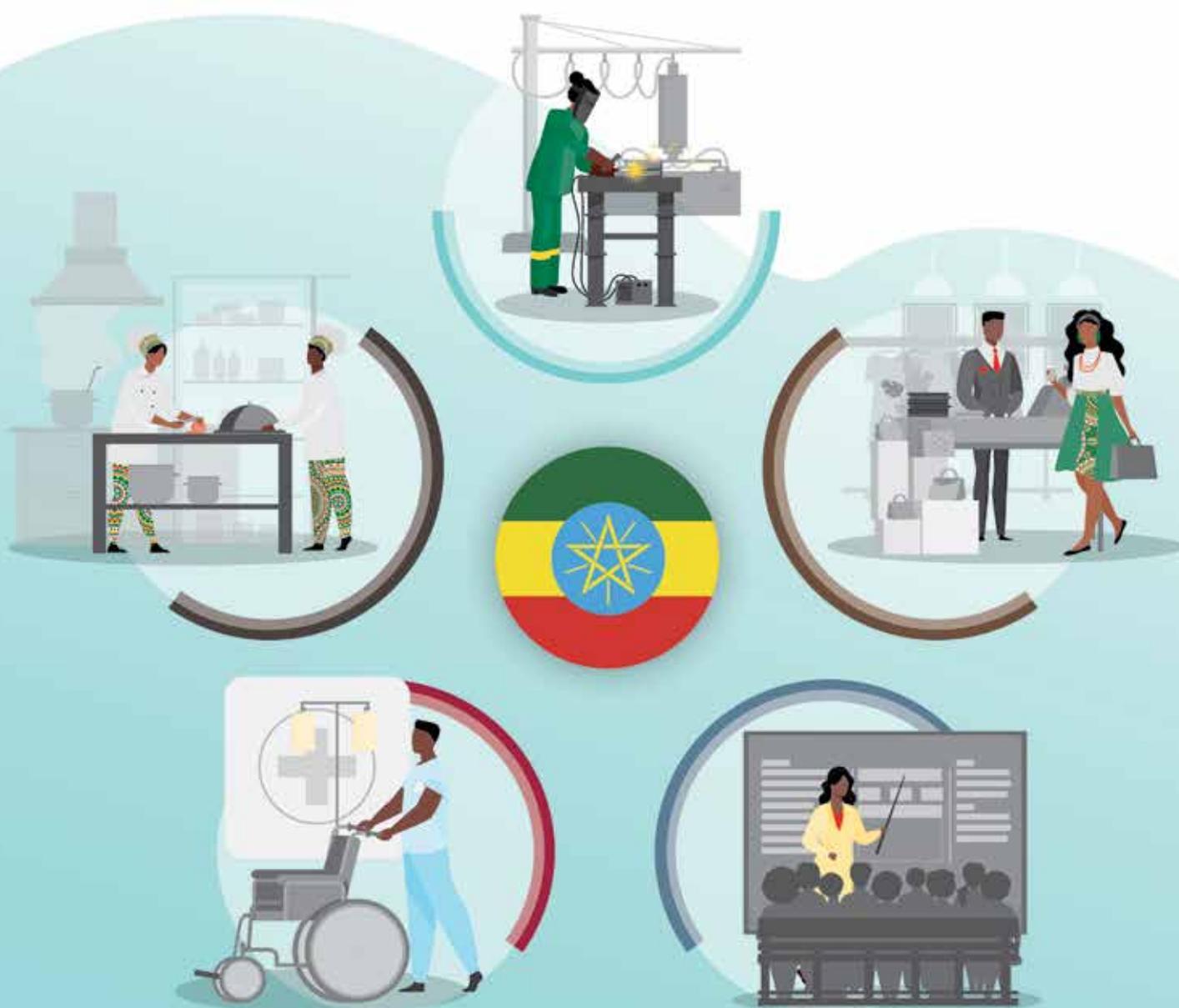


LABOUR MARKET AND SECTOR ANALYSIS:

Baseline Study for Cameroon, Ethiopia, Ghana,
Nigeria, Togo, and Tunisia

REPORT: ETHIOPIA



Acknowledgements

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1 Introduction

The Skills Initiative for Africa (SIFA) is an initiative of the African Union Commission (AUC) and the African Union Development Agency (AUDA-NEPAD) supported by the German Government and the European Union. SIFA promotes occupation prospects of young Africans through the support of innovative skills development programmes and close cooperation with the private sector as an integral key stakeholder in the creation of jobs.

In line with this, GIZ has tasked DNA Economics to come up with a methodology to prioritize various sub-sectors across 8 African countries¹. This is done to assist SIFA, which require information regarding the direction and extent of their investment and financing in prioritized sector, with a specific focus on technical and vocational training for students, across all member states of the African Union. Moreover, it informs decision making on future skills development initiatives of the respective AU Member states.

This research started prior to COVID-19. Of course, COVID-19 is likely to have a large impact on most, if not all, of the economies across the globe. Accordingly, this pre-COVID 19 methodology was adapted to ensure that a COVID-scenario analysis was completed, looking at the potential recessionary impact of the pandemic across the various sub-sectors within the countries of choice.

Given this backdrop, the current report looks to explain the methodology followed by DNA Economics in order to obtain reasonable forecasts for sub-sectoral employment and GDP trends with very tight data constraints. This methodology, although quite naïve in some sense, provides an indication of which sub-sectors will be worst affected across countries, without any up-to-date macroeconomic data.

As such, the report first sets out a methodology brief, before providing some context to the Ethiopian economy. This is followed by a forecast analysis, and concludes with a ranking of every sub-sector based on the indicators set out in the methodology.

¹Cameroon, Ethiopia, Ghana, Kenya, Nigeria, South Africa, Togo, and Tunisia

2 Methodology brief

As best as possible, this methodology aims to answer the following question:

“Which 3 sub-sectors would benefit most from a skills development intervention aimed at improving labour market prospects for those entering those sub-sectors?”

When defining which sub-sectors would benefit the most, we focused on a handful of indicators:

Table 1: Indicators Used to Analyse Sectoral Labour Demand

Statistical Indicators

Historical employment and real GDP growth per sub-sector

COVID-corrected employment and real GDP growth forecasts per sub-sector

Historical and forecasted contributions of each sub-sector to national GDP and national employment

Employment-GDP elasticities (i.e. by how much does employment change if real GDP in a sector changes)

The length of time before the COVID-19 economic shock dissipates per sub-sector

The gender-equitability of each sector’s employment prospects

Qualitative/Literature-Based Indicators

A sub-sector’s prevalence in the literature as a government/donor agency priority

A sub-sector’s perceived susceptibility to COVID-19 as found in research

Because some of these indicators were qualitative, and some are statistical in nature, it would have been arbitrary to combine them without using a statistical technique which corrects for:

1. The relationship between each variable (for instance, real GDP and employment are positively related),
2. The relationship between the same variable over time (real GDP growth in a previous year often pushes up real GDP growth in the current year due to inertia), and
3. What each variable is measured as (combining a % growth rate with the number of years it would take to recover, and so forth).

As such, Principal Components Analysis (PCA) appeared to be most suited to the analysis and was used to combine the indicators into an index of prioritization.

While historical indicators were easy enough to calculate, and while qualitative analysis was easy enough to conduct, the forecasting method was perhaps the most difficult. Due to the scarcity of data (only having data available in yearly format for all sub-sectors from between 2008 to 2018/19), the forecast method chosen needed to be able to work well with small samples. In order to do this the technical team chose a truly mixed-method following the methodology outlined below: (please do not forget the note 2 on mixed-methods)

²Using quantitative information to inform/mix with qualitative analysis, and/or vice versa, simultaneously.



Box 1: Brief Summary of Forecast Methodology

1



Use literature (Ehlen 2007, for example) to assess the impact of pandemic influenza on national and sub-sectoral growth



Economic growth is expected to decline by 2% in the best-case scenario, and 6% in the worst-case scenario in the year of the pandemic, before smoothing over time

2



From this, forecast national and sub-sectoral real GDP growth until 2024 using a Structural Vector Autoregression (SVAR)

3



Assess the relationship between changes in real GDP and Employment (Mistra and Suresh 2014) at a national and sub-sectoral level. Use these relationships to forecast employment changes given forecasted changes to national and sub-sectoral GDP in step 2

For more information on this methodology, contact Michele Capazario (michele.capazario@dnaeconomics.com)

In short, every scenario of economic decline between 2 and 6% is modelled for at a national level. Using the SVAR, these scenarios are translated into sub-sectoral changes in real GDP, whilst also forecasting how long it would take for each sub-sector to recover to pre-COVID levels. These are then weighted by employment-output elasticities for each sub-sector to understand the extent to which employment in each sub-sector would taper off.

This was followed by a wide stakeholder engagement workshop, which brought together key representatives in Ethiopia from the TVET and business spaces, as well as focal persons from SIFA offices within the country. These individuals all had vast expertise on elements of labour demand and labour supply within the country, and assisted in honing the findings from the quantitative analysis

3 Country context

The backdrop for the Ethiopian economy is set up in the following sub-sections. First, we provide a country fact sheet which summarizes some stylized facts about Ethiopia's economy. This is followed by a literature synthesis. This synthesis assesses which of the sub-sectors within the economy are priorities, and provides an assessment of trade and regional integration from an Ethiopian perspective.



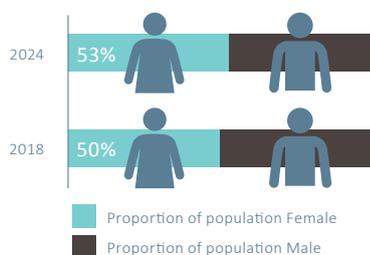
3.1 Country Fact Sheet

Box 2: Population, Employment, and Inequality Summary

Population



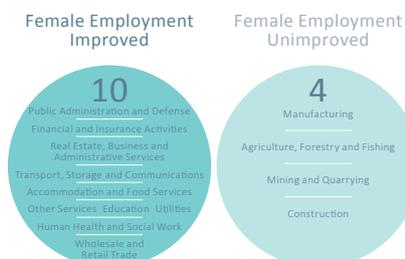
- In 2018, Ethiopia had a population of approximately 110 million.
- This is expected to increase to 125 million by 2024.
- The population is split almost equally by gender.



Employment



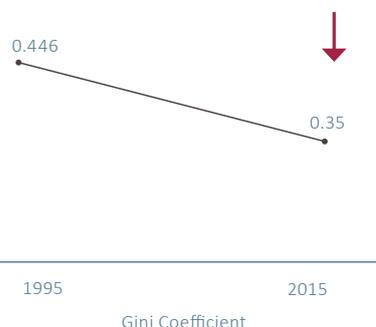
- Unemployment for males is lower (1.3%) than for females (2.4%)
- This is expected to remain relatively stable until 2024.
- Most sub-sectors (highlighted in darker blue) have improved in terms of gender-equitable employment over the last decade.



Income Inequality



- Ethiopia has experienced strong economic progress over the last 15 years.
- This economic wealth is being spread out across the population somewhat more equitably over time, an uncommon trend.



Source: (The World Bank, 2020)

While some data remains relatively out of date (specifically the Gini coefficient within the country, given its infrequent estimation), the picture of Ethiopian growth and relative improvements in standard of living are well documented over the last 10 years. In most sub-sectors, this also

comes with a more gender-equitable employment landscape, with some sectors (like the human health and social services sector) employing a majority female workforce in the country.

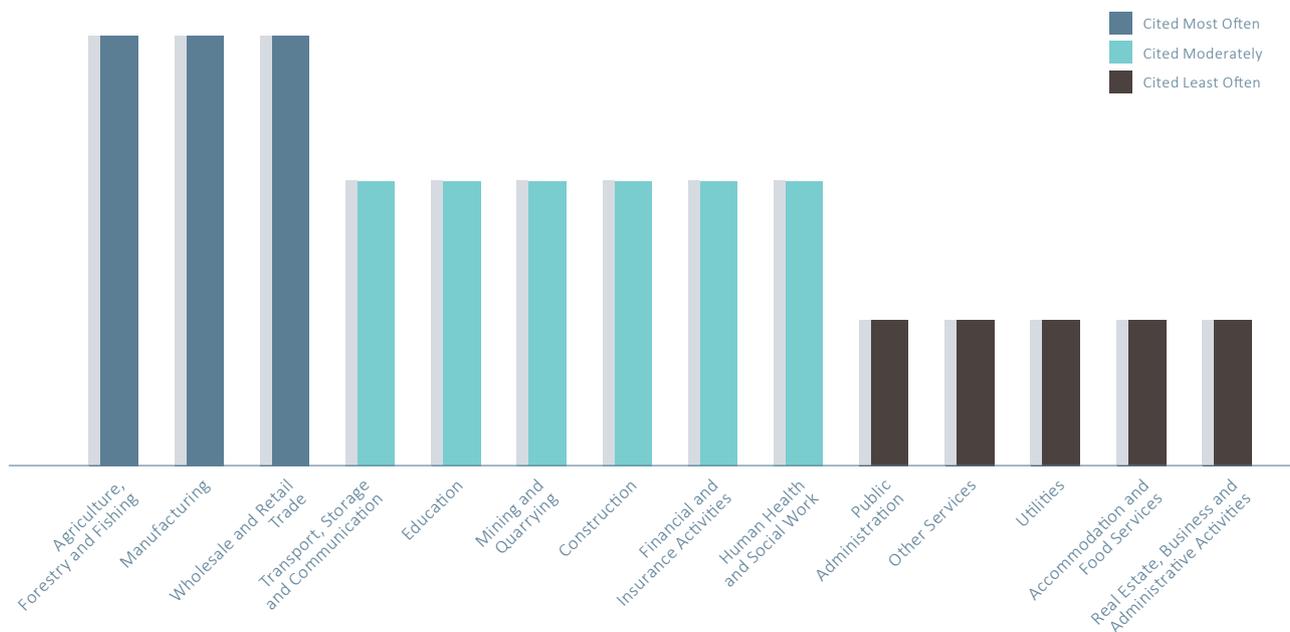
³(Quartz Africa, 2020)

3.2 Stylized Facts from Selected Literature

3.2.1 National Strategic Priority

In order to understand the developmental path of Ethiopia, it is imperative to analyse the literature. This literature (a summary of Ethiopian development and strategic priority goals), as analysed below, points out which of the sub-sectors are set to be of priority to investors and the state:

Figure 1: Sub-Sectors Priority across Literature Sources



Source: (IMF, 2020); (United Nations in Ethiopia, 2016)

Considering the literature analysis, strategic priorities for Ethiopia are set out below:

1. Between 2019 and 2024, major focus is expected to be placed on the agriculture, manufacturing, and wholesale/retail trade sub-sectors (the latter linked to a drive for improving trade across Africa). This is likely meant to spur employment of low-skilled workers, and improve economic growth “from the ground up”.
2. There is also some focus that is expected to be placed on:
 - a. Improved education and health outcome for Ethiopians

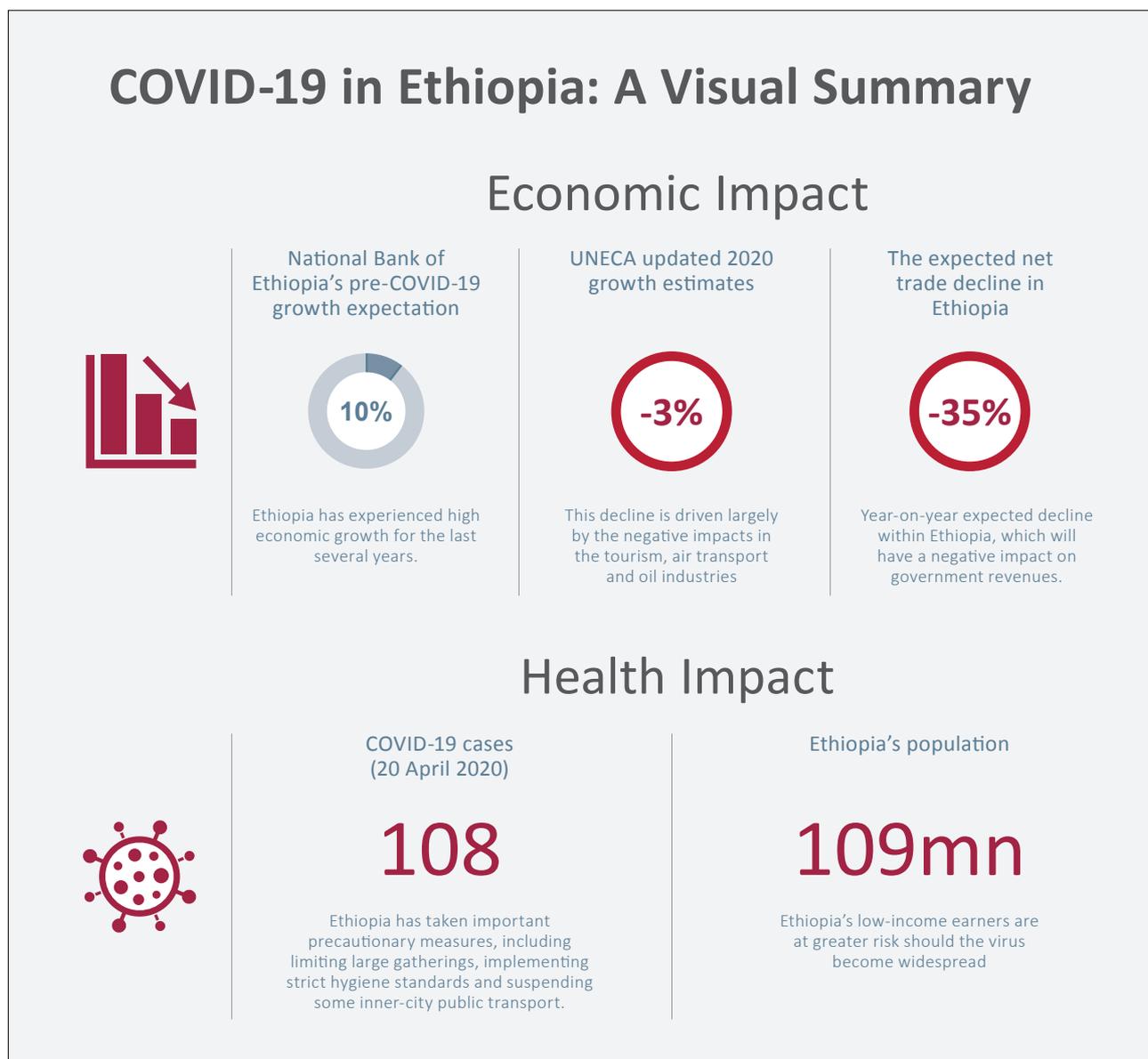
- b. Stronger employment in the physical labour (mining, quarrying, and construction) sub-sectors as a means to improve the economy’s infrastructure, and
- c. A drive to improve financial markets by improving financial services within the country.

It is by developing these sectors that the Ethiopian government hopes to lay the foundations for stable economic growth.

3.2.2 Potential Impact of COVID-19

Because of the uncertainty surrounding COVID-19 and the extent of its economic (and health) impact, the literature analysis also brings out the potential impact that COVID-19 might have on the Ethiopian economy. This is summarized below, and is included in the analysis further on:

Box 3: Summary of the Impact of COVID-19 on Ethiopia



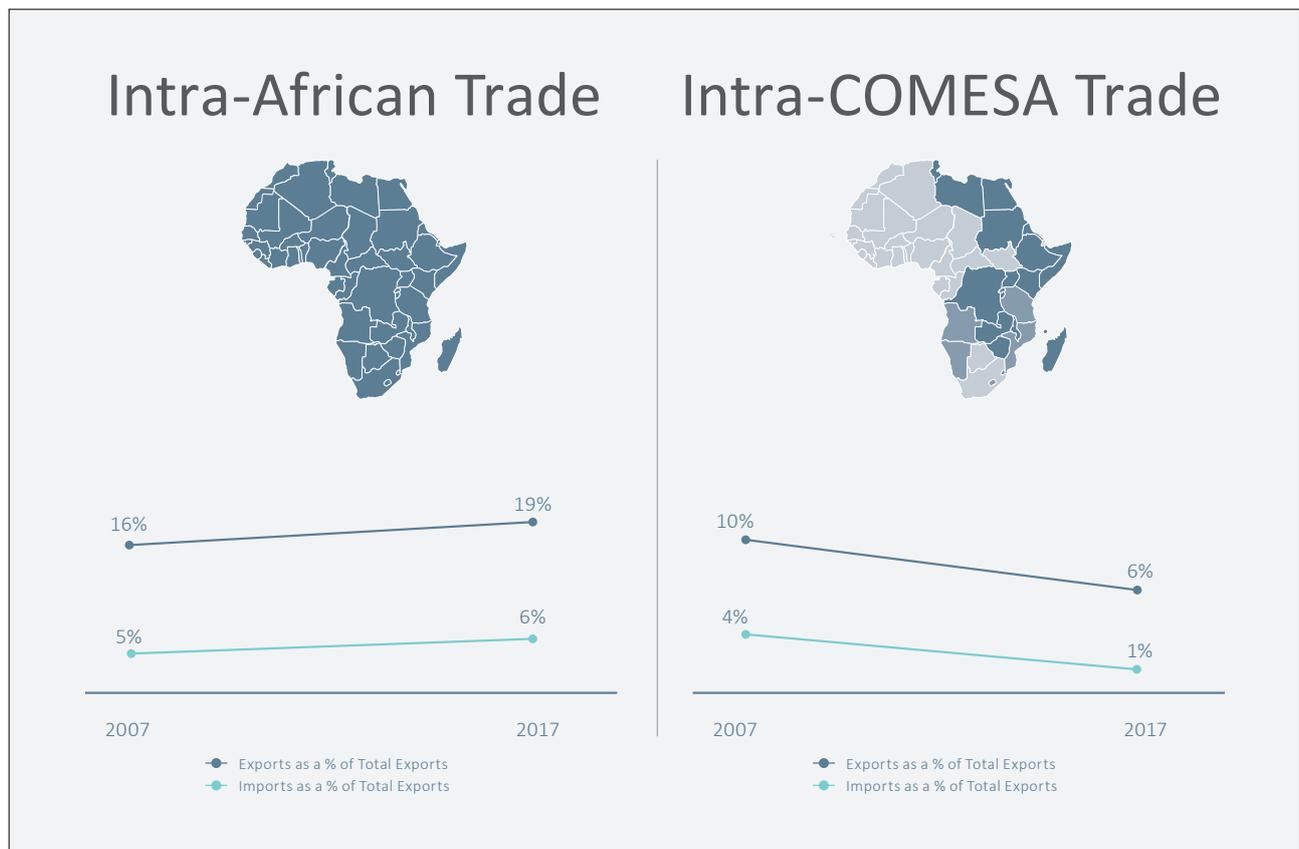
Source: (African Development Bank Group, 2020) (Davison, 2020) (Ethiopian Embassy UK, 2019) (Gebre, 2020) (UNICEF, 2020)

Because there is great uncertainty regarding the economic response to COVID-19, it is likely that this information will change on a regular basis. However, this analysis does point out that COVID-19 is expected to have an extremely large impact on the Ethiopian economy, especially given its potential loss in national revenue due to extremely depressed trade.

3.3 Trade and Regional Integration

Intra-Africa and Intra-COMESA trade is summarized below:

Figure 2: Regional Integration in Ethiopia across Africa and COMESA



Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

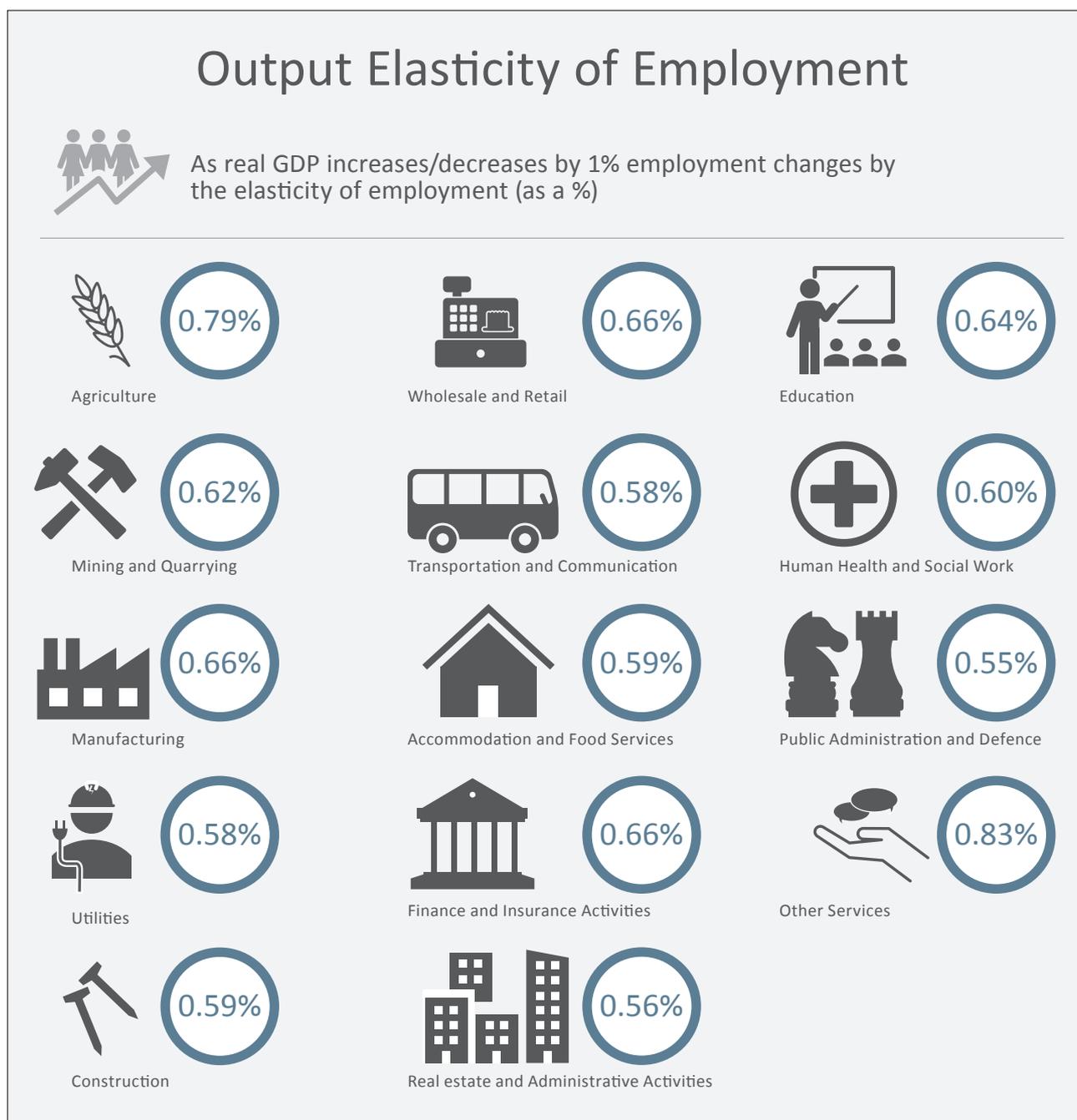
Since 2001, international exports from and imports to Ethiopia have risen rapidly. While intra-Africa trade has increased, intra-COMESA trade has decreased over the 10-year period. This signals that continental trade integration has improved, whilst intra-COMESA integration has worsened substantially.

4 Macroeconomic Analysis

4.1 Employment-Output Elasticity

In order to forecast in light of COVID-19, it is necessary to understand the relationship between real GDP and employment in order to model relatively accurate scenarios. This is best summarized by estimating the employment elasticity for each sector, as seen below:

Box 4: Output-Employment Elasticity Summary per Economic Sub-Sector in Ethiopia



Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

Of course, in normal circumstances, the higher the elasticity of employment, the more likely a sector is to incorporate growth into employment. However, the inverse also holds true- if an elasticity is high, then worsened economic growth theoretically translates to far worse losses in employment than if an elasticity was lower. Because this is the mechanism which assists us in modelling employment further into the report, the sectors with the highest employment elasticities are also those most susceptible to economic shocks, namely:

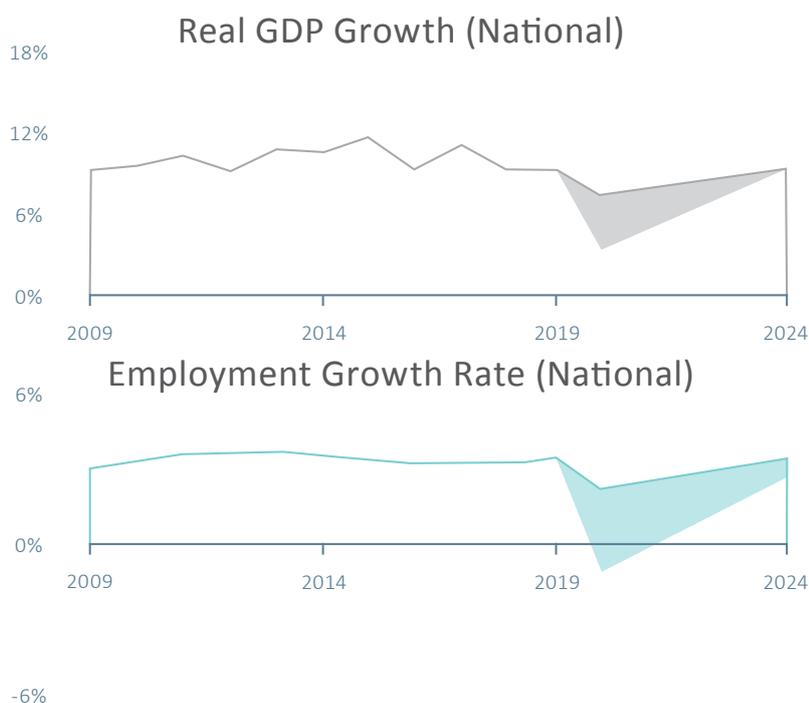
1. The other services sub-sector,
2. The agriculture sub-sector, and
3. The manufacturing sub-sector

On the other hand, the sector which is least susceptible to an employment shock is the finance and insurance activities sub-sector, which has a moderate employment-output elasticity of 48%. If GDP were to decline in this sector by 1%, employment would only drop by 0.48%. It is this relationship which assists in the modelling of forecasts for employment growth and decline in the following sections.

4.2 National

At a national level, because of Ethiopia's strong historical growth, it is likely that the impact of COVID-19 on national economic prospects will be marked, but far less damaging than in countries with low historical growth trajectories:

Figure 3: National Real GDP and Employment Forecasts for Ethiopia



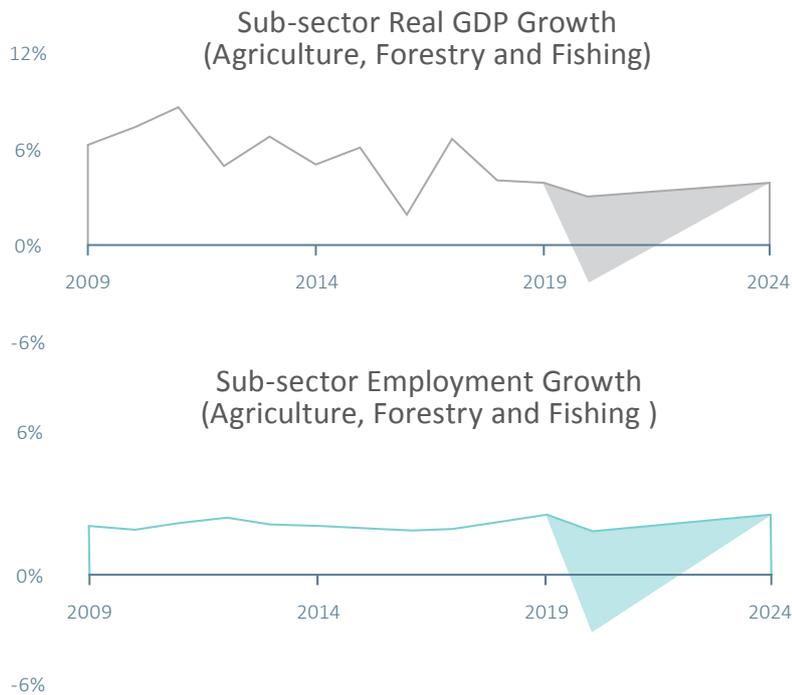
These forecasts show that, relative to real GDP growth in 2019 of 11% and employment growth of 5%:

- Due to COVID, the best-case scenario would be for Ethiopia's growth in 2020 to hover around 8%, whilst recovering to 2019 levels by 2024.
- In the worst-case scenario, Ethiopia's economy would still recover fully by 2024. If this is the case, it is expected that real GDP will grow by between 3-4% in 2020, before improving slightly over the following years.
- These scenarios translate to a forecast of decline in employment, in the worst case by up to 1.5-2% (this translates to approximately 560 000 jobs being lost).

Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

4.3 Primary sector

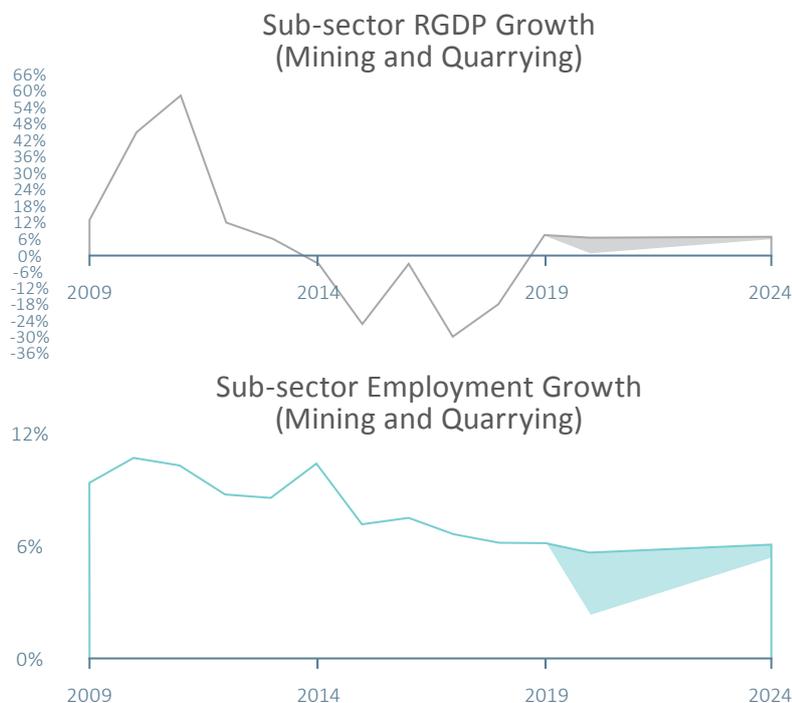
While the agriculture sector has historically been growing quite robustly, the forecasts suggest that:



- Real GDP is expected to decline by up to 2.5% in the worst case, or grow by a less robust 2.5% in the best case in 2020.
- This translates to employment growth of between -3 and 2% increase in 2020.
- In the worst case, the sub-sector is likely to recover partially by 2022 in terms of both employment and real GDP growth.
- While national employment would only drop by 146 000 jobs in the worst-case scenario, the agriculture sector is set to shed up to 800 000 jobs in total (employing approximately 33 million people in total) in the worst case. It is likely that these job losses will be offset by employment growth in other sectors though.

Source: Analysis of data from Central Bank of Ethiopia (2020); verified by data from The World Bank (2020) and United Nations (2020)

Historically, the mining and quarrying sector (having employed 309 000 people in 2019) has experienced high but volatile economic growth, with more consistent employment growth:

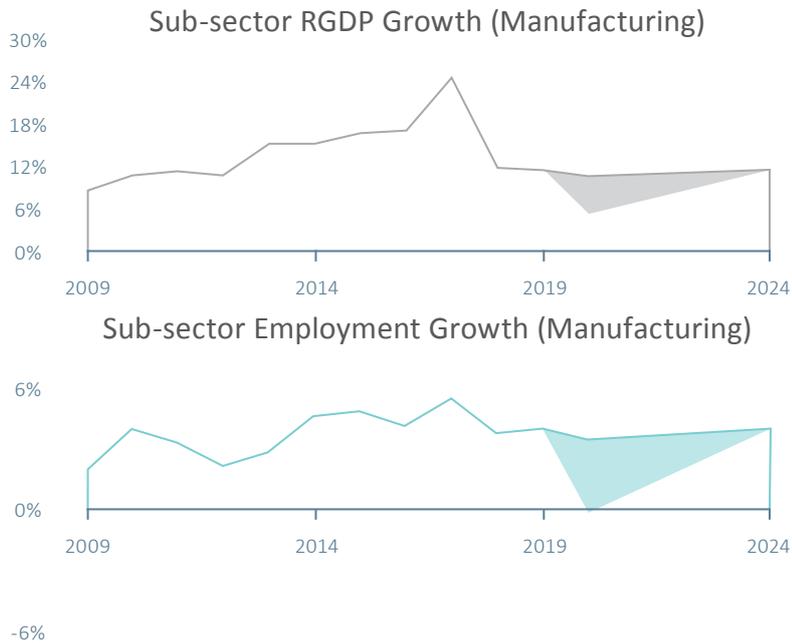


- Real GDP is expected to track growth of between 0 and 6% in the worst and best cases for 2020
- This translates to an increase of employment between 3% and 5% for 2020, while historically this growth would have hit peaks of 7%.

Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

4.4 Secondary sector

Output growth in the manufacturing sector (having employed 2.8 million people in 2019) is expected to be slightly more robust post-COVID than employment



- Real GDP is expected to decline from approximately 12% in 2019 to approximately 6% in 2020.
- This translates to an employment decrease of up to 0.25% in 2020, in the worst case scenario. This translates to the shedding of up to 5 200 jobs.
- In the worst case, the sub-sector is likely to recover partially by 2021, before regaining pre-COVID growth levels by 2023/2024.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

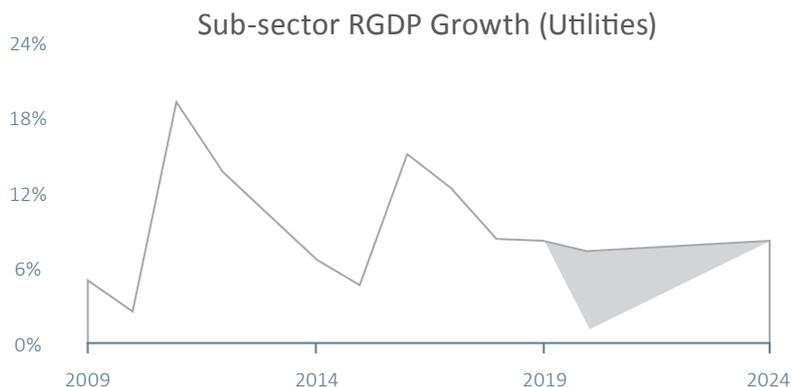
Historically, the construction sub-sector- which employed 1.9 million people in 2019- has grown quite rapidly, but has been declining slightly



- Real GDP, which was growing at 18% in 2019, is expected to grow by 12% in 2020 given the worst-case COVID scenario.
- This translates to a decrease in employment growth from 7% in 2019 to a minimum of 3% in 2020.
- By 2023, it is forecast that the sector will recover to more robust growth levels than in 2019.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

Because the utilities sub-sector, which employed 304 000 people in 2019, has historically grown quite strongly, it is expected that:



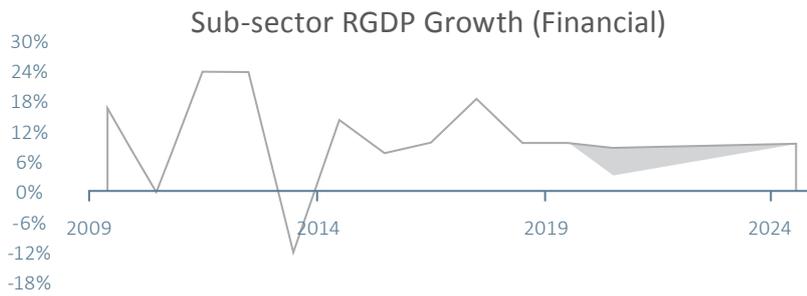
- Real GDP which historically grew by 7% is expected to grow by, at least, 2.5% in the worst-case COVID scenario in 2020.
- This translates to employment growth which could be, at worst, 0.5%, as opposed to historical growth of approximately 4% in 2019.
- The sector is forecast to recover to 2019 growth levels by 2023/2024.



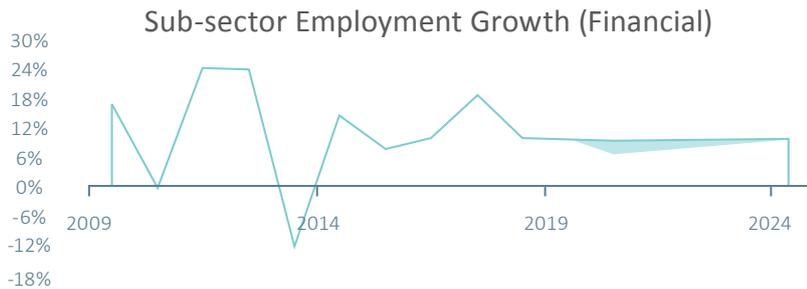
Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

4.5 Tertiary Sector

The financial sub-sector (having employed 240 000 people in 2019) is forecast to do the following:

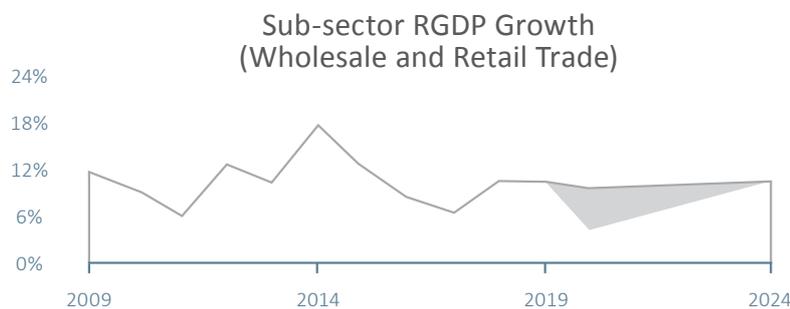


- Real GDP, which was growing up to 9% in 2019, is expected to **grow less rapidly by, at worst, 3% in 2020**.
- The forecasting model projects that, as opposed to 9% historical employment growth, the **number of people employed will grow in the sector by, at worst, 6%, and at best, close to 8% in 2020**.

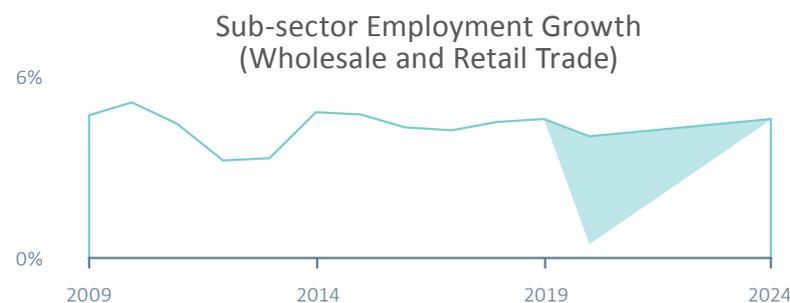


Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

The wholesale and retail sector (having employed 3.5 million people in 2019), although historically growing robustly, is forecast to lose some of its historical gains, post COVID-19:

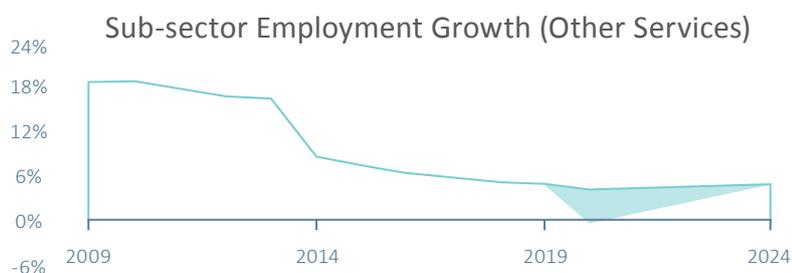
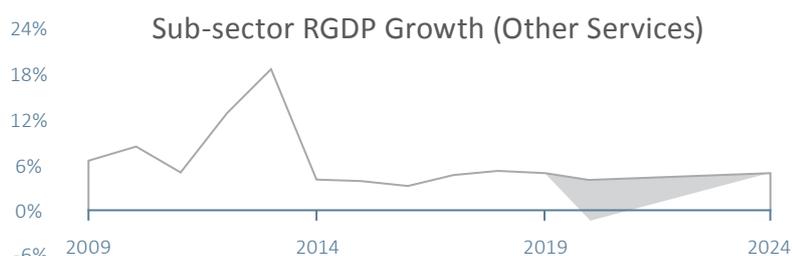


- Real GDP is expected to **grow by a minimum of 4% in 2020, as opposed to approximately 10% in 2019**.
- This translates to a decline in the employment growth rate from 4% in 2019 to a minimum of **0.5% in 2020, in the worst-case scenario**.
- The sector is expected to recover to pre-COVID levels of growth by 2023/2024 as well.



Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

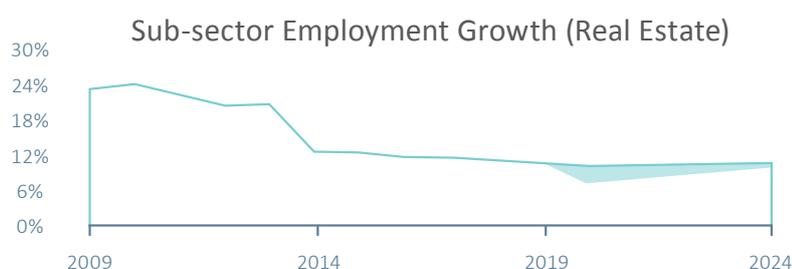
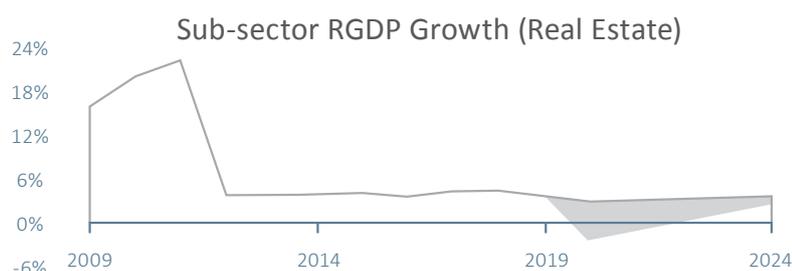
The other services sector is forecast to decline, both in terms of GDP growth and in terms of employment:



- Real GDP is expected to decline by up to 1% in the worst case, or grow by a less robust 2.5% in the best case in 2020.
- This translates to employment decline of up to 0.5% in 2020 (4 700 jobs) in total from 4.5 million people in 2019.
- In the worst case, the sub-sector is likely to recover partially by 2022/2023 in terms of both employment and real GDP growth.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

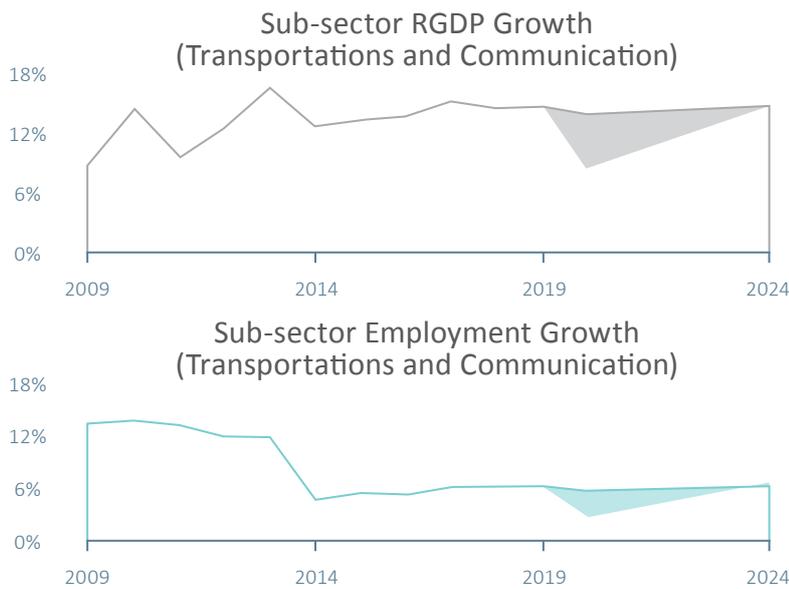
The real estate sector, which employed 660 000 Ethiopians in 2019, is expected to decline in terms of GDP, and employment is expected to grow more slowly than historically due to COVID-19 :



- Real GDP in the worst-case scenario is expected to decline by up to 2% in 2020.
- However, because employment has historically been growing rapidly in the sector, economic growth translates to an increase of employment between 6% and 8% for 2020, while historically this growth would have hit peaks of 24%.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

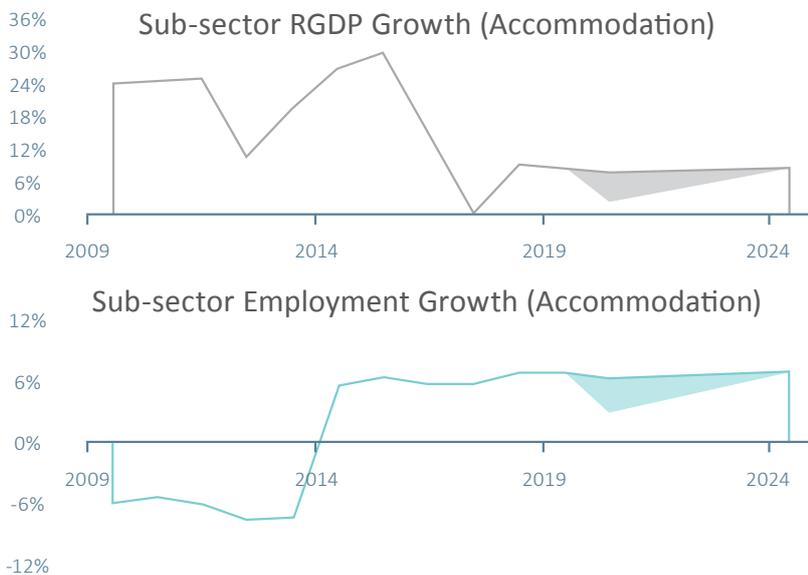
The transportation and communications sub-sector, which employed 671 000 people in 2019, is potentially reinforced by historically strong growth trends:



- Real GDP is expected to grow slower than historically (15% in 2019) by 7-8% in the worst-case scenario for 2020.
- This translates to an increase in employment growth between 3% and 4%.
- In the best case, the sub-sector is likely to recover to pre-COVID levels of growth by 2023, with employment expected to grow more in 2024 than it had in 2019.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

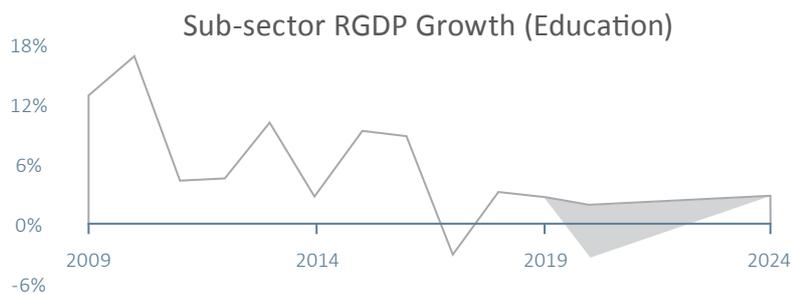
The accommodation and tourism sector (employing 770 000 people in 2019) is expected to grow less robustly as well:



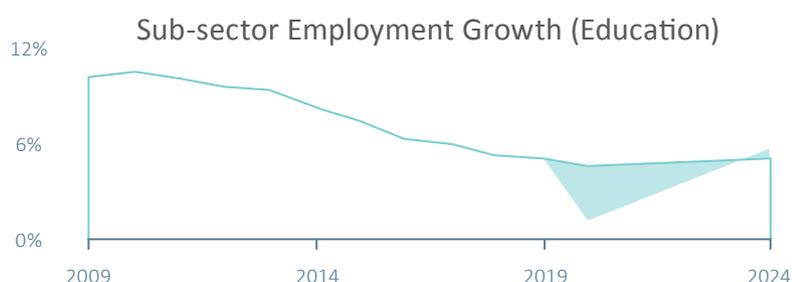
- Real GDP is expected to track growth of between 0.5 and 5% in the worst and best cases for 2020, as opposed to historical growth of closer to 9% in 2018/2019.
- This translates to between an increase of employment between 1% and 3% for 2020, while historically this growth would have hit peaks of 7%.

Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

Forecasts for the education sub-sector, which employed 1.2 million people in 2019, suggest that:

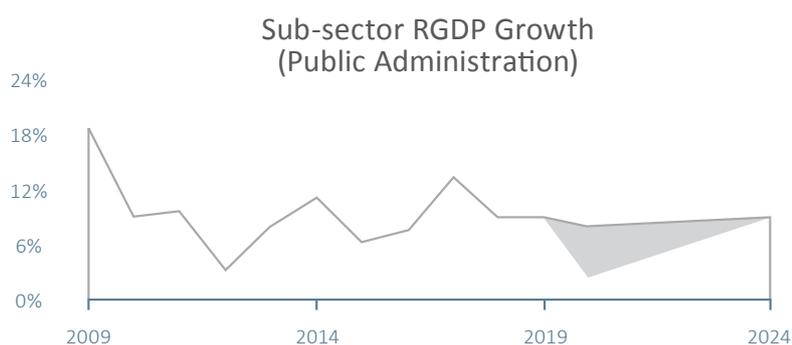


- Real GDP is expected to **decline** by up to 3% in the worst-case scenario for 2020.
- This translates to employment growth of between 1% and 3% in 2020, far lower than historical growth of closer to 8%.
- In the worst case, the sub-sector is likely to recover slightly by 2022 in terms of real GDP growth, whilst employment is expected to recover to pre-COVID levels by 2023.

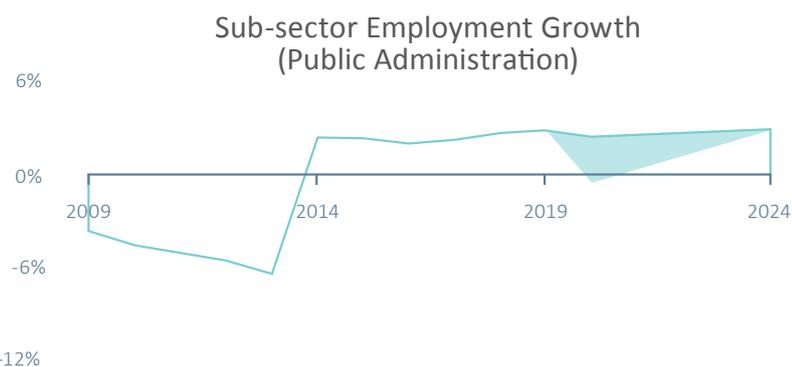


Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

In the public administration sector (which employed 400 000 people in 2019):

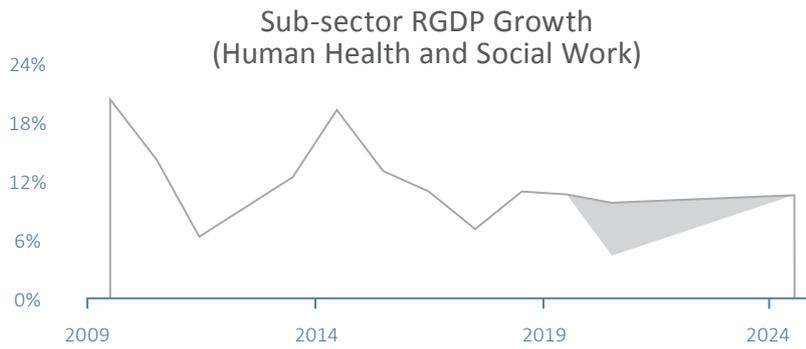


- Real GDP is expected to **track growth** of between 2 and 6% in the worst and best cases for 2020.
- This translates to employment either declining by up to 0.5%, or increasing slowly by 2% in the worst and best cases, respectively, for 2020. In the worst case, this translates to the shedding of 2 300 jobs.

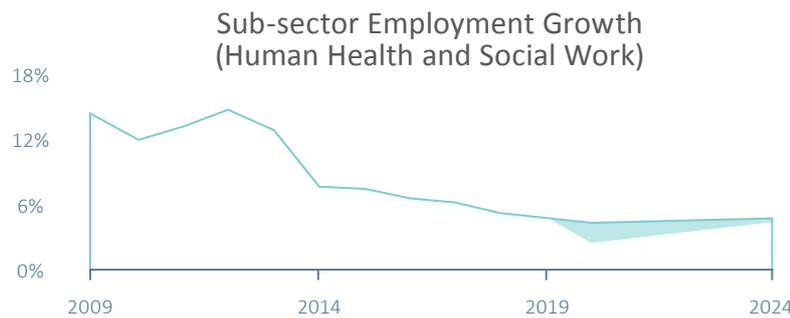


Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

The healthcare sector, which employed 416 000 people in 2019) has historically been growing quite robustly, the forecasts suggest that:



- Real GDP is expected to grow slower in comparison to 2019 (approximately 12%) by up to a minimum of 4.5% in the worst case in 2020.
- This translates to employment growth of between 2 and 3% in 2020, as opposed to historical growth levels hovering around 5%.



Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

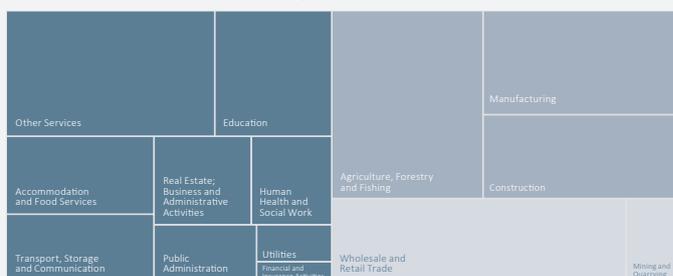
5 Labour Supply Analysis

The Ethiopian labour market exhibits features of development, and features of informality, which makes its comprehensive analysis extremely interesting. Some strong analysis has been done in the Ethiopian labour market regarding labour supply, although some of this is potentially outdated. As such, below is an infographic which provides the labour market context in Ethiopia from a supply side with as recent information as was able to be collected:

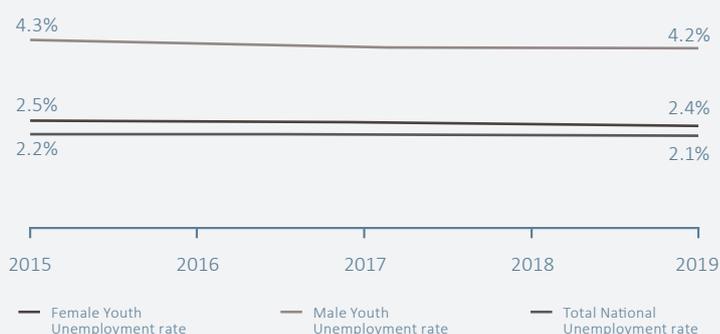
Box 5: Labour Supply Snapshot in Ethiopia

Ethiopia Labour Supply Analysis

Labour Market Landscape

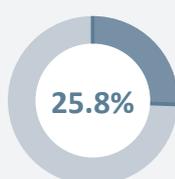


- The sectors which found themselves at the top of the rankings in the next section are those sectors which contribute largely to national employment (with the agriculture sector in Ethiopia specifically employing roughly 34.5 million Ethiopians in 2019 out of a 50 million strong employee base).



- National unemployment is hovering around the 2% mark as of 2019 (and is forecast to increase due to COVID-19), youth unemployment for females is double that (at 4.2%). Male youth unemployment is similar to national unemployment
- This signals that the economy, which has employed approximately 50 million people, is struggling to absorb its female youth into the labour force more so than it absorbs male youth or older generations.

Forms of Employment



Estimate of the proportion of Ethiopians employed in the informal sector



This translates to the informal sector employing as many as 13.4 million Ethiopians out of its 52 million employees



of females are self-employed

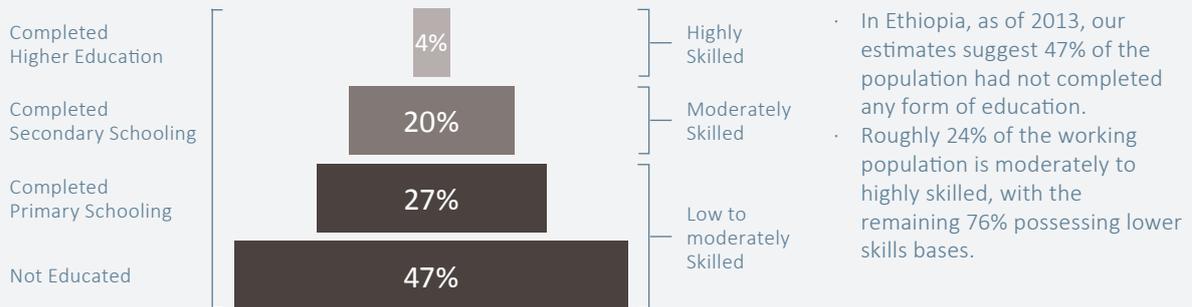


of males are self-employed

In absolute terms, informal employment is high, but in percentage terms it is low in comparison to other African countries. However, the proportion of workers self-employed is extremely high in Ethiopia. Because of this:

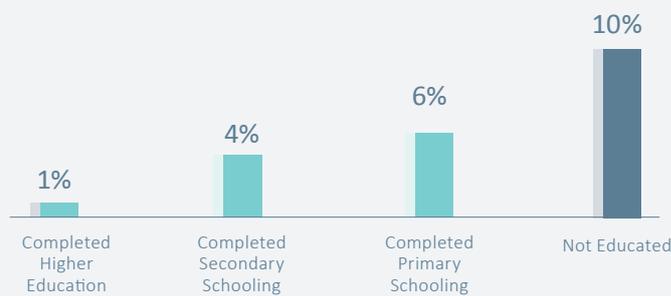
- Job security is potentially moderate in the economy, and
- Skills levels are potentially moderate as well, given the low informal employment rate, but the extremely high self-employment rate.

Education and Training Profile



- In Ethiopia, as of 2013, our estimates suggest 47% of the population had not completed any form of education.
- Roughly 24% of the working population is moderately to highly skilled, with the remaining 76% possessing lower skills bases.

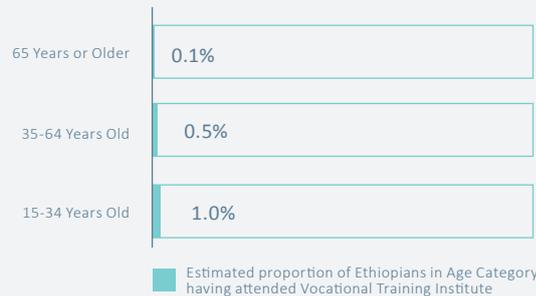
Proportion of Employed Ethiopians who are Underemployed per Schooling level



Our own estimates suggest that very few highly skilled individuals in Ethiopia are underemployed (i.e. are either overqualified for the work that they do or could work more time but are not given the chance to do so). However, 11% of individuals with no education underemployed (i.e. those with low skill levels)

1 200 000

The number of Ethiopians who have completed some form of TVET qualification by 2013



Estimated proportion of Ethiopians in Age Category having attended Vocational Training Institute

In a 2020 study of skills gaps in Ethiopia, it was found that particular skills gaps existed in the:

- **Agricultural sub-sector** (lack of agro-processing knowledge particularly),
- **Manufacturing sub-sector** (specifically related to machine operations),
- **Wholesale, retail, business and marketing industries** (particularly, on the soft skills associated with sales and with after-sales services), and
- **Transportation, communication and storage sub-sectors** (where logistical system designs are not optimal because there is a breakdown in the needs of suppliers versus those who sell goods and services).

This mirrors findings from the 2009 skills list created by the Federal Register, which shows that skills in the manufacturing, logistics, construction, and agricultural sectors (especially in the more advanced technical operations within these sectors) had not been effectively home-grown, implying that skills needs have remained relatively unchanged in Ethiopia.

Source: (The ILO, 2020); (The World Bank, 2020); (Department of State, 2009); (Le Mat, 2020); (Desta, 2018)

From the analysis, a handful of findings come through:

- Even though Ethiopian unemployment levels are relatively low, it is likely because of the high level of self-employment within the economy. It is this high self-employment rate which makes many of the jobs in Ethiopia extremely vulnerable to economic shocks, especially now in the time of COVID-19.
 - Youth unemployment rates tend to be higher for females than for males as well, signalling that the economy is struggling to absorb some of its female youth into the workforce adequately.
- Although robust development plans have been created to develop the TVET³ system in Ethiopia, there is currently a skills mismatch between the practical aspect of TVET completion and what employers in Ethiopia need from workers entering the workforce. This is specifically true in the Agriculture, Transportation and Communication, and Manufacturing sectors, although some skills shortages have also been pointed out in the Construction and Wholesale/Retail sectors as well.
- Those without education in Ethiopia tend to be the workers which are underemployed/underutilized, even though they are often times self-employed or employed by a family member.
- It is also apparent that the majority of Ethiopians are coming from a low-skills base (roughly 74% in fact), and this means that the scope for intervention is large to bridge the gap from low to moderate or even high skills in the country

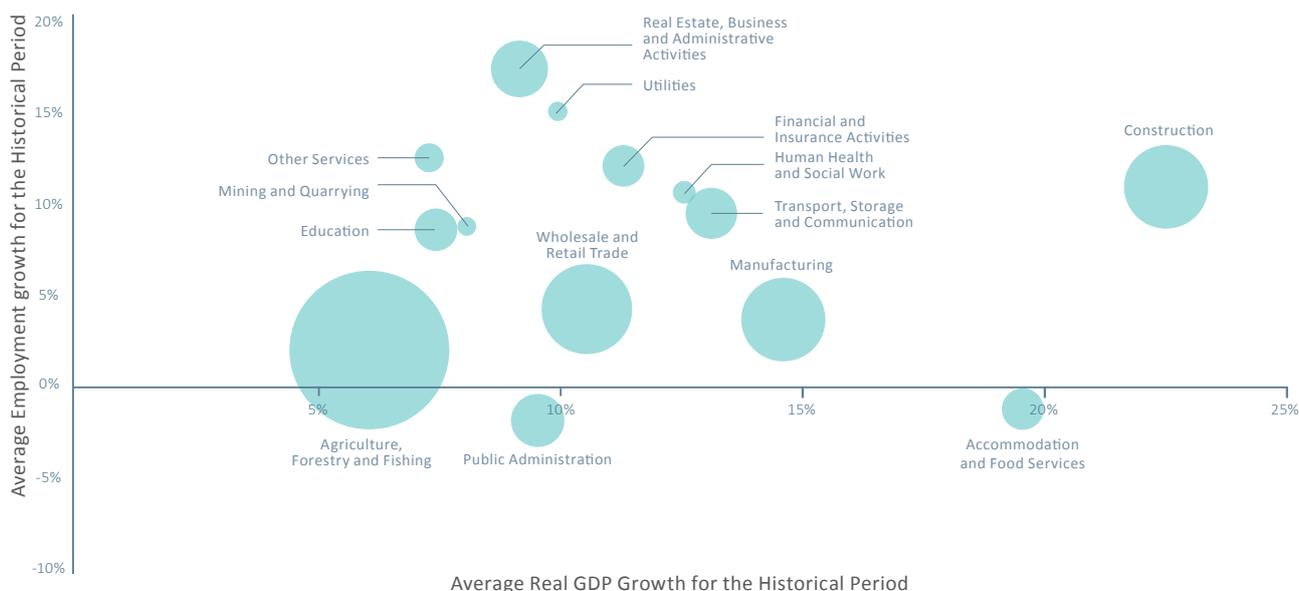
³According to UNESCO and the ILO (2001), TVET refers to “aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupants in various sectors of economic and social life”. Of course, there are differences between TVET systems across the globe, across countries and even across TVET institutions within the same country, but for the extents and purposes of this report even though qualification levels may vary, a TVET qualification of any form is still classified as providing high levels of competency or skill.

6 Sub-sectors deep dive

6.1 Sub-Sector Choice

In order to choose which sub-sectors to focus on, it is first important to place each sub-sector into a matrix which summarizes their position within the Ethiopian economy. As such, we employ a similar sort of analysis as found in FG Consulting (2019), by using an employment-output growth matrix for both the historical and the forecasted period. The size of the bubble relates directly to the contribution of that sub-sector to real GDP⁴.

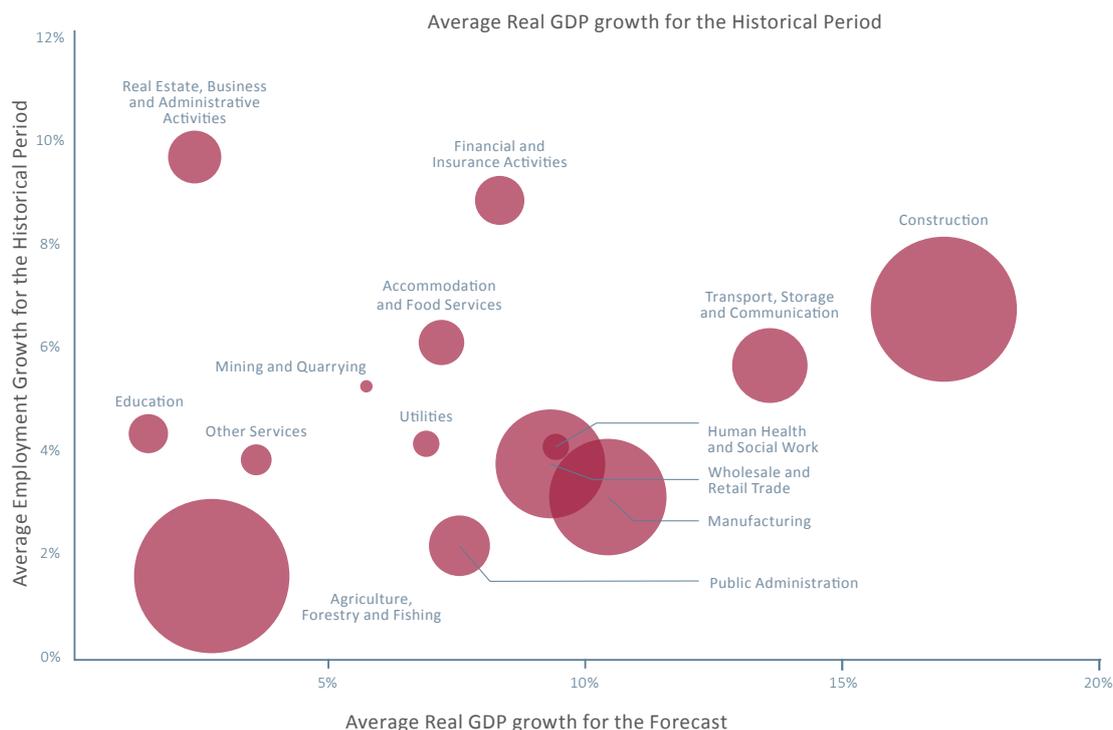
Figure 4: GDP and Employment Growth Matrix for all Sub-Sectors in Ethiopia (Averaged from 2008-2019)



Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

⁴As the bubble gets larger, so too does a sector’s contribution to national real GDP within that time period on average.

Figure 5: GDP and Employment Growth Matrix for all Sub-Sectors in Ethiopia (Averaged from 2020-2024)



Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

More than anything these graphics only summarize the analysis done before, and feed into the methodology to obtain priority sectors based on those sectors real GDP trends, employment trends, sizes, gender equitability, and the impact of COVID-19 on those sectors (as outlined in the methodology).

Given these bubble summaries, broad analysis suggests that, while still relatively better off than most countries prospects due to high historical growth, it is clear that the Ethiopian macroeconomy will be growing much slower in the forecasted period than in the historical period due to COVID-19:

- The agriculture sub-sector has shrunk the most (historically accounting for 41% of national GDP, but forecasted to account for 28% of national GDP).
- Even though the forecasted period shows high employment growth and high output growth, the historical period in the Ethiopian context was one of huge leaps forward. Thus, even though the economy has “shrunk”, it has done so coming from an extremely low base. It is this growth from a low base that puts Ethiopia at a unique position in Africa (and perhaps, the world) to stave off the worst of the economic shock from COVID-19.

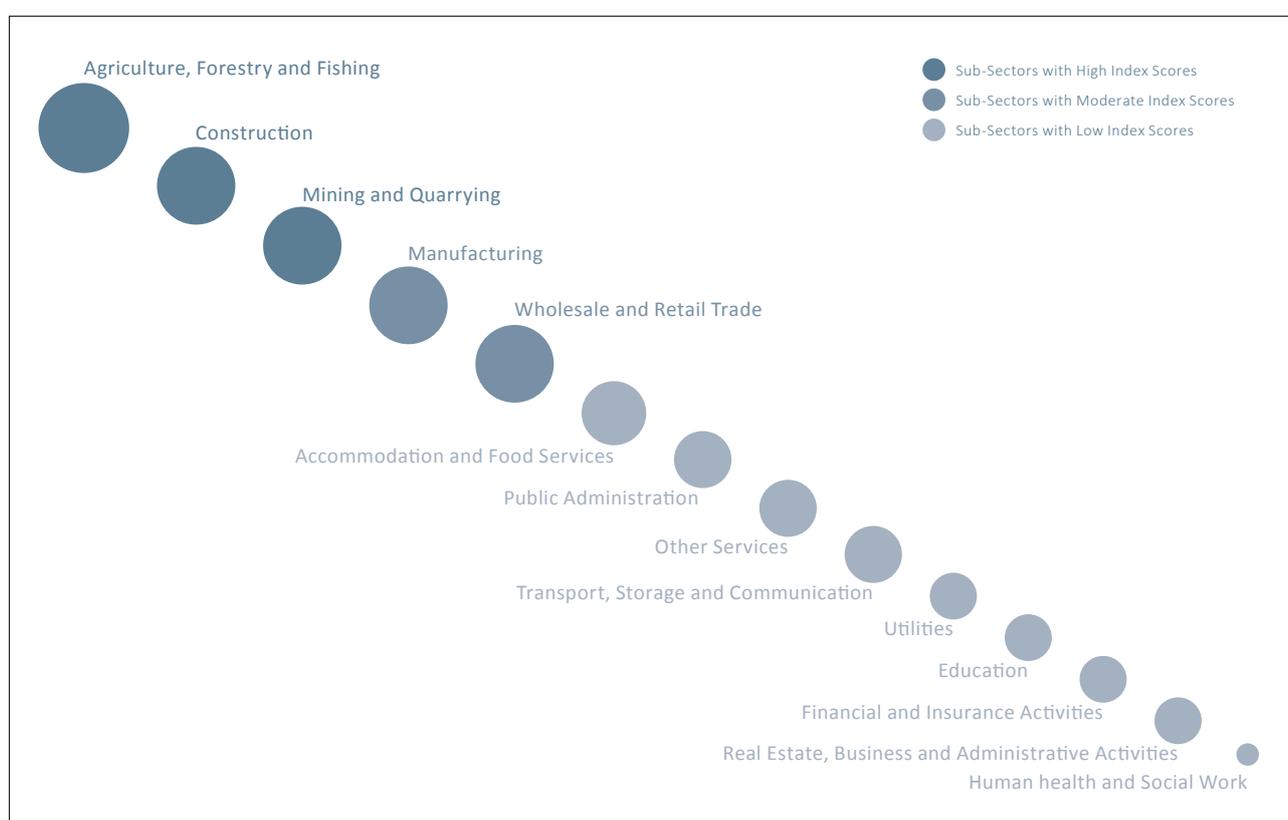
6.2 Sub-Sector Ranking

Given all previous evidence, we use Principal Components Analysis (PCA⁵) to rank the sub-sectors. Weighting is based off of the following indicators:

- Historical employment and GDP growth,
- Forecasted employment and GDP growth taking into account the potential impact of COVID-19,
- Employment elasticity of output,
- A sub-sector's prevalence in the literature surrounding government priority,
- A sub-sector's susceptibility to COVID-19 as found in the literature,
- The persistence of an economic shock of the COVID-19 type at a sub-sector level (i.e., how long it takes for a sector to at least slightly recover from an economic shock), and
- Whether the sub-sector is gender-equitable by means of either:
 - An increasing trend of female employment between the historical and forecasted periods, or
 - Employing a female-majority workforce.

Prior to COVID-19, the sub-sectors were ranked according to the relevant indicators, and the following ranking was obtained:

Figure 6: Pre-COVID Labour Demand Index Rankings

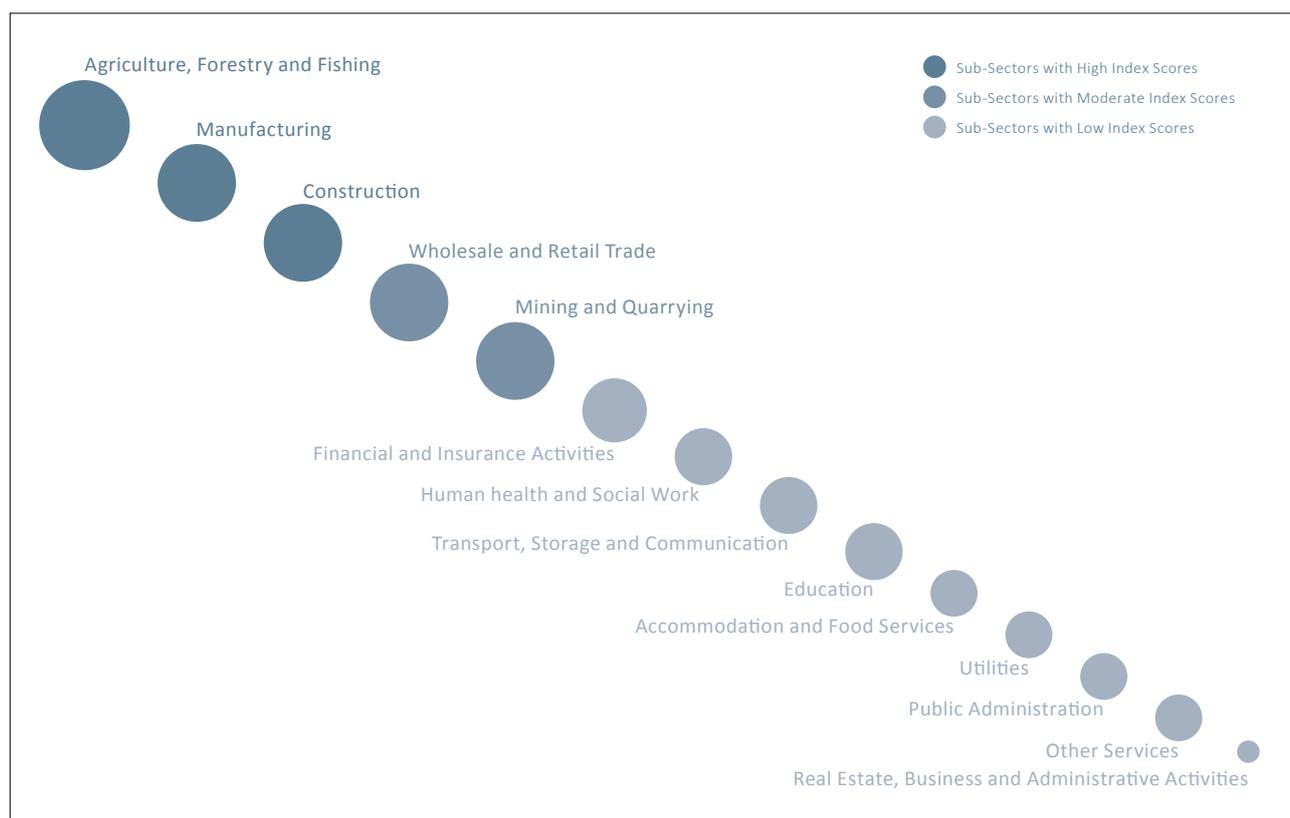


Source: Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

⁵PCA is a weighting technique which attributes weight based on total variation of a particular indicator across time and across dimensions. It attempts to decompose each indicator, relative to all the others, into its core components. This method corrects for things like the relationships between the indicators which are meant to be weighted (for instance, output and employment are related).

This ranking, inclusive of the expected impact of COVID-19, is summarized below⁶:

Figure 7: Post-COVID Labour Demand Index Rankings



Source : Analysis of data from Open Data for Africa (2020); verified by data from The World Bank (2020) and United Nations (2020)

From the graph, the following sub-sectors are expected to be the most robust across the 8 dimensions/indicators:

1. The Agriculture sub-sector,
2. The Manufacturing sub-sector, and
3. The Construction sub-sector

These are the sub-sectors which, across dimensions, tend to perform robustly across the various dimensions, and are susceptible to an economic shock due to COVID-19. That is not to say that each sub-sector is best performing across all dimensions (i.e. real GDP growth in the agriculture sector is not forecast to be the highest). Instead, it is these sub-sectors that simultaneously have:

- Relatively strong economic prospects,
- Relatively Gender-equitable employment prospects,
- A place in the literature as a strategic priority, and
- A relative susceptibility to COVID-19 and its prospective economic impact.

Given that the National Development Plan of Ethiopia places major focus on agriculture, forestry and fishing, the development of infrastructure, and on the development of the manufacturing sector as some of its key tenets, it is clear to see that this prioritization framework set out in this report speaks directly to priorities already being pursued in the country until 2030.

⁶The size of each bubble is directly related to the index score for each sub-sector. Those sub-sectors that are highlighted in red fall below the average index score, while those in yellow or green fall above the average index score.

7 Sector deep dive analysis

During October and November, DNA Economics sent out surveys to business and TVET representatives across Ethiopia. During this time, internet connection had been intermittent in some areas, resulting in 5 survey responses (2 from the TVET perspective- one of them partial- as well as 1 complete and 2 partial responses from the business perspective). While these survey results may not be representative of all opinions in Ethiopia, secondary research suggests that there is a lot of truth in what respondents have alluded to.

First, from the TVET/labour supply standpoint, the completed survey pointed out the following:

- **In the agriculture, forestry, and fishing sector:**
 - Courses in animal production (poultry, fattening, sheep, goats and cattle and animal product after processed were most popular. This popularity related directly to market conditions- because of high demand for services in the animal production space in the country, students realise that courses in animal sciences provide strong job prospects.
 - On the other hand, courses in aquaculture, logging and fishing were the least popular among students. This is simply due to the arid climate in parts of Ethiopia, ensuring that demand for labour in these areas is low.
- **In the manufacturing space:**
 - The most popular courses related to manufacturing CTFL (Clothing, Textiles, Footwear and Leather), the processing of basic metals, and the manufacturing of fabricated materials. Studies in all of these areas have favourable job prospects, as is confirmed by business representatives who provided responses to the survey sent out by DNA Economics.
 - In comparison, courses in the manufacture of electrical equipment and computers, as well as the repair and installation of all types of equipment, were undersubscribed. A mixture of low student awareness and inadequate training facilities ensure that this is the case. It was, however, noted by business representatives that there was demand for services in the repair and installation of machinery and equipment, suggesting that- with low levels of graduate throughput- this could be an area which will develop skills gaps in the future.
- **Finally, in the construction sector:**
 - Courses specialising in the construction of buildings, the finishing of buildings (tiling, roofing, and carpeting, etc.), and the demolition and preparation of sites are all popular among students. Because of a large drive in infrastructure expenditure in Ethiopia in recent years (which is expected to continue until 2030), industry demand for skills in these areas is very high.
 - On the other hand, courses in roads, railways and utilities construction are all undersubscribed. This is also true for courses in the building design space. This is due to a mismatch between what the TVET system is able to provide, and what skills are required by the public sector. With outdated curricula, poor access to technology, and poor teaching capacity, this is an area for improvement in the construction teaching space going forward.

Because the respondents stated that their courses are mandated for development by the government, it is clear that the government centrally plans the provision of skills in TVETs in the country⁷. While labour market intelligence at the government's disposal is not up to date in some cases, there is a sense that the courses being offered by TVET institutions in Ethiopia link in some way to industry demands.

⁷This was confirmed in stakeholder engagements with academics in Ethiopia on the 25th of November 2020.

With that said, the TVET respondent pointed out the following as areas in which their TVET has yet to offer courses, but which are in high demand in Ethiopia nevertheless:

1. In the agriculture space, skills in agro-processing are in high demand by the private sector in Ethiopia. While courses in **agro-processing** are currently some of the most popular being offered by the TVET in question, a lack of lecturers and a lack of the most modern machinery places students at a disadvantage when entering the labour market. These students do not have the practical skills which the industry requires, and may not be effectively utilised as employees once graduated.
2. In the manufacturing space, a similar lack of lecturers and a lack of modern technology has stopped the TVET from offering courses demanded by the industry in the following areas of specialisation:
 - a. The manufacture of food products,
 - b. Furniture production,
 - c. The processing of rubber and plastics,
 - d. The manufacture of vehicle spare parts, and
 - e. The production of construction materials.
3. Finally, courses offered in construction testing and construction inspection remain limited.

Because the sample of survey respondents is not representative, it is difficult to tell whether there are sufficient offerings in the abovementioned areas across other TVET institutions in the country.

According to business representatives, due to a lack of modern technology and tools at the disposal of public TVETs in Ethiopia⁸, the perceived standard of public TVET education is low. This is especially true for artisanal courses, and is due to a lack of attention given to these courses by the government⁹.

While the sample of interviewees was severely limited, a few pieces of formal secondary research¹⁰ provide strong overlaps with what was said by respondents. Box 6 synthesises the evidence from these pieces of evidence:

⁸Ethiopia currently applies a 70/30 principal on practicality of training, favouring that 70% of TVET training be practical, while the remaining 30% is theoretical. Whether this principal is applied or not is a potentially contentious, although it is widely believed that this principal is not applied, making some TVET interventions unpractical (Le Mat, 2020). This is confirmed by the small sample of business representatives who responded to the survey sent out by DNA Economics.

⁹According to a stakeholder during a skills mapping workshop in November 2020, the Ethiopian government centrally plans public TVET educational offerings. The government apparently applies a lesser known 70/30 principal to most education institutions, which states that 70% of all post-school education must relate to science and technology, while the remaining 30% be focused on social sciences. This leaves very little room for public universities to offer quality non-STEM artisanal courses, creating technical skills gaps in the country as a direct consequence.

¹⁰(Desta, 2018); (Job Creation Commission of Ethiopia, 2019); (Le Mat, 2020)

Box 6: Focal Areas for Job Creation and Skills Gaps in those Focal Areas (2020-2025)

Areas with strong employment prospects	Skills gaps in focal areas
<p>Horticulture Poultry Agro-processing</p>	 <p>Agriculture, Forestry and Fishing</p> <ul style="list-style-type: none"> · Harvest-handling techniques · Seed production · Crop production methods · Feed production studies · Animal sciences · Butchering
<p>Agro-processing CTFL Construction equipment</p>	 <p>Manufacturing</p> <ul style="list-style-type: none"> · Food processing science · Beverage processing sciences · CTFL machine operating skills · Construction equipment manufacturing
<p>Site examination Construction design</p>	 <p>Construction</p> <ul style="list-style-type: none"> · Draughting · Engineering processes · Site inspection skills · Woodwork · Metalwork · Finishing (flooring, tiling, roofing and so forth)

This synthesis provides direct areas of intervention which will curb existing skills gaps in the country under the three sectors pointed out as showing strong signals of labour demand according to the quantitative analysis.

It bears mentioning that stakeholders mentioned the need to also bolster skills in the education and ICT sectors in Ethiopia as well. Because quality education is critical for the production of quality graduates, it is important that this space is also focal. This focus on improving pedagogy should be complemented focusing on producing graduates to work in the ICT industry, which enables all other economic sectors (without information technology, productivity would decline drastically in the country).

However, although both of these sectors are extremely critical for the success of Ethiopian development going forward, our own analysis has sought to provide SIFA with 3 economic sectors which show strong signals of increased labour demand in the near future. Given our evidence, the education and ICT industries (the latter, housed in the Transportation, Storage and Communication sector) are extremely small and are unable to provide a large amount of employment opportunities for the youth in the country in the short- to medium-term. Therefore, the ensuing conclusions deal with only those 3 sectors prioritised by the labour demand analysis.

8 Labour demand and Labour supply conclusions

Ethiopia has been characterised by historically high levels of economic growth, being seen as an African economic success story by many. That said, there are still many areas in the Ethiopian labour market which prove to be a challenge for policy makers to understand and improve upon (especially, the low level of skills in the country that is slowing the transition into complete industrialization).

Considering the labour market as it is, the analysis of various forecasts suggest that focus should be placed on the Agriculture, Manufacturing and Construction sub-sectors, as the National Development Plan of Ethiopia points out as well. However, because there are skills shortages in these sub-sectors, interventions within these spaces should aim to improve the fit between the employees aiming to be employed in those sectors and the needs of the employers in the country.

First and foremost, the agriculture sector in Ethiopia is highlighted as having 3 focal areas which will drive employment in the next 3-5 years, namely:

1. Horticulture,
2. Poultry, and
3. Agro-processing

In the horticulture space, though, key skills gaps exist which impede the progress of the industry. More concretely, producing graduates with knowledge in seed and crop production, as well as in harvest-handling techniques is required. From the poultry perspective, students having studied animal sciences seem to be extremely employable. However, there is a current shortage of individuals with this knowledge. Beyond animal sciences, seed and grain production, as well as butchering techniques are key to the success of the poultry value chain. Currently, there are skills gaps in these areas as well which warrant bridging.

Of course, the most pertinent skills gap in the case of agriculture (and manufacturing) is agro-processing. This cross-cutting industry relates specifically to growing or raising produce, and moving it “from farm to table”. The Jobs Creation Commission of Ethiopia directly highlights skills deficiencies in the food and beverage manufacturing industry. A similar finding can be made for the manufacturing sector- because the Ethiopian economy is striving to implement technological changes in the agriculture and manufacturing sectors, technical expertise on manufacturing machinery in the country is far below where it should be. This relates, not only to

agro-processing techniques, but also to the manufacturing and processing of clothing, textiles, footwear and leather products an area in which Ethiopia is aiming to increase its trade in the coming years.

This is a relatively low-hanging fruit as a means to intervene, because up-skilling low-skilled workers who have very little education in the practical, machine-use of manufacturing is far easier than trying to move those same people into obtaining an advanced tertiary education. This sort of technical qualification coming from the TVET system in Ethiopia is, however, still not well matched to the needs of employers, and the need for

- Draughting
- Technical engineering
- Site inspection skills (particularly, Safety, Health, Environment and Quality- SHEQ- practitioners)
- Wood- and metal-work, and
- Finishing (i.e., flooring, tiling, roofing, etc.)

Again, though, the issue of practicality needs to be brought to mind. Because many find that the TVET institutions in Ethiopia are currently providing more theoretical than technical education, a concerted

effort needs to be made to provide access to tools and machinery used in the workplace of Ethiopians today. Out of date tools and a lack of practical training lead to mismatches between what employers require, and what potential employees are able to provide in terms of expertise. Although resourcing is not easy, providing learnerships to individuals and linking TVETs to private sector businesses will alleviate some of these mismatches and allow potential graduates to obtain practical skills rather than just theoretical knowledge.

It is with this technical aspect of training that the demand for moderately to highly skilled labour in these three Ethiopian sectors can be better matched with a more adequately skilled supply of labourers, who will then be able to implement development targets more effectively in the country in the coming years post COVID-19.

Appendix 1 Validation Cliff Notes

The following is a summary of the minutes taken during the validation meeting with stakeholders in Ethiopia:

Minutes SIFA Macroeconomic and Labour Market Sector Analysis Study Validation Workshop Ethiopia

Date: 23 July 2020 | Presentation: Michele Capazario (DNA Economics) | Facilitation: Erick Sile (SIFA)

Participants in attendance:

1. Kalkidan Tadesse (Ministry of Science and Higher Education)
2. Marangoni Ludovica (GIZ)
3. Naomi Lintini (ILO)
4. Nicholas Ouma (AUC)
5. Grace Obeda (AfDB)
6. Tekestebirhan Hailemelekot (GIZ)
7. Bizuneh Debebe
8. Dr Hagos Tesfaye
9. Alemayehu
10. Lars Fiechel (GIZ)
11. Essete Abebe (SIFA)
12. Dagmawit Tilahun (SIFA)
13. Ernst Hustaedt (SIFA)
14. Unami Mpofu (AUDA-NEPAD)
15. Erick Sile (SIFA)
16. Sabine Klaus (SIFA)
17. Zarina Khan (SIFA)
18. Tiego Legodi (SIFA)
19. Michele Capazario (DNA Economics)

PURPOSE

Initially planned to take place in Ethiopia, this workshop was organized virtually on 23 July 2020, because of the current pandemic which makes traveling across borders impossible. To finalize the draft reports shared with stakeholders, this workshop sought to gather the following information for the finalization of the report:

1. Validation of assumptions made by Researchers;
2. The report's meaning and usefulness in relation to the National Development Plan and what is seen in the field;
3. Likelihood of the priority sectors highlighted in the report to enhance employability in a post COVID-19 environment;
4. Skills needed at country level in the identified priority sectors.

PRESENTATION

The consultant presented the methodology used to rank the sub-sectors. The projection of GDP growth and employment growth relied on economic data over the last 10 years, up to 2018. This data, obtained mostly from the National Bureau of Statistics and other international organizations such as ILO and The World Bank, went through an initial validation process at country level. The economic model used to rank the sub-sectors used a weighting system relying on the following indicators:

- Historical employment and GDP growth;
- Forecasted employment and GDP growth taking into account the potential impact of COVID-19;
- Employment elasticity of output;
- A sub-sector's prevalence in the literature with regards to government priorities;
- A sub-sector's susceptibility to COVID-19 as found in the literature,
- The persistence of an economic shock of the COVID-19 type at a sub-sector level (i.e., how long it takes for a sector to at least slightly recover from an economic shock), and
- Whether the sub-sector is gender-equitable by means of either:
 - An increasing trend of female employment between the historical and forecasted periods, or
 - Employing a female-majority workforce.
- According to the forecasting model, the following three sub-sectors are likely to benefit most from interventions aimed at improving labour market prospects for those entering the labour market:
 1. Agriculture, Forestry and Fishing;
 2. Wholesale;
 3. Construction

Discussions

At 2%, unemployment in Ethiopia is low, one of the lowest on the continent. Self-employment and under-employment are the likely reasons for this low unemployment rate, translated in the field by high vulnerability and poverty. Also, a large majority of Ethiopians who have not completed secondary education (about 74%) come from a very low skills base and are mostly self-employed or underemployed. To ensure decent employment for most Ethiopians, support to entrepreneurs and development of incubators are some of the ways to increase income for those in self-employment.

The report does not really delve into how to solve issues of high underemployment as its whole intent is to give high level information on economic sub-sectors. However, a sector deep-dive will provide recommendations to address specific skills mismatch.

The report does not highlight which specific skills are needed in the various sub-sectors to address skills required by the demand side. However, it is generally admitted that ICT knowledge and education, although not listed as key priority sectors, are cross-functional and would boost growth in other sub-sectors such as agriculture, manufacturing and construction.

It was noted during the discussions that the ICT sector is very small in Ethiopia and the training, often theoretical, does not produce enough experts to accelerate the pace of e-commerce which is picking up in other East African countries. Because technology could be used in other sub-sectors, it is a perfect time to invest in the digital economy. This would imply re-evaluating the types of jobs needed,

assessing how to train people for new jobs, and re-skilling the workforce. Partnerships between TVETs and the private sector need to be created to help fill the existing skills gaps.

As is the case in many African countries, investments in the education sector will help create the manpower necessary to bring solutions to unemployment problems. In the particular case of Ethiopia where the vast majority of the population does not have a high school degree, it came at a surprise to some participants in the workshop that education is not listed as a key priority sub-sector. The size of the education sector in terms of GDP contribution is probably the reason for its low ranking in the list of priority sub-sectors. However, as with ICT, education is an enabler which will facilitate growth in other sectors. Therefore, the report will be updated to include a section discussing the role of education, particularly in reskilling/upskilling people in the informal sector. Training the informal sector workforce will have direct implications on increased income and productivity.

The “Accommodation and food” sub-sector was growing rapidly pre-COVID-19 and is no longer considered a priority sector post-COVID-19 not only because not much demand is anticipated in the short term, but also because it will take an estimated two to three years for the sector to recover.

The general feedback from participants is that the report’s recommendations are very useful and will contribute to guiding actions of the newly created Ministry of Science and Higher Education, which oversees TVETs in Ethiopia.

Way forward

1. A section will be added in the report to discuss the role of education and IT in the Ethiopian context;
2. A sector deep-dive analysis into the key priority sectors will reveal specific occupations in need, providing recommendations on training required to meet existing demand in the private sector;
3. Final report including more supply side information and recommendations to bridge the skills gap will be shared with all stakeholders.

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