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Assessing the Short-term Impacts of COVID-19 on Ethiopia's Economy

External and domestic shocks and pace of recovery

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ABSTRACT

In this paper, we analyze the economic impacts of response measures adopted in Ethiopia to curtail the spread of the COVID-19 pandemic. We carry out simulations using an economywide multiplier model based on a 2017 Social Accounting Matrix (SAM) for the country that properly depicts interactions between economic agents. The pandemic's impact on the global economy combined with disruptions it causes in Ethiopia represents a large, unprecedented shock to the country's economy. In such situations, a SAM-based multiplier model provides an ideal tool for measuring the short-term direct and indirect impacts of a shock on an economic system since there is limited room for proper adjustment of economic decisions. We model the seven-week partial lockdown policy implemented in Ethiopia from mid-March to early May 2020. We also consider two possible economic recovery scenarios that may emerge as the COVID-19 control policies are relaxed during the latter part of 2020 in order to generate insights on the potential continuing impact of the virus at the end of 2020.

Although the country took early swift measures, our assessment of the partial lockdown measures suggests that they were not as strict as those observed in other Africa countries. Accordingly, our estimates of the economic costs of COVID-19 on Ethiopia are significantly lower than those reported for other countries on the continent. We estimate that during the lockdown period Ethiopia's GDP suffered a 14 percent loss (43.5 billion Birr or 1.9 billion USD) compared to a no-COVID case over the same period. Nearly two-thirds of the losses were in the services sector. Although no direct restrictions were imposed on the agriculture sector, which serves as the primary means of livelihood for most Ethiopians, the sector faced a 4.7 percent loss in output due to its linkages with the rest of the economy. Poor export performance due to a slowdown in global trade and restrictions on the transport sector also partly explain the decline in agricultural output. The broader agri-food system also was affected considerably because of its linkages with the rest of the economy. In terms of the welfare of Ethiopians, we estimate that the economic impacts during the lockdown caused 10.1 million additional people to fall below the poverty line.

These findings have implications for better understanding the direct and indirect impacts of COVID-19 and for policy design during the recovery period to return Ethiopia's economy to a normal growth trajectory and to protect the livelihoods of the most vulnerable in the process.

EXECUTIVE SUMMARY

With the outbreak of the COVID-19 pandemic in the absence of effective vaccines or other curative medication, countries have resorted to preventive measures to reduce transmission of the virus, such as social distancing, travel restrictions, and economic lockdown policies. However, the economic costs of these response measures are predicted to be high, especially in low-income countries and for poor individuals when their day-to-day livelihoods are disrupted. The global nature of the pandemic also limits the size of international support flows to poorer countries to mitigate the socioeconomic effects of COVID-19. National and global COVID-19 response measures are expected to cause substantial disruptions to demand trends, domestic and international supply chains, tourism revenue, foreign direct investment, and private remittance flows.

In this study, we examine several domestic and global channels through which COVID-19 can affect the Ethiopian economy using a Social Accounting Matrix (SAM) multiplier modeling approach. This economywide model framework is suited to measuring short-term impacts of unanticipated, rapid-onset shocks. Our results show that Ethiopia's partial lockdown, which started in mid-March 2020, likely caused GDP to fall by 14.3 percent or 1.9 billion USD over the seven-week lockdown period modeled relative to the GDP expected for the same seven-week period under a no-COVID scenario. These estimates for Ethiopia of the economic impact of COVID-19 related response measures imposed are among the lowest estimated across several countries in sub-Saharan Africa in which such COVID-19 related modeling scenarios were run. The lower impact estimated for Ethiopia is likely due to the country not implementing quite as strict lockdown measures as were imposed in many of the other countries. Given the sorts of policy measures implemented in Ethiopia during the partial lockdown period, the closing of hotels, bars, and restaurants was the measure that had by far the largest effect on the economy, accounting for 28.2 percent of the fall in GDP. Falling export demand was the second most important factor, explaining 22.0 percent of the reduction in Ethiopia's economic output.

Most of the economic costs of the partial lockdown measures are found in Ethiopia's service sector as well as in some manufacturing activities. Whereas the agricultural sector was largely exempt from lockdown measures, linkages to the more adversely affected services and industrial sectors and external shocks caused an estimated 10.6 percent loss in value-added in the agri-food system, which constitutes agriculture, agro-processing, food services, and food trade and transport services. This result demonstrates the strong linkages between economic sectors and the general equilibrium nature of the effects of COVID-19 on the economy. The employment effect of the COVID-19 shock is also considerable, particularly since it strongly affected labor-intensive self-employment, particularly in urban centers.

Following the gradual relaxation of the COVID-19 related restrictions that were in place in March, April, and May, the Ethiopian economy is now rebounding. The overall economic cost of the pandemic depends on the pace with which the restrictive measures are eased. To provide an assessment of the economic effects of COVID-19 over time, we establish a faster recovery scenario and contrast it to a slower recovery scenario. Our faster recovery scenario is characterized by strong economic rebound post-lockdown and a return of the Ethiopian economy to near normal conditions by the end of 2020. The slower recovery scenario points toward a more modest rebound with economic activity remaining at below pre-COVID levels by December 2020.

Annual GDP is estimated to slow down by 4.0 percentage points in 2019/20 and by between 2.4 and 2.9 percentage points during the 2020/21 fiscal year. Prior to the pandemic, the predicted short-run GDP growth rate for Ethiopia was 7.4 percent (AfDB 2020). In monetary terms, real GDP is estimated to decline by a cumulative level of around 2.4 billion USD by the end of the 2019/20

fiscal year, i.e., June 2020. This decline is due to the combined impact of domestic COVID-19 control measures and external shocks on trade and remittance flows. However, the economic growth paths for the faster and slower recovery scenarios diverge slightly with cumulative GDP losses by the end of the second quarter of fiscal year 2020/21, i.e., December 2020, estimated at 2.9 billion USD under the faster recovery trajectory and 3.3 billion USD under the slower trajectory.

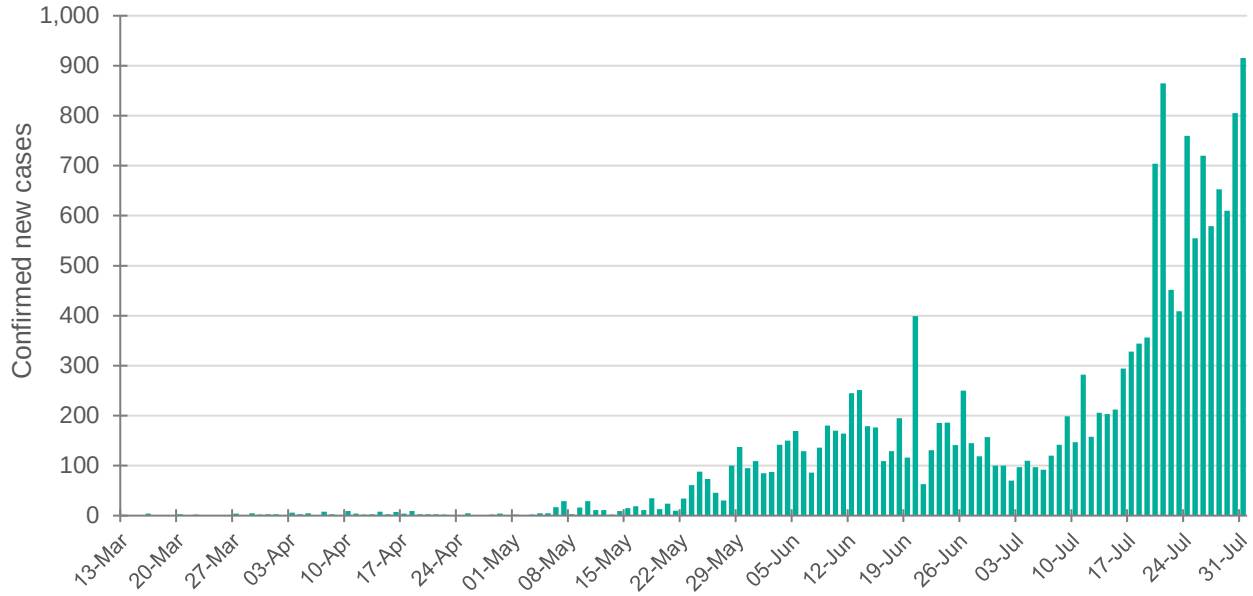
We also find that income losses to households during the partial COVID-19 lockdown period are substantial, ranging from 9.8 percent for the poorest households to 15.7 percent for the highest income households. These income losses are estimated to cause around 10.1 million Ethiopians to temporarily become poor, resulting in an increase in the national poverty headcount of 8.8 percentage points. This rise in poverty suggests the need for well-directed relief measures that would support the welfare of the most vulnerable. The modeling results show that many poor households will remain adversely impacted by COVID-19 related shocks at the end of 2020, although the poverty rate gradually stabilizes as restrictions are relaxed and the economy recovers.

This study does not consider the impact of any COVID-19 relief measures, but the Government of Ethiopia, in collaboration with various economic stakeholders and development partners, is already implementing several support measures that are aimed at providing social protection and revitalizing the economy. The design and implementation of these policies and programs will be critical to mitigating the negative impacts of COVID-19 and determining the speed of the economic recovery. A follow-up study will examine how each of a range of measures would help the economy recover. The results of this follow-up research will provide guidance on how best to prioritize investments for optimal economic outcomes as Ethiopia recovers from the COVID-19 pandemic.

1. INTRODUCTION

The COVID-19 pandemic has become a global health and economic challenge since its outbreak in December 2019. To date, more than 34 million people have been diagnosed with the virus worldwide, with over 1 million deaths (WHO 2020). To reduce the humanitarian and economic impacts of the pandemic, countries introduced various degree of response measures. Like many other African countries, the virus starts to spread to Ethiopia in early March. The government then took several preventive measures to contain its spread. Whereas these measures have been critical in containing viral transmission and the potential for widespread economic and human losses in Ethiopia, cases have increased since the first case was identified on 13 March 2020 (Figure 1.1). Between the diagnosis of the first case and 30 September 2020, the virus infected more than 76,000 people in Ethiopia and killed more than 1,200 (WHO 2020).

Figure 1.1: Daily cases of COVID-19 reported in Ethiopia, 13 March to 31 July 2020



Source: Data from Worldometers.info (2020)

The pandemic poses an unprecedented shock to the world economy both directly and as a result of the response measures countries have adopted, including partial or full shutdowns of economic activities, which simultaneously affects both domestic and global value chains. Combined with the global effects, national measures have considerable unavoidable impacts on household incomes and livelihoods and on the wider economy. Although the domestic response measures in place in Ethiopia are not as strict as those imposed in some countries in Africa, when coupled with the external economic impact channels, massive disruptions could be seen in various sectors and in the economy in general. Understanding the nature of these impacts is the first step to designing appropriate policy responses and relief measures that target the most vulnerable, aid in economic recovery efforts, and return the economy to its pre-COVID growth trajectory. This paper utilizes a Social Accounting Matrix (SAM)-based multiplier model to provide a rapid assessment of the economic and welfare effects of the COVID-19 pandemic in Ethiopia. In line with previous studies that indicate that the pandemic affects sectors and segments of the society differently (Andam et al. 2020; Goshu et al. 2020; Zhang et al. 2020), this study provides a careful identification of the relevant impact channels. We also provide recommendations on potential areas of intervention to limit the economic effect of the pandemic.

The insights from this study should be looked at against several caveats behind the analysis. First, we simply provide an analysis of the anticipated economic impacts associated with COVID-19 and the response measures that are targeted at reducing viral transmission, without accounting for the relief measures and behavioral responses by economic agents to changes in the socio-economic conditions facing them. Second, assumptions made on the size, nature and directions of the sectoral shocks are second best and are evolving. Third, other policies and reform measures unrelated to COVID that are being taken by the government are unaccounted for, but could significantly determine the recovery dynamics of the economy.

The paper is organized as follows. In the next section, we describe Ethiopia's principal response measures to contain the transmission of COVID-19. Next, we describe the methods and data used in the modeling analysis. We then present the results of the study. We conclude with key insights from our results and consider what additional analyses are needed to deepen our understanding of the economic impact of the virus in Ethiopia and how to the economy might rapidly recover.

2. ETHIOPIA'S RESPONSES TO COVID-19

The first case of infection was recorded in Ethiopia on 13 March 2020 – just two months after the first confirmed case outside of China on 13 January 2020. Since then through end-September, the country recorded 76,000 COVID-19 cases with 1,204 causalities. The first COVID-19 related death was recorded on 5 April. In mid-October 2020, there were over 43,000 active cases.

Table 2.1: Policy measures taken in Ethiopia to contain COVID-19 transmission between mid-March and early May 2020

Date	Policy measure
13 March	First confirmed COVID-19 case in Ethiopia.
16 March	Authorities closed schools across the country and banned all public gatherings, including sports.
20 March	Ethiopian government announced that Ethiopian Airlines would suspend flights to 80 destinations.
23 March	Prime Minister suggested that aid package announced in early March would be increased to 5 billion Birr (154 million USD).
	Measure introduced to put all arriving passengers to a 14-day mandatory quarantine.
	Country closed its land borders to nearly all human traffic.
27 March	Ethiopia's National Bank announced plans to inject 15 billion Birr (456 million USD) as liquidity for private banks.
30 March	Regional authorities ban public transportation, a measure which was later relaxed.
31 March	Postponement announced of Ethiopia's parliamentary election. Originally scheduled for August, postponed to such a time as when the pandemic is no more a health threat.
2 April	To help Ethiopia mitigate the effects of COVID-19, World Bank approved 82.6 million USD (half grant; half credit) from the International Development Association.
3 April	Prime Minister's office announced a COVID-19 Multi-Sectoral Preparedness and Response Plan, which will require 1.64 billion USD in funding.
5 April	Ethiopia confirms first COVID-19-related death from local community spread.
8 April	Prime Minister declared nationwide state of emergency that gives government the mandate to take measures to further curb the transmission of the virus.
	Ethiopia's cabinet approved a loan of 54.9 million USD from the Africa Center for Disease Control and Prevention.
13 April	Authorities implement door-to-door screening in Addis Ababa. Later extended to cities in other regions.
30 April	Executive **B**oard of the International Monetary Fund approves 411 million USD in emergency assistance to Ethiopia to address the COVID-19 pandemic.
2 May	To stimulate the economy, government introduced tax waivers and cost sharing measures that amount to 78 billion Birr in order to benefit the 80 percent of businesses affected by COVID-19.

Source: Authors, based on announcements issued by several institutions

Although not at the level of some African countries, such as Rwanda and Nigeria, Ethiopia introduced a range of response measures to contain the spread of COVID-19 (Table 2.1). The first

set of measures were introduced by the Office of the Prime Minster on 16 March and included the closure of schools, banning of public gatherings, and restrictions on sporting activities, bars and entertainment outlets, and hotel and restaurant services. To limit cross border transmission of the virus, Ethiopia also suspended many of the scheduled flights of the national carrier, Ethiopian Airlines. In addition, passengers entering the country through all borders were forced to undergo a 14-day mandatory quarantine. Authorities also closed all land borders, and federal and regional governments put restrictions on inter-city transport. Public transport providers were required to operate at passenger loads of under half-capacity. As these measures could have far reaching implications for economic performance, in our analysis here we consider the imposition of these control measures to limit spread of the virus as the start of an economic 'lockdown' that extended for several weeks.

However, despite these restrictions, after the first COVID-19 related local death on April 5 government declared a state of emergency that gave it the mandate to take further measures to curb transmission of the virus (IMF 2020). These included door-to-door health screening in Addis Ababa and surrounding areas, later extended to cities in other regional states. It is now over seven months since the pandemic began in Ethiopia. Some of these control measures have now been relaxed, even though the spread of the virus is not showing any sign of slowing down.

There are several pathways through which the COVID-19 control measures may affect the economy. Restrictions on population movement and transportation may affect the ability of people to carry out their normal economic activities at service delivery sites, production facilities, administrative offices, and marketing outlets. Logistics in supply chains that are essential to accessing raw materials, intermediate inputs, and product markets will also be affected. In addition, declines in global trade and remittance flows is predicted to have considerable economic impacts, since both play critical role in the Ethiopian economy. However, the response measures and external shocks have not been applied uniformly across all sectors of the Ethiopian economy. Consequently, each economic impact pathway needs to be considered at sectoral and activity level.

In addition to imposing restrictions, the government also has designed and implemented several relief measures. Ten days after the first COVID-19 case, the government announces a stimulus package of 5 billion Birr (154 million USD) to build resilience against the virus and to mitigate its potential socio-economic impact (IMF 2020). The central bank also committed to inject 15 billion Birr (456 million USD) as added liquidity for private banks so that they could help businesses relax the financial constraints they were facing. To support local business that may have been affected by the pandemic, the government of Ethiopia also announced tax relief amounting 78 billion Birr. To support the government's efforts to halt the spread of COVID-19, the World Bank agreed to provide 2.64 billion Birr (82.6 million USD) worth of support (Ministry of Finance 2020). At the same time, the International Monetary Fund approved a 411 million USD emergency assistance package for Ethiopia. Finally, the Prime Minister's office released a COVID-19 Multi-Sectoral Preparedness and Response Plan, which will require 1.64 billion USD in funding.

Although the country has embarked on these relief and recovery interventions, our SAM-based multiplier study only focuses on modeling the short-term economic impacts of both domestic and global restrictions aimed at containing the spread of the virus. Although Ethiopia has not yet put in place the strict lockdown measures seen in some countries in Africa, we consider the measures that were put in place between mid-March and early May as our lockdown scenario. The restrictions were enforced to different degrees across the nation. However, due to lack of clearer information, we assume in working with our model that the measures had nationwide coverage.

3. SIMULATING THE ECONOMIC IMPACTS OF COVID-19

3.1. Social Accounting Matrix multiplier model for Ethiopia

This study applies a Social Accounting Matrix (SAM) multiplier model approach to analyze the short-term economywide impacts of COVID-19 on the economy of Ethiopia. SAM multiplier models have been one of the most widely used tools to study the economywide effects of policy and exogenous shocks and their impacts on output, income distribution, and welfare. As indicated, the COVID-19 pandemic is expected to affect Ethiopia's economy through several distinct domestic and external channels. Analysis of the overall economic impact of such shocks at a national level requires an economywide approach.

SAM-based models are particularly well-suited to measuring short-term direct and indirect impacts of unanticipated shocks, such as those associated with COVID-19. With COVID shocks being unexpected, quite sudden, and at a high level of severity, it is unlikely for the economy to fully adjust to the shock in the short term through smoothly changing relative commodity and factor prices. In such cases, fixed-price multiplier models have proved appropriate. Accordingly, this study applies a multisector income multiplier model previously piloted in a number of countries in Africa (Baulch et al. 2020; Andam et al. 2020; Amewu et al. 2020) and now built on the Ethiopian SAM data.

Earlier reduced variants of SAM multiplier models are input-output multipliers from input-output models. SAM multipliers are derived using the same procedure as input-output multipliers. With the endogenous accounts of an enlarged SAM denoted by y, exogenous accounts by g, and the square matrix representing the direct propensities by $\mathrm{A_a}$, the vector of endogenous accounts y in the SAM-based income multiplier model can be computed as:

$$\mathrm{y} = \mathrm{A_a y} + \mathrm{g} = (\mathrm{I}\text{-}\mathrm{A_a})^{-1}\mathrm{g} = \mathrm{M_a g}$$

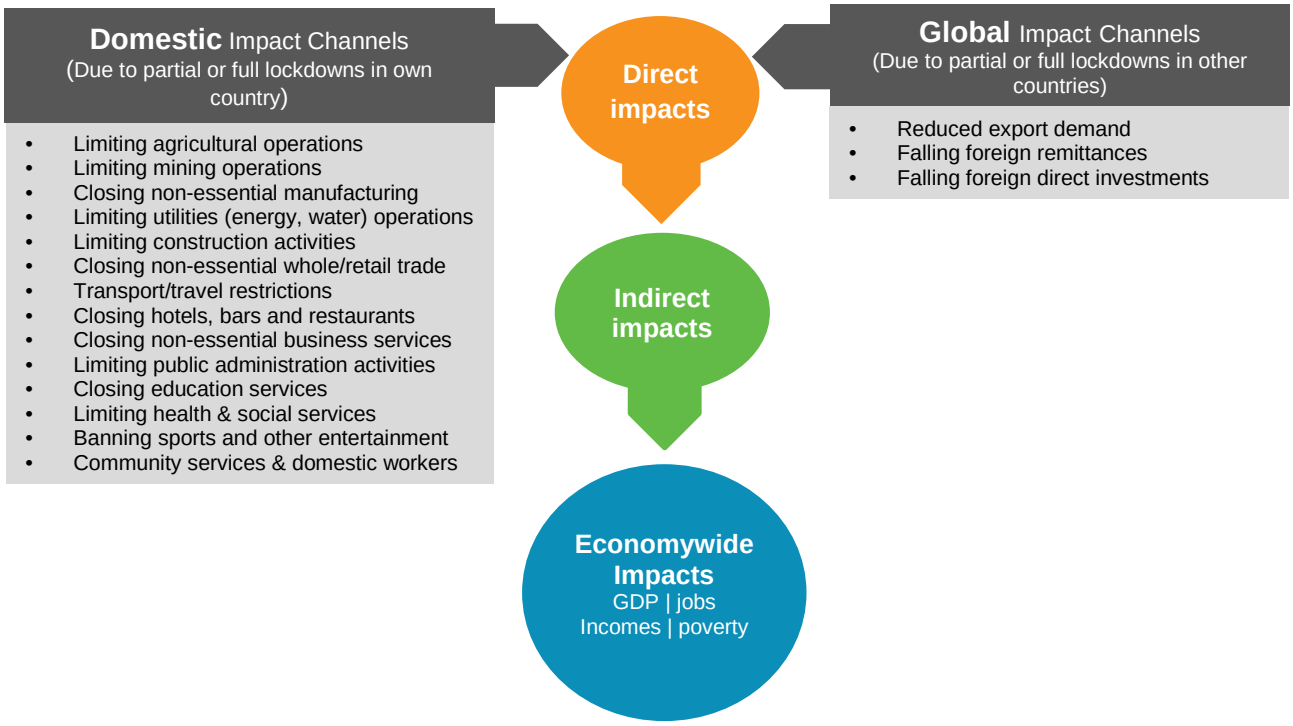
where $\mathrm{M_a}$ is the SAM multiplier matrix with $\Delta \mathrm{y} = \mathrm{M_a} \Delta \mathrm{g}$. The SAM-based quantity model assumes that prices are fixed; hence they are also called fixed-price models.

In this study, we used a 2017 SAM for Ethiopia that captures resource flows associated with economic transactions taking place in the economy, showing the interlinkages and relationships between all economic actors, i.e., productive activities, households, firms, government, and the rest of the world. The Ethiopia SAM includes 79 production sectors and 80 commodity types. The production sectors employ eight types of labor classified by residence (rural or urban) and skill levels and combines them with a single land and three capital factor types. Factor incomes are distributed to 15 representative household types classified by residence and income quintiles. Households spend their incomes on consumption, transfer to other households, pay taxes, and save the balance. The government receives taxes and makes expenditures, including transfers to households. There are also several tax accounts as well as the rest of the world account in the 2017 Ethiopia SAM.

In the SAM multiplier model, the shocks associated with COVID-19 are imposed in the simulations at detailed sector levels, taking into consideration their economywide interlinkages. We consider two main channels for the economic effects of COVID-19 (Figure 3.1): (a) a set of shocks induced by external factors, and (b) a set of shocks emerging from local lockdown measures taken to contain viral transmission. The external shocks are further categorized into shocks to export demand resulting from exogenous decreases in demand from the rest of the world for the country's exports; and, secondly, declines in remittance inflows resulting from slowdowns in economic activities in the host countries of Ethiopian immigrants. In the SAM multiplier model, both external and domestic shocks are modeled on the demand side in a manner that then lowers the supply of goods and services produced in the affected sectors directly and indirectly through sectoral

interlinkages. Hence, output in sectors that are not directly affected by either of the external or domestic shocks could still be noticeably affected, particularly if input-output interlinkages for those sectors are strong.

Figure 3.1: Framework for analyzing COVID-19 in a SAM multiplier model



Source: Authors, adapted from IFPRI analyses of COVID-19 impacts on key countries and regions. See https://www.ifpri.org/COVID-19.

Useful as they are for shock analysis, SAM multiplier models have several limitations. The model lacks behavioral relationship, i.e., it assumes that technical input-output relationships, output choices of producers, and consumption patterns of households do not change in response to simulated shocks. Also, prices are assumed to be fixed, so all changes caused by the shocks in simulations are reported without a price effect. However, such fixed-price approaches are common in assessing short-term shocks in which the shock inhibits the ability of markets to adjust to a new equilibrium through endogenous price adjustment processes (Amewu et al. 2020).

3.2. Scenarios and assumptions

Already several months into the COVID-19 pandemic, we are aware of the actual response measures Ethiopia has undertaken to contain the spread of the virus. However, as new cases are occurring at an apparently faster rate, the pace of easing of any COVID-19 related restrictions over the coming months is not fully clear. Hence, to have a wider picture of the potential effects of the pandemic, we consider the following three main scenarios: (a) the period of the seven-week lockdown; (b) a faster recovery scenario post-lockdown, and (c) a slower recovery scenario post-lockdown. The faster recovery scenario assumes greater speed in the economy coming back to normalcy by the end of 2020. By contrast, the slower recovery scenario assumes only a modest rebound of economic activities by the end of the year with economic activity still remaining noticeably below pre-COVID levels. Both the faster and slower recovery scenarios assume comparable rates of easing for the period over which we already know what actions government has taken, i.e., through mid-September 2020. However, given the uncertainty of how the situation will evolve from September 2020, the recovery rates assumed under the faster and slower recovery scenarios thereafter are hypothetical. The detailed assumptions on the recovery scenarios are reported in Table 3.1.

Table 3.1: Recovery scenarios for Ethiopia's economy

Fiscal Year & Quarter	Month	Faster recovery	Slower recovery	Global shocks
2019/20 Q3	January to March	No shocks in pre-COVID-19 period		
2019/20 Q4	April	Seven-week lockdown period starts in mid-March		Decline in remittances and export demand
	May			
	June	Direct shocks eased by 20%	Direct shocks eased by 20%	
2020/21 Q1	July to September	Direct shocks eased by 50% (transport, hotels/bars & sports by 40%)	Direct shocks eased by 50% (transport, hotels/bars & sports by 40%)	Shocks reduced by 50%
2020/21 Q2	October to December	Direct shocks eased by 100% (some services by 90%)	Direct shocks eased by 90% (some services by 80%)	Shocks reduced by 75%

Source: Authors.
Note: We follow Ethiopia's fiscal year in setting up the recovery scenarios and estimating the impacts on GDP. Ethiopia's fiscal year starts on July 1 and ends on June 30.

In summary, our modeling exercise on the impact of the COVID-19 pandemic on the Ethiopian economy looks at a roughly seven-week period between mid-March and early May 2020of partial economic restrictions in the country. Both domestic and global shocks are simulated as shocks on final demand that lead to falls in the production of affected sectors. Further, the model estimates of the economic costs of the lockdown period are the effects in the absence of any policy responses the government might have taken. But, as indicated in our discussion of Ethiopia's response to the pandemic, the country designed several relief measures, including monetary policy stimuli, tax holidays, demand subsidy to households, mobilization of foreign assistance and lending, and several other macroeconomic policy interventions. Other policies and reform measures unrelated to COVID-19 that are being taken by the government are also not accounted for.

4. ECONOMIC IMPACT OF THE COVID-19 PANDEMIC

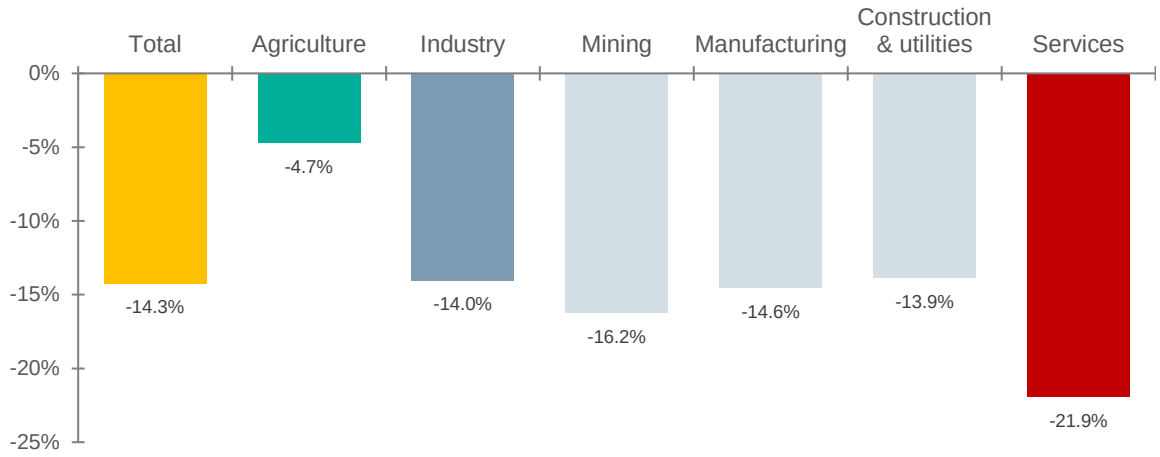
In this section, we report results from the SAM multiplier model scenarios for Ethiopia examining the economic impact of the COVID-19 pandemic. We first present the cost of the pandemic as a result of the relatively strict partial 'lockdown' measures. This will be followed by a discussion of the economic costs of the pandemic as the COVID-19 containment measures are relaxed as modeled by the two recovery scenarios. In presenting the results, we first focus on the aggregate impacts of the measures, such as on national GDP and aggregate sectoral GDP. The discussion of results is in comparison to a no-COVID (or normal) economic situation.

4.1. Economic impacts during the lockdown period

Impacts on total and sectoral GDP

In this section, we present the aggregate effects of COVID-19 on the Ethiopian economy as estimated using the SAM multiplier model. We then show the predicted effects on Ethiopia's agri-food system. Ethiopia's GDP is estimated to have fallen by 14.3 percent during the seven-week economic lockdown period compared to a no-COVID scenario (Figure 4.1). The lockdown affects different subsectors to varying degrees. The services sector GDP falls by 21.9 percent due primarily to large declines in the hospitality and trade sub-sectors. The industrial sector GDP also falls by about 14 percent, driven primarily by large declines in mining (16.2 percent). On the other hand, due to the absence of direct restrictions on the sector, agricultural GDP is estimated to have fallen only by 4.7 percent. Losses the agricultural sector experienced can primarily be explained by the sector's interlinkages with the rest of the economy and the direct effect of COVID-19 on global trade, which affected Ethiopia's agricultural exports.

Figure 4.1: Estimated change in total and sectoral GDP in Ethiopia's economy during seven-week lockdown period compared to a situation with no COVID-19 restrictions, percent

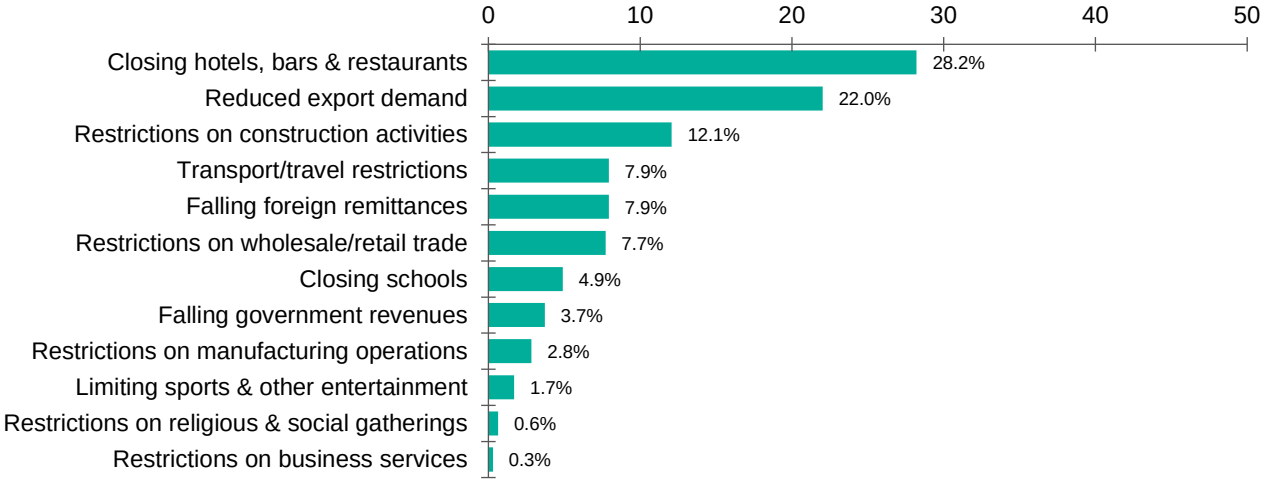


Source: Authors' calculations based on Ethiopia SAM Multiplier Model results

In line with the effects on GDP across sectors, we also find significant difference between sectors in job losses (see Annex). Our estimates show that the service sector faced the largest loss in employment during the lockdown period.

The role of the various impact channels on the economy during the economic lockdown differs (Figure 4.2). Each impact channel affects the economy directly as a result of the COVID-19 related policy measures and indirectly due to backward and forward linkages across sectors. Given the underlying nature of the control measures imposed during the seven-week partial lockdown as modeled, the closing of hotels, bars, and restaurants had the largest effect on the economy. This channel accounts for 28.2 percent of the overall 14.3 percent fall in GDP. The modeling results show falling export demand to be the second main channel, with restrictions on construction activities, a slowdown in transportation activities, falling remittances, and restrictions on wholesale and retail trade following in that order. As the economy is gearing towards recovery from the effects of the pandemic, the government, together with its development partners, will have to pay particular attention and offer targeted support to the sectors associated with these main channels through which the COVID-19 lockdown and related restrictions caused a sharp fall in Ethiopia's GDP.

Figure 4.2: Percentage contribution of key impact channels to GDP losses during the seven-week lockdown period, percent of total losses

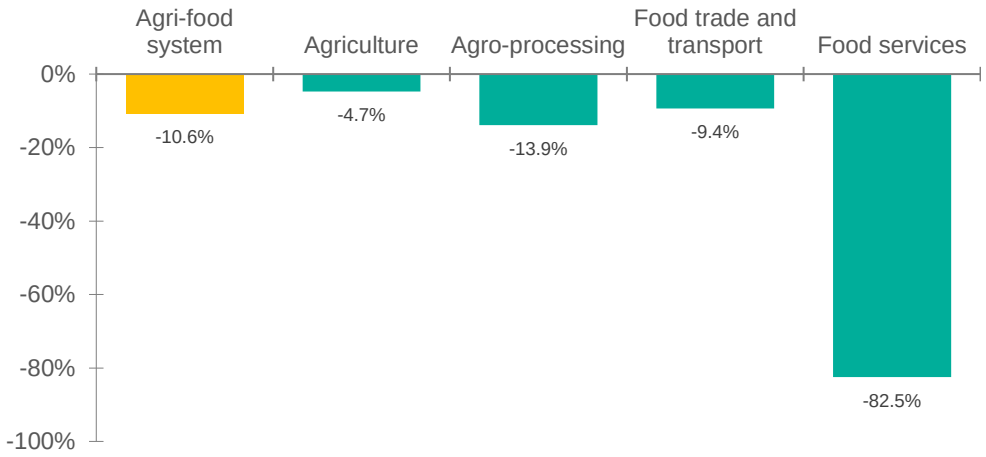


Source: Authors calculations based on Ethiopia SAM Multiplier Model results

Impacts on the agri-food system

The agri-food system (AFS) is defined here as comprising all economic activities, both downstream and upstream, related to agriculture, including agricultural production itself, agro-processing, food trade and transport, and food services. The Ethiopia SAM multiplier model captured the impact of COVID-19 on the country's AFS during the seven-week lockdown period modeled, again relative to a no-COVID situation during the same time period. Figure 4.3 shows a 10.6 percent fall in AFS GDP during the lockdown period. As noted, the decline in agricultural GDP – within the AFS – is modest at 4.7 percent. However, due to the size of the sector, it is one of the main contributors to the losses in monetary terms within AFS. Of the other AFS components, food services experienced the largest percentage decline in GDP at 83 percent, followed by agro-processing. Whereas food services experienced the largest relative losses among AFS sub-sectors, agro-processing is the smallest component of the AFS, so its contribution to total AFS losses in GDP was minimal.

Figure 4.3: Change in GDP of agri-food system and its components during the seven-week lockdown period compared to a situation with no COVID-19 restrictions, percent



Source: Authors calculations based on Ethiopia SAM Multiplier Model results.

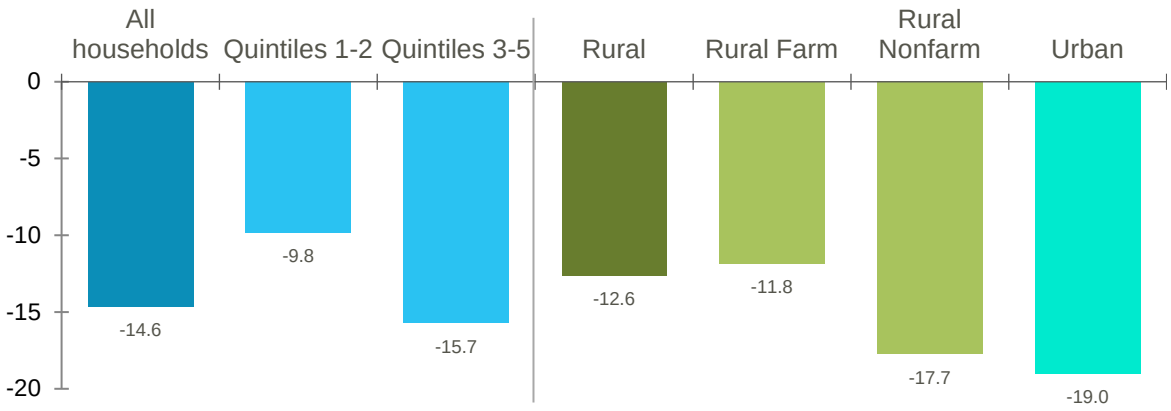
Impacts on household incomes and poverty

We expect considerable impacts on household incomes and poverty headcount during the lockdown due to the fall in economic activity and associated losses in jobs. The Ethiopian SAM multiplier model includes 15 household groups consisting of three major groups – rural farm, rural non-farm, and urban households – further disaggregated by welfare quintiles.

Figure 4.4 reports aggregate household income effects with the poorest two welfare quintiles combined as a group and the upper three quintiles as a separate group. We note several key results.

- Incomes of households in the top three quintiles are more adversely affected than are incomes for poorer households – incomes fell for wealthier households by 15.7 percent during the lockdown period. This finding is in line with findings from other African economies (Amewu et al. 2020; Andam et al. 2020).
- Incomes of urban households were affected more than those of rural households – incomes for urban households fell by 19.0 percent compared to 12.6 percent for rural households.
- Among rural households, incomes for rural non-farm households were affected more than for farm households – incomes fell on average by 17.7 percent for rural non-farm households.

Figure 4.4: Change in household income during seven-week lockdown period, percent



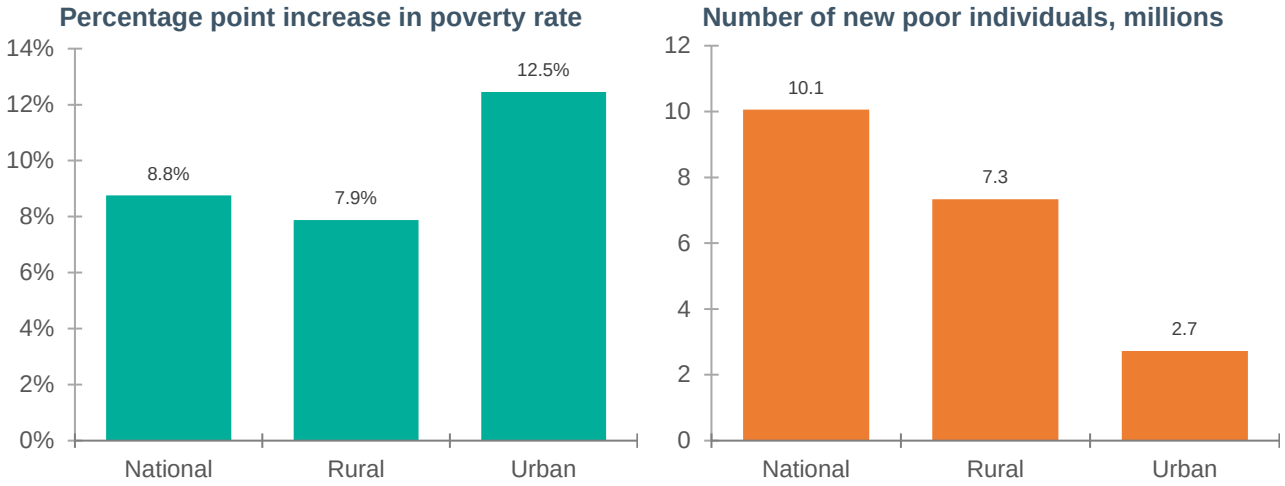
Source: Authors calculations based on Ethiopia SAM Multiplier Model results

These results are explained by the nature of the lockdown and the effects of the external impact channels for COVID-19 on the Ethiopian economy:

- Most economic activities that were shut down during the lockdown were in the services and industry sectors, which are principally located in urban areas.
- The export and remittance channels through which COVID-19 affects the Ethiopian economy have greater direct impacts on predominantly urban sectors, jointly affecting the livelihoods of those who are more dependent on non-farm activities.

As a result of these reductions in incomes, the simulation results indicate an 8.8 percentage point temporary increase in Ethiopia's national poverty rate. Urban areas saw a greater rise in the share of the population falling below the poverty line due to the lockdown than did rural communities (Figure 4.5). This temporary increase in poverty is equivalent to 10.1 million more people falling into poverty nationally during the seven-week lockdown period – 7.3 million more in rural areas and 2.7 million more in urban areas. These findings suggest that, even though Ethiopia did not impose as strict restrictions on economic activity as did many other countries in Africa, COVID-19 could still significantly reverse the gains in poverty reduction registered over the past few years, at least temporarily.

Figure 4.5: Change in poverty during seven-week lockdown period



Source: Authors calculations based on Ethiopia SAM Multiplier Model results

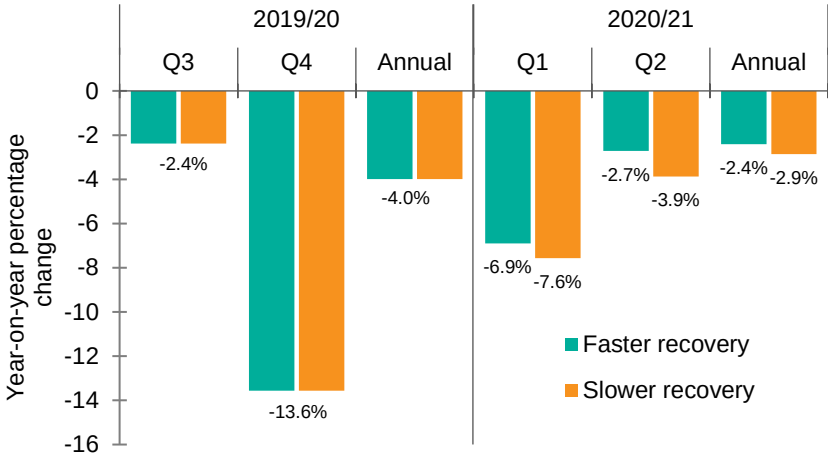
4.2. Economic impacts under faster and slower recovery scenarios

Even after several months of dealing with the COVID-19 pandemic, it remains difficult to predict how Ethiopia's economy will recover from both the domestic and the global shocks the pandemic has caused. We therefore consider two recovery scenarios: (a) a faster recovery where the economy quickly rebounds to a normal situation by the end of 2020 – i.e., quarter two of the 2020/21 Ethiopian fiscal calendar; and (b) a slower recovery pace where business operations are assumed to remain below pre-COVID levels by the end of 2020. We assume identical recovery trajectories for the period through early September as developments in both the domestic and global economic context are known up until this time. The two recovery scenarios differ from mid-September to the end of December (see Table 3.1).

Impacts on total GDP

The assumptions under the two recovery scenarios are reflected in our simulation results (Figure 4.6). These indicate identical GDP effects through the end of fiscal year 2019/20, with a 4.0 percent lower GDP than would have been achieved under a no COVID-19 case. Under the fast recovery scenario, Ethiopia's GDP in the second quarter of 2020/21 is expected to be 2.7 percent lower than under a no-COVID situation, whereas the economy will have 3.9 percent lower GDP under the slow recovery scenario. This means that the total production of Ethiopia's economy will be between 2.4 and 2.9 percent smaller than would have been the case without the COVID-19 pandemic. As highlighted earlier, across the different sectors of the economy, growth outlooks differ. However, generally the faster recovery scenario shows most sectors bouncing back towards normal condition more quickly. The employment effects across the two recovery scenarios are very similar to these GDP effects (see Annex).

Figure 4.6: Percentage change in total GDP under faster and slower recovery scenarios by quarter of the Ethiopian fiscal year

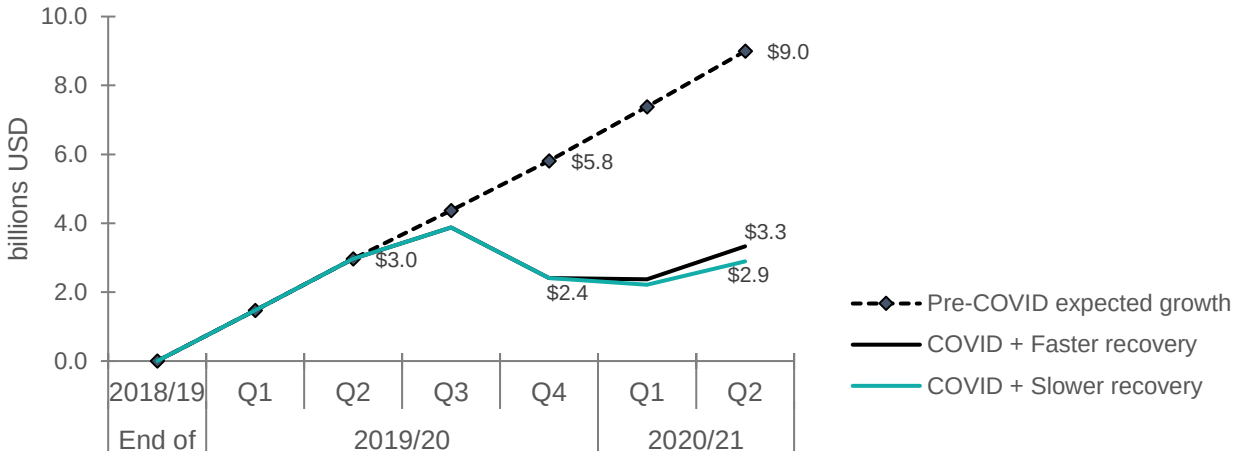


Source: Authors calculations based on Ethiopia SAM Multiplier Model results
Note: We follow Ethiopia's fiscal year that starts on July 1 and ends on June 30.

Figure 4.7 shows cumulative changes in GDP (in constant billions of USD) by quarter over the course of the 2019/20 and 2020/21 Ethiopian fiscal years. The broken line shows the projected growth rate of 7.4 percent for the 2019/20 and 2020/21 period under a no COVID-19 situation (AfDB 2020). This growth projection represents a gain in GDP per quarter of about 1.5 billion USD. As note in Table 3.1, COVID-19 is projected to have no impact on the Ethiopian economy during the first and second quarters of fiscal year 2019/20 and only a slight impact during the third quarter which runs between January to March 2020. With our assumption of identical recovery trajectory for the period through mid-September 2020, the two recovery scenarios have almost identical negative impacts for most of the period modeled. Hence, real GDP declines by around

2.4 billion USD at the end of quarter four of fiscal year 2019/20 due to the combined impact of domestic COVID-19 control measures and external shocks to trade and remittances. Thereafter, the growth paths for the faster and slower recovery scenarios slightly diverge with cumulative GDP losses of 2.9 billion USD and 3.3 billion USD, respectively, by the end of the second quarter of FY 2020/21 (December 2020). With the effect of COVID-19 spreading across two fiscal years and the country implementing only somewhat light restrictive measures, the cumulative gain in GDP remains positive throughout the period covered. However, relative to the without COVID-19 scenario, 5.7 billion USD of GDP is lost under the faster recovery scenario and 6.1 billion USD under the slower recovery scenario.

Figure 4.7: Cumulative changes in GDP from end of 2018/19 under two recovery scenarios by quarter of the Ethiopian fiscal year

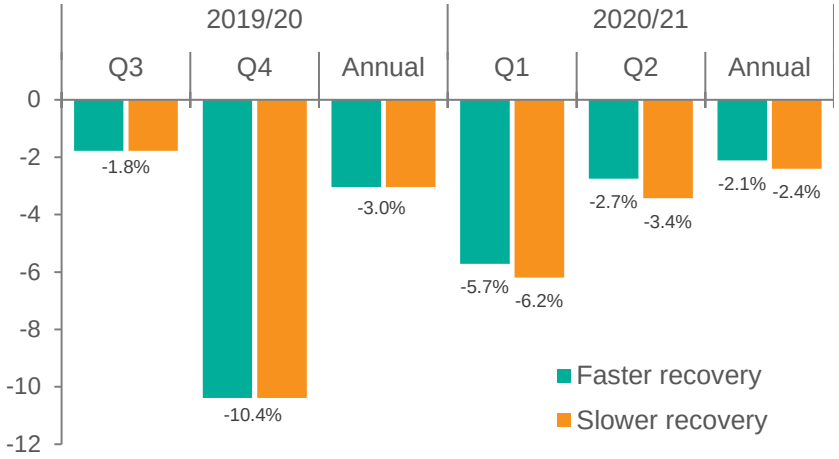


Source: Authors calculations based on Ethiopia SAM Multiplier Model results
Note: We follow Ethiopia's fiscal year that starts on July 1 and ends on June 30.

Impacts on the agri-food system

We also assess the impact of COVID-19 on the agri-food system under the two recovery scenarios. With the economy recovering through time and the relatively modest impact of the pandemic on agriculture, the effect on Ethiopia's agri-food system is expected to be modest.

Figure 4.8: Percentage change in agri-food system GDP under faster and slower recovery scenarios by quarter of the Ethiopian fiscal year



Source: Authors calculations based on Ethiopia SAM Multiplier Model results
Note: We follow Ethiopia's fiscal year that starts on July 1 and ends on June 30.

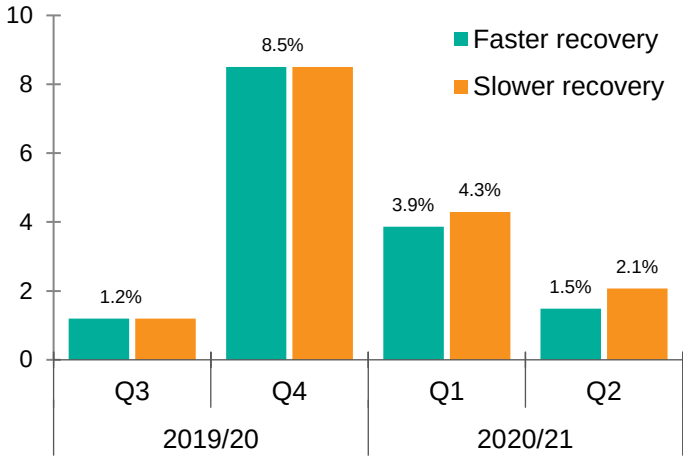
The simulation results show a 3.0 percent decline in AFS GDP by the end of fiscal year 2019/20 (June 2020) under both recovery scenarios (Figure 4.8). The sector is expected to face a 2.1 or 2.4

percent decline in GDP under the faster and slower recovery scenarios, respectively, by the end of 2020/21. With the agricultural, food services, and agro-processing sector GDPs expected to grow in a no-COVID situation by well above 3 percent, growth in AFS will remain positive through both the 2019/20 and 2020/21 fiscal years.

Impacts on household incomes and poverty

Changes in household income and employment (see Annex) due to COVID-19 are reflected in the poverty level for Ethiopia. Figure 4.9 reports the poverty effects post-lockdown throughout the first half of fiscal year 2020/21. After a rise in poverty by 8.5 percent in the fourth quarter of fiscal year 2019/20, the poverty rate is expected to stabilize by the end of 2020/21 with business operations reaching closer to normal operations and more people returning to work. Under a faster recovery scenario, the poverty rate is expected to increase by only 1.5 percent from the second half of September to the end of December 2020, compared to 2.1 percentage points under a slower recovery scenario.

Figure 4.9: Percentage point change in national poverty headcount rate under faster and slower recovery scenarios by quarter of the Ethiopian fiscal year



Source: Authors calculations based on Ethiopia SAM Multiplier Model results
Note: We follow Ethiopia's fiscal year that starts on July 1 and ends on June 30.

Our simulation results indicate a much smaller increase in poverty rates under both scenarios during the recovery period compared to during the partial lockdown period – those households adversely affected economically by the lockdown measures will start to again earn incomes. This income will be used to finance household consumption expenditure. Many households that fell into poverty during the lockdown will see their consumption level improve to above the poverty line as the economic recovery progresses.

However, our estimates of the changes in poverty should be viewed with caution since we disregard the potential consumption smoothing efforts of households either through dissaving or sale of assets. In addition, we do not track changes in consumption preferences by households as they optimize household expenditures to meet their basic needs under a constrained budget environment.

5. HOW DO ETHIOPIA'S ESTIMATES COMPARE WITH THOSE FROM OTHER AFRICAN COUNTRIES?

Similar SAM multiplier models have recently been employed to assess the impact of COVID-19 in a number of African economies. In this section, we compare these results for Ethiopia against estimates from those other countries.

Table 5.1 reports GDP losses during the COVID-19 lockdown period and the two recovery scenarios for seven African countries, including Ethiopia. Estimated GDP losses in Rwanda, Nigeria, and Ghana are considerably higher than are the estimates from Ethiopia. Rwanda and Nigeria imposed strict lockdowns stretching across most of the regions in each country, ultimately resulting in higher estimated losses in GDP. Malawi is the only country where the GDP loss estimated from the relatively loose social distancing measures taken there is lower than that estimated for Ethiopia.

Table 5.1: Simulated economic impacts of lockdowns and other COVID-19 restrictions in selected African countries

Country	Scenario	GDP loss during lockdown, percent	Annual GDP effects over four quarters, percent change	
			Faster easing	Slower easing
Ethiopia*	Seven-week partial lockdown	-14.3	-5.5	-6.4
Ghana	Three-week lockdown in urban centers	-27.9	-8.6	-12.3
Malawi	Two-month social distancing	-11.6	-4.0	-5.2
Nigeria	Eight-week lockdown across states	-37.6	-8.9	-17.1
Rwanda	Six-week lockdown	-39.1	-11.5	-16.4
Sudan	Three-month extended lockdown	-13.8 to -18.2	-4.8	-9.8
Senegal	Four week-lockdown	-20.3	-5.5	-7.4

Source: Authors compilation from Amewu et al. (2020); Baulch et al. (2020); Andam et al. (2020); Aragie et al. (2020); Abay et al. (2020); and Fall et al. (2020).
*The comparable four quarter GDP effects for Ethiopia under the fast and slower scenarios are roughly calculated since the four quarters of the COVID-19 period lie in two different fiscal years.

In most of these countries, the COVID-19 infection rate has continued to escalate after restrictions under the initial 'lockdown' period were relaxed. This suggests a possibility of new lockdowns and further restrictions being implemented in due course, possibly further pushing the costs of the lockdown measures specifically in countries that have so far adapted more relaxed restrictions, such as Ethiopia and Malawi.

It should be noted that the differences in estimates of the economic impact of COVID-19 restrictions are not only due to difference in the composition and magnitude of those restrictions but could partly be due to (slight) differences in model assumptions. There are also fundamental differences in input-output relationships across the country models that explain the specific structure of their economies.

6. CONCLUDING REMARKS AND NEXT STEPS

The government of Ethiopia instituted in March 2020 a set of restrictions on economic activity as part of its efforts to contain COVID-19, which had become a global health challenge. These measures caused disruptions to businesses and to human activity, but are expected to provide rewards in the form of reduced mortality and morbidity due to the virus and a faster return of the economy to normalcy. The design and implementation of national and global economic recovery plans and a return in consumers' confidence will be critical to the success to this recovery. In this regard, Ethiopia's COVID-19 Multi-Sectoral Preparedness and Response Plan assumes a central role. The plan identifies a set of several ambitious relief measures designed to contribute to an economic recovery which target the health, education, and agriculture sectors, among others. The plan will require 1.6 billion USD in funding for full implementation. International development partners, such as the International Monetary Fund and the World Bank, are also contributing to these efforts.

An important result from our analysis is that many activities in the services and manufacturing sectors were affected by the direct lockdown measures, global shocks which reduced demand for Ethiopia's exports, and through economywide linkage effects. These impacts resulted in loss of employment opportunities for existing and new entrants to labor markets across the country, at least temporarily reversing the gains in poverty reduction that Ethiopia has registered in recent years. The recovery of the economy will depend acutely on how small and medium-sized firms perform over the short and medium run. Stimulus packages to help firms in badly affected sectors are needed not only to protect the livelihood of workers and entrepreneurs earning income from these firms but also to advance the economic recovery overall.

Whereas the current analysis provides first-order estimates of the short-run impacts of COVID-19 on the Ethiopian economy, a number of research gaps still remain. We plan to examine the medium to long-term economy-wide impacts of policy interventions designed to revive the Ethiopian economy as the pandemic subsides. Such an analysis will allow us to fully integrate COVID-19 response measures, including those detailed under the COVID-19 Multi-Sectoral Preparedness and Response Plan, and identify additional measures or sectors to target that can be instrumental as Ethiopia embarks on a faster recovery.

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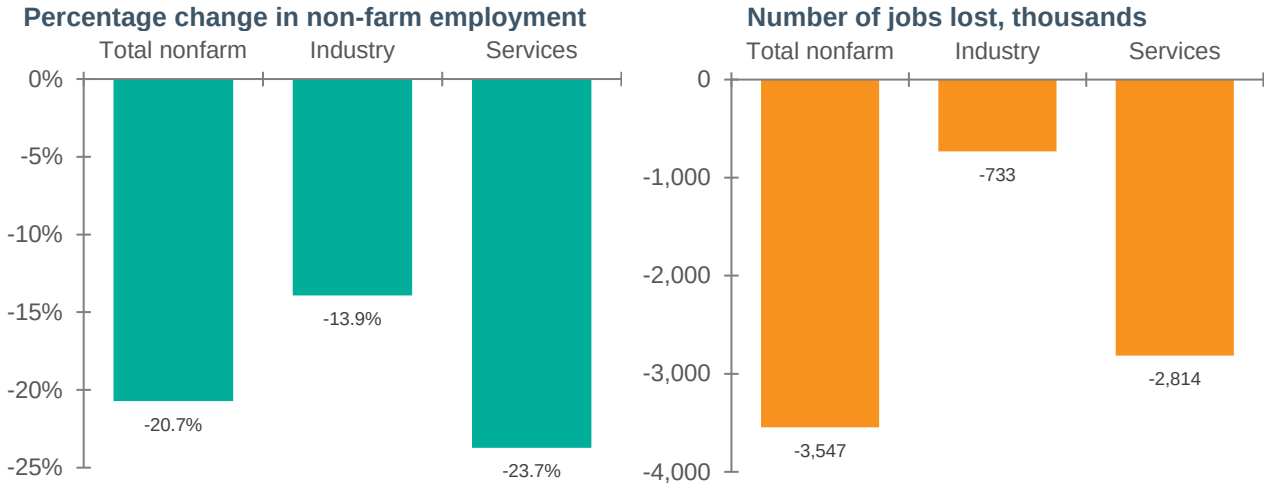
ANNEX – IMPACTS ON NON-FARM EMPLOYMENT DURING LOCKDOWN AND RECOVERY PERIODS

Appendix Figure A1 reports on the change in non-farm employment during the seven-week lockdown period in Ethiopia – both the percentage change and the number of jobs lost. We focus on the effect of COVID-19 on non-farm employment since the pandemic particularly affects the non-farm sector, and it is easier to measure employment in the non-farm sector than in agriculture. The model simulation results show a 21 percent fall in non-farm employment during the lockdown period, with an estimated 3.5 million people having lose their jobs.[1] There are large differences across different sectors of the economy in the share and number of jobs lost. The service sector, which is dominated by small and medium sized enterprises, is estimated to have seen a 23.7 percent decline in employment that left more than 2.8 million workers jobless.

Appendix Figure A1: Change in non-farm employment during the seven-week lockdown period



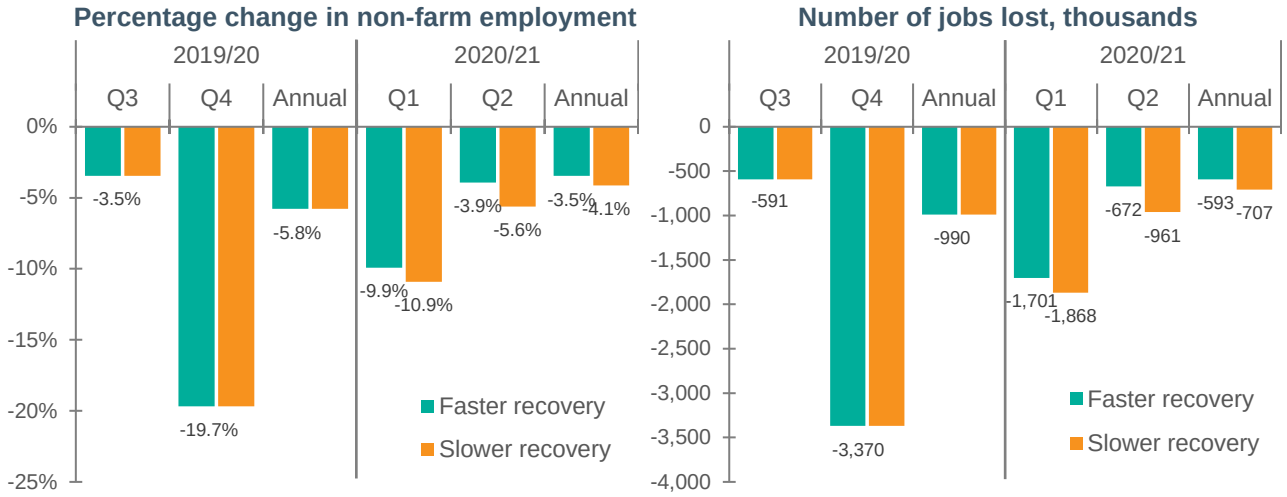
Source: Authors calculations based on Ethiopia SAM Multiplier Model results

As the economy recovers, we expect the effect on non-farm employment to gradually stabilize. By the end of fiscal year 2019/20 (June 2020), we estimate that the share of jobs lost will have improved to 5.8 percent of what employment would have been without COVID, a significant improvement from the 19.7 percent loss during the lockdown period during which the effect of the pandemic was most significantly felt (Appendix Figure A2). This 5.8 percent loss is equivalent to 990,000 fewer jobs at the end of the 2019/20 fiscal year.

As the economy stabilizes, the loss in employment declines further to between just under 3.5 percent under the faster recovery scenario and 4.1 percent under the slower recovery scenario. This is equivalent to 593,000 and 707,000 job losses, respectively. Whereas these estimates are large and may appear exaggerated, they do not actually include new entrants to the job market during the study period. This result suggests that the ever-increasing unemployment rate – especially among youth – will be one of the biggest challenges facing the economy during the post-COVID-19 economic recovery period.

[1] The employment change data is based on ILO information.

Appendix Figure A2: Change in non-farm employment under faster and slower recovery scenarios by quarter of the Ethiopian fiscal year



Source: Authors calculations based on Ethiopia SAM Multiplier Model results
Note: We follow Ethiopia's fiscal year that starts on July 1 and ends on June 30.

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