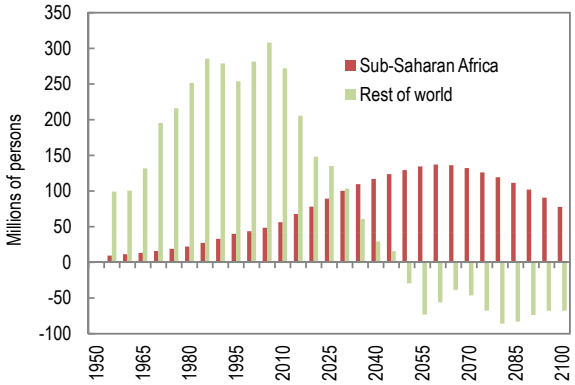
2. How Can Sub-Saharan Africa Harness the Demographic Dividend?

By 2035, the number of sub-Saharan Africans reaching working age (15–64) will exceed that of the rest of the world combined (Figure 2.1). This is a trend with potentially significant implications for both the region and the global economy, as described below:

- For the region, the implications of current trends include a rapid increase in population and a demographic transition—a pronounced increase in the share of working age population (SWAP, see Box 2.1). In most other parts of the world, similar transitions have been associated with higher saving and investment, raising potential and actual growth. Conversely, if countries' economic performance were to falter, the implications of such demographic developments could be dire.
- For the global economy, integrating sub-Saharan Africa's labor force into global supply chains would be beneficial. Indeed, given the aging population structure of much of the rest of the world, there may be little alternative. For the last several decades, the global working age population has been expanding at a rapid pace, supporting higher global growth. But more recently, this trend has started to reverse. On current trends, the world's working age population, excluding that of sub-Saharan Africa, will start to decline by 2050 or so. With aging populations elsewhere, sub-Saharan Africa will drive global population growth in the future.

This chapter considers the significance of the demographic transition for sub-Saharan Africa. The aim is to identify the policies that will help countries maximize the demographic dividend—an episode of higher economic growth driven by changes in the age structure of the population and by accompanying policies. To this end, this chapter reviews sub-Saharan Africa's demographic transition in a historical and global context; examines the opportunities it provides for countries in the region; considers policies that can help maximize the demographic dividend, in light of the experiences in east Asia and Latin America; and estimates the economic impact of the demographic transition under alternative scenarios.

Figure 2.1. Change in Working Age Population
(ages 15–64)



Sources: United Nations, World Population Prospects, 2012; and IMF staff calculations.

The main findings are as follows:

- Sub-Saharan Africa can benefit from a significant demographic dividend, the magnitude of which will depend on the speed of transition and policy choices. Sub-Saharan Africa's income per capita could be an additional 25 percent higher in 2050 solely as a result of the demographic transition. By 2100, it could be about 55 percent higher. If complemented with supportive policies, the dividend could increase to about 50 percent by 2050 and nearly 120 percent by 2100. For many countries, this represents the potential to graduate from low-income to middle-income status.
- To maximize the dividend, sub-Saharan Africa will have to create high-productivity jobs at an average of about 18 million jobs per year until

This chapter was prepared by a team led by John Wakeman-Linn comprising Rahul Anand, Paulo Drummond, Richard Erlebach, Francisco Roch, Vimal Thakoor, and Juan Treviño. Research assistance was provided by Idan Elmelech, Cleary Haines, and George Rooney.

2035—an extremely rapid and possibly unprecedented rate—to absorb the new entrants in the labor force. It will also require policies to be in place that encourage a gradual transition from the informal sector, which currently accounts for about 90 percent of the 400 million jobs in low-income sub-Saharan African countries, to non-agricultural formal sector employment.[1] Failure to create sufficient jobs could result in severe economic and social problems.

- The overall magnitude of the dividend will depend on the speed of the transition, that is, how fast infant mortality and fertility rates decline. For some sub-Saharan African countries where fertility rates remain high, significant gains can be achieved by decreasing infant mortality and fertility rates. The more rapidly those rates decline, the greater and faster will the increase in the share of the working age population be. Failure to speed up the transition will delay the demographic dividend.
- Factors that matter for growth—for example, macroeconomic stability, trade openness, and strong institutions— also matter for harnessing a demographic dividend, but take on greater importance in the face of rapidly growing populations and increasing shares of working age population. Some policies, however, become relatively more important in the context of the demographic transition. Investments in human capital, including health care and education, are critical in the early phases to speed up the transition, improve the productivity of the workforce, and increase the size of the potential dividend. Policies that promote flexible labor markets, facilitate the development of labor-intensive sectors that can compete globally, and liberalize trade are necessary to increase employment opportunities. Similarly, furthering financial sector development to effectively channel savings into investment can increase employment and growth. Many of these policies are interlinked, and exploiting their synergies is critical to increasing the dividend.

[1] The informal sector is defined as including both self-employment and agricultural employment.

SUB-SAHARAN AFRICA'S DEMOGRAPHIC TRANSITION

Demographic Developments

Most of sub-Saharan Africa is undergoing a demographic transition, owing to declining infant mortality and fertility rates. This is leading to an increase in the share of the working age population. Sub-Saharan Africa's population, currently of about 800 million, is projected to rise to 2 billion by 2050 and to 3.7 billion by 2100 (Figure 2.2).

By 2050:

- The youngest subgroup (ages 0–14) is projected to double to about 685 million.
- The working age population (ages 15–64) is projected to triple to 1.25 billion.
- The number of elderly (older than 65) is projected to quadruple to 100 million, reflecting improvements in life expectancy.

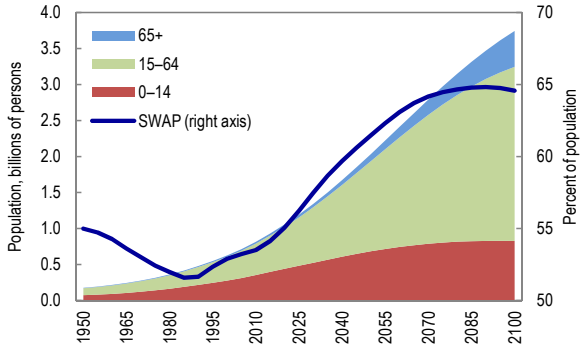
These projections are based on the medium-fertility scenario of the United Nations, which assumes a fertility decline in high-fertility countries similar to that observed for Asia and Latin America after the 1950s.[2] However, they are subject to uncertainty, and large upside risks exist from the persistence of high fertility rates in some sub-Saharan African countries.[3] The high-fertility scenario of the United Nations suggests that sub-Saharan Africa's population could increase more than sixfold by 2100, compared with the fourfold increase under the medium-fertility scenario (Figure 2.3).[4] The rest of the chapter uses the medium-fertility scenario of the United Nations.

[2] The United Nations defines high-fertility countries as countries with fertility rates above 5.1, and low-fertility countries as those with rates below 2.1.

[3] In recent years, the United Nations has increased its projected population figures for sub-Saharan Africa several times, as fertility rates have failed to decline as fast as projected.

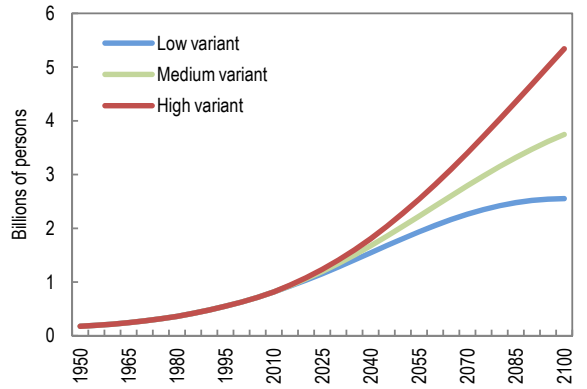
[4] The high-fertility scenario assumes an extra half child relative to the medium variant, while the low-fertility scenario estimate assumes half a child less relative to the medium-fertility scenario. A constant difference of half a child above or below the medium-fertility scenario would result in a global population of about 1.3 billion more or less in 2050 compared with the medium-fertility scenario.

Figure 2.2. Sub-Saharan Africa: Population Structure, 1950–2100



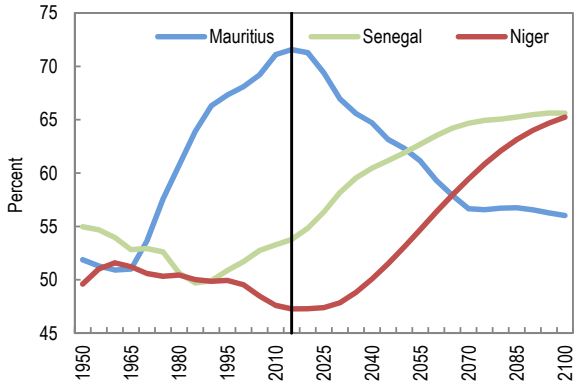
Sources: United Nations, World Population Prospects, 2012; and IMF staff calculations.
Note: SWAP = share of working age population.

Figure 2.3. Sub-Saharan Africa: Population Under Three Scenarios, 1950–2100



Source: United Nations, World Population Prospects, 2012.

Figure 2.4. Selected Countries: Share of Working Age Population at Different Stages of Transition, 1950–2100



Source: United Nations, World Population Prospects, 2012.

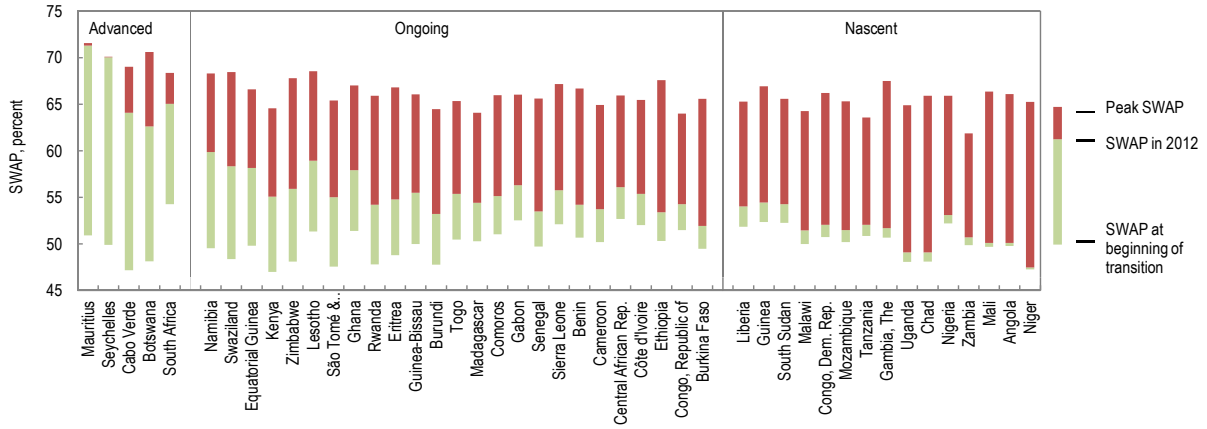
The pace and path of the demographic transition varies greatly across sub-Saharan Africa (Box 2.2). Three broad groups can be distinguished based on the evolution of their share of the working age population: (1) advanced, where the transition is largely complete; (2) ongoing, where the transition is underway; and (3) nascent, where little or no transition has yet taken place.[5] Figure 2.4 illustrates these groupings with three countries that fall broadly into these categories. Figure 2.5 shows how far sub-Saharan African countries have advanced in their transitions.[6]

- **Advanced.** These countries started their transitions in the 1960s and have nearly completed the process, in roughly the same time frame as east Asia and Latin America. Their transitions were made feasible by fast declines in mortality and fertility rates. These countries experienced some of the highest GDP growth in sub-Saharan Africa during their transition, and graduated to middle-income status (Figure 2.6). Box 2.3 presents the case of Mauritius, where the transition was initially challenging, but where complementary policies contributed to its success.
- **Ongoing.** This group includes a number of countries where the transition started during the 1980s, and where the peak share of the working age population will not be reached before 2050. The increase in the share of the working age population to date varies between 10 percentage points for countries such as Namibia and Swaziland, to marginally more than 2 percentage points for countries like Burkina Faso and Republic of Congo.
- **Nascent.** The transition in these countries has been slow as they have generally made little progress in moving from high to low mortality and fertility rates. As a result, the share of their

[5] A country is classified as (1) advanced, if its SWAP has increased by more than 10 percentage points since the beginning of the transition and if it has completed more than three-quarters of its transition; (2)ongoing, if the SWAP has increased between 2 and 10 percentage points; and (3) nascent, if the SWAP has increased by less than 2 percentage points.

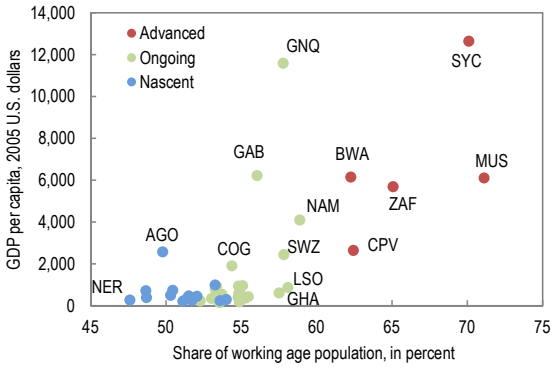
[6] Our focus on the turning points of the SWAP to define the beginning and end of the demographic transition is driven by the macroeconomic implications of the transition.

Figure 2.5. Sub-Saharan Africa: Evolution of Shares of Working Age Population (SWAP)



Sources: United Nations, World Population Prospects, 2012; and IMF staff calculations.
Note: A country is classified as (1) advanced, if its SWAP has increased by more than 10 percentage points since the beginning of the transition and if it has completed more than three-quarters of its transition; (2) ongoing, if the SWAP has increased between 2 and 10 percentage points; and (3) nascent, if the SWAP has increased by less than 2 percentage points.

Figure 2.6. Sub-Saharan Africa: Share of Working Age Population and Real GDP per Capita, 2010



Sources: United Nations, World Population Prospects, 2012; and World Bank, *World Development Indicators*.
Note: See page 70 for country acronyms.

working age population is only projected to increase significantly after 2050. This group includes Angola, Democratic Republic of the Congo, Nigeria, Tanzania, and Uganda, some of the most populous countries in sub-Saharan Africa, but it also includes Niger, where the transition is just beginning.

Fertility rates drive the speed of transition. Average fertility in sub-Saharan Africa has declined to 4.7 children per woman, but remains high in many countries, reflecting high infant mortality rates, cultural preferences, and, in some cases limited access to family planning initiatives (Guengant and May 2013; United Nations 2014). High fertility is positively correlated with infant mortality and inversely correlated with income levels (Figures 2.7 and 2.8).

As the focus of this chapter is on how to successfully manage the demographic transition, the rest of the discussion focuses on countries in the ongoing and nascent stages.

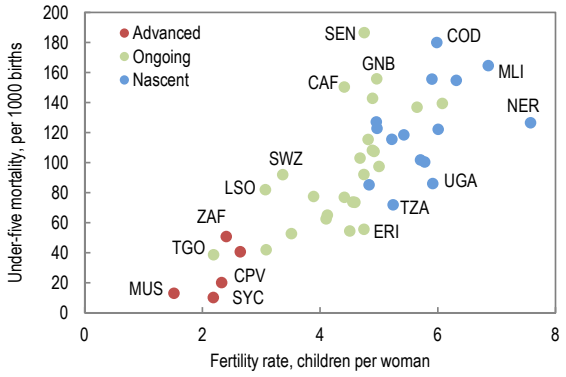
Regional Context

Demographic developments are projected to vary significantly across sub-Saharan Africa (Figure 2.9). The eastern and western parts of sub-Saharan Africa will have the biggest increase in population, which is projected to exceed 1 billion in both regions. The population in the southern region will remain largely flat, reflecting the completion of the demographic transition in its largest economies, Botswana and South Africa. As a country, Nigeria is projected to have the largest increase.

Global Context

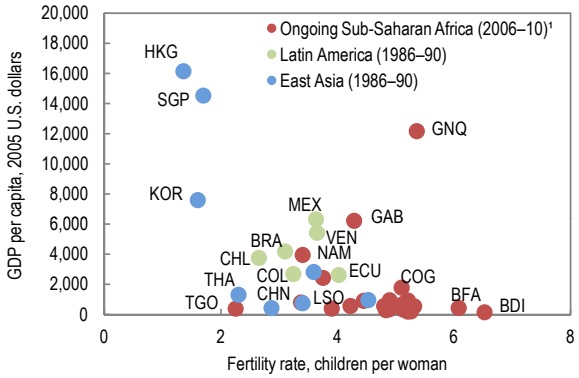
The rising share of sub-Saharan Africa's working age population is increasing the continent's productive potential at a time when most advanced economies face aging populations and a declining share of their working age populations (Figures 2.10 and 2.11). Sub-Saharan Africa's share of the global labor force is thus projected to increase from 10 percent in 2010 to 37 percent by 2100 (Figure 2.12).

Figure 2.7. Sub-Saharan Africa: Under-five Mortality and Fertility Rates, 2010–15



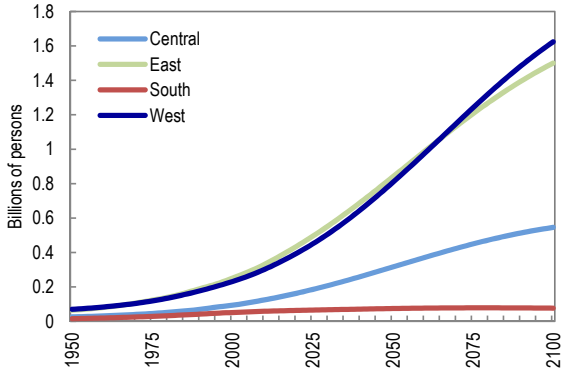
Source: United Nations, World Population Prospects, 2012.
Note: The data used both actual and projected rates. See page 70 for country acronyms.

Figure 2.8. Real GDP per Capita and Fertility Rates



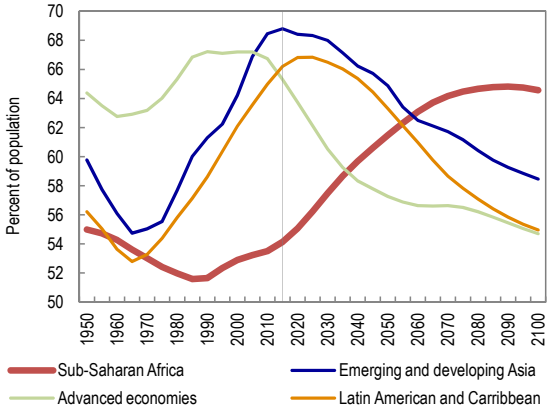
Source: United Nations, World Population Prospects, 2012.
Note: The dates in parentheses refer to the period for which the fertility rate and GDP per capita are shown. See page 70 for country acronyms.
¹ Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.9. Sub-Saharan Africa: Population Trends by Region, 1950–2100



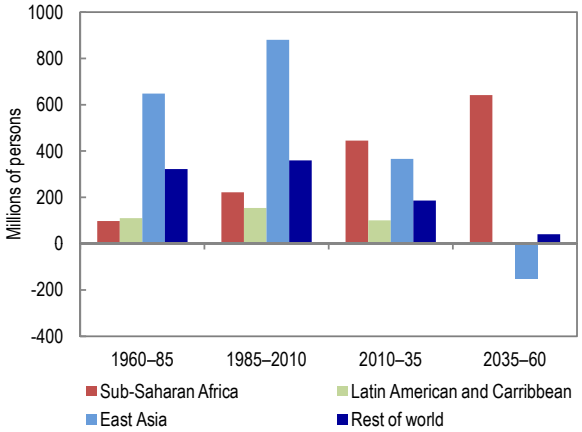
Source: United Nations, World Population Prospects, 2012.

Figure 2.10. Global Trends in Share of Working Age Population, 1950–2100



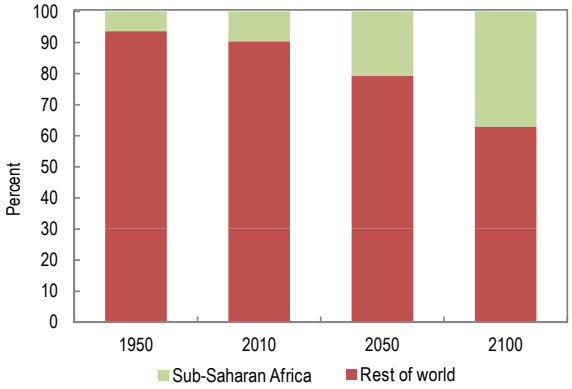
Source: United Nations, World Population Prospects, 2012.

Figure 2.11. Changes in Working Age Population: 1960–2060



Source: United Nations, World Population Prospects, 2012.

Figure 2.12 Share of World Labor Force



Source: United Nations, World Population Prospects, 2012.

The magnitude of these demographic developments will have major implications both for sub-Saharan Africa and for the global economy, as labor could flow from sub-Saharan Africa to other regions and capital could flow from other regions to sub-Saharan Africa.

THE DEMOGRAPHIC DIVIDEND: CHANNELS AND CHALLENGES

As noted previously, the demographic transition presents sub-Saharan African countries with an opportunity to benefit from the demographic dividend arising from additional growth due to changes in the population age structure and accompanying policies. A demographic transition involves several stages, each affecting growth through different channels (Galor and Weil 2000):

- First, the rising share of the working age population provides a direct channel for increasing per capita incomes. If the increased workforce is employed, there should be greater economic output and labor income per household.
- Second, declining fertility rates are generally associated with higher female labor force participation rates, further increasing the workforce and contributing to even larger reductions in the fertility rate (Bloom and others 2009; Soares and Falcao 2008). Removing legal and institutional impediments to female labor force participation can enable economies to benefit from an expanded pool of labor (Gonzalez and others 2015).
- Third, reductions in the number of children and concurrent increases in life expectancy are associated with greater private investment in education and health care, thereby enhancing the productivity of the workforce (Rosenzweig 1990; Soares 2005).
- Fourth, because saving rates tend to be highest for working age individuals, growth will receive a further temporary boost to the extent that those savings are channeled into investments (Higgins 1998; IMF 2004; Hassan, Sanchez, and Yu 2011).

But capturing this dividend is not automatic. To capture the largest dividend possible, sub-Saharan African countries will need to accelerate the declines in infant mortality and fertility, and generate large numbers of new jobs—on average, 18 million per year from 2010 to 2035—while ensuring those new workers are productive. Governments will need to strive to do this while confronting three important challenges:

- First, fertility rates in many sub-Saharan African countries could remain higher for longer, which could delay and reduce the size of any potential dividend.
- Second, rising populations will strain public resources and implementation capacity. To provide these growing populations with even the current level of services, sub-Saharan African countries will need to increase their road networks; power, water, and sewer systems; and delivery of health and education services. However, to fully exploit the potential demographic dividend, they will need not only to maintain their current level of services, but also to increase per capita investments in health, education, and infrastructure.
- Finally, the bulk of sub-Saharan Africa is employed in the informal sector, which is likely to remain the main source of employment in the near term. Moreover, evidence suggests that most women in sub-Saharan Africa have no choice but to work in the informal sector, as they have to both raise their children and earn an income. The lower levels of productivity associated with this sector could result in sub-Saharan Africa having lower-than-average productivity during part of its transition.

The next section reviews the degree of success two other regions—east Asia and Latin America—had in managing their own demographic transitions. It also contrasts the experience of sub-Saharan African countries in the "ongoing" group to the experiences of some east Asian and Latin American countries 25 years into their transitions.

THE DEMOGRAPHIC DIVIDEND: INTERNATIONAL EXPERIENCES

Differentiated Trends

East Asia and Latin America started their demographic transition at about the same time in the 1960s.[7] The starting year for these two regions is set to 1965, while for "ongoing" sub-Saharan African countries, the starting year is set to 1985—the year the share of the working age population started to increase, which for our purposes can be considered as the onset of the demographic transition. It can be insightful to compare the movement of key variables in these three regions during their demographic transitions.

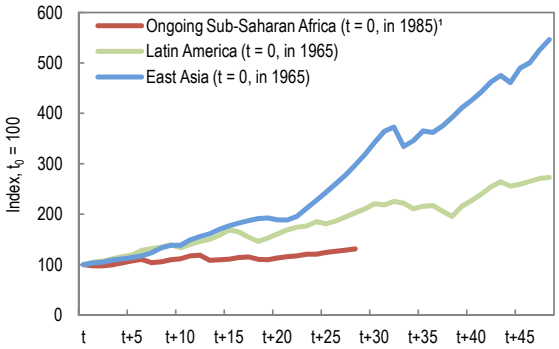
GDP per capita. East Asia, with only about half of Latin America's GDP per capita at the beginning of the transition, grew at an average annual rate of 3.7 percent over the last 50 years, in contrast with 2.2 percent in Latin America (Figure 2.13). Bloom, Canning, and Malaney (1999) estimate that at least 45 percent of east Asia's growth was attributable to the transition. Sub-Saharan Africa entered the transition with a much lower GDP per capita, and has seen little growth in GDP per capita in the first 25 years of its transition.

The size of the SWAP. East Asia saw a faster decline in fertility and, consequently, a faster increase in the share of the working age population than Latin America (Figures 2.14 and 2.15). Sub-Saharan African countries had fertility levels similar to those in Latin American countries at the beginning of the transition, but have declined even more slowly than in Latin America, leading to a much slower increase in the SWAP.

Changes in the structure of the economy. In east Asia, the share of agriculture fell sharply as a result of a rapid growth in labor-intensive manufacturing (Figure 2.16). Although at the outset the share of agriculture in GDP was significantly lower,

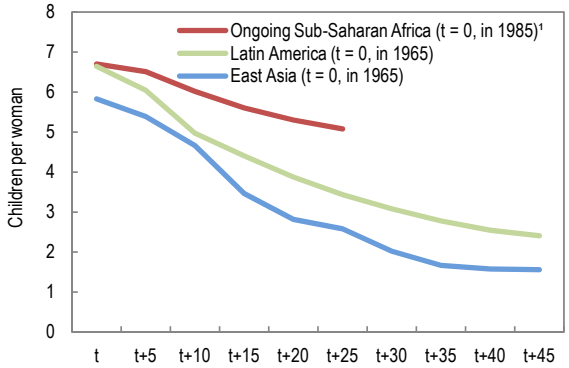
[7] In this section, Latin America comprises Brazil, Chile, Colombia, Ecuador, Mexico, and Venezuela; and east Asia comprises China, Hong Kong SAR, Indonesia, Malaysia, Philippines, Singapore, South Korea, and Thailand. Argentina, Japan, and Uruguay are excluded because of their diverging demographics relative to their respective regions.

Figure 2.13. Selected Regions: Real GDP per Capita Index



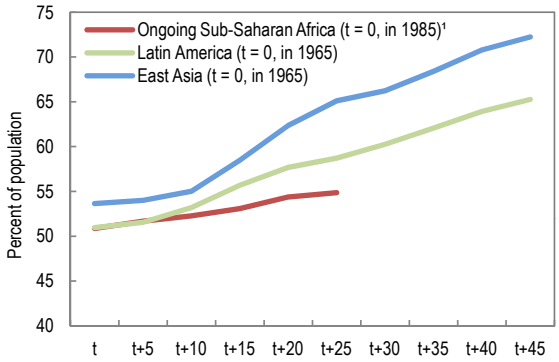
Sources: World Bank, *World Development Indicators;* and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.14. Selected Regions: Median Fertility Rates



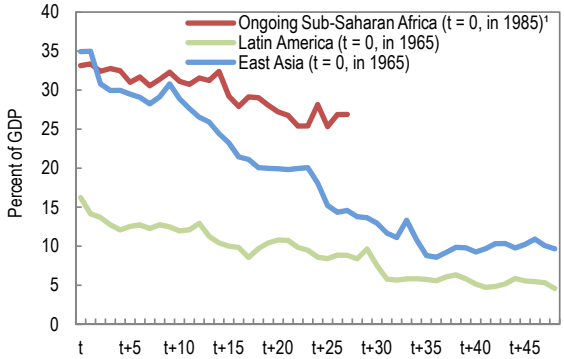
Sources: World Bank, *World Development Indicators;* and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.15. Selected Regions: Median Share of Working Age Population



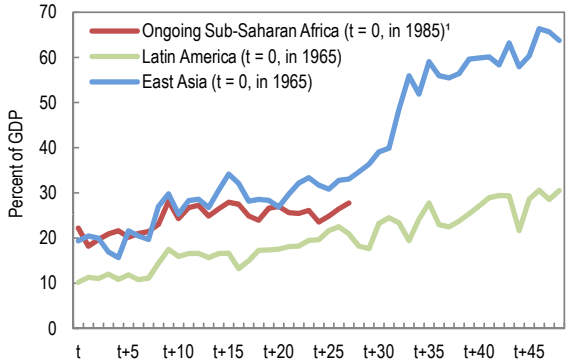
Sources: World Bank, *World Development Indicators;* and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.16. Selected Regions: Median Share of Agriculture in GDP



Sources: World Bank, *World Development Indicators*; and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.17. Selected Regions: Median Export Share in GDP



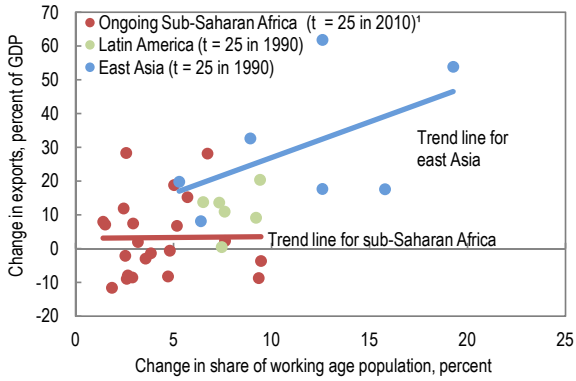
Sources: World Bank, *World Development Indicators*; and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

the decline in the share of agriculture was much slower in Latin America. Although sub-Saharan Africa started at the same level as east Asia, its dependence on agriculture remains high.

Exports. Exports as a share of GDP almost tripled in east Asia (Figure 2.17; Page 1997; IDB 1997).[8] The increase was much more modest in Latin America. The increase in exports in sub-Saharan Africa has been relatively modest compared with the path seen in east Asia (Figure. 2.18). Indeed, while sub-Saharan Africa had a larger share of exports than Latin America at the start of their respective transitions, their export shares were almost identical 25 years later. Moreover, a significant part of sub-Saharan Africa's exports consists of extractive products. Since the extractive industry tends to be capital intensive, it does not necessarily create jobs on the same scale as labor-intensive manufacturing and services sectors.

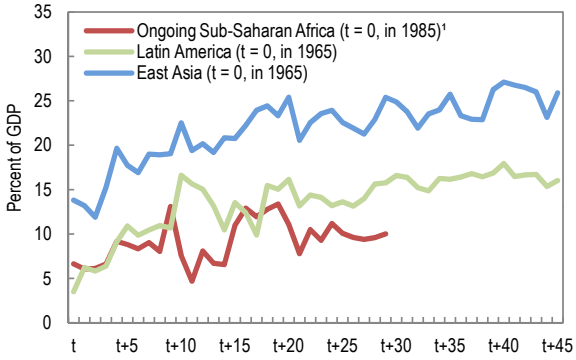
Saving and investment. Starting at a higher base, private saving in east Asia reached a much higher level than in Latin America (Figure 2.19). Also, during the transition, public saving in east Asia did not deteriorate, as it did in Latin America (Figure 2.20; Uy 1993). Most sub-Saharan African countries in the ongoing stage have experienced modest

Figure 2.18. Selected Regions: Change in Share of Working Age Population and Change in Exports Between t = 0 and t = 25



Sources: World Bank, *World Development Indicators*; and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

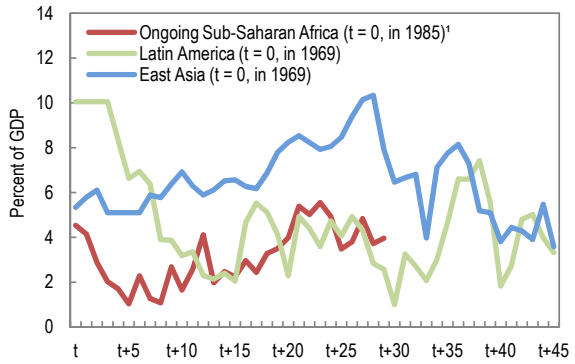
Figure 2.19. Selected Regions: Median Private Saving



Sources: IMF, World Economic Outlook database; and IMF staff estimates.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

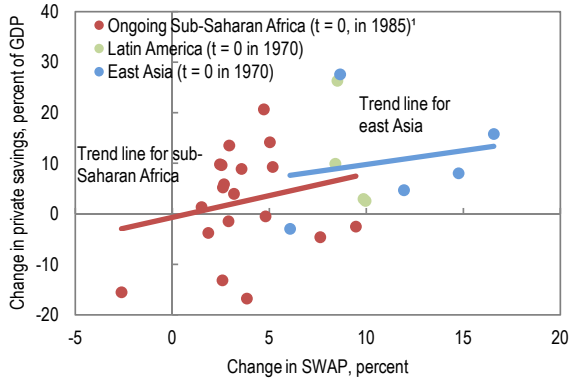
[8] Most of the east Asian economies liberalized trade and adopted policies to promote manufacturing exports (Page 1994). In contrast, Latin America pursued policies to protect domestic industries from external competition, such as import tariffs, quotas and licenses, and export subsidies (Elson 2013).

Figure 2.20. Selected Regions: Median Public Saving



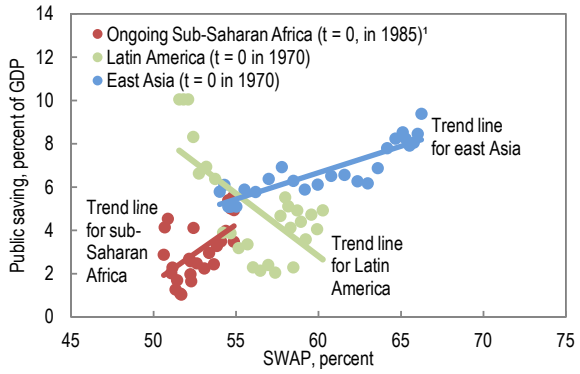
Source: IMF, World Economic Outlook database.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.21. Selected Regions: Change in Share of Working Age Population and Change in Private Saving Between t = 0 and t = 25



Sources: United Nations, World Population Prospects, 2012; and IMF, World Economic Outlook database.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

Figure 2.22. Selected Regions: Median Public Saving and Share of Working Age Population from t = 0 to t = 25



Sources: United Nations, World Population Prospects, 2012; and IMF, World Economic Outlook database.
[1] Ongoing sub-Saharan Africa refers to countries in the ongoing stage of transition, as defined in Figure 2.5.

increases in private and public savings (Figures 2.21 and 2.22).

The demographic transition did not contribute as much to growth in Latin America as it did in east Asia (Drummond, Thakoor, and Yu 2014—Box 2.4). Studies suggest that policy differences played a key role in the different regional outcomes. The interaction of a faster demographic transition and better suited economic policies in east Asia is estimated to account for about 40 percent of the growth differential with Latin America (Bloom and Canning 2001).

The Critical Role of Policies

Policy differences between east Asia and Latin America can provide useful insights for sub-Saharan African countries going through their demographic transitions. As noted previously, east Asian countries had a faster transition and captured a larger demographic dividend than Latin American countries. They did this by putting in place a macroeconomic framework conducive to tapping the potential provided by the increase in the working age population. Health and education policies allowed east Asia to have a faster transition and improved the overall productivity of the workforce, while macroeconomic stability and complementary policies—related to structural transformation and international trade—favored job creation and saving (Bloom, Canning, and Sevilla 2003; Reher 2011). Specifically, east Asia's better performance in capturing the demographic dividend has been attributed to the following:

- *Policies contributed to a faster demographic transition.* This was partly attributable to public programs encouraging couples to reduce childbearing and the provision of low-cost means to regulate fertility (Mason 2003).
- *Investments in human capital ensured the workforce was more productive.* Public investment in education contributed to higher productivity by improving skills and health, thereby contributing to meeting the needs of growing and diversifying economies (Page 1994; Mason 1997; Gribble and Bremner 2012).

- *Job creation was facilitated by labor market flexibility and a shift to labor-intensive manufacturing sectors.* Wages were allowed to move more flexibly in response to macroeconomic shocks. They also reduced the income gap between the formal and informal sectors, contributing to overall social stability, and thus enhancing the environment for growth (Mason 1997, 2003; Elson 2013). By contrast, in many Latin American countries, import-substitution policies supported the development of powerful vested interests, allowing wages to grow in excess of productivity gains, and hampering investment and growth prospects (Elson 2013). Additionally, stiff labor protection regulations benefited only a subset of workers in the private formal sector and the public sector.
- *Higher trade integration stimulated job creation, structural transformation, and technology transfer.* If Latin America had been as open as east Asia, it is estimated that its average annual GDP per capita growth rate would have been 0.9 percentage point higher during 1965–85 (Summers and Heston 1991).Conversely, following the transition, about 40 percent of the increase in Latin America's growth potential in the late 1980s has been attributed to trade liberalization.[9]
- *Increased savings from the demographic transition were channeled toward investment, with simultaneous financial sector development.* East Asia's higher saving rates were supported by a decline in dependency ratios, faster growth, and the extended family structure, which reduced the decline in saving traditionally associated with retirement (Mason and Kinugasa 2008; Page 1994; Mason 1997).[10] Higher saving supported investment, which exceeded 20 percent of GDP on average during 1960–90. Also, east Asian countries adopted additional measures, including tax policies, to promote investment and keep the relative price of capital goods low. The region experienced a faster increase in capital per worker than in Latin America. Half of the total estimated demographic dividend in east Asia can be attributed to capital accumulation (Bloom and Williamson 1998).

POLICY OPTIONS FOR SUB-SAHARAN AFRICA

The demographic transition and accompanying economic transformation is evolving at a slower pace in sub-Saharan Africa relative to east Asia. To improve the prospects of harnessing a higher dividend, creating jobs to absorb the new workforce entrants while increasing overall productivity levels will be vital. It will also require maintaining macroeconomic stability to spur economic transformation and facilitate private sector development, including by protecting investor rights, strengthening the rule of law, and reducing the cost of doing business. The implementation of these policies will likely require fiscal space to allow for a scaling up of some components of expenditure, while maintaining debt sustainability. A reprioritization of government spending toward social and infrastructure spending can contribute to improving the productivity of the workforce and reducing bottlenecks to private sector development. Reducing distortionary taxes on capital and income can also create incentives for the private sector to expand its activities and increase the demand for labor.

The speed of the transition is one of the main determinants of the magnitude of the demographic dividend (Drummond, Thakoor, and Yu 2014). In several sub-Saharan African countries, there is significant scope to increase the magnitude of the dividend by speeding the transition (Guengant and May 2013). This reflects the high fertility rates in many countries at the "ongoing" and "nascent" stages. Reducing infant mortality and supporting children's health and nutrition needs could contribute to a reduction in fertility and allow for greater

[9] According to the Inter-American Development Bank (IDB 1997), 0.8 percentage point of the 1.9 percent increase in Latin America's growth potential in the late 1980s was due to trade liberalization.

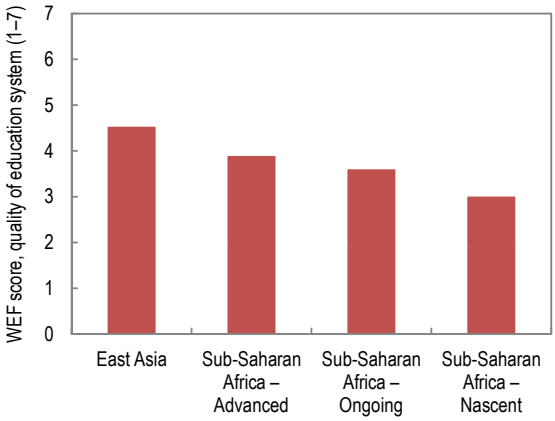
[10] Higgins and Williamson (1997) suggest that demographic changes raised accumulation rates in east Asia by 3.4 percentage points, thus augmenting the growth in GDP per capita by an estimated 1.5 percentage points—about three-fourths of the higher growth east Asia experienced due to demographic factors.

investment in human capital, while also maximizing children's opportunities in the education system (Ruger, Jamison, and Bloom 2001).

Building Capacity to Improve Productivity

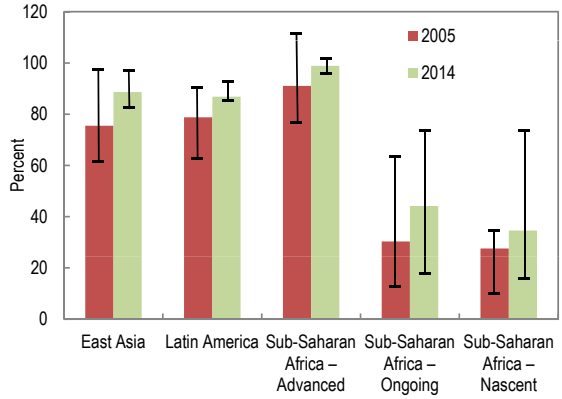
Sub-Saharan Africa has made significant progress in improving access to primary education. There is still, however, a need to improve access to secondary and tertiary education, as well as to improve education quality at all levels. Enhanced education outcomes will be particularly important to improve the employability and increase the productivity of new entrants to the workforce. Evidence suggests that female education also contributes to a decline in fertility rates and can thus increase the speed of transition. Policy priorities in this area should include expanding school enrollment, and increasing completion rates, especially for girls, and ensuring that secondary and tertiary education are relevant for the skills needed in the workforce (Figures 2.23 and 2.24).

Figure 2.23. Quality of Education Index, Median, 2014



Source: World Economic Forum (WEF), Global Competitiveness Index, 2014.

Figure 2.24. Gross Secondary School Enrollment, Median, 2005 and 2014



Source: World Bank, *World Development Indicators*.
Note: Lines indicate distance between minimum and maximum. Gross enrollment is computed as the total enrollment in secondary education, regardless of age, expressed as a percentage of the population of official secondary education age. This explains why the rate is greater than 100 percent in some cases.

Creating Jobs and Furthering Structural Transformation

Sub-Saharan Africa needs to create jobs for the 450 million workers projected to join the workforce between 2010 and 2035. Many of the countries in the ongoing and nascent transition stages are characterized by a high share of agricultural employment and low levels of formal sector employment. Therefore, creating high-productivity non-agricultural jobs on a sufficient scale is likely to be the biggest challenge for sub-Saharan Africa during the transition (Fox and others 2013). The following measures could help:

- *Increasing agricultural productivity and diversifying into labor-intensive activities outside agriculture.* Agricultural productivity can be improved by increasing access to irrigation, increasing use of high-yield varieties, and improving market access. In addition, economic diversification would require reducing administrative burdens, simplifying regulations, promoting competition, and investing in human and physical capital (*Regional Economic Outlook: Sub-Saharan Africa,* April 2014).
- *Promoting private sector development.* This would allow the private sector to engage in new areas of economic activity. Private sector development could be facilitated by reforms that support a more business-friendly environment.
- *Meeting infrastructure needs.* Filling the infrastructure gaps in transport, telecommunications, and energy will be critical to expanding manufacturing and services, as well as reducing the cost of doing business (*Regional Economic Outlook: Sub-Saharan Africa,* October 2014).

Improving intraregional infrastructure also could better connect sub-Saharan African markets, making it possible to exploit economies of scale and boost industrialization.

- *Increasing labor market flexibility to support formal sector job creation.* Labor market rules need to be supportive of employment by shifting from protection of jobs to protection of workers, that is, supporting workers during job search between jobs and facilitating retraining. Greater wage and employment flexibility would also reduce transaction costs, increase incentives for businesses to switch to the formal sector, invest, and enhance productivity. Designing active labor market policies in cooperation with the private sector and other stakeholders, while taking into account the cost and benefit of such policies, could potentially foster job creation.
- *Promoting household enterprises.* As the informal sector is likely to remain the main source of income in the near term for many in sub-Saharan Africa, policies to enhance the producivity of the household enterprise sector will be needed. Policies will also be required to lower the compliance costs for small and medium-sized enterprises (SMEs) and to provide them with services that enable them to grow.

Given the global demographic profile, there is significant scope for sub-Saharan Africa to become a net labor supplier to the rest of the world. Migration could potentially benefit both sub-Saharan Africa and the rest of the world. Sub-Saharan Africa could benefit from higher remittances, while employers elsewhere could benefit from the labor supply as they face stagnant or declining numbers of workers in their own countries. Global policymakers will need to balance economic, political, and social considerations when designing policies related to migration.

Expanding Horizons Through Trade Liberalization

Higher trade openness would aid job creation to absorb the growing working age population, and allow sub-Saharan Africa to benefit from technology transfers and integration into global value chains. Expanding intraregional trade and expanding regional markets could boost incentives for domestic production, especially in labor-intensive manufacturing sectors, and attract higher investment. International experience suggests that the decline in unemployment and increase in saving along a country's average age profile is much steeper for countries more open to trade (Behrman, Duryea, and Székely 1999). Chapter 3 provides further details on policies to bolster trade integration.

Channeling Savings to Finance Investment and Further Financial Market Development

Financial markets in most sub-Saharan African countries remain thin. Financial deepening could help harness the increased saving from a rising share of the working age population by improving financial inclusion and capital market development, leading to the increased saving being more successfully intermediated to finance investment. This would help firms expand, give household enterprises better access to credit, and allow individuals to create their own job opportunities. It would require eliminating distortions for the banking sector, applying the legal and regulatory framework evenhandedly, and increasing the market size (*Regional Economic Outlook: Sub-Saharan Africa,* October 2006). The following policies could further financial deepening and integration:

- *Addressing insufficient infrastructure for physical access and promoting financial literacy in countries with low access to financial services.* Increasing bank competition to reduce transaction costs and encouraging the development of mobile banking (as in Angola and Kenya) could increase financial inclusion (*Regional Economic Outlook: Sub-Saharan Africa,* April 2014). Sub-Saharan African countries could benefit

from other countries' successful experiences in augmenting financial access: microfinance institutions (as in Kenya through the Kenyan Finance Women's Trust), financial cooperatives (as in Burkina Faso), and private firms (as in Ethiopia and Kenya).

- *Developing regional markets could address the challenges posed by the small size of some economies.* Such markets could also help expand the investor base, reduce financial infrastructure and transaction costs, and provide scale efficiencies. Developing financial infrastructure, updating regulation and supervision systems, and harmonizing prudential supervisory rules and practices in the region would boost financial integration.
- *Creating pension systems.* The old age pension coverage rate in many sub-Saharan African countries is very low. As the number of retirees increase in the future, it is very likely that countries will expand public spending on old age pensions. This has to be done in a fiscally sustainable manner. For occupational pensions, putting in place actuarially sound systems could help channel long-term saving and provide the elderly with an additional source of income during retirement, thereby mitigating some of the pressures on government expenditure.

POLICY SCENARIOS

This section assesses the demographic dividend sub-Saharan Africa might experience under various scenarios. It considers the median sub-Saharan African country in the sample, excluding advanced-stage countries, with an initial 2010 GDP per capita of about $550. Using the full sample estimates and approach adopted in Drummond, Thakoor, and Yu (2014), the evolution of GDP per capita is simulated under six scenarios.[11] These scenarios differ across three main dimensions:

(1) Ability of the economy to absorb new entrants into the labor force. If the economy is unable to absorb all the new entrants, unemployment will increase. The magnitude of the demographic dividend will subsequently be lower.

(2) Policy changes implemented. Supportive policies can increase the magnitude of the dividend. In the scenarios, this is modeled as a 1 percentage point annual increase in trade openness. This would still be slower than the trade openness increase experienced in most of the east Asian countries.

(3) Speed of the demographic transition. The baseline uses the United Nations' medium-fertility scenario. But two alternatives with varying fertility rates are also considered.

The main assumptions regarding the scenarios (summarized in Table 2.1.) are as follows:

Scenario 1–rising unemployment. The economy is unable to create jobs on a significant scale. The share of the working age population employed remains at the 2010 level.[12] Hence, as the transition evolves, unemployment rises. An alternative interpretation of scenario 1 could be one in which jobs created are at a lower level of productivity, resulting in a lower dividend.

Scenario 2–more jobs. All new entrants to the labor force find jobs at historical levels of productivity.

Scenario 3–more jobs and better policies. Policy changes translate into an increase in trade openness.

Scenarios 4 and 5–more jobs, differing transitions. The fertility rate varies according to the low- and high-fertility variants of the United Nations projections, thereby changing the speed of the transition.

Scenario 6–more jobs, better policies, faster transition. All new entrants get jobs, better policies are in place, and the transition proceeds faster. This can be interpreted as the best-case scenario.

[11] Scenarios 1 and 2 replicate the results of Drummond, Thakoor, and Yu (2014).

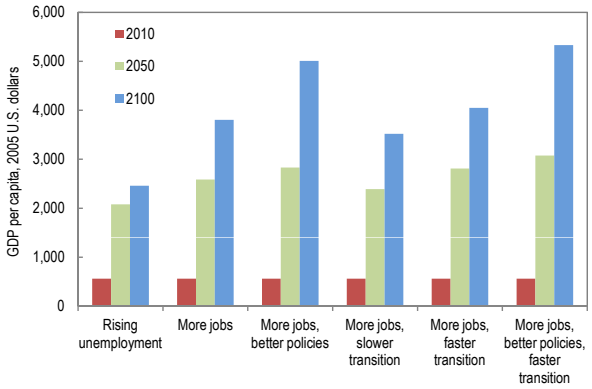
[12] In the worst-case scenario, jobs would be created at an even slower pace than in scenario 1, resulting in rapidly rising unemployment. We do not attempt to estimate the GDP implications of such a development, as the resulting social and political tensions would not be effectively captured in the model.

Table 2.1. Assumptions of Policy Scenarios

	Dimensions						
	(1) Ability to Absorb New Entrants (share of working age population employed)		(2) Policy (trade openness)		(3) Speed of Transition (fertility rate)		
Assumptions:	Constant at 2010 level	Increases 1:1 with increase in working-age population (WAP)	Unchanged	Improved	Slow (high rate)	Medium (United Nations Scenario)	Fast (low rate)
Scenarios:							
1. Rising unemployment	X		X			X	
2. More jobs		X	X			X	
3. More jobs, better policies		X		X		X	
4. More jobs, slower transition		X	X		X		
5. More jobs, faster transition		X	X				X
6. More jobs, better policies, faster transition		X		X			X

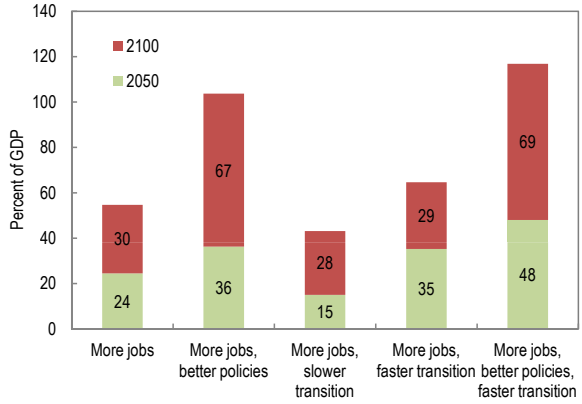
Source: IMF staff compilation.

Figure 2.25. Sub-Saharan Africa: GDP per Capita Under Various Scenarios



Sources: World Bank, *World Development Indicators;* and IMF staff estimates.

Figure 2.26. Sub-Saharan Africa: Demographic Dividend Relative to Scenario 1



Source: IMF staff estimates.

The results from the various scenarios are described below and in Figure 2.25, with the additional dividend generated under scenarios 2–6 (relative to scenario 1) shown in Figure 2.26.

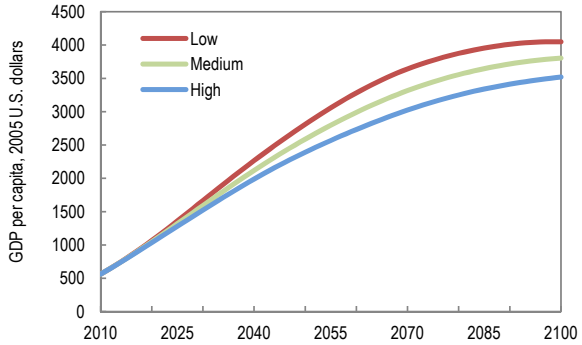
Rising unemployment: Despite the rising unemployment, sub-Saharan Africa's per capita GDP in 2050 would increase by about $1,300 relative to 2010 per capita GDP, reflecting not only the fact that the ratio of working adults in the total population increases, but also a continuation of existing trends and catch-up opportunities unrelated to the demographic transition.

More jobs: Harnessing the potential provided by the demographic transition through sufficient job creation could result in GDP per capita being higher by about 25 percent in 2050 and by a combined 54 percent by 2100 compared to scenario 1.

More jobs, better policies: With supportive policies, GDP per capita could be higher by about 36 percent in 2050, and more than double by 2100. This increase in GDP per capita would be broadly similar to what happened in east Asia, but it would be achieved over a longer period.

Jobs with differing transitions: The potential gains from focusing on policies to speed up the demographic transition could be significant (Figure 2.27). While the difference in assumption between the high- and low-fertility scenarios

Figure 2.27. Sub-Saharan Africa: Dividends Under Different Fertility Scenarios



Source: IMF staff estimates.

is small—one child per woman—a faster transition could result in a dividend of about 35 percent by 2050, compared with 25 percent in the medium-fertility scenario and 15 percent under the high-fertility scenario.

More jobs, better policies, faster transition: A combination of strong job creation, better policies, and faster transition characterized by lower fertility can result in a dividend of nearly 50 percent by 2050, and nearly 120 percent by 2100. The faster transition increases the dividend and brings forward the time at which it materializes.

CONCLUSIONS

Most sub-Saharan African countries will experience both a rapidly growing population and a rising share of the working age population over the coming decades. This transition presents an opportunity to capture a demographic dividend, provided countries implement supportive policies and address challenges arising from the need to provide for rapidly growing populations.

The magnitude of the demographic dividend will largely depend on the speed of the transition and the adoption of supporting policies. Reducing fertility rates can contribute to a faster transition. Creating jobs to absorb new entrants into the labor force will be critical. To fully capture the dividend, sub-Saharan Africa will need to create jobs at an extremely rapid pace for decades. The private sector has a key role to play, both as a source of employment and in furthering economic diversification into new sectors. Enhanced infrastructure and openness to trade will help ensure viable opportunities for businesses to invest and grow. Improved health and education standards will be essential to ensure that the growing pool of workers has the necessary skills. Flexible labor markets will be crucial to ensure workers' competitiveness, and financial development will help tap savings for enhanced investment. In the near term, it is likely that the bulk of job creation will remain in the informal sector, so efforts to enhance the productivity of the informal sector will be vital. It will also be important to start planning ahead for the projected increase in pensioners by putting in place viable pension systems.

Sub-Saharan African countries stand at a crossroads. Successful reduction of mortality and fertility rates, combined with effective implementation of supporting policies, could enable these countries to capture a large demographic dividend and improve the quality of life for all their citizens. But failure to seize the opportunity provided by the demographic transition could result in a rapid growth in the number of unemployed citizens, with potentially severe social and economic consequences.

Box 2.1. Defining Demographic Transition

A demographic transition can be viewed as a cycle driven by declining mortality and fertility rates, resulting in a change in the overall age structure of a population. It occurs in phases. In the early phases, the transition is driven by declining mortality rates, which leads to an increase in the rate of population growth. Lower infant and child mortality rates lead to declining fertility and a corresponding decline in population growth rates (Figure 2.1.1). Ultimately, the share of the working age population increases (Figure 2.1.2). The share of the working age population (SWAP) is defined as the share of the population aged 15–64 relative to the overall population:

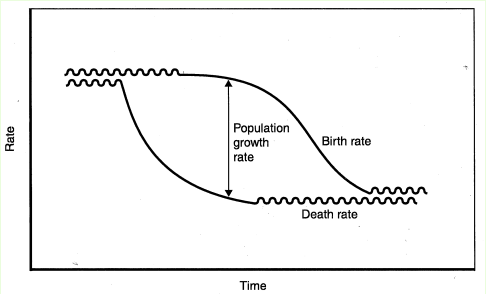
$$\text{SWAP}=\frac{\text{pop (15–64)}}{(\text{pop}[0–14]+\text{pop}[15–64]+\text{pop}[65+])}$$

Once the SWAP peaks, the economy faces an aging population, characterized by an increase in the number of retirees relative to the active population.

Demographers refer to this increase in the SWAP, and the resulting decrease in the dependency ratio, as an "age-structural transition." They consider the beginning of the transition as the point at which fertility starts to decline and the end of the transition as either the point at which fertility has fallen by a specific amount, or has reached replacement level.

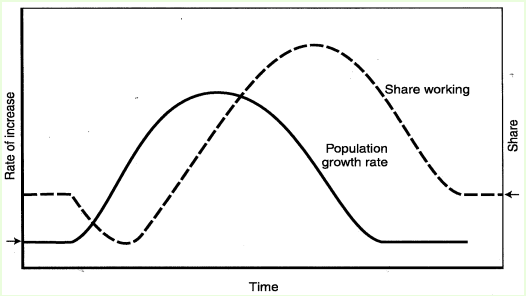
Since the share of the SWAP is the most direct channel of a demographic dividend, we focus on its evolution in sub-Saharan Africa. As evident from Figure 2.2, sub-Saharan Africa's SWAP started increasing in the mid-1980s. This chapter considers this turning point as the beginning of the transition for sub-Saharan Africa.

Figure 2.1.1. Phases in Demographic Transition



Source: Reprinted from Bloom, Canning, and Sevilla (2003). With permission from RAND Corporation.

Figure 2.1.2. The Evolution of SWAP During Transition



Source: Reprinted from Bloom, Canning, and Sevilla (2003). With permission from RAND Corporation.

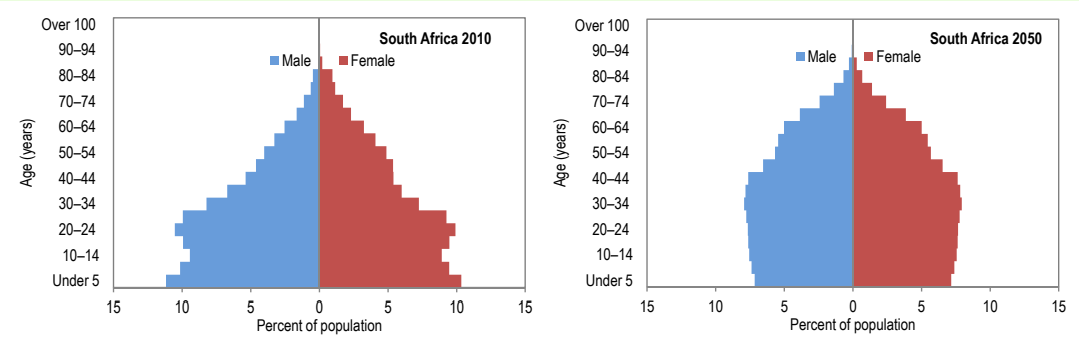
Box 2.2. Differing Transitions Within Sub-Saharan Africa

This box presents the expected evolution of the demographic profile for the three groups—advanced, ongoing, and nascent—using the examples of South Africa, Ethiopia, and Niger.

Advanced Transition

The population pyramids for South Africa show that the demographic transition has been largely completed, with falling fertility rates resulting in a relatively even distribution of the population below age 35 and the falling size of youth cohorts (Figure 2.2.1). Life expectancy at birth in South Africa in 2010 was 57 years. As mortality rates fall and life expectancy increases, South Africa will experience continued modest growth in the share of its working age population, from 64 percent to 68 percent, as well as a rapid rise in the proportion of adults over 65, from 5 percent to 11 percent by 2050. Other countries in this group, such as Mauritius, will experience a fall in the share of the working age population and even greater shifts to old-age dependency, as they are further along the demographic transition.

Figure 2.2.1. Advanced Transition



Source: United Nations, World Population Prospects, 2012.

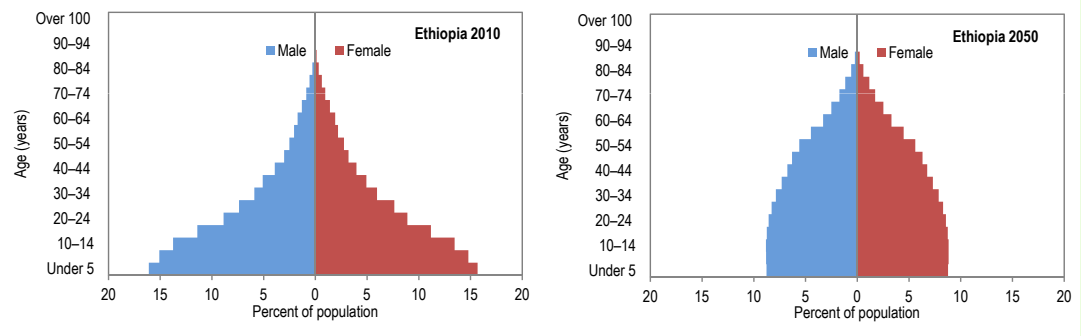
Ongoing Transition

With declining infant mortality and fertility rates, Ethiopia is expected to move from a concave population pyramid in 2010 to a more convex one by 2050. Ethiopia's under-five population is expected to increase from 14 million to 16 million by 2050, while its total population increases from 87 million to 188 million. The cohort aged 14 years and younger is projected to rise to 49 million by 2050, from 37 million in 2010 (Figure 2.2.2). The cohort of working age adults is projected to increase from 45.5 million (52 percent of the population) in 2010 to 125 million (67 percent of the population) in 2050. Similar increases in the share of the working age population are expected in other countries in this group.

(*continued*)

Box 2.2 (*continued*)

Figure 2.2.2. Ongoing Transition

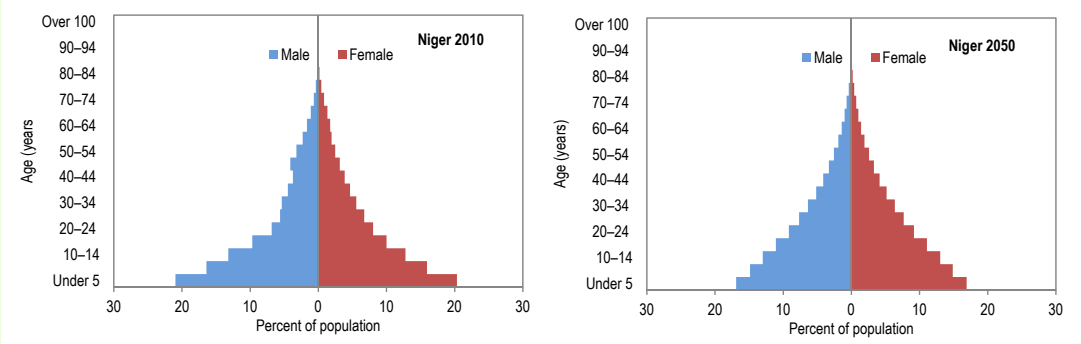


Source: United Nations, World Population Prospects, 2012.

Nascent Transition

Niger continues to face high mortality and high fertility rates. However, as these start to decline with improvements in health and well-being, Niger's under-five population is expected to increase from 3 million to 13 million by 2050, while its total population increases from 15 million to 70 million. The 5- to 14-year-old cohort is projected to rise to 19 million by 2050, from 4.6 million in 2010 (Figure 2.2.3). The cohort of working age adults is projected to increase from 7.5 million (48 percent of the population) in 2010 to 37 million (53 percent of the population) in 2050. This group, which includes populous countries such as Angola, Mali, Nigeria, and Uganda, is expected to have the fastest-growing population in sub-Saharan Africa, as fertility rates remain among the highest.

Figure 2.2.3. Nascent Transition



Source: United Nations, World Population Prospects, 2012.

Box 2.3. Mauritius: Demographics and Development

The economic prognosis for Mauritius in the 1960s was bleak. The island was the archetypal monoculture economy, with sugar accounting for more than 90 percent of earnings and limited industrial proficiency outside the sugar industry. The country's small market size and lack of profitable investment opportunities, coupled with a low saving rate, increased its downside risks (Meade 1961). In addition, the population was increasing in excess of 3 percent per year, driven by a fertility rate in excess of five (Figure 2.3.1a). The failure of the import substitution industry to create jobs on any significant scale further blighted economic prospects and per capita GDP was stagnating.

In the 1980s, the Mauritian government adopted a series of measures that harnessed the potential offered by the growing labor force and complemented these with a deliberate effort to reduce the fertility rate through a proactive family planning campaign. These policies were largely responsible for what came to be known as the "Mauritian Miracle" (Figure 2.3.1b). In addition to macroeconomic and political stability, policies that have contributed to Mauritius' economic success included the following:

- A shift to an export-led strategy—When the authorities realized that import substitution was not suited to the endowments of the country, they shifted to export promotion. An export processing zone regime was put in place and complemented with a package of time-bound fiscal and nonfiscal incentives, including greater labor market flexibility, to encourage exports. The new strategy reignited growth.
- Economic diversification—The aims of the export promotion strategy were to diversify the economic base, create jobs, and increase export earnings. Mauritius targeted the textiles sector for entering the global value chain, which allowed that sector to leverage its pool of cheap labor, particularly women, and contributed to a decline in unemployment (Figure 2.3.1c). The diversification strategy also extended to tourism and financial services.
- Integration into the global economy—Mauritius exhibited openness to both trade and foreign direct investment, which allowed it to benefit from textiles investors relocating from Hong Kong SAR in the early 1980s. Additionally, it negotiated various preferential trade agreements, which allowed it to benefit from duty-free exports, particularly to Europe.
- Human capital—High literacy rates (aided by free education) and a cheap labor force at the onset of the industrialization strategy increased Mauritius's attractiveness as an investment destination. Growth decomposition shows that labor (augmented for human capital) contributed significantly to growth during the 1980s (Figure 2.3.1d; Svirydzenka and Petri 2014). Looking ahead, this contribution is expected to be marginal, which will reduce the growth potential (Figure 2.3.1e).

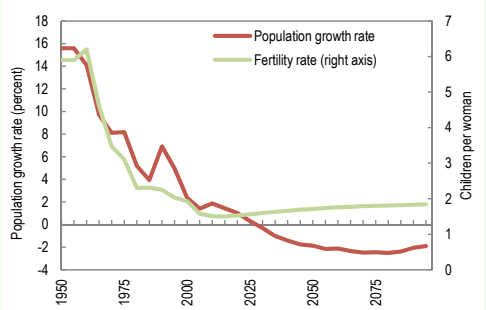
The favorable demographic window is now closing and the economy faces an aging and declining population in the coming years (Figure 2.3.1f). This will also create the challenge of managing the fiscal pressures from an aging population, particularly as pension expenditures increase (Soto, Thakoor, and Petri, forthcoming).

(*continued*)

Box 2.3. *(continued)*

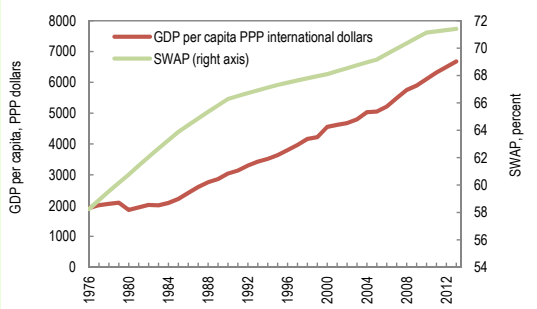
Figure 2.3.1. Demographics and Economic Developments in Mauritius

a. Fertility and Population Growth Rates



Sources: United Nations World Populations Prospects, 2012; and IMF staff calculations.

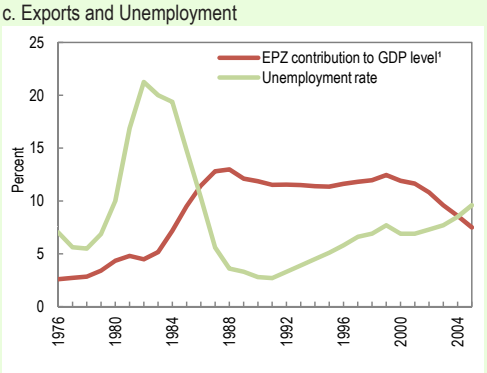
b. Share of Working-Age Population (SWAP) and GDP per Capita



Sources: United Nations World Populations Prospects, 2012; and World Bank, *World Development Indicators*.

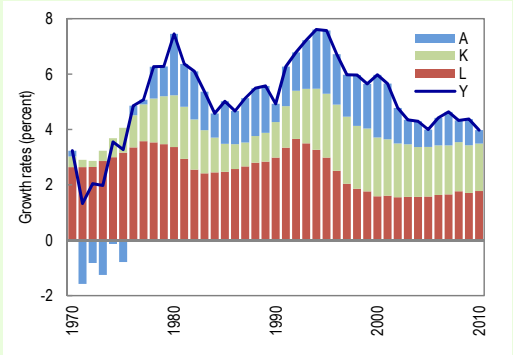
Note: PPP = Purchasing Power Parity.

c. Exports and Unemployment



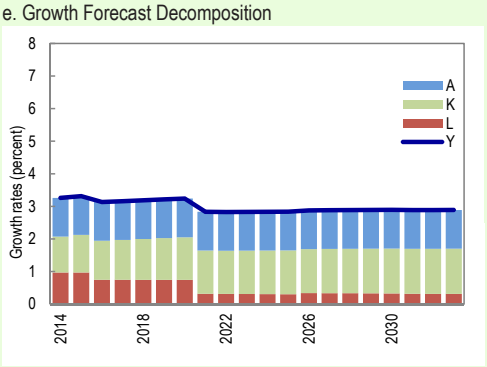
Source: IMF, staff calculations.
¹EPZ = Export processing zones.

d. Growth Decomposition With Human Capital Augmented Labor



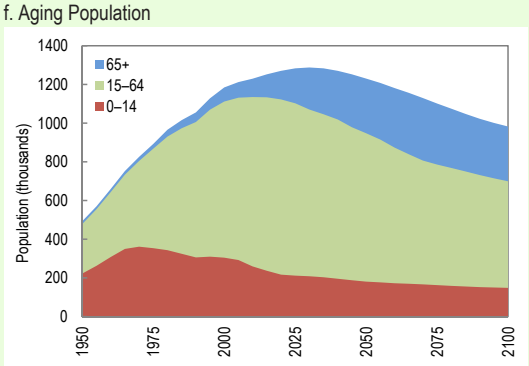
Source: Svirydzenka and Petri (2014).
Note: A = total factor productivity growth rate; K = contribution of physical capital; L = contribution of labor stock, incorporating skills level; Y = GDP growth rate.

e. Growth Forecast Decomposition



Source: Svirydzenka and Petri (2014).
Note: A = total factor productivity growth rate;
K = contribution of physical capital; L = contribution of labor stock, incorporating skills level; Y = GDP growth rate.

f. Aging Population



Source: United Nations World Populations Prospects, 2012.

Box 2.4. Empirical Estimates of Demographic Dividends

This box presents the empirical estimates of demographic dividends in Drummond, Thakoor, and Yu (2014), who investigate the impact of demographic developments on the growth rate of real GDP per capita using a panel of 172 countries. Given the slow dynamic nature of demographic data, they use five-year data over the period 1960 to 2010. The estimated specification is:

$$y_{it} = \alpha + \beta_0 Log(WAS)_{it} + \beta_1 \Delta WAS_{it} + \beta' X_{it} + c_i + \theta_t + \varepsilon_{it}$$

where *i* is the country index and *t* is the period index. c_i is the country-specific effect, and θ_t is a period dummy for the time fixed effect. Among the two demographic variables, $Log(\text{WAS})_{it}$ is the initial working age share, while ΔWAS_{it} is the growth of working age share over the five-year period *t*. X_{it} is a vector of variables that includes, among others, the initial GDP level, trade openness, and sectoral transformation, approximated by the share of agriculture in the economy.

Key results are presented in Table 2.4.1. For the full sample, the two demographic factors have positive impacts on growth and are significant at the 1 percent level. The results suggest that having a large working age population increases the economy's productive capacity from the outset and a fast growing share of working age population further speeds up the growth process. The other macroeconomic variables have the expected signs. The other results also show that while the demographic variables are statistically significant for Asia, it is not the case for Latin America and the working age share is negative for sub-Saharan Africa. They attribute the latter result to sub-Saharan Africa being in the early stages of its transition.

The authors then quantify the demographic dividend that the median sub-Saharan African country, with an initial GDP per capita of about $550, could potentially reap from 2010 to 2100, using the full sample estimates. Taking 2010 as the starting year, two scenarios are considered: (1) where the share of the working age population employed remains constant, and (2) where the share of the working age population rises, as predicted by the median-fertility scenario of the United Nations. While per capita GDP is expected to peak at about $2,475 in the first scenario, an environment that allows all entrants to find a job causes per capita GDP to rise to $3,865 by 2100.

Table 2.4.1. Fixed Effect Estimates of Real GDP per Capita Growth, 1965–2010

	Full sample	Asia	Latin America	Sub-Saharan Africa
Log initial GDP per capita	-5.22 ***	-6.14 ***	-7.15 ***	-6.02 **
	(-6.33)	(-3.02)	(-5.38)	(-2.49)
Trade openness	0.02 ***	0.01	0.02	0.03
	(2.9)	(0.58)	(1.36)	(1.4)
Sectoral change (agriculture)	-0.16 ***	-0.27 ***	0.02	-0.18 **
	(-3.30)	(-2.84)	(0.21)	(-2.33)
Log working age share (WAS)	12.57 ***	19.19 **	1.52	-34.27 **
	(3.37)	(2.56)	(0.21)	(-2.32)
ΔWAS	0.53 ***	0.81 ***	-0.25	0.02
	(3.75)	(3.11)	(-1.19)	(0.08)
Constant		-31.66	52.08 **	176.34 ***
		(-1.11)	(2.07)	(3.31)
Observations	1100	287	204	197
R -squared	0.29	0.41	0.35	0.46
Number of countries	172	53	31	44
Adjusted *R* -squared	0.28	0.39	0.31	0.44

Source: Drummond, Thakoor, and Yu (2014).

Note: Robust t-statistics in parentheses. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. All regresions include time fixed effects.
WAS = Share of working age population.