



Work/Jobs

Thematic Futures

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This theme considers current and future employment trends in Africa, comparing the impact of the different scenarios modelled in separate themes. On the current trajectory, the growth in the African labour force will far outstrip the supply of jobs, leaving many of the continent's citizens dependent on the informal sector for survival. In the Current Path forecast, Africa would have to look at public work programmes and an extensive system of social grants, to alleviate extreme poverty. Africa's high labour participation rate could contribute to the continent's economic development if gaps in education and health are addressed to ensure a productive and appropriately skilled labour force. The question is if digitisation and the use of modern technology, such as being pursued by Ghana, can more rapidly formalise African economies and accelerate employment growth, with all the associated benefits. To provide sufficient meaningful work, the continent needs a shift in mindset and policy that would allow a speedier escape from poverty compared with the slow progress envisioned in the Current Path forecast.

Summary

- According to the **definition** of employment as used by the International Labour Organization a large proportion of Africans are employed, although much of this employment is in the **informal sector**. This explains why Africa's **labour force participation rate** is currently at around 65% and set to increase to 67% by 2043.
- Africa's labour force size surpassed India's in 2021 and will exceed China's by 2035. But without drastic improvements in education and health, Africa's **labour productivity gap** relative to these countries will have widened significantly by 2043.
- With formal employment in Africa expanding by less than 1.8% per year, while the labour force is expanding by 2.6%, **job prospects** for Africa in the Current Path forecast are not good.
- **Currently**, most Africans are employed in the agricultural sector, followed by the service sector and manufacturing. However, the **tension** between employment-intensive growth and productivity-intensive growth means that the balance of jobs in Africa will likely shift in the future.
- **Digitisation** can unlock economic potential, as seen in the Ghanaian example. The **Fourth Industrial Revolution** will change the future of work and could contribute to incrementally formalising Africa's large informal economies. However, with the **demand** for labour increasingly set to move away from low-skilled to semi-skilled and skilled labour, Africans will need to reskill and upskill.
- In the immediate future, many African governments will have to rely on **social grants** and employment schemes rather than an expanding job market to reduce poverty and alleviate inequality, with various models available for consideration.

Defining the concept of work

The [International Labour Organization's](#) (ILO) definition of employment includes work in both the formal and the informal sectors. According to this definition then, nominally, a large portion of Africa's labour force is considered employed, and unemployment in Africa is estimated at roughly 7%, compared with 5% in India and China. However, most 'employment' occurs in the informal sector, which is significantly larger in Africa.

Generally, the informal portion of an economy declines as GDP per capita increases. Typically, a larger portion of the economies of poor countries are informal compared with that of rich countries, and many more people are employed in the informal sector in poorer countries than in wealthier ones.

In this context, the actual meaning of employment – having paid work – means earning something. But it is seldom a living wage. Employment data therefore would include an executive of a company, who may be earning a million dollars a year, and a teacher in the Democratic Republic of the Congo (DR Congo), who earns US\$100 per month. It also includes a street vendor in Soweto, South Africa who sells packets of peanuts and may be earning 20 or 30 cents per day in the informal sector. Hence, it is no surprise that the ILO found that over 630 million persons in employment globally survived in extreme or moderate poverty in 2019 – a number that increased substantially with the COVID-19 pandemic. [1]

Generally, one would assume that people employed in the formal sector would enjoy better job quality, including adequate earnings, job security and safe working conditions, whereas those in the informal sector would be worse off. The reality is more complex, with many in the formal sector actually classified as extremely poor. The ILO refers to these people as working poor – employed people who live in households that fall below the poverty line and who are unable to lift themselves and their families above the poverty threshold. The working poor are, of course, generally better off than unemployed people or those outside the labour force who survive from hand to mouth.

Many people in the informal sector live below or just above rates of extreme poverty, which explains the challenges in interpreting ILO employment data. Inevitably, the rate of the working poor in the informal sector is much higher than that in the formal sector. In the absence of a social net, employment in the informal sector is, of course, better than no employment or income. But by its nature, informal work does not offer benefits such as health insurance, unemployment insurance or paid leave. Most informal workers, many of which are self-employed, need to work every day to earn their living and pay for their basic household necessities. Their lives are precarious and their ability to survive shocks (such as lockdowns during COVID-19) is limited.

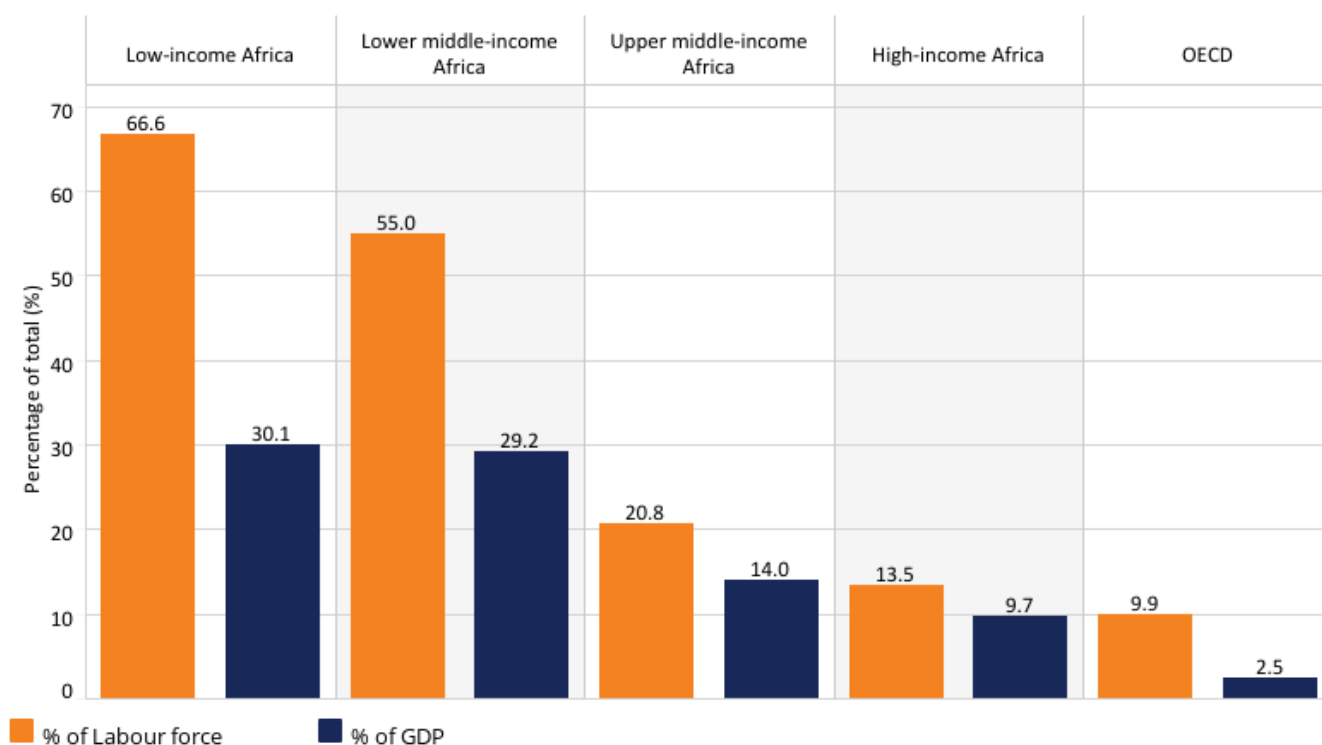
Although the informal sector provides employment for unskilled and undereducated individuals, employment in this context cannot be classified as 'decent work', which the ILO defines as including 'a fair income, security in the workplace and social protection for families.' [x]

In recognition of these challenges, the ILO is now in the process of revising the statistical standards used to measure work and economic activity in the informal economy.

Employment in the formal and informal sectors

Whereas the informal sector accounts for only around 3% of the GDP of the 38 members of the [Organisation of Economic Co-operation and Development](#) (OECD) and informal labour accounts for a mere 10% of the labour force, the ratio for Africa's country income groups is much higher (Chart 1). The informal sector in developed countries is often of an illicit nature compared with its survivalist character in poor countries.

Chart 1: Size of the informal sector in Africa by country income group: contribution to GDP and portion of labour



Source: IFs 7.63 initialising from International Labour Organization and International Monetary Fund data
 The Organisation for Economic Co-operation and Development (OECD) is an international organisation that consists of 38 members from North and South America, Europe and Asia-Pacific.

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Employment also differs by age. Underemployment among younger adults (aged 15–24) is higher than among adults (25 years) and is higher in rural areas than in urban areas.

Prior to the COVID-19 pandemic, the ILO estimated that the adult unemployment rate (15 years or older) in Southern Africa was 26%, making it the region with the highest unemployment rate globally. An important reason is that the informal sector is smaller in Southern Africa than elsewhere in Africa and so serves as less of a cushion to unemployment than elsewhere. With low levels of employment, inequality is generally high. Generally labour market participation rates only recovered from the pandemic in 2023, reflecting the damage it caused.

The reason is rooted in historically extractive policies based on cheap labour and minerals in much of Southern Africa – a region that achieved the transition to majority rule quite recently and with ruling parties heavily infused with ideological models from several decades ago, most prominently the former Union of Soviet Socialist Republic. In addition to the skewed economic structures inherited at the time of transition to majority rule, all are stuck in a mindset of economic centralism and top-down control that offers little room for self-help. As a result, economic emancipation has not yet taken place. Governments promise to provide for their citizens but rarely do.

In South Africa, the most recent country in the region to transition to majority rule, the previous system of mining, education and business was premised on the extraction of maximum profits and burdened the country with huge inequalities. With poor-quality education and limited entrepreneurship, employment is particularly low and inequality is exceptionally high. In fact, on both these counts South Africa fares worst globally. In the IFs forecast to 2043, South Africa

is also set to buck the informality trend. Whereas the size of the informal sector is set to decline slowly elsewhere (both its contribution to GDP and as a portion of the total labour force), it is likely to increase in South Africa, largely as a result of tardy economic growth and, at only 19% of the labour force, it coming off a much lower base than elsewhere on the continent (the average for Africa is 58%).

At low levels of development, the informal sector is generally much less productive than the formal sector, but the gap typically reduces as countries move up the income ladder. At higher levels of development, a large informal sector may often reflect a determined effort to avoid regulation, because informality is often more nefarious at higher levels of income compared with being survival oriented at low levels of development. In high-income countries, productivity in the informal sector could, in select examples, be similar to that in the formal sector, as the primary orientation is often not survival but regulatory avoidance. Therefore, productivity in the informal sector in a country such as Italy or Greece, where the illicit economy is large, is not likely to differ from that in the formal sector. These characteristics are reflected in the modelling in IFs.

Irrespective of the level of development, a large informal sector is costly for society and constrains sustainable development. Workers active in the informal sector do not contribute to direct taxes (as they are not registered to pay personal or company tax) but the informal sector still requires infrastructure and services. A large informal sector therefore puts an additional burden on service delivery and congests public infrastructure without contributing to either, except through indirect taxes such as value-added and service taxes. However, this drag is balanced by the extent to which it absorbs people who would otherwise not have any employment or opportunity.

The ILO data on unemployment in Africa described earlier is therefore quite misleading without appropriate context, as poignantly revealed by 40% of respondents in a 2018 [Afrobarometer](#) survey saying that unemployment is the most important issue for governments to address, significantly more than concerns about healthcare or poor infrastructure.

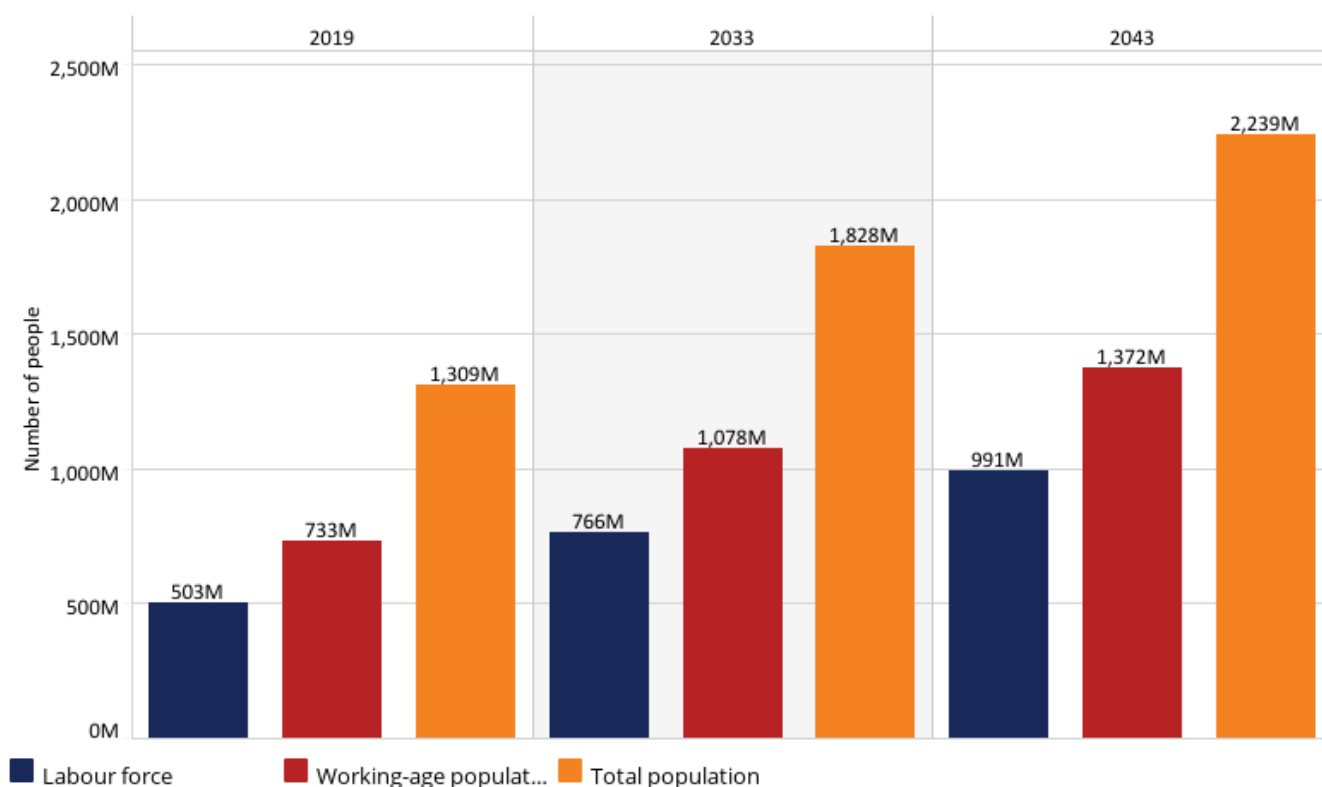
Labour force participation rates

The labour force participation rate, calculated as the number of people employed as a percentage of the total working-age population (typically 15–64 years of age), is generally used to indicate the ratio of active workers in an economy. Because of the inclusion of employment in the informal sector discussed in a previous section, the 2019 rate for Africa was high, at 65%, and set to increase to 67% by 2043. Outside Africa, labour participation rates are lower and slowly declining (from a current rate of 61% for the world except Africa), largely determined by the increase in population above the retirement age of 64, when people exit the labour market. The increase in the labour force participation rate in Africa indicates that more young Africans are joining the labour market than leaving.

The labour force participation rate in low-income countries (which typically have a large informal sector) is often higher than in middle- or high-income countries, because workers in poor countries tend to take any job to earn a living, regardless of the quality of that employment, and also because low-income countries generally have younger populations.

Reflected in Chart 2, Africa had a total population of 1 309 million in 2019, of whom 733 million (56%) were of working age (15–64 years). With the labour participation rate at 65%, the estimated total labour force amounted to 503 million people (also evident in Chart 3), of whom about 58% were employed in the informal rather than the formal sector.

Chart 2: Total population, working-age population and labour force in Africa, 2019, 2033 and 2043



Source: IFs 7.63 initialising from UN Population Division and International Labour Organization data

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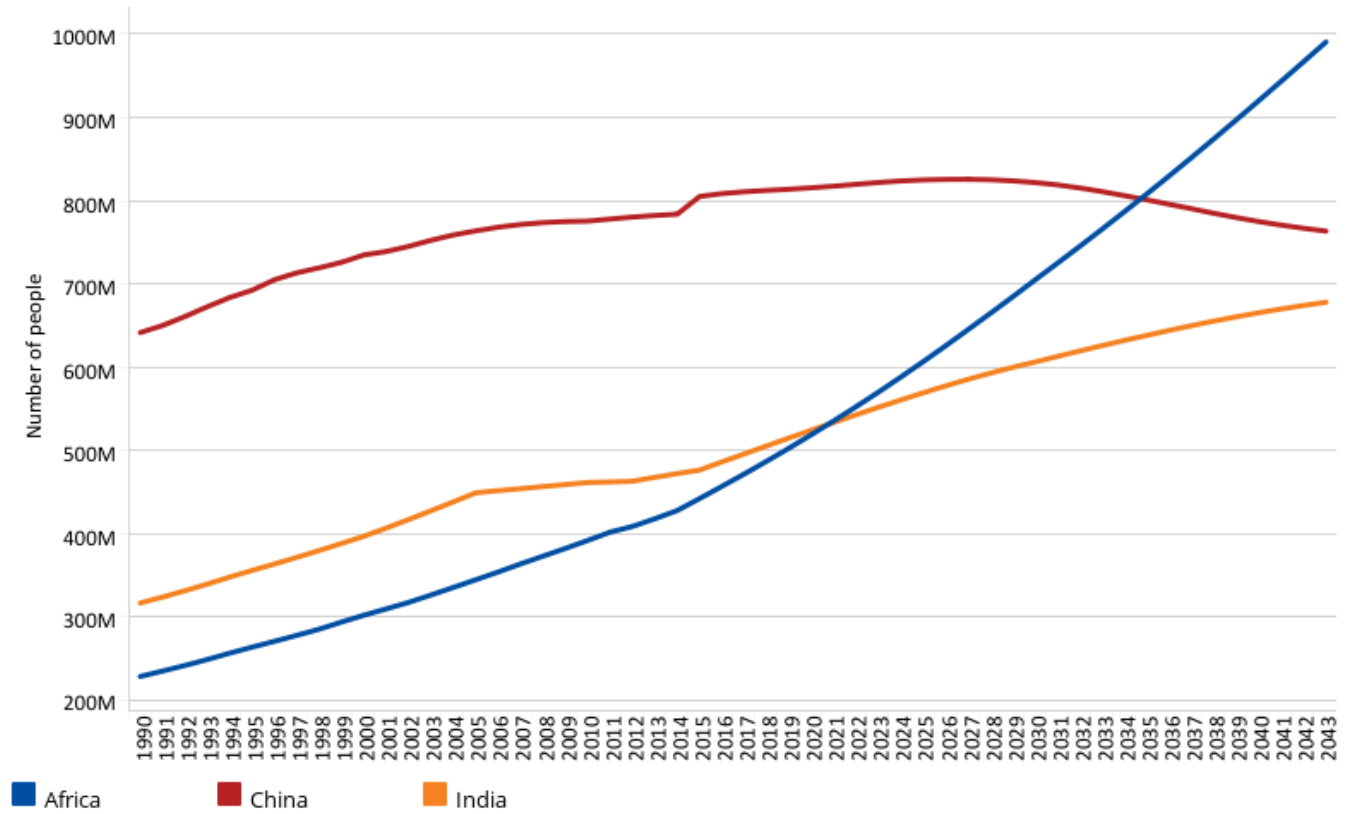
Typically, **labour participation** is higher among men than women and cultural factors also play a role. In North Africa, the difference is about 47 percentage points, compared with a much smaller difference of 11 percentage points in sub-Saharan Africa. Women struggle to find employment in North Africa given the numerous barriers placed on female advancement in most Muslim countries where the role of women is still generally stereotyped as main caregivers and that of men as the main breadwinners. In this region, and in the Arab States generally, female labour **underutilisation** is therefore particularly pronounced.

Other than for its poor gender equality, North Africa does much better than sub-Saharan Africa on most other counts. Unemployment in North Africa is at 'only' 12.3%, whereas West, Central and East Africa experience rates of double that. The share of workers in the formal sector is also higher and poverty rates much lower. In fact, North Africa has already achieved the Sustainable Development Goal of eliminating extreme poverty (meaning a national rate below 3% using US\$1.90 per person per day), whereas extreme poverty in sub-Saharan Africa was at 41% in 2019.

Labour in Africa compared with China and India

Africa's portion of the total population considered able to work – which constitutes its labour force – is large and rapidly increasing, as shown in Chart 3. In 2019, it was estimated at 503 million, very close to India's 515 million and which it surpassed in 2021. By 2035, Africa's labour force is set to be larger than China's (808 million) and by 2043 it will have increased to more than 1 billion.

Chart 3: Size of the labour force in Africa, India and China, 1990–2043



Source: IFs 7.63 initialising from International Labour Organization and World Bank data

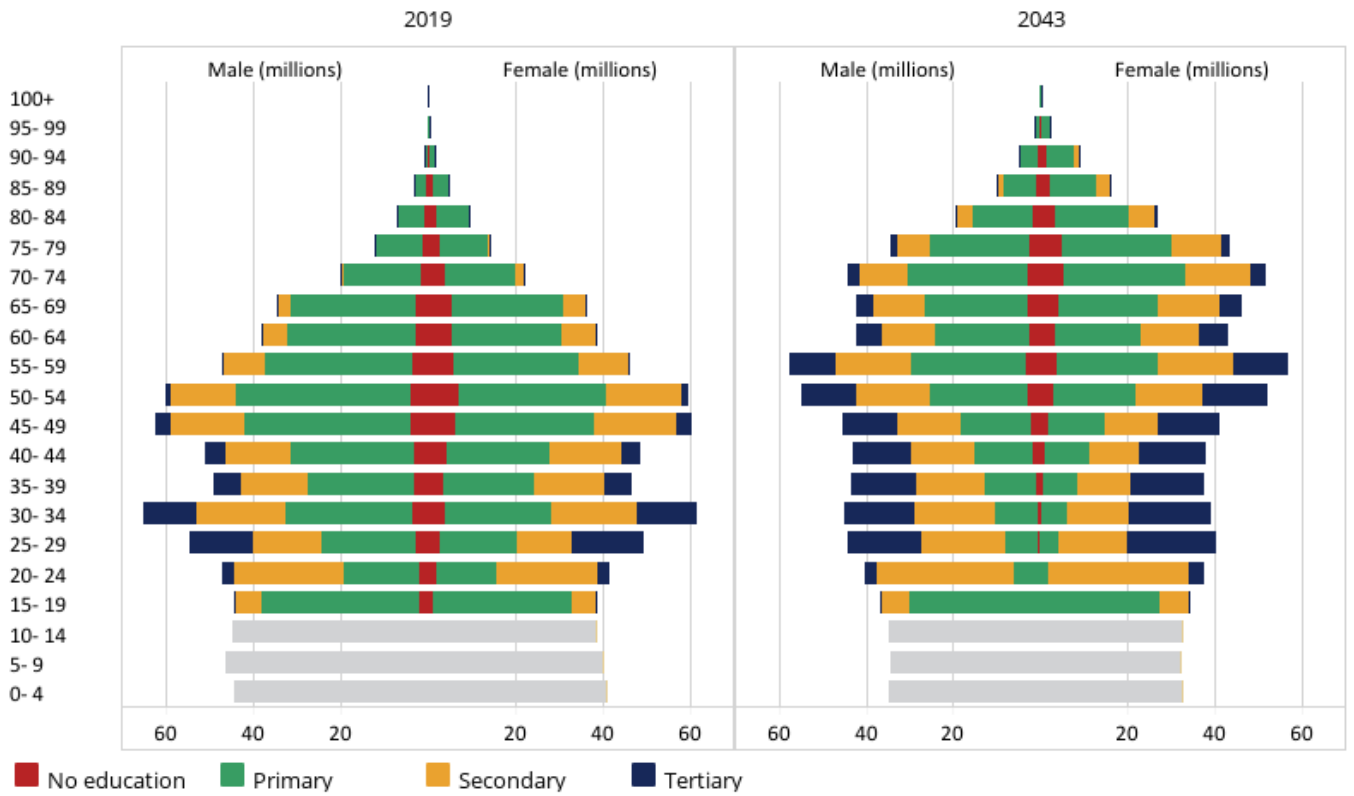
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As labour contributes significantly to growth at low levels of development, Africa has substantial potential. But based on size alone, that potential is misleading without drastic improvements in education and health, and considering that technology is steadily reducing the traditional contribution of labour to economic growth.

Two key indicators of the ability of a workforce to be productive – education level and general health – are presented in Charts 4, 5 and 6, which compare the current and 2043 situations in China, India and Africa in the Current Path forecast. Note that while the x-scale for China and India is the same, 60 million on either side, that for Africa in Chart 6 is 120 million, reflecting Africa’s large labour force in 2043.

Chart 4: Education by age, sex and level for China, 2019 vs 2043

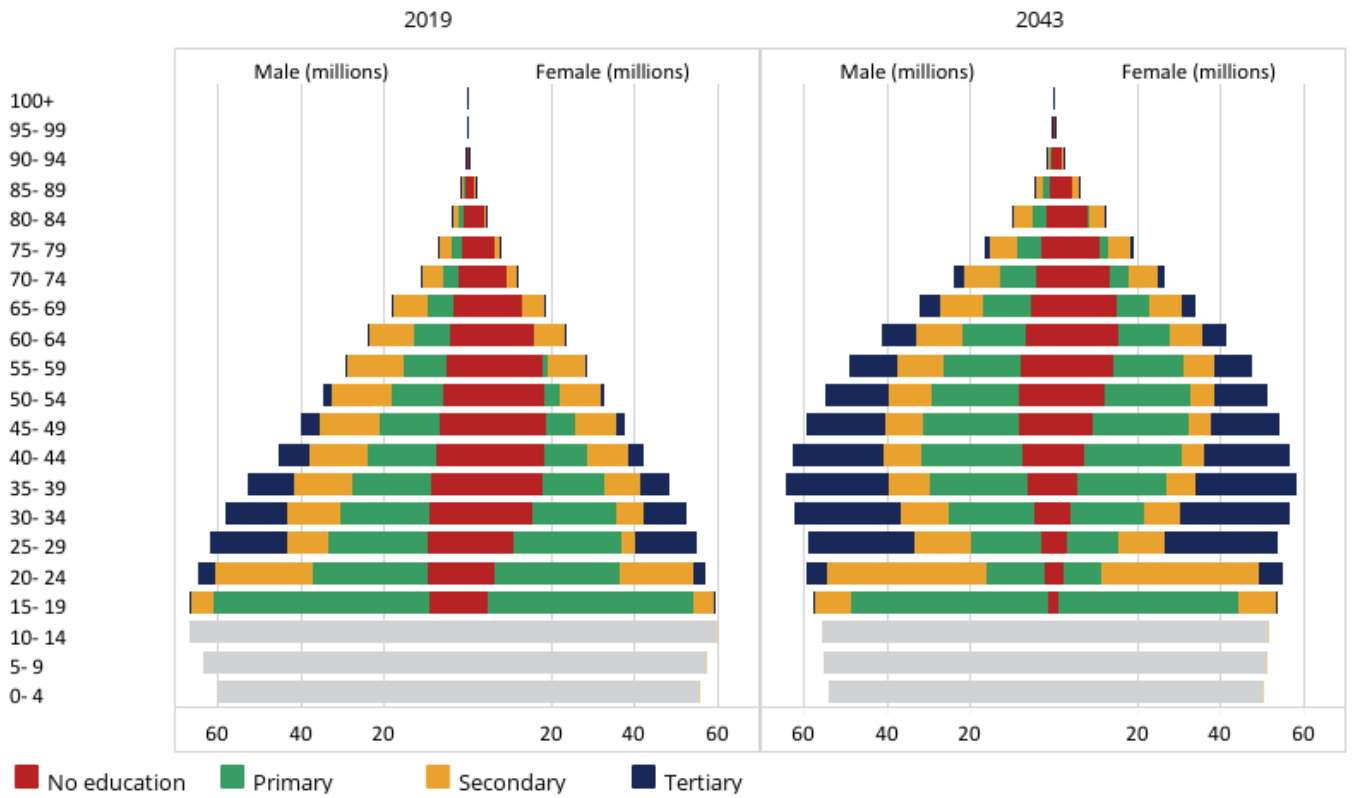


Source: IFs 7.63 initialising from UN Population Division medium term forecast and UNESCO and Barro-Lee educational data

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Chart 5: Education by age, sex and level for India, 2019 vs 2043

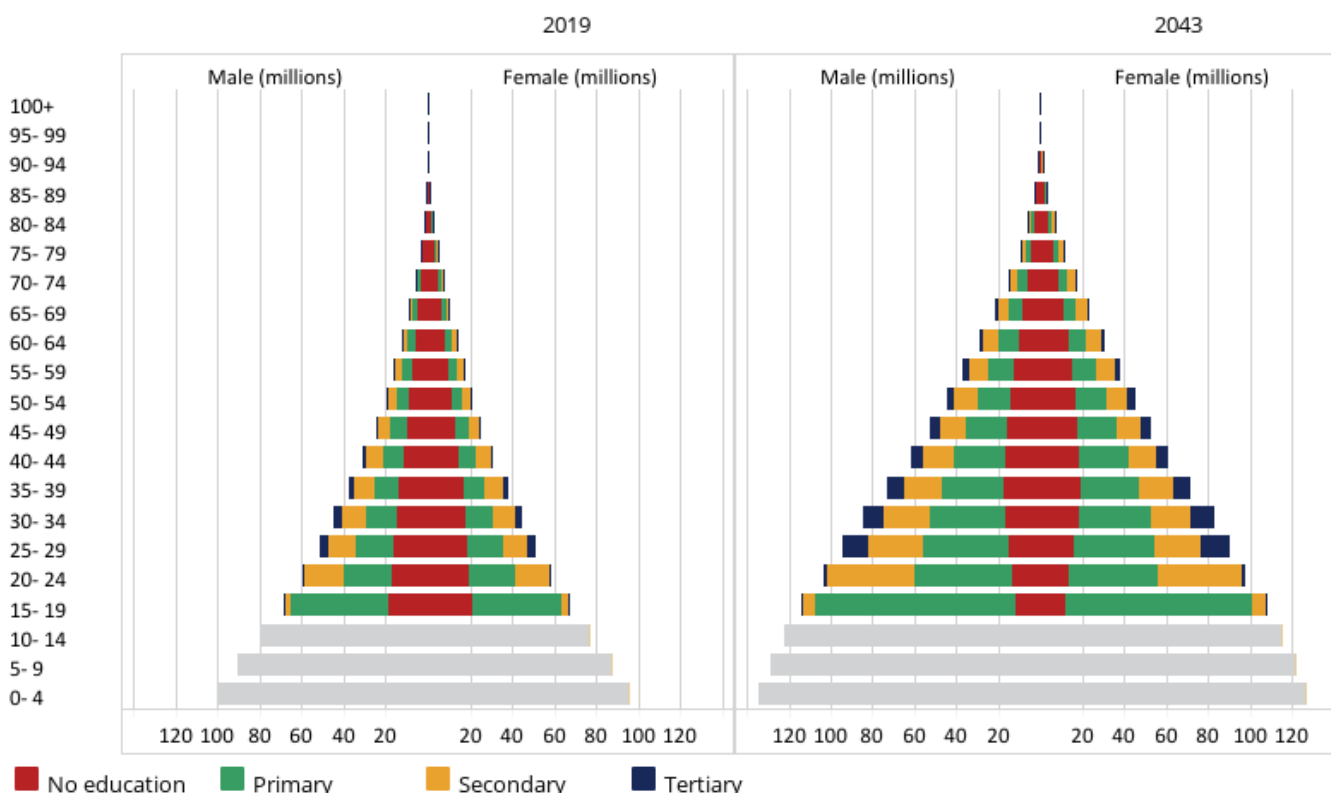


Source: IFs 7.63 initialising from UN Population Division medium term forecast and UNESCO and Barro-Lee educational data

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Chart 6: Education by age, sex and level for Africa, 2019 vs 2043



Source: IFs 7.63 initialising from UN Population Division medium term forecast and UNESCO and Barro-Lee educational data

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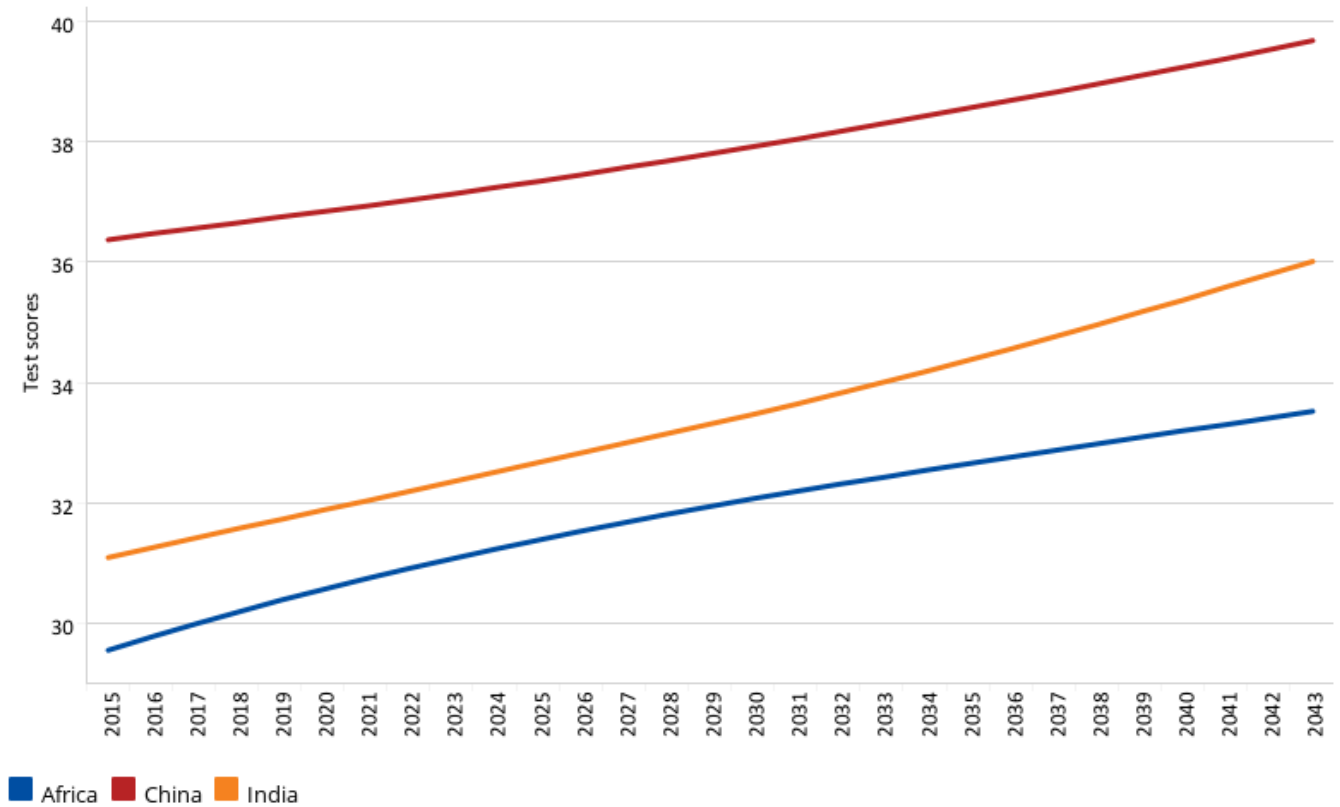
The following differences emerge:

- Africa's population pyramid retains its broad base to 2043, reflecting its youthful population structure and its large cohort of child dependants, whereas that of India increasingly takes on the image of the Taj Mahal, a fat, rounded belly of working-age persons who are increasingly well educated. China, in contrast, has a large elderly population, who need to be supported by a shrinking working class, but is on track to provide a secondary education to the majority of its younger population by the end of the forecast horizon, a target that India is likely to achieve only several decades later.
- Africa lags significantly behind both India and China in providing education at primary, secondary and tertiary levels.[2] Whereas the mean years of education in Africa for adults (15 years and older) was 6.2 years in 2019 and is expected to increase to 7.6 years by 2043, it was 8.3 years in China in 2019 and is forecast to increase to 10.1 years by 2043. Mean years of adult education in India will increase from 7.2 years to 9.1 years in this time. Although the amount of education adults receive in Africa is improving, the continent will slowly fall further behind China and India over the next two decades.
- Men typically are better educated than women. In 2019, Chinese men had about 0.8 years more education than women. The difference in India is 2 years and in Africa the difference is 1.2 years. In all instances, the IFs Current Path forecast is for the male-female gap to decline by 2043.

Africa also trails with regard to the quality of education, both currently and likely in the future, as shown in Chart 7. On this

important measure, the IFs forecast presents poor progress compared to China and India.

Chart 7: Education quality in China, India and Africa, 2015–2043



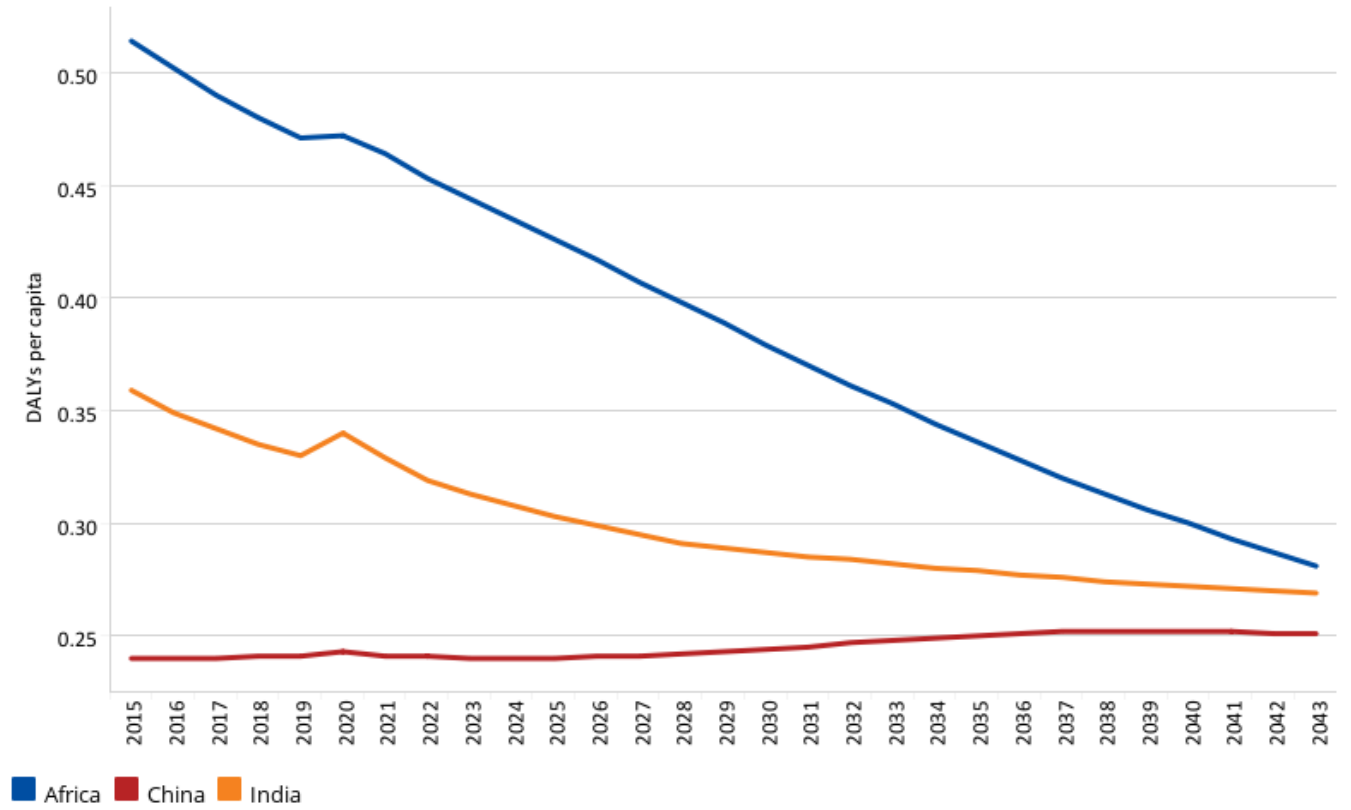
Source: IFs 7.63 initialising from World Bank EDSTATS data

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A second key indicator of the ability of a workforce to be productive is its general health. To compare countries and regions, we turn to a combined indicator of premature mortality and the years lived with a disability owing to prevalent cases of the disease or health condition. The two are combined in the measure termed disability-adjusted life years (DALYs). One DALY represents the loss of the equivalent of one year of full health and is a combined indicator of premature mortality and the years lived with a disability owing to prevalent cases of the disease or health condition.

Chart 8 presents the DALYs per capita for China, India and Africa and shows positive convergence over time. In 2019, DALYs in Africa were 0.47 million per million of its population, compared with 0.33 in India and 0.24 in China. In other words, the burden of ill health in Africa is almost double that of China. Coming from such a high level, rapid progress is possible, but it will take time.

Chart 8: DALYs per capita for China, India and Africa, 2015–2043

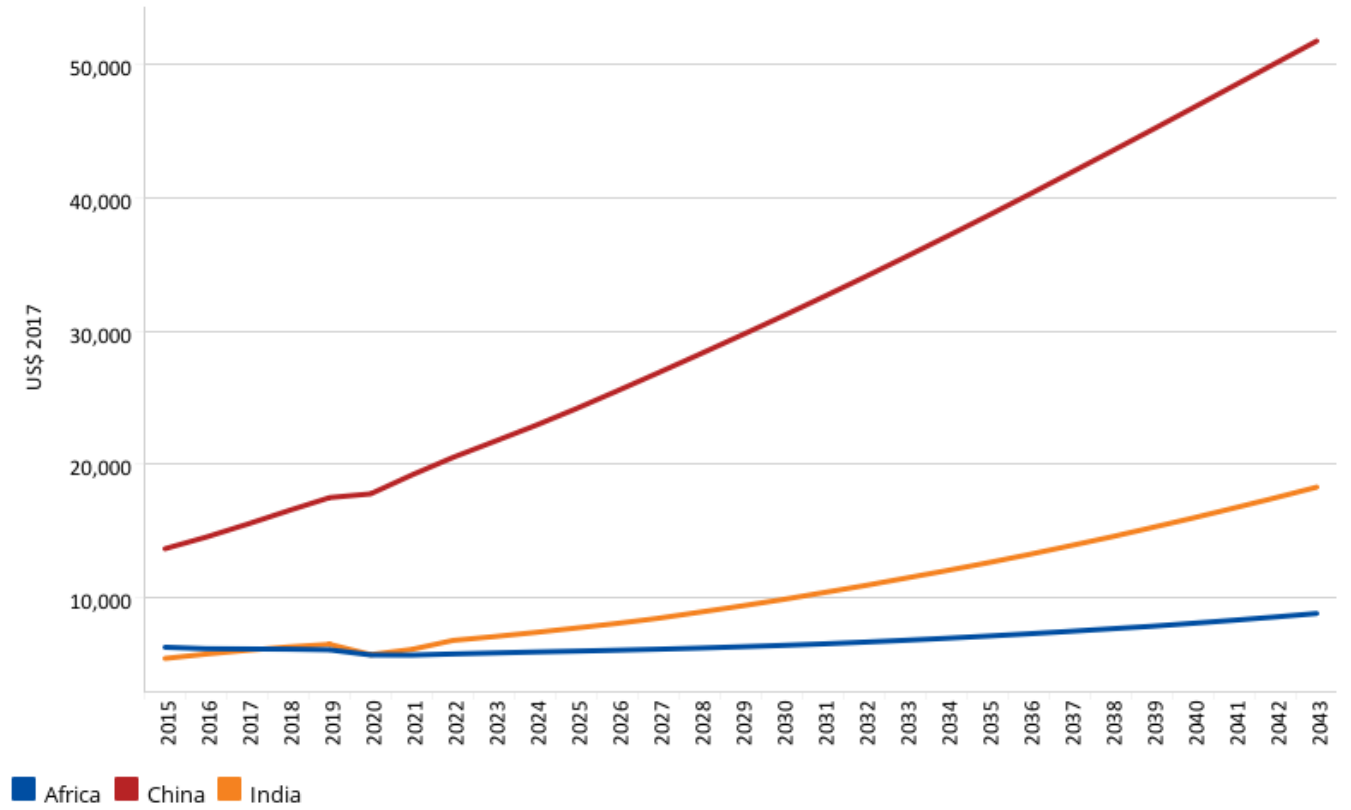


Source: IFs 7.63 initialising from Institute for Health Metrics and Evaluation data

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The combined effect of poor education and poor health is that labour productivity in Africa is, on average, significantly below that of China and India, as shown in Chart 9.

Chart 9: Labour productivity for China, India and Africa, 2015–2043



Source: IFs 7.63 initialising from International Labour Organisation and World Development Indicators data

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In 2019, average labour productivity in Africa was about one third of that in China and about US\$400 below that of India. By 2043, the gap will have widened significantly, with labour productivity in Africa being less than half of that in India and only 17% of that in China. Again, the IFs forecast is for slow improvements in Africa.

Trends in employment

Although estimates vary, the job prospects in the Current Path forecast for Africa are not good.

Between 2000 and 2014, **formal employment** in Africa expanded by less than 1.8% per year, while the labour force expanded by 2.6%. Even at the robust average annual economic growth rate of 4.8% during this period, it could not create enough formal-sector jobs. According to the **African Development Bank**, 10–12 million youths, many of them educated, enter the African workforce annually, yet only 3 million formal jobs are created each year. The International Monetary Fund (IMF)[3] calculates that sub-Saharan Africa has to create 20 million formal jobs per year for the next two decades, instead of the average of 9 million jobs added annually since 2000. The Africa Growth Initiative at the Brookings Institution estimates that Africa needs to create 12–15 million jobs annually to absorb **youth** entering the labour market.

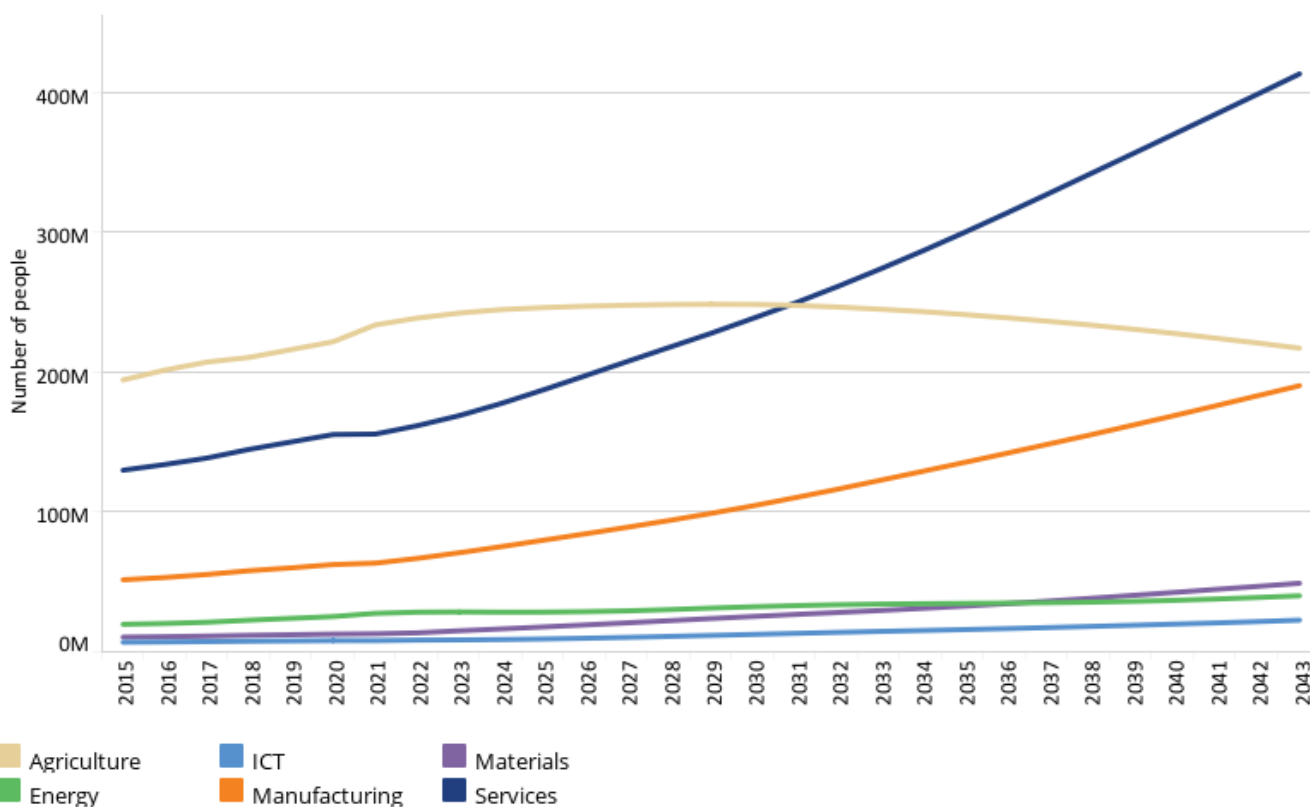
Across all country income groups, the share of employment in services (the largest economic sector in most countries) is growing and the share of employment in both agriculture and manufacturing is declining. This applies as much to Africa as to the rest of the world.

But will services-led growth provide sufficient jobs?

Historically, **technology-driven shifts** in employment – for example, following the introduction of the personal computer – have created more jobs than they have destroyed. In this future, the demand for skilled and semi-skilled workers is steadily increasing and that for unskilled labour (of which Africa has a large supply) will decrease. In the themes on agriculture and manufacturing, we note that in much of Africa workers are moving out of subsistence agriculture in rural areas and into low-end services in the informal sector in urban areas. Working conditions are generally worse in the service sector than in the manufacturing sector and only marginally better than in the subsistence agriculture sector.

Currently, most Africans are employed in the agricultural sector, which accounts for roughly a third more employment than the size of the labour force employed in the service sector, although the contribution of the service sector to GDP is substantially larger than the agricultural sector. Services, in turn, employ more than double the number of Africans employed in the manufacturing sector. Other sectors, such as energy, materials and ICT, employ significantly fewer people. Much of Africa’s agriculture consists of subsistence farming and most services are low-end services in informal settlements in urban areas, characteristics that translate into low levels of productivity. It is therefore no surprise that Africa grows slowly (Chart 10).

Chart 10: Labour employment in Africa by sector, 2015–2043



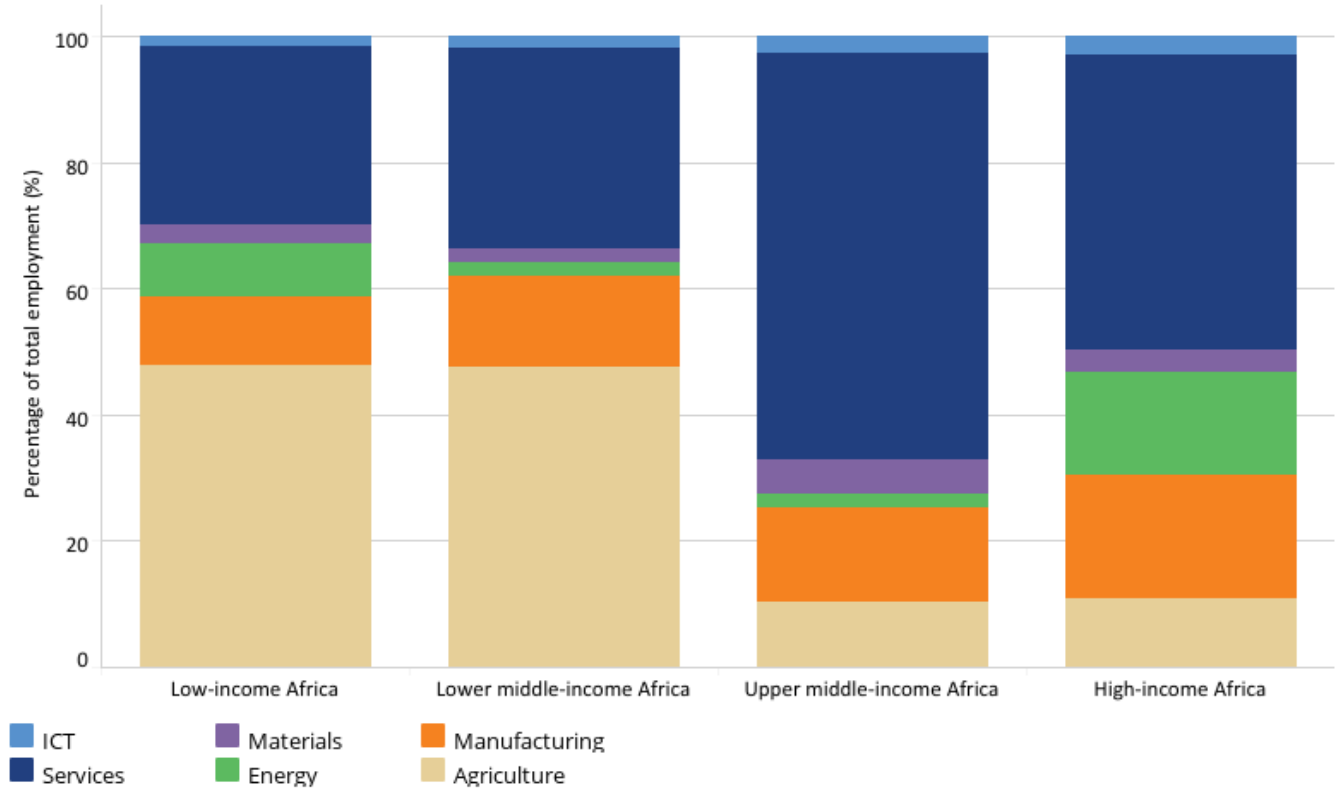
Source: IFs 7.63 initialising from International Labour Organization data

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Employment by sector varies significantly between countries and income groups, as shown in Chart 11. This is followed by a representation of the contribution of each of these sectors to GDP in Chart 12.

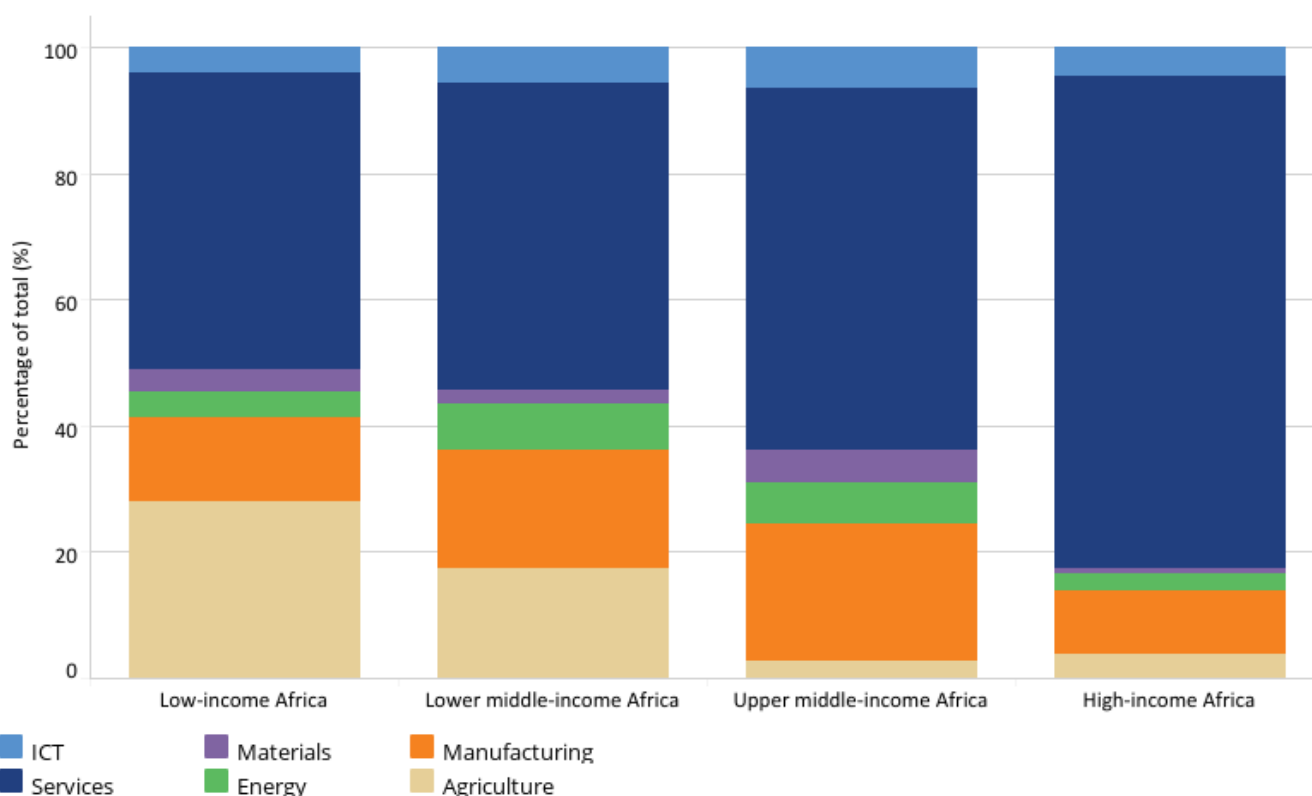
Chart 11: Employment by sector according to income groups, 2019



Source: IFs 7.63 initialising from International Labour Organization data

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Chart 12: Contribution of economic sectors to GDP according to income grouping, 2019



Source: IFs 7.63 initialising from International Monetary Fund data

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In summary, employment in the agricultural sector dominates in low- and lower middle-income countries (accounting for 46 of the 54 states in Africa in IFs), but the contribution of agriculture to GDP is quite low. Generally, the service sector dominates in its contribution to GDP for all country income groups, particularly for upper middle- and high-income countries, and employment in this sector is growing.

Is economic growth driven by employment or productivity?

The employment versus contribution to GDP per sector could be seen as a broad indication of productivity in each sector, also discussed previously in comparing productivity in Africa with that in China and India. The relationship is complex. For example, owing to the large surplus of labour on the continent, economic growth in Africa is actually more **employment** intensive than it would otherwise be. It is often cheaper to employ more labour than to invest in better systems, technology or even in training for current employees.

Meagre investments in health and education lead to a skills gap, which, in turn, results in low labour productivity, as also reflected in the World Bank's **Human Capital Index**, which ranks sub-Saharan Africa lowest globally with regard to lost productivity of the next generation of workers.

Against this background, the various scenarios discussed in this website are likely to result in only modest employment growth – insufficient for a substantive impact.

There is an unavoidable tension between employment-intensive growth and productivity-intensive growth. If an economy does not grow, the pressure for more output per worker will contribute to the steady decline in employment or a reduction in average remuneration. Typically, that would happen through the process of automation. To grow employment, Africans need to pay particular attention to measures that can unlock more rapid economic growth while paying attention to the nature of that growth. The often-unspoken challenge is whether it is politically possible for Africa to pursue the exploitative manufacturing labour practices through which countries such as China and the Asian Tiger economies initially developed. This is discussed in more depth in the theme on governance, but pertinent to the discussion here is that it is inherently more difficult for low-income democracies (of which Africa has many) to institute the measures required for rapid economic growth than for authoritarian states. But then, the latter are seldom focused on implementing pro-growth policies in any case, with China, Rwanda and until recently Ethiopia the obvious exceptions.

In the discussion on the Current Path and manufacturing, the phenomenon of premature deindustrialisation from already low levels in Africa was briefly explored. It appears unlikely that Africa will be able to grow employment rapidly based on growth in manufacturing, as was the case during industrialisation in today's developed countries. The analysis presented in those themes is that middle-income countries are experiencing declining shares of industry as a contribution to GDP and hence declining shares of employment in this sector. This is happening at an earlier stage of development than it did in today's developed countries.[4] But because manufacturing is important in changing the productive structures in the entire economy (i.e. also in the agriculture and service sectors), African countries need to pursue industrialisation aggressively where this is possible.

The trend of premature deindustrialisation complicates the potential impact of structural transformation towards more formal and less vulnerable employment in many African countries. In effect, the opportunity for industrialisation in Africa as a pathway to provide employment and productivity improvements seems to be slipping away. As **manufacturing** is the single most important vehicle through which economies transition to higher **productivity**, the long-term impact of premature deindustrialisation could be debilitating. The conclusion, presented by many, is that **African countries** need to look elsewhere for growth, primarily tourism, agriculture, natural resource extracts, and IT services.

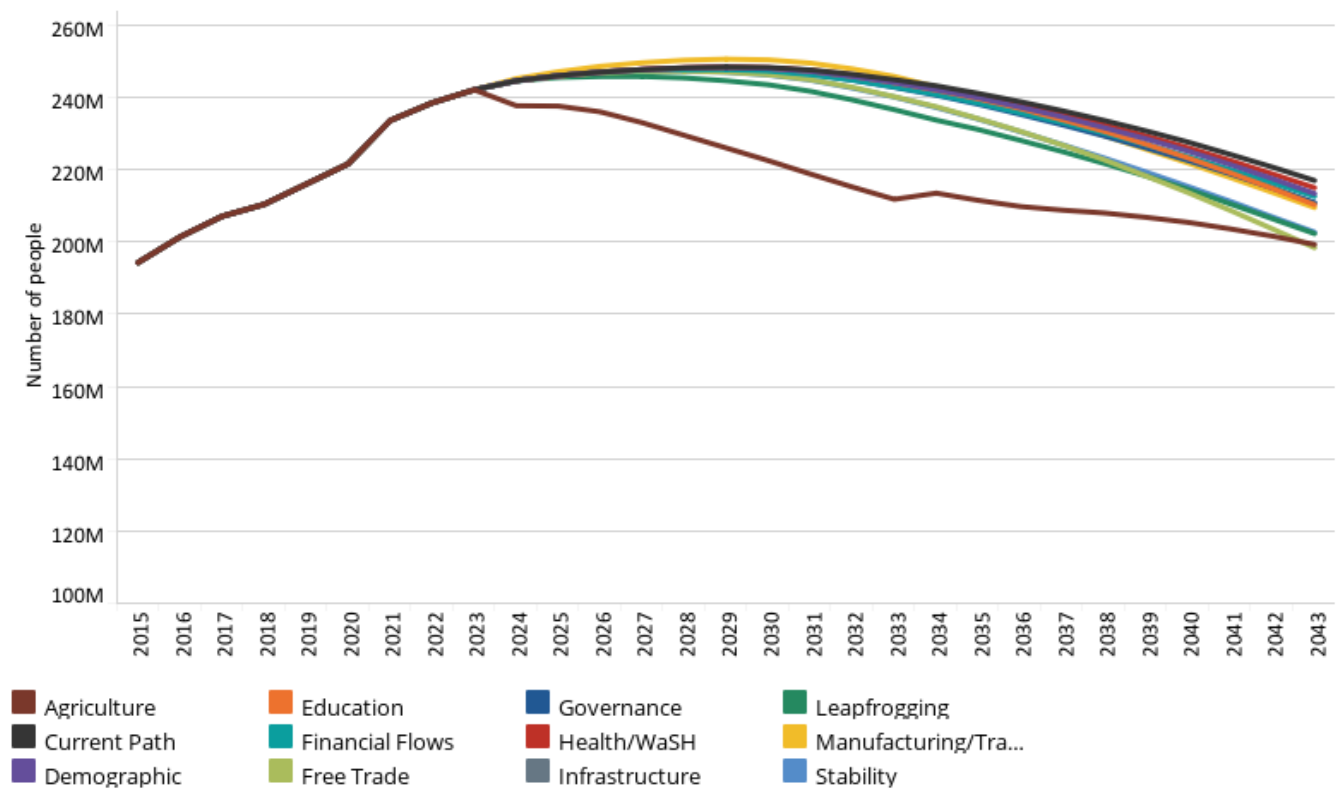
The problem is that few of these sectors offer particularly exciting employment or productivity prospects. Africa is already overly dependent on natural resource extraction and very vulnerable to the associated swings in commodity prices. Commodity dependence can provide growth, but it is often linked to political dysfunction and may trap a country at the low end of the value chain. Tourism is employment intensive, but not all countries have the offerings to provide attractive packages or destinations. Nor does tourism offer the kind of learning-driven productivity improvements generally common to manufacturing. Agriculture, where Africa has **significant potential**, automates even faster than industry.

In the short to medium term, the Agriculture scenario appears to have the most potential to have a positive impact on creating employment. However, that will not be on the farm, where employment will increase only if the size of the agricultural sector and its contribution to GDP substantially increase; instead, it will more likely be in the associated supply and distribution chains. The Agriculture scenario is about transforming current traditional agriculture from subsistence to smallholder farming, eventually being incorporated into value chains that link smallholding farmers to retailers using ICT and a host of applications that become the glue holding this complex system together. In this manner, agriculture moves into manufacturing through agriprocessing with significantly higher levels of productivity.

The analysis on manufacturing illustrates that, over a time horizon of a decade and longer, a manufacturing growth path unlocks more rapid economic growth and eventually also provides more jobs than agriculture. In addition, improvements in productivity in agriculture are bound to reduce employment intensity as they introduce modern technology into the sector – although a growing agricultural sector would increase the total number of jobs even as employment intensity declines. In other words, the agricultural sector will not provide the jobs that Africa so desperately needs, although it certainly would play an important role.

The results from IFs support these tentative findings. Total employment does not change much between the various scenarios, but there is a shift of employment between sectors, thus not more jobs, just different jobs. This is most noticeable in the Agriculture scenario, which sees a large decline in employment although with a roughly similar number of jobs being created in the service, ICT and other sectors.

Chart 13: Labour employment in agriculture by scenario, 2015–2043



Source: IFs 7.63 initialising from International Labour Organization data

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The Manufacturing scenario has the most positive impact on employment, and emphasises the importance of growing Africa’s manufacturing sector not because of the (limited) potential of manufacturing to create jobs in the 21st century, but because of its importance in changing the productive structures of African economies and unlocking faster growth. The evidence is that a larger manufacturing sector has important enabling spillover effects. For example, it incentivises high-end services such as financial intermediation, which is crucial for the development of the private sector and also encourages a more productive agricultural sector and consequently the transition into agriprocessing and agribusiness. These changes eventually produce higher growth rates and a more rapidly growing economy, which, in turn, creates more jobs (although only in the medium to longer term).

Also important, although less explicit, are the limits of Africa’s higher than expected levels of democratisation in affecting a manufacturing-led growth path. Whereas authoritarian countries such as Ethiopia and Rwanda can pursue exploitative manufacturing labour practices that enable them to compete on cost with emerging Asia, it is doubtful whether that is replicable in countries where democratic accountability is more deeply entrenched.

The African Center for Economic Transformation (ACET) in Ghana is one of many institutions that advocates that both agriculture and light manufacturing are key requirements for the future, and argues for a dual track to industrialisation, where one route leverages the relative abundance of workers for labour-intensive and export-oriented light

manufacturing, while the other leverages advantages in agriculture for globally competitive agriculturally based manufacturing. Although an agriculture growth path is appropriate for low-income countries, a manufacturing growth path generally becomes more important once countries achieve middle-income status.

However, as a contribution to GDP, the service sector already dominates. In the Current Path forecast, the contribution from the service sector to Africa's economy steadily increases from 50% in 2019 to 55% by 2043, while that of agriculture declines by more than half, to 7%. This is in line with a global trend towards more service-oriented economies, with job growth particularly in non-routine work such as personal-care services.

Given the dominance of the service sector, most future formal employment growth on the African continent is set to come from here, which includes tourism, retail, trade, transportation, finance and other activities. This is in contrast to the African growth experience over the last 35 years, which, in general, relied on growth in capital-intensive resource- and energy-based industries and did not generate a sufficient number of jobs.[5] Instead, most of the new jobs 'were created in sectors with low productivity levels, such as subsistence agriculture and low value-added services. Self-employment has continued to be predominant.' [6]

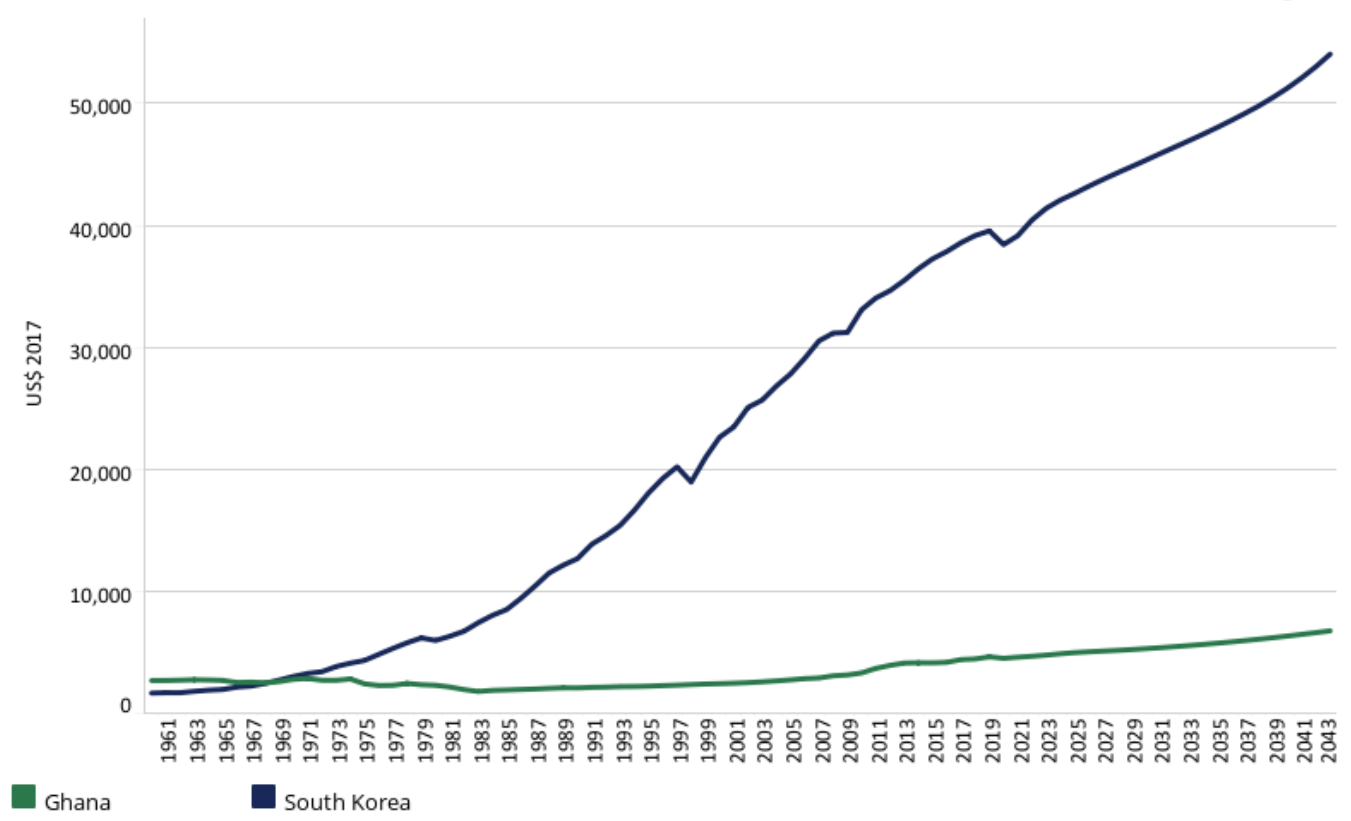
The implication of the preceding analysis is that Africa would have to look at other means, such as public work programmes and an extensive system of social grants, to alleviate extreme poverty. Even then the majority of job growth is likely to be in the informal rather than the formal sector. Given the size of the informal sector and the nature of work in Africa, the key question when looking at the future of work is whether digitisation and the use of modern technology can more rapidly formalise African economies and accelerate employment growth, with all the associated benefits described so far.

The potential of digitisation in Ghana

Academics often compare the dismal development outcomes in independent Ghana with the stellar progress made in South Korea.

When Ghana and South Korea gained independence, South Korea was the poorer of the two, but today its average income level is nine times that of Ghana (Chart 14). South Korea had few natural resources; in contrast, [Ghana](#) has, for five centuries, been part of a region known as the Gold Coast, and the mineral is still Ghana's most valuable export.

Chart 14: GDP per capita for Ghana and South Korea, 1960–2043



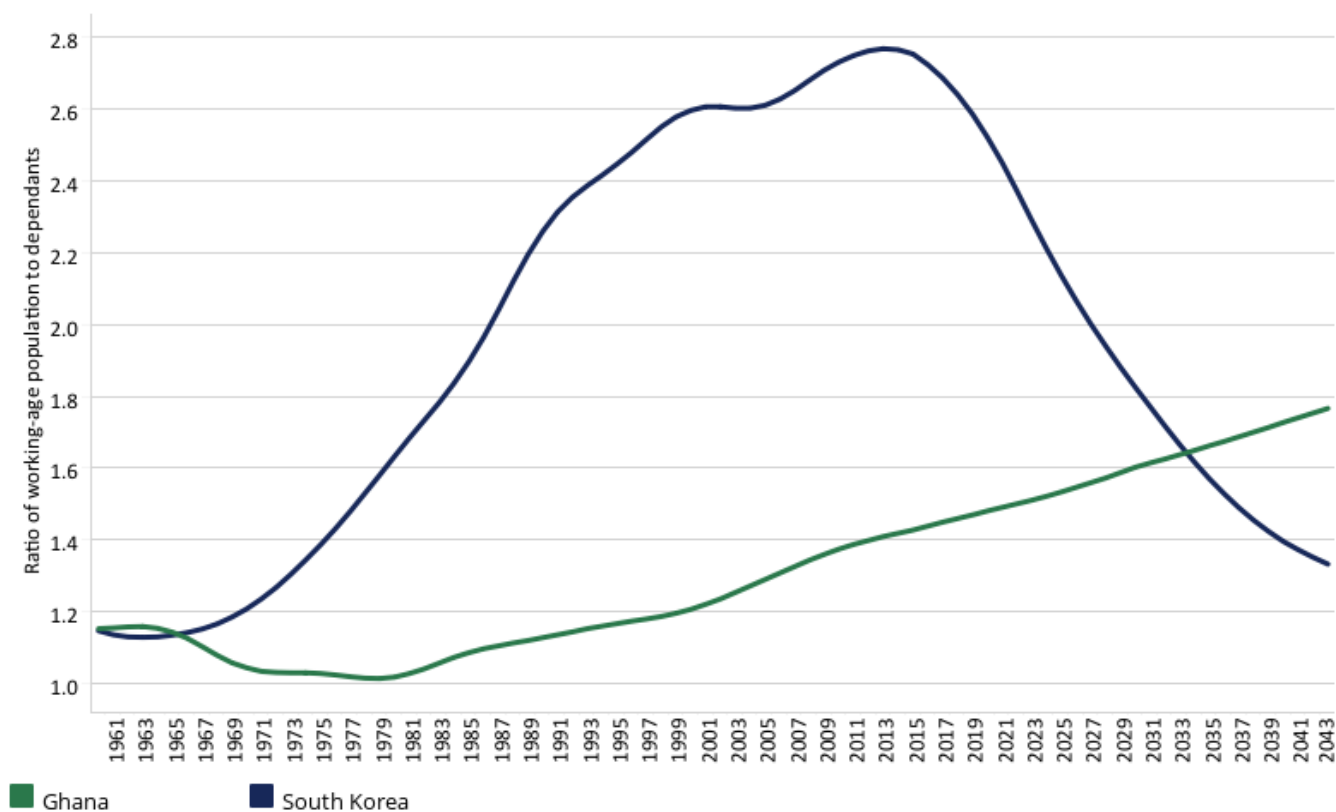
Source: IFs 7.63 initialising from UN Population Division World Population Prospects medium variant life expectancy and World Development Indicators data

[View on Tableau Public](#)

South Korea placed its focus on food self-sufficiency, basic education, family planning and the provision of basic healthcare. Because it managed to reduce its rates of fertility rapidly, it experienced a steady increase in the number of working-age persons to dependants. Thanks to this demographic dividend, the ratio of working-age persons to dependants increased from 1.2 in the late 1950s to almost 2.8 in 2016 (Chart 15) – an extraordinarily high ratio, achieved only by China and the other Asian Tiger economies.

The result helped South Korea to transform its economy rapidly. With fewer mouths to feed and schools to build, South Korea could invest in improving the human capital endowment of its existing youthful population to contribute to increased productivity.

Chart 15: Demographic dividend for Ghana and South Korea, 1960–2043



Source: IFs 7.63 initialising from UN Population Division World Population Prospects data

View on Tableau Public ↶ ↷ ↺ ↻ | 📄 🗑️ 🔗 Share

Labour is only one contributor to economic growth, but with the right policies and technology, Ghana too may now be poised for take-off.

By African standards, Ghana has a small population (around 31 million people). It is more urbanised than most African countries (close to 57% – a rate that South Korea achieved in 1981), allowing for a more rapid transition to digital services and also making it easier to provide water, sanitation and other services. By 2043, 68% instead of 57% (in 2019) of its citizens will live in urban areas – an advantage that will accelerate economic growth and possibly allow Ghana to graduate from its current lower middle-income status to become an upper middle-income country.

Partly because of higher-than-average rates of urbanisation, the total fertility rate (currently at four children per woman) is declining rapidly and Ghana will enter its demographic sweet spot by around 2038, earlier than most other West African countries (although more than half a century later than South Korea). The favourable demographic dividend should subsequently ensure more rapid growth rates, provided that Ghana manages to sustain the progress it has demonstrated towards inclusive, democratic governance over the last decade (as an alternative to South Korea’s autocratic development model) and can leapfrog towards more rapid development by using information and digital systems.

If Ghana can stay its course, that may just be possible.

In 2012, the country introduced biometric voter registration and a smart national identification system (dubbed the Ghana Card), which uses biometrics, has been rolled out – free of charge – since 2018. The process will provide each Ghanaian

with a unique personal identification number (PIN). This is a huge leap forward, as Ghana has, until recently, had no comprehensive identity system, and the pace of roll-out astounds bureaucrats in China and Western countries, where such systems were originally rolled out manually and with great effort over several decades.

A [smart identification card](#) will subsequently be required to open a bank account, apply for a passport or driver's licence, register a SIM card, buy property, register a business or even enrol children in school (children are linked to their parents' identification cards).

Exports or imports are directly linked to the PIN to eliminate fraud and theft in the shipping and clearing of goods at ports and harbours. Already the number of agencies required to inspect a container in Ghana has been reduced from 16 to just three, which cuts a lot of red tape.

Furthermore, the PIN will be used to verify a person's identity during job searches and applications, for e-tickets at airports, at border crossings, police checkpoints and the like. It will eventually become mandatory for the validation of payments, particularly electronic payments.

Most importantly, an identification number allows large portions of the informal sector to be brought into the formal economy.

In addition to the smart identification system, the GhanaPostGPS will provide a unique digital address for each 5 m² of land area in a country that previously had no formal system of finding a specific location without local knowledge.^[3] Armed with a digital address, small and informal businesses can now register for a bank account, access credit and receive deliveries via drones. It basically means that anyone with a phone technically will have a bank account and can get a parcel. [Drone delivery](#) of emergency medical supplies and COVID-19 vaccines has already started with the company Zipline.

Besides many other benefits, these innovations will improve tax collection, as both informal and formal businesses will steadily be forced to use electronic payment systems, which are all part of the formal economy. In turn, this will enable the state to deliver other services, such as education, roads, water and sanitation. The 2019 report on Africa by the United Nations Commission for Africa (UNECA) finds that in the long-term government revenue on the continent can be increased by 12–20% of GDP through the rigorous pursuit of tax and non-tax income collection, which is possible through digitisation. Leveraging digital systems to increase revenue collection through e-taxation increased revenue collection in Rwanda by 6% of GDP. South Africa used online tax payments to reduce compliance costs and the time to comply with the value-added tax by 22%.^[7]

Soon Ghana will also have a fully digital platform to pay for all government services, including driver's licences and car registrations, and the digitisation of land ownership (as part of the Ghana Enterprise Land Information System project) is slowly progressing. The aim is that a new base map survey (the first since 1974) will use blockchain technology to secure and verify the ownership of all **land**. Furthermore, with the support of the World Bank, the Ghanaian Ministry of Education is adopting modern technology by delivering its lessons through the use of e-learning technology. ^[X]

Technology also enables the documentation of important personal events (e.g. births, adoptions, legitimations and recognitions, deaths, marriages, divorces, separations and annulments), which are fundamental to having a legal identity and guaranteeing human rights and access to public services. It can provide access to finance and information about health, and offers a way to educate and connect people. ^[8]

Modern technology also allows for better policing of something like mining licences, for example. In many African countries, including in South Africa and the DR Congo, illegal mining is rife, often practised by desperate illegal migrants

who mine at night in extremely dangerous conditions. Some [150 drone pilots](#) have already been trained to monitor illegal mining across Ghana.

In recognition of these efforts, [Google](#) opened its first African artificial intelligence research centre in Accra, bringing together top machine learning researchers and engineers. The centre will work with local universities and jointly with a small number of other centres in Paris, Zurich, Tokyo, Beijing, Montreal, Toronto, Seattle, Cambridge/Boston, Tel Aviv/Haifa, New York, and the Google headquarters in San Francisco. In 2021, [Twitter's](#) then CEO and co-founder, Jack Dorsey, announced that Ghana would serve as the company's headquarters in Africa, following the announcement, in 2020, that the secretariat of the African Continental Free Trade Area would be located in Accra.

Many challenges remain, most notoriously the tendency to rush into spending public money ahead of elections on projects that are never completed,^[9] but Ghana's National Development Planning Commission has now teamed up with the Copenhagen Consensus to create a new initiative, Ghana Priorities, which aims to steer the government away from pork-belly politics by using evidence to assess the return on each cedi spent. By September 2020, the partnership had assessed more than 400 ideas and narrowed them down to 79. An example is a pilot scheme for the early diagnosis of tuberculosis, which could prevent more than 3 000 deaths in six years. Benefits outweigh costs more than 100 times.^[10]

Ghana also announced its [One District One Factory \(1D1F\)](#) initiative in 2017 as it seeks to change the nature of its economy from one dependent on the export of raw materials to one focused on manufacturing, value addition and export of processed goods. According to its website, the initiative is private sector led, with government creating the necessary environment for businesses to access funding and other support services to establish factories. In this model, 'Ghanaian entrepreneurs will own the companies, operate them and bear all the risks and rewards of the projects.'

Time will tell if this ambitious effort to spread domestic industry across the country can compete with the traditional model that aims to attract foreign companies and that clusters infrastructure and incentives in specialised industrial zones.

Digitisation, automation and the future of work

The explosion in digital platforms is slowly changing the nature of what it means to be in the informal or formal sector. A process of the digital business progression, where each step is low cost and low risk, incrementally formalises the informal sector.

Instead of being casual labour, many workers who are active in the informal economy already live in the [gig economy](#). Ng'weno and Porteous write:

In the short term, technology will create new opportunities in the gig economy: shared-ride drivers, homestay hosts, e-commerce logistics, e-commerce sellers, and small-scale e-commerce producers. These will be supplemented by an army of 'digital translators.' ... As the economy digitises, more people are needed to help customers and citizens transition into the digital economy. Most of these translators work on commission and set their hours.

It's time we recognised the truth about the future of work in Africa: it isn't in the growth of full-time formal sector jobs. The future of work will be people working multiple gigs with 'somewhat formal' entities. This is already true, and it will be for the foreseeable future. When we consider the future of work in Africa, the question shouldn't be whether jobs will be formal or informal but how digital platforms and new technologies might make this type of work more productive and of better quality for workers themselves.

Of course, the gig economy does not have only positive effects. Generally, the impact of digitisation is to lower barriers to entry and increase competition. However, in Africa, this could further force down wages and increase the number of people engaged in informal and unregulated work. The gig economy is, therefore, likely to result in more precarious or insecure work, with lower job and income security, poorer working conditions and lower social protection coverage than when employees are in standard employment. But even that is not a given: business innovation and government intervention will surely fill this gap.

Then again, digital technologies could significantly help formalise African economies (explored in the Leapfrogging scenario). Still, as elsewhere, the future of work will be determined by the interplay of automation and innovation.[11] 'While automation leads to a decline in employment in old sectors, innovation makes new sectors or tasks possible,' argues the Mo Ibrahim Foundation.[12] Much of that will inevitably occur in the informal sector.

Estimates about the impact of the Fourth Industrial Revolution differ hugely and include alarmist forecasts about the destruction of up to 30% of all jobs globally by 2030. However, it is unlikely that artificial intelligence, robotics and automation will change the historical trend that saw technological revolutions create more jobs than they destroy. Wealthy regions, Europe and North America in particular, are enjoying an unprecedented bonanza of jobs, especially in Europe, with low-end workers being upskilled with a concomitant rise in wages.[13]

Impact of automation in developing countries

The impact of automation will likely be different in the developing world compared with the developed world, largely because robotics presents a more direct threat to higher-paid routine labour in rich countries, although it will eventually also threaten jobs in developing countries.

As with every previous industrial revolution, new jobs will emerge that will replace the jobs lost to robots and automation. These developments will occur at every level and could appear to threaten large communities. For example, as China, the US and Europe transition to electric vehicles, and the rest of the world follows, millions of established jobs associated with the internal combustion engine will eventually become redundant, to be replaced by skill requirements related to electric engines, battery storage and energy management systems. However, this time around more jobs will be automated as production processes evolve.

The impact of robots and [artificial intelligence](#) will very likely widen the gap between rich and poor countries by shifting more investment to advanced economies where automation is already established. Developing economies will tend to specialise in sectors that rely more on unskilled labour and the impact could result in a permanent decline in the terms of trade of poorer countries. In that way robots may still end up stealing jobs in developing countries.

The question is whether the current crop of workers will be able to reskill and upskill. For example, as South African transitions from coal to renewables as the dominant source of energy, thousands of coal miners in places such as Mpumalanga will lose their jobs. Many thousands more jobs will be created across the country as distributed wind, solar and biomass energy sources come on line, but that shift is only possible if accompanied by a drastic effort to rapidly improve and transform skills.

The largest potential for robot-based automation is in countries with large and well-paying manufacturing sectors, such as Germany, Japan, South Korea, the US and increasingly China. The automation of low-wage and light manufacturing jobs, such as those generally found in Africa, seems much less likely in the foreseeable future. Both the African Development Bank and the UN Conference on Trade and Development suggest that robot-based automation has had a relatively small

effect in developing countries so far, which is likely to remain given their lack of technological diversification. The impact of robotisation is mostly concentrated in countries with a large manufacturing sector dominated by industries such as automotives and electronics.[14]

The current views on automation are that jobs will increase in vocations that cannot easily be replaced by robots, such as those that require non-routine cognitive skills, such as managing teams, nursing and cleaning. Care work that requires empathy and judgement (such as nurses and elderly care) is harder to automate and is likely to increase as populations around the world age. So, people will have to transition from one set of skills that may be replaced by automation to another, where that threat is not as acute. This is clearly less of a challenge in Africa, where employment is less formal and structured than elsewhere.

However, the demand for routine, job-specific skills, such as those required for processing payroll, bookkeeping or assembling goods, will decrease and jobs that combine different skill sets will increase. As a result, global value chains are becoming more knowledge intensive and low-skilled labour is becoming less important as a factor of contribution compared to capital and technology. [15] The demand for labour is increasingly away from low-skilled to semi-skilled and skilled labour, and it is for this reason that more and better education is so important for Africa.

A 2017 report by McKinsey estimates that less than 5% of occupations are candidates for full automation and that the 'correct' lens through which automation should be viewed is that of tasks, not occupations or jobs.

Technology by technology and job by job, there will be continued progress – and it will differ hugely between countries at different levels of development. In Japan and Germany, countries with highly paid and scarce workers, many of whom work in the automotive industry, a higher percentage of additional work could be automated. However, in many parts of Africa new jobs could be created at much lower start-up costs owing to the reductions in the capital costs and lower barriers to entry.[16] These findings underline the importance of providing the basics for empowerment, such as household electricity and low-cost global Internet coverage, which will unlock access to education, trade and other means of self-help.

So, will future jobs also come to Africa or will most still be created in Asia? In considering this question, it is important to bear in mind that the capital and labour intensity of manufacturing is declining and that technology (or knowledge) is globalising.

In view of these considerations, and contrary to the trepidation with which the Fourth Industrial Revolution is viewed in Europe and North America, the view from Africa is positive. As progress comes from a low base, it offers prospects for a degree of catch-up. For one, this is because of the expectation that it would create more jobs in both the formal and informal sector.

In a recent research survey, less than a fifth of respondents thought the Fourth Industrial Revolution would have a negative impact on jobs. In fact, the vast majority were excited about its positive impact.

In this vein, a report prepared for the European Commission concluded that the nature of work is part of the changing economy and 'no longer a static concept but an umbrella term for roles performed in a different manner and under different legal arrangements.' [17]

Instead of workers being replaced completely by machines, the more likely future is one in which people work alongside highly productive machines. This is already evident in the way in which ICT is penetrating modern life through the use of smartphone applications to augment or ease the completion of everyday tasks.

Therefore, the impact of the digital economy in OECD countries will include a trend towards short-term contracts and part-time work, although the vast majority of workers in the EU, for example, are still on full-time contracts. In addition, the Commission believes that automation will reduce routine job opportunities, such as those on a typical assembly line, in the formal sector.[18]

Yet, in a certain sense, Africans might find this an easier transition, as Africans in the formal and informal sector often already juggle a number of part-time jobs. The trend towards the so-called gig economy or Internet employment, which is characterised by freelance, on-demand work, is the latest manifestation of this greater fragmentation of work. And with COVID-19 lockdown strategies in many countries forcing many employees to work remotely, the gig economy and off-site work were given a major boost. In time, the COVID-19 pandemic will have revolutionised the service sector globally.

In the gig economy, independent workers are hired for short-term tasks, often via online work platforms that pay them for each transaction or 'gig' they complete. At high levels of complexity and value, the gig economy is about digital technologies enabling geographically dispersed teams, who often come from different countries, to be assembled around a given project. [19] Although formally regarded as still being quite small in much of Africa (at less than 0.3% of the labour force), it is burgeoning, especially in on-demand services, ranging from fast-food deliveries to more sophisticated tasks such as accounting and editing. [20]

The interesting thing about the notion of the gig economy is that it is already a reality in Africa, although in a different form. Many entrepreneurial Africans in countries such as Kenya and Nigeria already hustle to keep bread on the table by doing any number of jobs, tasks and functions in a seamless and often informally structured work environment. Innovations that will provide safety nets, such as unemployment insurance, healthcare and risk cover, are sure to follow. The Fourth Industrial Revolution is unlocking opportunities for millions of self-employed workers that did not previously exist (However, the 2020 World Employment and Social Outlook [report](#) from the ILO does warn that new forms of work are eroding the earning power of the self-employed.)

It is unlikely that we will witness widespread automation in sub-Saharan Africa, but work in this part of the world will still be threatened by widespread automation elsewhere, which will reduce production costs. The region's large informal economy and lack of digital infrastructure currently preclude such a development, as low pay levels mean that labour will remain cheap. Cheap labour in this region may, through technology, also be able to compete with more expensive labour elsewhere – but only if Africans have the required minimum skills.

Social grants

It is likely that most African governments will have to rely on social grants rather than an expanding job market to assist the poor and alleviate extreme inequality while also allowing the informal sector to flourish. This is demonstrated by the impact of grant programmes in countries as diverse as Brazil, South Africa and India.

In its original conceptions, income grants were conditional. Poor people were provided with food stamps or other means to subsidise food, education and transport if they fell below a certain income threshold. The latter was monitored through cumbersome and costly regular means testing to determine whether the beneficiary is still alive, still qualifies for the grant, etc. Some literature also suggests that in developing countries, with weak and inefficient bureaucracies, [targeted subsidies](#) tend to result in more inequality than universal ones. This acknowledges the significant information asymmetry between the bureaucracy and the population, and that promotion of good (or effective) governance is a necessary factor for targeted subsidies to work.

Universal, non-means tested grants have steadily become more common, including in South Africa where the ruling party has placed particular emphasis on redistributive policies rather than on growth. In contrast to the four million South

Africans receiving **social grants** in 1994, more than 18 million people (close to a third of the population) benefit from these today, and the number is set to increase further. However, in the long term, high levels of transfers are likely to constrain economic growth.

Even with this hugely expensive and expansive grant system, more than half of South Africans still live in extreme poverty (using the upper middle-income extreme poverty level of US\$5.50 as benchmark). With only 6.9 million **taxpayers** out of a total population of 60 million, the South African system has made a huge contribution to alleviating poverty but is eventually unsustainable at its current levels of GDP per capita without much more rapid economic growth. Only significantly higher economic growth can reduce extreme poverty, reduce unemployment and chip away at inequality in South Africa. In the meanwhile, spending on consumption steadily squeezes out productive government investment on growth.

Social grants are also used as part of a poverty reduction strategy in India, where the government committed to a campaign to ensure that every Indian has a bank account, is linked to the Internet and can be biometrically identified.

The Aadhaar project, meaning 'foundation', started off as a voluntary programme to help tackle corruption and fraud. Today Aadhaar offers the first national database of the Indian population. It has enrolled more than 1.1 billion Indians on its biometric, digital and physical identity system. Linking bank accounts to biometric identification and cellphones creates a system that can overcome the pervasive corruption that is often part of social grant systems, where large amounts of cash are doled out to sometimes illiterate beneficiaries by poorly paid officials who are themselves often destitute.

Aadhaar requires that each person goes through an enrolment process, during which a facial photograph, ten fingerprints and scans of both irises are recorded along with the citizen's demographic information (name, address, gender and date of birth). Once the enrolment is completed and the biometric data verified, the person is issued with a 12-digit unique identification number.

Service providers can verify someone's identity with the Unique Identification Authority of India and registration on the system is required to open a bank account, file a tax return or get a SIM card. Using mobile phone systems, funds (including social grants) can now be transferred directly to individuals, doing away with physical cash payments. There are, of course, risks with such systems, particularly in autocratic countries such as China where the government can readily use this as a means for political and social control.

Many African countries are doing the same, but in some, such as in Kenya where corruption is truly endemic, repeated efforts to collect the biometric data of its population and establish a national identification system are treated with deep suspicion as yet another means by which politicians and officials cream illicit profit off to their advantage. [21]

A second, more radical concept than social grants is the idea of a universal basic share, which is an equal payment to all citizens, without any conditions or a means test. Its attraction lies in its simplicity: instead of having to determine whether an individual falls below a certain income level and hence meets the means test, the payment is simply made to everyone above a certain minimum age.

The problem with this approach may be linked not to the availability of money as such but rather to the tax policies of **African governments**. Tax rates in Africa are notoriously low, largely because African governments 'forgo **revenues** worth almost a third of those they actually collect' through a bewildering array of tax breaks to donors, special economic zones and by offering tax holidays to big investors, often mining houses. Thus '**tax collection** in Africa resembles an exasperating fishing expedition, in which the big fish wriggle into **tax** havens and the tiddlers hide in the informal sector.'

Conclusion: Thinking differently about the future

On the current trajectory, the growth in the African labour force will far outstrip the supply of jobs, leaving many of the continent's citizens dependent on the informal sector. This will make some of them eager to migrate elsewhere in search of opportunities, including to neighbouring Europe. These conclusions re-emphasise the importance of revolutions in agriculture, trade, leapfrogging and manufacturing to increase growth and employment. In addition, it is also evident that the **informal sector** has been the main driver of employment growth in Africa and is likely to be where Africa's youth bulge is going to battle it out for their livelihoods.

Only if one views employment in Africa through the lens of self-employment (much of which occurs within the informal sector), digitisation and the Fourth Industrial Revolution does it become possible to think differently about the future of work in Africa. With large numbers of youth entering the labour market, the demand for jobs in Africa is huge and steadily increasing. However, Africa's labour force generally lacks many of the purported enablers for rapid job creation, such as adequate health and appropriate associated basic infrastructure and appropriate levels of education and skills .

A large cohort of young people with improving levels of education, who are either unemployed or eking out a survival in the informal sector, could be a destabilising force – both in Africa and its immediate neighbourhood. Young Africans are increasingly connected with one another and the rest of the world through the Internet and social media and will not stop seeking out the opportunities and lifestyles their peers have in the developed parts of the world.

The theme on stability deals with the structural drivers of instability, including the combination of youth and unemployment. In a different context the group of unemployed youths coincides with the large group of so-called NEETS – Africans not in education, employment or training. Clearly, the orientation of education opportunities towards the actual opportunities or needs within the economy, vocational training in particular, could assist in lowering the political temperature. In addition, there is the potential for job creation in agriculture, light manufacturing, modern services, tourism and creative industries.

As much of Africa's growth will come from commodity exports, governments should raise incomes through commodity value addition and find ways of extending the value chains of capital-intensive projects into the domestic economy. Furthermore, governments have to find ways of enhancing productivity and improving working conditions and regulations to reduce workers' vulnerability. The public sector will also have an important role in creating jobs for social development and through public works programmes, both to improve livelihoods and enhance skills.

Most concerning is that the vast number of Africans that survive in the informal sector will struggle to overcome the hurdles created by the Fourth Industrial Revolution. This underlines the importance of using digitisation to open new opportunities for this group, such as access to finance and bringing the informal sector into the mainstream through productive linkages and by reforming laws and regulations.

This theme used the example of Ghana to illustrate how modern technology could potentially formalise its economy more rapidly. By following and building on this example, African governments can harness the potential of digitisation to formalise and empower portions of the informal economy and empower ordinary citizens with access to finance, education and opportunity. Digitisation can help with the modernisation of agriculture and lift smallholder farmers out of poverty, but only if governments and leaders are aware of the opportunities it offers and develop effective digital strategies that support local innovation firms to compete and invest in household electricity (a precondition) and affordable access to the Internet.

To provide sufficient meaningful work, the continent needs a shift in mindset and policy that would allow a speedier escape from poverty compared with the slow progress envisioned in the Current Path forecast. Only if African governments are able to help create a culture of entrepreneurship will the continent be able to reduce unemployment. Attitudes need to change from 'getting an education to get a job' to 'getting an education to create jobs and opportunities'.

Even then, such entrepreneurship and self-employment will make only a small contribution to employment rather than solving the unemployment challenge, and it is inevitable that interventions such as social grants and public work programmes will have to be implemented on a massive scale if Africa is to reduce extreme poverty and provide the means for survival of a large portion of its population.

Endnotes

1. Moderate and extreme poverty would include the share of workers living in households with income or consumption per capita below US\$3.20 per day in purchasing power parity.
2. India is a lower middle-income country (there are 23 in Africa) and China is now an upper middle-income country (there are only seven in Africa). According to the World Bank, China is on track to be classified as a high-income country around 2023.
3. A Abdychev et al, 2018, The Future of Work in Sub-Saharan Africa, Washington, DC: International Monetary Fund.
4. International Labour Organization, World Employment and Social Outlook: Trends 2018, Geneva: International Labour Office, 2018, 2.
5. H Bhorat, R Kanbur, C Rooney and F Steenkamp, Sub-Saharan Africa's manufacturing sector: Building complexity, Abidjan: African Development Bank, 2017.
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7. United Nations Economic Commission for Africa, Fiscal policy for financing sustainable development in Africa, Addis Ababa: UNECA, 2019, 113.
8. United Nations Economic Commission for Africa, Fiscal policy for financing sustainable development in Africa, Addis Ababa: UNECA, 2019, xiii.
9. Ghana's countryside is littered with half-built bridges, as one example. In fact, since 2000 the fiscal deficit seems to have increased with every election (except for one).
10. Staff writer, High noon for half-bridges, The Economist, 19 September 2020.
11. Mo Ibrahim Foundation, Africa's Youth: Jobs or Migration?, London: Mo Ibrahim Foundation, 2019, 44.
12. Mo Ibrahim Foundation, Africa's Youth: Jobs or Migration?, London: Mo Ibrahim Foundation, 2019, 44.
13. The Economist, The feature is entitled The great jobs boom, 25 May 2019.
14. C Monga, Industrialization: A primer, in Industrialized Africa – Strategies, Policies, Institutions, and Financing. Abidjan: African Development Bank Group, 2017, 10; United Nations Conference on Trade and Development, Trade and development, beyond austerity: Towards a global new deal, New York: UNCTAD, 2017, ix.
15. S Lund et al, Globalization in transition: The future of trade and value chains, New York: McKinsey Global Institute, 2019, 2.
16. McKinsey estimates that across 46 countries (both developing and developed economies), it looks as if, by 2030, a range with a midpoint of 16% of occupations will have been automated and dislocated by automation. The range is large, and can go from very little to 30% as it depends on the rate of adoption, nature of the country and wage dynamics in the various sectors in that country. One can expect that in advanced economies it would be higher, say, 20%, whereas for developing countries the midpoint will be much lower as wages are lower. McKinsey, podcast, What is the future of work?, 1 December 2017.
17. European Commission, The future of work skills and resilience for a world of change, EPSC Strategic Notes, Issue 13, 2016, 11.
18. European Commission, The future of work skills and resilience for a world of change, EPSC Strategic Notes, Issue 13, 2016, 4.
19. Africans in the informal sector do not have much job security and global developments such as the gig economy appear to also shift the risk of employment steadily to the employee in an environment where there are few or no social safety nets such as unemployment benefits and where unions are weak. This means that employees have less bargaining power, opening the potential for job insecurity and greater wage differentials. European Commission, The future of work skills and resilience for a world of change. EPSC Strategic Notes, Issue 13, 2016, 2.
20. Mo Ibrahim Foundation, Africa's Youth: Jobs or Migration?, London: Mo Ibrahim Foundation, 2019, 46.
21. Sounds BBC, Kenya's controversial biometric project, sound recording (World Service), 2019.

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Dr Jakkie Cilliers is the ISS's founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees and head of the African Futures and Innovation (AFI) programme at the Pretoria office of the ISS. His 2017 best-seller *Fate of the Nation* addresses South Africa's futures from political, economic and social perspectives. His three most recent books, *Africa First! Igniting a Growth Revolution* (March 2020), *The Future of Africa: Challenges and Opportunities* (April 2021), and *Africa Tomorrow: Pathways to Prosperity* (June 2022) take a rigorous look at the continent as a whole.

About African Futures & Innovation

Scenarios and forecasting can help Africa identify and respond to opportunities and threats. The work of the African Futures & Innovation (AFI) program at the Institute for Security Studies aims to understand and address a widening gap between indices of wellbeing in Africa and elsewhere in the world. The AFI helps stakeholders understand likely future developments. Research findings and their policy implications are widely disseminated, often in collaboration with in-country partners. Forecasting tools inspire debate and provide insights into possible trajectories that inform planning, prioritisation and effective resource allocation. Africa's future depends on today's choices and actions by governments and their non-governmental and international partners. The AFI provides empirical data that informs short- and medium-term decisions with long-term implications. The AFI enhances Africa's capacity to prepare for and respond to future challenges. The program is headed by Dr Jakkie Cilliers.