	0.0%
Europe	10.15	12.69	14.82	46.0%	0.8%	9.845	12.31	14.65	48.8%	0.8%	97.88	99.99	99.98	2.1%	0.0%

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
			Years					Years					Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	1.845	2.596	4.608	149.8%	1.8%	0.64	1.918	4.583	616.1%	4.0%	60.96	83.44	95.62	56.9%	0.9%
Uganda	3.598	5.484	7.666	113.1%	1.5%	3.654	6.101	8.916	144.0%	1.8%	89.23	97.02	100	12.1%	0.2%
Tanzania, United Rep. of	3.297	6.075	8.847	168.3%	2.0%	2.029	5.1	8.299	309.0%	2.9%	91.59	94.79	99.99	9.2%	0.2%
Kenya	5.476	7.43	9.662	76.4%	1.1%	4.275	6.883	9.675	126.3%	1.6%	77.98	94.92	100	28.2%	0.5%
Madagascar	2.634	3.626	5.26	99.7%	1.4%	1.491	2.956	4.892	228.1%	2.4%	92.96	97.32	98.46	5.9%	0.1%
Mozambique	1.897	3.84	6.821	259.6%	2.6%	1.342	3.004	6.343	372.7%	3.2%	77.9	90.62	100	28.4%	0.5%
Malawi	3.608	5.965	7.362	104.0%	1.4%	2.521	4.597	6.203	146.1%	1.8%	91.16	95.46	96.04	5.4%	0.1%
Zambia	5.859	6.352	7.653	30.6%	0.5%	5.284	7.288	9.421	78.3%	1.2%	90.16	92.37	99.87	10.8%	0.2%
Burundi	1.99	3.171	5.772	190.1%	2.2%	0.79	1.865	4.634	486.6%	3.6%	58.35	76.62	96.25	65.0%	1.0%
Rwanda	2.614	3.469	5.354	104.8%	1.4%	1.948	2.828	4.897	151.4%	1.9%	82.18	93.56	96.77	17.8%	0.3%
Somalia	0.255	1.351	2.282	794.9%	4.5%	0.226	0.934	1.796	694.7%	4.2%	10.39	35.73	51.34	394.1%	3.2%
Zimbabwe	6.806	8.893	10.3	51.3%	0.8%	5.306	8.456	10.61	100.0%	1.4%	88.69	95.18	96.96	9.3%	0.2%
Eritrea	2.391	3.59	4.992	108.8%	1.5%	1.072	2.187	3.83	257.3%	2.6%	52.19	73.53	96.71	85.3%	1.2%
Mauritius	6.565	8.513	11.03	68.0%	1.0%	5.671	7.902	10.67	88.2%	1.3%	97.15	99.97	100	2.9%	0.1%
Comoros	3.142	3.504	5.044	60.5%	1.0%	2.058	3.017	5.473	165.9%	2.0%	56.39	77.32	98.44	74.6%	1.1%
Djibouti	4.09	4.508	6.441	57.5%	0.9%	3.005	3.704	6.274	108.8%	1.5%	39	74.78	98.85	153.5%	1.9%
Africa-Eastern	**3.221**	**4.743**	**6.702**	**108.1%**	**1.5%**	**2.262**	**4.214**	**6.672**	**195.0%**	**2.2%**	**76.49**	**89.51**	**96.59**	**26.3%**	**0.5%**
Congo; Dem. Rep. of	4.806	5.651	7.024	46.2%	0.8%	2.174	2.958	4.359	100.5%	1.4%	56.26	67.63	81.49	44.8%	0.7%
Angola	5.49	5.913	7.827	42.6%	0.7%	4.665	5.781	8.054	72.6%	1.1%	38.08	88.29	98.59	158.9%	1.9%
Cameroon	4.414	5.467	7.117	61.2%	1.0%	3.138	4.47	6.379	103.3%	1.4%	74.03	84.31	97.1	31.2%	0.5%
Chad	3.659	4.127	5.505	50.5%	0.8%	2.513	3.07	4.641	84.7%	1.2%	62.63	74.45	83.29	33.0%	0.6%
Central African Republic	3.072	3.487	4.631	50.7%	0.8%	1.492	2.088	3.689	147.3%	1.8%	47.6	67.32	78.9	65.8%	1.0%
Congo, Rep. of	5.217	5.618	7.256	39.1%	0.7%	4.99	5.755	7.787	56.1%	0.9%	56.48	80.56	93.04	64.7%	1.0%
Gabon	8.071	8.29	10.54	30.6%	0.5%	7.367	7.92	10.44	41.7%	0.7%	88.52	99.05	100	13.0%	0.2%
Equatorial Guinea	9.219	8.473	10.19	10.5%	0.2%	8.838	9.157	11.48	29.9%	0.5%	89.67	99.5	100	11.5%	0.2%
São Tomé and Príncipe	3.501	3.698	4.787	36.7%	0.6%	2.62	3.607	5.168	97.3%	1.4%	95.05	97.49	98.09	3.2%	0.1%
Africa-Middle	**4.756**	**5.489**	**6.974**	**46.6%**	**0.8%**	**2.871**	**3.674**	**5.202**	**81.2%**	**1.2%**	**57.05**	**74**	**85.86**	**50.5%**	**0.8%**
Egypt	7.887	11.24	13.28	68.4%	1.0%	5.349	9.217	11.94	123.2%	1.6%	97.48	99.98	100	2.6%	0.1%
Sudan	2.941	4.39	6.664	126.6%	1.6%	1.884	3.778	6.807	261.3%	2.6%	45.06	79.47	97.8	117.0%	1.6%
Algeria	6.988	8.96	10.85	55.3%	0.9%	5.165	8.21	10.62	105.6%	1.5%	99.77	100	99.77	0.0%	0.0%
Morocco	5.557	6.41	8.029	44.5%	0.7%	4.63	5.951	8.186	76.8%	1.1%	91.73	98.58	99.95	9.0%	0.2%
Tunisia	6.243	8.705	10.99	76.0%	1.1%	4.705	8.384	11.38	141.9%	1.8%	99.98	100	99.98	0.0%	0.0%
Libyan Arab Jamahiriya	7.019	8.774	10.46	49.0%	0.8%	6.119	10.02	12.54	104.9%	1.4%	97.75	99.98	99.91	2.2%	0.0%
Africa-Northern	**6.289**	**8.399**	**10.3**	**63.8%**	**1.0%**	**4.518**	**7.312**	**9.891**	**118.9%**	**1.6%**	**86.85**	**95.01**	**99.37**	**14.4%**	**0.3%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
			Years					Years					Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	8.428	11.41	14.13	67.7%	1.0%	7.824	10.41	12.96	65.6%	1.0%	89.3	99.98	100	12.0%	0.2%
Namibia	6.109	7.38	9.975	63.3%	1.0%	5.317	7.316	10.06	89.2%	1.3%	87.41	99.93	100	14.4%	0.3%
Lesotho	4.413	6.49	9.011	104.2%	1.4%	5.573	7.409	10.07	80.7%	1.2%	78.19	96.22	99.84	27.7%	0.5%
Botswana	6.535	8.797	11.02	68.6%	1.1%	6.228	8.925	11.41	83.2%	1.2%	87.61	100	100	14.1%	0.3%
Swaziland	5.83	7.834	11.02	89.0%	1.3%	6.565	8.071	11.01	67.7%	1.0%	81.05	99.28	100	23.4%	0.4%
Africa-Southern	**8.082**	**10.85**	**13.52**	**67.3%**	**1.0%**	**7.569**	**10.04**	**12.59**	**66.3%**	**1.0%**	**88.61**	**99.82**	**99.99**	**12.8%**	**0.2%**
Nigeria	4.149	6.171	7.84	89.0%	1.3%	2.962	5.091	7.256	145.0%	1.8%	66.76	83.09	93.68	40.3%	0.7%
Niger	1.412	2.314	4.135	192.8%	2.2%	0.731	1.735	4.169	470.3%	3.5%	43.89	68.12	88.96	102.7%	1.4%
Côte d'Ivoire	3.973	5.049	7.648	92.5%	1.3%	2.735	3.623	6.504	137.8%	1.7%	57.91	85.74	100	72.7%	1.1%
Ghana	5.408	6.305	8.041	48.7%	0.8%	3.598	5.458	7.872	118.8%	1.6%	67.07	87.37	96.97	44.6%	0.7%
Burkina Faso	3.045	3.828	6.015	97.5%	1.4%	1.884	2.916	5.751	205.3%	2.3%	46.66	71.45	97.95	109.9%	1.5%
Mali	1.4	2.935	5.164	268.9%	2.6%	0.637	2.405	4.774	649.5%	4.1%	61.02	79.99	99.45	63.0%	1.0%
Senegal	3.029	3.977	6.421	112.0%	1.5%	2.002	3.685	6.594	229.4%	2.4%	71.6	86.84	98.9	38.1%	0.6%
Guinea	3.389	4.989	7.214	112.9%	1.5%	1.943	2.988	5.246	170.0%	2.0%	70	79.29	96.02	37.2%	0.6%
Benin	3.64	5.678	7.587	108.4%	1.5%	1.526	3.21	5.472	258.6%	2.6%	78.65	89.43	98.13	24.8%	0.4%
Togo	4.678	6.22	7.17	53.3%	0.9%	2.092	3.819	5.29	152.9%	1.9%	78.55	85.61	97.36	23.9%	0.4%
Sierra Leone	3.207	4.059	5.7	77.7%	1.2%	1.658	2.523	4.675	182.0%	2.1%	46.97	68.57	94.36	100.9%	1.4%
Liberia	3.295	4.393	5.347	62.3%	1.0%	1.568	2.781	4.067	159.4%	1.9%	42.32	58.54	78.01	84.3%	1.2%
Mauritania	2.582	3.797	5.956	130.7%	1.7%	1.462	2.736	5.215	256.7%	2.6%	77.96	87.78	94.42	21.1%	0.4%
Guinea-Bissau	1.585	3.175	4.516	184.9%	2.1%	0.239	1.184	2.53	958.6%	4.8%	47.25	64.89	83.25	76.2%	1.1%
Gambia	3.561	5.121	6.315	77.3%	1.2%	1.743	3.464	4.928	182.7%	2.1%	61.8	73.87	86.39	39.8%	0.7%
Cape Verde	5.252	7.426	9.55	81.8%	1.2%	4.309	7.209	9.659	124.2%	1.6%	91.83	100	99.39	8.2%	0.2%
Africa-Western	**3.747**	**5.278**	**7.061**	**88.4%**	**1.3%**	**2.474**	**4.164**	**6.403**	**158.8%**	**1.9%**	**63.9**	**81.37**	**94.71**	**48.2%**	**0.8%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
			Years					Years					Percent		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	2.641	3.032	4.361	65.1%	1.0%	2.784	3.186	4.745	70.4%	1.1%	55.93	76.82	89.08	59.3%	0.9%
Dominican Republic	5.429	7.105	9.606	76.9%	1.1%	6.116	8.408	11.3	84.8%	1.2%	83.13	99.11	100	20.3%	0.4%
Cuba	8.492	10.8	12.7	49.6%	0.8%	8.621	10.97	13.09	51.8%	0.8%	99.32	100	99.83	0.5%	0.0%
Puerto Rico	9.238	11.75	13.96	51.1%	0.8%	9.973	12.69	15.27	53.1%	0.9%	99.21	99.96	100	0.8%	0.0%
Jamaica	5.393	7.554	9.405	74.4%	1.1%	6.38	8.481	10.16	59.2%	0.9%	91.91	99.85	100	8.8%	0.2%
Trinidad and Tobago	8.351	10.64	13.36	60.0%	0.9%	8.423	10.46	12.93	53.5%	0.9%	92.83	100	99.84	7.6%	0.1%
Bahamas	9.149	10.63	12.51	36.7%	0.6%	8.632	10.88	13.08	51.5%	0.8%	93.51	99.99	99.9	6.8%	0.1%
Barbados	8.687	10.69	12.56	44.6%	0.7%	7.931	10.22	12.35	55.7%	0.9%	98.21	100	99.99	1.8%	0.0%
St. Vincent & the Grenadines	7.508	10.14	12.16	62.0%	1.0%	6.635	9.72	12.19	83.7%	1.2%	93.23	99.99	99.99	7.3%	0.1%
Grenada	7.632	9.191	11.38	49.1%	0.8%	6.908	9.189	11.64	68.5%	1.0%	85.96	100	99.99	16.3%	0.3%
St. Lucia	8.052	10.45	12.27	52.4%	0.8%	7.355	10.37	12.55	70.6%	1.1%	99.33	100	99.99	0.7%	0.0%
America-Caribbean	**6.225**	**7.482**	**9.015**	**44.8%**	**0.7%**	**6.592**	**8.039**	**9.822**	**49.0%**	**0.8%**	**84.31**	**93.03**	**96.28**	**14.2%**	**0.3%**
Guatemala	4.396	6.665	8.693	97.7%	1.4%	3.371	5.916	8.567	154.1%	1.9%	91.5	96.66	99.99	9.3%	0.2%
Honduras	4.667	6.664	8.36	79.1%	1.2%	4.894	8.485	10.95	123.7%	1.6%	92.29	97.36	99.56	7.9%	0.2%
El Salvador	5.164	6.857	9.299	80.1%	1.2%	5.209	7.102	9.761	87.4%	1.3%	93.3	99.18	100	7.2%	0.1%
Nicaragua	4.62	6.372	8.259	78.8%	1.2%	5.583	7.782	9.94	78.0%	1.2%	86.49	95.97	99.61	15.2%	0.3%
Costa Rica	6.59	8.56	10.71	62.5%	1.0%	6.615	9.175	11.5	73.8%	1.1%	94.8	99.93	100	5.5%	0.1%
Panama	8.255	9.805	11.17	35.3%	0.6%	8.641	10.59	12.12	40.3%	0.7%	98.41	99.99	100	1.6%	0.0%
Belize	7.078	8.268	10.22	44.4%	0.7%	6.422	8.463	10.67	66.1%	1.0%	95.58	99.99	99.99	4.6%	0.1%
America-Central	**5.163**	**7.058**	**9.008**	**74.5%**	**1.1%**	**5.03**	**7.412**	**9.776**	**94.4%**	**1.3%**	**92.23**	**97.63**	**99.87**	**8.3%**	**0.2%**
United States of America	12.55	13.79	15.04	19.8%	0.4%	12.61	14.21	15.69	24.4%	0.4%	95.74	99.93	99.99	4.4%	0.1%
Mexico	7.739	9.362	11.12	43.7%	0.7%	7.171	9.46	11.48	60.1%	0.9%	98.53	99.96	100	1.5%	0.0%
Canada	12	13.46	14.72	22.7%	0.4%	12	13.98	15.75	31.3%	0.5%	98.72	99.96	99.99	1.3%	0.0%
America-North	**11.35**	**12.7**	**14.11**	**24.3%**	**0.4%**	**11.26**	**13.05**	**14.72**	**30.7%**	**0.5%**	**96.63**	**99.94**	**99.99**	**3.5%**	**0.1%**
Brazil	5.604	8.382	10.95	95.4%	1.3%	5.486	9.037	12.07	120.0%	1.6%	96.74	99.91	100	3.4%	0.1%
Colombia	5.607	8.109	10.17	81.4%	1.2%	6.021	8.515	10.51	74.6%	1.1%	92.19	99.83	100	8.5%	0.2%
Argentina	9.162	11.21	12.97	41.6%	0.7%	9.451	11.76	13.59	43.8%	0.7%	98.69	99.97	99.99	1.3%	0.0%
Venezuela, RB	6.403	8.82	10.85	69.5%	1.1%	6.376	9.073	11.06	73.5%	1.1%	92.86	99.99	100	7.7%	0.1%
Peru	8.828	11.07	12.79	44.9%	0.7%	7.809	10.68	12.73	63.0%	1.0%	96.46	99.98	100	3.7%	0.1%
Chile	8.827	11.68	14.03	58.9%	0.9%	8.808	11.77	14.23	61.6%	1.0%	91.14	99.99	100	9.7%	0.2%
Ecuador	7.384	9.465	10.82	46.5%	0.8%	7.114	9.139	10.68	50.1%	0.8%	96.22	98.88	99.8	3.7%	0.1%
Bolivia	6.957	9.678	12.08	73.6%	1.1%	6.021	9.252	11.96	98.6%	1.4%	95.39	99.99	99.84	4.7%	0.1%
Paraguay	6.507	9.098	10.84	66.6%	1.0%	6.384	9.625	11.69	83.1%	1.2%	94.71	98.59	99.99	5.6%	0.1%
Uruguay	7.865	10.74	13.04	65.8%	1.0%	8.363	11.17	13.33	59.4%	0.9%	97.77	99.61	100	2.3%	0.0%
Guyana	6.517	8.406	10.55	61.9%	1.0%	6.596	7.953	9.819	48.9%	0.8%	95.15	99.4	98.97	4.0%	0.1%
Suriname	6.883	7.361	9.326	35.5%	0.6%	6.395	8.29	10.76	68.3%	1.0%	94.1	99.95	100	6.3%	0.1%
America-South	**6.541**	**9.116**	**11.36**	**73.7%**	**1.1%**	**6.452**	**9.522**	**12.03**	**86.5%**	**1.3%**	**95.76**	**99.86**	**99.98**	**4.4%**	**0.1%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
	Years					Years					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	7.337	8.924	10.84	47.7%	0.8%	5.231	7.583	10.19	94.8%	1.3%	89.6	99.97	100	11.6%	0.2%
Japan	10.81	12.82	14.39	33.1%	0.6%	10.02	12.23	14.3	42.7%	0.7%	99.67	99.98	100	0.3%	0.0%
Korea, Rep. of	11.99	12.97	14.15	18.0%	0.3%	10.05	11.26	12.7	26.4%	0.5%	98.5	99.92	99.99	1.5%	0.0%
Taiwan	9.969	12.01	13.76	38.0%	0.6%	8.991	11.86	14.29	58.9%	0.9%	98.58	100	100	1.4%	0.0%
Korea, Dem. Rep. of	5.312	6.58	8.059	51.7%	0.8%	4.291	5.847	7.808	82.0%	1.2%	79.02	95.35	99.48	25.9%	0.5%
Hong Kong	10.08	10.4	12.19	20.9%	0.4%	8.984	9.646	11.78	31.1%	0.5%	95.89	100	100	4.3%	0.1%
Mongolia	5.6	9.12	11.44	104.3%	1.4%	4.641	9.51	12.46	168.5%	2.0%	90.42	100	99.99	10.6%	0.2%
Asia-East	**7.785**	**9.329**	**11.13**	**43.0%**	**0.7%**	**5.831**	**8.062**	**10.52**	**80.4%**	**1.2%**	**90.71**	**99.91**	**99.99**	**10.2%**	**0.2%**
India	7.184	9.27	11.58	61.2%	1.0%	4.182	6.255	8.982	114.8%	1.5%	89.49	98.98	100	11.7%	0.2%
Pakistan	3.35	3.323	4.769	42.4%	0.7%	1.377	2.26	4.46	223.9%	2.4%	69.38	87.32	98.69	42.2%	0.7%
Bangladesh	3.565	4.584	6.374	78.8%	1.2%	1.987	4.025	6.327	218.4%	2.3%	89.85	95.14	99.04	10.2%	0.2%
Afghanistan	1.697	2.107	3.186	87.7%	1.3%	0.598	1.098	2.842	375.3%	3.2%	31.95	65.15	81.05	153.7%	1.9%
Iran, Islamic Rep. of	7.391	10.68	12.85	73.9%	1.1%	5.115	8.233	10.95	114.1%	1.5%	97.22	100	100	2.9%	0.1%
Nepal	3.222	3.253	4.862	50.9%	0.8%	1.273	2.159	4.569	258.9%	2.6%	81.63	93.82	100	22.5%	0.4%
Uzbekistan	4.842	7.09	8.872	83.2%	1.2%	3.672	5.809	7.796	112.3%	1.5%	83.27	99.19	99.92	20.0%	0.4%
Sri Lanka	7.391	9.994	12.55	69.8%	1.1%	6.821	9.49	12.42	82.1%	1.2%	99.69	99.99	99.5	-0.2%	0.0%
Kazakhstan	10.03	12.79	14.77	47.3%	0.8%	9.271	12.09	14.41	55.4%	0.9%	95.01	100	100	5.3%	0.1%
Tajikistan	10.78	12.47	13.49	25.1%	0.4%	9.081	10.1	11.25	23.9%	0.4%	98.76	99.85	100	1.3%	0.0%
Turkmenistan	5.136	5.757	7.921	54.2%	0.9%	4.115	4.852	7.219	75.4%	1.1%	80.35	100	99.98	24.4%	0.4%
Kyrgyzstan	4.594	6.999	8.61	87.4%	1.3%	3.518	6.177	8.127	131.0%	1.7%	87.95	98.92	100	13.7%	0.3%
Bhutan	5.407	6.12	8.966	65.8%	1.0%	4.455	5.44	8.546	91.8%	1.3%	75.97	98.86	99.72	31.3%	0.5%
Maldives	5.677	6.83	9.673	70.4%	1.1%	4.691	5.981	8.87	89.1%	1.3%	97.86	100	98.01	0.2%	0.0%
Asia-South Central	**6.286**	**7.805**	**9.607**	**52.8%**	**0.9%**	**3.702**	**5.468**	**7.817**	**111.2%**	**1.5%**	**86.55**	**95.99**	**98.66**	**14.0%**	**0.3%**
Indonesia	6.532	8.842	10.59	62.1%	1.0%	5.314	8.093	10.33	94.4%	1.3%	95.09	99.28	100	5.2%	0.1%
Philippines	7.962	8.986	10.13	27.2%	0.5%	8.364	9.886	11.25	34.5%	0.6%	92.45	97.64	99.93	8.1%	0.2%
Vietnam	4.986	8.247	10.8	116.6%	1.6%	3.891	7.176	10.06	158.5%	1.9%	96.56	99.31	99.86	3.4%	0.1%
Thailand	7	8.686	10.96	56.6%	0.9%	6.624	9.283	12.1	82.7%	1.2%	96.14	99.99	100	4.0%	0.1%
Myanmar	3.246	5.66	7.782	139.7%	1.8%	2.941	5.85	8.557	191.0%	2.2%	98.83	99.54	100	1.2%	0.0%
Malaysia	8.99	10.93	13	44.6%	0.7%	8.202	11.12	13.69	66.9%	1.0%	100	100	100	0.0%	0.0%
Cambodia	3.667	4.6	6.509	77.5%	1.2%	2.574	3.766	6.144	138.7%	1.8%	96.1	96.62	99.74	3.8%	0.1%
Lao PDR	4.427	6.314	8.745	97.5%	1.4%	3.349	5.544	8.336	148.9%	1.8%	86.31	95.56	99.99	15.8%	0.3%
Singapore	9.272	10.97	13.04	40.6%	0.7%	8.137	9.987	12.38	52.1%	0.8%	95.02	99.99	99.84	5.1%	0.1%
Timor-Leste	4.874	6.243	7.748	59.0%	0.9%	3.879	5.711	7.792	100.9%	1.4%	69.13	80.51	97.83	41.5%	0.7%
Brunei Darussalam	10.88	11.82	13.35	22.7%	0.4%	10.56	12.27	14.06	33.1%	0.6%	96.51	100	100	3.6%	0.1%
Asia-South East	**6.32**	**8.461**	**10.34**	**63.6%**	**1.0%**	**5.577**	**8.211**	**10.51**	**88.5%**	**1.3%**	**95.46**	**98.93**	**99.94**	**4.7%**	**0.1%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
	Years					Years					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	6.002	7.943	9.492	58.1%	0.9%	4.851	7.411	9.579	97.5%	1.4%	93.71	99.98	100	6.7%	0.1%
Yemen	5.012	7.289	9.549	90.5%	1.3%	3.781	6.131	9.681	156.0%	1.9%	78.21	95.72	100	27.9%	0.5%
Iraq	6.19	8.539	10.87	75.6%	1.1%	4.074	6.334	9.143	124.4%	1.6%	90.24	98.82	99.99	10.8%	0.2%
Saudi Arabia	9.158	10.16	12.83	40.1%	0.7%	8.84	11.59	14.5	64.0%	1.0%	63.57	100	100	57.3%	0.9%
Syria	7.73	8.989	10.47	35.4%	0.6%	5.531	7.79	9.894	78.9%	1.2%	97.2	99.99	99.95	2.8%	0.1%
Israel	9.991	12.4	14.34	43.5%	0.7%	9.799	12.43	14.74	50.4%	0.8%	98.81	99.96	100	1.2%	0.0%
Azerbaijan	6.67	9.757	12.3	84.4%	1.2%	5.57	8.469	11.34	103.6%	1.4%	90.01	100	100	11.1%	0.2%
Jordan	10.01	12.83	14.64	46.3%	0.8%	8.173	12.47	14.88	82.1%	1.2%	93.34	99.75	99.81	6.9%	0.1%
Palestine	6.24	9.526	11.93	91.2%	1.3%	5.274	9.317	12.37	134.5%	1.7%	80.09	96.96	99.97	24.8%	0.4%
United Arab Emirates	10.47	12.17	14.98	43.1%	0.7%	10.23	13.8	16.98	66.0%	1.0%	89.89	100	99.77	11.0%	0.2%
Oman	9.136	10.19	11.99	31.2%	0.5%	8.657	10.64	12.88	48.8%	0.8%	79	99.96	100	26.6%	0.5%
Kuwait	7.822	9.229	12.06	54.2%	0.9%	7.857	10.57	13.22	68.3%	1.0%	92.12	99.99	100	8.6%	0.2%
Lebanon	7.916	9.951	12.02	51.8%	0.8%	7.138	9.665	11.98	67.8%	1.0%	84.84	99.98	100	17.9%	0.3%
Georgia	5.862	7.75	9.344	59.4%	0.9%	4.851	6.741	8.419	73.6%	1.1%	95.56	100	100	4.6%	0.1%
Armenia	6.399	9.134	11.23	75.5%	1.1%	5.427	8.072	10.14	86.8%	1.3%	86.52	100	99.96	15.5%	0.3%
Bahrain	10.28	11.51	13.28	29.2%	0.5%	9.875	12.1	14.23	44.1%	0.7%	99.64	100	100	0.4%	0.0%
Qatar	11.57	12.13	14.21	22.8%	0.4%	11.46	14.04	16.54	44.3%	0.7%	98.16	99.98	100	1.9%	0.0%
Cyprus	9.626	11.28	12.81	33.1%	0.6%	9.11	11.25	13.28	45.8%	0.8%	99.95	100	99.96	0.0%	0.0%
Asia-West	**6.952**	**8.881**	**10.91**	**56.9%**	**0.9%**	**5.745**	**8.271**	**10.88**	**89.4%**	**1.3%**	**87.87**	**99.14**	**99.98**	**13.8%**	**0.3%**
Australia	11.65	14.08	15.63	34.2%	0.6%	11.21	14.13	16.26	45.0%	0.7%	98.51	99.97	100	1.5%	0.0%
Papua New Guniea	3.383	4.832	6.564	94.0%	1.3%	2.532	4.115	6.356	151.0%	1.9%	57.9	78.8	96.97	67.5%	1.0%
New Zealand	12.43	14.8	16.5	32.7%	0.6%	12.16	15.21	17.53	44.2%	0.7%	100	99.92	100	0.0%	0.0%
Solomon Islands	4.162	4.841	5.976	43.6%	0.7%	3.127	4.27	5.702	82.3%	1.2%	63.68	76	95.67	50.2%	0.8%
Fiji	6.21	7.795	9.644	55.3%	0.9%	5.345	7.56	9.799	83.3%	1.2%	94.4	98.72	99.99	5.9%	0.1%
Vanuatu	5.703	7.208	9.463	65.9%	1.0%	4.794	6.686	9.2	91.9%	1.3%	96.23	99.51	99.98	3.9%	0.1%
Micronesia	6.818	8.233	9.613	41.0%	0.7%	5.908	7.792	9.884	67.3%	1.0%	84.2	95.34	99.63	18.3%	0.3%
Tonga	6.285	6.995	8.556	36.1%	0.6%	5.428	6.612	8.489	56.4%	0.9%	96.3	99.47	99.9	3.7%	0.1%
Samoa	6.415	7.932	9.931	54.8%	0.9%	5.612	8.076	10.32	83.9%	1.2%	88.82	99.64	100	12.6%	0.2%
Oceania	**9.808**	**11.53**	**12.82**	**30.7%**	**0.5%**	**9.284**	**11.42**	**13.23**	**42.5%**	**0.7%**	**90.19**	**94.5**	**99.09**	**9.9%**	**0.2%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Years of Education, Adult Males 25+					Years of Education, Adult Females 25+					Primary Education Enrollment Rate, Net				
	Years					Years					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	10.9	13.25	15.03	37.9%	0.6%	11.45	13.07	14.67	28.1%	0.5%	94.01	100	99.95	6.3%	0.1%
Ukraine	10.9	13.4	15.63	43.4%	0.7%	11.44	13.12	14.86	29.9%	0.5%	97.43	100	100	2.6%	0.1%
Poland	10.77	13.27	15.3	42.1%	0.7%	10.54	13.22	15.6	48.0%	0.8%	99.52	100	99.96	0.4%	0.0%
Romania	10.69	13.27	15.46	44.6%	0.7%	9.821	12.79	15.27	55.5%	0.9%	95.93	100	100	4.2%	0.1%
Czech Republic	11.09	14.2	16.59	49.6%	0.8%	9.576	13.06	15.93	66.4%	1.0%	97.68	100	100	2.4%	0.0%
Belarus	10.75	12.65	14.37	33.7%	0.6%	11.46	13.34	15.16	32.3%	0.6%	96.21	100	100	3.9%	0.1%
Hungary	10.34	13.56	16.07	55.4%	0.9%	9.224	12.84	16	73.5%	1.1%	94.34	100	99.99	6.0%	0.1%
Bulgaria	10.61	13.18	15.14	42.7%	0.7%	10.36	12.42	14.22	37.3%	0.6%	99.59	100	100	0.4%	0.0%
Slovakia	10.93	14.04	16.35	49.6%	0.8%	9.479	13.24	16.34	72.4%	1.1%	98.21	100	100	1.8%	0.0%
Moldova, Rep. of	10.02	11.9	13.53	35.0%	0.6%	9.045	11.41	13.49	49.1%	0.8%	97.63	99.97	99.93	2.4%	0.0%
Europe-East	**10.83**	**13.29**	**15.26**	**40.9%**	**0.7%**	**10.97**	**13.04**	**14.99**	**36.6%**	**0.6%**	**95.88**	**100**	**99.97**	**4.3%**	**0.1%**
United Kingdom	10.28	13.02	14.99	45.8%	0.8%	10.18	13.1	15.39	51.2%	0.8%	99.52	99.98	100	0.5%	0.0%
Sweden	11.84	13.95	15.58	31.6%	0.6%	11.9	14.17	16.08	35.1%	0.6%	98.57	99.99	100	1.5%	0.0%
Denmark	11.55	14.04	15.88	37.5%	0.6%	9.998	12.88	15.2	52.0%	0.8%	98.26	100	100	1.8%	0.0%
Ireland	9.733	11.97	13.55	39.2%	0.7%	9.743	12.02	13.74	41.0%	0.7%	97.86	99.99	99.94	2.1%	0.0%
Norway	12.51	14.47	15.85	26.7%	0.5%	12.07	14.48	16.34	35.4%	0.6%	98.73	100	99.97	1.3%	0.0%
Finland	11.17	13.5	15.36	37.5%	0.6%	10.67	13.27	15.51	45.4%	0.8%	99.56	100	100	0.4%	0.0%
Lithuania	10.3	13.07	15.08	46.4%	0.8%	9.55	12.92	15.67	64.1%	1.0%	96.01	100	99.98	4.1%	0.1%
Latvia	10.46	13.82	16.57	58.4%	0.9%	9.991	13.77	17.06	70.8%	1.1%	98.63	100	99.99	1.4%	0.0%
Estonia	9.792	12.82	15.63	59.6%	0.9%	9.66	12.76	16.07	66.4%	1.0%	98.87	100	99.99	1.1%	0.0%
Iceland	9.967	12.08	13.71	37.6%	0.6%	9.564	12.62	14.98	56.6%	0.9%	98.75	99.96	99.99	1.3%	0.0%
Europe-North	**10.63**	**13.22**	**15.11**	**42.1%**	**0.7%**	**10.4**	**13.21**	**15.45**	**48.6%**	**0.8%**	**99.1**	**99.99**	**99.99**	**0.9%**	**0.0%**
Italy	8.388	11.74	14.65	74.7%	1.1%	7.598	11.06	14.32	88.5%	1.3%	99.93	100	99.99	0.1%	0.0%
Spain	8.482	11.04	13.1	54.4%	0.9%	8.304	10.77	12.94	55.8%	0.9%	99.94	100	100	0.1%	0.0%
Greece	10.36	11.89	13.14	26.8%	0.5%	8.572	11.53	14.07	64.1%	1.0%	99.95	100	100	0.1%	0.0%
Portugal	5.737	8.015	10.26	78.8%	1.2%	5.793	8.945	11.87	104.9%	1.4%	99.7	100	99.99	0.3%	0.0%
Serbia	10.19	12.43	14.47	42.0%	0.7%	8.506	11.44	14.01	64.7%	1.0%	92.82	99.89	99.99	7.7%	0.1%
Croatia	7.909	11.11	13.82	74.7%	1.1%	6.774	10.2	13.3	96.3%	1.4%	95.26	100	99.99	5.0%	0.1%
Bosnia and Herzegovina	6.813	8.255	10.05	47.5%	0.8%	5.989	8.188	10.8	80.3%	1.2%	85.97	98.88	98.94	15.1%	0.3%
Albania	6.878	9.343	11.49	67.1%	1.0%	5.959	8.539	10.99	84.4%	1.2%	96.75	99.73	100	3.4%	0.1%
Macedonia, TFYR	7.751	11.22	13.81	78.2%	1.2%	6.792	10.2	13.06	92.3%	1.3%	95.53	100	99.96	4.6%	0.1%
Slovenia	8.64	12.28	15.39	78.1%	1.2%	7.914	11.6	14.99	89.4%	1.3%	99.5	100	99.97	0.5%	0.0%
Montenegro	7.48	9.934	12.32	64.7%	1.0%	6.65	9.704	12.49	87.8%	1.3%	92.96	99.96	99.65	7.2%	0.1%
Malta	9.469	11.28	13.26	40.0%	0.7%	8.723	10.59	12.83	47.1%	0.8%	95.61	100	99.99	4.6%	0.1%
Europe-South	**8.368**	**11.12**	**13.46**	**60.9%**	**1.0%**	**7.685**	**10.7**	**13.44**	**74.9%**	**1.1%**	**98.87**	**99.96**	**99.96**	**1.1%**	**0.0%**
Germany	10.78	13.01	15.34	42.3%	0.7%	9.843	11.82	14.31	45.4%	0.8%	100	99.99	100	0.0%	0.0%
France	9.587	12.76	15.23	58.9%	0.9%	9.204	12.55	15.43	67.6%	1.0%	99.99	100	100	0.0%	0.0%
Netherlands	10.14	11.83	13.75	35.6%	0.6%	9.419	11.26	13.51	43.4%	0.7%	99.72	100	100	0.3%	0.0%
Belgium	9.779	12.69	14.91	52.5%	0.8%	9.206	12.36	14.95	62.4%	1.0%	99.05	100	100	1.0%	0.0%
Austria	10.53	13.33	15.57	47.9%	0.8%	8.944	11.95	14.77	65.1%	1.0%	100	100	100	0.0%	0.0%
Switzerland	11.7	13.44	15.37	31.4%	0.5%	10.09	11.88	14.17	40.4%	0.7%	90.92	100	99.99	10.0%	0.2%
Luxembourg	11.73	12.85	14.47	23.4%	0.4%	11.37	13.21	15.06	32.5%	0.6%	97.53	99.98	99.94	2.5%	0.0%
Europe-West	**10.3**	**12.82**	**15.12**	**46.8%**	**0.8%**	**9.533**	**12.06**	**14.69**	**54.1%**	**0.9%**	**99.55**	**100**	**100**	**0.5%**	**0.0%**

Education

Base Case
Source: International Futures
Version 6.12, March 2009

	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**108.4**	**103.5**	**101.4**	**-6.5%**	**-0.1%**	**84.66**	**93.46**	**93.65**	**10.6%**	**0.2%**	**59.46**	**73.56**	**82.64**	**39.0%**	**0.7%**
Africa	**99.72**	**106.4**	**103.4**	**3.7%**	**0.1%**	**51.62**	**65.87**	**80.61**	**56.2%**	**0.9%**	**31.19**	**42.45**	**57.81**	**85.3%**	**1.2%**
Americas	**113.4**	**101.6**	**100.6**	**-11.3%**	**-0.2%**	**102.5**	**106**	**103.1**	**0.6%**	**0.0%**	**80.81**	**89.45**	**95.49**	**18.2%**	**0.3%**
Asia with Oceania	**109.8**	**103.4**	**100.9**	**-8.1%**	**-0.2%**	**85.41**	**98.88**	**96.43**	**12.9%**	**0.2%**	**54.24**	**76.61**	**88.44**	**63.1%**	**1.0%**
Europe	**105.6**	**100.5**	**100.1**	**-5.2%**	**-0.1%**	**103.2**	**101.6**	**101**	**-2.1%**	**0.0%**	**100.7**	**101.5**	**102.6**	**1.9%**	**0.0%**
World	**108.4**	**103.5**	**101.4**	**-6.5%**	**-0.1%**	**84.66**	**93.46**	**93.65**	**10.6%**	**0.2%**	**59.46**	**73.56**	**82.64**	**39.0%**	**0.7%**
Africa-Eastern	**105.2**	**105**	**102.2**	**-2.9%**	**-0.1%**	**38.57**	**57.58**	**83.49**	**116.5%**	**1.6%**	**14.31**	**30.08**	**59.42**	**315.2%**	**2.9%**
Africa-Middle	**90.82**	**106.5**	**106.3**	**17.0%**	**0.3%**	**32.43**	**49.89**	**65.86**	**103.1%**	**1.4%**	**17.53**	**26.53**	**38.48**	**119.5%**	**1.6%**
Africa-Northern	**100.4**	**103.8**	**101.5**	**1.1%**	**0.0%**	**88.49**	**98.94**	**102.8**	**16.2%**	**0.3%**	**59.76**	**76.98**	**85.58**	**43.2%**	**0.7%**
Africa-Southern	**107.2**	**102**	**100.2**	**-6.5%**	**-0.1%**	**94.76**	**99.33**	**100.2**	**5.7%**	**0.1%**	**86.71**	**105.4**	**109.4**	**26.2%**	**0.5%**
Africa-Western	**95.77**	**110**	**104.3**	**8.9%**	**0.2%**	**40.15**	**60.67**	**74.53**	**85.6%**	**1.2%**	**24.82**	**37.05**	**50.16**	**102.1%**	**1.4%**
Africa	**99.72**	**106.4**	**103.4**	**3.7%**	**0.1%**	**51.62**	**65.87**	**80.61**	**56.2%**	**0.9%**	**31.19**	**42.45**	**57.81**	**85.3%**	**1.2%**
America-Caribbean	**108.5**	**110.7**	**108.7**	**0.2%**	**0.0%**	**82.89**	**92.86**	**94.51**	**14.0%**	**0.3%**	**67.23**	**76.27**	**79.53**	**18.3%**	**0.3%**
America-Central	**113.4**	**104.1**	**101**	**-10.9%**	**-0.2%**	**74.65**	**87.57**	**97.99**	**31.3%**	**0.5%**	**59.55**	**74.1**	**92.94**	**56.1%**	**0.9%**
America-North	**105.4**	**100.3**	**100**	**-5.1%**	**-0.1%**	**103.2**	**101**	**100.6**	**-2.5%**	**-0.1%**	**85.14**	**95.61**	**98.75**	**16.0%**	**0.3%**
America-South	**123**	**101.9**	**100.4**	**-18.4%**	**-0.4%**	**106.8**	**115.2**	**107.4**	**0.6%**	**0.0%**	**79.57**	**85.97**	**93.87**	**18.0%**	**0.3%**
Americas	**113.4**	**101.6**	**100.6**	**-11.3%**	**-0.2%**	**102.5**	**106**	**103.1**	**0.6%**	**0.0%**	**80.81**	**89.45**	**95.49**	**18.2%**	**0.3%**
Asia-East	**109.9**	**101.1**	**100.4**	**-8.6%**	**-0.2%**	**99.34**	**108.9**	**99.44**	**0.1%**	**0.0%**	**63.07**	**91.57**	**101.5**	**60.9%**	**1.0%**
Asia-South Central	**110.6**	**105.6**	**101.4**	**-8.3%**	**-0.2%**	**73.38**	**92.99**	**93.26**	**27.1%**	**0.5%**	**43.65**	**66.69**	**80.66**	**84.8%**	**1.2%**
Asia-South East	**112.1**	**102.9**	**100.6**	**-10.3%**	**-0.2%**	**83.13**	**94.4**	**98.64**	**18.7%**	**0.3%**	**54.57**	**68.99**	**83.33**	**52.7%**	**0.9%**
Asia-West	**100.6**	**101.8**	**100.2**	**-0.4%**	**0.0%**	**83.84**	**97.2**	**99.95**	**19.2%**	**0.4%**	**63.63**	**80.18**	**91.02**	**43.0%**	**0.7%**
Oceania	**96.49**	**99.48**	**100.2**	**3.8%**	**0.1%**	**92.36**	**87.25**	**91.9**	**-0.5%**	**0.0%**	**106.8**	**82.63**	**86.3**	**-19.2%**	**-0.4%**
Asia with Oceania	**109.8**	**103.4**	**100.9**	**-8.1%**	**-0.2%**	**85.41**	**98.88**	**96.43**	**12.9%**	**0.2%**	**54.24**	**76.61**	**88.44**	**63.1%**	**1.0%**
Europe-East	**106.7**	**101**	**100.3**	**-6.0%**	**-0.1%**	**96.71**	**102.5**	**101.4**	**4.8%**	**0.1%**	**96.18**	**101.4**	**102.8**	**6.9%**	**0.1%**
Europe-North	**105.3**	**100.2**	**100.1**	**-4.9%**	**-0.1%**	**102.8**	**99.43**	**99.99**	**-2.7%**	**-0.1%**	**109.1**	**102.7**	**103.9**	**-4.8%**	**-0.1%**
Europe-South	**103.4**	**100.2**	**100**	**-3.3%**	**-0.1%**	**106.5**	**99.63**	**99.66**	**-6.4%**	**-0.1%**	**101.1**	**100.4**	**102.1**	**1.0%**	**0.0%**
Europe-West	**105.8**	**100.2**	**100.1**	**-5.4%**	**-0.1%**	**110.8**	**102.9**	**102**	**-7.9%**	**-0.2%**	**102.8**	**101.5**	**101.9**	**-0.9%**	**0.0%**
Europe	**105.6**	**100.5**	**100.1**	**-5.2%**	**-0.1%**	**103.2**	**101.6**	**101**	**-2.1%**	**0.0%**	**100.7**	**101.5**	**102.6**	**1.9%**	**0.0%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	87.02	89.13	96.92	11.4%	0.2%	38.49	56.8	80.44	109.0%	1.5%	10.19	32.58	63.05	518.7%	3.7%
Uganda	128.7	123.9	113.1	-12.1%	-0.3%	24.69	54.87	94.73	283.7%	2.7%	12.63	33.22	73.09	478.7%	3.6%
Tanzania, United Rep. of	107.6	102.5	100.8	-6.3%	-0.1%	12.35	35.33	80.76	553.9%	3.8%	7.002	19.81	54.73	681.6%	4.2%
Kenya	109.2	105.3	100.2	-8.2%	-0.2%	92.37	101.7	111.4	20.6%	0.4%	29	41.71	71.49	146.5%	1.8%
Madagascar	144.1	126	110	-23.7%	-0.5%	31.45	49.54	63.77	102.8%	1.4%	12.52	23.28	35.85	186.3%	2.1%
Mozambique	106.2	103.7	102.8	-3.2%	-0.1%	23.24	53.04	101.7	337.6%	3.0%	7.491	28.4	87.64	1069.9%	5.0%
Malawi	125.3	115.5	108.2	-13.6%	-0.3%	40.84	59.25	72.59	77.7%	1.2%	16.15	29.47	44.62	176.3%	2.1%
Zambia	109.4	100.4	103.1	-5.8%	-0.1%	50.15	56.43	85.59	70.7%	1.1%	19.92	28.02	54.55	173.8%	2.0%
Burundi	89.55	105.6	104.1	16.2%	0.3%	21.29	38.92	68.47	221.6%	2.4%	9.098	17.66	44.27	386.6%	3.2%
Rwanda	137.2	121.5	107.4	-21.7%	-0.5%	21.27	44.84	64.93	205.3%	2.3%	10.8	22.16	39.58	266.5%	2.6%
Somalia	19.51	86.91	75.51	287.0%	2.7%	6.657	23.24	27.37	311.1%	2.9%	5.489	9.484	11.55	110.4%	1.5%
Zimbabwe	103.6	101	98.83	-4.6%	-0.1%	61.2	76.6	88.81	45.1%	0.7%	31.95	46.01	62.71	96.3%	1.4%
Eritrea	77.22	125.9	110.1	42.6%	0.7%	48.68	73.05	89.73	84.3%	1.2%	21.45	34.14	49.35	130.1%	1.7%
Mauritius	103.7	100.2	100	-3.6%	-0.1%	98.45	100.3	100	1.6%	0.0%	79.73	102	102.2	28.2%	0.5%
Comoros	93.75	114.9	108.4	15.6%	0.3%	44.64	66.12	90.08	101.8%	1.4%	29.03	40.08	62.75	116.2%	1.6%
Djibouti	57.14	109.7	107.7	88.5%	1.3%	31.89	58.5	94.31	195.7%	2.2%	16.52	27.96	62.43	277.9%	2.7%
Africa-Eastern	**105.2**	**105**	**102.2**	**-2.9%**	**-0.1%**	**38.57**	**57.58**	**83.49**	**116.5%**	**1.6%**	**14.31**	**30.08**	**59.42**	**315.2%**	**2.9%**
Congo; Dem. Rep. of	67.89	90.6	103.2	52.0%	0.8%	33.03	46.2	65.38	97.9%	1.4%	18.3	23.9	36.06	97.0%	1.4%
Angola	154.1	166.5	122.1	-20.8%	-0.5%	27.55	63.69	69.17	151.1%	1.9%	13.67	34.79	46.73	241.8%	2.5%
Cameroon	111.4	113.1	109	-2.2%	0.0%	35.59	51.87	76.77	115.7%	1.5%	21.24	31.86	50.79	139.1%	1.8%
Chad	83.98	101.3	99.48	18.5%	0.3%	21.29	39.59	48.4	127.3%	1.7%	11.78	20.68	27.51	133.5%	1.7%
Central African Republic	66.94	97.8	105.4	57.5%	0.9%	18.28	37.97	55.41	203.1%	2.2%	9.443	17.25	28.6	202.9%	2.2%
Congo, Rep. of	109.6	117.8	112.2	2.4%	0.0%	57.68	73.27	81.37	41.1%	0.7%	23.39	30.27	44.68	91.0%	1.3%
Gabon	148.1	124	100.3	-32.3%	-0.8%	65.81	88.51	95.36	44.9%	0.7%	33.54	59.5	75.59	125.4%	1.6%
Equatorial Guinea	133.5	137.5	113	-15.4%	-0.3%	47.76	91.07	90.63	89.8%	1.3%	17.27	56.21	61.73	257.4%	2.6%
São Tomé and Príncipe	129.3	118.5	107.9	-16.6%	-0.4%	72.29	82.19	91.3	26.3%	0.5%	28.44	31.62	42.13	48.1%	0.8%
Africa-Middle	**90.82**	**106.5**	**106.3**	**17.0%**	**0.3%**	**32.43**	**49.89**	**65.86**	**103.1%**	**1.4%**	**17.53**	**26.53**	**38.48**	**119.5%**	**1.6%**
Egypt	104.1	100.4	100.1	-3.8%	-0.1%	99.68	96.84	99.62	-0.1%	0.0%	80.49	98.44	99.18	23.2%	0.4%
Sudan	70.64	112.1	105.5	49.3%	0.8%	50.25	92	102.1	103.2%	1.4%	27.14	58.57	74.13	173.1%	2.0%
Algeria	111.1	100.3	99.88	-10.1%	-0.2%	111.5	118.6	115.4	3.5%	0.1%	59.08	66.04	76.07	28.8%	0.5%
Morocco	112.9	104.8	100.3	-11.2%	-0.2%	71.77	91.68	101.4	41.3%	0.7%	38.12	54.49	73.51	92.8%	1.3%
Tunisia	110.1	100.1	100.1	-9.1%	-0.2%	107.9	107.1	102.6	-4.9%	-0.1%	72.07	85	95.92	33.1%	0.6%
Libyan Arab Jamahiriya	102.6	100.3	99.83	-2.7%	-0.1%	112.1	97.06	96.62	-13.8%	-0.3%	94.41	94.24	95.16	0.8%	0.0%
Africa-Northern	**100.4**	**103.8**	**101.5**	**1.1%**	**0.0%**	**88.49**	**98.94**	**102.8**	**16.2%**	**0.3%**	**59.76**	**76.98**	**85.58**	**43.2%**	**0.7%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	106.4	101.6	100.1	-5.9%	-0.1%	98.22	100.5	100.2	2.0%	0.0%	93.88	113.1	113.3	20.7%	0.4%
Namibia	110.6	101.7	100.1	-9.5%	-0.2%	77.85	97.83	103.8	33.3%	0.6%	29.4	48.4	84.43	187.2%	2.1%
Lesotho	117.9	109.7	100.4	-14.8%	-0.3%	49.52	74.56	96.46	94.8%	1.3%	27.05	48.73	83.26	207.8%	2.3%
Botswana	112.2	101.4	100.2	-10.7%	-0.2%	92.41	105.1	100.7	9.0%	0.2%	59.5	82.72	96.52	62.2%	1.0%
Swaziland	110.6	102.8	100.2	-9.4%	-0.2%	60.41	90.74	98.11	62.4%	1.0%	36.67	70.51	92.18	151.4%	1.9%
Africa-Southern	**107.2**	**102**	**100.2**	**-6.5%**	**-0.1%**	**94.76**	**99.33**	**100.2**	**5.7%**	**0.1%**	**86.71**	**105.4**	**109.4**	**26.2%**	**0.5%**
Nigeria	103.4	110.8	104.6	1.2%	0.0%	40.7	62.79	67.12	64.9%	1.0%	32.23	46.8	51.25	59.0%	0.9%
Niger	58.35	101.9	101.1	73.3%	1.1%	16.55	39.88	65.32	294.7%	2.8%	5.96	13.35	33.4	460.4%	3.5%
Côte d'Ivoire	82.38	112.5	102	23.8%	0.4%	33.54	57.68	84.49	151.9%	1.9%	15.24	28	55.78	266.0%	2.6%
Ghana	96.15	106.3	102.4	6.5%	0.1%	65.49	78.42	94.9	44.9%	0.7%	23.36	38.68	57.68	146.9%	1.8%
Burkina Faso	68.07	109.6	103.9	52.6%	0.8%	22.79	50.77	82.12	260.3%	2.6%	8.082	18.44	47.34	485.7%	3.6%
Mali	87.12	110.5	105.2	20.8%	0.4%	43.1	64.77	89.84	108.4%	1.5%	16.4	26.87	51.85	216.2%	2.3%
Senegal	87.18	102.3	101.3	16.2%	0.3%	33.62	56.88	85.69	154.9%	1.9%	14.79	27.11	53.2	259.7%	2.6%
Guinea	93.53	103.4	105.8	13.1%	0.2%	43.55	60	81.64	87.5%	1.3%	22.11	33.32	54.61	147.0%	1.8%
Benin	100.8	104.7	102.3	1.5%	0.0%	44.87	59.08	79.77	77.8%	1.2%	21.66	28.51	47.61	119.8%	1.6%
Togo	104.3	110	103.2	-1.1%	0.0%	57	64.31	81.63	43.2%	0.7%	21.65	25.38	37.24	72.0%	1.1%
Sierra Leone	145	153.4	122.9	-15.2%	-0.3%	29.32	54.69	80.24	173.7%	2.0%	26.66	35.55	59.38	122.7%	1.6%
Liberia	100.8	122.4	108.2	7.3%	0.1%	37.5	55.09	64.99	73.3%	1.1%	30.43	36.37	41.45	36.2%	0.6%
Mauritania	105.1	107.3	104.3	-0.8%	0.0%	30.9	49.34	66.42	115.0%	1.5%	22.6	35.4	49.5	119.0%	1.6%
Guinea-Bissau	77.28	106.5	105.2	36.1%	0.6%	25.43	46.67	61.93	143.5%	1.8%	12.13	21.36	32.28	166.1%	2.0%
Gambia	82.73	104.5	112.7	36.2%	0.6%	58.93	65.39	85.21	44.6%	0.7%	33.19	42.23	52.97	59.6%	0.9%
Cape Verde	108.1	101.4	99.71	-7.8%	-0.2%	92.18	110.9	108	17.2%	0.3%	46.25	63.15	85.27	84.4%	1.2%
Africa-Western	**95.77**	**110**	**104.3**	**8.9%**	**0.2%**	**40.15**	**60.67**	**74.53**	**85.6%**	**1.2%**	**24.82**	**37.05**	**50.16**	**102.1%**	**1.4%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross (Percent)					Lower Secondary Enrollment Rate, Gross (Percent)					Upper Secondary Enrollment Rate, Gross (Percent)				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	112.1	127.1	125.5	12.0%	0.2%	44.75	67.29	80.58	80.1%	1.2%	18.36	28.94	39.52	115.3%	1.5%
Dominican Republic	108.7	109.9	100.5	-7.5%	-0.2%	80.77	105.2	101.6	25.8%	0.5%	66.87	100.5	105.8	58.2%	0.9%
Cuba	103	100.1	99.82	-3.1%	-0.1%	102.4	99.66	99.31	-3.0%	-0.1%	89.57	94.46	98.45	9.9%	0.2%
Puerto Rico	123.8	100.1	100	-19.2%	-0.4%	105	98.68	100	-4.8%	-0.1%	102.4	96.91	100	-2.3%	0.0%
Jamaica	97.98	103.2	100.4	2.5%	0.0%	96.56	115.2	110.8	14.7%	0.3%	75.93	79.19	81.57	7.4%	0.1%
Trinidad and Tobago	106.1	101.5	100.5	-5.3%	-0.1%	90.04	110.2	103.9	15.4%	0.3%	79.01	99.55	99.42	25.8%	0.5%
Bahamas	105.1	101.3	100.3	-4.6%	-0.1%	96.53	98.42	98.81	2.4%	0.0%	83.5	94.31	97.26	16.5%	0.3%
Barbados	103	100.2	100	-2.9%	-0.1%	103.8	97.05	98.8	-4.8%	-0.1%	105.8	91.88	96.43	-8.9%	-0.2%
St. Vincent & the Grenadines	118.1	110.7	100.5	-14.9%	-0.3%	88.07	98.3	100.6	14.2%	0.3%	56.01	86.71	96.99	73.2%	1.1%
Grenada	101	102	100.4	-0.6%	0.0%	105.2	119.1	112	6.5%	0.1%	97.21	110.8	96.52	-0.7%	0.0%
St. Lucia	110.2	100.1	100	-9.3%	-0.2%	89.78	89.96	100.5	11.9%	0.2%	77.43	88	99.72	28.8%	0.5%
America-Caribbean	**108.5**	**110.7**	**108.7**	**0.2%**	**0.0%**	**82.89**	**92.86**	**94.51**	**14.0%**	**0.3%**	**67.23**	**76.27**	**79.53**	**18.3%**	**0.3%**
Guatemala	112.3	105.2	101.6	-9.5%	-0.2%	58.48	74.18	94.27	61.2%	1.0%	46.08	61.72	90.25	95.9%	1.4%
Honduras	109.9	101.3	100.3	-8.7%	-0.2%	71.34	85.22	98.96	38.7%	0.7%	92.52	90.53	102.3	10.6%	0.2%
El Salvador	116.3	105.7	100.7	-13.4%	-0.3%	84.66	101.6	101.5	19.9%	0.4%	51.48	76.65	89.63	74.1%	1.1%
Nicaragua	119.8	107.1	101.7	-15.1%	-0.3%	78.04	95.85	98.72	26.5%	0.5%	55.74	70.3	83.52	49.8%	0.8%
Costa Rica	112.5	100.5	100	-11.1%	-0.2%	97.48	105.2	106.7	9.5%	0.2%	61.78	87.64	101.7	64.6%	1.0%
Panama	111	100.9	100.1	-9.8%	-0.2%	89.02	97.85	99.29	11.5%	0.2%	60.3	84.34	98.51	63.4%	1.0%
Belize	114.7	100.3	100.1	-12.7%	-0.3%	98.98	102.4	102.8	3.9%	0.1%	57.46	73.11	96.34	67.7%	1.0%
America-Central	**113.4**	**104.1**	**101**	**-10.9%**	**-0.2%**	**74.65**	**87.57**	**97.99**	**31.3%**	**0.5%**	**59.55**	**74.1**	**92.94**	**56.1%**	**0.9%**
United States of America	104.6	100.3	100	-4.4%	-0.1%	101.7	100.4	100.1	-1.6%	0.0%	88.48	100.1	100.1	13.1%	0.2%
Mexico	108.9	100.2	100	-8.2%	-0.2%	108.6	102.9	102.6	-5.5%	-0.1%	62.56	81.83	94.35	50.8%	0.8%
Canada	101.6	100.2	100.1	-1.5%	0.0%	99.9	99.52	100.1	0.2%	0.0%	127.4	98.71	100.1	-21.4%	-0.5%
America-North	**105.4**	**100.3**	**100**	**-5.1%**	**-0.1%**	**103.2**	**101**	**100.6**	**-2.5%**	**-0.1%**	**85.14**	**95.61**	**98.75**	**16.0%**	**0.3%**
Brazil	134.1	102.2	100.5	-25.1%	-0.6%	117.1	131.4	116.4	-0.6%	0.0%	89.83	88.65	95.39	6.2%	0.1%
Colombia	114.2	102.4	100.2	-12.3%	-0.3%	93.37	94.94	97.1	4.0%	0.1%	66.73	77.61	89.94	34.8%	0.6%
Argentina	111.5	100.7	100.1	-10.2%	-0.2%	104.9	109	101.2	-3.5%	-0.1%	69.74	86.66	97.48	39.8%	0.7%
Venezuela, RB	106.2	100.6	100.1	-5.7%	-0.1%	89.73	101.1	100.3	11.8%	0.2%	59.48	75.87	85.16	43.2%	0.7%
Peru	116.3	102	100.1	-13.9%	-0.3%	105.7	103.5	102.4	-3.1%	-0.1%	76.26	97.44	101.9	33.6%	0.6%
Chile	107.2	100.9	100.1	-6.6%	-0.1%	101	101.5	100.1	-0.9%	0.0%	87.46	99.99	104.9	19.9%	0.4%
Ecuador	113.8	102.7	100.9	-11.3%	-0.2%	77.3	80.58	88.07	13.9%	0.3%	55.9	57.55	67.82	21.3%	0.4%
Bolivia	111.9	102.6	100.1	-10.5%	-0.2%	96.26	103.6	101	4.9%	0.1%	78.9	96.28	98.24	24.5%	0.4%
Paraguay	110.7	103	100.2	-9.5%	-0.2%	83.74	89.91	97.78	16.8%	0.3%	56.43	66.66	82.45	46.1%	0.8%
Uruguay	110.8	99.91	100.1	-9.7%	-0.2%	104.9	98.86	101.7	-3.1%	-0.1%	94.59	99.04	104.1	10.1%	0.2%
Guyana	126.6	114.5	99.99	-21.0%	-0.5%	114.8	85.8	98.76	-14.0%	-0.3%	68.97	84.84	92.66	34.3%	0.6%
Suriname	120.2	104	100.5	-16.4%	-0.4%	97.5	109.8	105.6	8.3%	0.2%	51.66	76.45	92.85	79.7%	1.2%
America-South	**123**	**101.9**	**100.4**	**-18.4%**	**-0.4%**	**106.8**	**115.2**	**107.4**	**0.6%**	**0.0%**	**79.57**	**85.97**	**93.87**	**18.0%**	**0.3%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	111.1	101.1	100.5	-9.5%	-0.2%	99.59	110.5	99.4	-0.2%	0.0%	57.63	90.89	101.7	76.5%	1.1%
Japan	101.1	100.1	100	-1.1%	0.0%	101.3	98.92	100	-1.3%	0.0%	104.1	102.1	104.1	0.0%	0.0%
Korea, Rep. of	104.3	100.1	100	-4.1%	-0.1%	99.64	100	100	0.4%	0.0%	92.13	95.94	103.9	12.8%	0.2%
Taiwan	106.3	100.1	100	-5.9%	-0.1%	103.6	99.94	100	-3.5%	-0.1%	98.27	95.61	100	1.8%	0.0%
Korea, Dem. Rep. of	102.6	109.5	102.1	-0.5%	0.0%	67.13	90.55	97.08	44.6%	0.7%	45.94	66.45	74.13	61.4%	1.0%
Hong Kong	104.2	100.5	100	-4.0%	-0.1%	103.1	100.8	100.1	-2.9%	-0.1%	77.49	99.45	104.2	34.5%	0.6%
Mongolia	101.7	101.7	100.1	-1.6%	0.0%	101	101.7	100.2	-0.8%	0.0%	83.37	87.97	96.46	15.7%	0.3%
Asia-East	**109.9**	**101.1**	**100.4**	**-8.6%**	**-0.2%**	**99.34**	**108.9**	**99.44**	**0.1%**	**0.0%**	**63.07**	**91.57**	**101.5**	**60.9%**	**1.0%**
India	113.4	105.6	100.6	-11.3%	-0.2%	77.16	102	99.83	29.4%	0.5%	44.01	73.52	90.49	105.6%	1.5%
Pakistan	97.16	103.3	102.1	5.1%	0.1%	43.48	61.29	78.05	79.5%	1.2%	23.67	35.75	54.9	131.9%	1.7%
Bangladesh	104.8	102.2	100.7	-3.9%	-0.1%	65.31	82.27	91.8	40.6%	0.7%	33.58	54.33	77.81	131.7%	1.7%
Afghanistan	115.3	130.3	111.6	-3.2%	-0.1%	28.29	45.15	49.13	73.7%	1.1%	12.71	18.12	22.37	76.0%	1.1%
Iran, Islamic Rep. of	107.4	100.6	100.1	-6.8%	-0.1%	93.41	102.1	100.9	8.0%	0.2%	79.9	97.88	97.5	22.0%	0.4%
Nepal	117.2	107.3	101.1	-13.7%	-0.3%	74.62	84.04	96.67	29.5%	0.5%	27.68	45.9	72.26	161.1%	1.9%
Uzbekistan	107.3	103.4	100.2	-6.6%	-0.1%	99.37	107.4	103.1	3.8%	0.1%	111.2	111.5	104.2	-6.3%	-0.1%
Sri Lanka	110.6	101.5	99.95	-9.6%	-0.2%	109.9	107	99.18	-9.8%	-0.2%	76.54	95.81	95.55	24.8%	0.4%
Kazakhstan	107.8	101.2	100.2	-7.1%	-0.1%	99.99	101.8	100.1	0.1%	0.0%	88.67	93.47	94.75	6.9%	0.1%
Tajikistan	102.8	100.3	100	-2.7%	-0.1%	95.49	98.56	99.74	4.5%	0.1%	56.44	61.58	75.15	33.2%	0.6%
Turkmenistan	116.1	106.7	101.4	-12.7%	-0.3%	68.94	111.3	107.6	56.1%	0.9%	48.33	94.86	92.49	91.4%	1.3%
Kyrgyzstan	100.7	105	100.3	-0.4%	0.0%	92.33	101.5	98.43	6.6%	0.1%	78.15	81.26	85.82	9.8%	0.2%
Bhutan	104.2	107.2	100.5	-3.6%	-0.1%	60.68	86.61	95.48	57.4%	0.9%	32.29	58.84	87.78	171.8%	2.0%
Maldives	122.1	101.9	98.96	-19.0%	-0.4%	126.2	132.3	99.11	-21.5%	-0.5%	24.18	65.76	87.07	260.1%	2.6%
Asia-South Central	**110.6**	**105.6**	**101.4**	**-8.3%**	**-0.2%**	**73.38**	**92.99**	**93.26**	**27.1%**	**0.5%**	**43.65**	**66.69**	**80.66**	**84.8%**	**1.2%**
Indonesia	114.8	104.1	100.3	-12.6%	-0.3%	80.79	94.85	98.73	22.2%	0.4%	50.19	60.98	76.73	52.9%	0.9%
Philippines	110.1	102.6	101	-8.3%	-0.2%	90.75	95.14	99.92	10.1%	0.2%	79.9	81.69	92.93	16.3%	0.3%
Vietnam	107.5	99.57	100.3	-6.7%	-0.1%	87.04	101.5	100.2	15.1%	0.3%	47.36	71.78	83.48	76.3%	1.1%
Thailand	108.8	100.4	100	-8.1%	-0.2%	99.38	103.7	103	3.6%	0.1%	63.16	81.79	91.72	45.2%	0.7%
Myanmar	115.6	103.9	101.3	-12.4%	-0.3%	60.4	73.73	89.52	48.2%	0.8%	40.86	60.85	80.6	97.3%	1.4%
Malaysia	101.2	100	100	-1.2%	0.0%	92.88	96.01	98.05	5.6%	0.1%	57.17	79.52	92.53	61.9%	1.0%
Cambodia	129.9	113.4	104.8	-19.3%	-0.4%	52.42	74.54	92.58	76.6%	1.1%	19.41	41.86	65.19	235.9%	2.5%
Lao PDR	122.4	109.9	101	-17.5%	-0.4%	57.82	84.1	98	69.5%	1.1%	38.4	63.59	93.13	142.5%	1.8%
Singapore	101.8	100.7	99.99	-1.8%	0.0%	81.72	98.65	99.84	22.2%	0.4%	69.15	97.58	99.64	44.1%	0.7%
Timor-Leste	102.6	106.9	103.7	1.1%	0.0%	71.79	77.85	94.13	31.1%	0.5%	39.45	42.69	64.04	62.3%	1.0%
Brunei Darussalam	108.3	101.1	100.4	-7.3%	-0.2%	112.7	99.29	99.48	-11.7%	-0.2%	80.54	87.71	92.94	15.4%	0.3%
Asia-South East	**112.1**	**102.9**	**100.6**	**-10.3%**	**-0.2%**	**83.13**	**94.4**	**98.64**	**18.7%**	**0.3%**	**54.57**	**68.99**	**83.33**	**52.7%**	**0.9%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	98.72	100.6	100.1	1.4%	0.0%	88.59	103.2	100.9	13.9%	0.3%	69.76	89.1	101.1	44.9%	0.7%
Yemen	94.23	101	100.4	6.5%	0.1%	57.5	86.36	99.8	73.6%	1.1%	43.79	71.17	91.19	108.2%	1.5%
Iraq	104.6	103.9	100.1	-4.3%	-0.1%	62.6	86.45	101.8	62.6%	1.0%	33.74	52.05	75.96	125.1%	1.6%
Saudi Arabia	90.72	104.3	100.2	10.4%	0.2%	87.18	107.3	99.46	14.1%	0.3%	83.33	106.4	98.12	17.7%	0.3%
Syria	114.4	100.3	100	-12.6%	-0.3%	97.47	91.32	95.06	-2.5%	-0.1%	36.34	51.18	70.22	93.2%	1.3%
Israel	109.3	100	100	-8.5%	-0.2%	80.66	99.47	100	24.0%	0.4%	104.6	98.27	100	-4.4%	-0.1%
Azerbaijan	105.9	101.4	100.4	-5.2%	-0.1%	93.26	102.1	100.5	7.8%	0.1%	75.28	96.35	96.11	27.7%	0.5%
Jordan	101.6	100.5	100.1	-1.5%	0.0%	94.94	101.6	99.29	4.6%	0.1%	79.15	98.06	101	27.6%	0.5%
Palestine	90.27	105.7	100.4	11.2%	0.2%	100.1	104.3	102.7	2.6%	0.1%	67.07	75.5	89.58	33.6%	0.6%
United Arab Emirates	104.4	101.4	99.99	-4.2%	-0.1%	95.15	100.2	97.92	2.9%	0.1%	81.79	89.49	93.98	14.9%	0.3%
Oman	98.8	101.8	100.2	1.4%	0.0%	99.72	100.6	99.56	-0.2%	0.0%	80.03	102.1	101.4	26.7%	0.5%
Kuwait	103.4	100.5	100	-3.3%	-0.1%	94.79	100.4	99.57	5.0%	0.1%	99.93	106.6	100.3	0.4%	0.0%
Lebanon	98.01	102.3	100.4	2.4%	0.0%	90.34	101.6	100	10.7%	0.2%	70.11	81.68	95.01	35.5%	0.6%
Georgia	106.1	102.2	100.7	-5.1%	-0.1%	101.4	101.6	100.9	-0.5%	0.0%	71.85	86.59	93.01	29.5%	0.5%
Armenia	109.3	101.3	100.1	-8.4%	-0.2%	102.8	102.2	100.1	-2.6%	-0.1%	86.85	102.8	99.38	14.4%	0.3%
Bahrain	103	100	100	-2.9%	-0.1%	106.4	98.44	99.37	-6.6%	-0.1%	100.8	100.8	100.5	-0.3%	0.0%
Qatar	106	100.6	100	-5.7%	-0.1%	100.6	101.7	100.1	-0.5%	0.0%	95.71	101	99.87	4.3%	0.1%
Cyprus	101	100	99.96	-1.0%	0.0%	99.1	100	99.94	0.8%	0.0%	98.59	96.36	100.4	1.8%	0.0%
Asia-West	**100.6**	**101.8**	**100.2**	**-0.4%**	**0.0%**	**83.84**	**97.2**	**99.95**	**19.2%**	**0.4%**	**63.63**	**80.18**	**91.02**	**43.0%**	**0.7%**
Australia	103.7	100	100	-3.6%	-0.1%	111.6	99.23	100	-10.4%	-0.2%	132.1	99.78	100	-24.3%	-0.6%
Papua New Guniea	66.5	95.4	100	50.4%	0.8%	24.7	51.01	70.63	186.0%	2.1%	25.24	37.52	53.94	113.7%	1.5%
New Zealand	101.2	99.9	100	-1.2%	0.0%	104.6	97.72	100	-4.4%	-0.1%	129.8	96.81	99.94	-23.0%	-0.5%
Solomon Islands	105.4	116.9	108.7	3.1%	0.1%	49.6	65.2	78.24	57.7%	0.9%	18.17	25.65	37.67	107.3%	1.5%
Fiji	106	105.5	100.6	-5.1%	-0.1%	100.5	113.1	108.2	7.7%	0.1%	71.3	89.95	107.5	50.8%	0.8%
Vanuatu	113.8	103.9	100	-12.1%	-0.3%	51.13	72.91	99.34	94.3%	1.3%	33.69	51.34	81.25	141.2%	1.8%
Micronesia	116.6	110.9	100.1	-14.2%	-0.3%	103.5	110.2	115	11.1%	0.2%	72.22	68.1	84.49	17.0%	0.3%
Tonga	110.9	101.2	100.1	-9.7%	-0.2%	93.09	89.05	102.1	9.7%	0.2%	103.5	103.9	122.7	18.6%	0.3%
Samoa	98.99	101.6	100.4	1.4%	0.0%	98.3	104.3	102.8	4.6%	0.1%	71.58	86.43	111.7	56.0%	0.9%
Oceania	**96.49**	**99.48**	**100.2**	**3.8%**	**0.1%**	**92.36**	**87.25**	**91.9**	**-0.5%**	**0.0%**	**106.8**	**82.63**	**86.3**	**-19.2%**	**-0.4%**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Primary Education Enrollment Rate, Gross					Lower Secondary Enrollment Rate, Gross					Upper Secondary Enrollment Rate, Gross				
	Percent					Percent					Percent				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	106.2	101.4	100.4	-5.5%	-0.1%	90.83	104.1	102.4	12.7%	0.2%	97.94	107	107	9.3%	0.2%
Ukraine	113	100.6	100.1	-11.4%	-0.2%	103.4	101.8	101.1	-2.2%	0.0%	97.71	97.52	100.9	3.3%	0.1%
Poland	100.9	100.2	100.1	-0.8%	0.0%	102.2	97.71	98.78	-3.3%	-0.1%	100.4	97.18	98.64	-1.8%	0.0%
Romania	108.7	100.8	100.3	-7.7%	-0.2%	100.1	103.6	102	1.9%	0.0%	79.52	97.97	99.21	24.8%	0.4%
Czech Republic	106.3	100.6	100.1	-5.8%	-0.1%	101.1	98.97	98.84	-2.2%	0.0%	97.01	99.29	99.29	2.4%	0.0%
Belarus	103.3	100.8	100.2	-3.0%	-0.1%	109.7	105.7	102.9	-6.2%	-0.1%	73.26	79.55	89.69	22.4%	0.4%
Hungary	104.8	100.8	100.1	-4.5%	-0.1%	99.18	100	98.94	-0.2%	0.0%	95.94	100.4	98.58	2.8%	0.1%
Bulgaria	108.2	100.6	100.4	-7.2%	-0.1%	97.14	103.9	103	6.0%	0.1%	116.5	93.67	99.17	-14.9%	-0.3%
Slovakia	106.3	100.5	100.1	-5.8%	-0.1%	102.3	103	100.1	-2.2%	0.0%	96.87	98.17	99.31	2.5%	0.0%
Moldova, Rep. of	108.7	101.2	100.5	-7.5%	-0.2%	99.65	100.5	100.4	0.8%	0.0%	81.24	82.51	98.84	21.7%	0.4%
Europe-East	**106.7**	**101**	**100.3**	**-6.0%**	**-0.1%**	**96.71**	**102.5**	**101.4**	**4.8%**	**0.1%**	**96.18**	**101.4**	**102.8**	**6.9%**	**0.1%**
United Kingdom	106.6	100.1	100	-6.2%	-0.1%	101.5	99.15	100	-1.5%	0.0%	108.1	104	105.4	-2.5%	-0.1%
Sweden	103.4	100.4	100.1	-3.2%	-0.1%	103.5	100.2	100.1	-3.3%	-0.1%	101.8	99.88	100.1	-1.7%	0.0%
Denmark	103.3	100.3	100.1	-3.1%	-0.1%	115.1	99.75	100.1	-13.0%	-0.3%	122.9	99.67	100	-18.6%	-0.4%
Ireland	105.5	100.1	100	-5.2%	-0.1%	105.6	99.51	99.21	-6.1%	-0.1%	120.6	107.4	107.2	-11.1%	-0.2%
Norway	100.5	100.2	100	-0.5%	0.0%	100.8	100.2	100	-0.8%	0.0%	119.9	100	100	-16.6%	-0.4%
Finland	101.7	100.1	100	-1.7%	0.0%	102.6	99.34	100	-2.5%	-0.1%	118.1	99.4	100	-15.3%	-0.3%
Lithuania	105.3	101.3	100.4	-4.7%	-0.1%	101.8	100.6	99.83	-1.9%	0.0%	93.93	96.53	102.5	9.1%	0.2%
Latvia	104	100.9	100.4	-3.5%	-0.1%	103.8	99.83	99.31	-4.3%	-0.1%	94.87	99.28	98.75	4.1%	0.1%
Estonia	103.8	100.5	100.2	-3.5%	-0.1%	111.4	99.98	99.62	-10.6%	-0.2%	94.66	99.84	99.33	4.9%	0.1%
Iceland	101	100.1	100.1	-0.9%	0.0%	101.4	99.87	100.1	-1.3%	0.0%	113.4	104.7	105	-7.4%	-0.2%
Europe-North	**105.3**	**100.2**	**100.1**	**-4.9%**	**-0.1%**	**102.8**	**99.43**	**99.99**	**-2.7%**	**-0.1%**	**109.1**	**102.7**	**103.9**	**-4.8%**	**-0.1%**
Italy	101.7	100	100	-1.7%	0.0%	105.9	100	100	-5.6%	-0.1%	96.69	98.59	100	3.4%	0.1%
Spain	103	100	100.1	-2.8%	-0.1%	114.3	98.85	98.94	-13.4%	-0.3%	121.7	109.7	110.1	-9.5%	-0.2%
Greece	102.2	100	100	-2.2%	0.0%	100.6	98.43	99.47	-1.1%	0.0%	104.2	97.59	99.28	-4.7%	-0.1%
Portugal	110.5	100	100	-9.5%	-0.2%	110.5	99.29	99.42	-10.0%	-0.2%	90.95	95.79	98.83	8.7%	0.2%
Serbia	107	101.1	100.1	-6.4%	-0.1%	93.6	101.3	100.8	7.7%	0.1%	78.86	92.84	97.56	23.7%	0.4%
Croatia	104.6	100.8	100.1	-4.3%	-0.1%	98.79	101.2	100.1	1.3%	0.0%	88.35	100.6	100	13.2%	0.2%
Bosnia and Herzegovina	106.2	102.8	99.6	-6.2%	-0.1%	83.69	98.95	99.63	19.0%	0.3%	66.08	79.16	84.02	27.1%	0.5%
Albania	108.4	100.7	100.3	-7.5%	-0.2%	99.87	101.5	100.2	0.3%	0.0%	58.02	79.79	91.22	57.2%	0.9%
Macedonia, TFYR	103.5	100.6	100	-3.4%	-0.1%	97.52	99.24	100.1	2.6%	0.1%	78.16	93.81	99.89	27.8%	0.5%
Slovenia	101.9	100.2	100.1	-1.8%	0.0%	98.12	100.2	100.2	2.1%	0.0%	99.03	98.78	100	1.0%	0.0%
Montenegro	109	101.1	100.3	-8.0%	-0.2%	92.9	101.8	99.23	6.8%	0.1%	75.52	84.69	90.21	19.5%	0.4%
Malta	103.3	100.5	100.3	-2.9%	-0.1%	107.2	111.3	104.3	-2.7%	-0.1%	91.81	96.57	99.77	8.7%	0.2%
Europe-South	**103.4**	**100.2**	**100**	**-3.3%**	**-0.1%**	**106.5**	**99.63**	**99.66**	**-6.4%**	**-0.1%**	**101.1**	**100.4**	**102.1**	**1.0%**	**0.0%**
Germany	102.8	100	100	-2.7%	-0.1%	106.3	100.8	99.09	-6.8%	-0.1%	97.37	102	102.4	5.2%	0.1%
France	109.6	100.1	100	-8.8%	-0.2%	112.6	99.49	99.49	-11.6%	-0.2%	112	99.43	99.43	-11.2%	-0.2%
Netherlands	106.5	100.1	100	-6.1%	-0.1%	129.9	128.4	124.9	-3.8%	-0.1%	106.3	109.1	111	4.4%	0.1%
Belgium	106.1	100.2	100.1	-5.7%	-0.1%	113.1	98.91	100.1	-11.5%	-0.2%	104.6	98.94	100	-4.4%	-0.1%
Austria	104.9	100.2	100	-4.7%	-0.1%	104.5	99.42	100	-4.3%	-0.1%	100.1	99.66	100	-0.1%	0.0%
Switzerland	107.5	102.5	101.2	-5.9%	-0.1%	105.3	102.8	101.4	-3.7%	-0.1%	81.27	101.6	100.7	23.9%	0.4%
Luxembourg	104.9	100.2	100	-4.7%	-0.1%	105.5	100.3	99.99	-5.2%	-0.1%	89.69	99.75	99.98	11.5%	0.2%
Europe-West	**105.8**	**100.2**	**100.1**	**-5.4%**	**-0.1%**	**110.8**	**102.9**	**102**	**-7.9%**	**-0.2%**	**102.8**	**101.5**	**101.9**	**-0.9%**	**0.0%**

Education

Base Case

Source: International Futures Version 6.12, March 2009

	Tertiary Enrollment Rate, Gross (Percent)					Gender Parity Index: Primary Education Net Enrl (Ratio of Female to Male Rates)			Gender Parity Index: Secondary Education Gross Enrl (Ratio of Female to Male Rates)			Gender Parity Index: Tertiary Education Gross Enrl (Ratio of Female to Male Rates)		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
World	**26.99**	**34.59**	**42.06**	**55.8%**	**0.9%**	**0.98**	**0.999**	**1.004**	**0.97**	**1.007**	**0.999**	**1.094**	**1.219**	**1.294**
Africa	**9.373**	**15.17**	**24.09**	**157.0%**	**1.9%**	**0.936**	**0.981**	**1.012**	**0.891**	**0.982**	**1.001**	**0.805**	**1.103**	**1.247**
Americas	**43.31**	**50.61**	**58.38**	**34.8%**	**0.6%**	**1.014**	**1.001**	**1**	**1.039**	**1.023**	**1.01**	**1.301**	**1.296**	**1.298**
Asia with Oceania	**22.51**	**33.6**	**43.25**	**92.1%**	**1.3%**	**0.977**	**1.005**	**1.003**	**0.955**	**1.01**	**0.996**	**0.965**	**1.2**	**1.307**
Europe	**56.12**	**62.81**	**68.66**	**22.3%**	**0.4%**	**0.999**	**1**	**1**	**0.999**	**0.997**	**0.996**	**1.249**	**1.26**	**1.283**
World	**26.99**	**34.59**	**42.06**	**55.8%**	**0.9%**	**0.98**	**0.999**	**1.004**	**0.97**	**1.007**	**0.999**	**1.094**	**1.219**	**1.294**
Africa-Eastern	**4.077**	**10.92**	**25.02**	**513.7%**	**3.7%**	**0.965**	**1**	**1.021**	**0.837**	**0.985**	**1.018**	**0.576**	**1.037**	**1.267**
Africa-Middle	**3.467**	**7.4**	**14.7**	**324.0%**	**2.9%**	**0.897**	**0.938**	**0.972**	**0.682**	**0.766**	**0.839**	**0.776**	**1.024**	**1.132**
Africa-Northern	**19.19**	**27.58**	**36.46**	**90.0%**	**1.3%**	**0.963**	**1.007**	**1.011**	**0.984**	**1.048**	**1.032**	**0.964**	**1.204**	**1.305**
Africa-Southern	**14.28**	**26.88**	**42.37**	**196.7%**	**2.2%**	**1.014**	**1.002**	**1**	**1.071**	**1.043**	**1.011**	**1.216**	**1.314**	**1.359**
Africa-Western	**9.855**	**15.42**	**21.38**	**116.9%**	**1.6%**	**0.871**	**0.957**	**1.024**	**0.797**	**0.99**	**1.041**	**0.586**	**1.029**	**1.202**
Africa	**9.373**	**15.17**	**24.09**	**157.0%**	**1.9%**	**0.936**	**0.981**	**1.012**	**0.891**	**0.982**	**1.001**	**0.805**	**1.103**	**1.247**
America-Caribbean	**27.4**	**34.91**	**44.01**	**60.6%**	**1.0%**	**0.996**	**0.994**	**0.994**	**1.033**	**1.035**	**1.016**	**1.562**	**1.4**	**1.339**
America-Central	**18.43**	**26.95**	**37.6**	**104.0%**	**1.4%**	**0.989**	**1.008**	**1**	**1.065**	**1.054**	**1.031**	**1.218**	**1.324**	**1.356**
America-North	**58.49**	**64.63**	**70.47**	**20.5%**	**0.4%**	**1.018**	**1**	**1**	**1.007**	**1.01**	**1.006**	**1.346**	**1.343**	**1.335**
America-South	**30.39**	**39.85**	**49.66**	**63.4%**	**1.0%**	**1.013**	**1.001**	**1**	**1.075**	**1.034**	**1.01**	**1.185**	**1.202**	**1.232**
Americas	**43.31**	**50.61**	**58.38**	**34.8%**	**0.6%**	**1.014**	**1.001**	**1**	**1.039**	**1.023**	**1.01**	**1.301**	**1.296**	**1.298**
Asia-East	**29.59**	**42.54**	**53.41**	**80.5%**	**1.2%**	**0.995**	**1**	**1**	**1.008**	**1.003**	**1.004**	**0.978**	**1.216**	**1.33**
Asia-South Central	**14.3**	**26.12**	**36.37**	**154.3%**	**1.9%**	**0.959**	**1.008**	**1.006**	**0.874**	**1.014**	**0.987**	**0.899**	**1.194**	**1.306**
Asia-South East	**23.39**	**32.43**	**40.9**	**74.9%**	**1.1%**	**0.989**	**1.009**	**1**	**1.016**	**1.044**	**1.009**	**1.007**	**1.168**	**1.261**
Asia-West	**28.32**	**36.43**	**45.03**	**59.0%**	**0.9%**	**0.943**	**1**	**1**	**0.889**	**0.969**	**0.982**	**0.951**	**1.17**	**1.269**
Oceania	**51.13**	**55.49**	**60.18**	**17.7%**	**0.3%**	**0.983**	**1**	**1.014**	**0.993**	**1.016**	**1.017**	**1.274**	**1.288**	**1.301**
Asia with Oceania	**22.51**	**33.6**	**43.25**	**92.1%**	**1.3%**	**0.977**	**1.005**	**1.003**	**0.955**	**1.01**	**0.996**	**0.965**	**1.2**	**1.307**
Europe-East	**58.56**	**68.06**	**71.73**	**22.5%**	**0.4%**	**0.996**	**1**	**1**	**0.992**	**0.989**	**0.99**	**1.277**	**1.256**	**1.264**
Europe-North	**57.51**	**64.65**	**72.25**	**25.6%**	**0.5%**	**0.999**	**1**	**1**	**1.019**	**1.005**	**1.001**	**1.395**	**1.368**	**1.347**
Europe-South	**55.34**	**57.83**	**62.96**	**13.8%**	**0.3%**	**0.998**	**1.001**	**1**	**1.013**	**1.004**	**1.001**	**1.277**	**1.292**	**1.308**
Europe-West	**50.97**	**57**	**65.68**	**28.9%**	**0.5%**	**1.002**	**1**	**1**	**0.987**	**0.996**	**0.996**	**1.094**	**1.178**	**1.253**
Europe	**56.12**	**62.81**	**68.66**	**22.3%**	**0.4%**	**0.999**	**1**	**1**	**0.999**	**0.997**	**0.996**	**1.249**	**1.26**	**1.283**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA														
Ethiopia	4.466	6.204	19.19	329.7%	3.0%	0.903	0.985	1.079	0.69	0.939	1.087	0.293	0.468	1.167
Uganda	4.778	15.38	33.69	605.1%	4.0%	0.925	0.985	1	0.845	1.017	1.014	0.822	1.263	1.338
Tanzania, United Rep. of	3.14	14.11	31.59	906.1%	4.7%	0.984	1.017	1	0.945	1.002	0.896	0.533	1.194	1.332
Kenya	5.023	14.86	30.06	498.4%	3.6%	1.015	1.021	1	0.961	1.033	1.021	0.66	1.103	1.294
Madagascar	3.031	7.354	18.33	504.8%	3.7%	0.998	1.003	1.006	0.964	0.974	1.01	0.95	1.046	1.24
Mozambique	2.894	16.97	43.3	1396.2%	5.6%	0.924	0.99	1	0.773	0.957	0.986	0.697	1.213	1.35
Malawi	0.847	3.383	15.28	1704.0%	6.0%	1.056	1.032	1.025	0.841	0.948	1.082	0.68	0.834	1.224
Zambia	5.335	13.91	25.16	371.6%	3.2%	1.016	1.033	1	0.87	1.078	1.056	0.68	1.14	1.289
Burundi	3.413	5.538	20.77	508.6%	3.7%	0.916	0.995	0.978	0.788	0.976	0.955	0.367	0.257	1.048
Rwanda	3.652	9.806	21.33	484.1%	3.6%	1.063	1.012	1.016	0.911	0.942	0.996	0.658	0.998	1.257
Somalia	3.563	3.5	3.253	-8.7%	-0.2%	0.646	0.873	0.966	0.948	0.967	1.049	0.308	0.32	0.323
Zimbabwe	6.483	18.44	28.1	333.4%	3.0%	1.014	1.019	1.021	0.93	1.011	1.053	0.661	1.093	1.268
Eritrea	2.15	2.893	5.164	140.2%	1.8%	0.863	0.903	0.96	0.644	1.008	0.944	0.188	0.18	0.485
Mauritius	18.68	32.83	44.69	139.2%	1.8%	1.004	1	1	0.994	1.006	1.001	1.296	1.338	1.363
Comoros	3.354	9.876	22.95	584.3%	3.9%	0.867	1.006	1.029	0.784	0.934	0.926	0.724	1.061	1.27
Djibouti	4.426	11.88	24.07	443.8%	3.4%	0.85	1.024	1.023	0.762	1.149	0.989	0.907	1.179	1.285
Africa-Eastern	**4.077**	**10.92**	**25.02**	**513.7%**	**3.7%**	**0.965**	**1**	**1.021**	**0.837**	**0.985**	**1.018**	**0.576**	**1.037**	**1.267**
Congo; Dem. Rep. of	1.31	2.225	11.25	758.8%	4.4%	0.85	0.918	0.961	0.594	0.709	0.824	0.997	0.573	1.023
Angola	3.575	14.35	21.65	505.6%	3.7%	1.276	0.998	1.028	0.973	0.733	0.706	1.169	1.317	1.294
Cameroon	8.528	15.44	23.65	177.3%	2.1%	0.963	0.997	1.027	0.83	0.952	0.986	0.756	1.059	1.237
Chad	4.122	12.48	14	239.6%	2.5%	0.751	0.817	0.856	0.4	0.67	0.82	0.221	0.847	1.056
Central African Republic	3.459	7.427	16.36	373.0%	3.2%	0.76	0.973	1.015	0.628	0.942	1.106	0.244	0.75	1.158
Congo, Rep. of	9.655	18.87	22.5	133.0%	1.7%	0.91	1.002	1.026	0.848	1.005	1.116	0.631	1.298	1.286
Gabon	11.99	23.16	32.84	173.9%	2.0%	0.997	1.015	1	0.894	1.021	0.987	0.675	1.07	1.256
Equatorial Guinea	7.678	19.65	28.63	272.9%	2.7%	0.939	1.003	1	0.642	0.993	0.99	0.763	1.212	1.302
São Tomé and Príncipe	8.563	11.09	18.92	121.0%	1.6%	0.98	0.998	1.012	1.072	1.08	1.076	0.894	1.02	1.205
Africa-Middle	**3.467**	**7.4**	**14.7**	**324.0%**	**2.9%**	**0.897**	**0.938**	**0.972**	**0.682**	**0.766**	**0.839**	**0.776**	**1.024**	**1.132**
Egypt	21.5	29.93	41.9	94.9%	1.3%	0.959	1	1	0.954	1.029	0.995	0.737	1.149	1.314
Sudan	9.413	19.35	26.28	179.2%	2.1%	0.861	1.014	1.044	0.948	1.127	1.103	1.092	1.259	1.302
Algeria	20.02	27.63	33.25	66.1%	1.0%	0.998	1	1	1.087	1.034	1.053	1.284	1.312	1.326
Morocco	15.02	23.58	34.38	128.9%	1.7%	0.979	1.028	1	0.864	1.012	1.009	0.864	1.121	1.282
Tunisia	26.83	36.62	47.83	78.3%	1.2%	1	1	1	1.105	1.067	1.001	1.396	1.402	1.396
Libyan Arab Jamahiriya	55.07	63.81	64.44	17.0%	0.3%	0.989	1	1	1.164	1.042	1.023	1.091	1.132	1.146
Africa-Northern	**19.19**	**27.58**	**36.46**	**90.0%**	**1.3%**	**0.963**	**1.007**	**1.011**	**0.984**	**1.048**	**1.032**	**0.964**	**1.204**	**1.305**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
AFRICA continued														
South Africa	15.43	27.83	42.95	178.4%	2.1%	1.01	1	1	1.069	1.042	1.011	1.217	1.308	1.357
Namibia	8.208	22.48	42.27	415.0%	3.3%	1.058	1.001	1	1.137	1.081	1.003	0.959	1.276	1.36
Lesotho	4.253	14.65	30.76	623.3%	4.0%	1.051	1.045	1	1.249	1.123	1.036	1.536	1.487	1.377
Botswana	7.207	28.35	46.38	543.5%	3.8%	1.029	1	1	1.024	0.978	1.001	1.372	1.41	1.395
Swaziland	5.704	19.58	36.58	541.3%	3.8%	1.007	1.013	1	1	1.046	1.005	1.065	1.285	1.348
Africa-Southern	**14.28**	**26.88**	**42.37**	**196.7%**	**2.2%**	**1.014**	**1.002**	**1**	**1.071**	**1.043**	**1.011**	**1.216**	**1.314**	**1.359**
Nigeria	13.23	19.06	20.61	55.8%	0.9%	0.871	0.946	1.03	0.864	1.044	1.088	0.623	1.093	1.215
Niger	2.296	4.559	17.54	663.9%	4.2%	0.756	0.954	1.012	0.78	1.16	1.122	0.264	0.607	1.178
Côte d'Ivoire	10.33	16.89	24.88	140.9%	1.8%	0.82	0.952	1	0.614	0.9	1.004	0.473	0.964	1.202
Ghana	7.791	11.77	20	156.7%	1.9%	0.988	0.997	1.061	0.914	1.049	1.082	0.653	0.914	1.168
Burkina Faso	4.811	13.39	26.27	446.0%	3.5%	0.826	0.999	1.038	0.752	1.148	1.048	0.628	1.146	1.296
Mali	4.779	10.99	22.67	374.4%	3.2%	0.797	0.939	0.999	0.624	0.832	0.962	0.454	1.021	1.257
Senegal	6.478	13.69	24.91	284.5%	2.7%	0.971	1.022	1.021	0.781	0.92	1.033	0.494	0.951	1.22
Guinea	6.39	14.8	24.06	276.5%	2.7%	0.854	0.931	0.985	0.563	0.72	0.9	0.365	0.942	1.205
Benin	6.563	13.09	24.02	266.0%	2.6%	0.82	0.93	1.017	0.621	0.84	0.964	0.368	0.818	1.159
Togo	6.369	6.722	12.34	93.8%	1.3%	0.865	0.902	1.009	0.527	0.614	0.762	0.235	0.316	0.747
Sierra Leone	3.351	11.15	24.17	621.3%	4.0%	0.815	0.974	1.037	0.732	0.983	0.972	0.356	1.077	1.297
Liberia	17.74	17.47	23.62	33.1%	0.6%	1.013	1.075	1.099	0.744	0.951	0.967	0.746	0.691	0.807
Mauritania	7.06	11.68	19.83	180.9%	2.1%	1.017	1.037	1.025	0.916	0.994	1.037	0.488	0.864	1.173
Guinea-Bissau	0.941	1.955	8.674	821.8%	4.5%	0.733	0.848	0.957	0.585	0.831	0.98	0.53	0.256	0.952
Gambia	2.784	7.903	17.26	520.0%	3.7%	1.076	0.969	0.985	0.882	1.05	0.952	1.007	1.282	1.284
Cape Verde	10.2	24.13	39.63	288.5%	2.8%	0.981	1	1	1.058	1.034	0.948	1.178	1.301	1.357
Africa-Western	**9.855**	**15.42**	**21.38**	**116.9%**	**1.6%**	**0.871**	**0.957**	**1.024**	**0.797**	**0.99**	**1.041**	**0.586**	**1.029**	**1.202**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
AMERICAS														
Haiti	2.872	8.658	17.37	504.8%	3.7%	0.967	0.956	0.98	0.811	0.906	1.086	0.695	1.1	1.24
Dominican Republic	28.01	36.53	48.33	72.5%	1.1%	1.01	1.016	1	1.169	1.143	0.986	1.597	1.588	1.562
Cuba	48.75	63.2	78.9	61.8%	1.0%	0.994	1	1	1.008	0.997	0.998	1.603	1.33	1.174
Puerto Rico	36.04	46.28	56.87	57.8%	0.9%	1.003	1	1	1.031	1.006	1	1.414	1.401	1.397
Jamaica	14.24	24.05	35.03	146.0%	1.8%	1.003	1.003	1	1.058	1.117	1.037	1.908	1.433	1.346
Trinidad and Tobago	16.22	37.48	48.71	200.3%	2.2%	1.01	1	1	1.041	0.993	0.992	1.216	1.318	1.358
Bahamas	20.22	33.71	46.48	129.9%	1.7%	1.03	1	1	1.027	1.015	1.005	1.845	1.486	1.406
Barbados	23.21	33.31	48.88	110.6%	1.5%	0.991	1	1	1.017	1.005	0.999	2.39	2.02	1.753
St. Vincent & the Grenadines	29.51	34.23	43.96	49.0%	0.8%	0.967	1	1	1.177	1.082	1.016	1.24	1.304	1.354
Grenada	32	35.53	44.39	38.7%	0.7%	0.991	1	1	1.041	1.054	0.947	1.252	1.288	1.328
St. Lucia	10.73	24.76	40.11	273.8%	2.7%	0.991	1	1	1.188	1.094	0.993	2.211	1.668	1.45
America-Caribbean	**27.4**	**34.91**	**44.01**	**60.6%**	**1.0%**	**0.996**	**0.994**	**0.994**	**1.033**	**1.035**	**1.016**	**1.562**	**1.4**	**1.339**
Guatemala	13.56	22.81	34.35	153.3%	1.9%	0.953	0.995	1	0.917	0.989	1.025	0.898	1.266	1.33
Honduras	15.34	22.68	32.43	111.4%	1.5%	1.021	1.046	1	1.267	1.175	1.07	1.39	1.361	1.362
El Salvador	19.83	29.55	40.69	105.2%	1.4%	1.003	1.013	1	1.031	1.073	1.015	1.213	1.281	1.322
Nicaragua	17.89	22.23	29.77	66.4%	1.0%	0.984	1.002	1.001	1.141	1.078	1.063	1.114	1.255	1.34
Costa Rica	26.1	42.33	57.25	119.3%	1.6%	1.025	1	1	1.052	1.008	0.981	1.219	1.247	1.286
Panama	34.38	43.59	53.66	56.1%	0.9%	0.995	1	1	1.072	1.046	1.023	1.647	1.663	1.631
Belize	4.322	22.57	43.59	908.6%	4.7%	1.029	1	1	1.016	1.007	1.01	1.832	1.446	1.397
America-Central	**18.43**	**26.95**	**37.6**	**104.0%**	**1.4%**	**0.989**	**1.008**	**1**	**1.065**	**1.054**	**1.031**	**1.218**	**1.324**	**1.356**
United States of America	69.85	75.62	79.81	14.3%	0.3%	1.027	1	1	1.005	1.006	1.001	1.397	1.369	1.339
Mexico	27.05	33.87	42.36	56.6%	0.9%	1.001	1	1	1.027	1.021	1.023	0.981	1.207	1.339
Canada	55.26	63.07	69.91	26.5%	0.5%	0.994	1	1	0.969	1.007	1	1.326	1.286	1.283
America-North	**58.49**	**64.63**	**70.47**	**20.5%**	**0.4%**	**1.018**	**1**	**1**	**1.007**	**1.01**	**1.006**	**1.346**	**1.343**	**1.335**
Brazil	21.99	32.11	43.39	97.3%	1.4%	1.017	1	1	1.086	1.034	1.002	1.306	1.328	1.359
Colombia	31.16	42.88	55.97	79.6%	1.2%	1.021	1.002	1	1.082	1.041	1.027	1.019	0.971	1.016
Argentina	54.59	60.76	67.54	23.7%	0.4%	0.992	1	1	1.103	1.022	1.009	1.414	1.392	1.357
Venezuela, RB	39.47	48.74	54.08	37.0%	0.6%	1.012	1	1	1.111	1.034	1.019	1.051	1.04	1.05
Peru	34.69	41.65	48.18	38.9%	0.7%	1.016	1	1	1.016	1.038	1.023	1.024	1.095	1.154
Chile	49.54	58.19	66.39	34.0%	0.6%	0.992	1	1	1.013	1.014	0.999	0.968	1.067	1.137
Ecuador	21.4	25.82	29.88	39.6%	0.7%	1.013	1.012	1.003	1.013	1.053	1.056	0.824	1.149	1.272
Bolivia	43.5	57.73	66.77	53.5%	0.9%	1.012	1	1	0.955	1.015	1.016	0.549	0.693	0.772
Paraguay	22.26	27.53	36.41	63.6%	1.0%	1.009	1.028	1	1.031	1.061	1.005	1.327	1.327	1.343
Uruguay	29.55	40.6	52.93	79.1%	1.2%	1.009	1	1	1.146	1.06	0.996	1.969	1.762	1.636
Guyana	11.48	23.82	36.37	216.8%	2.3%	0.992	1.008	1	0.982	1.075	0.988	1.502	1.375	1.368
Suriname	14.53	28.48	39.98	175.2%	2.0%	1.048	1	1	1.294	1.18	1.071	1.403	1.356	1.362
America-South	**30.39**	**39.85**	**49.66**	**63.4%**	**1.0%**	**1.013**	**1.001**	**1**	**1.075**	**1.034**	**1.01**	**1.185**	**1.202**	**1.232**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA														
China	23.61	38.53	50.9	115.6%	1.5%	0.996	1	1	1.01	1.002	1.004	1.038	1.285	1.379
Japan	60.64	66.54	73.56	21.3%	0.4%	1.002	1	1	1.003	1	0.995	0.9	1.003	1.094
Korea, Rep. of	110.4	111.5	111.9	1.4%	0.0%	0.968	1	1	0.993	1.024	1.005	0.652	0.768	0.852
Taiwan	41.05	48.72	58.51	42.5%	0.7%	0.998	1	1	1.031	0.988	1	1.272	1.312	1.343
Korea, Dem. Rep. of	18.42	23.53	27.98	51.9%	0.8%	0.963	1.01	1.009	0.957	1.059	1.043	1.166	1.252	1.287
Hong Kong	34.75	44.61	51.81	49.1%	0.8%	0.96	1	1	0.995	1.02	0.995	1.142	1.298	1.359
Mongolia	34.77	43.13	53.68	54.4%	0.9%	1.031	1	1	1.112	1.039	1.032	1.581	1.475	1.453
Asia-East	**29.59**	**42.54**	**53.41**	**80.5%**	**1.2%**	**0.995**	**1**	**1**	**1.008**	**1.003**	**1.004**	**0.978**	**1.216**	**1.33**
India	15.17	29.17	41.78	175.4%	2.0%	0.972	1.019	1	0.849	1.011	0.976	0.878	1.202	1.327
Pakistan	7.171	15.95	26.24	265.9%	2.6%	0.781	0.94	1.026	0.832	1.098	1.078	0.991	1.189	1.286
Bangladesh	9.621	20.46	30.01	211.9%	2.3%	1.037	1.042	1.016	1.036	1.026	1.002	0.702	1.088	1.22
Afghanistan	1.945	2.691	9.38	382.3%	3.2%	0.432	0.94	1.017	0.397	0.861	0.865	0.281	0.653	1
Iran, Islamic Rep. of	24.8	37.07	41.74	68.3%	1.0%	1.056	1	1	0.983	0.989	0.993	1.138	1.324	1.347
Nepal	8.546	14.24	23.26	172.2%	2.0%	0.885	1.023	1	0.865	1.008	0.976	0.422	0.947	1.195
Uzbekistan	19.05	26.89	32.74	71.9%	1.1%	0.988	0.985	1	0.969	1.016	0.991	0.839	1.022	1.106
Sri Lanka	11.34	26.06	37.92	234.4%	2.4%	1.004	1	1	0.988	0.958	1.008	0.77	1.125	1.294
Kazakhstan	44.88	59.17	59.49	32.6%	0.6%	0.997	1	1	0.984	1.008	1.002	1.424	1.465	1.459
Tajikistan	25.87	30.28	38.34	48.2%	0.8%	0.977	1	1	0.878	0.962	0.963	0.411	0.679	0.918
Turkmenistan	19.23	35.43	35.23	83.2%	1.2%	0.965	1	1	0.942	1.036	1.012	1.131	1.313	1.317
Kyrgyzstan	40.94	50.67	55.92	36.6%	0.6%	0.978	0.992	1	1.008	1.024	1.007	1.179	1.18	1.214
Bhutan	7.714	22.63	41.11	432.9%	3.4%	0.998	1.002	1	0.893	0.949	0.97	0.783	1.226	1.339
Maldives	24.35	37.46	51.33	110.8%	1.5%	1.017	1	1	1.115	1.01	0.977	1.217	1.331	1.379
Asia-South Central	**14.3**	**26.12**	**36.37**	**154.3%**	**1.9%**	**0.959**	**1.008**	**1.006**	**0.874**	**1.014**	**0.987**	**0.899**	**1.194**	**1.306**
Indonesia	19.8	26.75	34.26	73.0%	1.1%	0.972	1.014	1	0.997	1.051	0.997	0.838	1.124	1.284
Philippines	26.67	34.97	43.57	63.4%	1.0%	1.036	1.018	1	1.114	1.078	1.017	1.194	1.214	1.27
Vietnam	21.1	33.87	43.82	107.7%	1.5%	0.965	1	1	0.924	0.999	1.005	0.78	1.07	1.172
Thailand	45.09	53.26	60.25	33.6%	0.6%	0.997	1	1	1.062	1.014	1.001	1.109	1.13	1.175
Myanmar	10.96	21.86	31.05	183.3%	2.1%	1.017	1.008	1	1.02	1.117	1.041	1.539	1.552	1.535
Malaysia	30.08	43.34	52.45	74.4%	1.1%	1	1	1	1.089	1.072	1.034	1.23	1.248	1.266
Cambodia	6.731	19.78	30.89	358.9%	3.1%	0.988	0.997	1.005	0.773	0.924	1.03	0.785	1.253	1.328
Lao PDR	10.96	24.89	39.78	263.0%	2.6%	0.953	1.016	1	0.78	0.939	0.955	0.882	1.283	1.355
Singapore	49.64	59.82	63.52	28.0%	0.5%	0.983	1	1	0.929	0.985	1.002	0.882	1.037	1.148
Timor-Leste	9.164	16.83	28.88	215.1%	2.3%	0.962	1.005	1.033	1.015	1.142	1.14	1.228	1.255	1.322
Brunei Darussalam	14.72	31.16	44.27	200.7%	2.2%	1.01	1	1	1.05	1.057	1.032	1.629	1.444	1.404
Asia-South East	**23.39**	**32.43**	**40.9**	**74.9%**	**1.1%**	**0.989**	**1.009**	**1**	**1.016**	**1.044**	**1.009**	**1.007**	**1.168**	**1.261**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
ASIA WITH OCEANIA continued														
Turkey	36.51	43.84	53.55	46.7%	0.8%	0.957	1	1	0.842	0.966	0.982	0.78	1.04	1.223
Yemen	14.36	23.38	31.36	118.4%	1.6%	0.798	1.007	1	0.54	0.894	0.938	0.461	1.02	1.238
Iraq	20.3	30.18	40.39	99.0%	1.4%	0.874	0.993	1	0.699	0.967	1.008	0.675	1.085	1.198
Saudi Arabia	25.01	37.39	46.43	85.6%	1.2%	0.947	1	1	1.134	1.005	0.982	1.496	1.465	1.404
Syria	18.11	25.03	35.21	94.4%	1.3%	0.986	1	1	0.963	0.985	0.997	0.827	1.163	1.301
Israel	51.85	63.37	72.36	39.6%	0.7%	1.014	1	1	0.998	1.017	1	1.32	1.322	1.327
Azerbaijan	19.45	34.06	39.86	104.9%	1.4%	1.01	1	1	0.985	1.001	1.003	1.09	1.264	1.305
Jordan	39.93	49.42	63.37	58.7%	0.9%	1	1	1	1.024	1.023	0.994	1.06	1.148	1.231
Palestine	37.33	43.56	52.85	41.6%	0.7%	0.991	0.992	1	0.974	0.861	0.938	1.024	1.088	1.157
United Arab Emirates	22.58	37.23	47.45	110.1%	1.5%	0.992	1	1	1.017	1.037	1.024	1.818	1.473	1.418
Oman	19.22	30.44	41.19	114.3%	1.5%	1.014	1	1	0.951	0.949	0.996	1.329	1.612	1.451
Kuwait	15.52	39.75	49.57	219.4%	2.3%	0.99	1	1	1.032	0.941	0.98	2.262	1.677	1.485
Lebanon	45.07	52.44	60.54	34.3%	0.6%	0.991	1	1	1.057	0.967	0.996	1.122	1.185	1.226
Georgia	48.96	55.74	61.54	25.7%	0.5%	1.038	1	1	1.017	1.027	1.012	1.045	1.099	1.144
Armenia	27.92	40.34	47.71	70.9%	1.1%	1.047	1	1	1.038	0.995	0.999	1.233	1.325	1.358
Bahrain	24.73	37.16	46.97	89.9%	1.3%	1.004	1	1	1.054	1.043	1.015	2.03	1.601	1.443
Qatar	12.31	40.08	51.76	320.5%	2.9%	1	1	1	1.017	0.999	1.002	2.954	1.748	1.497
Cyprus	33.66	42.47	51.92	54.2%	0.9%	0.999	1	1	1.026	1.035	0.994	1.191	1.322	1.367
Asia-West	**28.32**	**36.43**	**45.03**	**59.0%**	**0.9%**	**0.943**	**1**	**1**	**0.889**	**0.969**	**0.982**	**0.951**	**1.17**	**1.269**
Australia	65.92	71.81	77.17	17.1%	0.3%	1.002	1	1	1.002	1.001	1	1.247	1.264	1.283
Papua New Guniea	3.77	15.37	23.38	520.2%	3.7%	0.86	0.997	1.054	0.788	1.097	1.083	0.694	1.21	1.277
New Zealand	67.82	73.03	80.58	18.8%	0.3%	1	1	1	1.01	1.007	1.001	1.473	1.462	1.411
Solomon Islands	11.71	15.89	22.04	88.2%	1.3%	0.995	0.966	1.007	0.854	0.957	1.021	1.032	1.17	1.251
Fiji	16.4	25.53	37.99	131.6%	1.7%	1.005	1.025	1	1.073	1.087	1.024	1.167	1.224	1.329
Vanuatu	8.369	18.93	32.92	293.4%	2.8%	0.978	1.002	1	0.881	0.947	0.986	0.752	1.103	1.281
Micronesia	16.19	24.46	35.23	117.6%	1.6%	0.981	1.026	1	1.025	0.936	1.037	1.042	1.185	1.314
Tonga	6.589	16.66	32.59	394.6%	3.2%	0.976	1.002	1	1.092	1.13	1.091	1.576	1.389	1.362
Samoa	10.25	21.84	40.49	295.0%	2.8%	1.01	1.002	1	1.131	1.079	1.034	0.998	1.212	1.323
Oceania	**51.13**	**55.49**	**60.18**	**17.7%**	**0.3%**	**0.983**	**1**	**1.014**	**0.993**	**1.016**	**1.017**	**1.274**	**1.288**	**1.301**

Education

Base Case: Countries in Year 2060 Descending Population Sequence	Tertiary Enrollment Rate, Gross					Gender Parity Index Primary Education Net Enrl			Gender Parity Index Secondary Education Gross Enrl			Gender Parity Index Tertiary Education Gross Enrl		
	Percent					Ratio of Female to Male Rates			Ratio of Female to Male Rates			Ratio of Female to Male Rates		
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	2010	2035	2060
EUROPE														
Russian Federation	62.94	74.12	74.92	19.0%	0.3%	0.993	1	1	0.987	0.983	0.982	1.285	1.243	1.257
Ukraine	65.54	74.78	82.05	25.2%	0.5%	0.996	1	1	0.987	0.99	0.99	1.162	1.147	1.127
Poland	57	65.06	71.42	25.3%	0.5%	1.002	1	1	0.999	0.999	0.997	1.388	1.386	1.391
Romania	41.59	50.41	56.08	34.8%	0.6%	1.005	1	1	0.994	0.968	0.989	1.247	1.257	1.27
Czech Republic	46.3	50.45	55.11	19.0%	0.3%	1.025	1	1	1.014	1.007	1	1.164	1.197	1.227
Belarus	57.74	66.25	71.86	24.5%	0.4%	0.969	1	1	1.05	1.091	1.052	1.354	1.342	1.349
Hungary	54.48	58.99	64.16	17.8%	0.3%	0.986	1	1	0.987	0.988	0.996	1.468	1.474	1.471
Bulgaria	43.71	51.56	59.59	36.3%	0.6%	0.992	1	1	0.961	0.977	1.028	1.143	1.185	1.226
Slovakia	38.63	46.16	52.95	37.1%	0.6%	1.009	1	1	0.998	0.99	0.997	1.244	1.186	1.188
Moldova, Rep. of	30.35	39.64	52.06	71.5%	1.1%	0.981	1	1	1.022	0.992	0.993	1.441	1.345	1.358
Europe-East	**58.56**	**68.06**	**71.73**	**22.5%**	**0.4%**	**0.996**	**1**	**1**	**0.992**	**0.989**	**0.99**	**1.277**	**1.256**	**1.264**
United Kingdom	52.28	60.42	69.35	32.7%	0.6%	0.997	1	1	1.021	1.005	1	1.365	1.336	1.327
Sweden	66.01	71.95	78.2	18.5%	0.3%	0.996	1	1	0.995	1.004	1	1.529	1.465	1.407
Denmark	69.53	76.04	82.72	19.0%	0.3%	1.006	1	1	1.029	1.001	1	1.376	1.377	1.357
Ireland	54.63	64.2	68.96	26.2%	0.5%	1.009	1	1	1.062	1.011	1.011	1.251	1.263	1.267
Norway	63.32	68.06	72.53	14.5%	0.3%	1.005	1	1	1.005	1	1	1.536	1.531	1.481
Finland	85.28	85.34	88.67	4.0%	0.1%	1.003	1	1	1.033	1.003	1	1.204	1.233	1.237
Lithuania	63.25	69.93	75.37	19.2%	0.4%	1.001	1	1	0.986	1.002	0.998	1.547	1.522	1.485
Latvia	58.45	67.29	74.7	27.8%	0.5%	1.023	1	1	1.001	0.988	0.997	1.744	1.653	1.548
Estonia	53.55	59.6	66.34	23.9%	0.4%	0.998	1	1	0.991	1.01	1.014	1.634	1.6	1.572
Iceland	51.4	61.05	69.34	34.9%	0.6%	0.982	1	1	1.007	1.007	1.003	1.856	1.714	1.585
Europe-North	**57.51**	**64.65**	**72.25**	**25.6%**	**0.5%**	**0.999**	**1**	**1**	**1.019**	**1.005**	**1.001**	**1.395**	**1.368**	**1.347**
Italy	55.71	55.74	59.95	7.6%	0.1%	0.999	1	1	0.988	1.009	1	1.365	1.389	1.404
Spain	61.05	63.67	67.94	11.3%	0.2%	1	1	1	1.038	1.002	1.001	1.23	1.27	1.306
Greece	86.03	86.31	88.07	2.4%	0.0%	0.999	1	1	0.987	1.016	1.011	1.138	1.139	1.13
Portugal	50.3	55.12	63.09	25.4%	0.5%	0.997	1	1	1.077	1.013	0.995	1.269	1.235	1.245
Serbia	35.74	45.19	55.28	54.7%	0.9%	0.999	1	1	1.025	0.999	0.994	1.154	1.07	1.072
Croatia	37.08	43.37	52.33	41.1%	0.7%	0.995	1	1	1.023	0.999	1	1.191	1.228	1.267
Bosnia and Herzegovina	16.99	25.77	35.42	108.5%	1.5%	0.987	1.022	1	0.992	0.985	1.008	1.073	1.258	1.329
Albania	16.44	29.21	40.57	146.8%	1.8%	1.004	1	1	0.959	0.944	1.004	1.527	1.396	1.364
Macedonia, TFYR	25.93	28.48	36.14	39.4%	0.7%	0.993	1	1	0.979	0.966	1	1.376	1.366	1.369
Slovenia	68.42	72.76	79.6	16.3%	0.3%	0.999	1	1	1	0.995	0.999	1.394	1.372	1.325
Montenegro	30.77	36.34	44.51	44.7%	0.7%	0.994	1	1	1.017	1.018	0.994	1.246	1.3	1.341
Malta	30.04	41.53	53.21	77.1%	1.1%	0.99	1	1	0.99	0.99	1.027	1.314	1.299	1.321
Europe-South	**55.34**	**57.83**	**62.96**	**13.8%**	**0.3%**	**0.998**	**1.001**	**1**	**1.013**	**1.004**	**1.001**	**1.277**	**1.292**	**1.308**
Germany	48.46	52.95	61.36	26.6%	0.5%	1	1	1	0.987	0.996	0.997	0.963	1.133	1.269
France	51.17	58.08	67.73	32.4%	0.6%	1	1	1	0.999	0.996	0.996	1.259	1.257	1.275
Netherlands	57.54	61.3	66.54	15.6%	0.3%	0.997	1	1	0.981	0.99	0.99	1.078	1.124	1.168
Belgium	58.85	64.92	73.67	25.2%	0.5%	1.007	1	1	0.975	1	1	1.232	1.265	1.293
Austria	52.48	67.8	76.77	46.3%	0.8%	1	1	1	0.964	0.999	1	1.109	1.087	1.144
Switzerland	51.53	59.5	68	32.0%	0.6%	1.057	1	1	0.943	1.002	1	0.893	1.035	1.149
Luxembourg	16.84	34.12	49.77	195.5%	2.2%	1.032	1	1	1.057	1.003	0.999	1.166	1.302	1.363
Europe-West	**50.97**	**57**	**65.68**	**28.9%**	**0.5%**	**1.002**	**1**	**1**	**0.987**	**0.996**	**0.996**	**1.094**	**1.178**	**1.253**

Infrastructure

Base Case
Source: International Futures
Version 6.12, March 2009

	Water Use per Capita					Crop Yield					Energy Demand Ratio to GDP			Carbon Emissions				
	Annual Thousands of Cubic Meters					Annual Metric Tons per Hectare					Barrels of Oil Equivalent Per Thousand Dollars			Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
World	**0.611**	**0.605**	**0.59**	**-3.4%**	**-0.1%**	**3.213**	**3.838**	**4.038**	**25.7%**	**0.5%**	**1.964**	**1.355**	**0.753**	**7.37**	**11.01**	**8.344**	**13.2%**	**0.2%**
Africa	**0.234**	**0.2**	**0.18**	**-23.1%**	**-0.5%**	**2.322**	**3.074**	**3.383**	**45.7%**	**0.8%**	**4.076**	**2.585**	**1.239**	**0.351**	**0.715**	**0.949**	**170.4%**	**2.0%**
Americas	**0.913**	**0.914**	**0.867**	**-5.0%**	**-0.1%**	**3.166**	**3.719**	**3.836**	**21.2%**	**0.4%**	**1.54**	**1.044**	**0.631**	**2.132**	**3.012**	**2.447**	**14.8%**	**0.3%**
Asia with Oceania	**0.629**	**0.659**	**0.693**	**10.2%**	**0.2%**	**3.775**	**4.431**	**4.772**	**26.4%**	**0.5%**	**2.52**	**1.595**	**0.807**	**3.343**	**5.494**	**3.672**	**9.8%**	**0.2%**
Europe	**0.638**	**0.703**	**0.726**	**13.8%**	**0.3%**	**3.672**	**4.119**	**4.008**	**9.2%**	**0.2%**	**1.744**	**1.17**	**0.605**	**1.535**	**1.775**	**1.264**	**-17.7%**	**-0.4%**
World	**0.611**	**0.605**	**0.59**	**-3.4%**	**-0.1%**	**3.213**	**3.838**	**4.038**	**25.7%**	**0.5%**	**1.964**	**1.355**	**0.753**	**7.37**	**11.01**	**8.344**	**13.2%**	**0.2%**
Africa-Eastern	**0.14**	**0.129**	**0.123**	**-12.1%**	**-0.3%**	**2.571**	**3.696**	**3.898**	**51.6%**	**0.8%**	**3.049**	**2.568**	**1.106**	**0.026**	**0.1**	**0.258**	**892.3%**	**4.7%**
Africa-Middle	**0.022**	**0.019**	**0.016**	**-27.3%**	**-0.6%**	**2.187**	**2.749**	**3.007**	**37.5%**	**0.6%**	**6.34**	**4.358**	**2.748**	**0.039**	**0.067**	**0.069**	**76.9%**	**1.1%**
Africa-Northern	**0.697**	**0.698**	**0.726**	**4.2%**	**0.1%**	**2.685**	**3.157**	**3.719**	**38.5%**	**0.7%**	**3.736**	**2.226**	**1.077**	**0.127**	**0.233**	**0.216**	**70.1%**	**1.1%**
Africa-Southern	**0.264**	**0.263**	**0.261**	**-1.1%**	**0.0%**	**1.598**	**1.862**	**1.848**	**15.6%**	**0.3%**	**4.046**	**2.012**	**0.912**	**0.102**	**0.165**	**0.222**	**117.6%**	**1.6%**
Africa-Western	**0.099**	**0.094**	**0.092**	**-7.1%**	**-0.1%**	**2.239**	**2.983**	**3.433**	**53.3%**	**0.9%**	**4.831**	**3.606**	**2.041**	**0.056**	**0.15**	**0.184**	**228.6%**	**2.4%**
Africa	**0.234**	**0.2**	**0.18**	**-23.1%**	**-0.5%**	**2.322**	**3.074**	**3.383**	**45.7%**	**0.8%**	**4.076**	**2.585**	**1.239**	**0.351**	**0.715**	**0.949**	**170.4%**	**2.0%**
America-Caribbean	**0.439**	**0.417**	**0.397**	**-9.6%**	**-0.2%**	**3.499**	**3.76**	**3.541**	**1.2%**	**0.0%**	**1.821**	**1.199**	**0.687**	**0.028**	**0.046**	**0.05**	**78.6%**	**1.2%**
America-Central	**0.23**	**0.21**	**0.195**	**-15.2%**	**-0.3%**	**3.087**	**3.605**	**3.748**	**21.4%**	**0.4%**	**1.871**	**1.433**	**0.816**	**0.016**	**0.04**	**0.05**	**212.5%**	**2.3%**
America-North	**1.428**	**1.45**	**1.369**	**-4.1%**	**-0.1%**	**2.217**	**2.741**	**2.743**	**23.7%**	**0.4%**	**1.469**	**0.977**	**0.581**	**1.819**	**2.419**	**1.79**	**-1.6%**	**0.0%**
America-South	**0.451**	**0.467**	**0.466**	**3.3%**	**0.1%**	**3.144**	**3.993**	**4.43**	**40.9%**	**0.7%**	**2.055**	**1.386**	**0.79**	**0.269**	**0.507**	**0.557**	**107.1%**	**1.5%**
Americas	**0.913**	**0.914**	**0.867**	**-5.0%**	**-0.1%**	**3.166**	**3.719**	**3.836**	**21.2%**	**0.4%**	**1.54**	**1.044**	**0.631**	**2.132**	**3.012**	**2.447**	**14.8%**	**0.3%**
Asia-East	**0.504**	**0.52**	**0.525**	**4.2%**	**0.1%**	**5.212**	**5.577**	**5.363**	**2.9%**	**0.1%**	**2.052**	**1.381**	**0.722**	**1.935**	**2.945**	**1.344**	**-30.5%**	**-0.7%**
Asia-South Central	**0.738**	**0.766**	**0.815**	**10.4%**	**0.2%**	**2.772**	**3.699**	**4.319**	**55.8%**	**0.9%**	**4.38**	**2.163**	**0.952**	**0.571**	**1.296**	**1.178**	**106.3%**	**1.5%**
Asia-South East	**0.576**	**0.583**	**0.58**	**0.7%**	**0.0%**	**3.261**	**3.979**	**4.448**	**36.4%**	**0.6%**	**3.339**	**2.077**	**1.068**	**0.315**	**0.459**	**0.315**	**0.0%**	**0.0%**
Asia-West	**0.781**	**0.794**	**0.812**	**4.0%**	**0.1%**	**5.476**	**6.085**	**6.357**	**16.1%**	**0.3%**	**3.485**	**1.799**	**0.881**	**0.36**	**0.595**	**0.632**	**75.6%**	**1.1%**
Oceania	**0.877**	**0.915**	**1.034**	**17.9%**	**0.3%**	**1.446**	**1.92**	**2.244**	**55.2%**	**0.9%**	**2.33**	**1.371**	**0.708**	**0.162**	**0.199**	**0.204**	**25.9%**	**0.5%**
Asia with Oceania	**0.629**	**0.659**	**0.693**	**10.2%**	**0.2%**	**3.775**	**4.431**	**4.772**	**26.4%**	**0.5%**	**2.52**	**1.595**	**0.807**	**3.343**	**5.494**	**3.672**	**9.8%**	**0.2%**
Europe-East	**0.591**	**0.688**	**0.72**	**21.8%**	**0.4%**	**2.792**	**3.292**	**3.231**	**15.7%**	**0.3%**	**6.662**	**2.688**	**1.147**	**0.611**	**0.725**	**0.439**	**-28.2%**	**-0.7%**
Europe-North	**0.279**	**0.287**	**0.293**	**5.0%**	**0.1%**	**2.828**	**3.155**	**3.057**	**8.1%**	**0.2%**	**1.217**	**0.806**	**0.44**	**0.258**	**0.277**	**0.196**	**-24.0%**	**-0.5%**
Europe-South	**1.138**	**1.295**	**1.441**	**26.6%**	**0.5%**	**3.787**	**4.487**	**4.692**	**23.9%**	**0.4%**	**1.24**	**0.957**	**0.647**	**0.245**	**0.289**	**0.231**	**-5.7%**	**-0.1%**
Europe-West	**0.519**	**0.531**	**0.516**	**-0.6%**	**0.0%**	**5.472**	**5.726**	**5.1**	**-6.8%**	**-0.1%**	**1.245**	**0.859**	**0.492**	**0.43**	**0.496**	**0.409**	**-4.9%**	**-0.1%**
Europe	**0.638**	**0.703**	**0.726**	**13.8%**	**0.3%**	**3.672**	**4.119**	**4.008**	**9.2%**	**0.2%**	**1.744**	**1.17**	**0.605**	**1.535**	**1.775**	**1.264**	**-17.7%**	**-0.4%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita					Crop Yield					Energy Demand Ratio to GDP			Carbon Emissions				
	Annual Thousands of Cubic Meters					Annual Metric Tons per Hectare					Barrels of Oil Equivalent Per Thousand Dollars			Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA																		
Ethiopia	0.078	0.075	0.071	-9.0%	-0.2%	2.508	3.991	4.515	80.0%	1.2%	3.692	4.537	1.774	0.004	0.012	0.024	500.0%	3.6%
Uganda	0.01	0.009	0.009	-10.0%	-0.2%	3.492	5.145	6.234	78.5%	1.2%	3.786	2.871	1.253	0.004	0.019	0.059	1375.0%	5.5%
Tanzania, United Rep. of	0.133	0.122	0.116	-12.8%	-0.3%	3.553	4.209	4.347	22.3%	0.4%	2.509	2.174	0.916	0.003	0.017	0.058	1833.3%	6.1%
Kenya	0.046	0.043	0.042	-8.7%	-0.2%	2.436	3.053	3.121	28.1%	0.5%	2.669	2.51	1.076	0.004	0.016	0.034	750.0%	4.4%
Madagascar	0.801	0.759	0.735	-8.2%	-0.2%	2.39	3.074	3.323	39.0%	0.7%	3.319	4.031	2.424	0.002	0.005	0.012	500.0%	3.6%
Mozambique	0.032	0.032	0.031	-3.1%	-0.1%	2.348	3.318	3.759	60.1%	0.9%	2.307	1.577	0.779	0.001	0.01	0.037	3600.0%	7.5%
Malawi	0.079	0.079	0.078	-1.3%	0.0%	3.488	5.793	6.34	81.8%	1.2%	4.351	4.725	1.938	0.001	0.003	0.005	400.0%	3.3%
Zambia	0.148	0.144	0.135	-8.8%	-0.2%	0.892	1.198	1.254	40.6%	0.7%	2.948	2.794	1.244	0.001	0.004	0.008	700.0%	4.2%
Burundi	0.038	0.036	0.031	-18.4%	-0.4%	3.384	6.037	5.771	70.5%	1.1%	3.373	3.85	1.448	0	0.001	0.004		
Rwanda	0.016	0.015	0.013	-18.8%	-0.4%	5.075	7.863	6.471	27.5%	0.5%	2.612	2.885	1.35	0.001	0.002	0.005	400.0%	3.3%
Somalia	0.402	0.415	0.397	-1.2%	0.0%	2.913	4.947	5.891	102.2%	1.4%	15.25	12.45	5.267	0	0	0		
Zimbabwe	0.321	0.306	0.302	-5.9%	-0.1%	1.309	1.591	1.725	31.8%	0.6%	5.205	3.034	1.354	0.003	0.008	0.009	200.0%	2.2%
Eritrea	0.068	0.063	0.06	-11.8%	-0.3%	2.266	2.624	2.505	10.5%	0.2%	4.305	5.788	3.272	0	0.001	0.001		
Mauritius	0.499	0.51	0.535	7.2%	0.1%	1.41	1.9	2.564	81.8%	1.2%	1.191	1.02	0.715	0.001	0.002	0.002	100.0%	1.4%
Comoros	0.016	0.015	0.014	-12.5%	-0.3%	1.483	1.755	1.849	24.7%	0.4%	2.989	3.106	1.362	0	0	0		
Djibouti	0.025	0.025	0.025	0.0%	0.0%	2.185	2.636	2.698	23.5%	0.4%	1.884	2.239	1.274	0	0	0		
Africa-Eastern	**0.14**	**0.129**	**0.123**	**-12.1%**	**-0.3%**	**2.571**	**3.696**	**3.898**	**51.6%**	**0.8%**	**3.049**	**2.568**	**1.106**	**0.026**	**0.1**	**0.258**	**892.3%**	**4.7%**
Congo; Dem. Rep. of	0.01	0.009	0.008	-20.0%	-0.4%	3	4.092	4.558	51.9%	0.8%	4.338	5.087	3.044	0.002	0.009	0.031	1450.0%	5.6%
Angola	0.022	0.019	0.017	-22.7%	-0.5%	3.838	5.402	6.393	66.6%	1.0%	10.17	5.337	3.242	0.023	0.035	0.014	-39.1%	-1.0%
Cameroon	0.061	0.058	0.059	-3.3%	-0.1%	1.193	1.707	2.383	99.7%	1.4%	2.997	2.866	1.875	0.004	0.009	0.012	200.0%	2.2%
Chad	0.024	0.021	0.02	-16.7%	-0.4%	1.095	1.553	2.152	96.5%	1.4%	7.188	5.275	4.297	0.002	0.002	0.001	-50.0%	-1.4%
Central African Republic	0.01	0.009	0.009	-10.0%	-0.2%	0.828	1.017	1.06	28.0%	0.5%	2.826	3.262	1.686	0	0.001	0.001		
Congo, Rep. of	0.01	0.009	0.008	-20.0%	-0.4%	6.152	6.809	6.474	5.2%	0.1%	4.359	3.078	2.441	0.002	0.005	0.005	150.0%	1.8%
Gabon	0.086	0.077	0.071	-17.4%	-0.4%	1.701	1.84	1.767	3.9%	0.1%	3.713	2.606	1.675	0.002	0.004	0.004	100.0%	1.4%
Equatorial Guinea	0.216	0.196	0.182	-15.7%	-0.3%	0.893	1.009	0.988	10.6%	0.2%	6.411	3.606	2.343	0.003	0.003	0.001	-66.7%	-2.2%
São Tomé and Príncipe	0.283	0.263	0.242	-14.5%	-0.3%	0.985	1.315	1.286	30.6%	0.5%	5.023	4.649	2.002	0	0	0		
Africa-Middle	**0.022**	**0.019**	**0.016**	**-27.3%**	**-0.6%**	**2.187**	**2.749**	**3.007**	**37.5%**	**0.6%**	**6.34**	**4.358**	**2.748**	**0.039**	**0.067**	**0.069**	**76.9%**	**1.1%**
Egypt	0.903	0.837	0.803	-11.1%	-0.2%	10.29	10.64	10.85	5.4%	0.1%	2.839	1.883	0.925	0.034	0.08	0.096	182.4%	2.1%
Sudan	1.047	1.026	1.037	-1.0%	0.0%	0.791	1.121	1.533	93.8%	1.3%	4.309	2.794	1.788	0.01	0.03	0.028	180.0%	2.1%
Algeria	0.189	0.203	0.233	23.3%	0.4%	1.303	1.825	2.602	99.7%	1.4%	6.156	3.459	1.871	0.042	0.051	0.027	-35.7%	-0.9%
Morocco	0.429	0.455	0.52	21.2%	0.4%	1.717	2.418	3.389	97.4%	1.4%	2.253	1.917	0.988	0.012	0.022	0.023	91.7%	1.3%
Tunisia	0.272	0.292	0.335	23.2%	0.4%	1.184	1.667	2.36	99.3%	1.4%	2.225	1.423	0.781	0.006	0.015	0.02	233.3%	2.4%
Libyan Arab Jamahiriya	0.737	0.762	0.783	6.2%	0.1%	0.828	1.267	1.574	90.1%	1.3%	4.94	2.358	1.212	0.024	0.035	0.02	-16.7%	-0.4%
Africa-Northern	**0.697**	**0.698**	**0.726**	**4.2%**	**0.1%**	**2.685**	**3.157**	**3.719**	**38.5%**	**0.7%**	**3.736**	**2.226**	**1.077**	**0.127**	**0.233**	**0.216**	**70.1%**	**1.1%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita — Annual Thousands of Cubic Meters					Crop Yield — Annual Metric Tons per Hectare					Energy Demand Ratio to GDP — Barrels of Oil Equivalent — Per Thousand Dollars			Carbon Emissions — Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AFRICA continued																		
South Africa	0.269	0.269	0.268	-0.4%	0.0%	1.464	1.744	1.826	24.7%	0.4%	4.266	2.139	0.939	0.099	0.156	0.209	111.1%	1.5%
Namibia	0.149	0.145	0.137	-8.1%	-0.2%	0.797	0.939	0.884	10.9%	0.2%	2.348	1.516	0.768	0.001	0.003	0.006	500.0%	3.6%
Lesotho	0.028	0.027	0.026	-7.1%	-0.1%	1.908	2.215	2.132	11.7%	0.2%	2.051	2.077	1.129	0	0.001	0.001		
Botswana	0.108	0.105	0.101	-6.5%	-0.1%	1.43	1.68	1.479	3.4%	0.1%	1.341	0.905	0.631	0.001	0.004	0.005	400.0%	3.3%
Swaziland	0.912	0.851	0.834	-8.6%	-0.2%	2.394	2.732	2.92	22.0%	0.4%	2.18	1.794	0.929	0	0.001	0.002		
Africa-Southern	**0.264**	**0.263**	**0.261**	**-1.1%**	**0.0%**	**1.598**	**1.862**	**1.848**	**15.6%**	**0.3%**	**4.046**	**2.012**	**0.912**	**0.102**	**0.165**	**0.222**	**117.6%**	**1.6%**
Nigeria	0.061	0.055	0.05	-18.0%	-0.4%	3.99	5.605	6.617	65.8%	1.0%	6.063	3.892	2.974	0.042	0.105	0.109	159.5%	1.9%
Niger	0.156	0.148	0.145	-7.1%	-0.1%	1.261	1.973	2.506	98.7%	1.4%	3.79	4.283	1.775	0.001	0.003	0.007	600.0%	4.0%
Côte d'Ivoire	0.051	0.046	0.043	-15.7%	-0.3%	1.344	1.738	1.912	42.3%	0.7%	2.347	2.515	1.489	0.003	0.009	0.011	266.7%	2.6%
Ghana	0.045	0.046	0.044	-2.2%	0.0%	3.769	5.52	6.433	70.7%	1.1%	4.164	4.116	2.05	0.003	0.006	0.007	133.3%	1.7%
Burkina Faso	0.061	0.059	0.06	-1.6%	0.0%	1.329	1.944	2.665	100.5%	1.4%	3.463	3.242	1.317	0.001	0.005	0.011	1000.0%	4.9%
Mali	0.488	0.462	0.469	-3.9%	-0.1%	1.167	1.675	2.329	99.6%	1.4%	3.677	3.693	1.567	0.001	0.005	0.008	700.0%	4.2%
Senegal	0.191	0.178	0.167	-12.6%	-0.3%	1.374	1.755	1.783	29.8%	0.5%	2.986	2.884	1.423	0.002	0.006	0.01	400.0%	3.3%
Guinea	0.161	0.142	0.128	-20.5%	-0.5%	2.847	3.317	3.256	14.4%	0.3%	2.563	2.549	1.289	0.001	0.004	0.006	500.0%	3.6%
Benin	0.016	0.015	0.015	-6.3%	-0.1%	3.496	5.068	6.32	80.8%	1.2%	2.756	3.359	1.535	0.001	0.003	0.006	500.0%	3.6%
Togo	0.027	0.024	0.023	-14.8%	-0.3%	0.967	1.048	1.024	5.9%	0.1%	3.681	4.65	2.468	0.001	0.001	0.001	0.0%	0.0%
Sierra Leone	0.067	0.065	0.063	-6.0%	-0.1%	3.659	4.64	5.441	48.7%	0.8%	2.633	2.457	1.171	0	0.002	0.003		
Liberia	0.032	0.028	0.026	-18.8%	-0.4%	1.747	1.76	1.683	-3.7%	-0.1%	2.726	4.168	1.953	0	0	0.001		
Mauritania	0.563	0.539	0.518	-8.0%	-0.2%	1.864	2.615	3.13	67.9%	1.0%	3.19	3.687	1.869	0	0.001	0.001		
Guinea-Bissau	0.111	0.099	0.09	-18.9%	-0.4%	1.075	1.339	1.285	19.5%	0.4%	3.605	4.775	2.366	0	0	0		
Gambia	0.02	0.018	0.017	-15.0%	-0.3%	1.819	2.03	1.899	4.4%	0.1%	2.945	3.381	1.714	0	0	0.001		
Cape Verde	0.04	0.039	0.038	-5.0%	-0.1%	4.123	5.707	6.645	61.2%	1.0%	1.418	1.23	0.782	0	0	0.001		
Africa-Western	**0.099**	**0.094**	**0.092**	**-7.1%**	**-0.1%**	**2.239**	**2.983**	**3.433**	**53.3%**	**0.9%**	**4.831**	**3.606**	**2.041**	**0.056**	**0.15**	**0.184**	**228.6%**	**2.4%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita — Annual Thousands of Cubic Meters					Crop Yield — Annual Metric Tons per Hectare					Energy Demand Ratio to GDP — Barrels of Oil Equivalent — Per Thousand Dollars			Carbon Emissions — Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
AMERICAS																		
Haiti	0.116	0.109	0.103	-11.2%	-0.2%	2.371	2.56	2.335	-1.5%	0.0%	2.427	2.896	1.637	0.001	0.002	0.003	200.0%	2.2%
Dominican Republic	0.384	0.386	0.371	-3.4%	-0.1%	1.763	2.219	2.146	21.7%	0.4%	2.43	1.36	0.763	0.007	0.015	0.017	142.9%	1.8%
Cuba	0.744	0.804	0.89	19.6%	0.4%	1.132	1.383	1.607	42.0%	0.7%	2.731	1.685	0.776	0.008	0.012	0.016	100.0%	1.4%
Puerto Rico	0.755	0.725	0.698	-7.5%	-0.2%	10.45	10.73	9.609	-8.0%	-0.2%	0.424	0.52	0.423	0.002	0.007	0.009	350.0%	3.1%
Jamaica	0.161	0.162	0.159	-1.2%	0.0%	3.32	3.625	3.429	3.3%	0.1%	2.904	2.109	1.017	0.002	0.003	0.002	0.0%	0.0%
Trinidad and Tobago	0.24	0.245	0.249	3.8%	0.1%	1.569	1.813	1.775	13.1%	0.2%	5.41	2.412	1.064	0.007	0.005	0.001	-85.7%	-3.8%
Bahamas	0.301	0.289	0.285	-5.3%	-0.1%	9.227	9.376	9.197	-0.3%	0.0%	0.529	0.631	0.522	0	0.001	0.001		
Barbados	0.338	0.341	0.345	2.1%	0.0%	2.444	2.609	2.217	-9.3%	-0.2%	0.77	0.801	0.586	0	0	0		
St. Vincent & the Grenadines	0.087	0.09	0.086	-1.1%	0.0%	1.309	1.508	1.347	2.9%	0.1%	1.389	1.332	0.79	0	0	0		
Grenada	0.287	0.291	0.276	-3.8%	-0.1%	1.689	1.964	1.792	6.1%	0.1%	1.273	1.37	0.815	0	0	0		
St. Lucia	0.063	0.066	0.068	7.9%	0.2%	3.225	3.582	3.501	8.6%	0.2%	1.154	1.128	0.758	0	0	0		
America-Caribbean	**0.439**	**0.417**	**0.397**	**-9.6%**	**-0.2%**	**3.499**	**3.76**	**3.541**	**1.2%**	**0.0%**	**1.821**	**1.199**	**0.687**	**0.028**	**0.046**	**0.05**	**78.6%**	**1.2%**
Guatemala	0.16	0.147	0.139	-13.1%	-0.3%	2.545	3.061	3.205	25.9%	0.5%	1.882	1.829	1.018	0.005	0.015	0.021	320.0%	2.9%
Honduras	0.119	0.115	0.108	-9.2%	-0.2%	2.155	2.33	2.147	-0.4%	0.0%	3.112	2.483	1.165	0.002	0.006	0.007	250.0%	2.5%
El Salvador	0.186	0.181	0.176	-5.4%	-0.1%	1.971	2.351	2.424	23.0%	0.4%	1.974	1.546	0.84	0.003	0.006	0.007	133.3%	1.7%
Nicaragua	0.256	0.248	0.238	-7.0%	-0.1%	0.918	1.089	1.047	14.1%	0.3%	3.13	2.52	1.231	0.001	0.003	0.003	200.0%	2.2%
Costa Rica	0.624	0.574	0.559	-10.4%	-0.2%	8.024	8.436	8.714	8.6%	0.2%	1.304	0.933	0.591	0.002	0.004	0.003	50.0%	0.8%
Panama	0.262	0.268	0.248	-5.3%	-0.1%	2.059	2.487	2.164	5.1%	0.1%	1.64	1.063	0.66	0.003	0.006	0.009	200.0%	2.2%
Belize	0.545	0.552	0.561	2.9%	0.1%	3.939	5.479	6.539	66.0%	1.0%	1.134	0.96	0.68	0	0	0.001		
America-Central	**0.23**	**0.21**	**0.195**	**-15.2%**	**-0.3%**	**3.087**	**3.605**	**3.748**	**21.4%**	**0.4%**	**1.871**	**1.433**	**0.816**	**0.016**	**0.04**	**0.05**	**212.5%**	**2.3%**
United States of America	1.655	1.672	1.546	-6.6%	-0.1%	2.882	3.49	3.388	17.6%	0.3%	1.377	0.923	0.553	1.529	2.051	1.541	0.8%	0.0%
Mexico	0.773	0.803	0.818	5.8%	0.1%	2.228	2.87	3.042	36.5%	0.6%	1.743	1.292	0.803	0.117	0.181	0.161	37.6%	0.6%
Canada	1.444	1.502	1.42	-1.7%	0.0%	1.541	1.864	1.798	16.7%	0.3%	2.48	1.434	0.71	0.173	0.187	0.087	-49.7%	-1.4%
America-North	**1.428**	**1.45**	**1.369**	**-4.1%**	**-0.1%**	**2.217**	**2.741**	**2.743**	**23.7%**	**0.4%**	**1.469**	**0.977**	**0.581**	**1.819**	**2.419**	**1.79**	**-1.6%**	**0.0%**
Brazil	0.324	0.328	0.319	-1.5%	0.0%	2.152	2.513	2.53	17.6%	0.3%	1.924	1.368	0.777	0.1	0.198	0.246	146.0%	1.8%
Colombia	0.235	0.235	0.235	0.0%	0.0%	4.174	4.881	5.327	27.6%	0.5%	2.939	1.958	0.934	0.036	0.07	0.073	102.8%	1.4%
Argentina	0.795	0.881	0.879	10.6%	0.2%	1.639	2.271	2.447	49.3%	0.8%	1.329	0.986	0.648	0.037	0.063	0.07	89.2%	1.3%
Venezuela, RB	0.32	0.329	0.357	11.6%	0.2%	2.896	4.091	5.702	96.9%	1.4%	3.41	1.879	1.023	0.049	0.075	0.062	26.5%	0.5%
Peru	0.741	0.783	0.844	13.9%	0.3%	3.522	4.992	6.415	82.1%	1.2%	1.919	1.504	0.885	0.012	0.028	0.031	158.3%	1.9%
Chile	0.798	0.803	0.806	1.0%	0.0%	5.638	6.775	7.057	25.2%	0.4%	1.946	1.079	0.63	0.016	0.041	0.048	200.0%	2.2%
Ecuador	1.332	1.35	1.276	-4.2%	-0.1%	4.694	6.153	5.915	26.0%	0.5%	5.423	3.707	2.238	0.012	0.014	0.004	-66.7%	-2.2%
Bolivia	0.157	0.17	0.178	13.4%	0.3%	1.397	1.878	2.291	64.0%	1.0%	4.686	2.451	1.184	0.004	0.011	0.012	200.0%	2.2%
Paraguay	0.084	0.077	0.076	-9.5%	-0.2%	2.648	3.165	3.509	32.5%	0.6%	2.44	2.315	1.358	0	0.001	0.004		
Uruguay	0.97	1.143	1.228	26.6%	0.5%	2.925	4.113	4.708	61.0%	1.0%	1.128	0.916	0.639	0.002	0.005	0.006	200.0%	2.2%
Guyana	2.369	2.999	3.622	52.9%	0.9%	1.345	1.853	2.194	63.1%	1.0%	2.348	1.971	0.969	0	0	0.001		
Suriname	1.542	1.65	1.705	10.6%	0.2%	4.701	5.234	5.069	7.8%	0.2%	1.644	1.437	0.897	0	0	0.001		
America-South	**0.451**	**0.467**	**0.466**	**3.3%**	**0.1%**	**3.144**	**3.993**	**4.43**	**40.9%**	**0.7%**	**2.055**	**1.386**	**0.79**	**0.269**	**0.507**	**0.557**	**107.1%**	**1.5%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita — Annual Thousands of Cubic Meters					Crop Yield — Annual Metric Tons per Hectare					Energy Demand Ratio to GDP — Barrels of Oil Equivalent — Per Thousand Dollars			Carbon Emissions — Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA																		
China	0.444	0.459	0.465	4.7%	0.1%	6.307	7.197	7.498	18.9%	0.3%	4.344	1.682	0.771	1.379	2.3	0.915	-33.6%	-0.8%
Japan	0.698	0.731	0.772	10.6%	0.2%	10.28	10.33	9.285	-9.7%	-0.2%	0.777	0.619	0.404	0.302	0.297	0.196	-35.1%	-0.9%
Korea, Rep. of	0.388	0.391	0.42	8.2%	0.2%	10.37	10.67	10.1	-2.6%	-0.1%	2.2	1.161	0.641	0.136	0.202	0.121	-11.0%	-0.2%
Taiwan	3.159	3.276	3.273	3.6%	0.1%	2.234	2.818	2.747	23.0%	0.4%	1.769	1.128	0.614	0.056	0.085	0.082	46.4%	0.8%
Korea, Dem. Rep. of	0.413	0.429	0.447	8.2%	0.2%	4.414	4.859	4.97	12.6%	0.2%	15.01	7.934	3.229	0.046	0.039	0.013	-71.7%	-2.5%
Hong Kong	0.683	0.677	0.668	-2.2%	0.0%	2.224	2.428	2.268	2.0%	0.0%	0.681	0.55	0.396	0.015	0.019	0.012	-20.0%	-0.4%
Mongolia	0.173	0.171	0.163	-5.8%	-0.1%	0.648	0.733	0.68	4.9%	0.1%	5.483	3.441	1.415	0.001	0.003	0.005	400.0%	3.3%
Asia-East	**0.504**	**0.52**	**0.525**	**4.2%**	**0.1%**	**5.212**	**5.577**	**5.363**	**2.9%**	**0.1%**	**2.052**	**1.381**	**0.722**	**1.935**	**2.945**	**1.344**	**-30.5%**	**-0.7%**
India	0.602	0.635	0.699	16.1%	0.3%	2.708	3.866	5.394	99.2%	1.4%	4.013	1.99	0.883	0.366	0.848	0.76	107.7%	1.5%
Pakistan	1.101	1.064	1.074	-2.5%	0.0%	3.014	4.295	5.867	94.7%	1.3%	3.973	3.025	1.443	0.033	0.092	0.082	148.5%	1.8%
Bangladesh	0.562	0.547	0.544	-3.2%	-0.1%	6.176	7.085	7.51	21.6%	0.4%	2.414	2.003	1.099	0.015	0.054	0.06	300.0%	2.8%
Afghanistan	0.75	0.7	0.608	-18.9%	-0.4%	1.411	2.196	1.723	22.1%	0.4%	5.596	6.285	3.012	0.002	0.006	0.01	400.0%	3.3%
Iran, Islamic Rep. of	1.104	1.156	1.285	16.4%	0.3%	3.465	4.804	6.291	81.6%	1.2%	5.299	2.459	1.418	0.077	0.15	0.153	98.7%	1.4%
Nepal	0.386	0.389	0.4	3.6%	0.1%	4.01	5.651	6.57	63.8%	1.0%	3.361	3.375	1.658	0.002	0.007	0.008	300.0%	2.8%
Uzbekistan	2.279	2.404	2.583	13.3%	0.3%	2.616	3.729	4.536	73.4%	1.1%	8.577	4.834	2.338	0.014	0.021	0.025	78.6%	1.2%
Sri Lanka	0.649	0.69	0.713	9.9%	0.2%	3.057	3.504	3.737	22.2%	0.4%	2.32	1.726	0.897	0.005	0.015	0.018	260.0%	2.6%
Kazakhstan	2.4	2.332	2.553	6.4%	0.1%	0.825	0.797	0.837	1.5%	0.0%	11.52	3.303	1.515	0.052	0.09	0.051	-1.9%	0.0%
Tajikistan	1.892	1.978	2.172	14.8%	0.3%	2.567	3.66	4.812	87.5%	1.3%	6.523	4.54	1.791	0	0.002	0.001		
Turkmenistan	5.302	5.616	5.846	10.3%	0.2%	2.45	3.522	4.119	68.1%	1.0%	8.39	2.849	1.958	0.004	0.01	0.006	50.0%	0.8%
Kyrgyzstan	2.037	2.218	2.443	19.9%	0.4%	2.537	3.603	4.294	69.3%	1.1%	7.09	4.806	2.111	0.001	0.001	0.001	0.0%	0.0%
Bhutan	0.702	0.767	0.727	3.6%	0.1%	1.775	2.286	2.286	28.8%	0.5%	2.313	1.648	0.881	0	0.001	0.001		
Maldives	0.01	0.01	0.009	-10.0%	-0.2%	2.201	2.791	2.496	13.4%	0.3%	1.095	0.895	0.585	0	0	0.001		
Asia-South Central	**0.738**	**0.766**	**0.815**	**10.4%**	**0.2%**	**2.772**	**3.699**	**4.319**	**55.8%**	**0.9%**	**4.38**	**2.163**	**0.952**	**0.571**	**1.296**	**1.178**	**106.3%**	**1.5%**
Indonesia	0.385	0.412	0.415	7.8%	0.2%	3.215	4.169	4.288	33.4%	0.6%	4.068	2.71	1.45	0.109	0.109	0.042	-61.5%	-1.9%
Philippines	0.344	0.338	0.335	-2.6%	-0.1%	3.702	4.224	4.466	20.6%	0.4%	2.746	1.963	0.956	0.024	0.068	0.082	241.7%	2.5%
Vietnam	0.873	0.868	0.88	0.8%	0.0%	6.999	7.469	7.77	11.0%	0.2%	4.832	2.365	1.096	0.032	0.041	0.003	-90.6%	-4.6%
Thailand	1.313	1.405	1.412	7.5%	0.1%	3.276	3.716	3.651	11.4%	0.2%	3.529	1.917	0.883	0.06	0.096	0.088	46.7%	0.8%
Myanmar	0.662	0.69	0.717	8.3%	0.2%	3.142	3.5	3.595	14.4%	0.3%	1.155	1.601	1.327	0.008	0.015	0.019	137.5%	1.7%
Malaysia	0.358	0.351	0.338	-5.6%	-0.1%	0.642	0.757	0.664	3.4%	0.1%	3.703	1.713	0.851	0.043	0.079	0.044	2.3%	0.0%
Cambodia	0.294	0.296	0.323	9.9%	0.2%	1.682	2.388	3.404	102.4%	1.4%	2.739	1.852	0.969	0.002	0.009	0.011	450.0%	3.5%
Lao PDR	0.517	0.577	0.607	17.4%	0.3%	3.753	5.335	6.499	73.2%	1.1%	3.393	1.959	0.948	0.001	0.004	0.008	700.0%	4.2%
Singapore	0.044	0.044	0.046	4.5%	0.1%	2.269	2.576	3.032	33.6%	0.6%	2.397	1.454	0.831	0.032	0.033	0.015	-53.1%	-1.5%
Timor-Leste	0.373	0.354	0.335	-10.2%	-0.2%	4.957	6.527	7.159	44.4%	0.7%	4.881	4.216	1.525	0	0.001	0.001		
Brunei Darussalam	0.241	0.239	0.25	3.7%	0.1%	2.229	3.11	4.399	97.4%	1.4%	6.295	2.881	1.291	0.004	0.005	0.002	-50.0%	-1.4%
Asia-South East	**0.576**	**0.583**	**0.58**	**0.7%**	**0.0%**	**3.261**	**3.979**	**4.448**	**36.4%**	**0.6%**	**3.339**	**2.077**	**1.068**	**0.315**	**0.459**	**0.315**	**0.0%**	**0.0%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita — Annual Thousands of Cubic Meters					Crop Yield — Annual Metric Tons per Hectare					Energy Demand Ratio to GDP — Barrels of Oil Equivalent — Per Thousand Dollars			Carbon Emissions — Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued																		
Turkey	0.57	0.63	0.702	23.2%	0.4%	3.041	4.326	5.503	81.0%	1.2%	2.342	1.33	0.723	0.062	0.134	0.179	188.7%	2.1%
Yemen	0.314	0.287	0.272	-13.4%	-0.3%	3.685	4.382	4.469	21.3%	0.4%	5.257	3.23	1.761	0.007	0.021	0.034	385.7%	3.2%
Iraq	1.613	1.622	1.673	3.7%	0.1%	1.216	1.633	2.054	68.9%	1.1%	3.274	2.057	1.131	0.008	0.032	0.076	850.0%	4.6%
Saudi Arabia	0.755	0.73	0.746	-1.2%	0.0%	2.002	2.755	3.782	88.9%	1.3%	5.105	2.458	1.094	0.129	0.183	0.161	24.8%	0.4%
Syria	1.027	0.918	0.868	-15.5%	-0.3%	1.927	2.136	2.2	14.2%	0.3%	4.793	3.115	1.408	0.012	0.024	0.027	125.0%	1.6%
Israel	0.29	0.252	0.226	-22.1%	-0.5%	10.53	10.63	9.07	-13.9%	-0.3%	1.135	0.798	0.504	0.016	0.036	0.039	143.8%	1.8%
Azerbaijan	2.106	2.235	2.326	10.4%	0.2%	2.391	3.227	3.524	47.4%	0.8%	6.52	2.999	1.587	0.01	0.014	0.005	-50.0%	-1.4%
Jordan	0.189	0.183	0.175	-7.4%	-0.2%	5.302	6.483	6.773	27.7%	0.5%	3.092	1.553	0.749	0.004	0.01	0.019	375.0%	3.2%
Palestine	0.495	0.458	0.445	-10.1%	-0.2%	10.82	12.05	13.08	20.9%	0.4%	2.415	2.086	1.106	0.001	0.004	0.006	500.0%	3.6%
United Arab Emirates	0.506	0.465	0.461	-8.9%	-0.2%	7.829	7.582	7.488	-4.4%	-0.1%	2.733	1.568	0.858	0.03	0.035	0.029	-3.3%	-0.1%
Oman	0.528	0.495	0.484	-8.3%	-0.2%	7.094	7.69	8.304	17.1%	0.3%	3.398	1.891	0.991	0.009	0.013	0.007	-22.2%	-0.5%
Kuwait	0.172	0.162	0.159	-7.6%	-0.2%	10.7	10.97	11.14	4.1%	0.1%	4.956	2.307	1.206	0.031	0.043	0.025	-19.4%	-0.4%
Lebanon	0.383	0.358	0.357	-6.8%	-0.1%	10.49	11.01	11.59	10.5%	0.2%	2.078	1.305	0.752	0.004	0.007	0.006	50.0%	0.8%
Georgia	0.858	1.109	1.372	59.9%	0.9%	2.722	3.558	4.125	51.5%	0.8%	3.338	2.401	1.217	0.001	0.002	0.002	100.0%	1.4%
Armenia	1.003	1.171	1.338	33.4%	0.6%	3.237	4.467	5.38	66.2%	1.0%	3.228	1.554	0.847	0.001	0.003	0.003	200.0%	2.2%
Bahrain	0.412	0.401	0.394	-4.4%	-0.1%	2.186	2.596	2.617	19.7%	0.4%	2.668	1.637	0.84	0.003	0.004	0.002	-33.3%	-0.8%
Qatar	0.357	0.347	0.347	-2.8%	-0.1%	7.088	7.324	7.251	2.3%	0.0%	17.74	6.278	2.447	0.029	0.03	0.009	-69.0%	-2.3%
Cyprus	0.285	0.287	0.29	1.8%	0.0%	6.3	6.704	6.071	-3.6%	-0.1%	1.415	0.937	0.599	0.002	0.002	0.001	-50.0%	-1.4%
Asia-West	**0.781**	**0.794**	**0.812**	**4.0%**	**0.1%**	**5.476**	**6.085**	**6.357**	**16.1%**	**0.3%**	**3.485**	**1.799**	**0.881**	**0.36**	**0.595**	**0.632**	**75.6%**	**1.1%**
Australia	1.27	1.406	1.655	30.3%	0.5%	0.943	1.284	1.726	83.0%	1.2%	2.419	1.394	0.707	0.153	0.181	0.185	20.9%	0.4%
Papua New Guniea	0.017	0.018	0.018	5.9%	0.1%	3.484	4.487	5.128	47.2%	0.8%	4.51	2.865	1.952	0.002	0.004	0.004	100.0%	1.4%
New Zealand	0.541	0.603	0.735	35.9%	0.6%	1.15	1.602	2.237	94.5%	1.3%	1.552	1.005	0.552	0.006	0.013	0.014	133.3%	1.7%
Solomon Islands	0.326	0.317	0.296	-9.2%	-0.2%	2.538	3.436	3.572	40.7%	0.7%	2.112	2.515	1.552	0	0	0		
Fiji	0.085	0.092	0.108	27.1%	0.5%	0.951	1.326	1.855	95.1%	1.3%	1.343	1.433	0.878	0	0.001	0.001		
Vanuatu	0.287	0.278	0.271	-5.6%	-0.1%	0.537	0.731	0.824	53.4%	0.9%	2.245	2.215	1.109	0	0	0		
Micronesia	0.291	0.292	0.282	-3.1%	-0.1%	2.23	2.88	3.105	39.2%	0.7%	1.996	2.011	0.998	0	0	0		
Tonga	0.276	0.259	0.243	-12.0%	-0.3%	0.7	0.857	0.812	16.0%	0.3%	2.618	2.426	1.112	0	0	0		
Samoa	0.294	0.308	0.348	18.4%	0.3%	0.479	0.678	0.935	95.2%	1.3%	2.219	1.935	0.945	0	0	0		
Oceania	**0.877**	**0.915**	**1.034**	**17.9%**	**0.3%**	**1.446**	**1.92**	**2.244**	**55.2%**	**0.9%**	**2.33**	**1.371**	**0.708**	**0.162**	**0.199**	**0.204**	**25.9%**	**0.5%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Water Use per Capita — Annual Thousands of Cubic Meters					Crop Yield — Annual Metric Tons per Hectare					Energy Demand Ratio to GDP — Barrels of Oil Equivalent Per Thousand Dollars			Carbon Emissions — Billion Tons per Year				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	2010	2035	2060	% Chg	% An Chg
EUROPE																		
Russian Federation	0.556	0.624	0.628	12.9%	0.2%	1.083	1.219	1.038	-4.2%	-0.1%	10.24	3.265	1.417	0.405	0.442	0.181	-55.3%	-1.6%
Ukraine	0.842	1.114	1.193	41.7%	0.7%	2.118	2.579	2.36	11.4%	0.2%	10.36	3.758	1.274	0.047	0.06	0.058	23.4%	0.4%
Poland	0.32	0.371	0.397	24.1%	0.4%	3.58	4.252	3.915	9.4%	0.2%	2.695	1.393	0.753	0.077	0.118	0.122	58.4%	0.9%
Romania	0.312	0.365	0.393	26.0%	0.5%	3.247	3.637	3.407	4.9%	0.1%	4.056	2.299	1.074	0.018	0.029	0.019	5.6%	0.1%
Czech Republic	0.199	0.259	0.334	67.8%	1.0%	2.433	3.439	4.151	70.6%	1.1%	3.272	1.931	0.923	0.025	0.024	0.017	-32.0%	-0.8%
Belarus	0.3	0.359	0.39	30.0%	0.5%	2.751	3.208	3.129	13.7%	0.3%	3.813	2.041	0.991	0.009	0.014	0.012	33.3%	0.6%
Hungary	2.193	2.526	2.78	26.8%	0.5%	4.466	4.789	4.441	-0.6%	0.0%	3.091	1.715	0.846	0.017	0.02	0.014	-17.6%	-0.4%
Bulgaria	0.97	1.229	1.334	37.5%	0.6%	2.127	2.366	2.154	1.3%	0.0%	4.133	2.338	1	0.005	0.007	0.009	80.0%	1.2%
Slovakia	0.204	0.241	0.272	33.3%	0.6%	3.49	4.427	4.538	30.0%	0.5%	3.507	2.121	0.995	0.007	0.009	0.006	-14.3%	-0.3%
Moldova, Rep. of	0.577	0.678	0.754	30.7%	0.5%	2.622	3.006	3.174	21.1%	0.4%	3.83	3.11	1.25	0.001	0.001	0.002	100.0%	1.4%
Europe-East	**0.591**	**0.688**	**0.72**	**21.8%**	**0.4%**	**2.792**	**3.292**	**3.231**	**15.7%**	**0.3%**	**6.662**	**2.688**	**1.147**	**0.611**	**0.725**	**0.439**	**-28.2%**	**-0.7%**
United Kingdom	0.197	0.195	0.188	-4.6%	-0.1%	5.978	6.22	5.553	-7.1%	-0.1%	0.808	0.597	0.361	0.116	0.136	0.113	-2.6%	-0.1%
Sweden	0.303	0.304	0.287	-5.3%	-0.1%	2.635	2.729	2.306	-12.5%	-0.3%	1.459	0.971	0.543	0.02	0.022	0.012	-40.0%	-1.0%
Denmark	0.131	0.144	0.143	9.2%	0.2%	5.382	6.431	6.272	16.5%	0.3%	0.901	0.67	0.404	0.015	0.01	0.006	-60.0%	-1.8%
Ireland	0.285	0.266	0.256	-10.2%	-0.2%	2.984	3.022	2.933	-1.7%	0.0%	0.913	0.654	0.432	0.013	0.019	0.012	-7.7%	-0.2%
Norway	0.525	0.545	0.577	9.9%	0.2%	2.412	2.934	3.436	42.5%	0.7%	4.034	2.159	0.882	0.065	0.054	0.025	-61.5%	-1.9%
Finland	0.454	0.467	0.449	-1.1%	0.0%	2.351	2.5	2.18	-7.3%	-0.2%	1.72	1.128	0.604	0.019	0.022	0.017	-10.5%	-0.2%
Lithuania	1.066	1.441	2.1	97.0%	1.4%	1.727	2.427	3.304	91.3%	1.3%	3.119	1.696	0.823	0.004	0.006	0.005	25.0%	0.4%
Latvia	0.114	0.131	0.139	21.9%	0.4%	1.111	1.291	1.187	6.8%	0.1%	2.027	1.163	0.687	0.003	0.004	0.004	33.3%	0.6%
Estonia	1.107	1.319	1.402	26.6%	0.5%	1.514	1.732	1.604	5.9%	0.1%	3.176	1.521	0.785	0.004	0.004	0.003	-25.0%	-0.6%
Iceland	0.58	0.57	0.546	-5.9%	-0.1%	2.185	2.262	1.796	-17.8%	-0.4%	2.166	1.21	0.644	0	0	0		
Europe-North	**0.279**	**0.287**	**0.293**	**5.0%**	**0.1%**	**2.828**	**3.155**	**3.057**	**8.1%**	**0.2%**	**1.217**	**0.806**	**0.44**	**0.258**	**0.277**	**0.196**	**-24.0%**	**-0.5%**
Italy	0.737	0.791	0.847	14.9%	0.3%	5.447	5.63	5.192	-4.7%	-0.1%	1.202	0.95	0.649	0.119	0.122	0.091	-23.5%	-0.5%
Spain	0.887	0.941	0.977	10.1%	0.2%	2.825	3.013	2.715	-3.9%	-0.1%	1.127	0.847	0.578	0.067	0.092	0.069	3.0%	0.1%
Greece	0.807	0.859	0.902	11.8%	0.2%	3.671	3.868	3.605	-1.8%	0.0%	1.047	0.849	0.611	0.021	0.026	0.02	-4.8%	-0.1%
Portugal	1.084	1.135	1.147	5.8%	0.1%	2.517	2.691	2.471	-1.8%	0.0%	1.623	1.168	0.69	0.017	0.02	0.018	5.9%	0.1%
Serbia	6.474	8.279	9.434	45.7%	0.8%	5.027	6.338	6.624	31.8%	0.6%	4.905	3.005	1.284	0.007	0.01	0.015	114.3%	1.5%
Croatia	1.975	2.639	3.099	56.9%	0.9%	3.309	4.693	5.07	53.2%	0.9%	2.031	1.419	0.771	0.004	0.006	0.006	50.0%	0.8%
Bosnia and Herzegovina	1.138	1.412	1.838	61.5%	1.0%	3.296	4.67	6.023	82.7%	1.2%	2.576	2.277	1.131	0.002	0.002	0.002	0.0%	0.0%
Albania	0.559	0.617	0.642	14.8%	0.3%	2.193	2.628	2.729	24.4%	0.4%	2.589	1.671	0.883	0.001	0.003	0.004	300.0%	2.8%
Macedonia, TFYR	1.151	1.257	1.443	25.4%	0.5%	3.127	3.521	3.862	23.5%	0.4%	4.551	3.267	1.382	0.002	0.002	0.001	-50.0%	-1.4%
Slovenia	0.471	0.518	0.593	25.9%	0.5%	6.112	7.001	7.341	20.1%	0.4%	1.693	1.083	0.663	0.004	0.005	0.004	0.0%	0.0%
Montenegro	0.357	0.407	0.45	26.1%	0.5%	2.205	3.111	3.679	66.8%	1.0%	2.452	1.962	0.949	0	0.001	0.001		
Malta	0.05	0.052	0.057	14.0%	0.3%	5.719	6.686	6.988	22.2%	0.4%	2.262	1.309	0.722	0.001	0.001	0.001	0.0%	0.0%
Europe-South	**1.138**	**1.295**	**1.441**	**26.6%**	**0.5%**	**3.787**	**4.487**	**4.692**	**23.9%**	**0.4%**	**1.24**	**0.957**	**0.647**	**0.245**	**0.289**	**0.231**	**-5.7%**	**-0.1%**
Germany	0.473	0.494	0.492	4.0%	0.1%	6.032	6.201	5.237	-13.2%	-0.3%	1.159	0.794	0.454	0.202	0.206	0.161	-20.3%	-0.5%
France	0.563	0.567	0.535	-5.0%	-0.1%	5.159	5.436	4.743	-8.1%	-0.2%	1.255	0.868	0.492	0.101	0.15	0.145	43.6%	0.7%
Netherlands	0.554	0.535	0.513	-7.4%	-0.2%	10.78	10.8	9.48	-12.1%	-0.3%	1.642	1.132	0.662	0.06	0.067	0.048	-20.0%	-0.4%
Belgium	0.752	0.751	0.699	-7.0%	-0.1%	2.289	2.32	1.868	-18.4%	-0.4%	1.81	1.18	0.653	0.036	0.037	0.029	-19.4%	-0.4%
Austria	0.459	0.483	0.501	9.2%	0.2%	4.947	5.128	4.522	-8.6%	-0.2%	1.14	0.795	0.471	0.018	0.019	0.013	-27.8%	-0.6%
Switzerland	0.344	0.352	0.353	2.6%	0.1%	6.821	7.087	5.958	-12.7%	-0.3%	0.712	0.558	0.357	0.01	0.015	0.011	10.0%	0.2%
Luxembourg	0.134	0.136	0.136	1.5%	0.0%	2.276	3.11	3.891	71.0%	1.1%	1.319	0.981	0.612	0.003	0.004	0.003	0.0%	0.0%
Europe-West	**0.519**	**0.531**	**0.516**	**-0.6%**	**0.0%**	**5.472**	**5.726**	**5.1**	**-6.8%**	**-0.1%**	**1.245**	**0.859**	**0.492**	**0.43**	**0.496**	**0.409**	**-4.9%**	**-0.1%**

Infrastructure

Base Case

Source: International Futures Version 6.12, March 2009

	Road Density					Electricity Use					Telephone Density				
	Kilometers per 1000 Hectares					Annual KWH per Capita					Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**8.339**	**13.91**	**22.9**	**174.6%**	**2.0%**	**2314**	**4398**	**7976**	**244.7%**	**2.5%**	**213**	**353.2**	**510.4**	**139.6%**	**1.8%**
Africa	**3.635**	**5.302**	**8.115**	**123.2%**	**1.6%**	**567.4**	**1104**	**2707**	**377.1%**	**3.2%**	**35.46**	**72.51**	**176.8**	**398.6%**	**3.3%**
Americas	**7.079**	**14.14**	**26.45**	**273.6%**	**2.7%**	**5976**	**7806**	**11498**	**92.4%**	**1.3%**	**361.9**	**490.6**	**700.7**	**93.6%**	**1.3%**
Asia with Oceania	**10.09**	**16.82**	**28.05**	**178.0%**	**2.1%**	**1322**	**3881**	**8867**	**570.7%**	**3.9%**	**179.4**	**367**	**578.7**	**222.6%**	**2.4%**
Europe	**6.622**	**13.9**	**28.56**	**331.3%**	**3.0%**	**5659**	**10537**	**13580**	**140.0%**	**1.8%**	**459.2**	**714.5**	**827.1**	**80.1%**	**1.2%**
World	**8.339**	**13.91**	**22.9**	**174.6%**	**2.0%**	**2314**	**4398**	**7976**	**244.7%**	**2.5%**	**213**	**353.2**	**510.4**	**139.6%**	**1.8%**
Africa-Eastern	**9.11**	**10.36**	**13.53**	**48.5%**	**0.8%**	**229.7**	**602.1**	**2719**	**1083.7%**	**5.1%**	**11.49**	**38.14**	**177.6**	**1445.7%**	**5.6%**
Africa-Middle	**0.92**	**1.67**	**2.916**	**217.0%**	**2.3%**	**218.2**	**560.5**	**1060**	**385.8%**	**3.2%**	**7.999**	**37.66**	**76.74**	**859.4%**	**4.6%**
Africa-Northern	**1.027**	**3.106**	**7.906**	**669.8%**	**4.2%**	**934.9**	**2318**	**5908**	**531.9%**	**3.8%**	**99.99**	**178.3**	**370.2**	**270.2%**	**2.7%**
Africa-Southern	**0.979**	**4.724**	**14.22**	**1352.5%**	**5.5%**	**3702**	**5994**	**11604**	**213.5%**	**2.3%**	**110.6**	**274.9**	**714.4**	**545.9%**	**3.8%**
Africa-Western	**1.224**	**2.754**	**4.801**	**292.2%**	**2.8%**	**228.5**	**625.5**	**1387**	**507.0%**	**3.7%**	**14.05**	**44.15**	**97.14**	**591.4%**	**3.9%**
Africa	**3.635**	**5.302**	**8.115**	**123.2%**	**1.6%**	**567.4**	**1104**	**2707**	**377.1%**	**3.2%**	**35.46**	**72.51**	**176.8**	**398.6%**	**3.3%**
America-Caribbean	**50.97**	**52.49**	**56.02**	**9.9%**	**0.2%**	**1813**	**3910**	**8052**	**344.1%**	**3.0%**	**118.9**	**250.3**	**500**	**320.5%**	**2.9%**
America-Central	**7.138**	**8.804**	**13.84**	**93.9%**	**1.3%**	**825.7**	**2563**	**6628**	**702.7%**	**4.3%**	**129.5**	**223.4**	**422**	**225.9%**	**2.4%**
America-North	**6.094**	**18.11**	**37.73**	**519.1%**	**3.7%**	**10457**	**11795**	**13625**	**30.3%**	**0.5%**	**547.4**	**677.9**	**819.5**	**49.7%**	**0.8%**
America-South	**3.851**	**6.765**	**13.19**	**242.5%**	**2.5%**	**1866**	**4494**	**10229**	**448.2%**	**3.5%**	**200.7**	**343.4**	**631.7**	**214.7%**	**2.3%**
Americas	**7.079**	**14.14**	**26.45**	**273.6%**	**2.7%**	**5976**	**7806**	**11498**	**92.4%**	**1.3%**	**361.9**	**490.6**	**700.7**	**93.6%**	**1.3%**
Asia-East	**1.615**	**7.601**	**25.29**	**1465.9%**	**5.7%**	**2024**	**6538**	**13997**	**591.6%**	**3.9%**	**333.5**	**716**	**952.4**	**185.6%**	**2.1%**
Asia-South Central	**3.73**	**6.834**	**13.07**	**250.4%**	**2.5%**	**564.4**	**2049**	**6247**	**1006.8%**	**4.9%**	**60.25**	**153.7**	**391.1**	**549.1%**	**3.8%**
Asia-South East	**9.818**	**11.3**	**14.15**	**44.1%**	**0.7%**	**829.7**	**2287**	**5655**	**581.6%**	**3.9%**	**93.76**	**184.2**	**355**	**278.6%**	**2.7%**
Asia-West	**117.3**	**143.2**	**158.6**	**35.2%**	**0.6%**	**2444**	**4846**	**9057**	**270.6%**	**2.7%**	**189.1**	**332.4**	**560.2**	**196.2%**	**2.2%**
Oceania	**5.039**	**12.98**	**28.23**	**460.2%**	**3.5%**	**7622**	**9893**	**10356**	**35.9%**	**0.6%**	**412.3**	**575.3**	**635.4**	**54.1%**	**0.9%**
Asia with Oceania	**10.09**	**16.82**	**28.05**	**178.0%**	**2.1%**	**1322**	**3881**	**8867**	**570.7%**	**3.9%**	**179.4**	**367**	**578.7**	**222.6%**	**2.4%**
Europe-East	**2.294**	**7.939**	**15.25**	**564.8%**	**3.9%**	**3981**	**8886**	**12324**	**209.6%**	**2.3%**	**314.4**	**601.4**	**758.9**	**141.4%**	**1.8%**
Europe-North	**14.58**	**22.8**	**41.53**	**184.8%**	**2.1%**	**8771**	**13315**	**15441**	**76.0%**	**1.1%**	**594.1**	**819.9**	**870.3**	**46.5%**	**0.8%**
Europe-South	**8.749**	**14.43**	**25.22**	**188.3%**	**2.1%**	**4896**	**8941**	**13450**	**174.7%**	**2.0%**	**449.5**	**635.4**	**826.1**	**83.8%**	**1.2%**
Europe-West	**7.196**	**16.55**	**39.94**	**455.0%**	**3.5%**	**7175**	**12348**	**14174**	**97.5%**	**1.4%**	**616.8**	**864**	**889.2**	**44.2%**	**0.7%**
Europe	**6.622**	**13.9**	**28.56**	**331.3%**	**3.0%**	**5659**	**10537**	**13580**	**140.0%**	**1.8%**	**459.2**	**714.5**	**827.1**	**80.1%**	**1.2%**

Infrastructure

Base Case: Countries in Year 2060	Road Density					Electricity Use					Telephone Density				
	Kilometers per 1000 Hectares					Annual KWH per Capita					Lines per 1000 Persons				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	0.63	1.711	3.701	487.5%	3.6%	45.72	189.5	1012	2113.5%	6.4%	10.34	22.69	74.46	620.1%	4.0%
Uganda	2.005	4.177	9.749	386.2%	3.2%	395.2	1038	4762	1105.0%	5.1%	7.222	49.58	301	4067.8%	7.7%
Tanzania, United Rep. of	1.058	2.171	7.108	571.8%	3.9%	93.48	601	4839	5076.5%	8.2%	7.62	43.88	305.7	3911.8%	7.7%
Kenya	1.956	2.952	5.7	191.4%	2.2%	165.6	673.4	3214	1840.8%	6.1%	12.52	48.68	207.5	1557.3%	5.8%
Madagascar	0.288	1.163	2.832	883.3%	4.7%	274.4	413	1137	314.4%	2.9%	8.032	26.22	82.01	921.0%	4.8%
Mozambique	0.824	2.046	9.099	1004.2%	4.9%	315.2	1202	7088	2148.7%	6.4%	6.901	53.46	441.6	6299.1%	8.7%
Malawi	4.287	4.676	4.85	13.1%	0.2%	216.8	323	988.1	355.8%	3.1%	10.3	24.24	73.03	609.0%	4.0%
Zambia	0.965	1.646	3.715	285.0%	2.7%	604.2	949.5	2422	300.9%	2.8%	11.99	42.55	159.7	1231.9%	5.3%
Burundi	5.529	7.346	9.342	69.0%	1.1%	107.8	221.9	1093	913.9%	4.7%	6.099	18.76	79.39	1201.7%	5.3%
Rwanda	199.4	199.4	199.4	0.0%	0.0%	234.3	465.6	1484	533.4%	3.8%	5.673	27.26	103	1715.6%	6.0%
Somalia	0.099	0.528	1.132	1043.4%	5.0%	37.16	63.92	126.7	241.0%	2.5%	12.61	15.79	20.99	66.5%	1.0%
Zimbabwe	1.999	2.867	4.419	121.1%	1.6%	814.3	1491	2856	250.7%	2.5%	30.36	75.47	185.9	512.3%	3.7%
Eritrea	0.382	1.146	2.133	458.4%	3.5%	218	218	321	47.2%	0.8%	10.55	19.42	32.73	210.2%	2.3%
Mauritius	37.55	37.55	37.55	0.0%	0.0%	3367	6611	12868	282.2%	2.7%	297.4	477.9	790.8	165.9%	2.0%
Comoros	506.7	506.7	506.7	0.0%	0.0%	367	584.7	1807	392.4%	3.2%	23.37	41.48	122.5	424.2%	3.4%
Djibouti	30.8	30.8	30.8	0.0%	0.0%	624.3	980.9	2131	241.3%	2.5%	20.55	53.86	142.1	591.5%	3.9%
Africa-Eastern	**9.11**	**10.36**	**13.53**	**48.5%**	**0.8%**	**229.7**	**602.1**	**2719**	**1083.7%**	**5.1%**	**11.49**	**38.14**	**177.6**	**1445.7%**	**5.6%**
Congo; Dem. Rep. of	0.117	0.909	2.481	2020.5%	6.3%	57.8	148.5	589.6	920.1%	4.8%	2.453	15.05	48.96	1895.9%	6.2%
Angola	0.678	2.277	3.419	404.3%	3.3%	273.3	1420	2131	679.7%	4.2%	18.13	93.85	142.1	683.8%	4.2%
Cameroon	0.88	1.913	3.761	327.4%	2.9%	238.6	733.2	1998	737.4%	4.3%	12.08	49.65	134.1	1010.1%	4.9%
Chad	0.356	1.079	1.762	394.9%	3.3%	462	753	818.4	77.1%	1.2%	6.117	37.21	62.78	926.3%	4.8%
Central African Republic	0.437	0.836	1.767	304.3%	2.8%	219.5	388.3	985.1	348.8%	3.0%	5.437	24.15	72.85	1239.9%	5.3%
Congo, Rep. of	4.597	4.713	4.713	2.5%	0.0%	197.5	1131	1927	875.7%	4.7%	12.99	76.02	129.8	899.2%	4.7%
Gabon	33.38	33.38	33.38	0.0%	0.0%	1211	3600	5822	380.8%	3.2%	56.77	216.2	365.1	543.1%	3.8%
Equatorial Guinea	4.635	8.945	9.149	97.4%	1.4%	9518	10946	10946	15.0%	0.3%	88.18	391.9	455	416.0%	3.3%
São Tomé and Príncipe	2.084	3.593	5.733	175.1%	2.0%	446	514.9	1120	151.1%	1.9%	45.44	46.75	81.02	78.3%	1.2%
Africa-Middle	**0.92**	**1.67**	**2.916**	**217.0%**	**2.3%**	**218.2**	**560.5**	**1060**	**385.8%**	**3.2%**	**7.999**	**37.66**	**76.74**	**859.4%**	**4.6%**
Egypt	0.8	3.533	11.38	1322.5%	5.5%	1204	2809	8549	610.0%	4.0%	152.5	237.6	529.9	247.5%	2.5%
Sudan	0.165	1.506	3.823	2217.0%	6.5%	147.9	985	2631	1678.9%	5.9%	22.57	77.37	172.3	663.4%	4.1%
Algeria	0.729	2.686	5.081	597.0%	4.0%	811.7	2206	3971	389.2%	3.2%	86.26	163.2	253.3	193.6%	2.2%
Morocco	2.91	3.918	6.423	120.7%	1.6%	588.4	1581	4349	639.1%	4.1%	52.3	112.9	276.1	427.9%	3.4%
Tunisia	1.575	5.16	15.02	853.7%	4.6%	1252	3982	12227	876.6%	4.7%	140.5	302.8	752	435.2%	3.4%
Libyan Arab Jamahiriya	0.605	5.16	9.413	1455.9%	5.6%	4355	7561	8129	86.7%	1.3%	169.5	384.9	504.5	197.6%	2.2%
Africa-Northern	**1.027**	**3.106**	**7.906**	**669.8%**	**4.2%**	**934.9**	**2318**	**5908**	**531.9%**	**3.8%**	**99.99**	**178.3**	**370.2**	**270.2%**	**2.7%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Road Density Kilometers per 1000 Hectares					Electricity Use Annual KWH per Capita					Telephone Density Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	0.674	4.492	14.42	2039.5%	6.3%	3961	6242	12018	203.4%	2.2%	117	283.2	739.4	532.0%	3.8%
Namibia	0.578	2.91	13.48	2232.2%	6.5%	1592	3485	11832	643.2%	4.1%	78.63	196.6	728.1	826.0%	4.6%
Lesotho	2.468	3.072	5.538	124.4%	1.6%	458.8	987.8	3493	661.3%	4.1%	30.18	64.66	224.4	643.5%	4.1%
Botswana	6.735	14.48	23.88	254.6%	2.6%	4165	11013	14174	240.3%	2.5%	106.4	503.4	869.7	717.4%	4.3%
Swaziland	2.742	4.734	9.554	248.4%	2.5%	1450	2877	6950	379.3%	3.2%	42.68	140.6	433.2	915.0%	4.7%
Africa-Southern	**0.979**	**4.724**	**14.22**	**1352.5%**	**5.5%**	**3702**	**5994**	**11604**	**213.5%**	**2.3%**	**110.6**	**274.9**	**714.4**	**545.9%**	**3.8%**
Nigeria	0.45	2.801	5.506	1123.6%	5.1%	138.3	682.8	1222	783.6%	4.5%	13.86	51.75	87.16	528.9%	3.7%
Niger	0.234	0.787	2.119	805.6%	4.5%	197.8	306.3	1004	407.6%	3.3%	4.543	20.59	74	1528.9%	5.7%
Côte d'Ivoire	1.265	2.416	4.122	225.8%	2.4%	527.7	913.9	1724	226.7%	2.4%	18.32	50.94	117.5	541.4%	3.8%
Ghana	1.888	2.681	3.768	99.6%	1.4%	373.2	515.4	1052	181.9%	2.1%	17.95	35.14	76.91	328.5%	3.0%
Burkina Faso	0.624	1.864	4.861	679.0%	4.2%	355.7	695.5	2324	553.4%	3.8%	10.5	38.67	153.7	1363.8%	5.5%
Mali	1.668	1.841	2.787	67.1%	1.0%	331.9	566.2	1679	405.9%	3.3%	10.03	33.2	114.8	1044.6%	5.0%
Senegal	7.7	7.7	7.7	0.0%	0.0%	180.3	585.8	1908	958.2%	4.8%	26.02	51.38	128.6	394.2%	3.2%
Guinea	0.703	1.77	4.07	478.9%	3.6%	367.1	753	2007	446.7%	3.5%	7.247	38.63	134.6	1757.3%	6.0%
Benin	1.908	2.843	4.687	145.6%	1.8%	110.7	421.3	1694	1430.3%	5.6%	13.88	36.64	115.7	733.6%	4.3%
Togo	1.52	2.631	3.931	158.6%	1.9%	243.8	262.4	472	93.6%	1.3%	14.43	23.09	41.86	190.1%	2.2%
Sierra Leone	1.639	2.68	4.916	199.9%	2.2%	207.3	562.5	1941	836.3%	4.6%	7.666	32.93	130.6	1603.6%	5.8%
Liberia	0.635	1.295	2.599	309.3%	2.9%	107.2	153.2	506.5	372.5%	3.2%	2.856	14.25	43.94	1438.5%	5.6%
Mauritania	1.997	1.997	2.054	2.9%	0.1%	569.1	708.4	1417	149.0%	1.8%	17.78	41.08	98.93	456.4%	3.5%
Guinea-Bissau	8.444	8.444	8.444	0.0%	0.0%	153	204.5	477.7	212.2%	2.3%	9.188	19.11	42.2	359.3%	3.1%
Gambia	7.377	7.377	7.377	0.0%	0.0%	355.4	522.3	1219	243.0%	2.5%	30.34	42.47	86.97	186.7%	2.1%
Cape Verde	2.998	5.283	12.5	316.9%	2.9%	900.1	2385	8529	847.6%	4.6%	154.8	244.7	528.6	241.5%	2.5%
Africa-Western	**1.224**	**2.754**	**4.801**	**292.2%**	**2.8%**	**228.5**	**625.5**	**1387**	**507.0%**	**3.7%**	**14.05**	**44.15**	**97.14**	**591.4%**	**3.9%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Road Density Kilometers per 1000 Hectares					Electricity Use Annual KWH per Capita					Telephone Density Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	3.184	4.967	7.072	122.1%	1.6%	80.71	389.7	1243	1440.1%	5.6%	20.01	39.41	88.45	342.0%	3.0%
Dominican Republic	1.15	5.568	15.01	1205.2%	5.3%	1086	3874	10683	883.7%	4.7%	118.2	290.1	658.7	457.3%	3.5%
Cuba	2.768	5.07	15.78	470.1%	3.5%	1228	3102	12817	943.7%	4.8%	85.98	201.1	787.7	816.1%	4.5%
Puerto Rico	76.8	76.8	76.8	0.0%	0.0%	7101	14174	14174	99.6%	1.4%	311.2	758.3	869.7	179.5%	2.1%
Jamaica	436.5	436.5	436.5	0.0%	0.0%	2425	3026	5406	122.9%	1.6%	127.6	179.2	339.9	166.4%	2.0%
Trinidad and Tobago	17.28	22.16	22.16	28.2%	0.5%	4727	10792	14174	199.9%	2.2%	302.5	669.5	869.7	187.5%	2.1%
Bahamas	2.722	7.845	18.99	597.6%	4.0%	6324	9108	14174	124.1%	1.6%	427.8	583.5	869.7	103.3%	1.4%
Barbados	37.21	37.21	37.21	0.0%	0.0%	4611	7538	14174	207.4%	2.3%	507.1	617.9	907.6	79.0%	1.2%
St. Vincent & the Grenadines	31.03	31.03	31.03	0.0%	0.0%	2262	3682	9007	298.2%	2.8%	193.2	265.2	557.5	188.6%	2.1%
Grenada	3426	3426	3426	0.0%	0.0%	3016	4098	9364	210.5%	2.3%	267.2	302.2	579.1	116.7%	1.6%
St. Lucia	5.624	8.284	14.65	160.5%	1.9%	3150	5041	10400	230.2%	2.4%	203.6	317.9	641.7	215.2%	2.3%
America-Caribbean	**50.97**	**52.49**	**56.02**	**9.9%**	**0.2%**	**1813**	**3910**	**8052**	**344.1%**	**3.0%**	**118.9**	**250.3**	**500**	**320.5%**	**2.9%**
Guatemala	0.556	3.602	9.304	1573.4%	5.8%	525.8	1827	5311	910.1%	4.7%	104.4	164.6	334.2	220.1%	2.4%
Honduras	0.662	2.56	6.416	869.2%	4.6%	611.7	1517	4139	576.6%	3.9%	73.44	122.3	263.4	258.7%	2.6%
El Salvador	30.42	30.42	30.42	0.0%	0.0%	791.7	2661	8166	931.5%	4.8%	148.8	245.2	506.7	240.5%	2.5%
Nicaragua	7.083	7.083	7.083	0.0%	0.0%	358.6	1099	3141	775.9%	4.4%	43.13	86.95	203.1	370.9%	3.1%
Costa Rica	3.075	8.926	27.61	797.9%	4.5%	1958	6750	14174	623.9%	4.0%	346.7	652.5	966.4	178.7%	2.1%
Panama	5.277	9.892	21.1	299.8%	2.8%	1708	5813	14174	729.9%	4.3%	168.4	418.7	869.7	416.4%	3.3%
Belize	1.607	5.456	16.06	899.4%	4.7%	2540	5772	13867	445.9%	3.5%	140.1	337	851.1	507.5%	3.7%
America-Central	**7.138**	**8.804**	**13.84**	**93.9%**	**1.3%**	**825.7**	**2563**	**6628**	**702.7%**	**4.3%**	**129.5**	**223.4**	**422**	**225.9%**	**2.4%**
United States of America	8.388	23.12	45.85	446.6%	3.5%	12816	13588	14174	10.6%	0.2%	661	779.6	869.7	31.6%	0.6%
Mexico	0.666	4.96	13.01	1853.5%	6.1%	2026	4795	10572	421.8%	3.4%	202.2	348.4	652	222.5%	2.4%
Canada	2.463	14.51	38.12	1447.7%	5.6%	15952	18136	18136	13.7%	0.3%	615.6	812.3	869.7	41.3%	0.7%
America-North	**6.094**	**18.11**	**37.73**	**519.1%**	**3.7%**	**10457**	**11795**	**13625**	**30.3%**	**0.5%**	**547.4**	**677.9**	**819.5**	**49.7%**	**0.8%**
Brazil	2.359	5.377	13.06	453.6%	3.5%	1972	4443	11052	460.4%	3.5%	222.7	350.9	681.1	205.8%	2.3%
Colombia	11.89	11.89	11.89	0.0%	0.0%	1032	2823	9170	788.6%	4.5%	177.2	260.2	567.3	220.1%	2.4%
Argentina	6.411	11.11	20.87	225.5%	2.4%	2594	7096	14174	446.4%	3.5%	274.9	537.6	873.8	217.9%	2.3%
Venezuela, RB	1.549	5.264	10.2	558.5%	3.8%	2884	5409	8263	186.5%	2.1%	155.3	317.4	512.5	230.0%	2.4%
Peru	0.614	3.607	9.484	1444.6%	5.6%	955.3	3197	7790	715.5%	4.3%	96.61	229	484	401.0%	3.3%
Chile	7.047	14.03	27.48	290.0%	2.8%	3085	9310	14174	359.4%	3.1%	252.5	632.1	869.7	244.4%	2.5%
Ecuador	0.832	2.946	5.218	527.2%	3.7%	835.3	2052	3493	318.2%	2.9%	132.4	175.4	224.4	69.5%	1.1%
Bolivia	0.705	2.804	7.514	965.8%	4.8%	553.4	2240	6243	1028.1%	5.0%	79.18	181.6	390.5	393.2%	3.2%
Paraguay	0.688	1.966	5.022	629.9%	4.1%	921	1614	3841	317.0%	2.9%	58.45	105.1	245.4	319.8%	2.9%
Uruguay	5.567	9.366	19.18	244.5%	2.5%	2292	5989	14174	518.4%	3.7%	329.4	532.7	869.7	164.0%	2.0%
Guyana	2.696	3.673	6.93	157.0%	1.9%	1131	2261	5943	425.5%	3.4%	149.9	203.4	372.4	148.4%	1.8%
Suriname	1.084	3.82	9.642	789.5%	4.5%	2541	4499	8404	230.7%	2.4%	194.8	305.8	521	167.5%	2.0%
America-South	**3.851**	**6.765**	**13.19**	**242.5%**	**2.5%**	**1866**	**4494**	**10229**	**448.2%**	**3.5%**	**200.7**	**343.4**	**631.7**	**214.7%**	**2.3%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Road Density Kilometers per 1000 Hectares					Electricity Use Annual KWH per Capita					Telephone Density Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	0.557	5.952	23.59	4135.2%	7.8%	1219	5786	14174	1062.8%	5.0%	307.5	708.1	969.2	215.2%	2.3%
Japan	2.233	13.83	38.83	1638.9%	5.9%	7945	12881	14174	78.4%	1.2%	496.1	793.6	869.7	75.3%	1.1%
Korea, Rep. of	4.682	17.7	40.07	755.8%	4.4%	6369	13047	14174	122.5%	1.6%	564.3	957	957	69.6%	1.1%
Taiwan	9.742	17.91	38.78	298.1%	2.8%	6053	12095	14174	134.2%	1.7%	651	974.6	1068	64.1%	1.0%
Korea, Dem. Rep. of	5.305	5.416	5.416	2.1%	0.0%	1018	1471	2256	121.6%	1.6%	51.65	88.48	149.6	189.6%	2.1%
Hong Kong	127.1	127.1	127.1	0.0%	0.0%	7206	11448	14174	96.7%	1.4%	643.3	796.7	869.7	35.2%	0.6%
Mongolia	0.239	1.453	5.613	2248.5%	6.5%	917.2	1730	4769	420.0%	3.4%	64.97	115.1	301.5	364.1%	3.1%
Asia-East	**1.615**	**7.601**	**25.29**	**1465.9%**	**5.7%**	**2024**	**6538**	**13997**	**591.6%**	**3.9%**	**333.5**	**716**	**952.4**	**185.6%**	**2.1%**
India	0.616	4.627	13.73	2128.9%	6.4%	493.7	2224	8203	1561.5%	5.8%	54.45	165.3	508.9	834.6%	4.6%
Pakistan	0.828	3.442	7.267	777.7%	4.4%	442.4	1025	2503	465.8%	3.5%	39.58	76.18	164.6	315.9%	2.9%
Bangladesh	14.55	14.74	14.74	1.3%	0.0%	147.2	769.2	2584	1655.4%	5.9%	11.94	54.53	169.4	1318.8%	5.4%
Afghanistan	0.478	1.547	3.32	594.6%	4.0%	236.1	283	514.9	118.1%	1.6%	6.214	20.27	44.45	615.3%	4.0%
Iran, Islamic Rep. of	2.504	7.015	10.53	320.5%	2.9%	1874	5597	8399	348.2%	3.0%	301.6	510.4	531.4	76.2%	1.1%
Nepal	4.541	4.831	5.175	14.0%	0.3%	97.36	423.4	1496	1436.6%	5.6%	20.44	41.79	103.7	407.3%	3.3%
Uzbekistan	1.976	2.804	3.903	97.5%	1.4%	1735	2200	2241	29.2%	0.5%	72.63	102.7	148.7	104.7%	1.4%
Sri Lanka	101.2	101.2	101.2	0.0%	0.0%	435.8	2082	7145	1539.5%	5.8%	69.78	171.2	445	537.7%	3.8%
Kazakhstan	0.55	7.222	12.33	2141.8%	6.4%	3670	10265	10779	193.7%	2.2%	231.8	629.2	664.6	186.7%	2.1%
Tajikistan	1.995	2.568	3.961	98.5%	1.4%	2232	2326	2326	4.2%	0.1%	47.09	70.86	151.2	221.1%	2.4%
Turkmenistan	0.663	3.793	4.74	614.9%	4.0%	1303	4609	4690	259.9%	2.6%	86.77	279.5	289.5	233.6%	2.4%
Kyrgyzstan	0.38	1.26	2.623	590.3%	3.9%	1351	1357	1575	16.6%	0.3%	83.68	86.05	108.5	29.7%	0.5%
Bhutan	3.044	5.238	10.96	260.1%	2.6%	1360	3358	9257	580.7%	3.9%	52.89	174.6	572.6	982.6%	4.9%
Maldives	2196	2196	2196	0.0%	0.0%	1502	5127	14174	843.7%	4.6%	122	347.1	876.5	618.4%	4.0%
Asia-South Central	**3.73**	**6.834**	**13.07**	**250.4%**	**2.5%**	**564.4**	**2049**	**6247**	**1006.8%**	**4.9%**	**60.25**	**153.7**	**391.1**	**549.1%**	**3.8%**
Indonesia	17.31	17.31	17.31	0.0%	0.0%	533	1629	4167	681.8%	4.2%	68.32	131	265.1	288.0%	2.7%
Philippines	3.02	5.612	9.902	227.9%	2.4%	598.2	1727	4808	703.7%	4.3%	47.18	117.9	303.8	543.9%	3.8%
Vietnam	2.522	5.277	10.61	320.7%	2.9%	448.7	1991	6218	1285.8%	5.4%	200.9	316.8	389	93.6%	1.3%
Thailand	1.743	5.311	12.41	612.0%	4.0%	1752	4136	9376	435.2%	3.4%	124.4	268.7	579.8	366.1%	3.1%
Myanmar	0.647	1.727	3.501	441.1%	3.4%	144.9	614.3	1863	1185.7%	5.2%	13.82	46.72	125.9	811.0%	4.5%
Malaysia	6.785	11.65	18.22	168.5%	2.0%	3201	7605	14174	342.8%	3.0%	196.8	465.6	869.7	341.9%	3.0%
Cambodia	2.041	3.873	7.204	253.0%	2.6%	547.9	1830	4567	733.5%	4.3%	7.923	79.49	289.2	3550.1%	7.5%
Lao PDR	0.933	2.962	10.56	1031.8%	5.0%	650.4	2343	8585	1220.0%	5.3%	21.18	115	532	2411.8%	6.7%
Singapore	182.7	182.7	182.7	0.0%	0.0%	8567	11753	14174	65.4%	1.0%	509.3	714	869.7	70.8%	1.1%
Timor-Leste	2.417	3.778	7.147	195.7%	2.2%	702.7	1205	3621	415.3%	3.3%	8.807	54.85	232.1	2535.4%	6.8%
Brunei Darussalam	3.952	15.56	27.34	591.8%	3.9%	7365	11234	14174	92.5%	1.3%	301.7	624.4	869.7	188.3%	2.1%
Asia-South East	**9.818**	**11.3**	**14.15**	**44.1%**	**0.7%**	**829.7**	**2287**	**5655**	**581.6%**	**3.9%**	**93.76**	**184.2**	**355**	**278.6%**	**2.7%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Road Density Kilometers per 1000 Hectares					Electricity Use Annual KWH per Capita					Telephone Density Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	5.318	9.236	19.92	274.6%	2.7%	1690	5179	14174	738.7%	4.3%	273.3	477.3	869.7	218.2%	2.3%
Yemen	1.365	2.857	5.301	288.4%	2.8%	181	1024	3021	1569.1%	5.8%	44.89	95.69	195.9	336.4%	3.0%
Iraq	2.42	4.32	7.751	220.3%	2.4%	1475	2836	5022	240.5%	2.5%	44.12	122.7	316.7	617.8%	4.0%
Saudi Arabia	0.96	7.131	15.05	1467.7%	5.7%	5343	8923	12936	142.1%	1.8%	189	461.3	794.9	320.6%	2.9%
Syria	3.997	5.197	7.986	99.8%	1.4%	1057	1930	4723	346.8%	3.0%	153.1	178.8	298.7	95.1%	1.3%
Israel	45.44	54.94	55.57	22.3%	0.4%	6502	13211	14174	118.0%	1.6%	463	856.6	869.7	87.8%	1.3%
Azerbaijan	3.721	6.297	7.963	114.0%	1.5%	2366	4596	5491	132.1%	1.7%	161.2	294.4	345.1	114.1%	1.5%
Jordan	130.2	130.2	130.2	0.0%	0.0%	1417	3937	14174	900.3%	4.7%	119.6	273.6	869.7	627.2%	4.0%
Palestine	5919	5919	5919	0.0%	0.0%	1159	2210	5585	381.9%	3.2%	95.39	155.6	350.8	267.8%	2.6%
United Arab Emirates	1.692	11.48	24.49	1347.4%	5.5%	10978	14328	14328	30.5%	0.5%	326.5	679.2	869.7	166.4%	2.0%
Oman	3.557	8.148	13.78	287.4%	2.7%	3538	7273	11864	235.3%	2.4%	138.9	401.3	730.1	425.6%	3.4%
Kuwait	48.82	53.39	53.39	9.4%	0.2%	10957	12821	14174	29.4%	0.5%	273.4	613.1	869.7	218.1%	2.3%
Lebanon	5.733	9.668	16.82	193.4%	2.2%	2021	4811	11043	446.4%	3.5%	185.7	343	680.5	266.5%	2.6%
Georgia	0.698	2.554	5.831	735.4%	4.3%	909.8	2058	4353	378.5%	3.2%	141.1	191.9	276.3	95.8%	1.4%
Armenia	3.344	7.206	12.39	270.5%	2.7%	1395	4815	9745	598.6%	4.0%	218.4	458.4	602.1	175.7%	2.0%
Bahrain	45.41	45.41	45.41	0.0%	0.0%	9399	12685	14174	50.8%	0.8%	328.7	646.8	869.7	164.6%	2.0%
Qatar	34.23	59.26	59.26	73.1%	1.1%	15308	15308	15308	0.0%	0.0%	336.7	639.5	869.7	158.3%	1.9%
Cyprus	65.79	65.79	65.79	0.0%	0.0%	4820	10662	14174	194.1%	2.2%	537.1	812.6	882.6	64.3%	1.0%
Asia-West	**117.3**	**143.2**	**158.6**	**35.2%**	**0.6%**	**2444**	**4846**	**9057**	**270.6%**	**2.7%**	**189.1**	**332.4**	**560.2**	**196.2%**	**2.2%**
Australia	2.539	13.84	36.68	1344.7%	5.5%	10082	13456	14174	40.6%	0.7%	554.6	790.2	869.7	56.8%	0.9%
Papua New Guniea	0.371	1.499	3.097	734.8%	4.3%	562.3	1277	2050	264.6%	2.6%	15.34	64.08	137.2	794.4%	4.5%
New Zealand	5.171	12.01	32.57	529.9%	3.7%	9190	13684	14763	60.6%	1.0%	461	766.6	869.7	88.7%	1.3%
Solomon Islands	2.003	2.202	2.671	33.3%	0.6%	581.6	862.2	1523	161.9%	1.9%	20.18	48.93	105.4	422.3%	3.4%
Fiji	15.68	15.68	15.68	0.0%	0.0%	1423	2357	6425	351.5%	3.1%	135.7	179.5	401.5	195.9%	2.2%
Vanuatu	1.056	2.268	5.403	411.6%	3.3%	1166	1789	4014	244.3%	2.5%	39.75	93.88	255.8	543.5%	3.8%
Micronesia	568.1	568.1	568.1	0.0%	0.0%	1785	2477	5869	228.8%	2.4%	121.2	163	367.9	203.5%	2.2%
Tonga	9.067	9.067	9.126	0.7%	0.0%	1639	2208	5106	211.5%	2.3%	137.3	159.3	321.8	134.4%	1.7%
Samoa	42.25	42.25	42.25	0.0%	0.0%	1651	2795	7327	343.8%	3.0%	115.2	183.6	456	295.8%	2.8%
Oceania	**5.039**	**12.98**	**28.23**	**460.2%**	**3.5%**	**7622**	**9893**	**10356**	**35.9%**	**0.6%**	**412.3**	**575.3**	**635.4**	**54.1%**	**0.9%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Road Density Kilometers per 1000 Hectares					Electricity Use Annual KWH per Capita					Telephone Density Lines per 1000 Persons				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	0.766	7.726	14.44	1785.1%	6.0%	5024	11271	12663	152.1%	1.9%	325	701.5	778.3	139.5%	1.8%
Ukraine	3.122	6.4	13.16	321.5%	2.9%	2576	5597	10870	322.0%	2.9%	275.3	455.1	670.1	143.4%	1.8%
Poland	7.121	12.46	22.03	209.4%	2.3%	3112	8204	14174	355.5%	3.1%	346.5	632.8	876.8	153.0%	1.9%
Romania	0.683	5	12.08	1668.7%	5.9%	2009	4879	9692	382.4%	3.2%	225.7	377.3	598.9	165.4%	2.0%
Czech Republic	1.899	7.928	16.99	794.7%	4.5%	5550	8796	14174	155.4%	1.9%	349.6	545.7	869.7	148.8%	1.8%
Belarus	5.427	8.951	13.83	154.8%	1.9%	3174	6567	11636	266.6%	2.6%	371.7	553.8	716.3	92.7%	1.3%
Hungary	1.168	7.472	19.21	1544.7%	5.8%	3558	7687	14174	298.4%	2.8%	365.5	572	869.7	137.9%	1.7%
Bulgaria	5.575	8.079	14.29	156.3%	1.9%	3436	5991	11972	248.4%	2.5%	342.5	466.2	736.6	115.1%	1.5%
Slovakia	1.548	6.719	14.69	849.0%	4.6%	4924	7343	11836	140.4%	1.8%	257.4	425.4	728.4	183.0%	2.1%
Moldova, Rep. of	0.401	2.13	6.363	1486.8%	5.7%	876.5	1521	4291	389.6%	3.2%	221.4	222.5	272.6	23.1%	0.4%
Europe-East	**2.294**	**7.939**	**15.25**	**564.8%**	**3.9%**	**3981**	**8886**	**12324**	**209.6%**	**2.3%**	**314.4**	**601.4**	**758.9**	**141.4%**	**1.8%**
United Kingdom	16.72	24.06	42.49	154.1%	1.9%	6595	11875	14174	114.9%	1.5%	615.5	848.9	869.7	41.3%	0.7%
Sweden	1.654	15.35	46.16	2690.8%	6.9%	16157	18828	18828	16.5%	0.3%	700.6	871.4	871.4	24.4%	0.4%
Denmark	29.89	33.14	43.39	45.2%	0.7%	7193	11925	14174	97.1%	1.4%	666.6	851.5	869.7	30.5%	0.5%
Ireland	8.831	22.73	38.64	337.5%	3.0%	7372	11237	14174	92.3%	1.3%	620.9	762.2	869.7	40.1%	0.7%
Norway	23.12	31.82	44.67	93.2%	1.3%	24881	24881	24881	0.0%	0.0%	509.9	714.3	869.7	70.6%	1.1%
Finland	1.617	12.69	39.77	2359.5%	6.6%	16181	18900	18900	16.8%	0.3%	482.6	764.7	869.7	80.2%	1.2%
Lithuania	13.35	15.06	18.3	37.1%	0.6%	2475	6696	14174	472.7%	3.6%	272.8	498.9	869.7	218.8%	2.3%
Latvia	4.139	10.24	23.64	471.2%	3.5%	2591	8049	14174	447.0%	3.5%	361.7	670	893.9	147.1%	1.8%
Estonia	1.853	8.989	24.97	1247.5%	5.3%	4753	10239	14174	198.2%	2.2%	398.1	708.9	873.3	119.4%	1.6%
Iceland	17	27.38	45.53	167.8%	2.0%	27029	28149	28149	4.1%	0.1%	747.3	856.4	869.7	16.4%	0.3%
Europe-North	**14.58**	**22.8**	**41.53**	**184.8%**	**2.1%**	**8771**	**13315**	**15441**	**76.0%**	**1.1%**	**594.1**	**819.9**	**870.3**	**46.5%**	**0.8%**
Italy	1.942	9.351	23.63	1116.8%	5.1%	5337	9170	14174	165.6%	2.0%	453.1	628.8	869.7	91.9%	1.3%
Spain	7.853	13.63	25.25	221.5%	2.4%	5542	10775	14174	155.8%	1.9%	484.4	747.1	869.7	79.5%	1.2%
Greece	4.237	11.37	22.33	427.0%	3.4%	5081	10316	14174	179.0%	2.1%	604.8	797.7	869.7	43.8%	0.7%
Portugal	41.43	41.43	41.43	0.0%	0.0%	4286	7526	14174	230.7%	2.4%	413.5	549	869.7	110.3%	1.5%
Serbia	1.927	5.039	12.24	535.2%	3.8%	3042	4927	9947	227.0%	2.4%	320.4	395	614.3	91.7%	1.3%
Croatia	9.174	10.9	17.24	87.9%	1.3%	3128	6158	14174	353.1%	3.1%	430.8	538.2	869.7	101.9%	1.4%
Bosnia and Herzegovina	4.382	4.898	7.596	73.3%	1.1%	1594	2565	5709	258.2%	2.6%	251.6	251.6	358.3	42.4%	0.7%
Albania	6.433	8.613	11.97	86.1%	1.2%	1370	3875	9189	570.7%	3.9%	128.3	279.1	568.5	343.1%	3.0%
Macedonia, TFYR	2.324	3.684	7.047	203.2%	2.2%	2413	2794	5153	113.6%	1.5%	262.4	262.4	324.7	23.7%	0.4%
Slovenia	11.53	15.78	28.65	148.5%	1.8%	6263	11086	14174	126.3%	1.6%	456.7	727	869.7	90.4%	1.3%
Montenegro	63.51	63.51	63.51	0.0%	0.0%	2544	4423	10811	325.0%	2.9%	587	587	666.5	13.5%	0.3%
Malta	471.9	471.9	471.9	0.0%	0.0%	4573	9210	14174	209.9%	2.3%	527.2	729.3	909.1	72.4%	1.1%
Europe-South	**8.749**	**14.43**	**25.22**	**188.3%**	**2.1%**	**4896**	**8941**	**13450**	**174.7%**	**2.0%**	**449.5**	**635.4**	**826.1**	**83.8%**	**1.2%**
Germany	2.175	12.72	39.82	1730.8%	6.0%	6724	12217	14174	110.8%	1.5%	678	917.7	917.7	35.4%	0.6%
France	2.84	12.13	37.44	1218.3%	5.3%	7330	12530	14174	93.4%	1.3%	584.7	849	869.7	48.7%	0.8%
Netherlands	4.961	15.61	35	605.5%	4.0%	7131	11867	14174	98.8%	1.4%	517	769.6	869.7	68.2%	1.0%
Belgium	48.22	48.22	48.22	0.0%	0.0%	8166	12893	14174	73.6%	1.1%	489.2	782.7	869.7	77.8%	1.2%
Austria	16.3	21.95	36.44	123.6%	1.6%	7778	12323	14174	82.2%	1.2%	501	768	869.7	73.6%	1.1%
Switzerland	17.12	23.87	40.05	133.9%	1.7%	8514	12427	14174	66.5%	1.0%	741.5	877.6	877.6	18.4%	0.3%
Luxembourg	289.8	289.8	289.8	0.0%	0.0%	12967	13653	14174	9.3%	0.2%	567.1	739	869.7	53.4%	0.9%
Europe-West	**7.196**	**16.55**	**39.94**	**455.0%**	**3.5%**	**7175**	**12348**	**14174**	**97.5%**	**1.4%**	**616.8**	**864**	**889.2**	**44.2%**	**0.7%**

Infrastructure

Base Case
Source: International Futures Version 6.12, March 2009

	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**81.34**	**92.01**	**97.74**	**20.2%**	**0.4%**	**16.82**	**38.96**	**51.39**	**205.5%**	**2.3%**	**9.338**	**24.89**	**37.34**	**299.9%**	**2.8%**
Africa	**67.43**	**85.19**	**93.45**	**38.6%**	**0.7%**	**5.649**	**24.62**	**30.68**	**443.1%**	**3.4%**	**2.901**	**9.092**	**16.07**	**453.9%**	**3.5%**
Americas	**97.8**	**99.64**	**99.97**	**2.2%**	**0.0%**	**32.22**	**52.84**	**64.91**	**101.5%**	**1.4%**	**17.6**	**40.12**	**57.42**	**226.3%**	**2.4%**
Asia with Oceania	**77.71**	**91.46**	**98.88**	**27.2%**	**0.5%**	**13.13**	**37**	**55.02**	**319.0%**	**2.9%**	**7.176**	**24.33**	**39.51**	**450.6%**	**3.5%**
Europe	**99.97**	**100**	**100**	**0.0%**	**0.0%**	**33.47**	**65.18**	**72.83**	**117.6%**	**1.6%**	**19.94**	**42.51**	**60.89**	**205.4%**	**2.3%**
World	**81.34**	**92.01**	**97.74**	**20.2%**	**0.4%**	**16.82**	**38.96**	**51.39**	**205.5%**	**2.3%**	**9.338**	**24.89**	**37.34**	**299.9%**	**2.8%**
Africa-Eastern	**58.7**	**81.35**	**89.91**	**53.2%**	**0.9%**	**3.42**	**22.32**	**30.74**	**798.8%**	**4.5%**	**1.166**	**4.736**	**15.95**	**1267.9%**	**5.4%**
Africa-Middle	**57.77**	**79.84**	**91.29**	**58.0%**	**0.9%**	**3.492**	**22.59**	**24.13**	**591.0%**	**3.9%**	**1.815**	**5.807**	**8.295**	**357.0%**	**3.1%**
Africa-Northern	**81.11**	**92.09**	**98.61**	**21.6%**	**0.4%**	**10.45**	**30.63**	**43.34**	**314.7%**	**2.9%**	**5.933**	**21.39**	**31.63**	**433.1%**	**3.4%**
Africa-Southern	**97.99**	**98.89**	**99.83**	**1.9%**	**0.0%**	**15.8**	**40.26**	**65.85**	**316.8%**	**2.9%**	**10.62**	**28.74**	**41.68**	**292.5%**	**2.8%**
Africa-Western	**65.65**	**86.5**	**95.62**	**45.7%**	**0.8%**	**3.714**	**22.85**	**25.48**	**586.1%**	**3.9%**	**1.664**	**6.332**	**11.45**	**588.1%**	**3.9%**
Africa	**67.43**	**85.19**	**93.45**	**38.6%**	**0.7%**	**5.649**	**24.62**	**30.68**	**443.1%**	**3.4%**	**2.901**	**9.092**	**16.07**	**453.9%**	**3.5%**
America-Caribbean	**87.33**	**96.36**	**99.31**	**13.7%**	**0.3%**	**13.7**	**36.87**	**51.81**	**278.2%**	**2.7%**	**7.396**	**22.9**	**32.95**	**345.5%**	**3.0%**
America-Central	**86.81**	**98.81**	**100**	**15.2%**	**0.3%**	**12.32**	**32.61**	**46.19**	**274.9%**	**2.7%**	**6.93**	**21.83**	**34.77**	**401.7%**	**3.3%**
America-North	**99.9**	**100**	**100**	**0.1%**	**0.0%**	**49.27**	**68.02**	**72.72**	**47.6%**	**0.8%**	**24.55**	**52.59**	**77.78**	**216.8%**	**2.3%**
America-South	**97.66**	**99.68**	**100**	**2.4%**	**0.0%**	**16.89**	**40.37**	**60.41**	**257.7%**	**2.6%**	**11.89**	**30.51**	**40.99**	**244.7%**	**2.5%**
Americas	**97.8**	**99.64**	**99.97**	**2.2%**	**0.0%**	**32.22**	**52.84**	**64.91**	**101.5%**	**1.4%**	**17.6**	**40.12**	**57.42**	**226.3%**	**2.4%**
Asia-East	**98.11**	**99.23**	**99.62**	**1.5%**	**0.0%**	**17.16**	**48.09**	**75.3**	**338.8%**	**3.0%**	**11.61**	**34.86**	**56.08**	**383.0%**	**3.2%**
Asia-South Central	**52.17**	**82.29**	**98.23**	**88.3%**	**1.3%**	**8.948**	**29.38**	**44.67**	**399.2%**	**3.3%**	**3.393**	**17.32**	**30.15**	**788.6%**	**4.5%**
Asia-South East	**89.69**	**96.69**	**98.73**	**10.1%**	**0.2%**	**11.79**	**30.64**	**42.34**	**259.1%**	**2.6%**	**4.936**	**19.1**	**31.87**	**545.7%**	**3.8%**
Asia-West	**94.63**	**99.99**	**100**	**5.7%**	**0.1%**	**16.02**	**40.41**	**55.76**	**248.1%**	**2.5%**	**9.296**	**25.81**	**39.27**	**322.4%**	**2.9%**
Oceania	**92.29**	**98.28**	**99.6**	**7.9%**	**0.2%**	**39.01**	**60.17**	**60.68**	**55.5%**	**0.9%**	**15.69**	**35.45**	**55.15**	**251.5%**	**2.5%**
Asia with Oceania	**77.71**	**91.46**	**98.88**	**27.2%**	**0.5%**	**13.13**	**37**	**55.02**	**319.0%**	**2.9%**	**7.176**	**24.33**	**39.51**	**450.6%**	**3.5%**
Europe-East	**100**	**100**	**100**	**0.0%**	**0.0%**	**21.68**	**54.86**	**68.69**	**216.8%**	**2.3%**	**12.31**	**34.9**	**44.91**	**264.8%**	**2.6%**
Europe-North	**99.97**	**100**	**100**	**0.0%**	**0.0%**	**46.31**	**74.86**	**76**	**64.1%**	**1.0%**	**28.29**	**53.42**	**81.9**	**189.5%**	**2.1%**
Europe-South	**99.94**	**100**	**100**	**0.1%**	**0.0%**	**34.04**	**61.97**	**73.14**	**114.9%**	**1.5%**	**20.31**	**39.69**	**52.43**	**158.1%**	**1.9%**
Europe-West	**99.93**	**100**	**100**	**0.1%**	**0.0%**	**44.16**	**75.96**	**76**	**72.1%**	**1.1%**	**26.85**	**48.8**	**74.55**	**177.7%**	**2.1%**
Europe	**99.97**	**100**	**100**	**0.0%**	**0.0%**	**33.47**	**65.18**	**72.83**	**117.6%**	**1.6%**	**19.94**	**42.51**	**60.89**	**205.4%**	**2.3%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	22.61	49.76	72.52	220.7%	2.4%	0.783	20.86	24	2965.1%	7.1%	0.751	2.131	6.268	734.6%	4.3%
Uganda	81.42	100	100	22.8%	0.4%	3.44	23.66	38.81	1028.2%	5.0%	1.489	7.486	26.14	1655.5%	5.9%
Tanzania, United Rep. of	76.61	99.38	100	30.5%	0.5%	3.53	23.06	39.12	1008.2%	4.9%	1.187	5.911	26.94	2169.6%	6.4%
Kenya	73.73	95.14	100	35.6%	0.6%	7.652	23.37	32.7	327.3%	2.9%	1.753	6.794	23.11	1218.3%	5.3%
Madagascar	35.15	60.44	80.36	128.6%	1.7%	3.007	21.38	24.49	714.4%	4.3%	1.024	3.086	8.052	686.3%	4.2%
Mozambique	55.4	87.86	100	80.5%	1.2%	1.907	23.93	48	2417.0%	6.7%	0.94	7.275	31.25	3224.5%	7.3%
Malawi	81.34	96.13	100	22.9%	0.4%	3.629	20.99	23.9	558.6%	3.8%	0.802	2.314	6.402	698.3%	4.2%
Zambia	76.66	97.06	100	30.4%	0.5%	6.136	22.73	29.57	381.9%	3.2%	1.498	5.764	18.43	1130.3%	5.1%
Burundi	93.06	100	100	7.5%	0.1%	1.536	20.56	24.32	1483.3%	5.7%	0.386	1.404	6.72	1640.9%	5.9%
Rwanda	86.35	100	100	15.8%	0.3%	2.636	21.55	25.86	881.0%	4.7%	0.887	3.332	10.3	1061.2%	5.0%
Somalia	31.95	52.69	63.07	97.4%	1.4%	0.254	20.04	20.5	7970.9%	9.2%	0.11	0.153	0.195	77.3%	1.2%
Zimbabwe	81.44	100	100	22.8%	0.4%	8.624	24.7	31.28	262.7%	2.6%	2.184	9.458	24.19	1007.6%	4.9%
Eritrea	61.27	75.89	79.82	30.3%	0.5%	2.904	20.6	21.27	632.4%	4.1%	0.786	1.57	1.887	140.1%	1.8%
Mauritius	100	100	100	0.0%	0.0%	20.32	45.63	70.84	248.6%	2.5%	11.33	31.02	43.22	281.5%	2.7%
Comoros	51.81	74.8	93.29	80.1%	1.2%	5.995	22.06	27.14	352.7%	3.1%	1.365	4.378	12.91	845.8%	4.6%
Djibouti	86.63	100	100	15.4%	0.3%	6.867	23.75	28.42	313.9%	2.9%	2.395	7.933	17.1	614.0%	4.0%
Africa-Eastern	**58.7**	**81.35**	**89.91**	**53.2%**	**0.9%**	**3.42**	**22.32**	**30.74**	**798.8%**	**4.5%**	**1.166**	**4.736**	**15.95**	**1267.9%**	**5.4%**
Congo; Dem. Rep. of	61.68	80.96	92.26	49.6%	0.8%	2.849	20.33	22.33	683.8%	4.2%	0.328	1.04	3.441	949.1%	4.8%
Angola	52.86	81.84	92.67	75.3%	1.1%	4.322	28.16	28.36	556.2%	3.8%	5.279	19.43	21.97	316.2%	2.9%
Cameroon	65.88	88.09	100	51.8%	0.8%	2.26	23.73	27.9	1134.5%	5.2%	2.514	8.374	16.45	554.3%	3.8%
Chad	35.8	63.43	76.28	113.1%	1.5%	1.787	22.62	23.23	1199.9%	5.3%	1.734	6.012	7.43	328.5%	3.0%
Central African Republic	31.57	58.82	78.3	148.0%	1.8%	6.711	21.26	23.89	256.0%	2.6%	0.816	2.813	6.897	745.2%	4.4%
Congo, Rep. of	51.25	79.09	91.26	78.1%	1.2%	11.25	26.58	27.61	145.4%	1.8%	4.106	15.06	19.16	366.6%	3.1%
Gabon	89.61	100	100	11.6%	0.2%	14.88	40.24	43	189.0%	2.1%	11.05	28.1	32.14	190.9%	2.2%
Equatorial Guinea	100	100	100	0.0%	0.0%	6.626	59.26	47.31	614.0%	4.0%	11.55	31.59	32.32	179.8%	2.1%
São Tomé and Príncipe	69.98	86.77	95.49	36.5%	0.6%	12.64	21.79	24.43	93.3%	1.3%	1.675	4.222	7.972	375.9%	3.2%
Africa-Middle	**57.77**	**79.84**	**91.29**	**58.0%**	**0.9%**	**3.492**	**22.59**	**24.13**	**591.0%**	**3.9%**	**1.815**	**5.807**	**8.295**	**357.0%**	**3.1%**
Egypt	100	100	100	0.0%	0.0%	13.31	31.98	53.78	304.1%	2.8%	6.128	24.77	36.29	492.2%	3.6%
Sudan	46.75	78.43	96.17	105.7%	1.5%	3.791	25.51	30.4	701.9%	4.3%	2.404	11.93	23.77	888.8%	4.7%
Algeria	53.77	81.99	97.5	81.3%	1.2%	10.6	31.51	35.69	236.7%	2.5%	8.094	26.13	30.86	281.3%	2.7%
Morocco	100	100	100	0.0%	0.0%	10.73	27.88	37.18	246.5%	2.5%	5.54	17.58	30.28	446.6%	3.5%
Tunisia	100	100	100	0.0%	0.0%	14.92	39	68.31	357.8%	3.1%	8.676	29.21	41.76	381.3%	3.2%
Libyan Arab Jamahiriya	82.89	100	100	20.6%	0.4%	6.715	47.41	52.12	676.2%	4.2%	11.15	31.39	36.85	230.5%	2.4%
Africa-Northern	**81.11**	**92.09**	**98.61**	**21.6%**	**0.4%**	**10.45**	**30.63**	**43.34**	**314.7%**	**2.9%**	**5.933**	**21.39**	**31.63**	**433.1%**	**3.4%**

Infrastructure

Base Case: Countries in Year 2060	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	100	100	100	0.0%	0.0%	16.13	40.75	67.48	318.4%	2.9%	11.28	29.79	42.22	274.3%	2.7%
Namibia	99.62	100	100	0.4%	0.0%	12.34	33.22	66.75	440.9%	3.4%	5.97	25.21	40.63	580.6%	3.9%
Lesotho	41.5	71.05	95.69	130.6%	1.7%	6.19	23.69	33.8	446.0%	3.5%	1.741	7.392	24.16	1287.7%	5.4%
Botswana	100	100	100	0.0%	0.0%	23.74	62.37	76	220.1%	2.4%	11.23	35.67	55.76	396.5%	3.3%
Swaziland	100	100	100	0.0%	0.0%	11.74	30.94	47.46	304.3%	2.8%	5.551	22.57	34.31	518.1%	3.7%
Africa-Southern	**97.99**	**98.89**	**99.83**	**1.9%**	**0.0%**	**15.8**	**40.26**	**65.85**	**316.8%**	**2.9%**	**10.62**	**28.74**	**41.68**	**292.5%**	**2.8%**
Nigeria	69.78	93.37	100	43.3%	0.7%	2.887	23.64	24.83	760.1%	4.4%	1.924	8.111	11.61	503.4%	3.7%
Niger	27.17	53.38	75.48	177.8%	2.1%	1.667	20.89	23.97	1337.9%	5.5%	0.728	2.164	6.494	792.0%	4.5%
Côte d'Ivoire	66.67	89.02	100	50.0%	0.8%	6.926	23.31	26.81	287.1%	2.7%	1.984	7.231	14.42	626.8%	4.0%
Ghana	70.8	88.14	97.43	37.6%	0.6%	2.864	21.88	24.16	743.6%	4.4%	1.5	3.967	8.094	439.6%	3.4%
Burkina Faso	38.27	66.7	89.07	132.7%	1.7%	3.127	22.4	29.18	833.2%	4.6%	1.345	5.288	15.94	1085.1%	5.1%
Mali	33.74	61.45	83.55	147.6%	1.8%	3.756	21.93	26.63	609.0%	4.0%	1.244	4.351	12.14	875.9%	4.7%
Senegal	96.21	100	100	3.9%	0.1%	8.397	22.86	27.54	228.0%	2.4%	2.061	6.293	14.72	614.2%	4.0%
Guinea	91.29	100	100	9.5%	0.2%	4.07	22.63	27.93	586.2%	3.9%	1.381	5.709	15.85	1047.7%	5.0%
Benin	54.95	77.55	93.46	70.1%	1.1%	4.539	22.14	26.69	488.0%	3.6%	1.523	4.805	11.98	686.6%	4.2%
Togo	96.04	100	100	4.1%	0.1%	10.81	20.85	21.86	102.2%	1.4%	0.907	1.993	2.921	222.1%	2.4%
Sierra Leone	81.59	100	100	22.6%	0.4%	2.006	21.91	27.67	1279.4%	5.4%	0.759	3.865	14.32	1786.7%	6.1%
Liberia	28.62	52.06	70.57	146.6%	1.8%	0.588	20.3	22	3641.5%	7.5%	0.383	0.894	2.703	605.7%	4.0%
Mauritania	58.07	79.14	92.11	58.6%	0.9%	5.407	22.53	25.6	373.5%	3.2%	2.165	5.853	11.21	417.8%	3.3%
Guinea-Bissau	76.34	90.72	93.95	23.1%	0.4%	4.615	20.49	21.89	374.3%	3.2%	0.556	1.446	2.694	384.5%	3.2%
Gambia	81.42	97.47	100	22.8%	0.4%	8.304	21.8	24.82	198.9%	2.2%	1.343	3.997	9.18	583.5%	3.9%
Cape Verde	96.72	100	100	3.4%	0.1%	11.72	28.99	53.7	358.2%	3.1%	3.568	17.95	36.12	912.3%	4.7%
Africa-Western	**65.65**	**86.5**	**95.62**	**45.7%**	**0.8%**	**3.714**	**22.85**	**25.48**	**586.1%**	**3.9%**	**1.664**	**6.332**	**11.45**	**588.1%**	**3.9%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	67.6	87.48	97.97	44.9%	0.7%	6.902	22.15	24.91	260.9%	2.6%	1.476	4.661	9.672	555.3%	3.8%
Dominican Republic	100	100	100	0.0%	0.0%	14.47	38.35	62.21	329.9%	3.0%	8.047	29.42	40.97	409.1%	3.3%
Cuba	82.92	100	100	20.6%	0.4%	10.78	34.15	70.64	555.3%	3.8%	7.046	26.64	40.72	477.9%	3.6%
Puerto Rico	100	100	100	0.0%	0.0%	28.65	75.6	76	165.3%	2.0%	14.43	40.99	70.89	391.3%	3.2%
Jamaica	100	100	100	0.0%	0.0%	15.61	31.67	41.36	165.0%	2.0%	10.65	27.27	32.77	207.7%	2.3%
Trinidad and Tobago	100	100	100	0.0%	0.0%	23.73	66.11	76	220.3%	2.4%	12.37	37.81	48.03	288.3%	2.8%
Bahamas	95.96	100	100	4.2%	0.1%	33.66	55.44	76	125.8%	1.6%	15.28	34.74	48.49	217.3%	2.3%
Barbados	100	100	100	0.0%	0.0%	19.24	49.3	76	295.0%	2.8%	21.91	39.24	56	155.6%	1.9%
St. Vincent & the Grenadines	100	100	100	0.0%	0.0%	15.28	34.19	55.58	263.7%	2.6%	11.63	29.47	38.18	228.3%	2.4%
Grenada	76.97	100	100	29.9%	0.5%	16.49	35.84	57	245.7%	2.5%	13.97	30.01	38.21	173.5%	2.0%
St. Lucia	99.23	100	100	0.8%	0.0%	20.49	39.67	61.09	198.1%	2.2%	11.08	28.91	38.8	250.2%	2.5%
America-Caribbean	**87.33**	**96.36**	**99.31**	**13.7%**	**0.3%**	**13.7**	**36.87**	**51.81**	**278.2%**	**2.7%**	**7.396**	**22.9**	**32.95**	**345.5%**	**3.0%**
Guatemala	87.69	100	100	14.0%	0.3%	11	29.73	40.98	272.5%	2.7%	6.402	21.16	31.93	398.8%	3.3%
Honduras	69.05	93.21	100	44.8%	0.7%	10.84	27.2	36.35	235.3%	2.4%	4.257	15.44	29.27	587.6%	3.9%
El Salvador	100	100	100	0.0%	0.0%	12.62	33.6	52.26	314.1%	2.9%	7.647	26.75	36.39	375.9%	3.2%
Nicaragua	81.72	100	100	22.4%	0.4%	10.57	25.66	32.41	206.6%	2.3%	3.555	12.14	25.65	621.5%	4.0%
Costa Rica	98.46	100	100	1.6%	0.0%	18.43	50.83	76	312.4%	2.9%	12.23	33.28	57.49	370.1%	3.1%
Panama	87.44	100	100	14.4%	0.3%	14.67	47.51	76	418.1%	3.3%	11.67	32.21	49.99	328.4%	3.0%
Belize	95.66	100	100	4.5%	0.1%	17.07	42.06	74.79	338.1%	3.0%	11.37	31.37	45.4	299.3%	2.8%
America-Central	**86.81**	**98.81**	**100**	**15.2%**	**0.3%**	**12.32**	**32.61**	**46.19**	**274.9%**	**2.7%**	**6.93**	**21.83**	**34.77**	**401.7%**	**3.3%**
United States of America	100	100	100	0.0%	0.0%	59.87	75.82	76	26.9%	0.5%	27.9	59.65	89.81	221.9%	2.4%
Mexico	100	100	100	0.0%	0.0%	17.62	43.49	61.77	250.6%	2.5%	12.96	31.27	40.09	209.3%	2.3%
Canada	98.72	100	100	1.3%	0.0%	53.73	75.9	76	41.4%	0.7%	31.17	56.78	81.81	162.5%	1.9%
America-North	**99.9**	**100**	**100**	**0.1%**	**0.0%**	**49.27**	**68.02**	**72.72**	**47.6%**	**0.8%**	**24.55**	**52.59**	**77.78**	**216.8%**	**2.3%**
Brazil	100	100	100	0.0%	0.0%	16.21	39.86	63.67	292.8%	2.8%	13.14	31.1	40.93	211.5%	2.3%
Colombia	93.85	100	100	6.6%	0.1%	14.04	33.85	56.23	300.5%	2.8%	8.405	27.76	37.65	347.9%	3.0%
Argentina	100	100	100	0.0%	0.0%	20.9	51.98	76	263.6%	2.6%	13.62	34.7	51.63	279.1%	2.7%
Venezuela, RB	100	100	100	0.0%	0.0%	20.68	42.39	52.65	154.6%	1.9%	12.44	31.06	37.52	201.6%	2.2%
Peru	100	100	100	0.0%	0.0%	15.28	36.49	50.78	232.3%	2.4%	9.907	29.42	36.74	270.8%	2.7%
Chile	100	100	100	0.0%	0.0%	27.17	61.12	76	179.7%	2.1%	15.5	38.64	61.57	297.2%	2.8%
Ecuador	91.63	100	100	9.1%	0.2%	13.64	30.91	33.8	147.8%	1.8%	8.582	25.43	29.63	245.3%	2.5%
Bolivia	58.25	89	100	71.7%	1.1%	12.16	31.44	44.67	267.4%	2.6%	4.989	23.87	33.52	571.9%	3.9%
Paraguay	85.5	100	100	17.0%	0.3%	10.75	27	35.17	227.2%	2.4%	4.914	15.19	28.45	479.0%	3.6%
Uruguay	100	100	100	0.0%	0.0%	19.79	46.54	76	284.0%	2.7%	12.98	32.54	49.37	280.4%	2.7%
Guyana	100	100	100	0.0%	0.0%	15.52	28.85	43.48	180.2%	2.1%	4.577	18.18	32.58	611.8%	4.0%
Suriname	95.62	100	100	4.6%	0.1%	13.3	37.56	53.2	300.0%	2.8%	10.01	28.82	36.9	268.6%	2.6%
America-South	**97.66**	**99.68**	**100**	**2.4%**	**0.0%**	**16.89**	**40.37**	**60.41**	**257.7%**	**2.6%**	**11.89**	**30.51**	**40.99**	**244.7%**	**2.5%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	100	100	100	0.0%	0.0%	13.2	44.88	76	475.8%	3.6%	8.919	32.73	54.32	509.0%	3.7%
Japan	100	100	100	0.0%	0.0%	46.65	76	76	62.9%	1.0%	28.77	51.86	76.59	166.2%	2.0%
Korea, Rep. of	82.98	100	100	20.5%	0.4%	38.26	76	76	98.6%	1.4%	36.47	62.33	85.8	135.3%	1.7%
Taiwan	100	100	100	0.0%	0.0%	32.03	66.82	76	137.3%	1.7%	20.15	42.48	68.73	241.1%	2.5%
Korea, Dem. Rep. of	13.06	48.46	71.86	450.2%	3.5%	11.37	25.81	28.91	154.3%	1.9%	3.797	13.42	20	426.7%	3.4%
Hong Kong	100	100	100	0.0%	0.0%	57.46	75.91	76	32.3%	0.6%	36.22	59.77	68.71	89.7%	1.3%
Mongolia	41.65	72.26	96.3	131.2%	1.7%	11.02	26.65	38.84	252.5%	2.6%	3.547	13.84	29.71	737.6%	4.3%
Asia-East	**98.11**	**99.23**	**99.62**	**1.5%**	**0.0%**	**17.16**	**48.09**	**75.3**	**338.8%**	**3.0%**	**11.61**	**34.86**	**56.08**	**383.0%**	**3.2%**
India	43.41	79.64	100	130.4%	1.7%	9.621	30.35	52.41	444.7%	3.4%	3.269	20.16	36.18	1006.8%	4.9%
Pakistan	48.24	75.53	93.2	93.2%	1.3%	6.779	24.68	29.89	340.9%	3.0%	2.908	10.23	20.7	611.8%	4.0%
Bangladesh	91.77	100	100	9.0%	0.2%	2.699	24.03	30.21	1019.3%	4.9%	1.469	7.906	21.26	1347.2%	5.5%
Afghanistan	83.01	95.1	96.54	16.3%	0.3%	7.06	20.76	22.03	212.0%	2.3%	0.872	2.063	3.269	274.9%	2.7%
Iran, Islamic Rep. of	86.96	100	100	15.0%	0.3%	20.11	46.4	53.18	164.4%	2.0%	11.09	31.6	38.03	242.9%	2.5%
Nepal	22.54	53.64	77.36	243.2%	2.5%	4.15	22.25	25.91	524.3%	3.7%	1.216	4.61	11.52	847.4%	4.6%
Uzbekistan	86.88	100	100	15.1%	0.3%	9.192	25.06	28.85	213.9%	2.3%	2.745	11.21	19.14	597.3%	4.0%
Sri Lanka	96.85	100	100	3.3%	0.1%	9.606	31.19	48.23	402.1%	3.3%	4.784	22.71	34.91	629.7%	4.1%
Kazakhstan	93.61	100	100	6.8%	0.1%	10.58	59.56	62.59	491.6%	3.6%	11.37	36.43	43.2	279.9%	2.7%
Tajikistan	13.05	47.72	75.41	477.9%	3.6%	0.461	23.53	29.02	6195.0%	8.6%	1.976	7.534	18.51	836.7%	4.6%
Turkmenistan	26.43	68.32	88.62	235.3%	2.4%	1.575	35.88	33.58	2032.1%	6.3%	3.858	25.35	31.57	718.3%	4.3%
Kyrgyzstan	36.65	63.96	82.5	125.1%	1.6%	9.434	23.36	26.22	177.9%	2.1%	2.22	6.916	13.03	486.9%	3.6%
Bhutan	18.75	58.73	91.65	388.8%	3.2%	8.817	32.8	56.57	541.6%	3.8%	5.068	24.82	37.74	644.7%	4.1%
Maldives	100	100	100	0.0%	0.0%	13.15	39.28	76	477.9%	3.6%	6.777	28.77	53.59	690.8%	4.2%
Asia-South Central	**52.17**	**82.29**	**98.23**	**88.3%**	**1.3%**	**8.948**	**29.38**	**44.67**	**399.2%**	**3.3%**	**3.393**	**17.32**	**30.15**	**788.6%**	**4.5%**
Indonesia	100	100	100	0.0%	0.0%	11.34	28.22	36.46	221.5%	2.4%	4.292	17.97	30.01	599.2%	4.0%
Philippines	100	100	100	0.0%	0.0%	12.16	28.07	39	220.7%	2.4%	4.014	16.93	31	672.3%	4.2%
Vietnam	82.18	100	100	21.7%	0.4%	10.17	29.46	44.57	338.2%	3.0%	3.26	18.77	33.94	941.1%	4.8%
Thailand	100	100	100	0.0%	0.0%	16.35	38.33	57.04	248.9%	2.5%	9.501	29.17	38.18	301.9%	2.8%
Myanmar	23.41	58.81	82.23	251.3%	2.5%	0.252	23.22	27.36	10757.1%	9.8%	1.268	6.322	15.09	1090.1%	5.1%
Malaysia	100	100	100	0.0%	0.0%	28.49	52.53	76	166.8%	2.0%	13.14	34.45	47.27	259.7%	2.6%
Cambodia	87.05	100	100	14.9%	0.3%	2.119	26.87	38.04	1695.2%	5.9%	2.043	13.33	30.75	1405.1%	5.6%
Lao PDR	67.15	97.91	100	48.9%	0.8%	9.492	28.79	53.92	468.1%	3.5%	2.431	16.42	36.65	1407.6%	5.6%
Singapore	100	100	100	0.0%	0.0%	54.62	75.99	76	39.1%	0.7%	27.36	55.49	67.65	147.3%	1.8%
Timor-Leste	61.7	85.86	100	62.1%	1.0%	9.292	24.38	34.31	269.2%	2.6%	2.662	9.815	24.7	827.9%	4.6%
Brunei Darussalam	100	100	100	0.0%	0.0%	64.89	75.55	76	17.1%	0.3%	13.64	41.73	55.02	303.4%	2.8%
Asia-South East	**89.69**	**96.69**	**98.73**	**10.1%**	**0.2%**	**11.79**	**30.64**	**42.34**	**259.1%**	**2.6%**	**4.936**	**19.1**	**31.87**	**545.7%**	**3.8%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Mobile Phone Usage					Internet Usage					Broadband Usage				
	Percent of Population					Percent of Population					Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	100	100	100	0.0%	0.0%	16.09	43.82	76	372.3%	3.2%	12.52	32.28	48.44	286.9%	2.7%
Yemen	79.44	100	100	25.9%	0.5%	9.709	25.54	31.94	229.0%	2.4%	2.647	11.61	24.99	844.1%	4.6%
Iraq	79.72	100	100	25.4%	0.5%	10.13	27.79	39.84	293.3%	2.8%	3.057	15.06	31.13	918.3%	4.8%
Saudi Arabia	96.35	100	100	3.8%	0.1%	21.7	58.19	71.11	227.7%	2.4%	11.4	32.73	41.69	265.7%	2.6%
Syria	100	100	100	0.0%	0.0%	12.29	28.03	38.66	214.6%	2.3%	5.032	17.66	30.55	507.1%	3.7%
Israel	100	100	100	0.0%	0.0%	35.03	75.6	76	117.0%	1.6%	28.92	56.93	92.3	219.2%	2.3%
Azerbaijan	100	100	100	0.0%	0.0%	5.783	35.87	41.69	620.9%	4.0%	7.219	29.09	33.77	367.8%	3.1%
Jordan	100	100	100	0.0%	0.0%	13.37	35.36	76	468.4%	3.5%	6.227	26.38	45.84	636.1%	4.1%
Palestine	100	100	100	0.0%	0.0%	11.57	28.3	42.07	263.6%	2.6%	4.616	17.76	31.97	592.6%	3.9%
United Arab Emirates	100	100	100	0.0%	0.0%	43.74	75.69	76	73.8%	1.1%	14.43	37.44	54.19	275.5%	2.7%
Oman	92.52	99.43	100	8.1%	0.2%	22.81	55.27	66.87	193.2%	2.2%	11.45	31.96	39.42	244.3%	2.5%
Kuwait	100	100	100	0.0%	0.0%	36.62	75.48	76	107.5%	1.5%	12.41	46.45	54.3	337.6%	3.0%
Lebanon	100	100	100	0.0%	0.0%	19.73	41.99	63.63	222.5%	2.4%	14.18	32.26	41.97	196.0%	2.2%
Georgia	100	100	100	0.0%	0.0%	10.04	29.38	37.2	270.5%	2.7%	5.016	19.92	30.9	516.0%	3.7%
Armenia	97.34	100	100	2.7%	0.1%	11.13	39.65	58.5	425.6%	3.4%	6.037	28.93	40.56	571.9%	3.9%
Bahrain	100	100	100	0.0%	0.0%	32.88	73.35	76	131.1%	1.7%	14.38	36.99	47.72	231.8%	2.4%
Qatar	100	100	100	0.0%	0.0%	37.69	75.84	76	101.6%	1.4%	15.92	77.35	82.13	415.9%	3.3%
Cyprus	100	100	100	0.0%	0.0%	35.96	70.92	76	111.3%	1.5%	15.59	38.95	55.98	259.1%	2.6%
Asia-West	**94.63**	**99.99**	**100**	**5.7%**	**0.1%**	**16.02**	**40.41**	**55.76**	**248.1%**	**2.5%**	**9.296**	**25.81**	**39.27**	**322.4%**	**2.9%**
Australia	99.52	100	100	0.5%	0.0%	49.43	75.81	76	53.8%	0.9%	20.15	46.77	74.06	267.5%	2.6%
Papua New Guniea	73.49	96.75	100	36.1%	0.6%	9.354	24.77	28.1	200.4%	2.2%	2.143	9.52	18.04	741.8%	4.4%
New Zealand	99.15	100	100	0.9%	0.0%	46.05	70.54	76	65.0%	1.0%	19.19	41.26	66.28	245.4%	2.5%
Solomon Islands	47.29	72.84	87.82	85.7%	1.2%	4.016	23.15	26.02	547.9%	3.8%	2.31	7.225	12.65	447.6%	3.5%
Fiji	72.02	95.79	100	38.9%	0.7%	12.65	29.18	45.39	258.8%	2.6%	6.315	19.85	33.21	425.9%	3.4%
Vanuatu	32.65	63.48	87.65	168.5%	2.0%	12.22	26.76	35.86	193.5%	2.2%	4.489	14.88	28.45	533.8%	3.8%
Micronesia	91	100	100	9.9%	0.2%	14.4	29.47	43.19	199.9%	2.2%	6.805	21.29	31.9	368.8%	3.1%
Tonga	81.57	100	100	22.6%	0.4%	11.39	28.34	40.17	252.7%	2.6%	6.88	18.7	30.98	350.3%	3.1%
Samoa	72.01	96.83	100	38.9%	0.7%	10.79	30.8	48.95	353.7%	3.1%	6.279	23.1	34.46	448.8%	3.5%
Oceania	**92.29**	**98.28**	**99.6**	**7.9%**	**0.2%**	**39.01**	**60.17**	**60.68**	**55.5%**	**0.9%**	**15.69**	**35.45**	**55.15**	**251.5%**	**2.5%**

Infrastructure

Base Case: Countries in Year 2060 Descending Population Sequence	Mobile Phone Usage Percent of Population					Internet Usage Percent of Population					Broadband Usage Percent of Population				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	100	100	100	0.0%	0.0%	25.15	61.91	70.03	178.4%	2.1%	12.43	37.27	45.31	264.5%	2.6%
Ukraine	100	100	100	0.0%	0.0%	12.23	39.82	62.95	414.7%	3.3%	7.78	29.37	40.85	425.1%	3.4%
Poland	100	100	100	0.0%	0.0%	22.02	58.01	76	245.1%	2.5%	13.77	35.85	51.57	274.5%	2.7%
Romania	100	100	100	0.0%	0.0%	17.94	43.1	58.29	224.9%	2.4%	14.58	32.8	40.48	177.6%	2.1%
Czech Republic	100	100	100	0.0%	0.0%	28.82	57.75	76	163.7%	2.0%	18.18	37.39	46.69	156.8%	1.9%
Belarus	100	100	100	0.0%	0.0%	16.13	45.68	65.97	309.0%	2.9%	11.24	31.26	42.3	276.3%	2.7%
Hungary	100	100	100	0.0%	0.0%	25.19	56.29	76	201.7%	2.2%	17.63	37.56	49.18	179.0%	2.1%
Bulgaria	100	100	100	0.0%	0.0%	19.32	43.09	67.3	248.3%	2.5%	13.25	31.6	42.47	220.5%	2.4%
Slovakia	100	100	100	0.0%	0.0%	25.99	50.39	66.76	156.9%	1.9%	14.66	33.6	42.29	188.5%	2.1%
Moldova, Rep. of	100	100	100	0.0%	0.0%	8.946	25.71	36.96	313.1%	2.9%	3.174	11.34	28.6	801.1%	4.5%
Europe-East	**100**	**100**	**100**	**0.0%**	**0.0%**	**21.68**	**54.86**	**68.69**	**216.8%**	**2.3%**	**12.31**	**34.9**	**44.91**	**264.8%**	**2.6%**
United Kingdom	100	100	100	0.0%	0.0%	45.2	76	76	68.1%	1.0%	27.74	51.9	81.37	193.3%	2.2%
Sweden	100	100	100	0.0%	0.0%	55.63	76	76	36.6%	0.6%	32.77	60.71	93.81	186.3%	2.1%
Denmark	100	100	100	0.0%	0.0%	52.44	76	76	44.9%	0.7%	36.15	59.66	88.21	144.0%	1.8%
Ireland	100	100	100	0.0%	0.0%	45.88	75.84	76	65.6%	1.0%	20.21	54.72	77.76	284.8%	2.7%
Norway	99.42	100	100	0.6%	0.0%	59.73	75.94	76	27.2%	0.5%	33.22	63.45	90.56	172.6%	2.0%
Finland	100	100	100	0.0%	0.0%	51.04	76	76	48.9%	0.8%	33.95	57.59	84.37	148.5%	1.8%
Lithuania	100	100	100	0.0%	0.0%	22.99	53.77	76	230.6%	2.4%	18.11	37.92	49.86	175.3%	2.0%
Latvia	100	100	100	0.0%	0.0%	22.76	59.4	76	233.9%	2.4%	14.04	36.6	55	291.7%	2.8%
Estonia	100	100	100	0.0%	0.0%	37.37	64.77	76	103.4%	1.4%	24.74	46.2	62.13	151.1%	1.9%
Iceland	100	100	100	0.0%	0.0%	63.49	75.96	76	19.7%	0.4%	37.79	64.86	95.76	153.4%	1.9%
Europe-North	**99.97**	**100**	**100**	**0.0%**	**0.0%**	**46.31**	**74.86**	**76**	**64.1%**	**1.0%**	**28.29**	**53.42**	**81.9**	**189.5%**	**2.1%**
Italy	100	100	100	0.0%	0.0%	39.96	63.67	76	90.2%	1.3%	22.69	41.23	53.71	136.7%	1.7%
Spain	99.94	100	100	0.1%	0.0%	34.31	70.5	76	121.5%	1.6%	22.8	43.72	58.28	155.6%	1.9%
Greece	100	100	100	0.0%	0.0%	33.73	71.29	76	125.3%	1.6%	12.95	35.52	49.04	278.7%	2.7%
Portugal	99.43	100	100	0.6%	0.0%	36.31	54.46	76	109.3%	1.5%	22.19	39.61	51.95	134.1%	1.7%
Serbia	100	100	100	0.0%	0.0%	20.09	39.2	59.3	195.2%	2.2%	14.48	31.47	40.32	178.5%	2.1%
Croatia	100	100	100	0.0%	0.0%	22.52	47.96	76	237.5%	2.5%	13.78	32.71	45.2	228.0%	2.4%
Bosnia and Herzegovina	100	100	100	0.0%	0.0%	12.75	31.1	42.56	233.8%	2.4%	8.021	24.11	32.48	304.9%	2.8%
Albania	100	100	100	0.0%	0.0%	4.013	37.33	56.31	1303.2%	5.4%	7.385	28.36	38.49	421.2%	3.4%
Macedonia, TFYR	100	100	100	0.0%	0.0%	17.77	31.04	40.36	127.1%	1.7%	9.874	25.01	31.59	219.9%	2.4%
Slovenia	100	100	100	0.0%	0.0%	33.75	67.48	76	125.2%	1.6%	21.15	42.52	62.03	193.3%	2.2%
Montenegro	100	100	100	0.0%	0.0%	17.99	37.2	62.71	248.6%	2.5%	12.46	30.37	40.91	228.3%	2.4%
Malta	100	100	100	0.0%	0.0%	30.82	62.18	76	146.6%	1.8%	22.21	42	58.65	164.1%	2.0%
Europe-South	**99.94**	**100**	**100**	**0.1%**	**0.0%**	**34.04**	**61.97**	**73.14**	**114.9%**	**1.5%**	**20.31**	**39.69**	**52.43**	**158.1%**	**1.9%**
Germany	99.88	100	100	0.1%	0.0%	46.28	76	76	64.2%	1.0%	24.14	46.91	75.07	211.0%	2.3%
France	100	100	100	0.0%	0.0%	37.49	75.91	76	102.7%	1.4%	26.68	47.61	74.01	177.4%	2.1%
Netherlands	100	100	100	0.0%	0.0%	54.97	76	76	38.3%	0.6%	36.23	56.76	74.02	104.3%	1.4%
Belgium	99.99	100	100	0.0%	0.0%	43.69	75.89	76	74.0%	1.1%	30.3	50.01	70.94	134.1%	1.7%
Austria	99.64	100	100	0.4%	0.0%	49.76	76	76	52.7%	0.9%	25.56	49.42	73.66	188.2%	2.1%
Switzerland	100	100	100	0.0%	0.0%	45.92	76	76	65.5%	1.0%	33.67	57.36	82.14	144.0%	1.8%
Luxembourg	100	100	100	0.0%	0.0%	49.76	75.64	76	52.7%	0.9%	28.31	57.96	76.82	171.4%	2.0%
Europe-West	**99.93**	**100**	**100**	**0.1%**	**0.0%**	**44.16**	**75.96**	**76**	**72.1%**	**1.1%**	**26.85**	**48.8**	**74.55**	**177.7%**	**2.1%**

Infrastructure

Governance

Base Case

Source: International Futures Version 6.12, March 2009

	R&D Expenditures					Freedom House Index (Inverted)					Polity Democracy Index				
	Percent of GDP					Index Range: 2-14					Index Range: 1-20				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**2.18**	**2.512**	**3.11**	**42.7%**	**0.7%**	**8.401**	**9.467**	**10.12**	**20.5%**	**0.4%**	**12.95**	**13.81**	**14.94**	**15.4%**	**0.3%**
Africa	**0.424**	**0.742**	**1.542**	**263.7%**	**2.6%**	**7.209**	**8.443**	**9.74**	**35.1%**	**0.6%**	**10.94**	**11.81**	**13.1**	**19.7%**	**0.4%**
Americas	**2.477**	**2.57**	**2.786**	**12.5%**	**0.2%**	**11.95**	**12.65**	**13.28**	**11.1%**	**0.2%**	**18.42**	**18.94**	**19.43**	**5.5%**	**0.1%**
Asia with Oceania	**2.097**	**2.472**	**3.421**	**63.1%**	**1.0%**	**7.319**	**8.721**	**9.296**	**27.0%**	**0.5%**	**11.18**	**12.57**	**14.21**	**27.1%**	**0.5%**
Europe	**1.985**	**2.775**	**3.027**	**52.5%**	**0.8%**	**11.59**	**12.04**	**12.3**	**6.1%**	**0.1%**	**18.74**	**19.17**	**19.41**	**3.6%**	**0.1%**
World	**2.18**	**2.512**	**3.11**	**42.7%**	**0.7%**	**8.401**	**9.467**	**10.12**	**20.5%**	**0.4%**	**12.95**	**13.81**	**14.94**	**15.4%**	**0.3%**
Africa-Eastern	**0.235**	**0.452**	**1.274**	**442.1%**	**3.4%**	**7.595**	**9.313**	**11.42**	**50.4%**	**0.8%**	**11.78**	**12.37**	**13.78**	**17.0%**	**0.3%**
Africa-Middle	**0.339**	**0.434**	**0.37**	**9.1%**	**0.2%**	**4.556**	**5.392**	**6.779**	**48.8%**	**0.8%**	**6.715**	**7.702**	**9.364**	**39.4%**	**0.7%**
Africa-Northern	**0.387**	**0.742**	**1.685**	**335.4%**	**3.0%**	**4.734**	**5.251**	**5.851**	**23.6%**	**0.4%**	**5.834**	**7.823**	**10.38**	**77.9%**	**1.2%**
Africa-Southern	**0.796**	**1.417**	**2.808**	**252.8%**	**2.6%**	**12.85**	**13.7**	**13.76**	**7.1%**	**0.1%**	**18.51**	**19.27**	**19.54**	**5.6%**	**0.1%**
Africa-Western	**0.106**	**0.201**	**0.384**	**262.3%**	**2.6%**	**8.555**	**9.945**	**10.9**	**27.4%**	**0.5%**	**13.91**	**14.28**	**15.02**	**8.0%**	**0.2%**
Africa	**0.424**	**0.742**	**1.542**	**263.7%**	**2.6%**	**7.209**	**8.443**	**9.74**	**35.1%**	**0.6%**	**10.94**	**11.81**	**13.1**	**19.7%**	**0.4%**
America-Caribbean	**0.987**	**1.954**	**2.767**	**180.3%**	**2.1%**	**6.24**	**6.987**	**7.452**	**19.4%**	**0.4%**	**11.46**	**12.74**	**14.3**	**24.8%**	**0.4%**
America-Central	**0.278**	**0.955**	**2.017**	**625.5%**	**4.0%**	**10.36**	**11.17**	**12.25**	**18.2%**	**0.3%**	**17.93**	**18.43**	**19.09**	**6.5%**	**0.1%**
America-North	**2.734**	**2.808**	**2.872**	**5.0%**	**0.1%**	**13.56**	**13.82**	**14**	**3.2%**	**0.1%**	**19.53**	**19.7**	**19.92**	**2.0%**	**0.0%**
America-South	**0.708**	**1.383**	**2.55**	**260.2%**	**2.6%**	**10.86**	**12.1**	**13.2**	**21.5%**	**0.4%**	**17.89**	**18.77**	**19.45**	**8.7%**	**0.2%**
Americas	**2.477**	**2.57**	**2.786**	**12.5%**	**0.2%**	**11.95**	**12.65**	**13.28**	**11.1%**	**0.2%**	**18.42**	**18.94**	**19.43**	**5.5%**	**0.1%**
Asia-East	**2.543**	**2.998**	**4.107**	**61.5%**	**1.0%**	**4.429**	**5.085**	**5.491**	**24.0%**	**0.4%**	**5.601**	**7.798**	**10.4**	**85.7%**	**1.2%**
Asia-South Central	**0.736**	**1.208**	**2.264**	**207.6%**	**2.3%**	**9.739**	**11.51**	**11.68**	**19.9%**	**0.4%**	**15.47**	**15.71**	**16.43**	**6.2%**	**0.1%**
Asia-South East	**0.587**	**0.903**	**1.576**	**168.5%**	**2.0%**	**7.991**	**9.305**	**10.44**	**30.6%**	**0.5%**	**13.91**	**14.94**	**16.19**	**16.4%**	**0.3%**
Asia-West	**1.602**	**2.212**	**3.07**	**91.6%**	**1.3%**	**6.621**	**7.255**	**8.007**	**20.9%**	**0.4%**	**9.418**	**10.43**	**12.31**	**30.7%**	**0.5%**
Oceania	**1.785**	**2.476**	**2.549**	**42.8%**	**0.7%**	**13.03**	**13.4**	**13.8**	**5.9%**	**0.1%**	**19.69**	**19.61**	**19.67**	**-0.1%**	**0.0%**
Asia with Oceania	**2.097**	**2.472**	**3.421**	**63.1%**	**1.0%**	**7.319**	**8.721**	**9.296**	**27.0%**	**0.5%**	**11.18**	**12.57**	**14.21**	**27.1%**	**0.5%**
Europe-East	**1.071**	**2.263**	**2.934**	**173.9%**	**2.0%**	**8.372**	**9.089**	**9.492**	**13.4%**	**0.3%**	**17.34**	**18.16**	**18.73**	**8.0%**	**0.2%**
Europe-North	**2.355**	**3.027**	**3.071**	**30.4%**	**0.5%**	**13.93**	**13.99**	**14**	**0.5%**	**0.0%**	**19.91**	**19.95**	**19.96**	**0.3%**	**0.0%**
Europe-South	**1.106**	**1.842**	**2.463**	**122.7%**	**1.6%**	**13.45**	**13.66**	**13.85**	**3.0%**	**0.1%**	**19.45**	**19.61**	**19.74**	**1.5%**	**0.0%**
Europe-West	**2.375**	**3.241**	**3.244**	**36.6%**	**0.6%**	**14**	**14**	**14**	**0.0%**	**0.0%**	**19.73**	**19.85**	**19.77**	**0.2%**	**0.0%**
Europe	**1.985**	**2.775**	**3.027**	**52.5%**	**0.8%**	**11.59**	**12.04**	**12.3**	**6.1%**	**0.1%**	**18.74**	**19.17**	**19.41**	**3.6%**	**0.1%**

Infrastructure

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	R&D Expenditures Percent of GDP					Freedom House Index (Inverted) Index Range: 2-14					Polity Democracy Index Index Range: 1-20				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	0.064	0.083	0.245	282.8%	2.7%	6.201	7.049	9.731	56.9%	0.9%	10.94	11.34	12.78	16.8%	0.3%
Uganda	0.804	0.902	1.69	110.2%	1.5%	7.123	9.053	11.95	67.8%	1.0%	6.254	7.939	10.79	72.5%	1.1%
Tanzania, United Rep. of	0.09	0.212	1.1	1122.2%	5.1%	9.274	12.09	14	51.0%	0.8%	12.13	13.15	15.13	24.7%	0.4%
Kenya	0.123	0.227	0.738	500.0%	3.6%	10.22	12.23	14	37.0%	0.6%	17.96	18.24	19.09	6.3%	0.1%
Madagascar	0.121	0.15	0.309	155.4%	1.9%	10.14	11.6	14	38.1%	0.6%	16.81	16.61	16.86	0.3%	0.0%
Mozambique	0.589	0.741	2.046	247.4%	2.5%	9.56	13.84	14	46.4%	0.8%	15.87	16.33	18.1	14.1%	0.3%
Malawi	0.067	0.091	0.24	258.2%	2.6%	8.164	9.464	12.22	49.7%	0.8%	16	16.16	16.37	2.3%	0.0%
Zambia	0.018	0.108	0.482	2577.8%	6.8%	8.177	9.604	12.01	46.9%	0.8%	14.96	15.15	16.26	8.7%	0.2%
Burundi	0.307	0.316	0.493	60.6%	1.0%	6.191	8.066	12.12	95.8%	1.4%	8.984	9.533	11.41	27.0%	0.5%
Rwanda	0.044	0.097	0.326	640.9%	4.1%	5.101	6.234	8.09	58.6%	0.9%	7.102	8.159	10.16	43.1%	0.7%
Somalia	0.028	0.034	0.047	67.9%	1.0%	3.089	4.266	5.749	86.1%	1.3%	3.107	3.754	4.933	58.8%	0.9%
Zimbabwe	0.143	0.299	0.657	359.4%	3.1%	3.044	3.673	4.283	40.7%	0.7%	3.411	5.555	8.349	144.8%	1.8%
Eritrea	0.066	0.067	0.091	37.9%	0.6%	2.982	3.071	3.545	18.9%	0.3%	3.242	4.397	6.061	87.0%	1.3%
Mauritius	0.412	1.16	2.581	526.5%	3.7%	14	14	14	0.0%	0.0%	19.97	20	20	0.2%	0.0%
Comoros	0.101	0.15	0.423	318.8%	2.9%	8.078	9.151	11.74	45.3%	0.8%	15.78	15.51	16.44	4.2%	0.1%
Djibouti	0.159	0.238	0.495	211.3%	2.3%	6.088	6.786	8.055	32.3%	0.6%	11.97	12.48	14.01	17.0%	0.3%
Africa-Eastern	**0.235**	**0.452**	**1.274**	**442.1%**	**3.4%**	**7.595**	**9.313**	**11.42**	**50.4%**	**0.8%**	**11.78**	**12.37**	**13.78**	**17.0%**	**0.3%**
Congo; Dem. Rep. of	0.04	0.059	0.15	275.0%	2.7%	4.187	5.279	7.283	73.9%	1.1%	6.082	6.883	8.639	42.0%	0.7%
Angola	0.333	0.505	0.492	47.7%	0.8%	5.165	5.661	5.79	12.1%	0.2%	8.227	9.663	11.37	38.2%	0.6%
Cameroon	0.168	0.245	0.465	176.8%	2.1%	4.061	4.512	5.218	28.5%	0.5%	6.252	7.661	9.739	55.8%	0.9%
Chad	0.123	0.186	0.2	62.6%	1.0%	4.996	5.651	5.874	17.6%	0.3%	8.102	9.05	10.18	25.6%	0.5%
Central African Republic	0.25	0.276	0.398	59.2%	0.9%	5.094	6.009	7.511	47.4%	0.8%	9.002	9.517	10.84	20.4%	0.4%
Congo, Rep. of	0.025	0.19	0.246	884.0%	4.7%	7.063	7.813	8.143	15.3%	0.3%	6.283	7.865	9.786	55.8%	0.9%
Gabon	0.003	0.279	0.477	15800.0%	10.7%	6.972	7.265	7.571	8.6%	0.2%	6.424	8.531	11.1	72.8%	1.1%
Equatorial Guinea	2.128	2.252	1.561	-26.6%	-0.6%	3.011	3.063	2.976	-1.2%	0.0%	5.536	8.036	10.55	90.6%	1.3%
São Tomé and Príncipe	0.119	0.134	0.269	126.1%	1.6%	12.05	12.63	14	16.2%	0.3%	10.17	10.62	11.78	15.8%	0.3%
Africa-Middle	**0.339**	**0.434**	**0.37**	**9.1%**	**0.2%**	**4.556**	**5.392**	**6.779**	**48.8%**	**0.8%**	**6.715**	**7.702**	**9.364**	**39.4%**	**0.7%**
Egypt	0.228	0.584	1.804	691.2%	4.2%	5.126	5.94	6.961	35.8%	0.6%	4.479	6.977	10.21	128.0%	1.7%
Sudan	0.358	0.531	0.776	116.8%	1.6%	2.088	2.532	2.885	38.2%	0.6%	4.304	6.156	8.666	101.3%	1.4%
Algeria	0.459	0.679	0.906	97.4%	1.4%	5.051	5.543	5.913	17.1%	0.3%	12.24	13.56	14.97	22.3%	0.4%
Morocco	0.632	0.794	1.29	104.1%	1.4%	7.123	7.935	9.114	28.0%	0.5%	4.385	6.387	9.131	108.2%	1.5%
Tunisia	0.685	1.274	2.895	322.6%	2.9%	5.136	5.967	6.879	33.9%	0.6%	6.435	8.756	11.63	80.7%	1.2%
Libyan Arab Jamahiriya	0.308	1.084	1.351	338.6%	3.0%	2.041	2.287	2.369	16.1%	0.3%	3.581	6.44	9.484	164.8%	2.0%
Africa-Northern	**0.387**	**0.742**	**1.685**	**335.4%**	**3.0%**	**4.734**	**5.251**	**5.851**	**23.6%**	**0.4%**	**5.834**	**7.823**	**10.38**	**77.9%**	**1.2%**

Infrastructure

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	R&D Expenditures Percent of GDP					Freedom House Index (Inverted) Index Range: 2-14					Polity Democracy Index Index Range: 1-20				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	0.809	1.357	2.833	250.2%	2.5%	13.23	14	14	5.8%	0.1%	19.05	19.88	20	5.0%	0.1%
Namibia	0.375	0.798	2.665	610.7%	4.0%	11.21	13.04	14	24.9%	0.4%	15.99	16.81	18.48	15.6%	0.3%
Lesotho	0.022	0.147	0.713	3140.9%	7.2%	11.32	13.71	14	23.7%	0.4%	17.88	18.15	19.07	6.7%	0.1%
Botswana	0.95	2.482	3.192	236.0%	2.5%	12.22	14	14	14.6%	0.3%	19.04	20	19.59	2.9%	0.1%
Swaziland	0.342	0.662	1.573	359.9%	3.1%	4.03	4.643	5.415	34.4%	0.6%	1.532	4.248	7.917	416.8%	3.3%
Africa-Southern	**0.796**	**1.417**	**2.808**	**252.8%**	**2.6%**	**12.85**	**13.7**	**13.76**	**7.1%**	**0.1%**	**18.51**	**19.27**	**19.54**	**5.6%**	**0.1%**
Nigeria	0.098	0.209	0.261	166.3%	2.0%	8.166	9.68	10.3	26.1%	0.5%	14.04	14.68	15.21	8.3%	0.2%
Niger	0.063	0.088	0.243	285.7%	2.7%	10.11	11.77	14	38.5%	0.7%	13.83	13.66	14.53	5.1%	0.1%
Côte d'Ivoire	0.137	0.223	0.404	194.9%	2.2%	4.039	4.636	5.406	33.8%	0.6%	13.9	14.29	15.55	11.9%	0.2%
Ghana	0.108	0.138	0.255	136.1%	1.7%	12.28	13.46	14	14.0%	0.3%	17.83	17.6	17.87	0.2%	0.0%
Burkina Faso	0.174	0.245	0.604	247.1%	2.5%	7.121	8.463	10.95	53.8%	0.9%	10.01	10.69	12.61	26.0%	0.5%
Mali	0.093	0.145	0.394	323.7%	2.9%	12.2	14	14	14.8%	0.3%	15.9	15.99	16.77	5.5%	0.1%
Senegal	0.026	0.101	0.353	1257.7%	5.4%	11.13	12.64	14	25.8%	0.5%	17.78	17.6	18.28	2.8%	0.1%
Guinea	0.101	0.187	0.467	362.4%	3.1%	5.079	6.115	7.551	48.7%	0.8%	9.085	10.01	11.83	30.2%	0.5%
Benin	0.11	0.156	0.398	261.8%	2.6%	12.26	13.9	14	14.2%	0.3%	15.94	16.13	16.81	5.5%	0.1%
Togo	0.476	0.453	0.476	0.0%	0.0%	5.086	5.345	6.289	23.7%	0.4%	8.155	8.907	10.04	23.1%	0.4%
Sierra Leone	0.065	0.145	0.453	596.9%	4.0%	9.34	12.25	14	49.9%	0.8%	14.81	14.74	15.79	6.6%	0.1%
Liberia	0.043	0.053	0.132	207.0%	2.3%	7.218	8.414	11.72	62.4%	1.0%	9.985	10.25	11.19	12.1%	0.2%
Mauritania	0.143	0.178	0.336	135.0%	1.7%	5.063	5.491	6.477	27.9%	0.5%	4.283	5.825	8.099	89.1%	1.3%
Guinea-Bissau	0.053	0.065	0.126	137.7%	1.7%	8.2	9.257	11.83	44.3%	0.7%	9.023	9.45	10.37	14.9%	0.3%
Gambia	0.098	0.136	0.291	196.9%	2.2%	8.129	9.139	11.05	35.9%	0.6%	5.254	6.551	8.488	61.6%	1.0%
Cape Verde	0.22	0.552	1.925	775.0%	4.4%	14	14	14	0.0%	0.0%	11.81	13.1	15.13	28.1%	0.5%
Africa-Western	**0.106**	**0.201**	**0.384**	**262.3%**	**2.6%**	**8.555**	**9.945**	**10.9**	**27.4%**	**0.5%**	**13.91**	**14.28**	**15.02**	**8.0%**	**0.2%**

Infrastructure

Governance

Base Case: Countries in Year 2060	R&D Expenditures					Freedom House Index (Inverted)					Polity Democracy Index				
	Percent of GDP					Index Range: 2-14					Index Range: 1-20				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	0.107	0.151	0.296	176.6%	2.1%	3.042	3.391	4.022	32.2%	0.6%	8.078	8.834	10.33	27.9%	0.5%
Dominican Republic	0.451	1.086	2.406	433.5%	3.4%	12.39	14	14	13.0%	0.2%	17.97	18.68	19.87	10.6%	0.2%
Cuba	0.671	1.055	3.097	361.5%	3.1%	2.032	2.311	2.78	36.8%	0.6%	3.519	6.128	9.438	168.2%	2.0%
Puerto Rico	1.607	3.194	3.196	98.9%	1.4%	4.374	4.917	5.456	24.7%	0.4%	17.08	17.73	18.05	5.7%	0.1%
Jamaica	0.084	0.267	0.837	896.4%	4.7%	11.08	11.83	13.12	18.4%	0.3%	19	19.3	19.7	3.7%	0.1%
Trinidad and Tobago	0.352	1.738	2.349	567.3%	3.9%	10.28	11.53	12.24	19.1%	0.3%	20	20	20	0.0%	0.0%
Bahamas	1.432	2.055	3.186	122.5%	1.6%	14	14	14	0.0%	0.0%	16.89	17.91	18.05	6.9%	0.1%
Barbados	1.05	1.706	3.19	203.8%	2.2%	14	14	14	0.0%	0.0%	16.08	17.14	17.46	8.6%	0.2%
St. Vincent & the Grenadines	0.187	0.526	1.738	829.4%	4.6%	13.2	14	14	6.1%	0.1%	14.36	15.64	17.25	20.1%	0.4%
Grenada	0.693	0.935	2.112	204.8%	2.3%	13.12	14	14	6.7%	0.1%	15.04	16.13	17.72	17.8%	0.3%
St. Lucia	0.43	0.871	2.089	385.8%	3.2%	13.22	14	14	5.9%	0.1%	15.16	16.32	17.66	16.5%	0.3%
America-Caribbean	**0.987**	**1.954**	**2.767**	**180.3%**	**2.1%**	**6.24**	**6.987**	**7.452**	**19.4%**	**0.4%**	**11.46**	**12.74**	**14.3**	**24.8%**	**0.4%**
Guatemala	0.18	0.406	1.029	471.7%	3.5%	8.116	9.044	10.33	27.3%	0.5%	18.03	18.53	19.28	6.9%	0.1%
Honduras	0.069	0.254	0.771	1017.4%	4.9%	10.21	11.57	13.33	30.6%	0.5%	17.12	17.77	18.5	8.1%	0.2%
El Salvador	0.118	0.513	1.568	1228.8%	5.3%	11.19	12.72	14	25.1%	0.4%	16.98	17.69	18.91	11.4%	0.2%
Nicaragua	0.061	0.203	0.585	859.0%	4.6%	10.18	11.51	13.27	30.4%	0.5%	17.95	18.27	18.76	4.5%	0.1%
Costa Rica	0.484	1.599	2.978	515.3%	3.7%	14	14	14	0.0%	0.0%	19.98	20	20	0.1%	0.0%
Panama	0.428	1.369	2.954	590.2%	3.9%	13.3	14	14	5.3%	0.1%	19.02	19.62	19.37	1.8%	0.0%
Belize	0.587	1.309	3.121	431.7%	3.4%	13.23	14	14	5.8%	0.1%	14.44	15.58	17.03	17.9%	0.3%
America-Central	**0.278**	**0.955**	**2.017**	**625.5%**	**4.0%**	**10.36**	**11.17**	**12.25**	**18.2%**	**0.3%**	**17.93**	**18.43**	**19.09**	**6.5%**	**0.1%**
United States of America	2.914	2.933	2.951	1.3%	0.0%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Mexico	0.468	0.981	2.021	331.8%	3.0%	12.18	13.24	14	14.9%	0.3%	18.06	18.75	19.64	8.7%	0.2%
Canada	2.119	2.684	2.718	28.3%	0.5%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
America-North	**2.734**	**2.808**	**2.872**	**5.0%**	**0.1%**	**13.56**	**13.82**	**14**	**3.2%**	**0.1%**	**19.53**	**19.7**	**19.92**	**2.0%**	**0.0%**
Brazil	1.017	1.503	2.805	175.8%	2.0%	11.19	12.62	14	25.1%	0.4%	18.1	19.09	20	10.5%	0.2%
Colombia	0.211	0.576	1.842	773.0%	4.4%	8.168	9.177	10.64	30.3%	0.5%	17.08	17.81	18.9	10.7%	0.2%
Argentina	0.527	1.533	2.87	444.6%	3.4%	12.29	13.89	14	13.9%	0.3%	18.1	19.02	18.75	3.6%	0.1%
Venezuela, RB	0.348	0.911	1.497	330.2%	3.0%	9.152	10.15	10.84	18.4%	0.3%	16.15	17.22	18.27	13.1%	0.2%
Peru	0.165	0.633	1.444	775.2%	4.4%	11.26	12.7	14	24.3%	0.4%	19.06	19.72	20	4.9%	0.1%
Chile	0.728	2.153	2.953	305.6%	2.8%	14	14	14	0.0%	0.0%	19.12	20	19.37	1.3%	0.0%
Ecuador	0.09	0.253	0.434	382.2%	3.2%	10.1	10.72	11.25	11.4%	0.2%	16.11	16.74	17.32	7.5%	0.1%
Bolivia	0.311	0.685	1.414	354.7%	3.1%	10.27	12.19	13.87	35.1%	0.6%	18.07	18.94	19.85	9.9%	0.2%
Paraguay	0.112	0.251	0.713	536.6%	3.8%	10.16	11.17	12.76	25.6%	0.5%	18.09	18.65	19.22	6.2%	0.1%
Uruguay	0.351	1.182	2.837	708.3%	4.3%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Guyana	0.253	0.506	1.33	425.7%	3.4%	12.25	14	14	14.3%	0.3%	16.01	16.58	17.79	11.1%	0.2%
Suriname	0.587	1.025	1.898	223.3%	2.4%	13.24	14	14	5.7%	0.1%	14.39	15.35	16.89	17.4%	0.3%
America-South	**0.708**	**1.383**	**2.55**	**260.2%**	**2.6%**	**10.86**	**12.1**	**13.2**	**21.5%**	**0.4%**	**17.89**	**18.77**	**19.45**	**8.7%**	**0.2%**

Infrastructure

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	R&D Expenditures Percent of GDP					Freedom House Index (Inverted) Index Range: 2-14					Polity Democracy Index Index Range: 1-20				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	1.509	2.528	4.162	175.8%	2.0%	3.15	3.961	4.624	46.8%	0.8%	3.483	6.239	9.404	170.0%	2.0%
Japan	3.236	4.108	4.046	25.0%	0.4%	13.12	14	14	6.7%	0.1%	20	20	20	0.0%	0.0%
Korea, Rep. of	2.877	4.235	4.164	44.7%	0.7%	13.28	14	14	5.4%	0.1%	18.11	18.41	18.75	3.5%	0.1%
Taiwan	1.373	2.725	3.19	132.3%	1.7%	13.2	14	14	6.1%	0.1%	20	20	20	0.0%	0.0%
Korea, Dem. Rep. of	0.247	0.348	0.524	112.1%	1.5%	2.047	2.235	2.451	19.7%	0.4%	1.48	3.763	6.533	341.4%	3.0%
Hong Kong	1.03	1.415	1.534	48.9%	0.8%	3.266	3.43	3.573	9.4%	0.2%	18.39	18.68	18.96	3.1%	0.1%
Mongolia	0.305	0.482	1.157	279.3%	2.7%	12.43	14	14	12.6%	0.2%	20	20	20	0.0%	0.0%
Asia-East	**2.543**	**2.998**	**4.107**	**61.5%**	**1.0%**	**4.429**	**5.085**	**5.491**	**24.0%**	**0.4%**	**5.601**	**7.798**	**10.4**	**85.7%**	**1.2%**
India	0.869	1.245	2.431	179.7%	2.1%	11.49	14	14	21.8%	0.4%	18.91	19.35	20	5.8%	0.1%
Pakistan	0.239	0.345	0.621	159.8%	1.9%	5.11	5.703	6.586	28.9%	0.5%	5.27	6.801	9.106	72.8%	1.1%
Bangladesh	0.628	0.741	1.046	66.6%	1.0%	8.392	10.59	12.71	51.5%	0.8%	15.89	16.08	16.87	6.2%	0.1%
Afghanistan	0.071	0.083	0.134	88.7%	1.3%	4.981	5.34	6.349	27.5%	0.5%	3.23	4.41	6.249	93.5%	1.3%
Iran, Islamic Rep. of	0.726	1.536	1.893	160.7%	1.9%	4.08	4.686	4.921	20.6%	0.4%	4.53	7.19	10.1	123.0%	1.6%
Nepal	0.661	0.687	0.848	28.3%	0.5%	6.121	7.205	8.856	44.7%	0.7%	4.226	5.638	7.981	88.9%	1.3%
Uzbekistan	0.181	0.31	0.52	187.3%	2.1%	3.104	3.576	4.007	29.1%	0.5%	1.448	3.722	6.542	351.8%	3.1%
Sri Lanka	0.181	0.558	1.516	737.6%	4.3%	10.3	12.2	14	35.9%	0.6%	15.12	16.24	17.87	18.2%	0.3%
Kazakhstan	0.407	1.899	2.075	409.8%	3.3%	5.227	6.166	6.327	21.0%	0.4%	4.567	7.478	10.09	120.9%	1.6%
Tajikistan	0.138	0.228	0.529	283.3%	2.7%	5.156	5.833	6.836	32.6%	0.6%	7.299	8.88	11.1	52.1%	0.8%
Turkmenistan	0.251	0.939	0.789	214.3%	2.3%	2.033	2.606	2.599	27.8%	0.5%	1.474	4.155	6.871	366.1%	3.1%
Kyrgyzstan	0.205	0.266	0.421	105.4%	1.4%	5.108	5.738	6.531	27.9%	0.5%	7.282	8.717	10.48	43.9%	0.7%
Bhutan	0.323	0.769	2.087	546.1%	3.8%	5.155	6.104	7.258	40.8%	0.7%	2.461	4.952	8.548	247.3%	2.5%
Maldives	0.355	1.165	3.185	797.2%	4.5%	5.168	6.422	7.879	52.5%	0.8%	12.86	14.18	15.85	23.3%	0.4%
Asia-South Central	**0.736**	**1.208**	**2.264**	**207.6%**	**2.3%**	**9.739**	**11.51**	**11.68**	**19.9%**	**0.4%**	**15.47**	**15.71**	**16.43**	**6.2%**	**0.1%**
Indonesia	0.083	0.314	0.786	847.0%	4.6%	9.246	10.61	12.01	29.9%	0.5%	18.03	18.53	19.1	5.9%	0.1%
Philippines	0.135	0.384	0.995	637.0%	4.1%	11.23	12.89	14	24.7%	0.4%	17.94	18.18	18.84	5.0%	0.1%
Vietnam	0.226	0.594	1.428	531.9%	3.8%	3.154	3.992	4.69	48.7%	0.8%	3.421	5.826	9.006	163.3%	2.0%
Thailand	0.314	0.837	1.896	503.8%	3.7%	11.21	12.69	14	24.9%	0.4%	19	19.61	20	5.3%	0.1%
Myanmar	0.093	0.199	0.432	364.5%	3.1%	2.168	2.722	3.249	49.9%	0.8%	2.355	4.369	7.128	202.7%	2.2%
Malaysia	0.797	1.766	3.061	284.1%	2.7%	8.176	9.236	10.1	23.5%	0.4%	13.26	14.83	16.01	20.7%	0.4%
Cambodia	0.142	0.427	1.038	631.0%	4.1%	5.228	6.76	8.012	53.3%	0.9%	12	12.88	14.5	20.8%	0.4%
Lao PDR	0.165	0.543	1.937	1073.9%	5.0%	3.1	4.05	5.023	62.0%	1.0%	3.372	5.661	9.061	168.7%	2.0%
Singapore	2.513	2.556	2.599	3.4%	0.1%	7.119	7.57	7.828	10.0%	0.2%	8.496	10.51	12.48	46.9%	0.8%
Timor-Leste	0.175	0.288	0.827	372.6%	3.2%	10.03	11.41	14	39.6%	0.7%	15.97	16.18	17.23	7.9%	0.2%
Brunei Darussalam	0.073	0.271	0.468	541.1%	3.8%	5.017	5.241	5.38	7.2%	0.1%	19.08	19.24	19.4	1.7%	0.0%
Asia-South East	**0.587**	**0.903**	**1.576**	**168.5%**	**2.0%**	**7.991**	**9.305**	**10.44**	**30.6%**	**0.5%**	**13.91**	**14.94**	**16.19**	**16.4%**	**0.3%**

Infrastructure

Governance

Base Case: Countries in Year 2060	R&D Expenditures					Freedom House Index (Inverted)					Polity Democracy Index				
	Percent of GDP					Index Range: 2-14					Index Range: 1-20				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	0.725	1.495	3.272	351.3%	3.1%	10.22	11.81	13.58	32.9%	0.6%	17.08	17.89	18.91	10.7%	0.2%
Yemen	0.175	0.356	0.695	297.1%	2.8%	6.051	7.27	8.42	39.2%	0.7%	8.232	9.821	11.99	45.7%	0.8%
Iraq	0.201	0.49	1.143	468.7%	3.5%	4.065	4.986	5.849	43.9%	0.7%	1.46	3.959	7.329	402.0%	3.3%
Saudi Arabia	1.525	2.212	2.919	91.4%	1.3%	2.004	2.155	2.279	13.7%	0.3%	0.728	4.107	7.467	925.7%	4.8%
Syria	0.315	0.492	1.076	241.6%	2.5%	2.025	2.242	2.578	27.3%	0.5%	3.458	5.708	8.681	151.0%	1.9%
Israel	4.552	5.824	5.649	24.1%	0.4%	12.18	13.92	14	14.9%	0.3%	20	20	20	0.0%	0.0%
Azerbaijan	0.405	0.885	1.213	199.5%	2.2%	5.276	6.129	6.561	24.4%	0.4%	3.501	6.11	9.093	159.7%	1.9%
Jordan	0.297	0.868	3.131	954.2%	4.8%	7.194	8.675	10.48	45.7%	0.8%	8.394	10.6	12.67	50.9%	0.8%
Palestine	0.277	0.512	1.266	357.0%	3.1%	7.653	8.908	10.47	36.8%	0.6%	12.79	14.25	16.03	25.3%	0.5%
United Arab Emirates	2.424	3.189	3.186	31.4%	0.5%	4.024	4.293	4.557	13.2%	0.2%	2.718	5.72	8.72	220.8%	2.4%
Oman	1.477	2.045	2.672	80.9%	1.2%	5.017	5.336	5.609	11.8%	0.2%	2.648	5.674	8.767	231.1%	2.4%
Kuwait	0.323	0.527	0.707	118.9%	1.6%	7.036	7.642	7.634	8.5%	0.2%	3.643	6.541	9.408	158.2%	1.9%
Lebanon	0.709	1.283	2.487	250.8%	2.5%	5.043	5.643	6.274	24.4%	0.4%	15.17	16.37	17.62	16.2%	0.3%
Georgia	0.335	0.57	1.011	201.8%	2.2%	9.332	10.55	11.77	26.1%	0.5%	17.01	17.41	18.02	5.9%	0.1%
Armenia	0.317	1.101	2.146	577.0%	3.9%	7.289	8.992	9.988	37.0%	0.6%	15.14	16.31	17.62	16.4%	0.3%
Bahrain	2.498	3.055	3.188	27.6%	0.5%	6.053	6.298	6.599	9.0%	0.2%	3.677	6.522	9.347	154.2%	1.9%
Qatar	0.087	0.284	0.481	452.9%	3.5%	5.065	5.491	5.356	5.7%	0.1%	0.8	4.133	7.467	833.4%	4.6%
Cyprus	0.504	1.655	2.007	298.2%	2.8%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Asia-West	**1.602**	**2.212**	**3.07**	**91.6%**	**1.3%**	**6.621**	**7.255**	**8.007**	**20.9%**	**0.4%**	**9.418**	**10.43**	**12.31**	**30.7%**	**0.5%**
Australia	1.873	2.533	2.578	37.6%	0.6%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Papua New Guniea	0.145	0.304	0.477	229.0%	2.4%	10.09	12.16	13.57	34.5%	0.6%	19.8	19.46	19.52	-1.4%	0.0%
New Zealand	1.276	2.391	2.69	110.8%	1.5%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Solomon Islands	0.149	0.211	0.359	140.9%	1.8%	10.18	11.21	12.72	25.0%	0.4%	17.81	17.35	17.42	-2.2%	0.0%
Fiji	0.337	0.546	1.456	332.0%	3.0%	9.128	10.17	12.04	31.9%	0.6%	16.05	16.64	17.89	11.5%	0.2%
Vanuatu	0.28	0.419	0.917	227.5%	2.4%	12.18	13.46	14	14.9%	0.3%	12.57	13.52	15.17	20.7%	0.4%
Micronesia	0.418	0.572	1.33	218.2%	2.3%	14	14	14	0.0%	0.0%	13.75	14.56	16.06	16.8%	0.3%
Tonga	0.385	0.512	1.16	201.3%	2.2%	8.021	8.552	9.899	23.4%	0.4%	13.53	14.19	15.64	15.6%	0.3%
Samoa	0.388	0.643	1.656	326.8%	2.9%	12.19	13.59	14	14.8%	0.3%	13.47	14.48	16.23	20.5%	0.4%
Oceania	**1.785**	**2.476**	**2.549**	**42.8%**	**0.7%**	**13.03**	**13.4**	**13.8**	**5.9%**	**0.1%**	**19.69**	**19.61**	**19.67**	**-0.1%**	**0.0%**

Infrastructure

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	R&D Expenditures Percent of GDP					Freedom House Index (Inverted) Index Range: 2-14					Polity Democracy Index Index Range: 1-20				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	1.333	2.706	3.131	134.9%	1.7%	5.151	5.901	6.114	18.7%	0.3%	17.13	18.11	18.71	9.2%	0.2%
Ukraine	1.223	1.85	3.098	153.3%	1.9%	9.307	10.9	12.28	31.9%	0.6%	16.09	16.99	18.27	13.5%	0.3%
Poland	0.731	1.839	2.855	290.6%	2.8%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Romania	0.492	1.082	1.95	296.3%	2.8%	11.26	12.52	13.61	20.9%	0.4%	19.12	20	19.89	4.0%	0.1%
Czech Republic	1.395	2.013	3.047	118.4%	1.6%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Belarus	0.733	1.491	2.623	257.8%	2.6%	3.092	3.499	3.827	23.8%	0.4%	3.544	6.256	9.493	167.9%	2.0%
Hungary	0.986	1.774	2.9	194.1%	2.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Bulgaria	0.596	1.185	2.555	328.7%	3.0%	13.29	14	14	5.3%	0.1%	19.08	19.83	19.6	2.7%	0.1%
Slovakia	0.662	1.185	2.145	224.0%	2.4%	14	14	14	0.0%	0.0%	19.2	20	19.66	2.4%	0.0%
Moldova, Rep. of	0.819	0.929	1.525	86.2%	1.3%	9.263	10.6	12.71	37.2%	0.6%	18.01	18.46	19.4	7.7%	0.1%
Europe-East	**1.071**	**2.263**	**2.934**	**173.9%**	**2.0%**	**8.372**	**9.089**	**9.492**	**13.4%**	**0.3%**	**17.34**	**18.16**	**18.73**	**8.0%**	**0.2%**
United Kingdom	2.056	2.884	2.905	41.3%	0.7%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Sweden	4.004	4.545	4.453	11.2%	0.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Denmark	2.806	3.419	3.404	21.3%	0.4%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Ireland	1.738	1.83	1.922	10.6%	0.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Norway	1.769	1.86	1.951	10.3%	0.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Finland	3.729	4.388	4.307	15.5%	0.3%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Lithuania	0.908	1.712	2.974	227.5%	2.4%	12.3	13.55	14	13.8%	0.3%	20	20	20	0.0%	0.0%
Latvia	0.589	1.788	2.734	364.2%	3.1%	13.39	14	14	4.6%	0.1%	18.23	19.01	18.75	2.9%	0.1%
Estonia	1.155	2.328	2.96	156.3%	1.9%	14	14	14	0.0%	0.0%	16.26	17.31	17.49	7.6%	0.1%
Iceland	3.327	3.651	3.621	8.8%	0.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Europe-North	**2.355**	**3.027**	**3.071**	**30.4%**	**0.5%**	**13.93**	**13.99**	**14**	**0.5%**	**0.0%**	**19.91**	**19.95**	**19.96**	**0.3%**	**0.0%**
Italy	1.152	1.726	2.475	114.8%	1.5%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Spain	1.179	2.129	2.479	110.3%	1.5%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Greece	0.721	1.546	1.902	163.8%	2.0%	13.14	13.89	14	6.5%	0.1%	20	20	20	0.0%	0.0%
Portugal	0.792	1.387	2.636	232.8%	2.4%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Serbia	1.236	1.624	2.713	119.5%	1.6%	11.24	12.39	13.87	23.4%	0.4%	16.15	17.27	18.31	13.4%	0.3%
Croatia	1.228	1.791	3.357	173.4%	2.0%	12.22	13.44	14	14.6%	0.3%	17.17	18.43	18.81	9.6%	0.2%
Bosnia and Herzegovina	0.465	0.647	1.294	178.3%	2.1%	9.124	9.857	11.17	22.4%	0.4%	13.92	14.87	16.36	17.5%	0.3%
Albania	0.46	1.016	2.072	350.4%	3.1%	10.29	11.98	13.49	31.1%	0.5%	17.08	17.92	19.08	11.7%	0.2%
Macedonia, TFYR	0.283	0.385	0.93	228.6%	2.4%	10.13	10.74	12.04	18.9%	0.3%	19.11	19.91	20	4.7%	0.1%
Slovenia	1.76	2.731	3.198	81.7%	1.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Montenegro	0.588	1.008	2.433	313.8%	2.9%	6.28	7.032	8.097	28.9%	0.5%	14.55	15.87	17.32	19.0%	0.3%
Malta	0.41	1.351	2.183	432.4%	3.4%	14	14	14	0.0%	0.0%	17.08	18.09	18.08	5.9%	0.1%
Europe-South	**1.106**	**1.842**	**2.463**	**122.7%**	**1.6%**	**13.45**	**13.66**	**13.85**	**3.0%**	**0.1%**	**19.45**	**19.61**	**19.74**	**1.5%**	**0.0%**
Germany	2.555	3.494	3.473	35.9%	0.6%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
France	2.25	3.181	3.183	41.5%	0.7%	14	14	14	0.0%	0.0%	19.18	19.57	19.37	1.0%	0.0%
Netherlands	1.991	2.639	2.676	34.4%	0.6%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Belgium	1.968	2.87	2.892	47.0%	0.8%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Austria	2.429	3.111	3.116	28.3%	0.5%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Switzerland	2.756	3.258	3.253	18.0%	0.3%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Luxembourg	1.834	1.92	2.006	9.4%	0.2%	14	14	14	0.0%	0.0%	20	20	20	0.0%	0.0%
Europe-West	**2.375**	**3.241**	**3.244**	**36.6%**	**0.6%**	**14**	**14**	**14**	**0.0%**	**0.0%**	**19.73**	**19.85**	**19.77**	**0.2%**	**0.0%**

Governance

Base Case

Source: International Futures Version 6.12, March 2009

	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**7.302**	**7.008**	**6.739**	**-7.7%**	**-0.2%**	**3.747**	**4.966**	**6.644**	**77.3%**	**1.2%**	**2.576**	**3.027**	**3.655**	**41.9%**	**0.7%**
Africa	**6.087**	**6.105**	**6.091**	**0.1%**	**0.0%**	**2.658**	**2.93**	**3.769**	**41.8%**	**0.7%**	**1.853**	**2.028**	**2.413**	**30.2%**	**0.5%**
Americas	**7.832**	**7.747**	**7.582**	**-3.2%**	**-0.1%**	**5.435**	**6.773**	**8.525**	**56.9%**	**0.9%**	**3.25**	**3.721**	**4.409**	**35.7%**	**0.6%**
Asia with Oceania	**6.791**	**6.447**	**6.284**	**-7.5%**	**-0.2%**	**3.276**	**4.83**	**7.191**	**119.5%**	**1.6%**	**2.458**	**3.026**	**3.903**	**58.8%**	**0.9%**
Europe	**7.241**	**7.107**	**7.149**	**-1.3%**	**0.0%**	**5.769**	**7.943**	**9.252**	**60.4%**	**0.9%**	**3.379**	**4.328**	**4.795**	**41.9%**	**0.7%**
World	**7.302**	**7.008**	**6.739**	**-7.7%**	**-0.2%**	**3.747**	**4.966**	**6.644**	**77.3%**	**1.2%**	**2.576**	**3.027**	**3.655**	**41.9%**	**0.7%**
Africa-Eastern	**5.868**	**5.927**	**6.005**	**2.3%**	**0.0%**	**2.517**	**2.732**	**3.956**	**57.2%**	**0.9%**	**1.804**	**1.974**	**2.488**	**37.9%**	**0.6%**
Africa-Middle	**5.651**	**5.644**	**5.27**	**-6.7%**	**-0.1%**	**2.119**	**2.268**	**2.468**	**16.5%**	**0.3%**	**1.297**	**1.528**	**1.787**	**37.8%**	**0.6%**
Africa-Northern	**5.874**	**5.937**	**6.005**	**2.2%**	**0.0%**	**3.136**	**3.865**	**5.683**	**81.2%**	**1.2%**	**2.114**	**2.453**	**3.206**	**51.7%**	**0.8%**
Africa-Southern	**6.899**	**6.906**	**6.891**	**-0.1%**	**0.0%**	**4.591**	**6.075**	**9.7**	**111.3%**	**1.5%**	**3.17**	**3.6**	**4.86**	**53.3%**	**0.9%**
Africa-Western	**5.777**	**5.783**	**5.67**	**-1.9%**	**0.0%**	**2.339**	**2.554**	**2.91**	**24.4%**	**0.4%**	**1.711**	**1.895**	**2.111**	**23.4%**	**0.4%**
Africa	**6.087**	**6.105**	**6.091**	**0.1%**	**0.0%**	**2.658**	**2.93**	**3.769**	**41.8%**	**0.7%**	**1.853**	**2.028**	**2.413**	**30.2%**	**0.5%**
America-Caribbean	**6.745**	**6.701**	**6.626**	**-1.8%**	**0.0%**	**3.518**	**4.62**	**6.7**	**90.4%**	**1.3%**	**2.03**	**2.544**	**3.485**	**71.7%**	**1.1%**
America-Central	**6.975**	**7.02**	**7.007**	**0.5%**	**0.0%**	**3.176**	**4.05**	**5.885**	**85.3%**	**1.2%**	**2.085**	**2.506**	**3.282**	**57.4%**	**0.9%**
America-North	**8.098**	**8.092**	**8.07**	**-0.3%**	**0.0%**	**7.311**	**8.786**	**9.466**	**29.5%**	**0.5%**	**4.164**	**4.565**	**4.833**	**16.1%**	**0.3%**
America-South	**5.874**	**5.927**	**5.96**	**1.5%**	**0.0%**	**3.741**	**5.13**	**8.064**	**115.6%**	**1.5%**	**2.461**	**3.067**	**4.203**	**70.8%**	**1.1%**
Americas	**7.832**	**7.747**	**7.582**	**-3.2%**	**-0.1%**	**5.435**	**6.773**	**8.525**	**56.9%**	**0.9%**	**3.25**	**3.721**	**4.409**	**35.7%**	**0.6%**
Asia-East	**6.861**	**6.42**	**6.216**	**-9.4%**	**-0.2%**	**3.896**	**6.722**	**9.905**	**154.2%**	**1.9%**	**2.748**	**3.781**	**4.955**	**80.3%**	**1.2%**
Asia-South Central	**6.234**	**6.295**	**6.326**	**1.5%**	**0.0%**	**2.762**	**3.676**	**5.934**	**114.8%**	**1.5%**	**2.275**	**2.589**	**3.411**	**49.9%**	**0.8%**
Asia-South East	**6.343**	**6.319**	**6.207**	**-2.1%**	**0.0%**	**2.756**	**3.587**	**5.258**	**90.8%**	**1.3%**	**2.223**	**2.575**	**3.212**	**44.5%**	**0.7%**
Asia-West	**6.72**	**6.592**	**6.389**	**-4.9%**	**-0.1%**	**3.517**	**4.901**	**6.936**	**97.2%**	**1.4%**	**2.209**	**2.826**	**3.729**	**68.8%**	**1.1%**
Oceania	**7.822**	**7.807**	**7.804**	**-0.2%**	**0.0%**	**7.629**	**7.895**	**7.861**	**3.0%**	**0.1%**	**3.913**	**4.104**	**4.114**	**5.1%**	**0.1%**
Asia with Oceania	**6.791**	**6.447**	**6.284**	**-7.5%**	**-0.2%**	**3.276**	**4.83**	**7.191**	**119.5%**	**1.6%**	**2.458**	**3.026**	**3.903**	**58.8%**	**0.9%**
Europe-East	**5.77**	**5.598**	**5.697**	**-1.3%**	**0.0%**	**3.2**	**6.053**	**8.184**	**155.8%**	**1.9%**	**2.472**	**3.684**	**4.52**	**82.8%**	**1.2%**
Europe-North	**7.871**	**7.865**	**7.88**	**0.1%**	**0.0%**	**8.99**	**9.873**	**10**	**11.2%**	**0.2%**	**4.561**	**4.96**	**5**	**9.6%**	**0.2%**
Europe-South	**6.831**	**6.858**	**6.845**	**0.2%**	**0.0%**	**5.462**	**7.196**	**9.54**	**74.7%**	**1.1%**	**3.357**	**4.134**	**4.848**	**44.4%**	**0.7%**
Europe-West	**7.373**	**7.363**	**7.332**	**-0.6%**	**0.0%**	**8.256**	**10**	**10**	**21.1%**	**0.4%**	**4.178**	**5**	**5**	**19.7%**	**0.4%**
Europe	**7.241**	**7.107**	**7.149**	**-1.3%**	**0.0%**	**5.769**	**7.943**	**9.252**	**60.4%**	**0.9%**	**3.379**	**4.328**	**4.795**	**41.9%**	**0.7%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	5.014	5.014	5.014	0.0%	0.0%	2.212	2.261	2.696	21.9%	0.4%	1.642	1.778	2.043	24.4%	0.4%
Uganda	6.5	6.5	6.5	0.0%	0.0%	2.511	2.895	5.123	104.0%	1.4%	2.055	2.227	3.068	49.3%	0.8%
Tanzania, United Rep. of	6.3	6.3	6.3	0.0%	0.0%	2.915	3.242	5.62	92.8%	1.3%	2.124	2.266	3.138	47.7%	0.8%
Kenya	6.5	6.5	6.5	0.0%	0.0%	2.118	2.399	3.764	77.7%	1.2%	1.807	2.003	2.59	43.3%	0.7%
Madagascar	5.9	5.9	5.9	0.0%	0.0%	2.806	2.89	3.323	18.4%	0.3%	2.099	2.118	2.239	6.7%	0.1%
Mozambique	5.5	5.5	5.5	0.0%	0.0%	2.827	3.329	6.913	144.5%	1.8%	2.092	2.335	3.679	75.9%	1.1%
Malawi	5.5	5.5	5.5	0.0%	0.0%	2.805	2.871	3.269	16.5%	0.3%	1.707	1.828	2.032	19.0%	0.3%
Zambia	6.7	6.7	6.7	0.0%	0.0%	2.618	2.844	3.829	46.3%	0.8%	1.705	1.873	2.339	37.2%	0.6%
Burundi	4.5	4.5	4.5	0.0%	0.0%	2.305	2.373	2.894	25.6%	0.5%	1.21	1.461	1.875	55.0%	0.9%
Rwanda	5.1	5.1	5.1	0.0%	0.0%	3.109	3.248	3.857	24.1%	0.4%	1.904	1.986	2.237	17.5%	0.3%
Somalia	4.046	4.046	4.046	0.0%	0.0%	2.101	2.117	2.154	2.5%	0.0%	0.713	1.119	1.389	94.8%	1.3%
Zimbabwe	3.3	3.3	3.3	0.0%	0.0%	2.609	3.027	3.986	52.8%	0.9%	1.433	1.78	2.306	60.9%	1.0%
Eritrea	5.118	5.118	5.118	0.0%	0.0%	2.596	2.597	2.662	2.5%	0.1%	1.558	1.669	1.795	15.2%	0.3%
Mauritius	7	7	7	0.0%	0.0%	4.338	6.279	10	130.5%	1.7%	3.219	3.836	5	55.3%	0.9%
Comoros	5.41	5.41	5.41	0.0%	0.0%	2.387	2.517	3.248	36.1%	0.6%	1.011	1.309	1.869	84.9%	1.2%
Djibouti	5.705	5.705	5.705	0.0%	0.0%	2.54	2.754	3.442	35.5%	0.6%	1.762	1.913	2.279	29.3%	0.5%
Africa-Eastern	**5.868**	**5.927**	**6.005**	**2.3%**	**0.0%**	**2.517**	**2.732**	**3.956**	**57.2%**	**0.9%**	**1.804**	**1.974**	**2.488**	**37.9%**	**0.6%**
Congo; Dem. Rep. of	4.3	4.3	4.3	0.0%	0.0%	2.106	2.156	2.402	14.1%	0.3%	1.086	1.32	1.635	50.6%	0.8%
Angola	6.124	6.124	6.124	0.0%	0.0%	2.137	2.601	2.565	20.0%	0.4%	1.451	1.836	2.048	41.1%	0.7%
Cameroon	5.6	5.6	5.6	0.0%	0.0%	2.223	2.432	3.021	35.9%	0.6%	1.818	1.966	2.259	24.3%	0.4%
Chad	5.4	5.4	5.4	0.0%	0.0%	1.699	1.874	1.913	12.6%	0.2%	1.533	1.717	1.852	20.8%	0.4%
Central African Republic	4.9	4.9	4.9	0.0%	0.0%	2.408	2.509	2.866	19.0%	0.3%	0.912	1.207	1.614	77.0%	1.1%
Congo, Rep. of	4.8	4.8	4.8	0.0%	0.0%	2.329	2.733	2.842	22.0%	0.4%	1.296	1.67	1.953	50.7%	0.8%
Gabon	5	5	5	0.0%	0.0%	2.843	3.417	3.784	33.1%	0.6%	1.903	2.386	2.814	47.9%	0.8%
Equatorial Guinea	7.339	7.339	7.339	0.0%	0.0%	2.164	2.526	1	-53.8%	-1.5%	1.391	2.24	2.268	63.0%	1.0%
São Tomé and Príncipe	5.54	5.54	5.54	0.0%	0.0%	2.434	2.475	2.837	16.6%	0.3%	1.661	1.751	1.974	18.8%	0.3%
Africa-Middle	**5.651**	**5.644**	**5.27**	**-6.7%**	**-0.1%**	**2.119**	**2.268**	**2.468**	**16.5%**	**0.3%**	**1.297**	**1.528**	**1.787**	**37.8%**	**0.6%**
Egypt	6.1	6.1	6.1	0.0%	0.0%	3.487	4.415	7.655	119.5%	1.6%	2.313	2.705	3.926	69.7%	1.1%
Sudan	5.659	5.659	5.659	0.0%	0.0%	2.164	2.661	3.352	54.9%	0.9%	1.364	1.775	2.233	63.7%	1.0%
Algeria	4.6	4.6	4.6	0.0%	0.0%	2.831	3.426	4.036	42.6%	0.7%	2.02	2.367	2.695	33.4%	0.6%
Morocco	6.1	6.1	6.1	0.0%	0.0%	3.26	3.75	5.133	57.5%	0.9%	2.394	2.531	3.009	25.7%	0.5%
Tunisia	6.3	6.3	6.3	0.0%	0.0%	5.055	6.652	10	97.8%	1.4%	3.059	3.539	5	63.5%	1.0%
Libyan Arab Jamahiriya	6.764	6.764	6.764	0.0%	0.0%	2.711	4.695	5.317	96.1%	1.4%	1.857	2.885	3.375	81.7%	1.2%
Africa-Northern	**5.874**	**5.937**	**6.005**	**2.2%**	**0.0%**	**3.136**	**3.865**	**5.683**	**81.2%**	**1.2%**	**2.114**	**2.453**	**3.206**	**51.7%**	**0.8%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	6.9	6.9	6.9	0.0%	0.0%	4.632	6.122	10	115.9%	1.6%	3.252	3.676	5	53.8%	0.9%
Namibia	6.8	6.8	6.8	0.0%	0.0%	4.387	5.52	10	127.9%	1.7%	2.665	3.016	4.817	80.8%	1.2%
Lesotho	5.5	5.5	5.5	0.0%	0.0%	3.428	3.744	5.243	52.9%	0.9%	2.265	2.35	2.867	26.6%	0.5%
Botswana	7.2	7.2	7.2	0.0%	0.0%	6.132	10	10	63.1%	1.0%	3.406	4.844	5	46.8%	0.8%
Swaziland	6.231	6.231	6.231	0.0%	0.0%	2.725	3.582	6.019	120.9%	1.6%	1.834	2.3	3.355	82.9%	1.2%
Africa-Southern	**6.899**	**6.906**	**6.891**	**-0.1%**	**0.0%**	**4.591**	**6.075**	**9.7**	**111.3%**	**1.5%**	**3.17**	**3.6**	**4.86**	**53.3%**	**0.9%**
Nigeria	5.9	5.9	5.9	0.0%	0.0%	1.919	2.21	2.345	22.2%	0.4%	1.59	1.848	2.009	26.4%	0.5%
Niger	5.3	5.3	5.3	0.0%	0.0%	2.403	2.47	2.887	20.1%	0.4%	1.724	1.828	2.06	19.5%	0.4%
Côte d'Ivoire	5.5	5.5	5.5	0.0%	0.0%	1.912	2.143	2.628	37.4%	0.6%	1.261	1.564	1.983	57.3%	0.9%
Ghana	6.2	6.2	6.2	0.0%	0.0%	3.519	3.598	3.911	11.1%	0.2%	2.277	2.245	2.301	1.1%	0.0%
Burkina Faso	5.373	5.373	5.373	0.0%	0.0%	3.414	3.617	4.591	34.5%	0.6%	1.895	1.995	2.418	27.6%	0.5%
Mali	5.6	5.6	5.6	0.0%	0.0%	2.908	3.05	3.716	27.8%	0.5%	2.247	2.302	2.486	10.6%	0.2%
Senegal	5.8	5.8	5.8	0.0%	0.0%	3.213	3.396	4.052	26.1%	0.5%	2.326	2.331	2.522	8.4%	0.2%
Guinea	5.398	5.398	5.398	0.0%	0.0%	1.911	2.143	2.893	51.4%	0.8%	1.516	1.741	2.164	42.7%	0.7%
Benin	5.5	5.5	5.5	0.0%	0.0%	2.915	3.039	3.686	26.4%	0.5%	2.17	2.206	2.407	10.9%	0.2%
Togo	5.1	5.1	5.1	0.0%	0.0%	2.406	2.418	2.543	5.7%	0.1%	1.222	1.432	1.666	36.3%	0.6%
Sierra Leone	5.4	5.4	5.4	0.0%	0.0%	2.414	2.626	3.451	43.0%	0.7%	1.117	1.415	1.969	76.3%	1.1%
Liberia	4.643	4.643	4.643	0.0%	0.0%	2.204	2.233	2.444	10.9%	0.2%	0.827	1.131	1.486	79.7%	1.2%
Mauritania	5.65	5.65	5.65	0.0%	0.0%	3.115	3.207	3.631	16.6%	0.3%	2.374	2.345	2.423	2.1%	0.0%
Guinea-Bissau	4.5	4.5	4.5	0.0%	0.0%	2.259	2.289	2.453	8.6%	0.2%	1.282	1.511	1.716	33.9%	0.6%
Gambia	5.383	5.383	5.383	0.0%	0.0%	2.709	2.81	3.226	19.1%	0.3%	1.875	1.953	2.124	13.3%	0.2%
Cape Verde	5.89	5.89	5.89	0.0%	0.0%	2.706	3.595	7.27	168.7%	2.0%	2.376	2.679	4.004	68.5%	1.0%
Africa-Western	**5.777**	**5.783**	**5.67**	**-1.9%**	**0.0%**	**2.339**	**2.554**	**2.91**	**24.4%**	**0.4%**	**1.711**	**1.895**	**2.111**	**23.4%**	**0.4%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	5.9	5.9	5.9	0.0%	0.0%	1.813	1.933	2.322	28.1%	0.5%	0.839	1.167	1.62	93.1%	1.3%
Dominican Republic	6.3	6.3	6.3	0.0%	0.0%	3.177	4.878	8.411	164.7%	2.0%	2.065	2.817	4.245	105.6%	1.5%
Cuba	6.353	6.353	6.353	0.0%	0.0%	3.873	4.938	10	158.2%	1.9%	1.947	2.481	4.677	140.2%	1.8%
Puerto Rico	7.131	7.131	7.131	0.0%	0.0%	6.416	10	10	55.9%	0.9%	3.774	5	5	32.5%	0.6%
Jamaica	6.9	6.9	6.9	0.0%	0.0%	3.619	4.034	5.482	51.5%	0.8%	2.639	2.764	3.258	23.5%	0.4%
Trinidad and Tobago	6.8	6.8	6.8	0.0%	0.0%	4.369	7.918	10	128.9%	1.7%	3.255	4.62	5	53.6%	0.9%
Bahamas	6.7	6.7	6.7	0.0%	0.0%	5.951	7.616	10	68.0%	1.0%	3.661	4.232	5	36.6%	0.6%
Barbados	6.1	6.1	6.1	0.0%	0.0%	7.089	8.84	10	41.1%	0.7%	3.605	4.119	5	38.7%	0.7%
St. Vincent & the Grenadines	6.483	6.483	6.483	0.0%	0.0%	3.52	4.37	7.556	114.7%	1.5%	2.86	3.106	4.205	47.0%	0.8%
Grenada	6.663	6.663	6.663	0.0%	0.0%	3.573	4.221	7.372	106.3%	1.5%	2.731	2.971	4.143	51.7%	0.8%
St. Lucia	6.672	6.672	6.672	0.0%	0.0%	4.052	5.183	8.389	107.0%	1.5%	2.75	3.176	4.366	58.8%	0.9%
America-Caribbean	**6.745**	**6.701**	**6.626**	**-1.8%**	**0.0%**	**3.518**	**4.62**	**6.7**	**90.4%**	**1.3%**	**2.03**	**2.544**	**3.485**	**71.7%**	**1.1%**
Guatemala	6.5	6.5	6.5	0.0%	0.0%	2.546	3.119	4.752	86.6%	1.3%	1.722	2.127	2.898	68.3%	1.0%
Honduras	6.5	6.5	6.5	0.0%	0.0%	2.644	3.105	4.455	68.5%	1.0%	1.896	2.18	2.765	45.8%	0.8%
El Salvador	7.2	7.2	7.2	0.0%	0.0%	4.288	5.294	8.063	88.0%	1.3%	2.285	2.707	3.782	65.5%	1.0%
Nicaragua	6.3	6.3	6.3	0.0%	0.0%	2.634	2.989	3.983	51.2%	0.8%	1.861	2.091	2.537	36.3%	0.6%
Costa Rica	7.4	7.4	7.4	0.0%	0.0%	4.45	7.392	10	124.7%	1.6%	3.088	4.107	5	61.9%	1.0%
Panama	7.3	7.3	7.3	0.0%	0.0%	3.723	6.196	10	168.6%	2.0%	2.56	3.527	5	95.3%	1.3%
Belize	6.6	6.6	6.6	0.0%	0.0%	3.838	5.772	10	160.6%	1.9%	2.604	3.325	5	92.0%	1.3%
America-Central	**6.975**	**7.02**	**7.007**	**0.5%**	**0.0%**	**3.176**	**4.05**	**5.885**	**85.3%**	**1.2%**	**2.085**	**2.506**	**3.282**	**57.4%**	**0.9%**
United States of America	8.2	8.2	8.2	0.0%	0.0%	8.416	10	10	18.8%	0.3%	4.638	5	5	7.8%	0.2%
Mexico	6.5	6.5	6.5	0.0%	0.0%	3.672	4.97	7.683	109.2%	1.5%	2.647	3.199	4.275	61.5%	1.0%
Canada	8	8	8	0.0%	0.0%	8.884	10	10	12.6%	0.2%	4.691	5	5	6.6%	0.1%
America-North	**8.098**	**8.092**	**8.07**	**-0.3%**	**0.0%**	**7.311**	**8.786**	**9.466**	**29.5%**	**0.5%**	**4.164**	**4.565**	**4.833**	**16.1%**	**0.3%**
Brazil	5.9	5.9	5.9	0.0%	0.0%	3.813	5.174	8.719	128.7%	1.7%	2.628	3.173	4.508	71.5%	1.1%
Colombia	5.5	5.5	5.5	0.0%	0.0%	4.107	5.039	8.382	104.1%	1.4%	2.414	2.786	4.043	67.5%	1.0%
Argentina	5.8	5.8	5.8	0.0%	0.0%	3.099	5.728	10	222.7%	2.4%	2.403	3.53	5	108.1%	1.5%
Venezuela, RB	4.3	4.3	4.3	0.0%	0.0%	2.453	3.889	5.386	119.6%	1.6%	1.649	2.498	3.344	102.8%	1.4%
Peru	6.9	6.9	6.9	0.0%	0.0%	3.646	4.838	6.947	90.5%	1.3%	2.112	2.681	3.573	69.2%	1.1%
Chile	7.4	7.4	7.4	0.0%	0.0%	7.617	10	10	31.3%	0.5%	3.866	5	5	29.3%	0.5%
Ecuador	5.9	5.9	5.9	0.0%	0.0%	2.54	2.908	3.323	30.8%	0.5%	1.733	2.072	2.41	39.1%	0.7%
Bolivia	6.5	6.5	6.5	0.0%	0.0%	2.583	3.585	5.536	114.3%	1.5%	2.032	2.505	3.302	62.5%	1.0%
Paraguay	6.4	6.4	6.4	0.0%	0.0%	2.136	2.474	3.678	72.2%	1.1%	1.536	1.876	2.515	63.7%	1.0%
Uruguay	6.8	6.8	6.8	0.0%	0.0%	6.118	8.275	10	63.5%	1.0%	3.063	3.809	5	63.2%	1.0%
Guyana	6.4	6.4	6.4	0.0%	0.0%	2.56	3.236	5.439	112.5%	1.5%	2.389	2.604	3.391	41.9%	0.7%
Suriname	6.523	6.523	6.523	0.0%	0.0%	3.351	4.523	6.859	104.7%	1.4%	2.521	2.97	3.862	53.2%	0.9%
America-South	**5.874**	**5.927**	**5.96**	**1.5%**	**0.0%**	**3.741**	**5.13**	**8.064**	**115.6%**	**1.5%**	**2.461**	**3.067**	**4.203**	**70.8%**	**1.1%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	6	6	6	0.0%	0.0%	3.429	6.347	10	191.6%	2.2%	2.617	3.657	5	91.1%	1.3%
Japan	7.2	7.2	7.2	0.0%	0.0%	7.586	10	10	31.8%	0.6%	3.806	5	5	31.4%	0.5%
Korea, Rep. of	7	7	7	0.0%	0.0%	5.669	10	10	76.4%	1.1%	3.676	5	5	36.0%	0.6%
Taiwan	7.3	7.3	7.3	0.0%	0.0%	6.184	9.799	10	61.7%	1.0%	3.773	5	5	32.5%	0.6%
Korea, Dem. Rep. of	5.976	5.976	5.976	0.0%	0.0%	2.776	3.047	3.517	26.7%	0.5%	0.937	1.37	1.87	99.6%	1.4%
Hong Kong	8.7	8.7	8.7	0.0%	0.0%	9.361	10	10	6.8%	0.1%	4.481	5	5	11.6%	0.2%
Mongolia	6.2	6.2	6.2	0.0%	0.0%	3.058	3.545	5.363	75.4%	1.1%	2.175	2.408	3.086	41.9%	0.7%
Asia-East	**6.861**	**6.42**	**6.216**	**-9.4%**	**-0.2%**	**3.896**	**6.722**	**9.905**	**154.2%**	**1.9%**	**2.748**	**3.781**	**4.955**	**80.3%**	**1.2%**
India	6.4	6.4	6.4	0.0%	0.0%	2.992	4.108	7.39	147.0%	1.8%	2.482	2.834	3.991	60.8%	1.0%
Pakistan	5.6	5.6	5.6	0.0%	0.0%	2.146	2.439	3.187	48.5%	0.8%	1.988	2.11	2.431	22.3%	0.4%
Bangladesh	5.7	5.7	5.7	0.0%	0.0%	1.739	2.133	3.045	75.1%	1.1%	1.777	2.004	2.412	35.7%	0.6%
Afghanistan	5.167	5.167	5.167	0.0%	0.0%	2.498	2.528	2.667	6.8%	0.1%	1.327	1.481	1.701	28.2%	0.5%
Iran, Islamic Rep. of	6.1	6.1	6.1	0.0%	0.0%	3.043	5.213	6.173	102.9%	1.4%	1.961	2.999	3.552	81.1%	1.2%
Nepal	5.3	5.3	5.3	0.0%	0.0%	2.515	2.683	3.214	27.8%	0.5%	1.666	1.804	2.105	26.4%	0.5%
Uzbekistan	5.754	5.754	5.754	0.0%	0.0%	2.255	2.6	3.163	40.3%	0.7%	1.511	1.819	2.179	44.2%	0.7%
Sri Lanka	6.2	6.2	6.2	0.0%	0.0%	3.295	4.285	6.832	107.3%	1.5%	2.248	2.645	3.616	60.9%	1.0%
Kazakhstan	6.63	6.63	6.63	0.0%	0.0%	3.081	7.009	7.413	140.6%	1.8%	1.94	3.665	4.044	108.5%	1.5%
Tajikistan	5.572	5.572	5.572	0.0%	0.0%	2.14	2.381	3.187	48.9%	0.8%	1.54	1.779	2.227	44.6%	0.7%
Turkmenistan	5.997	5.997	5.997	0.0%	0.0%	1.85	3.694	3.289	77.8%	1.2%	1.124	2.095	2.228	98.2%	1.4%
Kyrgyzstan	5.665	5.665	5.665	0.0%	0.0%	2.321	2.494	2.917	25.7%	0.5%	1.71	1.896	2.137	25.0%	0.4%
Bhutan	6.111	6.111	6.111	0.0%	0.0%	6.127	7.323	10	63.2%	1.0%	2.649	2.999	4.252	60.5%	1.0%
Maldives	6.165	6.165	6.165	0.0%	0.0%	3.066	5.235	10	226.2%	2.4%	2.719	3.439	5	83.9%	1.2%
Asia-South Central	**6.234**	**6.295**	**6.326**	**1.5%**	**0.0%**	**2.762**	**3.676**	**5.934**	**114.8%**	**1.5%**	**2.275**	**2.589**	**3.411**	**49.9%**	**0.8%**
Indonesia	6.1	6.1	6.1	0.0%	0.0%	2.271	2.858	4.089	80.1%	1.2%	2.117	2.386	2.869	35.5%	0.6%
Philippines	6.6	6.6	6.6	0.0%	0.0%	2.558	3.204	4.821	88.5%	1.3%	2.341	2.548	3.116	33.1%	0.6%
Vietnam	5.5	5.5	5.5	0.0%	0.0%	2.69	3.68	5.917	120.0%	1.6%	2.176	2.585	3.417	57.0%	0.9%
Thailand	6.6	6.6	6.6	0.0%	0.0%	3.932	5.29	8.081	105.5%	1.5%	2.895	3.325	4.286	48.0%	0.8%
Myanmar	2.8	2.8	2.8	0.0%	0.0%	1.852	2.134	2.756	48.8%	0.8%	1.052	1.457	1.942	84.6%	1.2%
Malaysia	6.5	6.5	6.5	0.0%	0.0%	5.375	7.944	10	86.0%	1.2%	3.517	4.341	5	42.2%	0.7%
Cambodia	5.556	5.556	5.556	0.0%	0.0%	2.357	3.123	4.761	102.0%	1.4%	1.646	2.052	2.784	69.1%	1.1%
Lao PDR	5.694	5.694	5.694	0.0%	0.0%	3.348	4.361	8.095	141.8%	1.8%	1.543	2.098	3.658	137.1%	1.7%
Singapore	8.5	8.5	8.5	0.0%	0.0%	10	10	10	0.0%	0.0%	5	5	5	0.0%	0.0%
Timor-Leste	5.816	5.816	5.816	0.0%	0.0%	2.598	2.903	4.348	67.4%	1.0%	1.685	1.912	2.572	52.6%	0.8%
Brunei Darussalam	7.637	7.637	7.637	0.0%	0.0%	10	10	10	0.0%	0.0%	3.029	4.71	5	65.1%	1.0%
Asia-South East	**6.343**	**6.319**	**6.207**	**-2.1%**	**0.0%**	**2.756**	**3.587**	**5.258**	**90.8%**	**1.3%**	**2.223**	**2.575**	**3.212**	**44.5%**	**0.7%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	5.9	5.9	5.9	0.0%	0.0%	3.666	5.742	10	172.8%	2.0%	2.631	3.415	5	90.0%	1.3%
Yemen	5.806	5.806	5.806	0.0%	0.0%	2.706	3.189	4.096	51.4%	0.8%	1.597	1.953	2.437	52.6%	0.8%
Iraq	5.873	5.873	5.873	0.0%	0.0%	2.224	2.998	4.744	113.3%	1.5%	1.117	1.706	2.639	136.3%	1.7%
Saudi Arabia	7.162	7.162	7.162	0.0%	0.0%	3.43	5.266	7.148	108.4%	1.5%	2.359	3.374	4.397	86.4%	1.3%
Syria	5.3	5.3	5.3	0.0%	0.0%	3.438	3.911	5.473	59.2%	0.9%	1.633	1.984	2.735	67.5%	1.0%
Israel	6.7	6.7	6.7	0.0%	0.0%	6.661	10	10	50.1%	0.8%	3.757	5	5	33.1%	0.6%
Azerbaijan	6.03	6.03	6.03	0.0%	0.0%	2.472	3.75	4.625	87.1%	1.3%	1.816	2.481	2.966	63.3%	1.0%
Jordan	7	7	7	0.0%	0.0%	5.798	7.315	10	72.5%	1.1%	2.682	3.191	5	86.4%	1.3%
Palestine	6.101	6.101	6.101	0.0%	0.0%	2.616	3.247	5.267	101.3%	1.4%	1.647	2.08	2.996	81.9%	1.2%
United Arab Emirates	7.8	7.8	7.8	0.0%	0.0%	6.33	9.078	10	58.0%	0.9%	3.621	4.887	5	38.1%	0.6%
Oman	7.6	7.6	7.6	0.0%	0.0%	6.367	7.892	9.57	50.3%	0.8%	3.196	3.848	4.549	42.3%	0.7%
Kuwait	7.3	7.3	7.3	0.0%	0.0%	4.925	10	8.117	64.8%	1.0%	3.007	5	5	66.3%	1.0%
Lebanon	6.685	6.685	6.685	0.0%	0.0%	3.151	4.687	7.911	151.1%	1.9%	2.228	2.943	4.278	92.0%	1.3%
Georgia	6.4	6.4	6.4	0.0%	0.0%	2.426	3.059	4.242	74.9%	1.1%	1.768	2.143	2.707	53.1%	0.9%
Armenia	6.71	6.71	6.71	0.0%	0.0%	3.068	5.158	7.947	159.0%	1.9%	2.3	3.118	4.168	81.2%	1.2%
Bahrain	7.3	7.3	7.3	0.0%	0.0%	6.14	7.631	9.995	62.8%	1.0%	3.302	4.186	5	51.4%	0.8%
Qatar	7.881	7.881	7.881	0.0%	0.0%	7.447	10	10	34.3%	0.6%	5	5	5	0.0%	0.0%
Cyprus	6.9	6.9	6.9	0.0%	0.0%	6.004	8.852	10	66.6%	1.0%	3.685	4.808	5	35.7%	0.6%
Asia-West	**6.72**	**6.592**	**6.389**	**-4.9%**	**-0.1%**	**3.517**	**4.901**	**6.936**	**97.2%**	**1.4%**	**2.209**	**2.826**	**3.729**	**68.8%**	**1.1%**
Australia	7.8	7.8	7.8	0.0%	0.0%	9.219	10	10	8.5%	0.2%	4.628	5	5	8.0%	0.2%
Papua New Guniea	5.6	5.6	5.6	0.0%	0.0%	2.307	2.734	3.196	38.5%	0.7%	1.722	1.978	2.245	30.4%	0.5%
New Zealand	8.2	8.2	8.2	0.0%	0.0%	9.881	10	10	1.2%	0.0%	4.686	5	5	6.7%	0.1%
Solomon Islands	5.662	5.662	5.662	0.0%	0.0%	2.515	2.683	3.078	22.4%	0.4%	1.074	1.382	1.785	66.2%	1.0%
Fiji	6.1	6.1	6.1	0.0%	0.0%	4.046	4.605	7.039	74.0%	1.1%	2.155	2.408	3.362	56.0%	0.9%
Vanuatu	6.085	6.085	6.085	0.0%	0.0%	2.865	3.238	4.568	59.4%	0.9%	1.79	2.055	2.679	49.7%	0.8%
Micronesia	6.362	6.362	6.362	0.0%	0.0%	3.235	3.649	5.678	75.5%	1.1%	1.868	2.157	3.055	63.5%	1.0%
Tonga	6.322	6.322	6.322	0.0%	0.0%	3.148	3.488	5.222	65.9%	1.0%	1.78	2.044	2.845	59.8%	0.9%
Samoa	6.289	6.289	6.289	0.0%	0.0%	3.155	3.839	6.551	107.6%	1.5%	2.617	2.809	3.763	43.8%	0.7%
Oceania	**7.822**	**7.807**	**7.804**	**-0.2%**	**0.0%**	**7.629**	**7.895**	**7.861**	**3.0%**	**0.1%**	**3.913**	**4.104**	**4.114**	**5.1%**	**0.1%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Economic Freedom Index					Government Corruption Perception Index					Government Effectiveness Index				
	Index Range: 1-10					Index Range: 1-10					Index Range: 0-5				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	5.1	5.1	5.1	0.0%	0.0%	2.835	6.56	7.745	173.2%	2.0%	2.336	3.921	4.534	94.1%	1.3%
Ukraine	5.5	5.5	5.5	0.0%	0.0%	2.801	4.594	8.053	187.5%	2.1%	1.976	2.787	4.212	113.2%	1.5%
Poland	6.1	6.1	6.1	0.0%	0.0%	3.787	6.681	10	164.1%	2.0%	3.24	4.312	5	54.3%	0.9%
Romania	5.7	5.7	5.7	0.0%	0.0%	3.228	4.759	7.037	118.0%	1.6%	2.495	3.159	4.091	64.0%	1.0%
Czech Republic	6.8	6.8	6.8	0.0%	0.0%	4.6	6.226	8.975	95.1%	1.3%	3.36	4.05	5	48.8%	0.8%
Belarus	6.619	6.619	6.619	0.0%	0.0%	2.898	4.927	7.955	174.5%	2.0%	1.593	2.658	4.087	156.6%	1.9%
Hungary	7.4	7.4	7.4	0.0%	0.0%	5.271	7.321	10	89.7%	1.3%	3.307	4.11	5	51.2%	0.8%
Bulgaria	6.3	6.3	6.3	0.0%	0.0%	4.222	5.769	9.408	122.8%	1.6%	2.594	3.23	4.642	79.0%	1.2%
Slovakia	6.6	6.6	6.6	0.0%	0.0%	4.629	5.928	8.394	81.3%	1.2%	3.353	3.842	4.753	41.8%	0.7%
Moldova, Rep. of	5.806	5.806	5.806	0.0%	0.0%	2.955	3.352	5.056	71.1%	1.1%	1.758	2.027	2.779	58.1%	0.9%
Europe-East	**5.77**	**5.598**	**5.697**	**-1.3%**	**0.0%**	**3.2**	**6.053**	**8.184**	**155.8%**	**1.9%**	**2.472**	**3.684**	**4.52**	**82.8%**	**1.2%**
United Kingdom	8.1	8.1	8.1	0.0%	0.0%	9.019	10	10	10.9%	0.2%	4.569	5	5	9.4%	0.2%
Sweden	7.3	7.3	7.3	0.0%	0.0%	9.966	10	10	0.3%	0.0%	4.767	5	5	4.9%	0.1%
Denmark	7.7	7.7	7.7	0.0%	0.0%	9.976	10	10	0.2%	0.0%	4.871	5	5	2.6%	0.1%
Ireland	7.9	7.9	7.9	0.0%	0.0%	8.846	10	10	13.0%	0.2%	4.644	5	5	7.7%	0.1%
Norway	7.3	7.3	7.3	0.0%	0.0%	9.829	10	10	1.7%	0.0%	5	5	5	0.0%	0.0%
Finland	7.6	7.6	7.6	0.0%	0.0%	10	10	10	0.0%	0.0%	4.829	5	5	3.5%	0.1%
Lithuania	6.8	6.8	6.8	0.0%	0.0%	5.186	7.295	10	92.8%	1.3%	3.357	4.117	5	48.9%	0.8%
Latvia	6.8	6.8	6.8	0.0%	0.0%	4.631	7.751	10	115.9%	1.6%	3.297	4.451	5	51.7%	0.8%
Estonia	7.8	7.8	7.8	0.0%	0.0%	7.045	10	10	41.9%	0.7%	3.68	4.797	5	35.9%	0.6%
Iceland	7.7	7.7	7.7	0.0%	0.0%	10	10	10	0.0%	0.0%	5	5	5	0.0%	0.0%
Europe-North	**7.871**	**7.865**	**7.88**	**0.1%**	**0.0%**	**8.99**	**9.873**	**10**	**11.2%**	**0.2%**	**4.561**	**4.96**	**5**	**9.6%**	**0.2%**
Italy	6.6	6.6	6.6	0.0%	0.0%	5.001	6.394	10	100.0%	1.4%	3.212	3.967	5	55.7%	0.9%
Spain	7.2	7.2	7.2	0.0%	0.0%	7.166	9.568	10	39.5%	0.7%	3.918	4.855	5	27.6%	0.5%
Greece	6.9	6.9	6.9	0.0%	0.0%	4.617	6.572	10	116.6%	1.6%	3.466	4.407	5	44.3%	0.7%
Portugal	7.1	7.1	7.1	0.0%	0.0%	6.511	7.994	10	53.6%	0.9%	3.547	4.09	5	41.0%	0.7%
Serbia	6.626	6.626	6.626	0.0%	0.0%	2.995	4.122	7.125	137.9%	1.7%	2.468	2.967	4.156	68.4%	1.0%
Croatia	6	6	6	0.0%	0.0%	3.633	5.17	9.555	163.0%	2.0%	2.909	3.548	5	71.9%	1.1%
Bosnia and Herzegovina	6.403	6.403	6.403	0.0%	0.0%	2.974	3.461	5.197	74.7%	1.1%	2.001	2.304	3.072	53.5%	0.9%
Albania	6.1	6.1	6.1	0.0%	0.0%	2.551	4.042	6.87	169.3%	2.0%	2.306	2.916	4.012	74.0%	1.1%
Macedonia, TFYR	5.6	5.6	5.6	0.0%	0.0%	2.753	2.98	4.392	59.5%	0.9%	2.375	2.533	3.109	30.9%	0.5%
Slovenia	6.3	6.3	6.3	0.0%	0.0%	6.502	9.098	10	53.8%	0.9%	3.617	4.661	5	38.2%	0.6%
Montenegro	6.537	6.537	6.537	0.0%	0.0%	3.689	4.813	8.635	134.1%	1.7%	2.346	2.849	4.349	85.4%	1.2%
Malta	6.7	6.7	6.7	0.0%	0.0%	6.875	9.197	10	45.5%	0.8%	3.627	4.487	5	37.9%	0.6%
Europe-South	**6.831**	**6.858**	**6.845**	**0.2%**	**0.0%**	**5.462**	**7.196**	**9.54**	**74.7%**	**1.1%**	**3.357**	**4.134**	**4.848**	**44.4%**	**0.7%**
Germany	7.5	7.5	7.5	0.0%	0.0%	8.388	10	10	19.2%	0.4%	4.024	5	5	24.3%	0.4%
France	6.9	6.9	6.9	0.0%	0.0%	7.742	10	10	29.2%	0.5%	4.095	5	5	22.1%	0.4%
Netherlands	7.7	7.7	7.7	0.0%	0.0%	8.96	10	10	11.6%	0.2%	4.687	5	5	6.7%	0.1%
Belgium	7.4	7.4	7.4	0.0%	0.0%	7.559	10	10	32.3%	0.6%	4.331	5	5	15.4%	0.3%
Austria	7.7	7.7	7.7	0.0%	0.0%	8.961	10	10	11.6%	0.2%	4.37	5	5	14.4%	0.3%
Switzerland	8.2	8.2	8.2	0.0%	0.0%	9.61	10	10	4.1%	0.1%	4.954	5	5	0.9%	0.0%
Luxembourg	7.8	7.8	7.8	0.0%	0.0%	9.841	10	10	1.6%	0.0%	5	5	5	0.0%	0.0%
Europe-West	**7.373**	**7.363**	**7.332**	**-0.6%**	**0.0%**	**8.256**	**10**	**10**	**21.1%**	**0.4%**	**4.178**	**5**	**5**	**19.7%**	**0.4%**

Governance

Base Case

Source: International Futures Version 6.12, March 2009

	Knowledge Society Index					Economic Integration Index					Globalization Index				
	Index Range: 0-100					Index Range: 0-100					Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
World	**57.47**	**66.01**	**79.14**	**37.7%**	**0.6%**	**11.06**	**12.25**	**14.34**	**29.7%**	**0.5%**	**39.77**	**53.7**	**63.07**	**58.6%**	**0.9%**
Africa	**12.34**	**24.98**	**45.53**	**269.0%**	**2.6%**	**9.758**	**10.12**	**9.446**	**-3.2%**	**-0.1%**	**43.66**	**54.27**	**56.5**	**29.4%**	**0.5%**
Americas	**69.24**	**75.79**	**82.65**	**19.4%**	**0.4%**	**7.446**	**11.51**	**15.46**	**107.6%**	**1.5%**	**46.85**	**60.1**	**72.94**	**55.7%**	**0.9%**
Asia with Oceania	**47.59**	**58.6**	**79.34**	**66.7%**	**1.0%**	**7.339**	**9.672**	**12.61**	**71.8%**	**1.1%**	**33.83**	**48.1**	**60.71**	**79.5%**	**1.2%**
Europe	**55.71**	**71.78**	**83.01**	**49.0%**	**0.8%**	**21.02**	**19.85**	**20.72**	**-1.4%**	**0.0%**	**59.03**	**81.76**	**89.24**	**51.2%**	**0.8%**
World	**57.47**	**66.01**	**79.14**	**37.7%**	**0.6%**	**11.06**	**12.25**	**14.34**	**29.7%**	**0.5%**	**39.77**	**53.7**	**63.07**	**58.6%**	**0.9%**
Africa-Eastern	**3.85**	**14.95**	**41.27**	**971.9%**	**4.9%**	**6.607**	**9.601**	**9.845**	**49.0%**	**0.8%**	**40.05**	**50.78**	**56.26**	**40.5%**	**0.7%**
Africa-Middle	**5.704**	**14.03**	**17.02**	**198.4%**	**2.2%**	**27.47**	**22.16**	**17.88**	**-34.9%**	**-0.9%**	**40.88**	**52.57**	**51.4**	**25.7%**	**0.5%**
Africa-Northern	**14.29**	**28.13**	**50.19**	**251.2%**	**2.5%**	**8.384**	**8.05**	**8.33**	**-0.6%**	**0.0%**	**49.43**	**56.15**	**57.38**	**16.1%**	**0.3%**
Africa-Southern	**19.06**	**38.11**	**67.79**	**255.7%**	**2.6%**	**5.507**	**7.032**	**8.398**	**52.5%**	**0.8%**	**42.31**	**50.82**	**74.41**	**75.9%**	**1.1%**
Africa-Western	**4.908**	**12.52**	**20.6**	**319.7%**	**2.9%**	**14.65**	**15.36**	**9.934**	**-32.2%**	**-0.8%**	**44.97**	**58.35**	**57.49**	**27.8%**	**0.5%**
Africa	**12.34**	**24.98**	**45.53**	**269.0%**	**2.6%**	**9.758**	**10.12**	**9.446**	**-3.2%**	**-0.1%**	**43.66**	**54.27**	**56.5**	**29.4%**	**0.5%**
America-Caribbean	**29.36**	**51.28**	**72.01**	**145.3%**	**1.8%**	**9.29**	**10.8**	**14.21**	**53.0%**	**0.9%**	**34.29**	**50.92**	**68.84**	**100.8%**	**1.4%**
America-Central	**13.83**	**33.08**	**58**	**319.4%**	**2.9%**	**11.24**	**11.39**	**12.9**	**14.8%**	**0.3%**	**53.78**	**61.76**	**67.26**	**25.1%**	**0.4%**
America-North	**76.03**	**82.8**	**88.26**	**16.1%**	**0.3%**	**7.334**	**12.12**	**17.29**	**135.8%**	**1.7%**	**60.45**	**76.64**	**86.08**	**42.4%**	**0.7%**
America-South	**22.45**	**41.05**	**65.59**	**192.2%**	**2.2%**	**7.933**	**8.125**	**9.17**	**15.6%**	**0.3%**	**31.9**	**42.65**	**59.91**	**87.8%**	**1.3%**
Americas	**69.24**	**75.79**	**82.65**	**19.4%**	**0.4%**	**7.446**	**11.51**	**15.46**	**107.6%**	**1.5%**	**46.85**	**60.1**	**72.94**	**55.7%**	**0.9%**
Asia-East	**55.43**	**67.08**	**90.46**	**63.2%**	**1.0%**	**5.719**	**9.329**	**14.68**	**156.7%**	**1.9%**	**32.18**	**57.54**	**80.23**	**149.3%**	**1.8%**
Asia-South Central	**15.82**	**34.42**	**58.26**	**268.3%**	**2.6%**	**3.168**	**5.002**	**5.558**	**75.4%**	**1.1%**	**31.4**	**39.49**	**48.56**	**54.6%**	**0.9%**
Asia-South East	**22.94**	**35.59**	**51.41**	**124.1%**	**1.6%**	**21.56**	**18.82**	**15.48**	**-28.2%**	**-0.7%**	**42.6**	**47.89**	**54.31**	**27.5%**	**0.5%**
Asia-West	**34.89**	**54.14**	**74.54**	**113.6%**	**1.5%**	**11.78**	**13.33**	**14**	**18.8%**	**0.3%**	**36.37**	**52.36**	**62.06**	**70.6%**	**1.1%**
Oceania	**63.5**	**76.03**	**82.87**	**30.5%**	**0.5%**	**9.723**	**12.94**	**16.19**	**66.5%**	**1.0%**	**64.14**	**81.53**	**84.11**	**31.1%**	**0.5%**
Asia with Oceania	**47.59**	**58.6**	**79.34**	**66.7%**	**1.0%**	**7.339**	**9.672**	**12.61**	**71.8%**	**1.1%**	**33.83**	**48.1**	**60.71**	**79.5%**	**1.2%**
Europe-East	**46.08**	**68.02**	**79.57**	**72.7%**	**1.1%**	**13.93**	**13.28**	**15.84**	**13.7%**	**0.3%**	**47.56**	**65.71**	**73.79**	**55.2%**	**0.9%**
Europe-North	**65.38**	**79.48**	**87.69**	**34.1%**	**0.6%**	**27.57**	**26.16**	**25.65**	**-7.0%**	**-0.1%**	**75.7**	**98.46**	**100.8**	**33.2%**	**0.6%**
Europe-South	**46.35**	**59.47**	**73.53**	**58.6%**	**0.9%**	**10.43**	**11.82**	**12.93**	**24.0%**	**0.4%**	**52.52**	**75.73**	**90.66**	**72.6%**	**1.1%**
Europe-West	**56.38**	**73.63**	**84.67**	**50.2%**	**0.8%**	**23.68**	**22.11**	**22.21**	**-6.2%**	**-0.1%**	**72.84**	**98.35**	**100.7**	**38.2%**	**0.6%**
Europe	**55.71**	**71.78**	**83.01**	**49.0%**	**0.8%**	**21.02**	**19.85**	**20.72**	**-1.4%**	**0.0%**	**59.03**	**81.76**	**89.24**	**51.2%**	**0.8%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Knowledge Society Index Index Range: 0-100					Economic Integration Index Index Range: 0-100					Globalization Index Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA															
Ethiopia	1.599	1.821	15.88	893.1%	4.7%	6.071	11.33	7.867	29.6%	0.5%	45.99	54.2	50.35	9.5%	0.2%
Uganda	10.89	21.86	47.87	339.6%	3.0%	4.782	8.201	5.88	23.0%	0.4%	48.27	61.65	67.98	40.8%	0.7%
Tanzania, United Rep. of	1.566	12.37	38.95	2387.2%	6.6%	6.66	7.948	7.914	18.8%	0.3%	35.01	47.13	65.05	85.8%	1.2%
Kenya	2.585	12.34	32.39	1153.0%	5.2%	3.53	5.812	5.147	45.8%	0.8%	36.39	46.79	52.09	43.1%	0.7%
Madagascar	2.584	5.328	17.23	566.8%	3.9%	3.982	9.595	8.606	116.1%	1.6%	35.63	46.93	49.64	39.3%	0.7%
Mozambique	6.872	20.36	59.11	760.2%	4.4%	11.33	13.86	19.51	72.2%	1.1%	41.79	50.73	78.46	87.7%	1.3%
Malawi	0.692	1.256	13.43	1840.8%	6.1%	3.307	6.984	5.124	54.9%	0.9%	34.38	45.21	47.79	39.0%	0.7%
Zambia	2.245	9.655	24.81	1005.1%	4.9%	15.51	15.95	14.49	-6.6%	-0.1%	39.38	49.46	56.83	44.3%	0.7%
Burundi	3.9	3.968	18.26	368.2%	3.1%	1.831	10.19	6.359	247.3%	2.5%	32.39	45.63	48.57	50.0%	0.8%
Rwanda	1.526	5.757	19.84	1200.1%	5.3%	1.697	5.05	6.512	283.7%	2.7%	32.88	44.81	50.28	52.9%	0.9%
Somalia	0.459	0.498	0.631	37.5%	0.6%	19.44	34.48	33.02	69.9%	1.1%	19.55	35.01	34.98	78.9%	1.2%
Zimbabwe	2.22	14.58	28.49	1183.3%	5.2%	8.182	10.4	8.286	1.3%	0.0%	44.25	51.85	57.63	30.2%	0.5%
Eritrea	1.128	1.094	1.651	46.4%	0.8%	14.54	15.99	18.54	27.5%	0.5%	41.53	50.97	50.88	22.5%	0.4%
Mauritius	9.095	32.69	63.78	601.3%	4.0%	9.282	11.74	14.88	60.3%	0.9%	49.29	60.82	77.28	56.8%	0.9%
Comoros	1.784	7.397	22.48	1160.1%	5.2%	1.834	5.754	4.909	167.7%	2.0%	49.27	57.86	53.48	8.5%	0.2%
Djibouti	2.901	10.24	24.05	729.0%	4.3%	7.199	8.988	8.844	22.9%	0.4%	37.43	48.19	53.79	43.7%	0.7%
Africa-Eastern	**3.85**	**14.95**	**41.27**	**971.9%**	**4.9%**	**6.607**	**9.601**	**9.845**	**49.0%**	**0.8%**	**40.05**	**50.78**	**56.26**	**40.5%**	**0.7%**
Congo; Dem. Rep. of	0.448	0.638	7.192	1505.4%	5.7%	26.01	33.58	24.5	-5.8%	-0.1%	40.63	52.82	52.2	28.5%	0.5%
Angola	6.513	16.99	21.71	233.3%	2.4%	36.35	23.43	19.2	-47.2%	-1.3%	45.79	56.75	46.98	2.6%	0.1%
Cameroon	3.303	10.68	22.1	569.1%	3.9%	5.085	6.465	5.552	9.2%	0.2%	33.99	47.22	52.17	53.5%	0.9%
Chad	2.115	8.302	10.24	384.2%	3.2%	33.34	22.35	15.91	-52.3%	-1.5%	43.15	51.42	50.54	17.1%	0.3%
Central African Republic	3.351	5.368	15.59	365.2%	3.1%	1.564	7.32	5.523	253.1%	2.6%	35.01	45.27	47.84	36.6%	0.6%
Congo, Rep. of	1.82	12.31	17.83	879.7%	4.7%	32.85	27.04	19.59	-40.4%	-1.0%	47.67	56.25	56.34	18.2%	0.3%
Gabon	1.995	16.31	29.93	1400.3%	5.6%	22.35	19	23.47	5.0%	0.1%	48.83	56.27	59.05	20.9%	0.4%
Equatorial Guinea	26.9	39.59	40.26	49.7%	0.8%	56.3	45.42	43.44	-22.8%	-0.5%	60.33	84.62	65.09	7.9%	0.2%
São Tomé and Príncipe	4.667	6.454	16.05	243.9%	2.5%	6.655	9.85	7.651	15.0%	0.3%	41.22	47.16	49.1	19.1%	0.4%
Africa-Middle	**5.704**	**14.03**	**17.02**	**198.4%**	**2.2%**	**27.47**	**22.16**	**17.88**	**-34.9%**	**-0.9%**	**40.88**	**52.57**	**51.4**	**25.7%**	**0.5%**
Egypt	9.876	25.13	53.41	440.8%	3.4%	7.205	7.34	8.692	20.6%	0.4%	59.5	64.98	64.94	9.1%	0.2%
Sudan	6.543	18.14	28.2	331.0%	3.0%	7.806	5.217	6.082	-22.1%	-0.5%	36.05	48.77	55.04	52.7%	0.8%
Algeria	13.7	24.98	34.88	154.6%	1.9%	10.78	6.591	5.88	-45.5%	-1.2%	40.09	40.04	40.22	0.3%	0.0%
Morocco	13.32	24.04	41.29	210.0%	2.3%	5.435	6.193	6.535	20.2%	0.4%	53.97	59.18	53.39	-1.1%	0.0%
Tunisia	19.49	38.23	69.97	259.0%	2.6%	11.55	11.31	13.12	13.6%	0.3%	61.31	74.47	81.39	32.8%	0.6%
Libyan Arab Jamahiriya	29.89	45.83	50	67.3%	1.0%	9.8	13.52	5.506	-43.8%	-1.1%	15.45	43.98	47.24	205.8%	2.3%
Africa-Northern	**14.29**	**28.13**	**50.19**	**251.2%**	**2.5%**	**8.384**	**8.05**	**8.33**	**-0.6%**	**0.0%**	**49.43**	**56.15**	**57.38**	**16.1%**	**0.3%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Knowledge Society Index Index Range: 0-100					Economic Integration Index Index Range: 0-100					Globalization Index Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AFRICA continued															
South Africa	19.74	37.55	67.98	244.4%	2.5%	4.803	6.192	7.383	53.7%	0.9%	40.67	48.34	73.74	81.3%	1.2%
Namibia	9.917	27.64	66.38	569.4%	3.9%	4.826	4.511	8.3	72.0%	1.1%	43.51	57.35	82.27	89.1%	1.3%
Lesotho	3.516	13.53	33.87	863.3%	4.6%	39.86	31.91	22.22	-44.3%	-1.2%	61.74	69.77	77.78	26.0%	0.5%
Botswana	14.78	51.86	76.01	414.3%	3.3%	11.23	12.94	17.07	52.0%	0.8%	51.43	67.04	81	57.5%	0.9%
Swaziland	7.786	23.63	48.56	523.7%	3.7%	27.89	24.24	20.32	-27.1%	-0.6%	61.33	70.57	66.92	9.1%	0.2%
Africa-Southern	**19.06**	**38.11**	**67.79**	**255.7%**	**2.6%**	**5.507**	**7.032**	**8.398**	**52.5%**	**0.8%**	**42.31**	**50.82**	**74.41**	**75.9%**	**1.1%**
Nigeria	6.181	14.23	16.86	172.8%	2.0%	19.54	18.42	14.08	-27.9%	-0.7%	46.08	64.98	65.5	42.1%	0.7%
Niger	0.962	1.306	14.76	1434.3%	5.6%	3.367	10.48	6.546	94.4%	1.3%	46.77	51.96	49.14	5.1%	0.1%
Côte d'Ivoire	4.533	11.98	22.28	391.5%	3.2%	10.49	11.31	10.06	-4.1%	-0.1%	38.43	42.87	29.49	-23.3%	-0.5%
Ghana	3.881	7.585	16.66	329.3%	3.0%	9.35	9.772	9.808	4.9%	0.1%	43.2	51.09	51.25	18.6%	0.3%
Burkina Faso	3.198	10.7	27.54	761.2%	4.4%	-0.154	4.862	2.395	1655.2%		39.51	47.84	53	34.1%	0.6%
Mali	1.42	7.399	21.48	1412.7%	5.6%	7.043	12.09	7.835	11.2%	0.2%	49.26	61.38	56.03	13.7%	0.3%
Senegal	1.001	8.217	22.13	2110.8%	6.4%	5.878	7.245	6.1	3.8%	0.1%	38.02	47.07	51.96	36.7%	0.6%
Guinea	3.06	11.02	23.37	663.7%	4.1%	3.679	9.117	9.052	146.0%	1.8%	48.25	53.55	54.69	13.3%	0.3%
Benin	2.588	7.792	21.56	733.1%	4.3%	5.679	10.74	5.579	-1.8%	0.0%	49.38	61.19	54.37	10.1%	0.2%
Togo	7.559	7.104	11.73	55.2%	0.9%	12.99	14.97	15.76	21.3%	0.4%	55.07	61.37	54.13	-1.7%	0.0%
Sierra Leone	1.07	7.453	23.4	2086.9%	6.4%	3.656	7.604	7.605	108.0%	1.5%	34.46	46.31	52.63	52.7%	0.9%
Liberia	8.039	7.361	11.79	46.7%	0.8%	44.26	40.1	27.94	-36.9%	-0.9%	45.26	54.85	52.95	17.0%	0.3%
Mauritania	2.382	6.955	17.22	622.9%	4.0%	14.03	16.38	16.61	18.4%	0.3%	43.53	51.99	53.98	24.0%	0.4%
Guinea-Bissau	0.544	0.666	5.273	869.3%	4.6%	8.634	14.72	13.52	56.6%	0.9%	50.19	60.96	62.14	23.8%	0.4%
Gambia	1.502	5.861	15.76	949.3%	4.8%	21.74	19.86	14.65	-32.6%	-0.8%	43.18	50.21	51.75	19.8%	0.4%
Cape Verde	4.561	21.86	53.61	1075.4%	5.1%	8.912	8.151	9.328	4.7%	0.1%	59.28	71.45	95.15	60.5%	1.0%
Africa-Western	**4.908**	**12.52**	**20.6**	**319.7%**	**2.9%**	**14.65**	**15.36**	**9.934**	**-32.2%**	**-0.8%**	**44.97**	**58.35**	**57.49**	**27.8%**	**0.5%**

Governance

Base Case: Countries in Year 2060	Knowledge Society Index					Economic Integration Index					Globalization Index				
	Index Range: 0-100					Index Range: 0-100					Index Range: 0-100				
Descending Population Sequence	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
AMERICAS															
Haiti	1.81	6.77	15.89	777.9%	4.4%	3.818	5.812	5.575	46.0%	0.8%	50.26	59.73	62.87	25.1%	0.4%
Dominican Republic	24	39.77	65.38	172.4%	2.0%	11.99	11.45	12.61	5.2%	0.1%	44.55	54.27	75.93	70.4%	1.1%
Cuba	21.17	34.79	73.64	247.9%	2.5%	3.324	5.07	10.4	212.9%	2.3%	8.731	25.87	67.99	678.7%	4.2%
Puerto Rico	43.76	72.77	84.14	92.3%	1.3%	4.272	9.017	17.01	298.2%	2.8%	26.62	69.14	75.89	185.1%	2.1%
Jamaica	8.902	18.79	36.7	312.3%	2.9%	20.63	17.38	14.19	-31.2%	-0.7%	53.03	50.74	54.69	3.1%	0.1%
Trinidad and Tobago	9.124	44.49	65.68	619.9%	4.0%	30.45	24.54	27.4	-10.0%	-0.2%	36.87	68.63	82.02	122.5%	1.6%
Bahamas	23.85	44.05	72.44	203.7%	2.2%	9.381	11.25	14.65	56.2%	0.9%	47.16	59.88	79.82	69.3%	1.1%
Barbados	30.53	47.16	78.13	155.9%	1.9%	9.934	11.69	16.77	68.8%	1.1%	71.16	76.49	94.87	33.3%	0.6%
St. Vincent & the Grenadines	23.63	32.8	56.26	138.1%	1.8%	39	30.48	23.58	-39.5%	-1.0%	58.22	68.16	68.52	17.7%	0.3%
Grenada	31.75	37.92	60.05	89.1%	1.3%	33.86	26.9	21.43	-36.7%	-0.9%	59.87	69.22	88.66	48.1%	0.8%
St. Lucia	9.71	27.26	56.34	480.2%	3.6%	35.79	29.53	24.13	-32.6%	-0.8%	38.2	45.99	64.5	68.8%	1.1%
America-Caribbean	**29.36**	**51.28**	**72.01**	**145.3%**	**1.8%**	**9.29**	**10.8**	**14.21**	**53.0%**	**0.9%**	**34.29**	**50.92**	**68.84**	**100.8%**	**1.4%**
Guatemala	5.912	17.56	38.45	550.4%	3.8%	4.169	5.185	5.409	29.7%	0.5%	55.58	56.19	54.27	-2.4%	0.0%
Honduras	6.06	16.7	33.68	455.8%	3.5%	12.58	11.68	10.63	-15.5%	-0.3%	57.07	67.25	76.84	34.6%	0.6%
El Salvador	9.976	24.65	48.93	390.5%	3.2%	7.602	7.48	8.159	7.3%	0.1%	59.12	65.77	69.53	17.6%	0.3%
Nicaragua	6.562	15.25	29.23	345.4%	3.0%	13.75	12.04	9.545	-30.6%	-0.7%	56.21	65.28	72.24	28.5%	0.5%
Costa Rica	17.77	45.19	76.91	332.8%	3.0%	13.2	12.56	17.08	29.4%	0.5%	45.1	69.77	91.36	102.6%	1.4%
Panama	29.59	49.6	77.4	161.6%	1.9%	20.44	19.64	22.38	9.5%	0.2%	34.14	52.25	80.79	136.6%	1.7%
Belize	9.057	34.29	72.69	702.6%	4.3%	15.91	15.69	17.6	10.6%	0.2%	63.83	69.38	86.75	35.9%	0.6%
America-Central	**13.83**	**33.08**	**58**	**319.4%**	**2.9%**	**11.24**	**11.39**	**12.9**	**14.8%**	**0.3%**	**53.78**	**61.76**	**67.26**	**25.1%**	**0.4%**
United States of America	80.27	86.3	91.07	13.5%	0.3%	6.362	11.74	17.58	176.3%	2.1%	68.13	83.18	89.1	30.8%	0.5%
Mexico	19.2	34.6	57.19	197.9%	2.2%	9.58	9.535	9.735	1.6%	0.0%	33.45	51.89	72.27	116.1%	1.6%
Canada	64.24	76.97	83.98	30.7%	0.5%	18.47	19.52	21.24	15.0%	0.3%	76.92	97.09	101.2	31.6%	0.6%
America-North	**76.03**	**82.8**	**88.26**	**16.1%**	**0.3%**	**7.334**	**12.12**	**17.29**	**135.8%**	**1.7%**	**60.45**	**76.64**	**86.08**	**42.4%**	**0.7%**
Brazil	24.56	40.22	67.04	173.0%	2.0%	5.448	5.251	6.586	20.9%	0.4%	18.24	34.78	59.4	225.7%	2.4%
Colombia	11.27	25.72	54.14	380.4%	3.2%	10.03	8.747	6.989	-30.3%	-0.7%	59.58	50	58.08	-2.5%	-0.1%
Argentina	18.17	43.13	72.22	297.5%	2.8%	7.314	8.269	11.04	50.9%	0.8%	29.48	52.85	77.19	161.8%	1.9%
Venezuela, RB	22.6	37.33	50.32	122.7%	1.6%	12	11.54	8.186	-31.8%	-0.8%	34.5	44.36	52.46	52.1%	0.8%
Peru	22.68	34.53	50.07	120.8%	1.6%	6.437	5.107	5.318	-17.4%	-0.4%	57.87	47.92	52.81	-8.7%	-0.2%
Chile	38.1	63.54	81.23	113.2%	1.5%	19.42	19.4	23.72	22.1%	0.4%	33.03	62.14	78.69	138.2%	1.8%
Ecuador	7.044	16.58	26.03	269.5%	2.6%	13.66	9.331	7.547	-44.8%	-1.2%	41.36	35.74	31.19	-24.6%	-0.6%
Bolivia	16.2	30.12	46.99	190.1%	2.2%	16.66	11.5	9.421	-43.5%	-1.1%	59.28	64.36	73.79	24.5%	0.4%
Paraguay	13.39	19.84	33.94	153.5%	1.9%	9.004	9.487	9.13	1.4%	0.0%	52.42	46.56	38.99	-25.6%	-0.6%
Uruguay	16.9	38.47	70.91	319.6%	2.9%	6.772	7.303	10.37	53.1%	0.9%	33.28	49.64	75.71	127.5%	1.7%
Guyana	7.675	21.44	43.86	471.5%	3.5%	35.95	31.54	26.74	-25.6%	-0.6%	69.74	77.36	89.67	28.6%	0.5%
Suriname	9.551	28.08	51.93	443.7%	3.4%	1.981	3.247	6.388	222.5%	2.4%	47.3	63.96	62.6	32.3%	0.6%
America-South	**22.45**	**41.05**	**65.59**	**192.2%**	**2.2%**	**7.933**	**8.125**	**9.17**	**15.6%**	**0.3%**	**31.9**	**42.65**	**59.91**	**87.8%**	**1.3%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Knowledge Society Index Index Range: 0-100					Economic Integration Index Index Range: 0-100					Globalization Index Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA															
China	27.94	56.69	89.43	220.1%	2.4%	8.028	9.587	14.61	82.0%	1.2%	29.97	55.37	80.76	169.5%	2.0%
Japan	68.48	85.42	94.17	37.5%	0.6%	1.678	5.65	12.33	634.8%	4.1%	50.39	78.26	83.56	65.8%	1.0%
Korea, Rep. of	84.4	107.2	112	32.7%	0.6%	7.054	11.24	18.29	159.3%	1.9%	42.53	77.6	79.75	87.5%	1.3%
Taiwan	47.12	69.99	84.84	80.1%	1.2%	4.228	7.507	15.34	262.8%	2.6%	40.55	71.71	82.45	103.3%	1.4%
Korea, Dem. Rep. of	15.12	20.35	26.93	78.1%	1.2%	6.46	6.421	11.55	78.8%	1.2%	8.821	17.82	23.3	164.1%	2.0%
Hong Kong	24.05	42.94	57.29	138.2%	1.8%	58.56	50.69	41.24	-29.6%	-0.7%	83.96	97.16	97.55	16.2%	0.3%
Mongolia	29.48	37.31	54.91	86.3%	1.3%	16.31	17.48	20.93	28.3%	0.5%	58.05	68.55	76.32	31.5%	0.5%
Asia-East	**55.43**	**67.08**	**90.46**	**63.2%**	**1.0%**	**5.719**	**9.329**	**14.68**	**156.7%**	**1.9%**	**32.18**	**57.54**	**80.23**	**149.3%**	**1.8%**
India	16.62	34.67	61.21	268.3%	2.6%	1.558	2.647	5.292	239.7%	2.5%	27.38	32.89	51.21	87.0%	1.3%
Pakistan	4.448	13.41	26.74	501.2%	3.7%	1.348	3	2.548	89.0%	1.3%	36.19	44.42	31.32	-13.5%	-0.3%
Bangladesh	11.56	22.82	35.32	205.5%	2.3%	0.451	2.408	2.94	551.9%	3.8%	46.66	60.18	51	9.3%	0.2%
Afghanistan	0.695	0.819	6.005	764.0%	4.4%	2.005	6.366	13	548.4%	3.8%	35.36	44.56	48.22	36.4%	0.6%
Iran, Islamic Rep. of	21.05	43.12	53.82	155.7%	1.9%	7.382	15.64	7.367	-0.2%	0.0%	26.43	48.44	49.11	85.8%	1.2%
Nepal	8.992	15.47	26.67	196.6%	2.2%	0.844	3.353	3.481	312.4%	2.9%	47.86	59.08	63.29	32.2%	0.6%
Uzbekistan	10.82	18.83	27.17	151.1%	1.9%	5.658	4.275	6.518	15.2%	0.3%	40.03	46.9	31.88	-20.4%	-0.5%
Sri Lanka	4.424	22.5	46.78	957.4%	4.8%	6.426	7.448	8.909	38.6%	0.7%	54.31	69.78	81.78	50.6%	0.8%
Kazakhstan	30.17	59.45	61.34	103.3%	1.4%	23.88	28.61	32.25	35.1%	0.6%	48.97	74.58	71.64	46.3%	0.8%
Tajikistan	8.27	15.26	28.15	240.4%	2.5%	10.09	9.167	6.043	-40.1%	-1.0%	49.79	62.65	67.45	35.5%	0.6%
Turkmenistan	15.39	40.72	35.97	133.7%	1.7%	23.08	29.06	44.53	92.9%	1.3%	29.15	45.51	44.13	51.4%	0.8%
Kyrgyzstan	25.35	29.77	36.94	45.7%	0.8%	11.96	12.38	11.27	-5.8%	-0.1%	56.48	64.13	66.1	17.0%	0.3%
Bhutan	6.398	25.52	57.73	802.3%	4.5%	3.524	6.247	8.781	149.2%	1.8%	38.45	56.46	84.17	118.9%	1.6%
Maldives	21.21	43.99	79.9	276.7%	2.7%	14.27	14.27	22.1	54.9%	0.9%	47.24	68.93	109.8	132.4%	1.7%
Asia-South Central	**15.82**	**34.42**	**58.26**	**268.3%**	**2.6%**	**3.168**	**5.002**	**5.558**	**75.4%**	**1.1%**	**31.4**	**39.49**	**48.56**	**54.6%**	**0.9%**
Indonesia	12.16	22.32	35.81	194.5%	2.2%	4.394	4.331	5.061	15.2%	0.3%	47.43	44.67	46.98	-0.9%	0.0%
Philippines	20.81	30.73	45.94	120.8%	1.6%	9.953	10	9.717	-2.4%	0.0%	50.02	46.38	51.4	2.8%	0.1%
Vietnam	12.65	28.29	47.24	273.4%	2.7%	17.63	16.32	15.59	-11.6%	-0.2%	62.88	76.19	72.68	15.6%	0.3%
Thailand	31.28	43.68	62.67	100.4%	1.4%	16.64	15.98	16.2	-2.6%	-0.1%	17.32	33.99	55.16	218.5%	2.3%
Myanmar	3.331	13.41	24.69	641.2%	4.1%	1.96	5.181	7.888	302.4%	2.8%	0.103	14.55	20.46	19764.1%	11.2%
Malaysia	24.43	47.63	72.8	198.0%	2.2%	27.04	28.15	27.03	0.0%	0.0%	43.72	57.46	81.06	85.4%	1.2%
Cambodia	5.062	20.48	36.84	627.8%	4.0%	14.22	15.82	14.99	5.4%	0.1%	50.6	56.23	67.03	32.5%	0.6%
Lao PDR	5.735	24.13	54.3	846.8%	4.6%	6.279	9.97	11.2	78.4%	1.2%	38.79	53.41	82.08	111.6%	1.5%
Singapore	49.73	62.96	72.54	45.9%	0.8%	76.93	70.68	58.94	-23.4%	-0.5%	85	100.9	103.2	21.4%	0.4%
Timor-Leste	3.913	12.75	31.79	712.4%	4.3%	3.382	9.729	7.357	117.5%	1.6%	37.08	48.8	59.67	60.9%	1.0%
Brunei Darussalam	6.984	24.74	41.64	496.2%	3.6%	14.71	19.69	19.82	34.7%	0.6%	63.23	80.54	87.18	37.9%	0.6%
Asia-South East	**22.94**	**35.59**	**51.41**	**124.1%**	**1.6%**	**21.56**	**18.82**	**15.48**	**-28.2%**	**-0.7%**	**42.6**	**47.89**	**54.31**	**27.5%**	**0.5%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Knowledge Society Index Index Range: 0-100					Economic Integration Index Index Range: 0-100					Globalization Index Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
ASIA WITH OCEANIA continued															
Turkey	25.46	45.1	77.61	204.8%	2.3%	4.298	5.613	9.718	126.1%	1.6%	25.41	44.05	74.74	194.1%	2.2%
Yemen	6.484	18.48	31.39	384.1%	3.2%	8.988	7.102	6.743	-25.0%	-0.6%	54.3	62.8	42.6	-21.5%	-0.5%
Iraq	12.5	26.14	43.5	248.0%	2.5%	6.183	12.78	10.36	67.6%	1.0%	7.8	22.13	34.72	345.1%	3.0%
Saudi Arabia	33.04	53.02	70.83	114.4%	1.5%	15.19	16.21	15.48	1.9%	0.0%	36.26	65.6	82.72	128.1%	1.7%
Syria	8.911	19.86	38.93	336.9%	3.0%	5.332	5.451	7.005	31.4%	0.5%	42.08	38.05	37.76	-10.3%	-0.2%
Israel	84.77	109.2	115.9	36.7%	0.6%	12.17	14.97	22.52	85.0%	1.2%	69.69	96.38	91.88	31.8%	0.6%
Azerbaijan	10.99	31.07	42.85	289.9%	2.8%	42.34	40.52	32.11	-24.2%	-0.6%	67	85.27	71.13	6.2%	0.1%
Jordan	29.78	46.09	85.05	185.6%	2.1%	16.68	13.66	17.07	2.3%	0.0%	47.45	63.72	107.8	127.2%	1.7%
Palestine	17.52	25.85	43.73	149.6%	1.8%	2.612	4.169	5.026	92.4%	1.3%	55.06	66.63	71.17	29.3%	0.5%
United Arab Emirates	33.92	58.53	72.48	113.7%	1.5%	13.7	19.92	25.38	85.3%	1.2%	52.38	83.87	92.51	76.6%	1.1%
Oman	27.99	45.69	64.16	129.2%	1.7%	14.7	10.91	11.25	-23.5%	-0.5%	40.55	60.41	72.18	78.0%	1.2%
Kuwait	8.075	32.75	47.43	487.4%	3.6%	14.66	24.88	25.24	72.2%	1.1%	47.02	82.99	92.47	96.7%	1.4%
Lebanon	34.85	47.35	69.05	98.1%	1.4%	15.98	13.12	13.03	-18.5%	-0.4%	66.9	83.48	86.69	29.6%	0.5%
Georgia	29.81	38.54	49.61	66.4%	1.0%	11.94	11.07	11.11	-7.0%	-0.1%	58.85	70.71	77.9	32.4%	0.6%
Armenia	21.5	43.01	62.08	188.7%	2.1%	34.45	28.25	23.23	-32.6%	-0.8%	55.46	77.27	90.86	63.8%	1.0%
Bahrain	43.02	60.48	73.55	71.0%	1.1%	27.2	24.4	19.18	-29.5%	-0.7%	82.31	96.54	95.19	15.6%	0.3%
Qatar	16.49	41.93	51.63	213.1%	2.3%	18.53	36.61	55.64	200.3%	2.2%	50.81	87.74	102.1	100.9%	1.4%
Cyprus	28.05	50.74	65.6	133.9%	1.7%	22.69	22	22.17	-2.3%	0.0%	63.71	82.14	83.15	30.5%	0.5%
Asia-West	**34.89**	**54.14**	**74.54**	**113.6%**	**1.5%**	**11.78**	**13.33**	**14**	**18.8%**	**0.3%**	**36.37**	**52.36**	**62.06**	**70.6%**	**1.1%**
Australia	64.2	76.72	82.95	29.2%	0.5%	8.97	12.56	16.05	78.9%	1.2%	72.56	94.83	98.92	36.3%	0.6%
Papua New Guniea	2.177	14.13	23.01	957.0%	4.8%	18.48	17.67	11.43	-38.1%	-1.0%	42.95	52.07	54.37	26.6%	0.5%
New Zealand	64.28	80.84	92.04	43.2%	0.7%	14.7	15.12	17.89	21.7%	0.4%	58.22	83	91.32	56.9%	0.9%
Solomon Islands	7.826	12.23	19.8	153.0%	1.9%	19.27	14.89	11.87	-38.4%	-1.0%	53.66	58.84	56.17	4.7%	0.1%
Fiji	10.32	21.68	46.21	347.8%	3.0%	17.05	15.78	14.41	-15.5%	-0.3%	61.68	71.66	70.47	14.3%	0.3%
Vanuatu	4.776	15.98	35.84	650.4%	4.1%	33.77	27.64	19.57	-42.0%	-1.1%	63.35	71.09	72.78	14.9%	0.3%
Micronesia	9.827	19.66	41.92	326.6%	2.9%	4.539	4.999	7.052	55.4%	0.9%	44.19	53.87	69.16	56.5%	0.9%
Tonga	5.746	16.36	39.17	581.7%	3.9%	2.157	4.106	5.328	147.0%	1.8%	42.4	52.85	65.36	54.2%	0.9%
Samoa	6.412	20.23	50.45	686.8%	4.2%	7.117	7.807	9.156	28.6%	0.5%	44.53	57.28	76.51	71.8%	1.1%
Oceania	**63.5**	**76.03**	**82.87**	**30.5%**	**0.5%**	**9.723**	**12.94**	**16.19**	**66.5%**	**1.0%**	**64.14**	**81.53**	**84.11**	**31.1%**	**0.5%**

Governance

Base Case: Countries in Year 2060 Descending Population Sequence	Knowledge Society Index Index Range: 0-100					Economic Integration Index Index Range: 0-100					Globalization Index Index Range: 0-100				
	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg	2010	2035	2060	% Chg	% An Chg
EUROPE															
Russian Federation	48.65	73.91	80.21	64.9%	1.0%	14.37	13.82	17.86	24.3%	0.4%	40.54	66.61	71.51	76.4%	1.1%
Ukraine	43.7	60.05	81.95	87.5%	1.3%	10.79	10.65	13.24	22.7%	0.4%	43.09	50.39	64.22	49.0%	0.8%
Poland	46.88	66.29	84.22	79.7%	1.2%	9.542	10.39	13.45	41.0%	0.7%	62.95	73.51	82.88	31.7%	0.6%
Romania	30.29	43.37	58.82	94.2%	1.3%	9.571	9.448	9.971	4.2%	0.1%	65.33	75.16	74.1	13.4%	0.3%
Czech Republic	45.53	57.45	74.65	64.0%	1.0%	20.71	19.21	18.62	-10.1%	-0.2%	49.46	67.34	87.81	77.5%	1.2%
Belarus	50.98	66.4	84.45	65.7%	1.0%	9.751	9.489	11.29	15.8%	0.3%	39.94	55.79	78.56	96.7%	1.4%
Hungary	51.12	64.43	82.61	61.6%	1.0%	22.27	20.62	20.39	-8.4%	-0.2%	48.84	63.18	79.79	63.4%	1.0%
Bulgaria	30.81	44.29	67.93	120.5%	1.6%	20.45	18.31	18.94	-7.4%	-0.2%	73.72	90.13	96.52	30.9%	0.5%
Slovakia	33.24	44.59	61.97	86.4%	1.3%	20.42	18.7	18.05	-11.6%	-0.2%	59.23	59.44	69.89	18.0%	0.3%
Moldova, Rep. of	28.53	36.39	54.78	92.0%	1.3%	15.07	14.03	11.34	-24.8%	-0.6%	48.22	56.87	63.8	32.3%	0.6%
Europe-East	**46.08**	**68.02**	**79.57**	**72.7%**	**1.1%**	**13.93**	**13.28**	**15.84**	**13.7%**	**0.3%**	**47.56**	**65.71**	**73.79**	**55.2%**	**0.9%**
United Kingdom	57.59	73.72	82.83	43.8%	0.7%	29.16	26.52	24.87	-14.7%	-0.3%	71.1	95.97	97.52	37.2%	0.6%
Sweden	92.77	105.6	111.1	19.8%	0.4%	31.97	30.22	29.68	-7.2%	-0.1%	98.96	115.3	115.2	16.4%	0.3%
Denmark	80.43	92.85	99.62	23.9%	0.4%	23.43	23.65	25.7	9.7%	0.2%	91.93	112.1	114.1	24.1%	0.4%
Ireland	54.49	64.08	70.76	29.9%	0.5%	30.63	33.56	34.36	12.2%	0.2%	73.57	94.83	100.9	37.1%	0.6%
Norway	68.52	74.2	79.81	16.5%	0.3%	16.98	19.14	25.04	47.5%	0.8%	87.81	105.2	113.3	29.0%	0.5%
Finland	89.89	102.2	108.2	20.4%	0.4%	20.79	20.99	23.09	11.1%	0.2%	67.61	89.84	97.4	44.1%	0.7%
Lithuania	58.02	71.83	91.7	58.0%	0.9%	12.8	12.14	14.03	9.6%	0.2%	69.56	90.39	94.13	35.3%	0.6%
Latvia	54.69	74.31	91.99	68.2%	1.0%	12.16	13.11	16.69	37.3%	0.6%	73.59	94.38	96.27	30.8%	0.5%
Estonia	57.91	77.03	90.7	56.6%	0.9%	26.27	24.46	25.21	-4.0%	-0.1%	77.33	94.08	90.12	16.5%	0.3%
Iceland	78.36	89.49	96.96	23.7%	0.4%	24.25	23.66	27.27	12.5%	0.2%	71.65	80.26	80.98	13.0%	0.2%
Europe-North	**65.38**	**79.48**	**87.69**	**34.1%**	**0.6%**	**27.57**	**26.16**	**25.65**	**-7.0%**	**-0.1%**	**75.7**	**98.46**	**100.8**	**33.2%**	**0.6%**
Italy	43.17	54.09	70.91	64.3%	1.0%	6.581	8.265	10.59	60.9%	1.0%	45.34	66.2	83.74	84.7%	1.2%
Spain	55.62	69.85	79.19	42.4%	0.7%	17.16	16.66	15.82	-7.8%	-0.2%	51.12	84.29	95.76	87.3%	1.3%
Greece	35.61	51.38	63.21	77.5%	1.2%	3.325	7.011	10.33	210.7%	2.3%	52.99	83.55	92.05	73.7%	1.1%
Portugal	44.24	53.78	75.85	71.5%	1.1%	15.83	14.25	13.76	-13.1%	-0.3%	79	86.74	105.1	33.0%	0.6%
Serbia	28.7	41.98	65.48	128.2%	1.7%	6.952	7.172	7.958	14.5%	0.3%	69.03	81.96	100.8	46.0%	0.8%
Croatia	34.84	48.96	77.21	121.6%	1.6%	14.46	13.94	15.53	7.4%	0.1%	49.46	56.19	78.37	58.5%	0.9%
Bosnia and Herzegovina	9.63	21.47	41.29	328.8%	3.0%	9.543	8.858	10.86	13.8%	0.3%	63.48	73.05	83.61	31.7%	0.6%
Albania	15.48	33.68	56.63	265.8%	2.6%	8.175	8.55	10.79	32.0%	0.6%	53.98	77.26	95.67	77.2%	1.2%
Macedonia, TFYR	16.82	22.73	38.61	129.5%	1.7%	11.32	9.8	9.031	-20.2%	-0.5%	67.11	73.7	78.65	17.2%	0.3%
Slovenia	63.4	78.35	90.98	43.5%	0.7%	12.6	14.88	19.73	56.6%	0.9%	53.48	75.7	84.76	58.5%	0.9%
Montenegro	29.21	39.92	64.09	119.4%	1.6%	5.082	7.835	10.84	113.3%	1.5%	62.93	74.05	86.12	36.9%	0.6%
Malta	20.86	42.7	66.15	217.1%	2.3%	33.26	29.47	28.62	-14.0%	-0.3%	56.21	72.96	83.55	48.6%	0.8%
Europe-South	**46.35**	**59.47**	**73.53**	**58.6%**	**0.9%**	**10.43**	**11.82**	**12.93**	**24.0%**	**0.4%**	**52.52**	**75.73**	**90.66**	**72.6%**	**1.1%**
Germany	55.77	74.98	87.12	56.2%	0.9%	13.36	14.82	19.27	44.2%	0.7%	70.04	95.56	98.77	41.0%	0.7%
France	57.16	73.84	84.25	47.4%	0.8%	18.29	17.41	19.08	4.3%	0.1%	67.55	96.12	97.83	44.8%	0.7%
Netherlands	62.91	73.9	79.92	27.0%	0.5%	51.21	43.02	32.58	-36.4%	-0.9%	98.46	116.2	117.8	19.6%	0.4%
Belgium	51.76	68.38	79.34	53.3%	0.9%	81.65	64.87	45.21	-44.6%	-1.2%	85.7	108.6	106.8	24.6%	0.4%
Austria	52.25	69.66	81.67	56.3%	0.9%	14.7	17.2	21.34	45.2%	0.7%	61.64	85.57	91	47.6%	0.8%
Switzerland	56.7	72.49	84.45	48.9%	0.8%	30.63	28.57	26.17	-14.6%	-0.3%	81.74	101	100.5	23.0%	0.4%
Luxembourg	25.92	44.25	63.4	144.6%	1.8%	92.94	82.44	63.93	-31.2%	-0.7%	113.7	130.9	130.6	14.9%	0.3%
Europe-West	**56.38**	**73.63**	**84.67**	**50.2%**	**0.8%**	**23.68**	**22.11**	**22.21**	**-6.2%**	**-0.1%**	**72.84**	**98.35**	**100.7**	**38.2%**	**0.6%**

Index

Page numbers followed by the letter n indicate entries in notes.

Author Notes

Janet R. Dickson is a Research Associate at the Frederick S. Pardee Center for International Futures at the Josef Korbel School of International Studies, University of Denver. She has focused for many years on education research, analysis, and planning in a university setting, and has a particular interest in women's education and advancement.

Barry B. Hughes is Johns Evans Professor at the Josef Korbel School of International Studies and Director of the Frederick S. Pardee Center for International Futures, University of Denver. He initiated and leads the development of the International Futures (IFs) forecasting system.

Mohammod T. Irfan is a Post-Doctoral Fellow at the Frederick S. Pardee Center for International Futures at the Josef Korbel School of International Studies, University of Denver. His research focus is on long-term computer simulation of education systems around the world.

PATTERNS OF POTENTIAL HUMAN PROGRESS

VOLUME 2

ADVANCING GLOBAL EDUCATION

Janet R. Dickson, Barry B. Hughes, and Mohammod T. Irfan

"This look at the future—the potential for human progress—based on a massive collection of data and a rigorous projections model produces instructive scenarios of both likely and ideal trends in population, education finance, and education outcomes, including attainment and gender equity. This study can serve as a valuable guide for planning and policymaking in order to enhance the benefits and avoid pitfalls of anticipated trends. The study makes a strong case that investment in education today will return positive economic and social benefits tomorrow."

—Annababette Wils, Research Director, and George M. Ingram, Executive Director, Education Policy and Data Center, Academy for Educational Development

"A beautiful blend of data presentation and analysis for planning educational growth and its potential consequences."

—Henry M. Levin, William Heard Kilpatrick Professor of Economics and Education, Teachers College, Columbia University and Past President of the Comparative and International Education Society

"This volume presents an insightful, in-depth analysis of the outlook for global education and the implications of a more highly educated population on society. This provocative text is a must read for policymakers around the world."

—Fred Swaniker, Founder and CEO, African Leadership Academy

Advancing Global Education **is the second in a series of volumes that explores prospects for human development—how development appears to be unfolding globally and locally, how we would like it to evolve, and how better to assure that we move it in desired directions. The first volume addressed the reduction of global poverty. Questions that this volume addresses include:**

- ***How rapidly are education enrollments and adult attainment levels advancing around the world?***
- ***Which countries will hit the goal of universal primary education by 2015 and, for those that miss, when might they reach it?***
- ***How rapidly can countries realistically expect to reach the next big goal of universal lower secondary education?***
- ***What are the financial costs of accelerating progress in enrollment and attainment, and do expected benefits ultimately exceed those costs?***

Barry B. Hughes, series editor, is Director of the Frederick S. Pardee Center for International Futures and Professor at the University of Denver's Josef Korbel School of International Studies. He is coauthor of numerous books and founder of the International Futures computer model accessible at www.ifs.du.edu.

Volume 1 in the series has received an "Essential" CHOICE review.

PRINTED IN CANADA

COVER ART COURTESY OF MARGARET LAWLESS

ISBN 978-1-59451-756-3
90000>
9 781594 517563

Paradigm Publishers
3360 Mitchell Lane, Suite E
Boulder, CO 80301 USA
www.paradigmpublishers.com

PARDEE CENTER for International Futures

Frederick S. Pardee Center for International Futures
Josef Korbel School of International Studies
University of Denver
www.ifs.du.edu

OXFORD UNIVERSITY PRESS

Oxford University Press India
1 Jai Singh Road, Post Box 43
New Delhi 110001 India
www.oup.co.in