AFRICA DEVELOPMENT FORUM

OVERVIEW

Africa's Demographic Transition

Dividend or Disaster?

David Canning, Sangeeta Raja, and Abdo S. Yazbeck

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Foreword

"Demography is destiny" is both an important message and an inaccurate one. There is little doubt that demographic change can have a deep impact on poverty, economic growth, health, fragility, and human development, and as such it is extremely important. However, the nature of the impact of demographic change is not set in stone. The most important lesson from this book is that the right policies can help countries to reap the benefits of demographic change on the overall development of a nation.

This report lays out a range of policy actions that are needed at the various phases of the demographic transition and uses global and regional experiences to provide evidence on what has worked and what hasn't. Countries have a menu of options available to speed up the transition, improve investment in the resulting youth cohort, expand labor markets, and encourage savings.

While this study looks at lessons from East Asia, Latin America, and the Middle East, Sub-Saharan Africa currently exhibits two unique demographic characteristics. First, it is the only region in the world that is still at a very early stage of the demographic transition. As such, it can learn from other regions that have gone through the same journey to ensure that demographic change paves the way to deeper and more sustainable prosperity. As this book points out, this path is neither easy nor automatic. Success requires actions in different policy realms that are time-coordinated, adapted to the current level of the demographic transition, and results-driven.

The second unique characteristic of the region's demographic picture is its heterogeneity. While a small number of countries are far along the transition, with fertility rates that are below replacement levels, many others are exhibiting surprising delays in the transition in the last 10 years. Some countries are showing very little movement along the natural transition and are stuck at very high fertility rates. These large differences argue for differentiated policies that target different sectors and processes. They also argue for country to country learning and knowledge sharing.

Sub-Saharan Africa has experienced impressive and sustained economic growth and development. Some of that growth is powered by natural resources and policies that are opening up more markets and attracting investments. The demographic transition—particularly the speed with which it takes place and the economic and human development policies that accompany it—can power the next wave of economic growth with healthier and better educated youth cohorts that enter expanding labor markets, and contribute to improved financial markets.

Harnessing the demographic dividend means, first and foremost, empowering women and girls by improving their health, enhancing their human capital through increased investment in education and skills, and providing them with greater market, social, and decision-making power. The full potential of the demographic dividend *can* be realized in Sub-Saharan Africa with proactive policies that can help to make it happen.

Makhtar Diop
Vice President, Africa Region
World Bank

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This overview summarizes the larger report, which was prepared by a team led by Sangeeta Raja, together with David Canning, Elina Pradhan, and Abdo Yazbeck. The other members of the core team from the World Bank included Anne Bakilana, Yoonyoung Cho, David Locke Newhouse, Jonas Ingemann Parby, David Robalino, Michael Weber, and Roland White. Non-World Bank staff—Reiner Kingholz, Ruth Müller, and Franziska Woellert (Berlin-Institut für Bevölkerung und Entwicklung); Parfait Eloundou-Enyegue (Cornell University); Jocelyn Finlay, Mahesh Karra, and Akshar Saxena (Harvard University); Donald Hicks and Neelima Ramaraju (LLamasoft); Peter Glick and Sebastain Linnemayr (RAND); and Jean-Pierre Guengant, Supriya Madhavan, John May, Charles Simkins, Claudia Wolfe, Bienvenue Tien, and Joshua Wilde—helped prepare background papers that contributed to the overall report. Additional research support was provided by Carolyn Makumi and Yvette Atkins. The team benefited from continuous engagement with Deon Filmer and David Evans.

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Introduction

The demographic dividend describes the interplay between changes in a population's age structure due to the demographic transition and rapid economic growth. Declines in child mortality, followed by declines in fertility, produce a "bulge" generation and a period when a country has a large number of working-age people and a smaller number of dependents. Having a large number of workers per capita gives a boost to the economy provided there are labor opportunities for the workers.

More important for a sizable dividend, however, are changes in worker productivity. Smaller family sizes mean that both families and governments have more resources to invest in health and education per child. It also means that women are more able to enter the labor force. If the economic environment is conducive, and this large and well-educated cohort finds well-paying work, a first dividend comes as this productive labor boosts family and national income. Longer life spans mean that this large, better-earning cohort will also want to save for retirement. And with the right policies and a well-developed financial sector, a second dividend can come from higher savings and investments, leading to further productivity gains.

Except for a few countries in Southern Africa and some island nations, fertility rates and youth dependency rates in Sub-Saharan Africa are among the highest in the world, exposing the region to higher poverty rates, smaller investments in children, lower labor productivity, high unemployment or underemployment, and the risk of political instability. But demography need not lead to disaster. If the focus shifts from population numbers to population age structures, the prospects for Africa may be positive. Declines in fertility automatically raise income per capita in the short run and have the potential to bring further gains in savings and investments in the long run. With prudent policies, African countries can reap the benefits of this demographic dividend. Policy choices and actions can transform the population of a nation into a healthy, educated, empowered labor force that can contribute to real and sustained economic growth that lifts people out of poverty. As a bonus, a demographic dividend can even accelerate economic growth in ways that spread prosperity across society.

There is definite cause for optimism about Africa's potential to reap a demographic dividend. Child mortality rates, the leading edge of the demographic transition, are declining quickly in a majority of countries in the region. Fertility rates in Africa vary enormously with women's education. For example, women with a high school education in Ethiopia have below-replacement fertility—a total fertility rate (TFR) of less than 2 children per woman—while the national TFR is just fewer than 5 children per woman. The rapid expansion of school enrollments in the region makes it likely that the total fertility rate of the school-age cohort will be lower than that of previous cohorts. There also is renewed interest in improving access to family planning services. And once a substantial fertility decline gets under way, feedback loops can accelerate the process.

To realize this potential, strategic planning and preparation are required in each country. The first and perhaps most challenging step is to speed up the fertility decline in countries where it is currently slow or stalled. An accelerated fertility decline will produce a larger, healthier, and more productive workforce, and these gains in human capital can drive faster economic growth if economic policies create enough demand for labor. Reducing fertility leads to immediate gains in income per capita as youth dependency rates fall. However, achieving the full potential of the demographic dividend requires economic policies that take advantage of the opportunity. Formulating and implementing policies that strengthen financial institutions and encourage saving will channel rising incomes into domestic savings and investments that further fuel growth and development.

The relationship between the fertility transition and human development works in both directions, creating a virtuous cycle that can accelerate fertility decline, social development, and eventually economic growth. Empirical evidence points to three highly interactive accelerators:

- *Health, especially child health.* Child health is a critical input into fertility declines. As children's health and survival rates improve, family demand for more children declines as confidence in child survival increases. Smaller family sizes improve maternal health, which further improves child health, completing a virtuous cycle.
- *Education, especially education for girls*. Female education is a critical driver of lower desired fertility and the transition from high to low fertility. Fertility decline, in turn, has a strong effect on education by allowing for fewer, healthier, better nourished, and better educated children.
- *Women's empowerment, which is clearly related to the first two*. Better educated and healthier women—with more market, social, and decision-making power in the family—are likely to have fewer children (World Bank 2011).[1] And women who have fewer children—as a result of delayed age of marriage,

delayed first sexual contact, or more space between births—are much more likely to enter the paid labor market, to have higher earnings, and to be more empowered.

While speeding up the demographic transition can help to deliver more and higher-quality workers, the full economic benefits can be achieved only if there is strong demand for labor: the supply of labor is not enough in the absence of sufficient demand. Moreover, the workforce needs to be productively employed. East Asia reaped the demographic dividend because it combined a rapid demographic transition with export-oriented policies that increased the demand for labor. The best possible outcomes are the result of economic policies that expand the demand for labor coupled with policies that support a healthy, skilled workforce, which can in itself attract investments that create jobs.

After a period of stagnation, the takeoff in economic growth in Africa over the last 15 years creates some optimism for the future. A rise in foreign direct investments (FDI) is compensating to some extent for weak domestic savings. However, not all FDI is the same in creating jobs. Some FDI may support the growth of extractive industries in ways that do not absorb the increase in labor supply. In the short term, the economic dynamism in the region provides some fiscal space for governments to put in place policies to speed up the fertility decline and take advantage of the resulting demographic transition. The longer view hinges on the ability of Africa to continue this rapid growth and to create high-productivity jobs that absorb the youth bulge and the expected increase in female labor force participation in the formal sector.

This report presents a positive agenda for increasing the likelihood of first accelerating the demographic transition and then capturing the potential social and economic benefits to create a demographic dividend in Sub-Saharan Africa. There is a real possibility to realize a rapid demographic transition and a large demographic dividend given the region's rapidly decreasing child mortality, rapidly increasing female school enrollment, increasing demand for family planning, renewed high-level political support for tackling demographic challenges, and rapid economic growth. Reasons for concern include stagnant fertility rates, stubborn pockets of child malnutrition, cultural norms that greatly value high fertility, gender inequality, and low domestic savings. Based on evidence in and outside Africa, the report identifies policies that can begin to tackle the challenges of transition and build on recent successes.

While this report takes a regional approach to outlining the potential for a demographic dividend and presenting broad recommendations, country-level considerations will drive country-specific approaches. There is huge heterogeneity across Africa, making it critical to avoid a cookie-cutter approach. The priority actions listed at the end of this overview are likely to be important in

most countries. But country-specific actions must take into account the country's constraints and opportunities. Countries that still have high child mortality and fertility will naturally focus on policies to speed up the demographic transition. Those that have made substantial progress on mortality and fertility and that are seeing a rise in the working-age share of the population—the ratio of working-age people to youth and elderly dependents—will focus on creating jobs for the growing labor force. Countries with larger cohorts of older workers will focus on encouraging savings and investment.

The phrase "demographic dividend" might imply a simple interaction between age structure and economic growth. But the report lays out relationships across several sectors that go to the heart of human, social, and economic development. The sectors needed to encourage the demographic transition and produce a dividend include health, education, population, business development and investment, domestic savings, and trade. The relationships among sectors have the potential to create virtuous as well as vicious cycles. Once the demographic transition gets under way, it can accelerate, with economic growth leading to further demographic change that feeds more economic growth. The interconnectedness and range of issues touched on require national commitment and responses that transcend sector silos and engage broad segments of society.

Demographic Dividend or Disaster

The concept of a demographic dividend was introduced in the late 1990s to describe the interplay between changes in population structure and fast economic growth in East Asia (Bloom, Canning, and Malaney 2000; Bloom and Williamson 1998). The first demographic dividend—or extra boost to the economy—focuses on the labor supply effects of changes in age structure. It can be captured if three things happen. First, improvements in health status, especially child health, increase child survival and contribute to a decline in the number of children born to each family as the total number of children that families want to have decreases. The combination of higher child survival rates in one cohort and fewer children in the following cohorts produces a population bulge—a large cohort that works its way through the age structure—with large macroeconomic effects. Second, investments in health and education are higher in cohorts following the bulge. As families have fewer children, they and the government have more resources per child to invest in the education and health of the surviving children, increasing human capital (Kalemli-Ozcan, Ryder, and Weil 2000; Schultz 2005). And the labor supply gets an additional boost, as low fertility allows more women to enter the labor force (Bloom et al. 2009). Third, an economic environment has to be fostered so that this bulge cohort

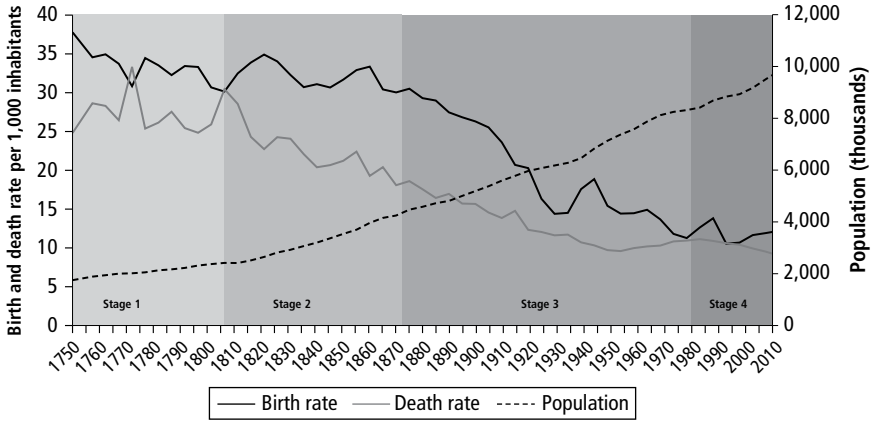
can find well-paying jobs, rather than simply be unemployed or forced into low-productivity work. If all three steps are successful and well timed, an economic dividend is produced as the large cohort moves into highly productive jobs, boosting family and national income.

In addition to this first dividend based on a productive labor supply, a possible second dividend results from the savings and investments of the bulge cohort as it matures and saves for retirement. This dividend can take place only if policies to promote saving are established and the financial sector is developed enough to attract savings and translate them into productive investments. Later, the bulge cohort ages, leading to a high old-age dependency rate, so savings have to be sufficient to finance this cohort's retirement and health care needs (figure O.1).

A demographic dividend is not guaranteed in every country. If, for example, the birth rate is slow to decline, investments in education are less likely because families and countries will have fewer resources per child. If economic reforms are not successful and high-productivity jobs are not created, the increased labor supply may not be employed productively and incomes will not rise substantially. If the financial sector is not reformed, savings from the bulge cohort will not materialize in large enough amounts to drive investment.

While achieving the dividend is not guaranteed, a failure to reduce family size will expose countries to additional risks. The large youth cohort that appears when child mortality first declines puts an enormous strain on family and national resources. The demographic dividend occurs only when fertility falls and the cohorts that follow are smaller, lowering the youth dependency ratio

Figure O.1 Four Stages of the Demographic Transition in Sweden, 1750–2010



Source: Statistics Sweden.

and allowing larger investment per child. Without a fertility decline, countries will face an ever-growing population base and ever-larger youth cohorts—and children will be further exposed to health risks, malnutrition, and lower public and private educational investments. This will result in higher youth dependency ratios, higher poverty, higher unemployment or underemployment, and greater risks of instability. Demography may be destiny, but countries can shape policies to try to ensure that this destiny produces a dividend and not a disaster.

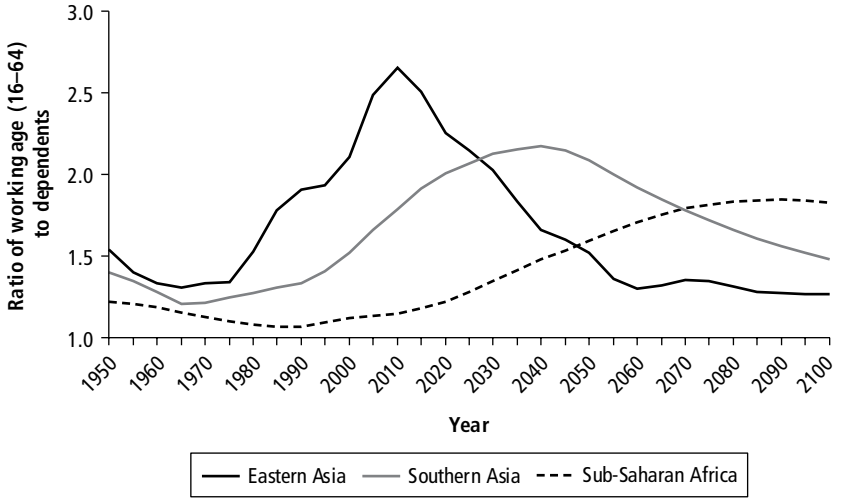
Demographic Dynamics in Africa

In recent years, Sub-Saharan Africa has undergone profound changes in its population structure. Rapid declines in death rates, particularly of children, have contributed to a rapidly growing population. In East and Southern Africa, life expectancy was rising until the advent of the human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS), although the increased availability of antiretroviral therapies has allowed for some recovery. Many African countries have also started to experience lower fertility, particularly among urban educated women. These demographic changes promise to have significant effects on economic performance. But compared to other regions of the world, Sub-Saharan Africa is experiencing an extremely slow decline in fertility. While child mortality rates have declined, fertility rates have remained high, leading to high youth dependency. High youth dependency rates are exacerbated by the heavy burden of HIV/AIDS, particularly in East and Southern Africa, which has increased mortality among working-age adults.

In addition to the two potential economic dividends—increased labor income and increased savings—that a fast transformation in the age structure and decline in dependency ratios can bring about, there are three additional benefits. First, lower fertility is usually associated with delayed age of first birth and longer spaces between births, both of which improve maternal and child health. Second, a lower youth dependency ratio allows larger investments per child in schooling. Third, lower fertility increases the potential for female employment and hence investment in women's education and empowerment. The benefits are worthy goals in themselves, but they also help to facilitate the two economic dividends.

Sub-Saharan Africa faces big challenges, however, in harnessing its demographic dividend. The first is that the demographic transition is projected to occur very slowly. In the 1950s, the three regions in figure O.2 had declining working-age shares in their populations due to falling child mortality rates and higher youth dependency. From 1975 to 2010, East Asia experienced a rapid decline in fertility that reduced youth dependency and increased the working-age share from less than 1.5 to a peak of 2.5 over 35 years. This substantial increase in

Figure O.2 Actual and Projected Ratio of Working-Age Population 16–64 Years of Age to Dependents in Select World Regions, 1950–2100



Source: UN Population Division 2013.
Note: Data after 2010 are projections based on medium-variant fertility.

East Asia closely parallels its economic takeoff: about one-third of the increased growth during the East Asian "economic miracle" can be attributed to the demographic dividend (Bloom, Canning, and Malaney 2000; Bloom and Williamson 1998). South Asia is following East Asia's lead, and its decline in fertility means that its working-age share is now rising rapidly and will peak in 2040.

In contrast, the projected decline in fertility in Sub-Saharan Africa implies that the working-age share started rising in 1990 but will not peak until 2080, a period of 90 years. Moreover, the ratio of working-age population per dependent will be less than 2 at its peak. Hence the impacts of the demographic transition on growth are expected to be small and slow in coming in Sub-Saharan Africa. A key question is whether the fertility decline in Sub-Saharan Africa can be accelerated so that the potential demographic dividend is larger and can occur more quickly.

The second challenge is that the potential of the demographic dividend is not always realized. While reductions in the youth dependency rate bring obvious benefits, the full potential for economic growth does not automatically follow. A large working-age population requires a comparably large demand for labor to reap the rewards of the demographic dividend. Without the appropriate social and economic policies, the extra labor supply can result in unemployment and underemployment, which can lead to political instability, elevated crime, and a

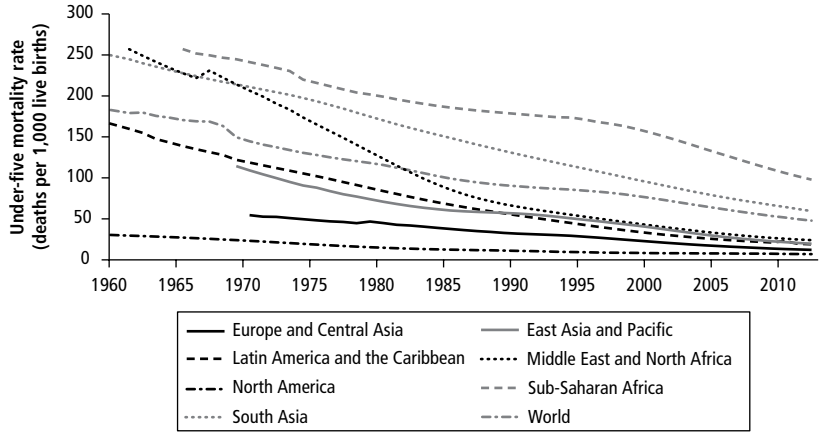
deterioration of social capital (Urdal 2006). Intuitively, the key determinants of whether a country will capitalize on its demographic opportunity relate to how flexible the economy is and how well it can absorb a rapidly increasing labor force. Latin America and North Africa have both enjoyed substantial reductions in fertility and increases in the working-age share of their populations, but not the economic takeoff seen in East Asia (Bloom and Canning 2003).

Slow Declines in Fertility

The declines in both mortality and fertility have been slower in Sub-Saharan Africa than in other regions. Nevertheless, the under-five mortality rate has decreased substantially in Sub-Saharan Africa over the last 50 years (figure O.3). During 1950–55, 307 of 1,000 Sub-Saharan African children born annually did not survive to see their fifth birthday; by 2005–10, the under-five mortality rate was 126 per 1,000 (UN Population Division 2013). This is a remarkable achievement with little economic growth in most of the period. The health improvements have been driven largely by public health interventions rather than by rising incomes.

Today child mortality in Sub-Saharan Africa is on par with that of North Africa and South Asia in the 1980s. While the declines have been remarkable, the rates are still higher than for any other region in the world, and there are wide variations within the region. Southern Africa has relatively low child mortality rates, with a range of between 17 and 50 deaths per 1,000 live births. Mortality rates are almost twice as high in Middle, East, and West Africa

Figure O.3 Under-Five Mortality Rate in Select World Regions, 1960–2012



Source: World Bank 2012.

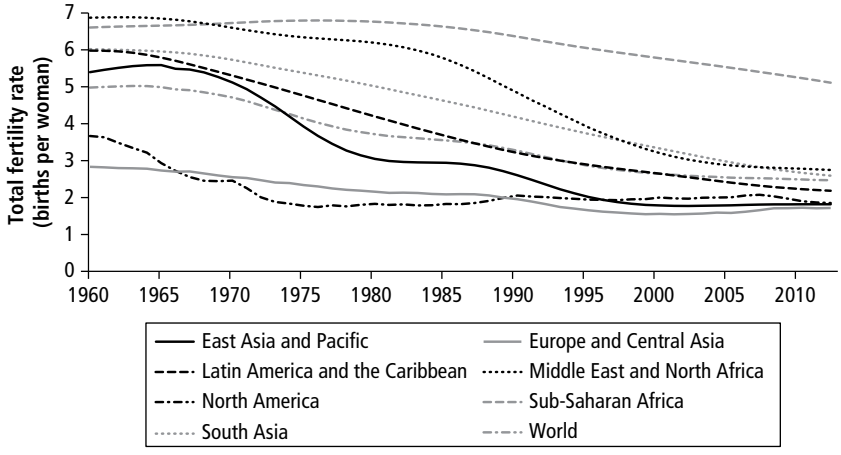
as in Southern Africa, with more than 150 deaths per 1,000 live births in some countries.

The fertility transition has also been slow. Fertility in Sub-Saharan Africa has declined, from 6.5 children per woman in 1950–55 to 5.4 in 2005–10, but much less than in other regions (figure O.4). In East Asia, fertility declined from 5.6 to 1.6 over the same period. Once again, regional averages mask large variations—for example, in the Democratic Republic of Congo and Niger, total fertility rates are rising.

The time gap between the decline in child mortality and the decline in fertility indicates that the population in Sub-Saharan Africa is set to rise rapidly. This rapid pace of population growth contrasts with the slow-growing or even declining populations in other regions, where fertility is much lower. By 2060 there will be about 10 billion people in the world—5.2 billion in Asia, 2.8 billion in Africa, 1.3 billion in the Americas, 0.7 billion in Europe, and 0.1 billion in the rest of the world. Thus Africa is poised to become a much larger part of the world population.

A key question is whether fertility in Africa will continue to decline slowly or whether the speed of the fertility transition will accelerate, as occurred in East Asia (Bongaarts and Casterline 2013). The reason for optimism about the prospects for an acceleration is that, while the decline in fertility has been slow overall, some countries have seen very rapid fertility declines. In addition, even in countries with high average fertility rates, some groups of women—for example, those with a high school level of education—are often close to replacement fertility. High fertility is not a foregone conclusion in Africa.

Figure O.4 Total Fertility Rate in Select World Regions, 1960–2012



Source: World Bank 2012.

Variations in the Fertility Transition

A group of countries in Southern Africa has total fertility rates of less than 3 (table O.1). Another group, including the Democratic Republic of Congo, Niger, and Nigeria, has very high fertility rates exceeding 6 children per woman. Between these extremes are countries at varying levels of fertility. Ghana and Zimbabwe have total fertility rates between 3 and 4 children per woman, Ethiopia and Kenya have rates between 4 and 5, while Tanzania and Uganda have rates between 5 and 6.

Table O.1 also shows fertility by country income level. There is a clear correlation between higher income and lower fertility in most countries, though there are some outliers to the relationship. In particular, Angola, the Republic

Table O.1 Total Fertility Rate in Sub-Saharan Africa, by Country Income Level, 2012

GDP per capita (quintile)	Total fertility rate (births per woman)						
	1–1.99	2–2.99	3–3.99	4–4.99	5–5.99	6–6.99	7+
1 Lowest				Central African Republic Eritrea Liberia	Guinea Malawi Mozambique	Burundi Congo, Dem. Rep. Somalia	Niger
2				Comoros Ethiopia Guinea-Bissau Madagascar Rwanda Sierra Leone Sudan Togo	Burkina Faso Gambia, The Uganda		
3			Lesotho Zimbabwe	Benin Cameroon Kenya Senegal	South Sudan Tanzania	Chad Mali	
4		Cabo Verde	Djibouti Ghana	Côte d'Ivoire Mauritania São Tomé and Príncipe	Congo, Rep. Zambia	Nigeria	
5 Highest	Mauritius	Botswana Seychelles South Africa	Namibia Swaziland	Equatorial Guinea Gabon	Angola		

Source: World Bank 2012.

of Congo, Nigeria, and Zambia, have high fertility despite having high gross domestic product (GDP) per capita. However, these countries have high levels of income from natural resources, which boosts average GDP per capita but may not translate into higher living standards for most people.

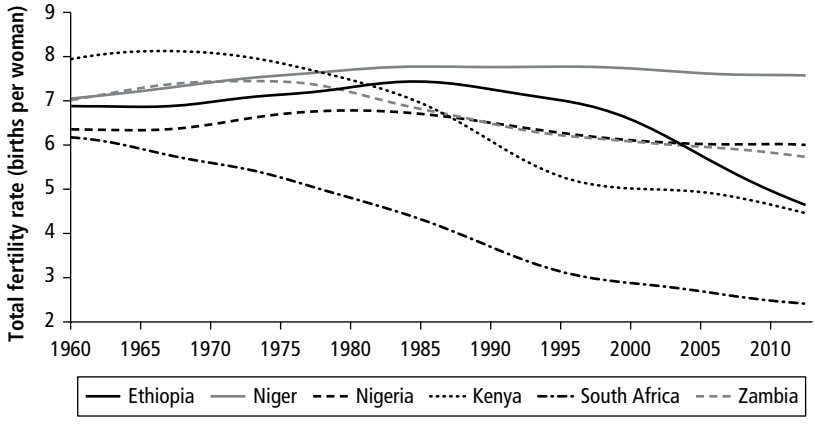
There is tremendous heterogeneity in fertility levels in Africa, as evidenced in table O.1. In Niger, Nigeria, and Zambia, total fertility rates since 1960 have remained consistently high, with at most only very modest declines (figure O.5). In another group of countries, including Kenya, fertility declined rapidly in the 1980s, but stalled after 1995. In still another group, including Ethiopia, fertility declined starting around 1995, while in South Africa, it fell rapidly throughout the time period. In addition to this variation across countries, there is great variability within countries. Fertility is lowest in the capital cities, with slightly higher levels in urban areas (figure O.6). It is highest in rural areas.

That some countries and areas within countries have moved very rapidly to low fertility rates points to possibilities for the continent as a whole.

Speeding up the Transition

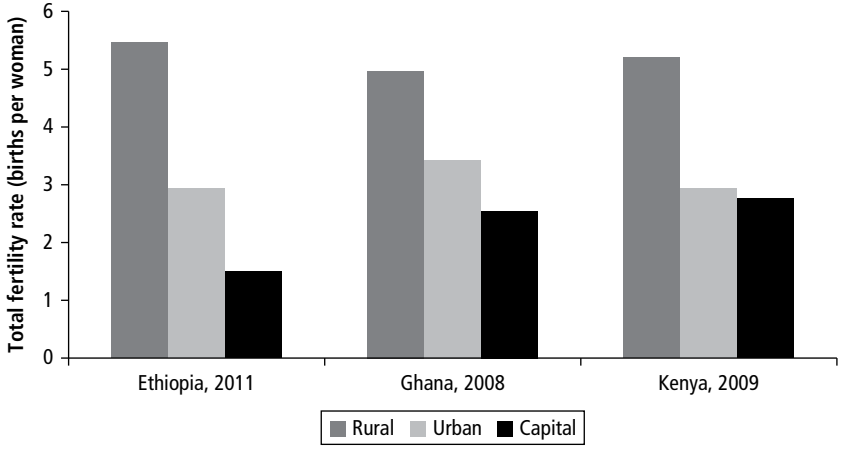
Why is the demographic transition, particularly the fertility transition, so slow in Africa, and can its acceleration bring a faster, and larger, demographic dividend? While a faster demographic transition is advantageous, partly for the income gains it brings, people care about things other than income, including their health and the number of children they have. Most of the benefits of the

Figure O.5 Total Fertility Rate in Select Sub-Saharan African Countries, 1960–2012



Source: World Bank 2012.

Figure O.6 Total Fertility Rate in Ethiopia, Ghana, and Kenya, by Rural-Urban Residence, Various Years



Source: Based on most recent demographic and health survey for the country.

demographic dividend accrue directly to families that decide to delay the age of first birth, improve the spacing of births, and limit the total number of births (Bloom et al. 2012). These benefits come in the form of greater health and work opportunities for women, better health and education for children, and higher incomes and savings for households.

Policies that allow families to make informed decisions and provide the means to implement these decisions are critical. Gender equality is an important part of decision making regarding family size because women bear most of the direct costs of childbearing. All of the policies for accelerating the transition are worthwhile regardless of the potential demographic dividend and independent of their effect on fertility. A healthier and better educated population with the ability to make choices about family structure is an inherent good.

Encouraging Smaller Families

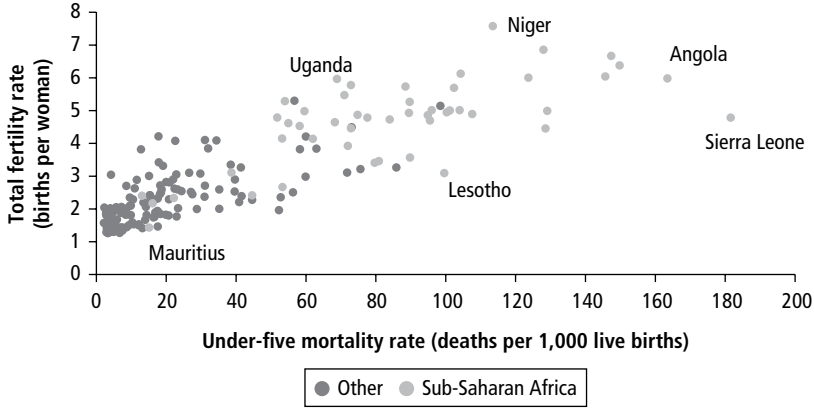
Fertility has five main social determinants: child mortality, urbanization, female education, the time cost of children, and desired investments in children.

A key driver of desired fertility is child morbidity and mortality. One of the strongest empirical regularities in demography is that the fertility transition starts typically after the mortality transition is already well established (figure O.1). Immediately following the death of a child, a couple may choose to have another child in order to compensate for, or replace, the loss. And couples

in a high-mortality environment may have many children with the expectation that some of their children will not survive (Ben-Porath 1976; Sah 1991; Schultz 1969, 1976). The correlation between the mortality rate and the fertility rate is clearly positive (figure O.7). Estimates suggest that each child death leads to about one additional birth (Hossain, Phillips, and LeGrand 2007; LeGrand and Phillips 1996; LeGrand et al. 2003). In high-mortality environments, around 25 percent of children die. This implies that in a pretransition society with fertility at around 8 children per woman, completely eliminating child mortality might decrease fertility by about 2 children per woman. The high under-five mortality rate is likely a very important driver of the high levels of desired fertility in Sub-Saharan Africa, and reducing child mortality would thus speed up the fertility transition. Table O.2 provides the information for countries in Sub-Saharan Africa. Some countries, such as Chad, the Democratic Republic of Congo, Mali, Nigeria, and Somalia, still have very high rates of child mortality and fertility; investing in child health may be a prerequisite for reducing fertility in this group of countries.

In agricultural societies where families work their own land, children can add to household production from an early age (Schultz 1997). Even in these rural settings, however, children are usually net consumers from the household's point of view (Lee 2000; Lee and Kramer 2002). In urban areas, the separation between the home and the workplace is greater, and there are fewer opportunities for children to engage in productive activities. Together with the higher cost of living in cities, these factors may explain the lower fertility rates in urban settings.

Figure O.7 Correlation between Under-Five Mortality Rate and Total Fertility Rate in Sub-Saharan Africa and Rest of the World, 2012



Source: World Bank 2012.

Table O.2 Under-Five Mortality Rate and Total Fertility Rate in Sub-Saharan African Countries, 2012

Under-five mortality rate, by quintile	Total fertility rate						
	1–1.99	2–2.99	3–3.99	4–4.99	5–5.99	6–6.99	7+
1 Lowest (13.1–55.0)	Mauritius	Botswana Cabo Verde Seychelles South Africa	Namibia	Eritrea Rwanda São Tomé and Príncipe	Tanzania		
2 (58.2–73.1)			Ghana	Ethiopia Gabon Kenya Madagascar Senegal Sudan	Gambia, The Malawi Uganda		
3 (74.8–94.9)			Djibouti Swaziland Zimbabwe	Benin Cameroon Comoros Liberia Mauritania	Mozambique Zambia		
4 (95.5–113.5)			Lesotho	Côte d'Ivoire Equatorial Guinea Togo	Burkina Faso Congo, Rep. Guinea South Sudan	Burundi	Niger
5 Highest (123.7–181.6)				Central African Republic Guinea-Bissau Sierra Leone	Angola	Chad Congo, Dem. Rep. Mali Nigeria Somalia	

Source: World Bank 2012.
Note: Under-five mortality is deaths per 1,000 live births; total fertility is births per woman.

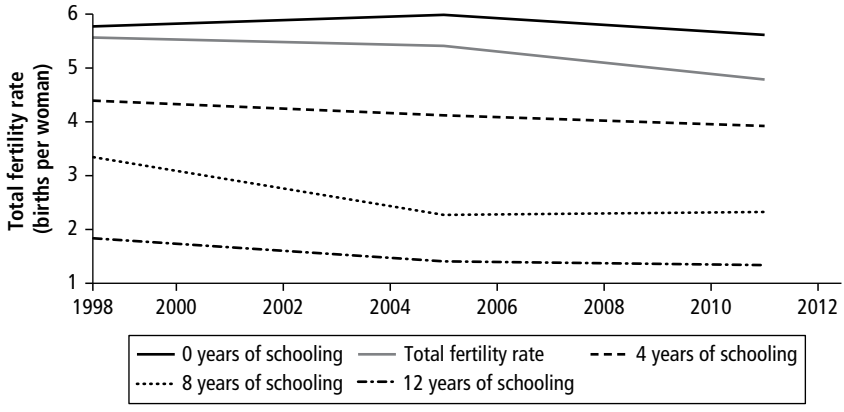
While a couple may prefer to have more children, the costs of an additional child can be high, particularly when considering the high time costs of child care, especially for women. As women's educational attainment and potential earnings rise, they face an increasing cost of childbearing in wages forgone. While fertility tends to rise with increased male education and income, it falls rapidly with increased female education, further reflecting the trade-off. For women with no education in Ethiopia, the total fertility rate

is just under 6 children per woman (figure O.8). For women with 12 years of schooling—women who have completed high school—fertility is less than 2 children per woman. An education reform that led to a substantial increase in female education in Ethiopia had similarly large effects on fertility, suggesting that the effect is causal (Pradhan and Canning 2013). Similar causal effects have been found in several studies. For example, an education reform in Kenya that increased the length of primary education by a year had the effect of increasing female educational attainment, delaying marriage, and lowering fertility (Chicoine 2012). Another study in Kenya, a randomized control trial by Duflo et al. (2006), finds that reducing the cost of school uniforms not only reduced dropout rates, but also reduced teenage marriage and childbearing. Osili and Long (2008) examine education reform in Nigeria and find that increasing female education by one year reduced early fertility by 0.26 birth.

The inverse relationship between fertility and women's educational attainment is evident in many Sub-Saharan African countries, including Ethiopia. Currently, education levels are rising rapidly in Sub-Saharan Africa (figure O.9), which means that fertility may decline in the future. But in many countries boys are still much more likely to be enrolled in school than girls.

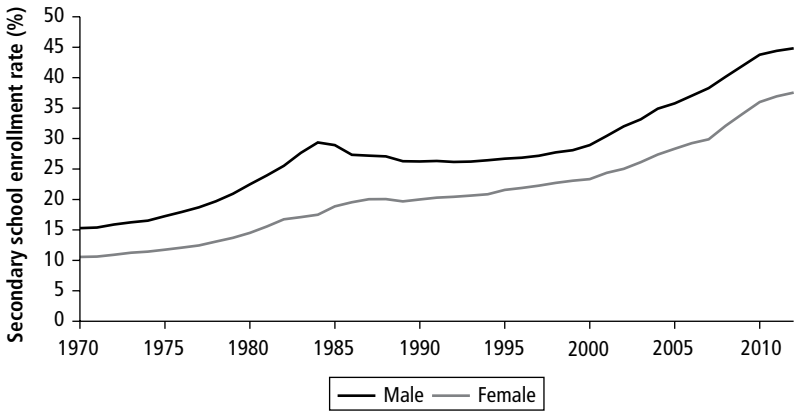
The rising level of education is very promising, but there is potential for rising inequality as well. Low fertility among the highly educated will mean higher parental investment and smaller families, leading to even better health and education in the next generation. But high fertility among women with

Figure O.8 Total Fertility Rate in Ethiopia, by Female Educational Attainment, 1998–2011



Source: Demographic and health survey for Ethiopia (2011).

Figure O.9 Secondary School Enrollment in Sub-Saharan Africa, by Gender, 1970–2012



Source: World Bank 2012.

low education and large families may mean correspondingly low investment in children, perpetuating the gap in education, health, and income. This intergenerational transmission of inequality can be broken to some extent by public education and health programs, since public sector investments per child can increase for all children as the national youth dependency rate declines (Eloundou-Enyegue 2013). But there may well be a rise in inequality at the start of the transition, as households with high education and income are the first to move toward low fertility.

The decline in fertility can also be examined with regard to a change in couples' preferences for having many children and making small investments per child to having fewer children and making larger investments per child. As incomes and education increase, couples place more importance on better health and more schooling for their children, which they can achieve by having fewer children. This shift in a couple's preference for fewer but "higher-quality" children is known as the quantity-quality trade-off (Becker 1981; Hanushek 1992). In addition to parental income and education, the returns to education and human capital accumulation also influence parental preferences for having fewer children. If technological progress raises the returns to schooling, families may decide to have fewer children so that they can invest more in the education of each child.

Changing Social Norms and Gender Equality

Complementing the empirical evidence on the links between household characteristics, incentives, and fertility is evidence that changes in fertility

reflect shifts in social and cultural norms (Bongaarts and Watkins 1996). When environmental or social changes that affect the fertility of some groups do take place, they may have spillover effects that permeate through the entire community. For this reason, changes in fertility behaviors may be more readily observed and studied at an aggregate level. Moreover, the presence of spillover effects at the societal level may help to explain why the fertility transition is slow to get started in some countries but picks up quickly once the transition gets under way.

The importance of social norms in fertility decision making highlights the need to design policies and programs that are tailored to address them (Bongaarts and Watkins 1996). Political leadership in discussing fertility and family size can help to set social norms. Media messages demonstrating the health and economic benefits of smaller families might be sufficient to alter behavior (Westoff and Koffman 2011). Social norms spread mainly through social networks and can reduce fertility through the mechanisms of social learning through peers and social influence. Social norms typically take longer to spread in heterogeneous societies than in homogeneous ones.

Gender inequality is important in determining fertility behavior. Men and women in Africa often have different fertility preferences, with women's desired fertility generally lower than that of men (Voas 2003). This is likely the case because women bear more of the costs associated with childbearing and child-rearing. The amount of care time invested, the exposure to health risks, and the opportunities forgone are greater for women than for men. There is also evidence that women are more directly attached to the welfare of their children than men. When given similar financial resources, women spent more on child health, education, and nutrition than men (Thomas 1990, 1994).

As a result of these factors, the number of children a couple has depends directly on a woman's position in the household and her bargaining power relative to that of her husband. Larger gaps between a husband and wife in age, education, and earnings are associated with more distorted bargaining power and higher household position for men, who tend to be older, more educated, and higher earners than their wives. This imbalance in bargaining power and household status allows men's preferences to dominate household decision making regarding work, resource allocation, and ideal family size. Increasing female education and improving labor market opportunities for women to put them on a par with men thus affects a range of decisions, including those that determine fertility.

Delaying the Age of Marriage and Planning Families

Reducing child mortality, improving women's education, influencing social norms, and promoting gender equality are factors that determine desired fertility. In contrast, the proximate determinants of fertility are the biological

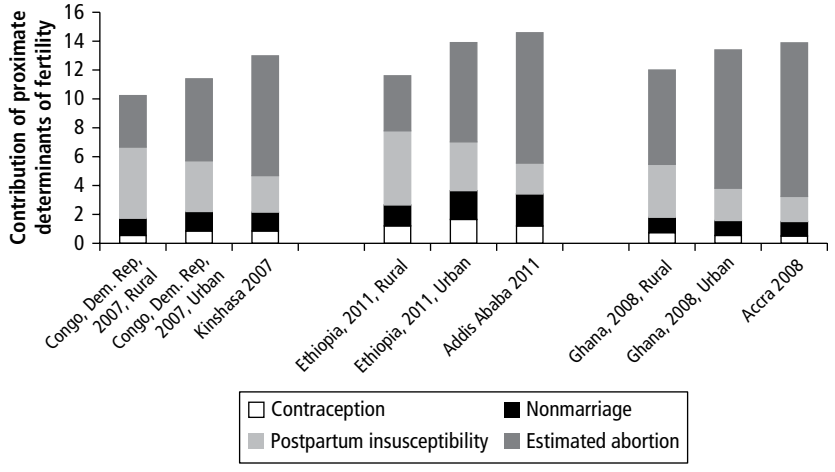
processes or behavioral mechanisms for women and couples to regulate their fertility directly. The following are the key proximate determinants of fertility:

- Postpartum insusceptibility to pregnancy due to extended periods of exclusive breastfeeding (postpartum lactational amenorrhea) and sexual abstinence after birth
- Nonmarriage and lack of sexual activity, usually by delays in the age of marriage, cohabitation, or sexual debut
- Use of contraception
- Abortion.

It is estimated that without any control of fertility through one of these four proximate channels, women would have an average of just over 15 children during their reproductive lives (Bongaarts 1978). Actual fertility rates in a population are generally much lower than this theoretical limit. The highest fertility rate is around 7 children per woman in rural areas of the Democratic Republic of Congo. Total fertility rates are much lower in Ethiopia and Ghana, particularly in the capital cities and other urban areas. In Accra and Addis Ababa, for example, fertility is close to around 2 children—the replacement level of fertility.

Different proximate determinants of fertility play varying roles in determining realized fertility (figure O.10). A major factor in reducing fertility below the theoretical limit is postpartum insusceptibility, with a smaller contribution from a

Figure O.10 Proximate Determinants of Fertility in the Democratic Republic of Congo, Ethiopia, and Ghana, Various Years



Source: Madhavan and Guengant 2013.

lack of or delay in marriage and very small effects of contraception and estimated abortion (Rossier 2003).[2] As fertility rates fall, the role of postpartum insusceptibility declines because fewer births imply fewer periods of insusceptibility. A major explanation for the difference in fertility between capital cities and rural areas is the higher age of marriage in capital cities, with smaller effects from contraceptive use and abortion. A study in Ethiopia finds that education reform had significant effects on the educational attainment of girls and the fertility of young women—mostly due to delay in the age of marriage (Pradhan and Canning 2013).

Contraception plays an important role in determining fertility, although the precise effect of family planning programs has been debated in the literature (Bongaarts 1994; Pritchett 1994). Recent analysis over a wide set of countries suggests that, although the gap between actual and desired fertility is less than 0.5 child per woman in most countries, the average gap is much higher in Sub-Saharan Africa, where it is more than 2 children per woman (Canning et al. 2013). These findings imply that family planning and other supply-side factors could potentially have a much bigger role in lowering fertility in Sub-Saharan Africa. Family planning is also highly cost-effective. Reproductive health, child health, and family planning interventions were carried out in Matlab, Bangladesh, in the 1980s and in Navrongo, Ghana, in the 1990s, with some areas receiving the treatment in each site and other areas acting as controls. In both countries there was a reduction in total fertility of about 1 to 1.5 children per woman in the treatment areas relative to the control areas (Debpuur et al. 2002; Schultz 2009a).

While the high desired fertility in Sub-Saharan Africa means that large reductions in fertility will likely require prior reductions in child mortality and female education, the gap between actual and desired fertility means that family planning can play a substantial role. Family planning allows women and families to achieve their desired family size through better timing and spacing of births and reduces the total number of births; these effects can bring large welfare benefits. In addition, the effects of family planning interventions are very quick, while the effects of the more distal determinants of desired fertility are slower; mortality expectations may lag behind reductions in child mortality and the fertility effects of girls' education only occur when these girls reach reproductive age. For these reasons, family planning interventions have the best prospects of speeding up the fertility transition in the near term, which may make them an attractive option for policy makers.

Human Development Payoffs

The concept of the demographic dividend was originally constructed to explain the link between the demographic transition, changes in age structure, and economic growth. While the main focus of the literature has been on economic

outcomes, the demographic transition has also had profound impacts on human development, regardless of the economic return.

Better Child and Maternal Health

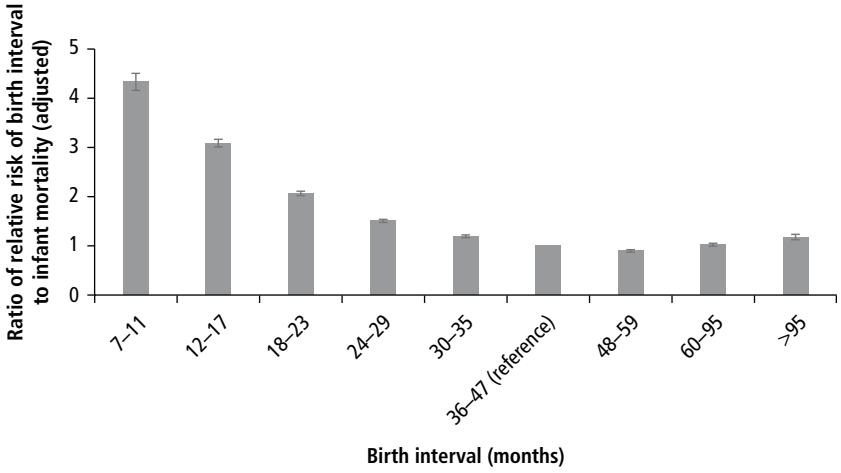
The transition from high fertility to low fertility can do much to improve maternal and child health in Sub-Saharan Africa. Smaller family size allows for increased investment per child in health, nutrition, and education. While it is well understood that improvements in education can lead to better economic outcomes, investments in health and nutrition in early childhood can have large effects on educational outcomes and incomes in adulthood. Early childhood health and nutrition affect children's physical and cognitive development, which in turn contributes to long-term health and economic well-being (Bleakley 2010). Moreover, improvements in child health have long-lasting effects on adult health and longevity (Barker 1992). Better adult health can further reinforce the incentive to continue investing in education and human capital development, given that a longer, healthy life span increases the time for recouping the returns to educational investments (Kalemli-Ozcan 2003).

Lower fertility rates are usually associated with increases in the mother's age at first birth and in the time interval between births (Finlay and Canning 2013). Delaying the age at first birth can reduce the pregnancy and childbirth risks facing adolescent girls. In Sub-Saharan Africa, teenage births are associated with a significantly higher risk of child mortality, child stunting, and maternal anemia (Finlay, Özaltin, and Canning 2011). Very short birth intervals do not allow the mother to recover from the physical stress of childbearing, increasing the risk of pregnancy-related and postpartum obstetric complications. Birth gaps of less than 18 months are associated with a doubling of the relative risk of child mortality (figure O.11). Birth spacing of at least 18 months between children contributes to substantial improvements in child and maternal health outcomes. Reducing high-risk early fertility and lengthening the interval between births can substantially improve the health and well-being of women and their children by decreasing the risk of maternal and child mortality (Ahmed et al. 2012; Jain 2011). These impacts point to the human development payoffs of supporting family planning for timing and spacing births, independent of any effect on total family size.

Investments in Girls' Education

Lowering fertility can increase educational investments through several mechanisms. Perhaps most well-known is the quantity-quality trade-off described earlier, through which fertility decisions and the allocation of investments in human capital are determined jointly. The demographic-economic relationship between fertility and education implies that lower fertility is both a cause and a consequence of increased educational investments; in particular, both fertility

Figure O.11 Adjusted Relative Risk of Infant Mortality in Sub-Saharan Africa, by Birth Interval, 1987–2011



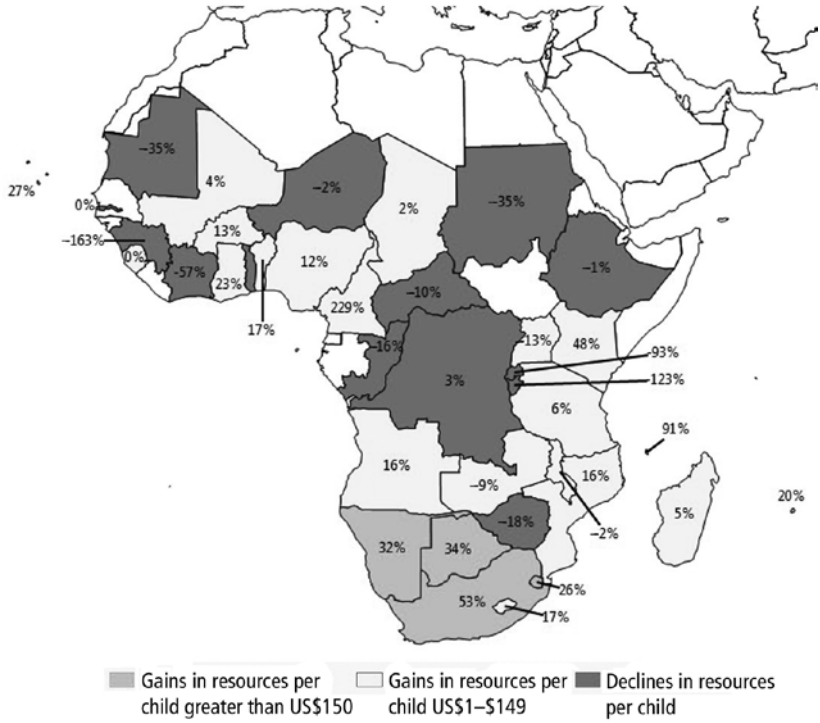
Source: Finlay and Canning 2013.
Note: Depicts the relative risk of infant mortality in Sub-Saharan Africa from the time since the previous birth, adjusting for other household characteristics.

and child schooling are determined by a common set of factors that affect families' incentives and preferences.

The provision of family planning services to people who desire smaller families can both reduce fertility and increase schooling. This effect may be particularly pronounced for girls' schooling because girls in high-fertility households are frequently kept out of school to care for their younger siblings. The Matlab study[3] finds strong effects of lower fertility where family planning interventions helped to lower fertility rates and improve child health and educational outcomes (Schultz 2009b). In addition to the results from Matlab, a study in Sub-Saharan Africa finds that unplanned births reduced the enrollment of young children and increased the dropout rate of older children, suggesting that additional births could tighten the resource constraints facing families (Eloundou-Enyegue and Williams 2006; Koissy-Kpein, Kuepie, and Tenikue 2012).

Aggregate spending on children is a fairly constant share of national resources in many countries and is independent of the size of the youth cohort, which implies that lower fertility can increase the resources potentially available to each child (Mason et al. 2009). Countries with the largest gains in spending per student tend to be those with lower rates of fertility and youth dependency (map O.1). However, the link is not guaranteed. Zimbabwe, for example, has seen large reductions in fertility, but even faster reductions in overall spending on education, reducing the amount of spending per child.

Map O.1 Contribution of Age Structure to Recent Changes in Resources per Child in Sub-Saharan Africa, 1990–2050



Source: Eloundou-Enyegue 2013.
Note: Country values indicate percentage change in resources per child.

Investments in education can have substantial effects on earnings as an adult: each additional year of schooling is associated with a 10 percent increase in wages (Psacharopoulos 1994). Smaller youth cohorts can therefore increase the availability of educational funding per child and can lead to an expansion in school enrollment as well as an improvement in educational quality (Eloundou-Enyegue and Giroux 2013).

Jobs Payoffs

Economic growth is driven by increasing the amount of inputs used for production or by increasing the productivity of those inputs. One of the most

important inputs for production is labor, which accounts for about two-thirds of all output produced (Hall and Jones 1999). Yet most models of economic growth do not focus on labor supply. Instead, they assume a fixed number of workers per capita. But substantial variations in the number of workers per capita over time can have significant impacts on GDP growth. For example, in East Asia the number of workers per capita has risen sharply over the last 40 years. This increase in labor supply, together with increases in physical and human capital inputs as opposed to increases in total factor productivity (TFP), accounts for most of the economic growth and development associated with the Asian economic miracle (Young 1995).

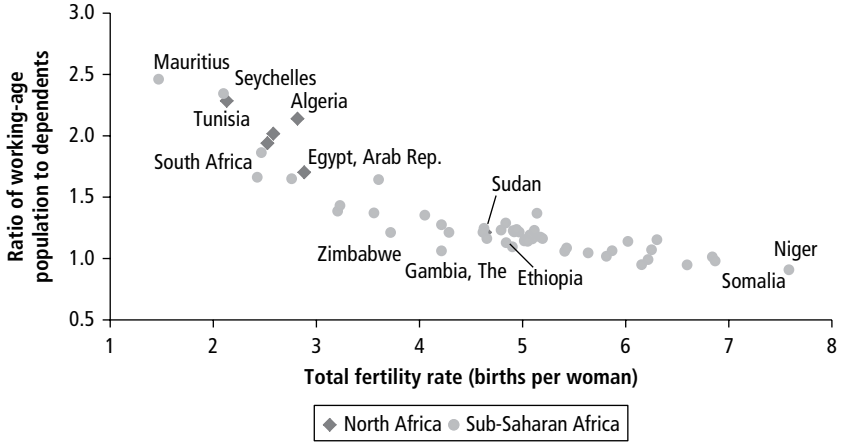
Increases in the workforce per capita stem primarily from two sources. One is the age structure of the population, which determines the ratio of working-age people to the total population. Labor force participation rates vary by age, with the highest rates between ages 25 and 60. So, a change in the population age structure can affect the labor supply per capita. The second source is a change in gender-specific labor force participation rates. While participation rates for men of working age tend to be uniformly high over time, those for women can fluctuate dramatically, which can rapidly change the total number of workers and thus output per capita.

Aggregate demographic forces can also affect the productivity of workers. An increase in the labor force can reduce the amount of available land and capital stock per worker, lowering productivity. In the long run, a shortage of capital can be corrected by investment, but not for the availability of land. In addition, a larger youth cohort may receive fewer resources and less schooling, which could reduce their educational attainment and their productivity when they enter the labor force.

Changing Age Structure

The most direct effect of demographic change on the labor force is through the age structure (figure O.12). The working-age range is conventionally defined as the population between ages 16 and 64, although the actual working-age range can be narrower or wider in practice, with children either working before age 16 or remaining in school after age 16 and older persons either taking early retirement or working longer into old age. In countries with high fertility rates, the rate of youth dependency is also high—the ratio of working-age people to dependents is around 1. As fertility falls, the youth dependency rate declines and the ratio of working-age people to dependents rises. When fertility falls to the replacement level of 2 children per woman, there are 2.5 workers per dependent. If output per worker stays constant, a rise in the working-age share of the population from 1 worker per dependent to 2.5 workers per dependent would lead to a 43 percent rise in income per capita. A few countries in Southern Africa have fertility rates comparable to those of North Africa and

Figure O.12 Ratio of Working-Age Population 16–64 Years of Age to Dependents and Total Fertility Rate in Africa, 2010



Source: Pradhan and Canning 2013.

a high ratio of working-age to dependent population, but most Sub-Saharan African countries still have high fertility rates.

More Women in the Workforce

The rapid economic growth of the Asian Tigers was fueled in large part by a rise in inputs associated with labor per capita, in part by an increase in the working-age share of the population, and in part by an increase in female labor force participation. Childrearing takes time and money, and the time required for child care may reduce the supply of labor. Fertility and female labor supply are decisions made in tandem. Women who have fewer children may decide to work more, and women who have good jobs and earn high wages may decide to have fewer children. In developed countries, the introduction of the contraceptive pill and legalization of abortion had significant impacts on fertility and led to increases in female participation in the labor force (Bailey 2006). Similarly, in Latin American countries, family planning services led to reductions in fertility and subsequent increases in female labor supply (Miller 2010).

But fertility reductions may have little effect on the female labor supply in the poorest developing countries, since almost all women in these countries work, independent of the number of children they have (Goldin 1994). In rural areas, women often work in the home and are usually either self-employed or unpaid workers in a family enterprise. In such settings, the household is a production unit as well as a consumption unit, and it is possible to combine child care with work.

This dual home-work environment may account for the small impact of family planning programs on female labor market participation in Matlab in rural Bangladesh; most of the labor market effect of the program was on female earnings (Schultz 2009b). In contrast, the workplace and home are often separated in urban environments in middle- and higher-income countries, making it more difficult to combine work and child care. But even in these settings, labor supply is not a simple binary choice. Women with low schooling and young children may undertake more flexible, less formal work rather than leave the labor market completely (Radhakrishnan 2010; Schultz 1990). This suggests that the effects of lower fertility on female labor supply may be seen primarily in more highly educated women in urban areas, who have the possibility of formal employment outside the home.

The demographic dividend resulting from a large supply of labor per capita due to favorable age structure and increased supply of female labor is not automatic (Bloom, Canning, and Sevilla 2003). Reductions in fertility do increase the working-age share of the population, but until fertility falls below the replacement level, future cohorts of working age are still larger than their predecessors. While the potential labor force per capita grows, the increase in labor supply must be matched by an increase in demand for labor to produce economic growth effectively. Countries with better governance and market-oriented economic polices experience substantial economic benefits when the fertility and youth dependency rates decline. But in the absence of good governance and appropriate economic policies, the labor supply effects may be wasted, and countries may miss their window of opportunity to attain a demographic dividend (Bloom, Canning, and Malaney 1999).

Economic Growth in Africa

The demographic transition generates a large supply-side shock to the economy, potentially increasing the number of workers, the human capital of the workforce, and the level of saving. But if the demographic dividend is to produce economic growth, this supply has to be matched by an increase in demand (box O.1). While many Asian countries benefited from the demographic dividend, Latin America and North Africa have seen much smaller economic gains from their changing age structure. The demographic transition raises the stakes for economic policy: the potential dividend magnifies the effects of good, or bad, policy choices.

One reason for being optimistic about the prospects for a demographic dividend in Africa is that, after a period of slow economic growth, the economic performance of the region has taken off in the last decade. Is this a short-run blip or a fundamental change? If the latter, it could be the start of a long-run

BOX O.1

Cohort Size and Youth Unemployment

The demographic dividend occurs when the ratio of working-age to dependent population starts to rise. But the absolute number of young workers entering the labor force is also rising, and a large youth cohort can have negative effects on productivity. Being born into a large cohort, known as generational crowding, may reduce cohort wages and curtail individual labor supply (Korenman and Neumark 2000). The presence of a large youth cohort may also lead to large-scale youth unemployment. In Sub-Saharan Africa, it is more likely that large numbers of young workers will be forced to work in low-productivity sectors such as agriculture and informal household enterprises. Large inflows of youth into the labor market also make it difficult to generate enough jobs to ensure that youth are productively employed. The key challenge in realizing the demographic dividend is to employ the working-age share of the population productively, which will increase output per capita and economic growth.

improvement in economic performance and growth that can provide jobs for the large working-age cohorts that are coming.

GDP growth rates in Africa were more than 4 percent a year in the 1960s and then fell between 1970 and 1995 before returning to levels above 4 percent a year after 2005 (figure O.13). But population growth in the region has been steady at just below 2.5 percent a year. This steady rise in population implies that GDP growth is much lower in per capita terms; indeed, GDP per capita fell in Sub-Saharan Africa between 1980 and 1995.

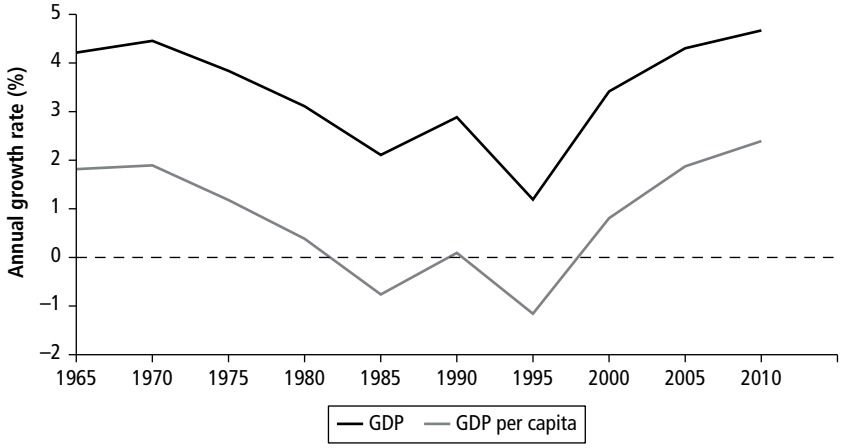
Increased economic growth creates the fiscal space needed to sustain investments in maternal and child health and in quality education, especially for girls. Moreover, economic growth can create the jobs needed to harness workforce expansion and achieve even faster economic growth.

How the Age Structure Can Drive Growth

Four features are favorable to growth: a rising share of the working-age population, increasing physical capital per worker (Zelleke et al. 2013), rising TFP (Tahari et al. 2004), and rising human capital in the form of rising education (figure O.14). Employment growth in the form of higher participation rates for the working-age population has played a very minor role in the past, but current trends suggest that the continent is ready for transformational economic growth beyond natural resources.

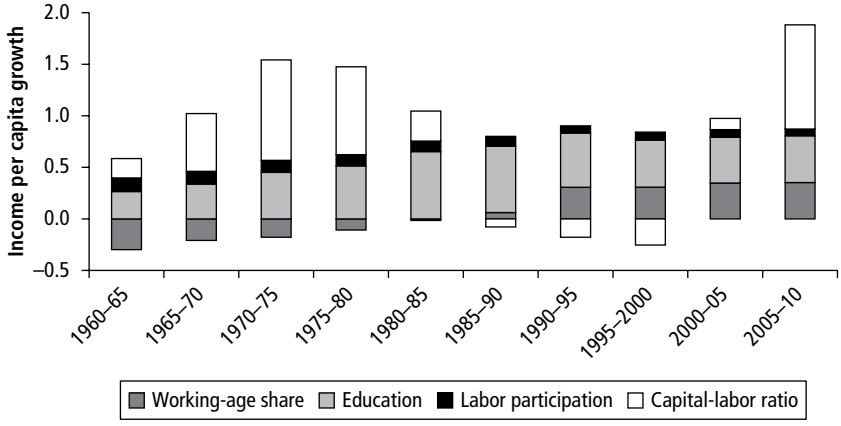
Swings in TFP drive the results for most of the 50 years to 2010, with a sharp decline between 1970 and 1995 linked to poor economic performance. The declines in productivity in Sub-Saharan Africa during this period may be

Figure O.13 Growth of GDP and GDP per Capita in Sub-Saharan Africa, 1965–2010



Source: Cho and Tien 2013.
Note: Data compiled from a sample of 32 balanced Sub-Saharan African countries.

Figure O.14 Growth of Income per Capita in Sub-Saharan Africa, by Source, 1960–2010



Source: Cho and Tien 2013.
Note: Data compiled from 32 Sub-Saharan African countries.

due in part to unfavorable geography (Bloom et al. 1998), political instability (Collier and Gunning 1999), poor economic policies (Easterly and Levine 1997), and rent seeking induced by natural resource exploitation (Sachs and Warner 2001). In particular, debt overhang following a decline in resource prices may reduce productivity (Deaton 1999). These overhangs are likely the

result of large price movements, such as changes in the price of oil and raw materials, as well as competition from other countries.

Since the mid-1990s, the contribution of agriculture to GDP has fallen and that of industry has risen. Simultaneously, the workforce has shifted away from agriculture and into higher-productivity jobs in industry and services; productivity is usually quite low in agriculture relative to other sectors. This sectoral shift is usually associated with rapid economic growth (Bloom et al. 2010). In Africa, the relative share of industry in GDP remained fairly steady at around 25 percent between 1970 and 2000. Since 2000, it has risen to about 30 percent. In contrast to wide swings in some other variables, increasing levels of education made a steady contribution to economic growth in Africa over the whole period.

As some African countries, particularly those in Southern Africa, began moving through the demographic transition in the 1990s, the youth dependency rate fell and the working-age share of the population rose, indicating an increase in the number of workers and in income per capita (figure O.15). This positive effect of a changing age structure contrasts with the situation before 1985, when youth dependency was rising and the working-age population share was declining, slowing economic growth. A rise in labor force participation rates also contributed to economic growth, but the effect was very small.

The decomposition described here is at the regional level, which can hide amazing heterogeneity in all of the variables driving these changes. For example, some countries are growing much faster than others, likely for different reasons.

Figure O.15 Labor Income and Consumption per Capita in Kenya, by Age, 1994

Source: National Transfer Accounts (http://www.ntaccounts.org/web/nta/show).

And fertility rates—which directly determine the working-age structure of the population and therefore contribute differently to slowing growth (for countries with high dependency ratios) or driving growth (for countries with low dependency ratios)—vary from country to country.

Savings Payoffs

Rapid economic growth in East Asia was mainly due to increases in factor inputs—most notably labor, capital, and education (Young 1995). Improvements in TFP played a minor role. All of the Asian Tigers enjoyed a surge in labor force per capita due to changes in the working-age share of the population and female labor force participation as well as increased savings and investment. The private saving rate in Taiwan, China, rose from around 5 percent in the 1950s to well over 20 percent in the 1980s and 1990s. Saving rates vary by age and are highest for Taiwanese households with heads who are between 50 and 60 years old. The rise in saving in Taiwan, China, and the other Asian Tigers can be explained in part by changes in the population age structure and in part by increases in life expectancy, which increase the incentive to save for retirement.

The life-cycle pattern of labor income is considerably different from that of consumption (Mwabu, Muriithi, and Mutegi 2011). Consumption by age is fairly flat, though somewhat lower for children than for adults, but labor income is concentrated in the working-age years and peaks at around age 40 (figure O.15). In Kenya, consumption exceeds labor income before age 23 and after age 60. This deficit of labor income to consumption can be financed by public or private transfers, by borrowing, or by accumulated assets.

In most countries, the young rely mainly on private transfers from other household members for their consumption and receive some public transfers for health and education. For the elderly, a wide range of approaches are used to finance consumption across the world, with some countries relying on private savings, others on government transfers, and others on private or family transfers. Family transfers to fund the consumption of the elderly are significant in East Asia. In most countries and regions of the world, however, funds tend to flow in the opposite direction, as the elderly make transfers to younger family members. In Sub-Saharan Africa, there are few data on age-specific income and consumption. In South Africa, despite a government-provided old-age pension, the major source of financing for old-age consumption is private savings (Oosthuizen 2013). It seems likely that people in most poor African countries rely on family transfers and, to some extent, private savings.

The need for income in old age implies that working-age adults, and especially older working-age adults, typically save for retirement, although this depends heavily on the incentives in the public pension system (Bloom et al. 2007). In Asia, rising working-age shares in the population were associated with a boom in savings and investment. The effect is expected to be less dramatic in

Africa, at least in the short run. In aggregate data, savings are higher when the working-age share of the population is larger. But there is also a strong income effect, because national saving rates are very low in low-income countries. In household data for very poor African countries, there is little evidence of life-cycle saving. For the poor, most savings are precautionary, in the event of health or income shocks in the near future, and are accrued in physical rather than financial assets (Aryeetey and Udry 2000). In higher-income countries, such as South Africa, there is substantial saving for retirement among workers in the formal sector. This mechanism may become more important for poorer countries over time as workers transition from informal to formal employment. In the short run, however, most of the poorer countries in the region need to maintain inflows of foreign borrowing and foreign direct investment to finance investment and to maintain or increase the capital-labor ratio.

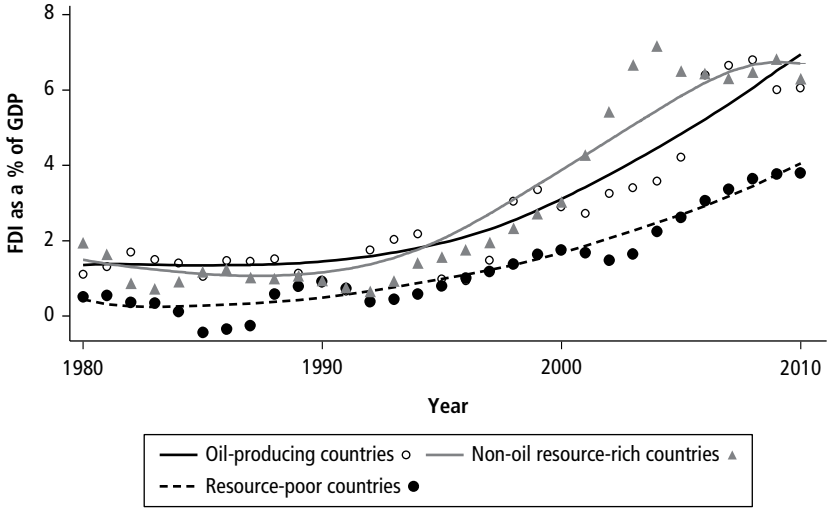
Investment Payoffs

Investment and capital formation have been drivers of economic growth in Sub-Saharan Africa over the last decade (figure O.16). Between 1985 and 2000, capital per worker declined because of low investment rates and large increases in the workforce. From 2005 to 2010, investment escalated tremendously, causing Sub-Saharan Africa to witness the highest rate of growth of capital per worker it has ever seen. There is a large gap between investment and savings in Sub-Saharan Africa, with about half of investment funded by the public sector, by borrowing abroad, or by FDI. In particular, FDI has risen sharply, from an annual rate of about 1 percent of GDP in 1995 to around 6 percent of GDP today. This boom in FDI explains a large part of the region's recent economic growth.

As with most of the other variables in this decomposition of regional economic growth, the level and nature of FDI hide considerable heterogeneity among countries, and these differences are important because the nature of FDI may have different impacts on expanding employment in different countries. Resource-rich countries (mainly oil-producing) are likely to benefit from rising commodity (oil) prices. Countries with greater political stability (such as reduced conflict) are likely to attract FDI and induce TFP growth. Countries with better human capital are likely to create an economic environment conducive to research and development and innovation, which can drive TFP growth. Countries with more openness (such as members of a customs union) are also a better environment for TFP growth.

Countries in Sub-Saharan Africa fall into three categories: oil-producing, nonoil resource-rich, and resource-poor countries. FDI has grown in all three, but at different rates (figure O.16). There has been a large increase in the share of FDI in GDP among resource-rich countries (both oil and nonoil), particularly in the late 2000s. But there has also been a substantial increase among resource-poor countries. The nature of FDI is important because it will affect the likelihood of

Figure O.16 FDI as a Share of GDP in Sub-Saharan African Countries, by Resource Status, 1980–2010



Source: Cho and Tien 2013.

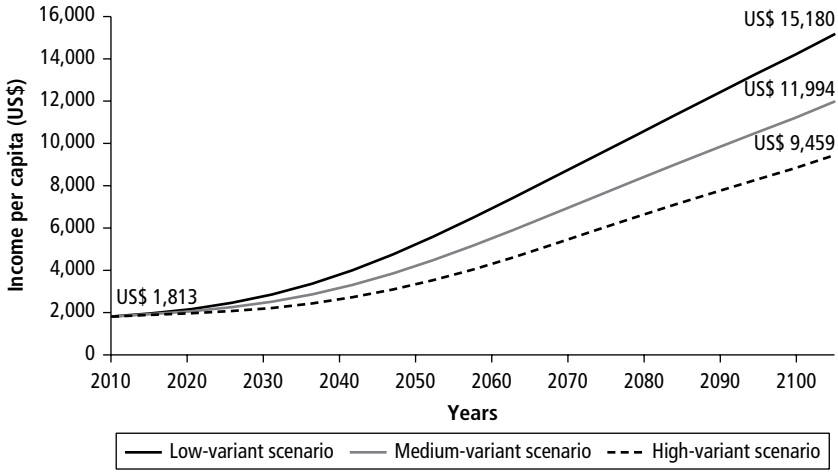
investments that will produce jobs: generating high-paying jobs for the youth bulge moving into working age is essential to capturing the economic payoffs.

The growth story for Africa is promising, with three notable contributors to the regional growth spurt: the potential for a favorable demographic structure if the demographic transition is accelerated in lagging countries, the increase in physical capital through investment, and the progress in total factor productivity.

What the Demographic Dividend Could Deliver

Growth decompositions can serve as the basis for modeling how changes in fertility can affect economic growth. Using mortality projections as the constant, various fertility scenarios were constructed for Nigeria tracing the economic consequences associated with each of them. Based on the model of Ashraf, Weil, and Wilde (2013), this decomposition takes into account the effects of fertility on age structure, female labor market participation, educational investments, changes in the capital-labor ratio, and industrialization. Figure O.17 presents projections for income per capita (adjusted for real purchasing power parity) for Nigeria using data from the United Nations population projections as a baseline (UN Population Division 2013). The low-, medium-, and high-fertility scenarios diverge slowly and eventually differ by about half a child so that the TFR under the low-fertility scenario is eventually about 1 child per woman lower than the total fertility rate in the high-fertility scenario. Under these scenarios, income per capita in the high-fertility scenario is projected to be just over

Figure O.17 Income per Capita under High-, Medium- and Low-Variant Scenarios in Nigeria, 2010–2100



Source: Canning, Karra, and Wilde 2013.

US$9,000 by 2060 (compared with just under US$2,000 today), while income per capita in the low-fertility scenario is projected to be more than US$13,000 by 2060. The low-fertility scenario raises the growth of income per capita by about 0.7 percentage point per year.

Policies to Speed up the Demographic Transition

To reap a large demographic dividend in the near term, Africa requires polices that accelerate the reduction in child mortality and help couples to achieve a smaller family size. A faster demographic transition will make the short-term benefits of the demographic transition much larger. A second set of policies takes advantage of the supply-side potential released by the demographic transition.

Policies in three key areas would help to accelerate the fertility transition and increase the demographic dividend: reductions in child mortality, increases in female education, and improved access to comprehensive family planning services. Improvements in these three areas are desirable regardless of the potential economic payoffs, but they should receive even higher priority than they do today.

The first set of policies is intended to reduce child (under-five) mortality. Independent of its intrinsic value, reducing child mortality will also reduce desired fertility. While many Sub-Saharan countries have made large

improvements over the last decade, child mortality remains high (Lozano et al. 2011). The leading causes of child mortality are complications during pregnancy and childbirth, newborn illness, childhood infections, malnutrition, and HIV/AIDS (Kinney et al. 2010). Cost-effective preventive interventions that can substantially reduce childhood mortality include maternal tetanus toxoid vaccination, exclusive breastfeeding, clean cord care, immunizations, vitamin A supplementation, prevention of mother-to-child transmission of HIV, and expansion of the use of insecticide-treated mosquito nets (Friberg et al. 2010). Neonatal resuscitation and case management of childhood illnesses such as diarrhea, pneumonia, malaria, and measles are also highly effective.

The second set of policies focuses on increasing female education. Educating women increases their ability to make decisions about their own and their children's health, their ability to access and use family planning methods, their bargaining position within the household, and their incentive to work. While school enrollment has been increasing in Africa, female enrollment has tended to lag behind male enrollment, particularly in some subregions. Enrollment is likely to be lower for girls than for boys when the household is poor or the girls have young siblings (Glick and Sahn 2000). Policies that can increase girls' enrollment in school include general increases in educational access, especially at the secondary level (Birdthistle et al. 2011). Conditional cash transfer programs requiring school attendance for cash disbursement have been shown to increase girls' school attendance substantially. In Bangladesh, the school stipend improved girls' achievement scores and led to a delay in their age of marriage. There is also evidence that unconditional transfers produced results, suggesting that reducing the pressure on household consumption marginally alleviated household poverty and allowed parents to send their girls to schools (Baird, McIntosh, and Özler 2009).

The third set of policies focuses on comprehensive family planning services. While the willingness to pay for contraception varies, women are more likely to buy contraception if the prices are highly subsidized, particularly those women who do not work and want fewer children than their husband (Prata et al. 2013). Reducing the cost of access to family planning services for low-income women and women whose bargaining position within the household is weak is therefore desirable. The quality and cost of services offered alongside contraceptives affects the uptake of contraception. While most women in Sub-Saharan Africa know about contraception, many do not consider contraceptives safe and a substantial number of users report side effects (Aryeetey, Kotoh, and Hindin 2011). While some women who stop using injectable contraceptives cite costs and stockouts as reasons for discontinuing their use, most report side effects as the principal reason (Burke and Ambasa-Shisanya 2011). Counseling and treatment services to address the effects of contraceptive use and opportunities to switch between contraceptive

methods to minimize side effects are important aspects of high-quality family planning. When high-quality services are provided in Sub-Saharan Africa, families use contraceptives mainly for timing and spacing births rather than for limiting them (Phillips et al. 2012). This suggests that family planning programs should emphasize reversible methods. It is also important to include other aspects of family planning such as information not only about the pros and cons of different methods but also about the benefits of delaying, spacing, and limiting births.

Policies to Reap the Demographic Dividend

To harness the demographic dividend, policies are required that both hasten the transition to smaller cohorts and enable cohorts to be productive. The number of policies and their prioritization will need to be nuanced for each country, depending on the state of its transition and its economic environment.

During the initial part of the demographic transition, the rise in the ratio of working-age to dependent population produces an automatic demographic dividend, but the dividend is even greater if young workers are employed productively. This may be difficult in the early part of the transition, when the absolute numbers of youth are rising and the economy might not be able to absorb the cohort into productive employment. However, there is scope for higher productivity in the formal sector, the agriculture sector, and the nonfarm informal sector.

The East Asian model focused on export-led growth. Africa could replace East Asia as the world's source of labor-intensive manufacturing due to rising wage rates in East Asia. In the past, political uncertainty deterred multinationals from setting up manufacturing bases in Africa. Despite low wages overall, Africa is a high-cost location because of the high cost of infrastructure and nonlabor inputs and the payment of high wages for workers with key skills. Trade barriers also add to costs (Iwanow and Kirkpatrick 2009). But the recent rise of FDI into Africa reflects a growing confidence in the region's manufacturing sector. In addition, expanding manufacturing increases the network of suppliers, which can encourage new investors to set up in Africa, generating the possibility of a rapid economic takeoff (Samir et al. 2010).

The challenge in most of Sub-Saharan Africa lies in engaging the large youth cohort in high-productivity formal sector jobs rather than in informal, low-productivity, low-wage jobs in agriculture or household-based enterprises. In higher-income countries such as South Africa, a large youth cohort can mean high youth unemployment. But in most Sub-Saharan countries, the large informal sector results in low unemployment rates, but with youth employed in low-productivity jobs.

One approach to harnessing the youth dividend is to increase the competitiveness of production in African countries and to expand exports and jobs in the formal sector. Despite low wages, much of Africa is not highly competitive in international markets due to government failures, high barriers to trade, lack of infrastructure, and lack of skilled manpower. Since most jobs are in the informal sector, policies can seek to raise the productivity of the informal sector. At the same time, policies can seek to increase the competitiveness of exports, which will expand the formal sector (World Bank 2013).

Raising agricultural productivity requires land policies that improve land titles and increase productivity—for example, policies that make credit available for investment in new farming techniques. It also requires policies that improve the skills needed to adopt high-productivity methods of farming and the infrastructure needed to connect farms to markets. Large numbers of informal household enterprises provide consumer services and consumables. Since these enterprises are outside the usual system of regulation, they may face harassment from the authorities. But they can also offer potential growth opportunities. By providing household enterprises with operating security and official recognition, governments can enable them to enter the formal sector eventually and to abide by formal regulations. This process may involve allotting official spaces to informal enterprises operating in cities and providing legal access to public infrastructure services such as water and electricity. As in the agriculture sector, the provision of financial services and skills can help informal enterprises to grow.

Prominent features of the Sub-Saharan African demographic transition will be the youth bulge and the higher labor force participation of women. Both can be addressed in part by employment policies ensuring that youth and particularly young women have appropriate labor skills. But the sheer size of the growing labor force means that youth and female employment policies will in themselves be inadequate. What is needed is a large increase in labor demand resulting from a substantial rise in economic growth. The demographic transition ensures the labor supply side of growth, but labor demand is needed to turn the transition into a demographic dividend.

In addition to increasing the opportunities for employment, Sub-Saharan Africa needs to prepare for the second demographic dividend by increasing savings for retirement. This effort requires setting up low-cost savings schemes accessible to workers in the informal and formal sectors and directing the boost in savings toward productive investment, eventually replacing foreign funds as the main source of investment financing.

There is a natural order of timing for the recommended policies, depending on a country's location in the demographic transition (table O.3). In countries with high fertility, policy makers should focus on the pace of the demographic transition. For high-fertility countries with high child mortality, reducing child

mortality should be the highest priority. For countries with high fertility despite low child mortality, such as Tanzania, action on the other determinants of desired fertility, such as female education, is indicated. Family planning activities should be directed to countries with a high unmet need for family planning (Casterline and El-Zeini 2014).

In countries where fertility is falling and the working-age share is rising, the focus should be on creating high-productivity employment for the large working-age cohort and encouraging investments in the health and education of the smaller youth cohort. In more mature economies, with larger formal sectors, which are near the high point of their dividend, the focus should be on generating domestic saving and female labor force participation outside the home. Ensuring sufficient savings for retirement will also address the issue of an aging population that will emerge as the transition comes to an end.

These policy recommendations may be difficult to implement in fragile states and countries where some areas are not under the government's control. In such cases, lack of security may make any interventions difficult and economic development nearly impossible. Therefore, emphasis should be placed on maintaining child health, access to health care, and family planning, where possible, to develop the preconditions for a demographic dividend.

The growth in Africa's working-age population will be relentless and inevitable. Will that growth produce a demographic dividend or a demographic disaster? The answer is up to Africa's policy makers—today. With the right policies, Africa's transition to smaller families can be accelerated. With the right policies, Africa's labor markets can provide productive work for a rapidly growing workforce. With the right policies, Africa can reap a tremendous demographic dividend to propel its economic takeoff.

Table O.3 Policies to Reap the Demographic Dividend

Purpose	Policies
Accelerate the fertility decline	Reduce child mortality, morbidity, malnutrition
	Increase female education and gender equity
	Address social norms on fertility
	Reduce child marriage
	Expand comprehensive family planning programs
Reap the first economic dividend	Improve education and human capital
	Attract foreign direct investments
	Improve business environment to build demand for labor
	Reduce trade barriers
	Encourage female employment outside the home
Reap the second economic dividend	Improve policies and institutions for domestic savings and investment

Notes

1. The *World Development Report 2012* on gender equality and development identifies the following areas as key priorities for addressing gender disparities: lowering the deaths of girls and women, eliminating gender disadvantage in education, increasing economic opportunities and lowering the earning and productivity gaps between women and men, shrinking the gender difference in voice in households and societies, and limiting the reproduction of gender inequality across generations (World Bank 2011). This book encompasses the recommendations of the *World Development Report 2012* regarding gender empowerment and specifically regarding the health of women and girls, educational opportunity, and labor participation in the formal sector.
2. Abortion rates are difficult to estimate from survey data due to stigma and underreporting. They are therefore modeled using a regression framework proposed by the Guttmacher Institute.
3. The Matlab and Navrongo studies are cited because they were designed to capture the causal impact of family planning on lowering fertility. Many other studies capture only correlations.

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Sub-Saharan Africa has experienced impressive and sustained economic growth and development. Some of that growth is powered by natural resources and policies that are opening up more markets and attracting investments. The demographic transition—particularly the speed with which it takes place and the economic and human development policies that accompany it—can power the next wave of economic growth with healthier and better educated youth cohorts that enter expanding labor markets and contribute to improved financial markets.

Africa's Demographic Transition: Dividend or Disaster? lays out a range of policy actions that are needed at the various phases of the demographic transition and uses global and regional experiences to provide evidence on what has worked and what has not. Countries have a menu of options available to speed up the transition, improve investment in the resulting youth cohort, expand labor markets, and encourage savings.

This book not only looks at lessons from East Asia, Latin America, and the Middle East, but also at unique demographic characteristics in Sub-Saharan Africa. Harnessing the demographic dividend means, first and foremost, empowering women and girls by improving their health, enhancing their human capital through increased investment in education and skills, and providing them with greater market, social, and decision-making power. The full potential of the demographic dividend can be realized in Sub-Saharan Africa with proactive policies that can help to make it happen.

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