

Emerging giant

Potential pathways for Ethiopia to 2040

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This report presents an integrated assessment of Ethiopia's future prospects using the International Futures modelling platform. The bulk of the report presents the likely development prospects of the country to 2040 along various measures such as poverty, healthcare and education, before presenting two alternative scenarios titled Abiynomics and Dark Days.

Key findings

- ▶ The Government of Ethiopia has made impressive improvements in agricultural productivity in recent years, but given the centrality of agriculture to everyday life in the country, it must remain a high priority.
- ▶ Climate change threatens to complicate and undercut many aspects of development on smallholder rainfed agriculture – the backbone of Ethiopia’s economy.
- ▶ Ethiopia’s education system faces enormous challenges at nearly every stage. Low attainment rates are fuelled by poor quality and high pupil-to-teacher ratios together with cultural practices including child marriage. Improving this will be a generational challenge. Along with its intrinsic benefits, improving the quality of education in Ethiopia is critical for meeting its industrialisation goals.
- ▶ Women and girls suffer from unequal access to education, resulting in highly disparate outcomes that create a gap in employment opportunities over the long run.
- ▶ As Ethiopia sheds some of its more authoritarian characteristics, it will enter a period of increased vulnerability and even instability that will require great care in managing the process of political and economic liberalisation.
- ▶ Lack of adequate access to basic infrastructure such as water, sanitation and hygiene facilities is an additional driver of suboptimal health outcomes including undernutrition, stunting and high death rates from communicable diseases like diarrhoea.
- ▶ Ethiopia’s high child undernutrition rate inhibits attempts to reduce infant and under-five mortality with 25% to 30% of its population suffering from insufficient access to nutritious food.

Recommendations

The Government of Ethiopia should focus on the following priorities to achieve the productivity and growth transition it aspires to:

- ▶ **Ensure food security:** If the country is to capitalise on its human potential, then Ethiopia must continue to invest in more productive and more resilient seed varieties, fertilisers and other inputs, including new technologies. The country also needs to move forward with a way to secure ownership and transferability of land and property rights, as well as liberalise the financial sector and ease access to credit.
- ▶ **Family planning:** In addition to improvements in basic healthcare, increase access to modern contraceptives.
- ▶ **Balance:** Ethiopia must balance expenditure on large-scale infrastructure projects against other investments that support human and economic development.
- ▶ **Transform and invest in education:** Changes to language policies, standardised teacher training requirements and the introduction of modern facilities and practices. Prioritise improvements in primary school survival and completion rates.
- ▶ **Social justice:** In addition to equalising opportunities in education, access to healthcare and employment there needs to be better recognition of, and support for, the critical role played by women in agriculture, commerce and civic engagement.
- ▶ **Governance reforms:** Ethiopia is at risk from its fragile institutions and ethnic pressures. On those issues that the Government of Ethiopia is not prepared to act on now, it should release public plans for how it intends to deal with them in future.

Introduction

Ethiopia has experienced remarkable economic growth. At an average rate of more than 10% per year from 2006/7 to 2016/17, it achieved the most robust gross domestic product (GDP) growth of any country globally, surpassing countries like China, Qatar and Rwanda. Over that same period, average incomes in Ethiopia nearly tripled, and the proportion of people with access to electricity doubled.¹

However these gains have been made from an extraordinarily low base and substantial challenges lie ahead, including reducing growing disparities between urban and rural areas as well as within rural areas. Economic growth has also recently decelerated significantly. More than 35 million people still lack reliable access to clean water and about 26 million people survive on less than US\$1.90 per day.²

Partly as a result, Ethiopia still struggles to ensure food security for significant portions of its 107 million inhabitants, has some of the highest levels of stunting in Africa and education outcomes remain frustratingly low. Perhaps most tellingly, people in Ethiopia are globally the least likely to have access to an improved sanitation facility.

Large public-led investment in infrastructure (i.e. construction) has fuelled much of the recent growth and there are concerns about the government's ability to sustain that push. Moreover, recent political changes among the parties that constitute the ruling Ethiopian People's Revolutionary Democratic Front (EPRDF) have raised concerns about future stability.

This report looks at the recent history and likely trajectory of human and economic development in Ethiopia with a time horizon to 2040, before exploring the most likely Current Path trajectory as well as two alternative scenarios that help frame the wide band of potential futures the country faces.

Background

After Haile Selassie was deposed in 1974, Ethiopia endured 17 years of brutal and systemic repression under the Marxist Derg regime. During this period the country suffered from regular famines, partly the product of the forced collectivisation of agriculture, as

well as widespread political persecution and violence – culminating in the Red Terror of 1976–1977.

A coalition of forces under the umbrella of the EPRDF eventually deposed the Derg regime in 1991.³

Although the EPRDF gained a degree of popularity under the leadership of Meles Zenawi – the charismatic strongman who also led the Tigray People's Liberation Front (TPLF) after the 1991 takeover – the coalition began to struggle after his death in 2012. The coalition was widely perceived to disproportionately benefit the Tigrayan population, a relatively small ethnic group from the north-west part of the country.

In 2015 Ethiopia held parliamentary elections as well as elections for its regional assemblies. The EPRDF, led by then prime minister Hailemariam Desalegn, gained 500 of the available 547 seats with the balance taken by affiliated parties. The process and the political environment fell short of being considered substantively free and fair by many.⁴

At an average rate of more than 10% per year, Ethiopia achieved the most robust GDP growth of any country globally

Then the announcement that the government intended to integrate services in the area immediately surrounding Addis Ababa (Oromia province) served as a catalyst for widespread protests and eventually violence, reflecting the deep-seated grievances and sense of marginalisation among many of Ethiopia's diverse groupings.

Protests calmed down and then reignited in November 2015 in Ginchi, a small town in Oromia about 80 km south-west of Addis Ababa. The government abandoned the plan to expand the capital in January 2016, but then in April of that year, 22 leaders from the Oromo Federalist Congress were charged under the country's broad counterterrorism law – events that triggered more violence. In August, protests spread to the Amhara Region, and more than 100 people were killed during a weekend of violence, leading to calls for investigation by the United Nations (UN).⁵

By October the crisis had reached tipping point. A heavy-handed response by security forces during the yearly

Irreecha cultural festival in Oromia on 2 October triggered a stampede that killed dozens, possibly hundreds, of people. Three days later the government locked mobile phone access to popular social media platforms like Facebook and WhatsApp.

On 9 October, the government declared a nationwide state of emergency that restricted freedom of movement, freedom of assembly and access to social media, and suspended due process for arrest and detention.⁶

In the weeks and months that followed, over 10 000 opposition members, most of whom came from the Amhara and Oromia regions, were rounded up and detained.⁷ Tensions simmered throughout 2017, with armed clashes between ethnic groups becoming commonplace in several regions. By the end of 2017, Public Radio International reported that there were as many as 400 000 internally displaced people (IDPs) in Ethiopia's Oromia and Somali regions.⁸

In February 2018, Desalegn announced his intention to resign as prime minister in response to the escalating unrest. By July 2018 the Internal Displacement Monitoring Centre noted that 'the humanitarian situation in Ethiopia deteriorated significantly, with continued intercommunal violence along the border areas of Oromia and Somali regions'.⁹

Close to 1.4 million people became IDPs between January and June 2018, and nearly 200 000 more have become IDPs since. Moreover, the displaced communities have spilt over into the Southern Nation, Nationalities, and Peoples' Region, one of the nine ethnically based regional states south-west of Addis Ababa.

In April 2018 Abiy Ahmed Ali, the chairman of the Oromo People's Democratic Organisation – now the Oromo Democratic Party – was elected as chairman of the EPRDF and prime minister of Ethiopia. He launched a sweeping political, economic, social and foreign policy reform programme in an effort to undercut the discontent that had led to the violence.

However beneath the swelling optimism in Ethiopia, the latent tension underpinning the violence of early 2018 continues to bubble. Abiy's reforms included sacking prominent members of the EPRDF, predominantly Tigrayans, stoking tension rooted in ethnic grievances. He also reached out to neighbouring Eritrea and opposition

parties – both those inside the country and those in exile – and embarked on a raft of reforms pursuant to his commitment to free and fair elections in the future, as well as to liberalise key economic sectors.

Meanwhile the International Monetary Fund in January 2019 warned that the country was at high risk of debt distress, with foreign currency debt now equal to more than three years of export earnings.¹⁰ Debt levels have stabilised, but the National Bank of Ethiopia is also struggling to control inflation, which hovered around 14% for most of 2018 and threatens to undermine attempts at economic liberalisation.

In response the government decided to start moving away from its public investment-led growth strategy in favour of greater partnership with the private sector. It is also clear that there remain factions within the EPRDF and the various security agencies that seek to derail his reform efforts.

The International Monetary Fund in January 2019 warned that the country was at high risk of debt distress

These fears came to a head in June 2019 when a number of people, including the Amhara Region president Ambachew Mekonnen, were killed by factions of the security forces from the region, events that also saw the assassination of the Chief of the General Staff of the Ethiopian National Defense Force in Addis Ababa.¹¹

Even without political violence, there are significant obstacles to overcome such as reductions in poverty and job creation.

It is clear that education, healthcare and basic infrastructure must improve if Ethiopia hopes to achieve the industrialisation goals outlined in the government's second Growth and Transformation Plan (GTP II) that runs to 2019/20. GTP II targets an average of 11% GDP growth annually, with the intention that the industrial sector, at the heart of its ambitions, should expand by 20% on average, translating into rapid economic growth and employment.

There are clear reasons to be optimistic about the future of Ethiopia, but there are also immense challenges on the

horizon. What also seems to be evident is that political developments since 2016 have provided significant fodder for both optimists and pessimists.

Purpose and scope

This report is a follow-up to a 2017 study, also conducted by the African Futures and Innovation (AFI) programme at the Institute for Security Studies (ISS).¹² The AFI programme is able to draw qualitative support from ISS staff in Addis Ababa as well as modelling support from the Frederick S. Pardee Center for International Futures at the Josef Korbel School of International Studies at the University of Denver (see Box 1). The project was funded by the Hanns Seidel Foundation (Nairobi), the United States Agency for International Development (USAID) through Social Impact, and the Swedish International Development Cooperation Agency.

The aim of the 2017 project was to enrich the understanding of the USAID mission in Ethiopia of the country's most likely development pathway across a number of key development systems as an input into its country planning process.

Box 1: The International Futures (IFs) model

IFs is a dynamic, global forecasting platform that blends historical data (more than 4 500 variables) and projections across several important development systems, including agriculture, demographics, economics, education, energy, the environment, governance, health, infrastructure, socio-political and technology. IFs is an integrated assessment model, which means that it draws on a number of other modelling approaches to produce its forecasts (e.g. computer-generated equilibrium models, econometrics and social accounting matrices). The model integrates a larger amount of data across a wider range of development systems than any other publicly available tool. The model is developed and maintained by the Frederick S. Pardee Center for International Futures at the Josef Korbel School of International Studies at the University of Denver. The tool is open-source and freely available for download at <http://pardee.du.edu>.¹³

While this study benefits from the support of multiple partners and sources, it is intended to act as an independent input into the internal planning processes of the Government of Ethiopia through the National Planning Commission. The project benefits from data releases and model changes within the IFs forecasting platform subsequent to the previous study. In addition, it explores the impact that the political and economic reform efforts of Prime Minister Abiy could have on the future of Ethiopia.

The report seeks to present an integrated assessment of the country's future. For example, Ethiopia's lack of core infrastructure is a major driver of suboptimal health outcomes in the country, which has negative impacts on education and the economy. Using an integrated tool like IFs allows users to explore these connections and may help policymakers identify leverage points to improve development outcomes.

Our previous analysis

Our 2017 report emulated 12 sets of positive and negative intervention clusters that were combined in a positive and a negative scenario to complement the Current Path forecast. The positive scenario simulated an ambitious but realistic five-year intervention (2017–21) across different

IFs lends itself to three primary avenues of analysis. First, users can explore trends and relationships to better understand how a country (or region) has progressed over time. Second, these relationships are formalised within the tool to create a Current Path scenario. The Current Path provides an indication of where a country seems to be heading under current conditions and policy preferences, and in the absence of any major shocks to the global system. Given that the landscape is shifting so rapidly in Ethiopia and that the country is in the midst of several large infrastructure projects, the IFs Current Path forecast has been slightly amended for this report as detailed in Annex 1. Third, scenario analysis gives users the ability to explore alternative futures and the leverage that policymakers may have to push systems towards more desirable outcomes.

development sectors, and explores the effects on development outcomes to 2030.

The headline takeaways from that report were that Ethiopia could expect very impressive returns by 2030 from improving agricultural resilience, facilitating better access to family planning and increasing access to education.

Improving agricultural yields was the most effective policy intervention for reducing poverty in Ethiopia to 2030.¹⁴ The major takeaways were that Ethiopia and its development partners ought to:

- **Boost agricultural yields.** Although Ethiopia has made steady progress in this area in recent years, it has a long way to go towards establishing food security. As additional land available for agriculture shrinks, boosting yields on existing land under cultivation – such as through expanding irrigation – will have to be the predominant strategy for achieving food security, reducing hunger, and growing incomes in the agriculture sector.
- The interventions targeting the agricultural sector reduced the number of people living in extreme poverty in Ethiopia by about 30%, compared to less than 10% in the cluster with the next most significant impact (fertility reduction).¹⁵
- Agricultural interventions also improved the size of the economy as measured by GDP by more than any other cluster explored and also improved the country's score on the Human Development Index (HDI) relative to most other interventions.
- **Address the bottleneck in primary education.** Facilitating access to education has the most significant impact on Ethiopia's HDI score. The country has had success improving gross primary enrolment rates (now above 100%), but less than half of the students who enrol in primary school make it to the final grade.¹⁶ Addressing the leakages in the education pipeline will help most students through the education system, grow the overall stock of education in the population and put Ethiopia in a better position to transform its economy.
- **Maintain the pace of fertility rate reductions.** Ethiopia has a large and growing population – more than half of which is under the age of 19 – that creates

challenges for expanding access to essential services like education, healthcare and basic infrastructure. Improving access to family planning will also help in the further development of basic health systems and improve gender equality in the country.

- **Improve access to water, sanitation and health (WASH) facilities.** Ethiopia has some of the lowest levels of access to WASH facilities of any country globally, which contributes to the high levels of undernourishment and stunting. Although access to clean water remains a priority, the sanitation intervention provided the largest return to health indicators.
- **Become more inclusive politically and economically.** Improving governance gave a strong boost to overall GDP and the 2017 study argued that government should focus on lowering the barriers to economic entry, normalising gender equality and improving domestic revenue collection to manage the continuous investment in infrastructure. None of that, it held, would be possible without political reform.

Improving agricultural yields was the most effective policy intervention for reducing poverty in Ethiopia to 2030

The government has been making progress on several of these fronts, most notably in opening up the political space and devoting more attention to the agricultural sector. However progress has not been as rapid in other areas – for instance with education and access to basic infrastructure.

Furthermore, much of this progress has been enabled by a large and sustained push on public infrastructure spending that will require careful debt management and further steps towards liberalisation.

The subsequent focus is steadily moving to privatisation and a larger role for the private sector. In addition to managing a delicate political transition at extremely low levels of human and economic development, the country likely faces a turbulent future.

In the public report of its 2018 Article IV Consultation, the International Monetary Fund stressed the need to promote fiscal consolidation and better revenue

collection, implement financial sector reform and greater exchange rate flexibility and attract more private investment, among other areas.¹⁷

The government has already committed to stabilising its debt level and to contract new debt at concessional terms, but managing inflation and balancing the need for greater revenue collection within the constraints of a low-income economy will be challenging.¹⁸

Box 2: Project notes

Peer country group: Kenya, Rwanda, Tanzania and Uganda

To make the comparison more genuine, **Ethiopia has been removed from the Africa and global low-income group.**

IFs relies on **data from international organisations** (the World Health Organization, World Bank, UN, etc.) in part because they are already standardised to ensure consistency and quality across countries. These organisations also all publish time series data, which is essential for forecasting.

Unless otherwise noted, all figures are taken from **IFs version 7.36** incorporating the adjustments reflected in Annex 1 and 2.

US\$ from IFs in the scenario section are in **2018 values.**

Ethiopia's recent past and likely future

Though the country faces challenges, Ethiopia's period of rapid economic growth since 2000 has translated into meaningful improvements in human development. Ethiopia has achieved the third most substantial decline in the proportion of its children suffering from undernutrition and, due to a massive expansion of health services, has experienced the most rapid decrease in fertility rates of any country in Africa since the turn of the millennium.

However progress has been achieved from a very low base and most of the population remains extremely vulnerable and without access to many basic services. Despite the recent gains there are still more undernourished children in Ethiopia than any other

country in Africa, save Nigeria. More than half the country lives without access to electricity and more than a third without clean water.

The massive public-led push on infrastructure development has also been somewhat of a mixed blessing. While infrastructure is sorely needed in Ethiopia, there is a risk that heavy investment in that sector could be drawing vital money away from priorities like agriculture, education, healthcare or even other types of infrastructure.

Education

A well-educated workforce that is literate and easily trained is a prerequisite for the kind of structural economic transformation envisioned in GTP II, the government's guiding policy document.¹⁹

The average adult in Ethiopia has 2.8 years of education, against 4.7 years in other low-income African countries

Recent progress notwithstanding, the reality is that human development outcomes (in particular education) in Ethiopia are well below other low-income countries in Africa and around the globe. The average Ethiopian adult (over the age of 15) received about 2.8 years of schooling in 2017. By contrast, the average adult in other low-income African countries received about 4.7 years of schooling – nearly twice as much.

Box 3: Education definitions

Gross enrolment rate: represent the total number of children enrolled in a given grade, regardless of age, divided by the number of age-appropriate children, and can therefore be greater than 100%.

Survival rate: the percentage of an entering cohort persisting to the beginning of the final year of a given level (e.g. primary).

Completion rate: the ratio between the number of students completing an education level (e.g. lower secondary) and the number of age-appropriate youth in the population at large.

Within the IFs model education is conceptualised as a pipeline, where there is an emphasis first on increasing enrolment and completion rates at lower levels, and which over time progresses to pushing students further along the pipeline from primary to lower secondary, upper secondary and, eventually, tertiary levels.

Put simply, failure to achieve universal enrolment and completion figures in primary school will make it impossible to achieve universal enrolment and completion in lower secondary school.

Table 1 shows primary and secondary education outcomes by level in Ethiopia and for key comparison groups. The table is shaded from green to red to identify the leaks (or bottlenecks) in Ethiopia's education pipeline, and reveals some clear challenges relative to other countries in Africa. The table does not include data for tertiary level that, in Ethiopia, has seen a rapid expansion from two to more than 30 universities in recent years. Progress at tertiary level is, however, very slow, and severely constrained by the earlier bottlenecks in the system.²⁰

In Ethiopia, the most glaring leak in the education pipeline comes at or before the level of primary completion. More than 80% of children in Ethiopia's peer countries complete primary school, more than twice the proportion in Ethiopia. If Ethiopia intends to improve economic growth and productivity, it must improve education outcomes. In other words enhancing primary survival and completion is a necessary first step towards the government's goal of industrialisation into light manufacturing.

Improving the quality of education provided at each level is a second important area of focus.²¹ Ethiopia scores significantly below the average for primary and secondary education quality compared to other low-income countries in Africa, as well as the global average for low-income countries, and below the peer group of countries. The Current Path forecast is for slow improvements but with Ethiopia falling slightly further behind.

Figure 1 shows a population pyramid for Ethiopia, shaded by level of education. It is composed of males on the left, females on the right, and ascends with age, with the top of the pyramid representing centenarians.

Progress at tertiary level is slow and severely constrained by earlier bottlenecks in the system

Ethiopia's GDP growth rates began to accelerate about 18 years ago, but the average of 2.7 years of education in the adult population over the age of 15 remains one of the lowest in the world. Along with low levels of overall attainment and poor quality outcomes, there is a very pronounced gender gap in Ethiopia's education system, with males receiving more than twice as much schooling as their female counterparts.

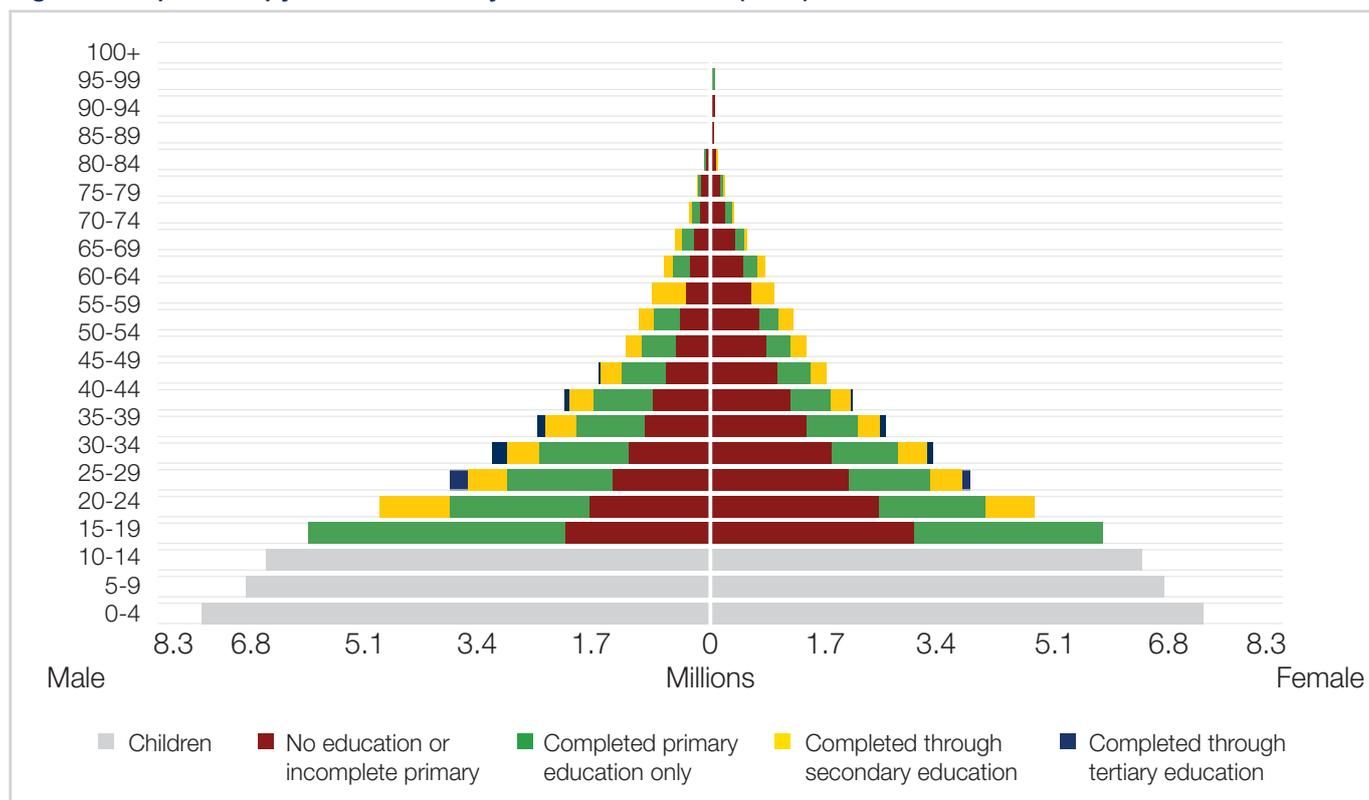
The large red portions running through the heart of the pyramid indicate the sizeable proportion of Ethiopians with no or incomplete primary education. It is particularly dominant on the right of the pyramid (females) and towards the top (older generations). Globally and across income categories, males receive more education, but

Table 1: Education outcomes, 2015

Country/region	Primary		Lower secondary		Upper secondary	
	Gross enrolment	Completion	Gross enrolment	Completion	Gross enrolment	Completion
Ethiopia	100.9	39.4	43.2	78.3	17.7	18.2
Peers (see Box 2)	101.4	82.3	86.4	73.6	31.2	12.2
Africa low-income	99.2	46.8	45.7	86.5	22.7	11.2
World lower-middle-income	101.0	50.2	54.7	84.3	30.3	14.8
World	104.7	93.1	92.3	84.0	76.8	40.2

Source: IFs version 7.36 using data from the UNESCO Institute for Statistics (UIS) and Barro-Lee

Figure 1: Population pyramid shaded by level of education (2015)



Source: IFs version 7.36 using data from UIS and Barro-Lee

on the order of 25% more, not 125% as is the case in Ethiopia. Moreover, education is a notoriously slow-moving system and investments will take decades to fully materialise.

If Ethiopia hopes to develop an efficient, world-class workforce – in line with the goals of GTP II – then it needs to invest more in education. Entry into even low-end manufacturing will require a better educated workforce and may, if not dealt with timeously, serve as a structural constraint in going up the productivity ladder.

Investments in education, particularly that of females, needs to receive much greater priority.

According to the Ethiopian Education Development Roadmap, there are several available policies to achieve better education outcomes. The report identifies teacher absenteeism, corporal punishment, gender inequality and insufficient school lunch programmes as bottlenecks to better education outcomes in Ethiopia.

Using Vietnam and Malaysia as examples, the report also makes a strong argument for compulsory English in public education beginning from Grade 1.²² The current

policy is that Ethiopians are taught in their mother tongue from Grades 1 to 4, then in Amharic until Grade 8 when the language of instruction switches to English.

Along with benefits to human development more broadly, investing more in education can help Ethiopia manage its demographic transition more smoothly. If young women are able to remain in school and begin to have more economic opportunities, they may decide to have fewer children.

Investments in education, particularly of females, needs to receive much greater priority

Alternatively, the broad promotion of genuine gender equality can help address cultural stigmas that force women into early childhood marriages, and normalise sexual violence, genital mutilation and other more subtle forms of discrimination that routinely force Ethiopian women and girls from school.²³

For their part, males who are incentivised to stay in school and are given reason to believe that they may one day have a stable job that can provide for a family will be less likely to engage in violence.

Demographics

Figure 2 also shows that Ethiopia has an extraordinarily young population, with roughly half of the country under the age of 19. Next to countries such as Uganda, Chad and Malawi, Ethiopia has one of the largest ‘youth bulges’ in the world – defined as the population between the ages of 15 and 29 relative to the adult population over the age of 15.

Other things being equal, large young (particularly male) populations with poor job prospects tend to be catalysts for instability – with the chances of violence rising significantly when 40% or more of the adult population is between the ages of 15 and 29.²⁴

Starting in 2000, Ethiopia has had success in lowering fertility rates and gradually moving towards a more stable

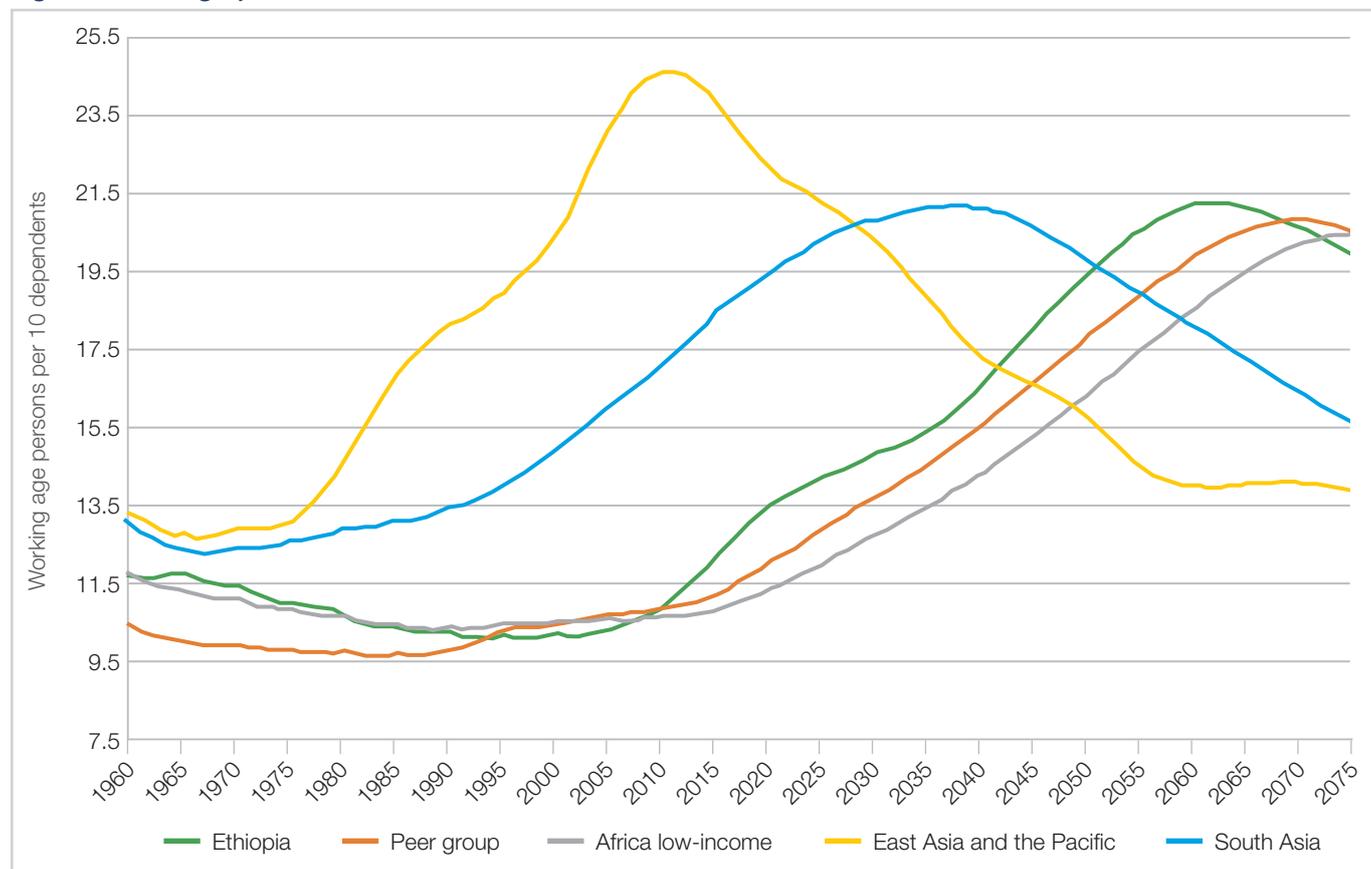
population structure, but like education, this transition also has a long fuse and will take decades to fully mature.

Ethiopia's large number of young males presents a formidable challenge to further progress in the short term

Ethiopia will continue to have a large youth contingent (i.e. greater than 40%) throughout the forecast horizon, although the country's youth bulge has begun to decline gradually. While the country will remain at increased risk of social instability relative to countries with older demographic profiles, this particular structural driver of instability is trending in Ethiopia's favour.

Ethiopia's large number of young males presents a formidable challenge to further progress in the short term, but it also provides a huge opportunity.²⁵ If the government can expand education and accelerate the pace of service delivery while simultaneously opening the

Figure 2: Demographic dividend



Source: IFS version 7.36 initialised from United Nations Population Division (UNPD) data

economic space to create job opportunities, that large young population can drive rapid economic growth.

The phenomenon also known as the demographic dividend, occurs when there is a particularly large number of people of working age (i.e. those between the ages of 15 and 65) relative to the number of dependents (i.e. children and the elderly) in a country or region.²⁶

The demographic dividend is a powerful force and can be used to explain significant portions of economic growth. Other things being equal, it is significantly easier to provide social safety nets, invest in infrastructure or roll out health and education services if there are, for instance 26 workers for every 10 dependents than if there are only 13 workers for every 10 dependents.

Those are not random figures either. In 2018, South Korea had twice as many workers relative to dependents as Ethiopia. From Figure 2, we also know that the vast majority of those dependents, in Ethiopia's case, are children.

Figure 2 shows the history and likely trajectory to 2075 of the demographic dividends in Ethiopia and select comparison regions. East Asia and the Pacific are included to illustrate the historical high-water mark for a regional demographic dividend, which at nearly 25 workers for every 10 dependents is unlikely to be replicated.

South Asia is the next region forecast to enjoy a sustained demographic dividend, which it is entering right now and is projected to continue until about mid-century. Although the ratio of workers to dependents is steadily improving, much of Africa will only enter this favourable demographic window around mid-century, so there is much more scope to influence the shape and timing of the curve through policy interventions.

The good news for Ethiopia is that its demographic dividend is projected to advance more rapidly and be slightly larger than its peer countries and significantly more rapidly than the average for other lower-income countries in Africa. This is partly due to successful family planning programmes and the provision of basic healthcare in previous decades. The demographic dividend in Ethiopia is gathering pace at the time of writing and will continue to do so for the foreseeable future.

But despite having one of the lowest total fertility rates (TFR) among low-income African countries, at more than four births per woman Ethiopia's TFR is still one of the 40 highest in the world. Given its high TFR and need for health services, there is scope to expand access to basic healthcare and modern contraceptives throughout the country.

Reviewing the 2017 ISS report on the future of Ethiopia revealed that it did not place sufficient emphasis on the severity of gender inequality in Ethiopia. Nearly all available metrics on gender inequality (e.g. gender parity in education, life expectancy for women versus men and employment) indicate that Ethiopian women perform more poorly than their counterparts across Africa, and globally.

Women in Ethiopia receive about half (58%) the level of education of their male peers

For example the gap between the average years of education in the male population and the female population in Ethiopia is the largest globally. Women in Ethiopia receive about half (58%) the level of education of their male peers.

This also shows up in other indicators. Although the country has made some progress on health outcomes in recent years – due to improved access to family planning and basic healthcare clinics – it has historically had one of the smallest gaps in life expectancy between men and women.

Typically, women live longer than men for a variety of reasons, but in some countries the gap in life expectancy is smaller than others. Ethiopia is currently ranked around 100th in the world, but as recently as 2005 it was ranked 145th globally, indicating rapid progress, but substantial potential for further improvements. Ethiopia has also had historically low levels of gender representation in parliament, with less than 10% of seats held until 2004. However, representation has risen fairly rapidly to 39% in 2018, which is close to double the global average of 23%. In addition, Prime Minister Abiy's cabinet is 39% female and he appointed the first woman president in 2018.²⁷

Agriculture

Agriculture has absorbed a significant portion of Ethiopia's rapidly growing working-age population in recent decades. According to the International Labour Organization (ILO) approximately two-thirds of Ethiopia's workforce is engaged in agriculture, much of it in smallholder farming and pastoralism.²⁸

In a 2016 study the World Bank noted that the number of people employed in agriculture grew by almost 11 million (from 19.9 million to 30.8 million) between 1999 and 2013, accounting for the majority of additional jobs.²⁹

The size of the agricultural labour force relative to other sectors has, however, declined slightly, from about 80% in 1999 to 77% in 2013.³⁰ Today a larger number of agricultural workers account for a smaller proportion of the total workforce, a trend that reflects the structural shifts occurring in Ethiopia's economy.

Even as the number of workers has grown, agriculture's share of total economic output (or gross domestic product) has steadily diminished, from around 50% in the 1990s to around 40% today – a share that is projected to decline to about 10% by 2040 along the Current Path forecast.³¹ This trend is inevitable, but shouldn't distract from the goal of improving productivity in the agricultural sector.

Given that agriculture remains the predominant economic and cultural way of life, boosting the efficiency of the sector is vital to improving livelihoods and transforming the economy. The ILO has noted that improving agricultural productivity and boosting local demand 'leads to the development of both upstream and downstream activities, the consolidation of value chains and the expansion of agro-industries, which are significant sources of employment and present real opportunities for economic diversification'.³² Ethiopia's government can leverage these employment opportunities by liberalising the financial sector and easing access to credit.

Although further improvements in the agricultural sector remain critical to the future of the country, there has been impressive progress recently. Between 2005 and 2015, total cereal yields increased by more than 85%, while the area harvested only increased by about 10%.³³

Along the Current Path forecast, average yields are forecast to increase by another 25% by 2040. There has

clearly been a focus on this sector from government, and the country can still expect major gains to food security and health outcomes from improving agricultural yields.

Despite these improvements Ethiopia remains highly vulnerable to drought and other environmental shocks like floods. This is partly because many of the gains made in the agricultural sector have come by placing additional land under cultivation.

Marginal agricultural land is difficult to manage during adverse conditions and ultimately does little to prevent hardship during droughts. According to the United Nations Food and Agriculture Organization (FAO), Ethiopia has nearly tripled the amount of land under crop cultivation since 1993, from about four million hectares to more than 10 million hectares today.³⁴

Another way of thinking about this is that between 2002 and 2016 Ethiopia added as much farmland as the entire nation of Kenya had in 2016. While expanding the amount of land under crop cultivation has improved overall agricultural output, it is not an approach that can continue indefinitely.

Between 2002 and 2016 Ethiopia added as much farmland as the entire nation of Kenya had in 2016

Given that land is finite and that lower productivity areas that have recently been added are highly vulnerable to climatic variation and drought, Ethiopia needs to maintain its focus on boosting yields on existing agricultural land.

Khalid Bomba, the CEO of Ethiopia's Agricultural Transformation Agency, acknowledges this by stating that 'there is no question that agricultural transformation is well under way in Ethiopia', but that 'much more could and needs to be done to accelerate the institutionalisation of this progress'.³⁵

Although more modern farming practices, access to improved seeds and better fertilisers have led to significant gains within the sector, there is considerable scope for further improvements. The country also needs to engage young people and women in farming to make the lifestyle more desirable, improve mechanisation on

farms and move towards more resilient and drought-resistant planting practices.

A key component of this has been the Agricultural Transformation Agency's Soil Information System (EthioSIS), a programme that uses satellite images to provide soil-specific fertiliser recommendations for the Amhara, Harari, Oromia, Southern Nations, Nationalities, and Peoples' and Tigray regions, with plans to expand throughout the country by the end of 2019.³⁶ EthioSIS and other applications of new technology could improve productivity in ways that are difficult to anticipate.

There are also inefficiencies built into the existing system. For example, despite a state-owned enterprise meant to promote efficiency in the agricultural sector, smallholder farmers can end up paying two to three times above market price for critical inputs such as fertiliser.³⁷ Moreover, because there is essentially no ownership or land title (a constitutional limitation), farmers have no bankable assets against which they can borrow.

The government has prepared legislation to address this issue, mainly by providing explicit rights of use for specific durations of time, but the bill has yet to be

introduced in parliament – though the Amhara Region has gone ahead with a similar provision.³⁸

Notwithstanding these challenges, the process of improving yields in Ethiopia is already under way. Yields per hectare increased from 1.4 metric tons per hectare in 1990 to 2.9 tons in 2014. These improvements were followed by the 2015-17 drought, which eventually required that emergency food assistance be provided to nearly 10 million Ethiopians. Much of that aid needed to be sustained into 2018, particularly in light of the surge in IDPs following the early 2018 violence.³⁹

Yields per hectare increased from 1.4 metric tons per hectare in 1990 to 2.9 tons in 2014

Among the more concerning trends moving forward is Ethiopia's ability to achieve and maintain food security in the face of a large and growing population and the uncertain impacts on agriculture from climate change.

If Ethiopia cannot close the gap between the amount of food it can supply domestically and the demand for

Box 4: Climate change

The Intergovernmental Panel on Climate Change (IPCC) anticipates climate change to affect Africa in diverse ways. Though some regions (notably South-Western Africa) are expected to become significantly warmer and drier over the coming decades (relative to 1990 levels), other areas like East Africa and the Horn are expected to see increased precipitation over the near to medium term. However, because Ethiopia can expect more rain in the future doesn't necessarily mean this will boost agricultural production. The IPCC has warned that 'regions of high or complex topography, such as the Ethiopian Highlands' might also see increased periods of extreme rainfall that could destroy fragile crops or cause flooding.⁴⁰

Moreover, changing environmental conditions may enable the incursion of hitherto unencountered pests. In particular, researchers have cautioned that warming in Ethiopia's highlands may allow *Hypothenemus*

hampei, a coffee berry borer, to occupy Arabica-producing coffee regions in Ethiopia, Uganda, Rwanda, Kenya and Burundi. If this does occur, agriculture's contribution to GDP growth would surely decline, to say nothing of the livelihoods of coffee farmers.⁴¹

There are also climate-related concerns that extend beyond agriculture. For example, temperature and precipitation changes will allow mosquitoes to proliferate in areas that have historically had a low incidence of malaria. A 2014 study conducted in the Ethiopian highlands suggests that 'unless disease monitoring and control efforts are boosted and sustained', additional malarial cases are a likely result.⁴²

Finally, the increased severity and frequency of both droughts and floods exacerbates the lack of WASH infrastructure in the country, leading to greater disease outbreaks during floods and increased water scarcity in droughts.

calories from its large population, the country will remain vulnerable to international price fluctuations in commodity markets, which threatens to undermine attempts at improving nutritional outcomes in the country.

On the Current Path, Ethiopia could be importing roughly 25% of its total agricultural demand by 2040. In response the government has already made irrigation development in the lowland regions a short-term budget priority.

Health

Although climate change presents new risks to Ethiopia's health systems, such as the increased geographical spread of malaria, recent trends in the sector have largely been positive. In the past 25 years the government and aid organisations have made significant investments in health infrastructure accompanied by a rollout of health services, particularly to women and children.

Since the late 1990s, the government and its development partners have founded 16 440 health posts and 3 547 health centres and built 311 hospitals.⁴³ Ethiopia's Health Extension Programme, which explicitly focuses on women and children, has also deployed more than 38 000 health extension workers throughout the country.⁴⁴

Given this broad and sustained investment, Ethiopia has made notable gains across various indicators related to health and mortality. Life expectancy has increased by nearly 40% since 1990 against 25% for other low-income countries in Africa.

Today the average Ethiopian can expect to live to 65 – about four years longer than their counterparts in other

Box 5: Health spending in Ethiopia

Ethiopia's reliance on external funding for basic health services represents a serious risk to human development outcomes in the country. More than US\$600 million in health funding was distributed by development partners in 2015, accounting for roughly half of total health spending in the country. The Health Sector Transformation Plan (HSTP) 2016-2020 estimated that the international donor community would supply about half the public capital resources necessary to execute the HSTP for fiscal year 2015/16.⁴⁵

low-income countries across Africa (61 years). Similarly, over the same time period infant mortality has decreased by more than 65% compared to less than 40% in other low-income African countries. Today infant mortality is 30% lower in Ethiopia than other African countries at similar levels of income.

Figure 3 presents life expectancy and infant mortality rates in Ethiopia, in other low-income African countries and in Africa as a whole from 1980 with a forecast to 2040. Though average life expectancy in Africa was about six years longer than in Ethiopia in 1980, Ethiopia made rapid progress and eventually closed the gap in around 2005.

Life expectancy has increased by nearly 40% since 1990 against 25% for other low-income countries in Africa

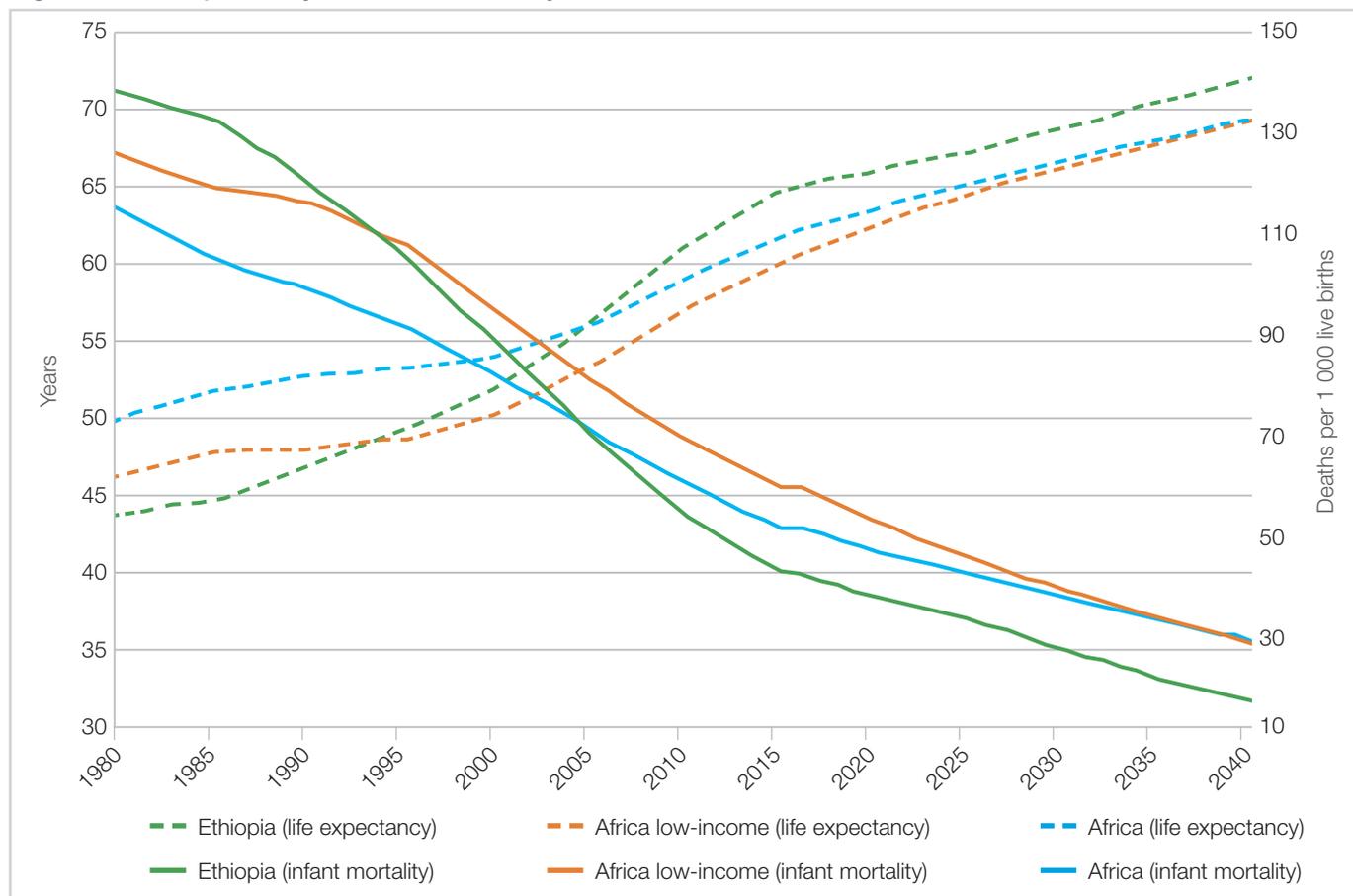
By 2040, the average Ethiopian is expected to have a life expectancy that is roughly one and a half years longer than the continental average. The gap between Ethiopian and African averages for infant mortality looks remarkably similar (though in the inverse), with a pronounced gap at either end (which switches in Ethiopia's favour).

Ethiopia has also made significant progress towards lowering its maternal mortality rate (MMR).⁴⁶ Since 1990, the MMR in Ethiopia has declined by about 70%, dropping from 1 250 deaths (per 100 000 live births) to 353. Ethiopia's MMR in 2015 was 20% lower than the continental average and almost 35% lower than the average for other low-income African countries.⁴⁷

Along with investing in basic healthcare improvements, the country has had success with its efforts to curb the spread of communicable diseases (especially malaria and tuberculosis). Since 1990, new HIV infections have decreased by 90% (although from a low base), malaria death rates have fallen by about 80% and malaria deaths in children under five by around 70%, though recent trends threaten to erode some of those gains.

Meanwhile tuberculosis (TB) has more than halved over the same time period, though the prevalence of multidrug-resistant TB remains a public health concern.⁴⁸

Figure 3: Life expectancy and infant mortality



Source: IFs version 7.36 initialised from UNPD data

Figure 4 shows the causes of death in Ethiopia in 2016 and illustrates that ‘other’ communicable diseases are the most likely cause of mortality today, followed by the two largest non-communicable diseases, cancer and cardiovascular disease.⁴⁹ For the most part Ethiopia’s burden of disease is roughly average for a developing country, though traffic fatalities and diarrhoeal deaths remain looming concerns going forward.

These gains are impressive, particularly when compared to other countries at similar levels of income. But on a global scale, health outcomes in Ethiopia are still poor. In 2016 Ethiopia ranked 146th in the world in life expectancy, 143rd in infant mortality and has the largest proportion of its citizens living without access to improved sanitation facilities of any country.

Lack of adequate access to WASH facilities has been identified as a primary driver of suboptimal health outcomes in the country and investments in those areas could accelerate some of this progress.

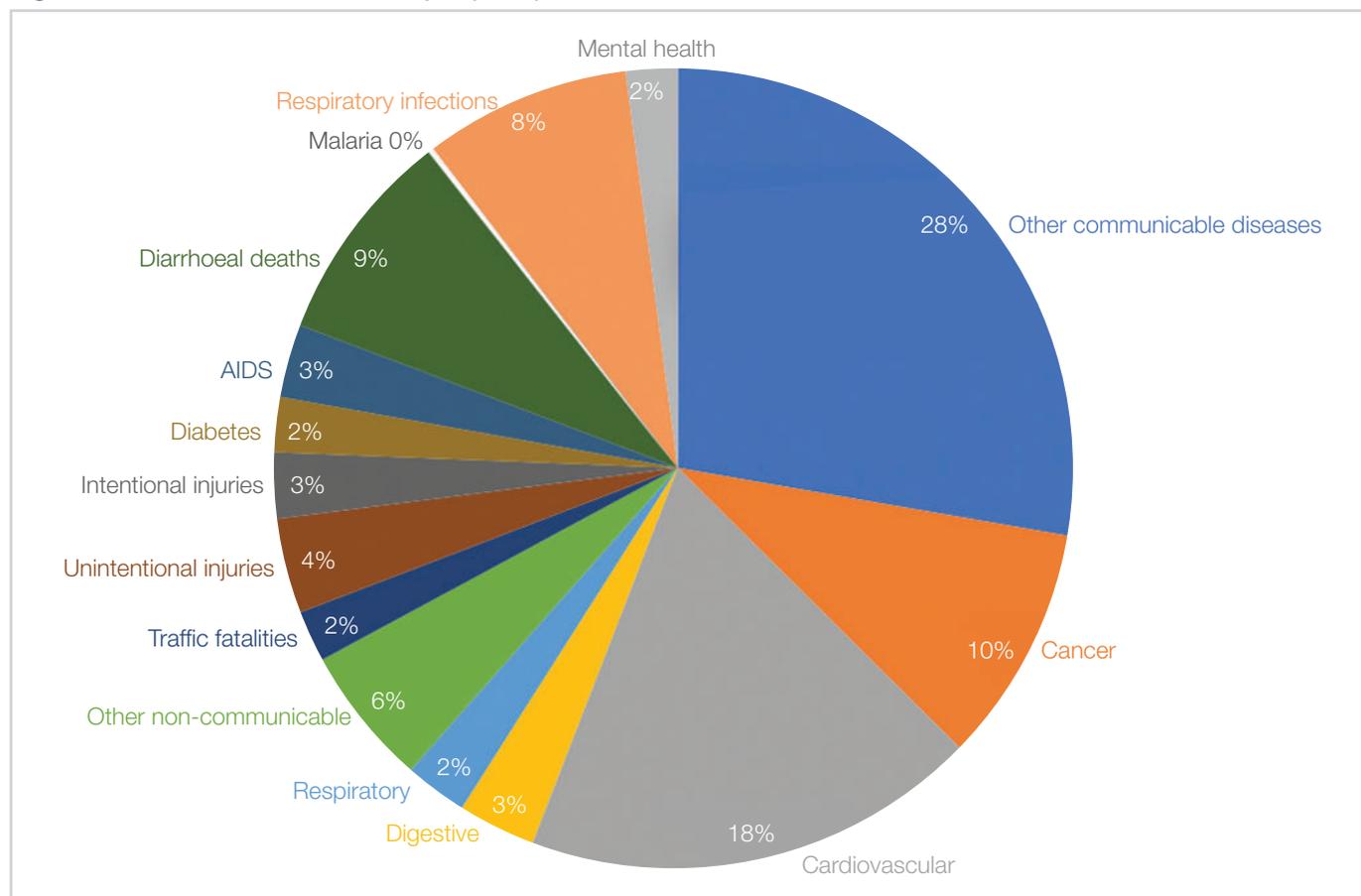
Despite a lack of access to basic infrastructure, Ethiopia is experiencing a more rapid epidemiological transition than other low-income African countries and death rates from non-communicable diseases will exceed those from communicable diseases several years earlier.

In 2016 Ethiopia ranked 146th in the world in life expectancy and 143rd in infant mortality

While communicable diseases are still the predominant cause of death in all low-income African countries, those causes of death are gradually being overtaken by non-communicable diseases that are inherently more expensive to diagnose, treat and manage than communicable diseases.⁵⁰

Non-communicable diseases also require a much stronger emphasis on preventive care, including access

Figure 4: Causes of death in Ethiopia (2016)⁵¹



Source: IFs version 7.36 using Institute for Health Metrics and Evaluation data

to basic infrastructure. On the Current Path, three of Ethiopia's five leading causes of death in 2040 will be non-communicable diseases, while 'other' communicable diseases (second) and unintentional injuries (fifth) account for the other two.⁵²

Basic infrastructure

Ethiopia's extremely low levels of access to basic infrastructure, in particular improved WASH facilities, is a major driver of undernutrition, stunting and high death rates from preventable communicable diseases like diarrhoea. In addition to having the lowest levels of improved sanitation access of any country globally, Ethiopia ranks 175th in the world in access to clean water, at roughly 65%. The country also ranks 156th in the world in access to electricity. In response the government has set itself the goal of reaching 100% access by 2025 using a combination of grid and off-grid solutions.

Although Ethiopia has also made impressive improvements in reducing undernutrition, an alarming

25% to 30% of its population still suffers from insufficient access to nutritious food.⁵³ Only India, China and Pakistan have more people living with undernutrition, according to the latest data. Because of Ethiopia's young demographic profile and cultural factors, many of the affected are children and women/mothers.

Only India, China and Pakistan have more people living with undernutrition, according to the latest data

While Ethiopia's rate of undernutrition is on par with other low-income African countries, its rate of childhood undernutrition is nearly six percentage points higher. Given that there are 41 million people under the age of 15 in Ethiopia, a six percentage point improvement in the country's rate of childhood undernutrition would represent a healthier future for about 2.5 million children.

This high child undernutrition rate inhibits attempts to reduce infant and under-five mortality, and can lead to a high rate of stunting in the general population.

Stunting is a condition resulting from sustained periods of undernutrition that constrains physical and cognitive development.⁵⁴ Stunting is also a permanent condition, meaning that stunted children can never achieve their full potential in school, and they grow into stunted adults. People who suffer from stunting also therefore face reduced economic productivity later in life, which can mean lower wages over their lifetimes.

Over time, a large stunted population can inhibit the long-term productivity of the country's workforce. Moreover, stunted individuals suffer from reduced reproductive capacity and increased risk of degenerative disease (i.e. diabetes), increasing the likelihood of experiencing negative health effects later in life.⁵⁵

Ethiopia's rate of stunting in the adult population is nearly 15 percentage points higher than the average for other low-income African countries. In 2015 Ethiopia was ranked third among low-income African countries in stunting, behind Somalia and Eritrea and just ahead of Niger and Chad.

By 2040 the gap between the stunting rate in Ethiopia and the average for other low-income African countries will remain at nine percentage points, meaning that stunting is expected to remain a drag on development across the forecast horizon.

Due to its large population and geographical spread, Ethiopia faces serious challenges with respect to expanding access to basic infrastructure. Despite the Current Path projection that the country will likely add piped water connections for close to 100 million people between 2019 and 2040, halving the number of people without an improved water source from 2019 levels, more than 15 million Ethiopians are projected to lack access to safe drinking water in 2040.

The figures are even starker for improved sanitation facilities. Despite adding about 80 million connections over the next 21 years, on the Current Path there are projected to be around 70 million people unnecessarily at risk of communicable diseases, malnutrition and stunting in 2040. Put another way, 10% of people in the country

will not have access to clean water in 2040, while nearly 50% will lack access to an improved sanitation facility.

Ethiopia is also forecast to increase access to electricity by more than 30 percentage points over the duration of the forecast. However in 2040 nearly 25% of the country is forecast to be without access to electricity. That achievement would fall significantly short of the 2025 target for universal access as set out in the National Electrification Program launched in March 2019.⁵⁶

Given the low base from which incomes are rising, it may be some time before those who are eventually connected to the grid are able to consistently afford to purchase that electricity.

A large population and geographical spread will complicate efforts to expand access to basic infrastructure

The opening up of the sector for private sector investment and the concomitant need for prices that reflect cost compounds this challenge. Moreover, poor rains in 2018 caused a drop in electricity production at the Gibe III hydroelectric dam, resulting in load shedding that lasted until July 2019.⁵⁷ An electricity shortage could derail the government's plans for continued economic growth and more rapid human development and could put further pressure on the Grand Ethiopian Renaissance Dam project.

While this project is likely to represent most of Ethiopia's electrical generation capacity once complete, there are other notable developments in the energy sector. The government is investing in a suite of renewable projects that includes about 300 MW of installed wind capacity, nearly 700 MW of planned wind projects and a series of solar projects initiated under the International Finance Corporation's Scaling Solar programme.⁵⁸

These projects represent an important step towards diversification of electricity generation, more diverse sources of financing and better assurance of supply, to say nothing of their environmental benefits.

However these projects are expensive, and so Ethiopia is simultaneously in danger of debt distress from a surge in public infrastructure spending, and some of the lowest levels of access to basic infrastructure on the globe.

On the one hand this reflects Ethiopia's immense size and challenging history. Because it is a large and growing country, improving access (as a proportion of the population) to basic infrastructure like electricity or safe water will be an uphill challenge. For example the country added new piped water connections for about 6.5 million people between 2005 and 2010, but the proportion of the population with access increased by only five percentage points.⁵⁹

On the other hand, the disconnect between infrastructure spending and levels of access to basic infrastructure reflects the priorities of the government, which has focused more on large projects meant to stimulate economic growth as a means of unlocking human development outcomes. Within IFs, infrastructure spending is broken down into 'basic' infrastructure and 'other' infrastructure – with other infrastructure representing ports, airports, railways etc.

For better or worse, most of Ethiopia's recent infrastructure spending has been on what IFs would consider 'other' infrastructure. This is not to say that the 'other' infrastructure that Ethiopia is investing in doesn't have benefits for human development – only that they are more difficult to quantify and formalise in a model.

The push on infrastructure and low-end manufacturing

Ethiopia's government has invested heavily in significant projects, like a railway from Addis Ababa to the port of Djibouti and a light rail in the capital. However the cornerstone of the country's push on infrastructure development is probably the Grand Ethiopian Renaissance Dam, the largest of several hydropower projects. When finished, the dam will produce about 6 400 MW of electricity at full capacity. By way of comparison, Power Africa calculates Ethiopia's total current installed generation capacity at 4 206 MW.⁶⁰

Originally scheduled for completion in 2018, in July 2018 Prime Minister Abiy Ahmed suggested that the project wouldn't be completed for a decade at the current rate of construction. In August 2018, a major implementer of the project – the Ethiopian Metals and Engineering Corporation (METEC), the former military-run company that was also involved in several other delayed projects – was publicly implicated in a massive scandal relating

to the installation of the dam's turbines. This also affected the other contractors. It was reportedly unable to account for nearly US\$100 million.⁶¹

Because of concerns from downstream riparian states, particularly Egypt, the technical details on the dam are shrouded in secrecy. A 2014 Massachusetts Institute of Technology (MIT) study of the dam provides some figures, as do a number of media articles, but without the release of an official study it is impossible to know for sure.⁶²

The governments of Ethiopia, Egypt and Sudan subsequently formed a tripartite commission, which among other priorities is responsible for developing a cost-benefit analysis – to be conducted by the French Artelia and BRL consultancies. However in November 2017 they unsuccessfully concluded their 17th meeting and haven't met to discuss the matter since.⁶³

From 2005 to 2010 Ethiopia added water connections for 6.5 million, but the ratio of people with access barely changed

Though the dam could meaningfully improve the lives of millions of Ethiopians, Egypt in particular is concerned that water levels in the Nile will be negatively affected while the dam is being filled, and that water will subsequently be diverted towards irrigation projects in Ethiopia or Sudan.⁶⁴

Once fully operational the dam will significantly increase annual electricity generation capacity in Ethiopia. The MIT report also speculates that Ethiopia's government can expect to earn as much as US\$1 billion per year on electricity exports, once all the projects are completed and on line.⁶⁵

The dam will, however, probably not be completed until 2022, and it could take anywhere between four and 15 years to fill. This period is also when environmental concerns – and tensions with Egypt – will be at their zenith because any water used to fill the dam will come at Egypt's expense.

In February 2019 Ethiopia's government hired the Chinese Gezhouba Group to complete the electro-mechanical work initially awarded to METEC. Becoming a net exporter of electricity by the early 2020s is a policy

goal incorporated into GTP II. Ethiopia's government has already started construction of transmission lines for export and signed purchase agreements with neighbouring countries, including a 500 MW deal with Kenya, a 60 MW deal with Djibouti and a 100 MW deal with Sudan. It also has tentative agreements with South Sudan, Tanzania, Rwanda and Yemen and is negotiating a contract with Uganda.⁶⁶

Provided this exported electricity is met with a simultaneous expansion of domestic electricity access – and, importantly, the means to afford it – the planned hydroelectric projects could be a tremendous boon for Ethiopia.

The government is financing through a variety of mechanisms. The initial contract was signed with the Italian construction firm Salini Impregilo for US\$4.8 billion, and the GoE has raised sizeable sums through public bond issues – though likely well shy of US\$4.8 billion.⁶⁷

In part due to cost overruns associated with delays, it remains unclear how rapidly the GoE will accumulate debt to fund GERD and other projects, and how much will come from other means.⁶⁸

GERD is not the only large-scale infrastructure project currently being undertaken. The recently completed 753 km Ethiopia-Djibouti railway line is the first modern electrified railway line in East Africa. The line was largely built parallel to an existing, narrow gauge line that had first opened in 1917, but which had fallen into disrepair. The new line took five years to complete at a cost of US\$4.5 billion and was officially opened on 1 January 2018.

The project is jointly owned by the governments of Ethiopia and Djibouti and was constructed by China Railway Group and China Civil Engineering Construction Corporation. Eventually the recent rapprochement between Ethiopia and Eritrea could also provide shorter access routes to the ports of Massawa and Assab, but both would require substantial investments before being able to play a meaningful role.⁶⁹

A third example is the investment being made in special economic zones, industrial parks and associated infrastructure. In an effort to improve on the poor logistics that constrain its ambition towards industrial development, Ethiopia's government embarked on

its Road Sector Development Program in 1997 that has placed particular emphasis on improved linkages between key cities and industrial parks to lower transportation costs, such as with the flagship Hawassa Industrial Park. This is one of up to 30 such parks being planned.⁷⁰ While there have been a number of success stories, the special economic zones are probably performing below their potential due to a lack of administrative autonomy given to these zones.⁷¹ In an effort to address the very low wages, particularly in the garment industry, the government is currently amending regulations in this regard.⁷²

In this context, the dearth of information surrounding debt from GERD complicates forecasting the extent to which infrastructure expenditure (and debt repayment) will crowd out other priorities, such as spending on health and education. The GoE has, however, announced its intention to allow greater private sector investment in these sectors and hence reduce pressure on the budget.

Partially in response to the fiscal burden created by these projects, early in 2019 the International Monetary Fund raised its rating of Ethiopia's risk of debt distress to high and eventually the US\$4 billion loan for the railway line is now to be repaid over 30 years instead of 10. Already, in August 2018, the World Bank agreed to provide US\$1 billion in direct budget support to Ethiopia. The Bank and other donors suspended budgetary help over the disputed election in 2005.⁷³

GERD is not the only large-scale project, the Ethiopia-Djibouti railway is the first modern electrified line in East Africa

The IMF has already cited a lack of clarity in the market for government securities, wildly fluctuating interest rates and the general opacity of the financial sector as factors complicating a more thorough analysis of the various infrastructure projects.⁷⁴

As a landlocked country, Ethiopia can expect significant benefits from investment in road and rail, though it must be careful to balance large-scale infrastructure projects against other investments that support human and economic development.

Governance

Within the first year of assuming office, Prime Minister Abiy announced his intention to hold a free and fair election in 2020, released thousands of political prisoners, invited previously exiled groups to return home, ended the 2016 state of emergency (a second followed, however) and announced his intention to pursue institutional reforms in the justice and security sectors. He also announced plans to gradually liberalise Ethiopia's state-owned enterprises, including key industries like telecoms.⁷⁵

Abiy also took the long overdue step of normalising relations with Eritrea. The two countries fought a bloody border war between 1998 and 2000 and there have been several subsequent skirmishes.⁷⁶ Phone calls and flights have been restored, diplomatic relations have been rekindled and there is a tentative agreement to allow landlocked Ethiopia access to Eritrea's port facilities.⁷⁷

Progress made in recent months has been promising, but the road ahead will inevitably be long and difficult. Ethiopia remains one of the least democratic countries in Africa (43rd out of 54 countries), with some of the lowest levels of civil and political freedom (47th in Africa), according to the Polity IV project and Freedom House, respectively. These scores are likely to be revised should elections in 2020 occur and proceed along the lines promised by Abiy.

Given Ethiopia's historical propensity for violence, liberalisation and reform are likely to be accompanied by ongoing turbulence. The country is also entering a period where the drivers of instability will not necessarily resemble those of the past.

Ethiopia will face a sizeable youth bulge for the foreseeable future, which poses risks to social and political stability, but that doesn't encapsulate the scope of political risk faced in the country. Along with including a forecast of one of the seminal metrics for projecting instability, from the Political Instability Task Force, IFs has conceptualised the probability of the onset of conflict into five categories, or types, of risk.⁷⁸

States can be at risk from demographic pressure, low levels of development, poor governance structures, structural imbalances across these dimensions, or 'horizontal inequalities' (see Table 2).⁷⁹

Table 2: Structural drivers of instability in IFs

Demographics	Large population, high rates of infant mortality, rapid population growth, a large youth bulge and high rates of migration
Development	Low GDP per capita and GDP per capita growth rate, low life expectancy
Governance	Regime type
Structural imbalances	Regime type vs GDP per capita, life expectancy vs GDP per capita and youth bulge vs regime type
Horizontal inequalities	Government policies that advantage particular ethnic groups, a large population and religious heterogeneity

Source: Julia Bello-Schünemann and Jonathan Moyer (2018)

These drivers are 'multi-dimensional, distinct and do not necessarily accumulate'.⁸⁰ In other words, these are not aggregate measures intended to classify or rank countries on a single scale. Rather the intent is to illustrate the different ways that countries experience social and political pressure across various dimensions that wax and wane over time.

It is possible for a state to be vulnerable in a single dimension, across several dimensions sporadically, or across all of them simultaneously for extended periods.⁸¹ Vulnerability can also vary starkly across the country, as is the case in Ethiopia.

There is a tentative agreement to allow landlocked Ethiopia access to Eritrea's port facilities

Ethiopia has historically been at high risk of instability from demographic pressures. While it remains at elevated risk from demographics, relative to other low-income African countries, they both decline in the forecast and are about equal in the year 2040.

The levels of risk caused by underdevelopment have fluctuated fairly dramatically over time, for both Ethiopia and the group of low-income countries. Both groups

were especially volatile during the 1990s, but have become more stable since – particularly in Ethiopia. The risk from underdevelopment in Ethiopia declines throughout the forecast in most low-income countries, though Ethiopia is projected to remain less vulnerable than the average low-income African country.

The same is not true of governance, albeit with a fairly major caveat. Before the recent reforms Ethiopia was significantly more at risk from its governance structures than from other drivers, and it is still unclear how Abiy's initial reforms will affect those risks.

That said, given that Ethiopia ranked well towards the bottom of Polity IV's scale before the recent raft of reforms, it can expect to see some improvement along this dimension of fragility should substantive free and fair elections occur in 2020.

Although Ethiopia is more vulnerable to demographic pressures than other low-income African countries, Ethiopia's regime type actually presented a greater risk to the country – with the impact of recent changes still to be captured in the data.

To categorise regime type, IFs uses data from the Polity IV project that classifies governments according to their institutional characteristics. These rankings span a spectrum running from full autocracies on one end, through mixed democratic/authoritarian systems (or anocracies) in the middle, to fully institutionalised democracies on the opposite end. Mixed regimes or anocracies have been found to be inherently less stable than either liberal democracies or full autocracies and are thus more prone to experience internal conflict and abrupt regime changes.⁸²

Along this measure of vulnerability, the changes under Abiy may help to defuse one of the most significant challenges to Ethiopia's future development identified in the 2017 ISS report but may unleash others. Should that occur, demographic pressure emerges as the most significant risk, but currently the risk of instability occurring based on regime type is nearly four times larger than for other low-income countries in Africa.

Ethiopia remains at considerable risk of political instability across various dimensions, not all of which are wholly captured by these metrics. Perhaps the most important is the high degree of ethnic divisions and factionalism in

the country exacerbated by the experiment with ethnic federalism that started under Meles Zenawi.⁸³

The result is an uneasy compromise where Ethiopia is explicitly divided into ethnic regions, with each state having the nominal right to secede but within the reality of a centralised governance practice. This leaves the country highly vulnerable.

A major question of the Abiy administration will be how it handles any potential attempts at secession, for it seems inevitable that local politicians will attempt to exploit these divisions. A well-organised regional independence movement could undermine the politically liberal tone he has set, as well as derail his attempts to maintain stability and rapid economic growth. Paradoxically, as the country liberalises, it may be at increased risk because it is moving into a solidly anocratic space.

As a result, as Ethiopia opens up and sheds some of its more authoritarian characteristics, it is likely to actually become less stable – at least in the short term. In addition to rising expectations, previously marginalised groups will naturally look for ways to obtain and gain influence.

Paradoxically, as the country liberalises, it may be at increased risk because it is moving into a solidly anocratic space

Ethiopia is therefore probably entering a period of innate instability that must be managed extremely carefully if the country hopes to shepherd a smooth transition into becoming a more inclusive state – whatever that looks like institutionally.

Beyond the particular dangers of political reform in Ethiopia, there is also empirical literature supporting the idea that factionalised anocratic states are, in general, more dangerous. A 2010 study by Jack Goldstone et al. found that partial democracies characterised by a high degree of factionalism were about 30 times as likely to experience a destabilising event as either full democracies or autocracies.⁸⁴

In that study factionalism was defined as 'parochial or ethnic-based political factions that regularly compete for political influence in order to promote particular agendas and favor group members to the detriment of common, secular, or cross-cutting agendas'.⁸⁵

This definition bears more than a passing resemblance to the recent period of Tigrayan domination of Ethiopia's political system. If Ethiopia's new government maintained its current momentum towards inclusion it would succeed in undercutting a major source of instability (governance).

Those changes would also positively impact on the country's structural imbalances, leaving demographics and development as the two primary drivers of instability moving forward. Though significant, these drivers of instability can largely be addressed by continued, yet more inclusive, economic growth, and by the continued rollout of better health services.

Alternative scenarios

Ethiopia is at a crossroads. Down one road lie uncertainty and change along with a series of difficult decisions and competing priorities. There will be new challenges, new critics and no shortage of second guessing. Although this road is fraught with many problems and will not be smooth, a first positive scenario, 'Abiynomics', demonstrates what may be possible in the years to come if Ethiopia's government successfully manages its governance transitions and pursues its intended development pathway.

A second, more pessimistic scenario – 'Dark Days' – demonstrates the development impact if the country reverts to the type of governance and instability that characterised it for much of the 20th century. While the future that Ethiopia is likely to experience may fall somewhere between these two extremes (i.e. closer to the Current Path forecast), they are meant to highlight the breadth of possible outcomes facing the country over the next 21 years.

Abiynomics

In the Abiynomics scenario, Ethiopia makes a series of targeted investments in key sectors already identified by the government, as well as the findings of this research. This is a future where the country continues to improve agricultural yields and the ability of its citizens to access healthy calories, leading to significant reductions in undernutrition.

The government also makes a broader push on basic infrastructure, to improve access to other services, like

water and sanitation, in addition to electricity and better roads and rail.

Most importantly, this is underpinned by a broad improvement in the quality and efficacy of governance, an improvement in regulatory quality and a reduction in corruption. Not only does the political space gradually become more inclusive, including a freer press, but there is also a gradual liberalisation of key sectors.

The government moves towards liberalising its currency and, ideally, eventually floating the Birr against a basket of foreign currencies, though this is likely to take time. The government also begins to implement structural land reform and takes steps to move towards individual land tenure. These reforms also instil confidence in both foreign and domestic investors, who take these as signals that the government is serious about reform and meaningful progress.

If the Abiynomics scenario were enacted, Ethiopia could expect a significant boost to human and economic development

In this scenario, the government continues to roll out family-planning efforts, leading to further reductions in the total fertility rate, maternal mortality rate and in the number of deaths in children under the age of five. Crucially, Ethiopia's government also makes an aggressive and gender-focused push to alleviate the bottleneck in completion of primary education.

This includes efforts to improve overall enrolment and completion in the short run, but also a longer-term push to equalise education outcomes across gendered lines over time – along with a sustained push to improve the quality of education. This is accompanied by a household transfers programme, meant to alleviate deep-seated poverty. The additional transfer (above the Current Path) is at US\$1.165 billion by 2030 and US\$6.24 billion by 2040.⁸⁶

If Abiynomics were implemented along the lines of this scenario, the country could expect a truly significant boost to human and economic development outcomes by 2040. In this scenario, there are more than eight million fewer Ethiopians surviving on less than US\$1.90 per day in 2040 than in the Current Path forecast. The average Ethiopian

can also expect to live nearly a year longer, and have about US\$959 additional dollars in his or her pocket in 2040, relative to the Current Path.

Despite a substantive push on electricity access, Ethiopia doesn't, however, achieve its goal to achieve universal electricity access by 2025 in line with the National Electrification Program 2.0 that was launched on 27 March 2019. In Abiynomics, Ethiopia gets to 68% access by 2025, and to full access shortly after 2035.

In Abiynomics, Ethiopia's GDP per capita is about US\$371 higher than the peer group, but US\$2 420 higher than in other low-income African countries

The Ethiopian economy should be about US\$91.2 billion larger in 2040 than in the Current Path forecast and with 650 000 fewer children suffering from undernutrition. In Abiynomics Ethiopia's GDP per capita is about US\$371 higher than the peer group, but US\$2 420 higher than the average for other low-income Africa countries. In short, Abiynomics it is a significantly brighter future.

Dark Days

In the Dark Days scenario, things start to unravel in the wake of problematic elections in 2020 or a decision to postpone or cancel them. Ethiopia experiences an abrupt period of political instability from 2023 to 2025. The high degree of ethnic factionalism in the country is a key source of vulnerability, but as the structural drivers of instability section shows, Ethiopia is at risk across various dimensions.

This period of instability is accompanied by increased military spending, which draws money from other important areas of government spending, as well as increased repression from police and security forces. There is also a rollback of civil liberties, closure of the political space, and the rapprochement with countries such as Eritrea, Egypt and Somalis stalls. These developments are accompanied by a general deterioration in the quality of governance and the pace of the expansion of basic services slows down.

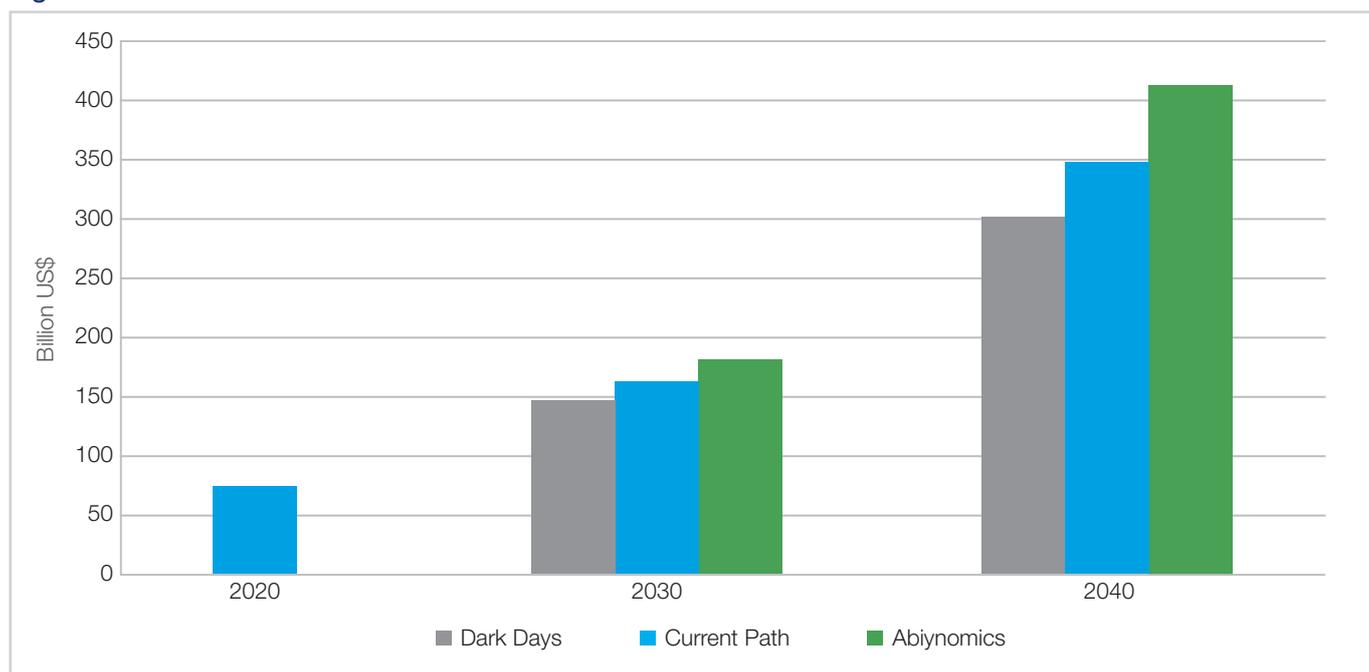
The Grand Ethiopian Renaissance Dam is completed only in 2030 and begins producing electricity in 2035, which further impedes the rollout of electricity, and there is a sustained period of decline in productivity in the agricultural sector leading to an accompanying difficulty in accessing calories. Other key infrastructure such as the continued investment in industrial parks is also delayed, and the government continues to accumulate foreign debt.

The cumulative impact of this scenario is a much slower progression in the quality of life for the average Ethiopian than in the Current Path forecast. There are nearly five million more people living in extreme poverty relative to the Current Path forecast and the economy is US\$49.8 billion smaller in



IN THE ABIYNOMICS SCENARIO, THERE IS A LONG-TERM PUSH TO EQUALISE EDUCATION OUTCOMES BETWEEN MEN AND WOMEN

Figure 5: GDP in the three scenarios



Source: IFs version 7.36 initialised from International Monetary Fund data

2040 than in the Current Path forecast. The contrast with the Current Path is stark and significantly worse when compared to the Abiynomics scenario.

Comparison

To begin with, the size of the Ethiopian economy in 2040 is projected to be more than US\$141 billion larger in the Abiynomics scenario than in the Dark Days scenario, as shown in Figure 5. The difference between the two scenarios is almost double the size of the entire Ethiopian economy in 2017.

While a larger economic pie is desirable, there are also meaningful differences for millions of Ethiopians between these two scenarios. As a result of improved food security and better access to WASH facilities, there are about 1.3 million fewer children suffering from undernutrition in the country. Moreover, the country is significantly less reliant on imported food than in the Current Path forecast, as shown in Figure 6. In the Dark Days scenario the country is importing well over 35% of its total crop demand in 2040, against almost 9% in the Abiynomics scenario.

In Abiynomics the average Ethiopian is also projected to have about US\$960 additional dollars to spend in 2040 compared to the Current Path (or US\$1 455 compared to

Dark Days) and the difference in the numbers of people with access to basic services runs well into the millions. Ethiopia achieves universal access to electricity well before 2040 in the Abiynomics scenario and to clean water in around 2040.

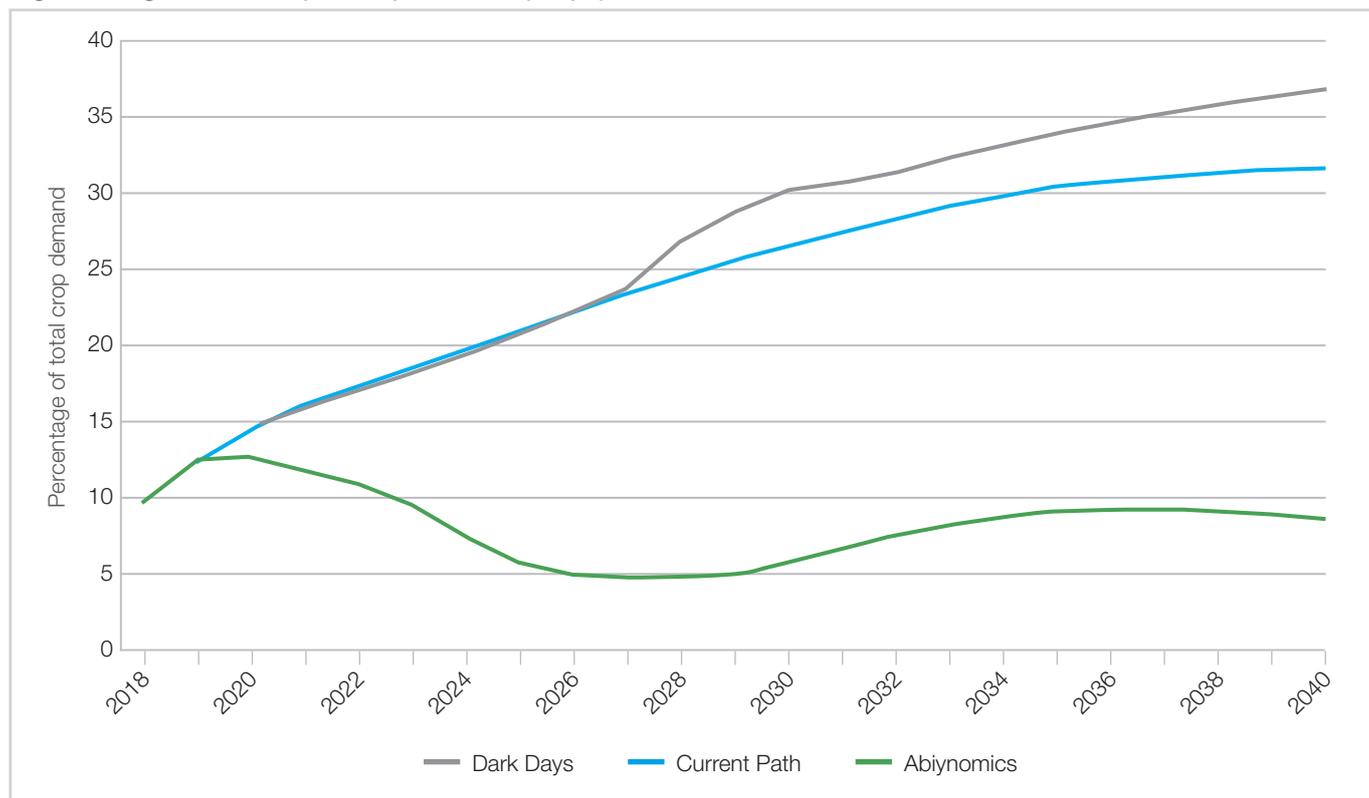
In Dark Days the percentages would be at 84% (water) and 58% (electricity) in 2040. Perhaps most importantly, in the Abiynomics scenario nearly 13.4 million fewer people live in extreme poverty in 2040 than in the Dark Days scenario, as shown in Figure 7.

Ethiopia's eventual trajectory will probably fall somewhere between the extremes shown in the figures above, but the breadth of possibilities underscores the magnitude of the decisions faced by the government at this critical juncture. The fate of billions of dollars of investment and, in many ways, the future of the region hangs in the balance – to say nothing of the lives of tens of millions of people. The road ahead remains fraught with obstacles.

Conclusion

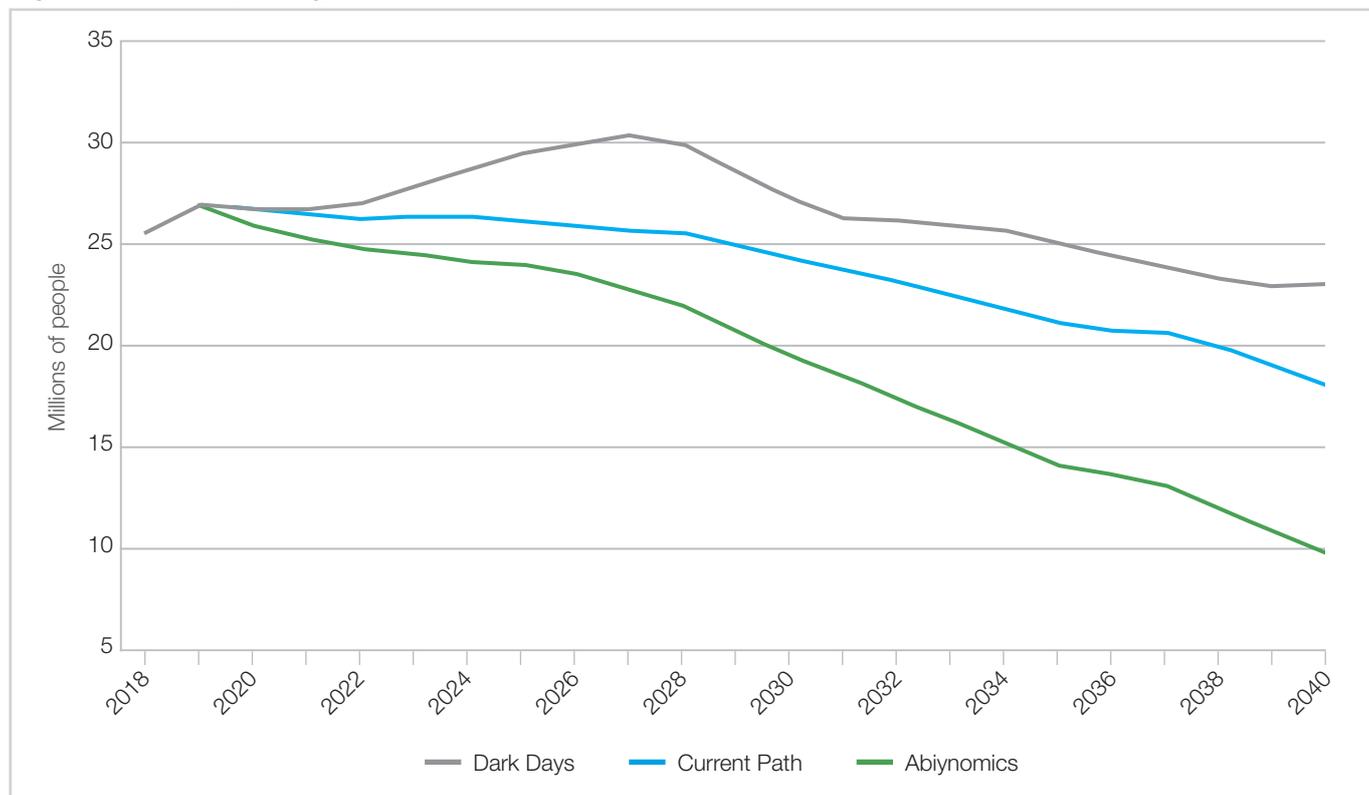
The analysis presented in this report places an emphasis on the long-term structural challenges that would enable Ethiopia to continue on the rapid progress it has made in the past 25 years. Our analysis indicated that poor levels of human development would increasingly

Figure 6: Agricultural import dependence (crops) in the three scenarios



Source: IFs version 7.36 initialised from Food and Agriculture Organization data

Figure 7: Extreme poverty in the three scenarios



Source: IFs version 7.36 initialised from World Bank data

act as a constraint on Ethiopia's stated goal towards industrialisation. Much has been done in this domain, but more is needed.

In particular, greater emphasis should be placed on overcoming constraints in the education system and the provision of basic infrastructure such as water, sanitation and electricity if the country wishes to build the human capital that would allow it to meaningfully pursue low-level industrialisation and export-oriented economic growth policies.

Over the past two decades, Ethiopia has done an impressive job of producing constant and robust economic growth, but the spillovers to human development have been uneven, with insufficient benefits accruing to the poorest segments of society.

In addition, progress hinges on the ability of the government to successfully continue making both the political and economic space more inclusive, such as through expanding opportunities for the private sector including a less rigid economy (such as rigid labour policies and limited competition).

This report recommends that Ethiopia's government focus on four key priorities to achieve the productivity transition that it aspires to, and the forecast highlighted in Abiynomics:

- **Ensure food security:** The Government of Ethiopia has made impressive improvements in agricultural productivity in recent years (including investments in expanding irrigation in the lowland regions), but given the centrality of agriculture to everyday life in the country, it must remain a high priority. Climate change threatens to complicate and undercut many aspects of development on smallholder, rainfed agriculture – the backbone of Ethiopia's economy. If the country is to capitalise on its human potential, then Ethiopia must continue to invest in more productive and more resilient seed varieties, irrigation, fertilisers and other inputs. Above all, the country needs to move forward in finding a way in which to secure ownership and transferability of land and property rights, as well as to liberalise the financial sector and ease access to credit.
- **Transform and invest in education:** Ethiopia's education system faces enormous challenges at nearly every stage. Low attainment rates are fuelled

by poor quality and high pupil-to-teacher ratios and cultural practices such as child marriage. Improving this will be a generational challenge. Without improving the quality of education Ethiopia won't be able to build the human capital required to industrialise. Better and more education is a prerequisite and appears to hinge on changes to language policies (a controversial issue hotly debated in Ethiopia), minimum teacher educational requirements and the introduction of modern facilities and practices.

- **Promote gender equality:** Cutting across all of the recommendations is the need to equalise opportunities, particularly for females. The country's struggles with ethnic nationalism have been extensively documented, here and elsewhere, but that focus should not obscure the systemic discrimination against women and girls. Just enabling women to stay in school at least as long as men would produce significant returns to human development. There would be broad improvements in the role of women in agriculture, commerce and civic engagement, to say nothing of helping to promote a culture of fairness, understanding and social justice.
- **Governance reforms:** Ethiopia is at risk from its fragile institutions. Paradoxically, as the country opens up and sheds some of its more authoritarian characteristics, it is likely to actually become less stable in the short term. None is more pressing than finding a way forward in terms of ethnic inclusion and halting a potential downward spiral towards ethnic nationalism and fragmentation. While institutional reform is key, it has to happen in a steady and measured way, which is to say genuinely. Moreover, on those issues that the Government of Ethiopia is not prepared to act on today, it ought to release public plans for how it intends to deal with them in future.

The Abiy administration has a rare opportunity to redefine a ruling party that has presided over a long history of exemplary economic growth and rising incomes. An increasingly prosperous and progressively inclusive Ethiopia could serve as an example to the rest of Africa that a country's past need not determine its future and that new times call for new ways of thinking. Harnessing these opportunities will require sacrifices and tough choices but the rewards are unimaginable compared to just a few decades ago.

Annex 1: Current Path adjustments

Two sets of adjustments were made that impact on the IFs Current Path forecast for Ethiopia. The first consists of additions or amendments to the historical data within IFs by means of an Ethiopia Project Data file. The second comprises a set of Current Path scenario adjustments designed to calibrate the forecast for Ethiopia.

The most significant change to the IFs Base Case comes from adjustments related to the completion of the Grand Ethiopian Renaissance Dam, although this remains surrounded by uncertainty.

This adjustment has the dam coming online in 2026, but that is speculative. The dam is scheduled to produce about 6 GW at full capacity.⁸⁷ Due to the nature of hydroelectric production and the lack of a publicly available planning document, the intervention has been calibrated to produce a more conservative 4.5 GW per annum.

The government of Ethiopia has also been expanding access to electricity fairly rapidly, from about 27% in 2014 according to the World Bank, to about 40% today according to Power Africa. The IFs estimate for

2019 is 36%, so an additional year of data has been included (2015) and the forecast has been adjusted slightly upwards. There have also been slight downward adjustments to water and sanitation access, along with the percentage of paved roads.

We have included an estimate of the average years of education in the adult population over the age of 15 from the UNDP that now reports it at about 2.7 years (1.6 for females and 3.8 for males).⁸⁸

We also included a more recent value for fertility rates as well as an adjustment in inward migration (based on the 2016 Demographic and Health Survey), both of which have an impact on population size over time.⁸⁹

Finally, we included more recent values for total road network density and traffic fatalities to account for the massive public-led infrastructure in the past five to 10 years.⁹⁰ There is more recent data on land use included, as well as an intervention on the amount of land available for crop use, to reflect the limited amount of viable agricultural land remaining in the country.⁹¹ There is also an increase in the amount of irrigated land to reflect the new priorities of the agricultural sector.

Project Data adjustments for Current Path

Series	Definition	Years changed	Most recent value
EdYearsAge15Female	Average years of education in the adult population over the age of 15	2015	1.6 years
EdYearsAge15Male	Average years of education in the adult population over the age of 15	2015	3.8 years
EdYearsAge15Total	Average years of education in the adult population over the age of 15	2015	2.7 years
HealthTrafficDeaths	Deaths from traffic accidents	2013	23 923 people
EnElecAccess%National	Proportion of the country with access to electricity	2015	33.4%
LandCrop	Amount of land devoted to crops	2013	16.259 Ha
LandForest	Amount of land devoted to forestry	2013	12.49 Ha
LandGrazing	Amount of land devoted to animal grazing	2013	20 Ha
LandOther	Amount of 'other' or marginal land	2013	51.32 Ha
LandTotal	Total amount of land	2013	100 Ha
RoadsTotalNetwork	Total length of road network	2013	60 466 km
TFRMedUNPD	Total fertility rate, UNPD medium estimate	2016	4.6 births

Current Path scenario changes in IFs

Series	Definition	Adjustment in IFs	2015 value	2040 value	Justification
landirareaequipm	Land area equipped for irrigation	Interpolate to 1.15 over 25 years	858.3 (Ha)	1 190 (Ha)	Since cropland is shrinking, focus has shifted to productivity
migrater	Migration rate (inward)	From 0.1 in 2015 to -0.12 in 2024	90 000 (inward)	20 000 (outward)	Changes net migration according to recent estimates (neutral by about 2023)
ldcropm	Crop land multiplier	In 2015 change/repeat at 0.4 for eight years then interpolate to 0.15 over 17 years	16.26 (Ha)	19.49 (Ha)	Based on workshop feedback – limited agricultural land remaining
econfreem	Economic Freedom – Fraser Institute	In 2018 interpolate to 1.2 over five years	5.6 (out of 10)	7.2	Changed to reflect more inclusive economic space after 2018 reforms
freedomm	Political freedom – Freedom House	In 2018 interpolate to 1.55 over five years	3 (out of 14)	5.8	Changed to reflect more inclusive political space after 2018 reforms
infraelecgenccapm	Electricity generation capacity per person	Interpolate to 1.3825 over three years starting in 2024 then change/repeat to 1 in 2028	2.9 GW	14 GW	Increases electricity production in line with estimates for Grand Ethiopian Renaissance Dam
infraelecaccm (Total)	Electricity access multiplier	Change/repeat to 1.35 in 2015 for five years, then interpolate to 1.1 over 21 years	41% (2018)	75%	Increases electricity access to come in line with Power Africa estimate
infraroadpavedpcntm	Road percentage paved	Interpolate to 0.9 over 25 years	14%	47%	Adjusted slightly to maintain continuity with historical trends
enpm (Hydro)	Energy production	In 2024, interpolate to 1.65 over three years then interpolate to 0.8 over 13 years	0.04 BBOE	0.26 BBOE	Increases energy production in line with estimates for Grand Ethiopian Renaissance Dam
Enpm (OtherRenew)	Energy production	In 2026 interpolate to 5 over five years	0.0021 BBOE	0.057	Included to calibrate total energy production
watsafem	Percentage of people with access to safe water	Interpolate to 0.9 over 10 years starting in 2030	63%	92%	Adjusted slightly to maintain continuity with historical trends
sanitationm	Percentage of people with access to improved sanitation	Interpolate to 0.9 over 10 years starting in 2030	7%	53%	Adjusted slightly to maintain continuity with historical trends
prodtf	Production of energy, minimum reserve ratio	Hold at 0	NA	NA	Included for calibration

Annex 2: Scenario interventions

Abiynomics scenario interventions in IFs

All interventions are from 2020, interpolate to 2024 and then are maintained at that level unless indicated otherwise.

Variable	Parameter	Adjustment in IFs	2020 value	2024 value	Benchmark
Yields	ylm	Interpolate from 1 to 1.35	2.9 MMT	4.1 MMT	Between 2005 and 2010 Malawi, Mozambique and Sierra Leone increased average yields by more than 50%
Calories per capita	clpcm	Interpolate from 1 to 1.1	2 310	2 640	Between 2009 and 2013 Angola increased the number of available calories per person by about 10%
Primary survival	edprisurm (Total)	Interpolate from 1 to 1.2	53%	70%	Between 2005 and 2010 Mozambique and Sierra Leone both increased primary completion by more than 30%
Lower secondary transition	edseclowrtranm (Total)	Interpolate from 1 to 1.2	49%	62%	Between 2009 and 2014 Thailand increased secondary enrolment by more than 30%, while Cameroon increased by more than 40%
Contraceptive use	contrusm	Interpolate from 1 to 1.2	44%	58%	Kenya's total fertility rate declined from 4.8 in 2005 to 4.3 in 2010
Child mortality	hlmortcdchldm (Total)	Interpolate from 1 to 0.925	10.6	8.1	No historical data for this series
MMR	hlmortcdadltm (Female)	Interpolate from 1 to 0.925	329	279	No historical data for this series but Ethiopia still above global average in 2040
Water	watsafem	Interpolate from 1 to 1.1 over five years, hold at 1.1 for 10 years then interpolate to 1 over five years	69%	74%	Ethiopia increased access by about 25% between 2010 and 2015, while Mozambique increased by 24%
Sanitation	sanitationm	Interpolate from 1 to 1.25 over five years, hold at 1.25 for five years, interpolate to 1.016 over eight years, interpolate to 0.999 over three years, then interpolate to 1 over two years and hold	12%	22%	Between 2005 and 2010 India increased access to improved sanitation facilities by nearly 10 percentage points, while Cambodia increased by about 12 percentage points

Variable	Parameter	Adjustment in IFs	2020 value	2024 value	Benchmark
Electricity	infraelecaccm (Total)	Interpolate from 1.35 to 1.55 (see Current Path)	46%	65%	Between 2000 and 2018 Kenya quadrupled electricity access, from 15% to about 60%
Effectiveness	goveffectm	Interpolate from 1 to 1.1	2	254	Between 2009 and 2014 Ukraine increased its score by about 25%, while Kenya improved by about 15%
Regulatory quality	govregqualm	Interpolate from 1 to 1.1	1.6	2.2	Between 2009 and 2014 Malaysia and Laos both improved by about 15%
Corruption	govcorruptm	Interpolate from 1 to 1.1	2.8	3.5	Between 2006 and 2011 Ghana increased its score by more than 15%
Primary enrolment	edpriintnm (Female)	Interpolate from 1 to 1.4 over 21 years	102%	118%	Between 2008 and 2013 Chad increased female primary enrolment by about 35%, while Niger achieved more than 30%
Primary survival	edprisurm (Female)	Interpolate from 1 to 1.4 over 21 years	57%	75%	Between 2008 and 2013 Sierra Leone and Mozambique increased female primary completion by more than 30%
Lower secondary transition	edseclowrtranm (Female)	Interpolate from 1 to 1.4 over 21 years	49%	61%	Between 2008 and 2013, 10 African countries achieved increases of 30% or more
Lower secondary completion	edseclowrtgram (Female)	Interpolate from 1 to 1.2 over 10 years	35%	40%	Between 2008 and 2014 Senegal achieved an increase of eight percentage points, from 76% to 82%
GEM	gemm	Interpolate from 1 to 1.1	0.47	0.54	Between 2004 and 2008 Ecuador improved from 0.49 to 0.6 and Chile improved from 0.46 to 0.52
Quality multiplier – primary	edqualpriallm	Interpolate from 1 to 1.1	20	21	Chad improved from 26 to 30 between 1995 and 2005
Quality multiplier – secondary	edqualsecallm	Interpolate from 1 to 1.1	31	32	Brazil improved from 41 to 43 between 2005 and 2010
Foreign direct investment	xfdistockm	Interpolate from 1 to 1.075	US\$28 billion	US\$44 billion	Represents an influx of investment in response to the liberalisation of the economy
Investment	invm	Interpolate from 1 to 1.05	2.5% GDP	3.4% GDP	Represents an influx of investment in response to the liberalisation of the economy
Household transfers	govhhtnrwelm (Unskilled)	Interpolate from 1 to 1.05	US\$670 million	US\$2.6 billion	Represents the rollout of a cash grants programme by the Government of Ethiopia

Dark Days scenario interventions in IFs

Variable	Parameter	Adjustment in IFs
Yields	ylm	Interpolate from 1 to 0.85 over seven years then interpolate to 1 over three years
Calories per capita	clpcm	Interpolate from 1 to 0.85 over seven years then interpolate to 1 over three years
Contraception use	contrusm	Interpolate from 1 to 0.9 over five years
Government spending	gdsm (Military)	Change/repeat to 5 for three years
Economic freedom	econfreem	Change/repeat to 0.9 for three years then interpolate to 1 over 15 years
Political freedom	freedomm	Change/repeat to 0.9 for three years then interpolate to 1 over 15 years
Government effectiveness	goveffectm	Interpolate from 1 to 0.85 over seven years
Corruption	govcorruptm	Interpolate from 1 to 0.9 over seven years
Electricity access (total)	infraelecaccm	Interpolate from 1.35 to 0.9 over 21 years
Water access (Piped)	watsafem	Interpolate from 1 to 0.9 over five years, hold at 0.9 until 2033 then interpolate to 0.825 over seven years
Sanitation access (Improved)	sanitationm	Interpolate from 1 to 0.9 over five years, hold at 0.9 until 2033 then interpolate to 0.825 over seven years
Societal violence multiplier	svmulm (Conflict and terror)	Change/repeat to 2 for three years
Societal violence multiplier	svmulm (Police conflict)	Change/repeat to 7 for three years
Societal violence to health switch	svtohlsw	Set to 1
Governance risk	govriskm	Change/repeat to 1.1 for 2020, then change/repeat to 1.9 for three years then hold at 1.1 until 2040
State failure (internal war)	sfintlwaradd	Change/repeat to 1 for three years

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