

Sub-Saharan Africa's Demographic Transition: A Window Of Opportunity For Growth

August 4, 2021

Key Takeaways

- By 2050, sub-Saharan Africa's working-age population is projected to increase more than twofold.
- We estimate that this will add up to 3 percentage points to average annual GDP growth in the next 10 years among key sub-Saharan economies.
- At present, sub-Saharan Africa risks being insufficiently prepared to reap the benefits of this demographic transition and, without correct and timely policy responses, the region's catch-up with developed economies may take a lot of time.

Countries in sub-Saharan Africa are undergoing the most significant demographic transition in their history. Unprecedented declines in fertility rates, lower child mortality, and increases in life expectancy will have crucial effects on the region's demographic dynamics for decades to come.

The age composition of a country's population is critical to economic growth. For the sub-Saharan African region, which has experienced subdued economic performance over the past decade, demographic transition may be a chance for stronger growth, but it could also be a major source of instability and fragility.

Statistics accumulated over the past several decades show how differently demographic transition has played out in East Asia, Latin America, and the Middle East. Taking into consideration the historical experiences of these regions, we have attempted to plot future growth paths for the five largest economies in the sub-Saharan African region (SSA-5; Ethiopia, Ghana, Kenya, Nigeria, and South Africa) and outline future opportunities and risks.

Demographic Shift

Fertility rates--the number of children per woman over her lifetime--have been declining steadily in sub-Saharan Africa (SSA) since 1990, to 4.6 in 2020 from 6.3 in 1990 (see chart 1). According to recent projections in World Population Prospects (United Nations, 2019), fertility rates in the region will continue to fall, and by 2050, in some SSA countries will decline to the levels close to the replacement rate (2.1 births per woman). In a few of these countries, such as South Africa, fertility rates may even fall below 2.0.

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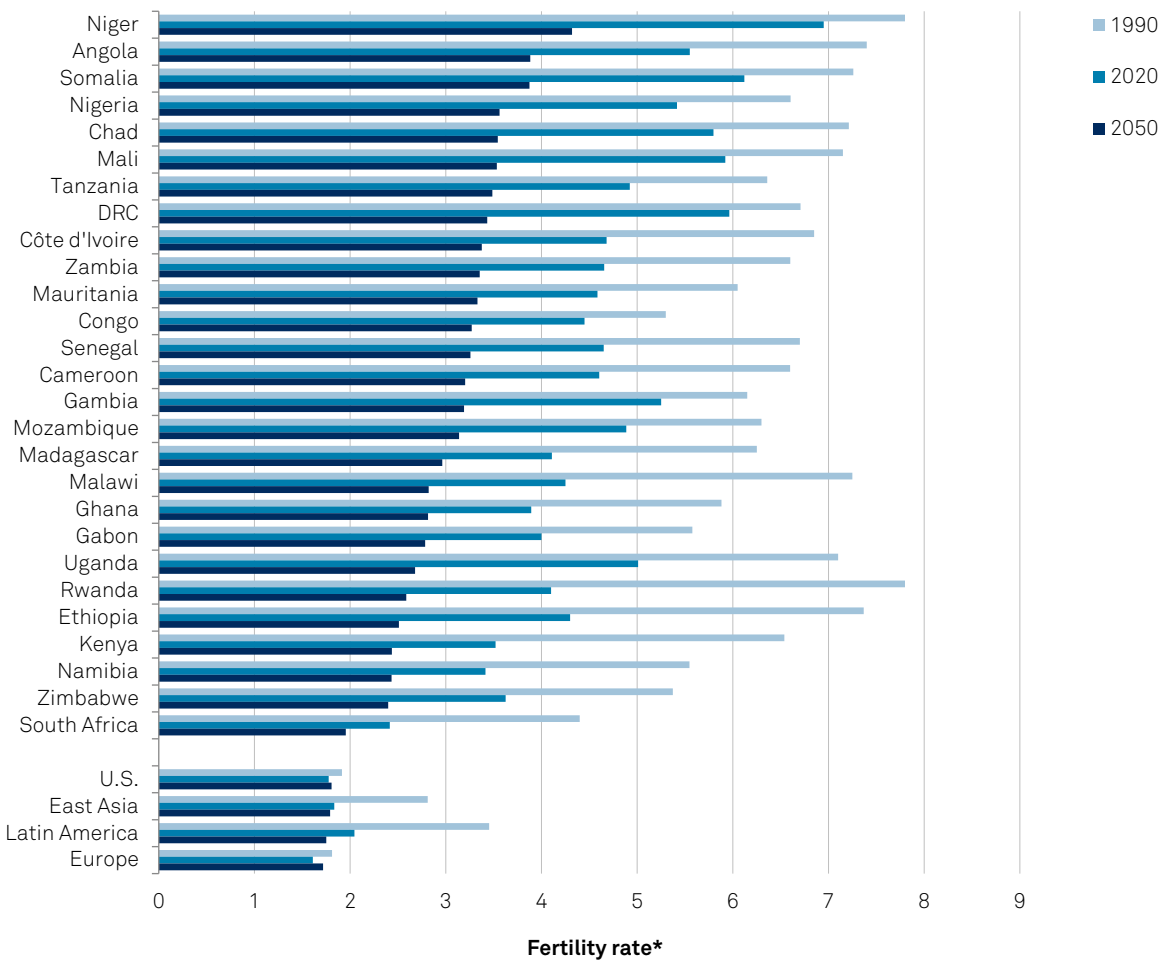
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These numbers are still significantly higher than in advanced and other emerging economies. For example, average fertility rates in both Southeast Asia and Latin America are expected to be around 1.85 by 2050 (down from 2.2 in 2020). The only region in the world that is expected to have fertility rates above the natural replacement rate is the Middle East and North Africa (MENA), projected at 2.5 in 2050. The average fertility rate across high-income economies is currently around 1.6 and is expected to stay around this value.

Still, the situation among SSA countries is not uniform. While fertility rates are in ongoing steep decline in South Africa, Kenya, and Ethiopia, some countries including Nigeria are still experiencing rates above 5. According to UN projections, Nigeria is expected to reach a population of 400 million by 2050 (up from 206 million in 2020), a rate expected to be the fourth-highest in the world.

Chart 1

Fertility Rates In Sub-Saharan Africa Are Projected To Decrease By One-Third By 2050



*Children per woman. Sources: UN World Population Prospects (2019), S&P Global Ratings.

The declining fertility rate in many SSA countries will have a tremendous effect on their demographic structure in most cases. It will make the demographic pyramid narrower at the bottom, and wider in the middle (see chart 2a). In other words, the relative share of people from the working-age population will increase, as there will be fewer children in the economy, but population aging has not yet started. Currently, the ratio of this nonworking-age population in SAA

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and the working-age population (those between ages 15 and 64) is 0.82, the highest of any region in the world. In a medium-fertility scenario, this ratio is projected to decrease to 0.61 in 2050; in a low-fertility scenario to 0.54. By 2070, the ratio is expected to be the lowest in the world. In Nigeria, however, the demographic transition is expected to be significantly slower, due to persistently high fertility rates (see chart 2b and chart 3).

Demographic Transition Varies Among Different Countries In Sub-Saharan Africa (SSA-4, Nigeria)

Chart 2a

Demographic Transition In Ethiopia, Ghana, Kenya, And South Africa

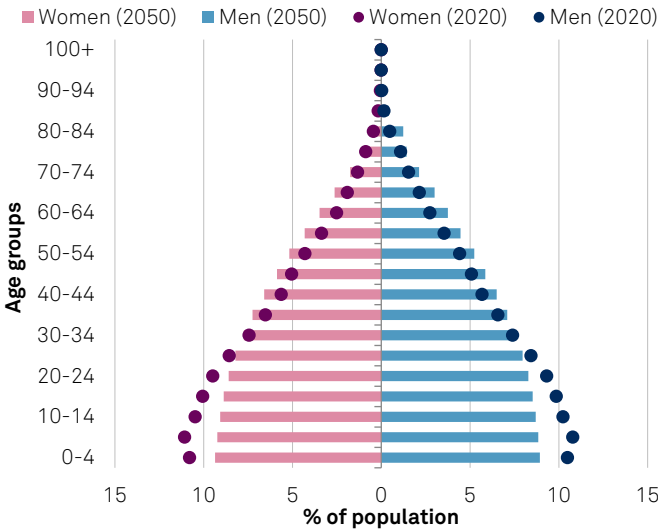
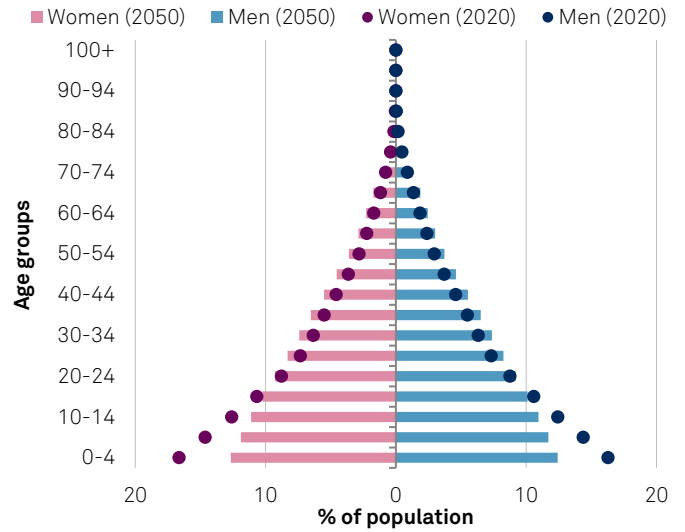


Chart 2b

Demographic Transition In Nigeria

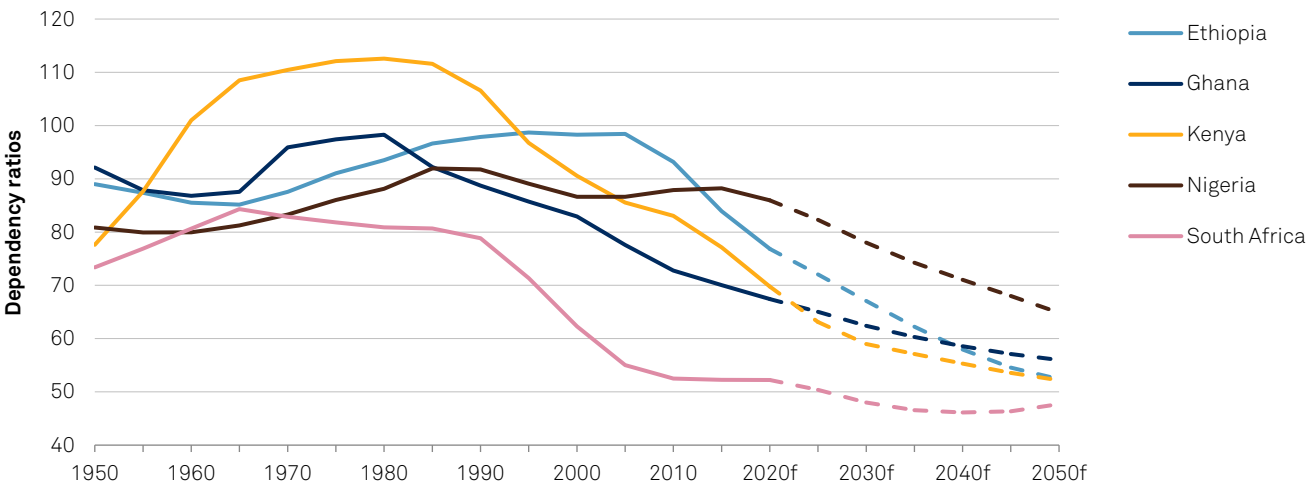


Sources: UN World Population Prospects (2019), S&P Global Ratings.

Sources: UN World Population Prospects (2019), S&P Global Ratings.

Chart 3

Dependency Ratios Of Ethiopia, Ghana, Kenya, Nigeria And South Africa Are Decreasing



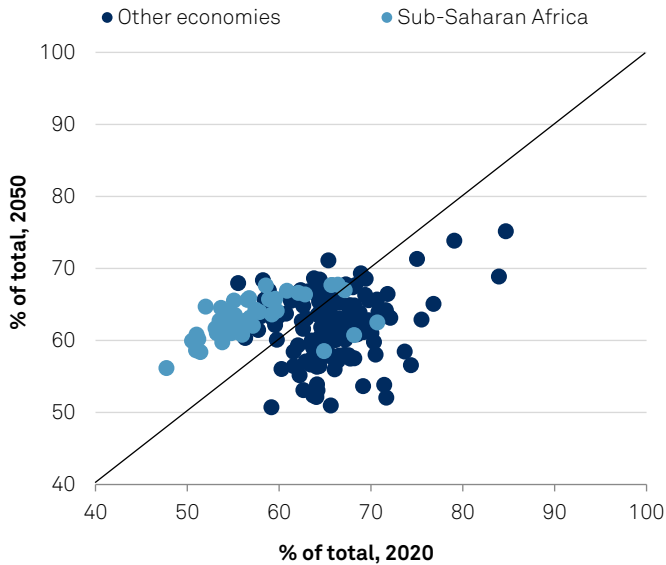
Note: Dashed lines represent forecasts. Dependency ratio--Ratio of non-working age to working-age population. f--Forecast. Sources: UN World Population Prospects (2019), S&P Global Ratings.

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By 2050, with the exception of small island economies, such as Seychelles or Mauritius, all countries in SSA will experience an increase in the share of working-age populations. Since most other countries in the world have already finished their demographic transition, sub-Saharan Africa will therefore be the main driver for working-age population growth in the world in the 21st century (see charts 4a and 4b). All in all, in next 30 years, SSA's working age population will increase more than twofold, accounting for 68% of the world's total growth.

Chart 4a

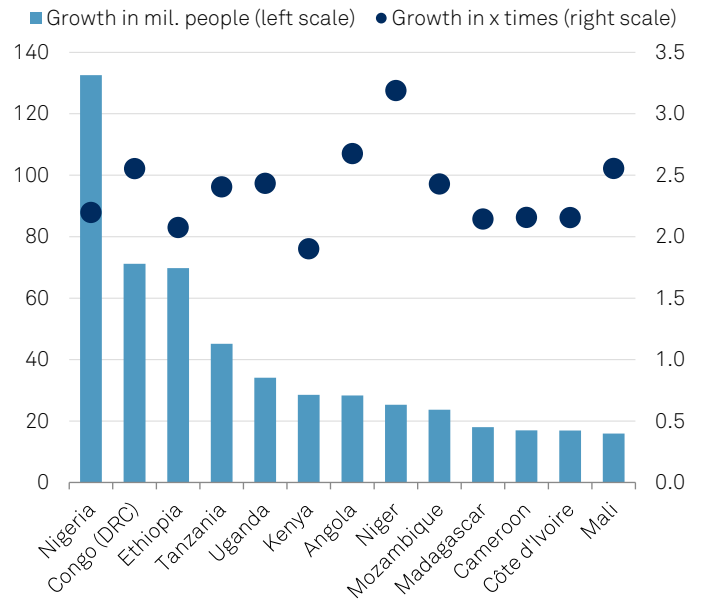
Sub-Saharan Africa Will Be The World's Main Source Of Increasing Labor Force In The 21st Century



Sources: UN World Population Prospects (2019), S&P Global Ratings.

Chart 4b

By 2050, Sub-Saharan Africa's Working Age Population Will Increase More Than Twofold



Sources: UN World Population Prospects (2019), S&P Global Ratings.

Demographic Dividend On The Horizon?

Sub-Saharan Africa's demographic transition presents an opportunity to reap a so-called demographic dividend (a term first coined by Bloom et al, 2003). This encompasses a process characterized by the consequences of an increased share of working-age population relative to the non-working (children and older-age people). With fewer people to support, a country has a window of opportunity for rapid GDP growth, given the right socioeconomic policy and investments.

There are several channels through which a demographic dividend can boost economic growth. First, when a larger share of the population can work, the relative share of dependents in the economy becomes smaller. If these working-age individuals are employed, then per capita income will increase. However, the demographic dividend is not only about an increase in a relative share of working-age population. Second, amid declining birth rates and a smaller average number of children, families can save more and use those savings on better education for their children. This can, in turn, increase human capital in the country, which then provides opportunities for increased labor productivity and creation of more sophisticated goods in the economy. Third, an increase in savings can lead to an increase in capital stock in the economy, since it can be translated into an increase in investments in the event of a favorable investment climate. The

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economic effect of an increase in savings can be even more significant than the effect of an increasing working-age population if savings are allocated efficiently.

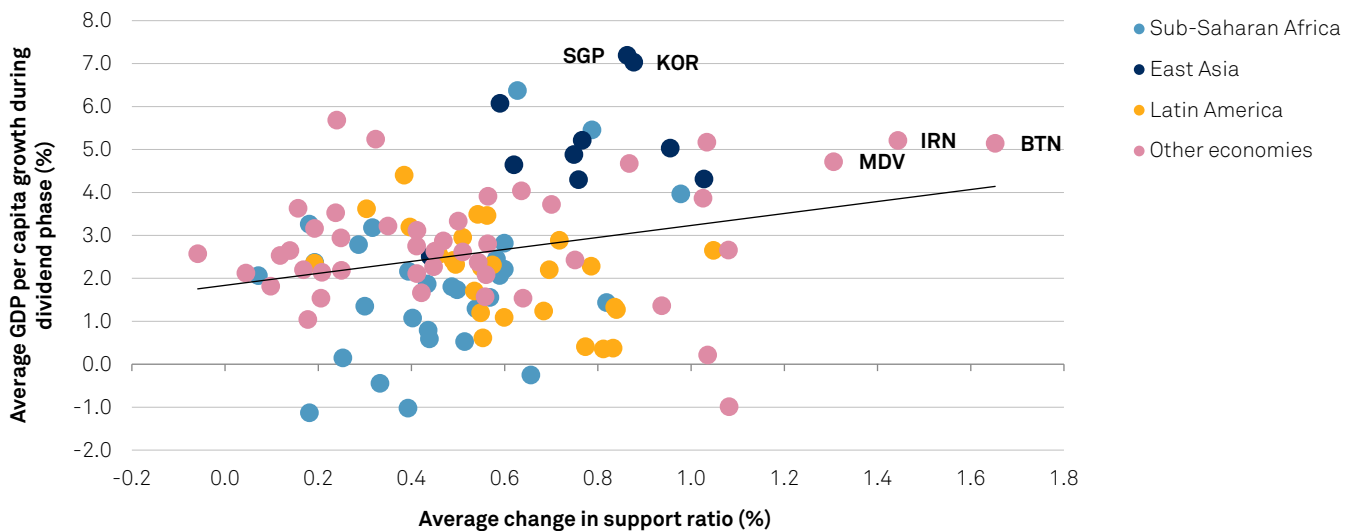
To reap these benefits, governments must wisely adapt their economic policies. If jobs are not created in tandem, the demographic dividend could become a source of instability, since the relative share of young unemployed people would increase. If governments do not invest in education, access to high-quality education is not improved. In this case, families will not be able to invest in better education for their children, so the increase in savings won't increase human capital. If banking services are not widely available and capital markets are not developed, an increase in savings won't necessarily correspond to an increase in investments.

It is also important to note that, at some point, the demographic dividend will become a demographic burden, since declining birth rates eventually cause population aging. Therefore, the window of opportunity to reap the benefits arising from the demographic dividend is limited.

Historical evidence shows a clear positive association between an increase in the share of employed people and economic growth, as observed in the correlation between the increase in support ratios (weighted ratio between the number of producers and consumers in the economy) and increase in GDP per capita (see chart 5).

Chart 5

Demographic Transition Is Associated With Higher Rates Of GDP Growth



Note: Change is computed over the "demographic dividend" period, when the weighted ratio of producers in the economy increases over the number of consumers. Sources: Penn World Tables, Mason and Lee (2020), S&P Global Ratings calculations.

However, this positive relationship is not without heterogeneity because growth rates vary significantly between regions and between countries within regions. With the exception of commodity-exporting economies (mostly those based in the Middle East), East Asian and Southeast Asian countries clearly outperformed other regions with comparable increases in support ratios. Average growth in East Asia during the demographic dividend was 5.1%, compared to 2.1% in Latin America, a region at a comparable stage of demographic transition. Within East Asia and Southeast Asia, South Korea and Singapore stood out, growing by 7% on average, thus overtaking the countries from preindustrial to mature industrial nations within a generation's working life. Since the start of the demographic transition, sub-Saharan Africa has had average annual per capita GDP growth of 1.8%, but most countries have just started their transition.

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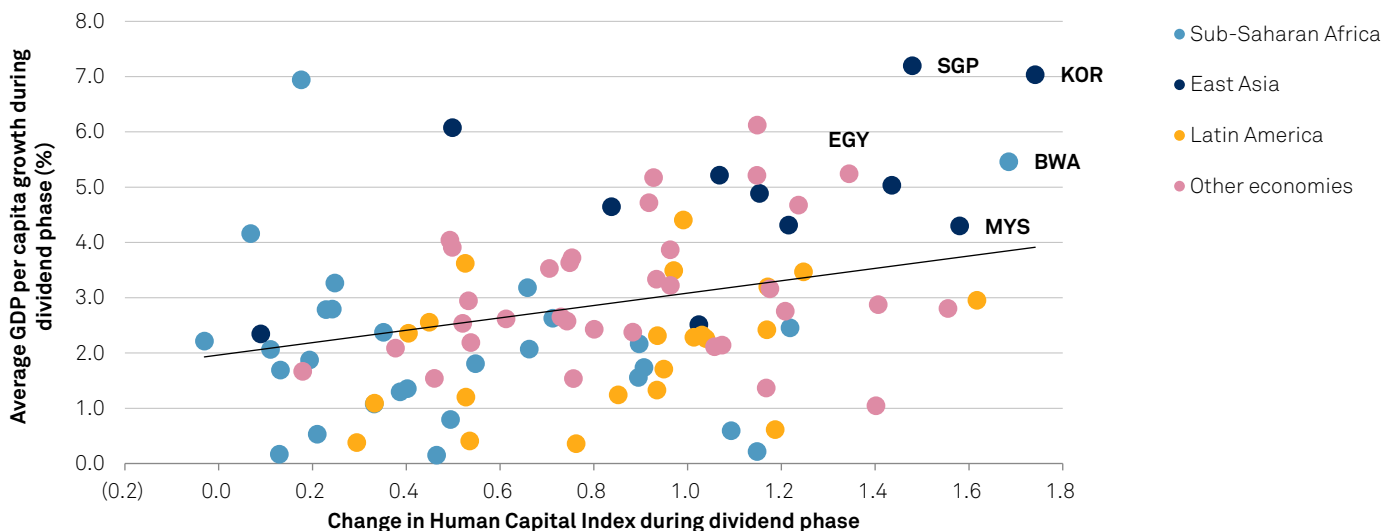
What do the differences between regions at a later stage of demographic transition, such as East Asia, Latin America, and the Middle East, tell us are necessary preconditions for a demographic dividend to be a success story? First and foremost, the increase in working-age population should be accompanied by job creation, both in terms of quantity and quality. Unless a sufficient number of well-paid jobs are created, demographic transition can actually be a source of risk, since young frustrated people may become a source of political instability. The most notable recent example of this is the Arab Spring revolutions of 2010-2012, when average youth unemployment in MENA countries reached 30%.

Second, investments in human capital are necessary to reap the benefits of the increase in savings. An increase in human capital (defined as quality-adjusted years of schooling) is associated with higher rates of economic growth during a demographic dividend phase (see chart 6). Compared to Latin American countries, East Asian countries were able to significantly increase the quality of education, especially notable in growth champions Singapore and South Korea. For example, from 1960 to 2010, South Korea's average years of schooling increased almost threefold to 12.05 from 4.2 (Barro & Lee, 2018). As of 2010, 42% of South Korea's population had tertiary education, up from just 2.6% in 1960. Not only the quantity but also the quality of education improved. For example, in the latest PISA rankings in mathematics, East Asian countries captured the first seven spots (OECD, 2018). Latin American countries, on other hand, experienced less significant improvements in quality and access to education, and couldn't reap the benefits of the demographic dividend to the same extent as their East Asian counterparts.

Investments in fixed assets are also very important, as capital-deepening raises labor productivity and creates more possibilities for higher added value production. For example, in Singapore, capital stock per capita has increased 11x over the past 50 years, while it grew only by around 50% in Nigeria and South Africa. In Ghana, capital stock per capita has been almost unchanged. Finally, sustainability policies are crucial, as population growth puts more pressure on the natural environment. For example, degradation of the farming soil can lead to the impoverishment of farmers and unsustainable urbanization.

Chart 6

An Increase In Human Capital Is Associated With Higher Rates Of Economic Growth During Demographic Transition



Note: Change is computed over the "demographic dividend" period – when the weighted ratio of producers in the economy increases over the number of consumers. Source: Penn World Tables and S&P Ratings calculations.

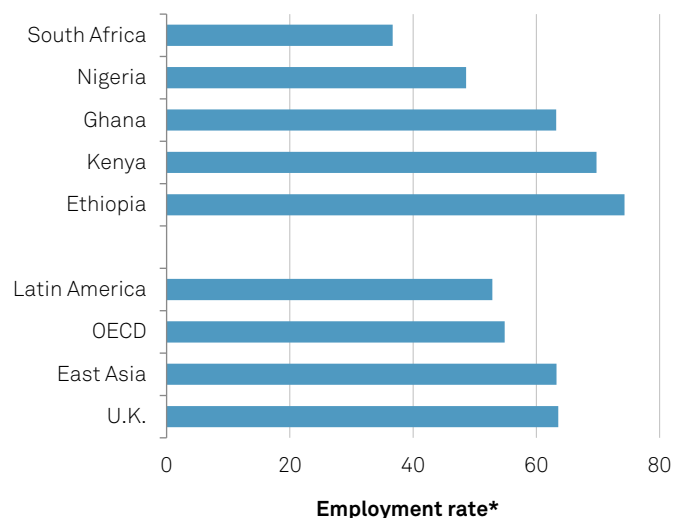
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What is the current situation in sub-Saharan African countries? According to support ratio projections, for most SSA-5 countries the demographic dividend is likely to continue beyond 2050, the only exception being South Africa, where this phase is expected to end by the mid-2040s. Support ratio growth rates are expected to moderate faster in Ethiopia, with its fastest decline in fertility rates. According to current projections, the decline in the birth rate in Nigeria is expected to be slower, therefore likely continuing its demographic dividend into the 22nd century.

So far, however, these processes haven't been supported by corresponding increases in employment rates and labor productivity (defined as GDP per population employed). In terms of employment rates, the SSA-5 countries are currently lagging comparators among East Asian and OECD countries (see chart 7a). Even worse, some countries, such as Nigeria and South Africa, have recorded labor productivity declines in recent years (see chart 7b). Moreover, in terms of access to education, the SSA region records the worst performance in the world. The financial sector, which could foster efficient reallocation of private savings, is still underdeveloped compared to developed markets and East Asia.

Chart 7a

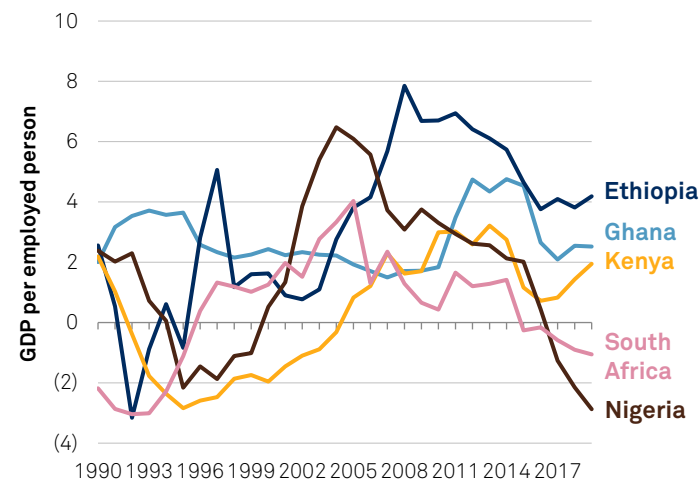
As of 2020 South African And Nigerian Employment Rates Lag OECD Countries And East Asia



*Of working age people (15+). Sources: World Bank, S&P Global Ratings.

Chart 7b

Labor Productivity Growth Of Sub-Saharan Economies Has Been Subdued Over The Past Five Years



Sources: Penn World Tables, S&P Global Ratings calculations.

Long-Term Growth Scenarios Beyond 2021

What are the implications for the SSA-5 of the demographic dynamics described above? Using historical data from 1951 to 2019 we estimated the likely range of potential real GDP growth rates in the next 10 years. Our GDP projections are based on our predictions of labor productivity (GDP per person employed), employment rates (ratio of employed people to working-age population), and UN projections for working-age populations.

To model labor productivity we took random draws from the history of labor productivity growth rates (1951-2019). Employment-rate projections are based on historical variance and annual growth of the employment rate in the past 10 years (2010-2019). Finally, working-age population (ages 15+) data is based on recent UN World Population Prospects (2019). Since some projections are based on random draws from its historical values, we used a Monte Carlo simulation

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(computational algorithm that is based on repeated random sampling from a predetermined set of values) to generate a probability distribution of a range of outcomes for potential growth over the next decade. In running 1 million simulations, the estimated median annual real GDP growth rate over the next 10 years was 4.5% on average for the SSA-5 countries, while the 90% confidence interval ran from -3.6% to 12.5% (see chart 8).

A Modified Growth Accounting Framework

We use a modified version of a simple growth accounting framework to assess the impact of changing labor force participation and growing working-age population growth on the economy's long-run economic performance. We delineate the growth identity of real GDP into its two primary contributions: GDP per labor force participant and labor inputs.

$$\text{GDP} = (\text{GDP}/\text{hours worked}) * (\text{hours worked}/\text{no. of employed}) * (\text{no. of employed}/\text{working age population 15+}) * \text{working age population 15+}$$

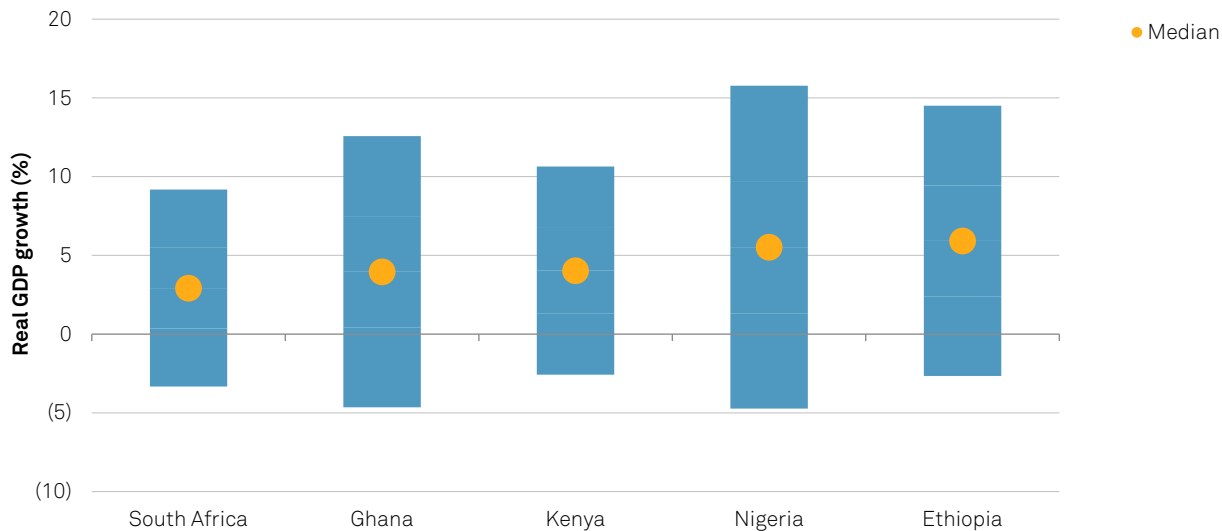
Or, simplifying the above equation gives:

$$\text{GDP} = \text{GDP per no. of employed (labor productivity)} * \text{employment rate} * \text{working-age population}$$

The multiplicative factor is transformed into additive relationship by using the natural log of both sides, thus giving us the growth rate contribution of each component (in percentage points) to GDP growth.

Chart 8

Average Growth Rates Of SSA-5 Countries 2021-2030



Note: Bars indicate 95% confidence interval. *Of working age people (15+). SSA-5--The five largest sub-Saharan African economies (Ethiopia, Ghana, Kenya, Nigeria, and South Africa). Source: S&P Global Ratings calculations.

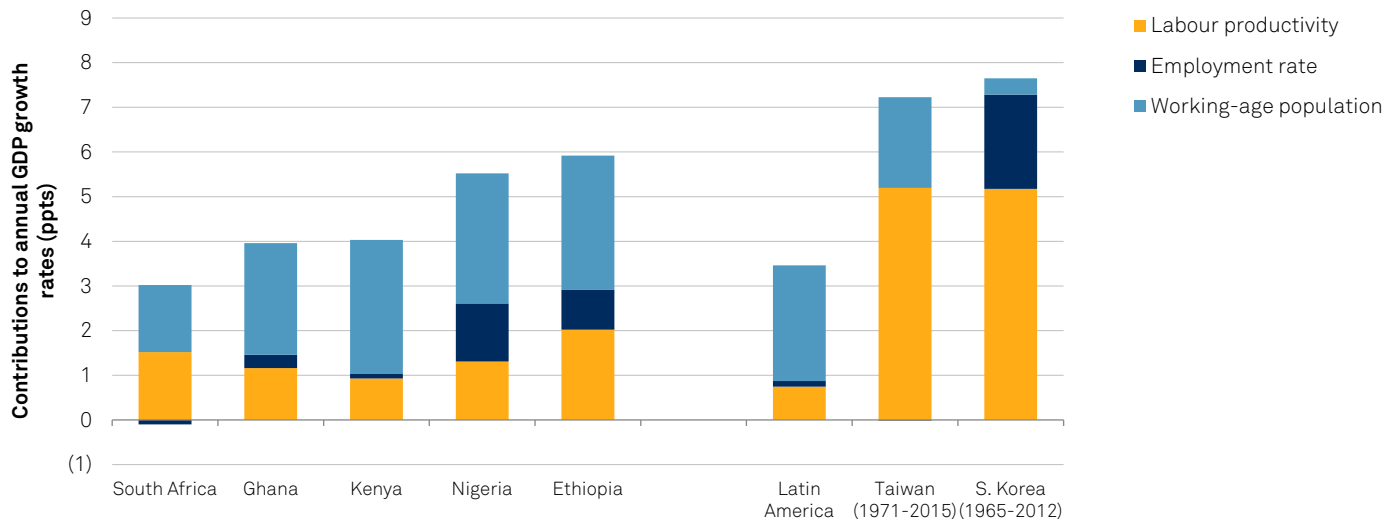
According to this statistical model, the increase in working-age population will continue to be the main driver of growth for SSA-5 economies over the next decade (see chart 9). Compared to the historical performance of East Asian growth champions, the SSA-5 are expected to lag behind in terms of labor-productivity growth and growth in the employment rate. At the same time, our projections are broadly in line with the historical growth dynamics of Latin American economies,

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which have mostly grown due to an increase in the working-age population. Therefore, to replicate East Asia's demographic dividend success story, the SSA-5 countries must create more jobs and improve their labor productivity through increases in investments and human capital. Otherwise, sub-Saharan Africa risks repeating the experience of Latin American economies.

Chart 9

Growth In The Working-Age Population Will Account For More Than Half Of The SSA-5's GDP Growth In The Coming Years



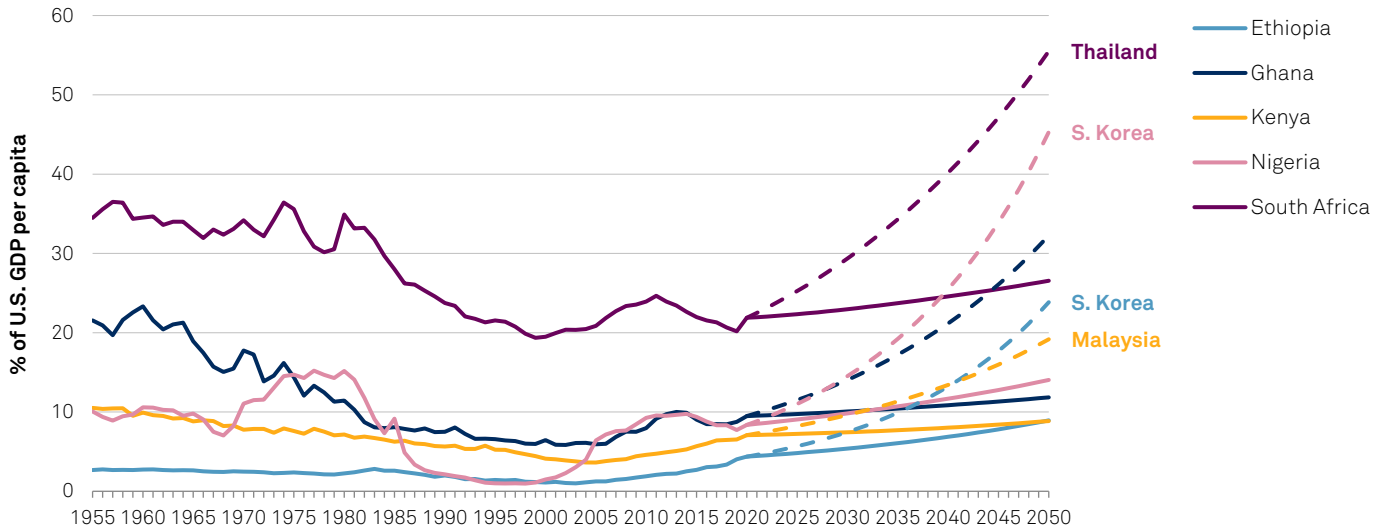
Note: Data for SSA-5 countries is based on model's projections for 2021-2030. ppts--Percentage points. SSA-5--The five largest sub-Saharan African economies (Ethiopia, Ghana, Kenya, Nigeria, and South Africa). Sources: S&P Global Ratings calculations, UN projections, Penn World Tables.

Although the projected growth rates for the SSA-5 might seem high, if we extrapolate the results of our model further into the future, convergence with developed economies is expected to be slow (see chart 10). Even though Ethiopia is projected to have the highest GDP per capita growth rates among SSA-5 countries, it will take more than 30 years to reach just 9.5% of U.S. GDP per capita (assuming U.S. GDP growth of 1.9%).

What would happen if the SSA-5 replicated the experience of East Asian countries? And how probable is such a scenario? To investigate this, we plotted a 75th percentile projection of the GDP growth path (a scenario that, according to our model is at least 2x less probable than the median one) for each SSA-5 country. We then analyzed whether labor productivity and employment rate projections in these scenarios correspond to the historical experience of any other country during their period of demographic transition. The results point to tremendous improvements in GDP-per-capita rates and suggest that an East Asian growth scenario is possible for some SSA-5 countries (as 75th percentile projections correspond to growth rates of selected Asian economies). For example, Nigeria could reach 45% of U.S. GDP per capita by 2050 if it could successfully replicate South Korea's experience, which is close to the model's 75th percentile.

Chart 10

On Current Projections, SSA-5 Convergence With Developed Economies Is Likely To Be Slow



Note: Unbroken lines indicate historical data and median projections, dashed line – 75th percentile projections. Name of the country on the right-hand side indicates the country with the closest historical average growth rates in employment and labor productivity during demographic dividend phase. Annual US GDP growth is assumed to be 1.9% (average growth over last 150 years, Jones (2015)). SSA-5--The five largest sub-Saharan African economies (Ethiopia, Ghana, Kenya, Nigeria, and South Africa). Sources: Penn World Tables, S&P Global Ratings.

Our results show that the SSA-5's growth convergence with East Asian countries is unlikely without notable increases in employment rates and labor productivity. How well positioned is sub-Saharan Africa to achieve this? First, employment rates could later improve if labor force participation among women increased. As of 2019, a labor participation gender gap was prevalent in all SSA-5 countries, with Nigeria and South Africa having a gap of more than 10 percentage points (World Bank, 2021). Second, an increase in employment would necessitate creation of new jobs. As media have often pointed out, the Southeast Asia region has become a job-offshoring powerhouse over the past decades. However, the situation is not as straightforward for sub-Saharan Africa. The region's long distance from major developed economies (and therefore weaker trade links), political instability, and poor infrastructure makes SSA a less attractive destination for job offshoring than Southeast Asian countries, especially when labor costs are largely comparable. In addition, the fourth industrial revolution, in which many labor-intensive jobs can now be automated, lowers the general appetite for job offshoring among international companies.

Nevertheless, just as in the case of demographic transition, the fourth industrial revolution could also be a blessing for sub-Saharan Africa if the right policy responses are in place. Digitalization could become a catalyst for job creation in the private sector and a major boost for small entrepreneurs. The experience of Latin America and East Asia shows that widespread access to the mobile internet is crucial. As of 2020, 4G coverage in sub-Saharan Africa is 49% compared to the global average of 84%, and mobile social media penetration is just at 11% (GSMA, 2020). Digitalization may also improve access to banking services and capital markets, and therefore support more productive allocation of savings in the economy. If governments are supportive of these developments, digitalization might foster significant increases both in employment rates and labor productivity.

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All in all, demographic transition could be a source of unprecedented economic growth, but also of unprecedented instability. At present, sub-Saharan Africa risks being insufficiently prepared to reap the benefits of demographic transition. However, with the right policy response, this situation could swiftly change. In this respect, the future is in Africa's own hands.

Table 1

Summary Statistics: Monte Carlo Simulation (n=1,000,000) Growth in percentage for key variables at 5, 25, 50, 75, and 95th percentile

	5%	25%	50%	75%	95%
Ethiopia					
Labor productivity	-6.39	-1.43	2.02	5.47	10.41
Employment rate	-0.83	0.19	0.90	1.61	2.62
Real GDP	-2.66	2.40	5.92	9.44	14.50
Kenya					
Labor productivity	-5.49	-1.71	0.93	3.57	7.36
Employment rate	-1.43	-0.53	0.10	0.73	1.63
Real GDP	-2.57	1.33	4.03	6.74	10.64
Ghana					
Labor productivity	-6.63	-2.03	1.16	4.35	8.97
Employment rate	-3.35	-1.20	0.30	1.80	3.95
Real GDP	-4.65	0.43	3.96	7.49	12.57
Nigeria					
Labor productivity	-8.33	-2.64	1.31	5.27	10.94
Employment rate	-2.20	-0.13	1.30	2.74	4.80
Real GDP	-4.73	1.30	5.52	9.72	15.77
South Africa					
Labor productivity	-3.58	-0.57	1.52	3.61	6.62
Employment rate	-3.70	-1.58	-0.10	1.38	3.50
Real GDP	-3.33	0.36	2.92	5.48	9.18

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