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# Impact of Covid-19 on Africa's Food and Beverage Manufacturing Companies: Evidence from Selected African Countries

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## Abstract

This study assesses how food and beverage manufacturing firms in Africa were affected by measures to contain the spread of the Covid-19 pandemic. The sector plays an important role as a source of food and employment on the continent. Consequently, any impacts on the sector will directly affect livelihoods and food security. The data was collected through two survey rounds (May and October 2020) among registered food and beverage manufacturing companies in Ethiopia, Kenya, Nigeria and South Africa. The study finds that the sector proved fairly resilient in the face of the pandemic. By October, most firms were recovering from the initial shock, although production volumes were often still lower than pre-Covid-19. The beverages sector was hardest hit due to restrictions on sales as well as restaurant and bar closures. Many companies were also negatively affected by measures implemented by foreign governments which hampered imports of inputs and exports of products. Companies mostly held onto their employees and found other strategies, such as shift work or paid leave, to cope with production shortfalls. Yet, some impacts appear to have deteriorated over time. With regard to raw material prices, already a major concern in May, the situation had worsened by October. Similarly, more (but still a minority of) firms were forced to lay off workers or reduce salaries in the longer run. To mitigate the negative fallouts of the pandemic, priority should be given to providing firms with financial support, better access to raw materials and social safety nets for employees.

# 1 Introduction

Outbreaks of various epidemics or pandemics have been recurrent throughout history. However, a pandemic of such a global scale as the Covid-19 pandemic can be considered as an unprecedented crisis in modern days, bringing about unusual challenges for populations and businesses alike. After the first officially reported outbreak in China in December 2019, the pandemic spread across the world. On 14 February 2020, the first case of Covid-19 was officially confirmed in Africa (Egypt) and at the end of February the first case was documented in Sub-Saharan Africa (Nigeria). By the end of 2020, close to 2.7 million infections had been confirmed in Africa with over 1 million cases in South Africa alone, but the actual number is likely to be significantly higher.<sup>1</sup>

The Covid-19 pandemic and especially the measures to contain the spread of the disease have greatly impacted business activities around the world. Evidence from low- and middle-income countries shows that many companies suffered losses in the early stages of the pandemic, but managed to recover to some extent in subsequent months (Apedo-Amah et al., 2020). Among negatively affected companies, smaller firms were hit harder by company closures and losses in sales. Employment effects of the Covid-19 pandemic appear to have been more subdued as companies adjusted to the shock by reducing working hours rather than laying off workers (Apedo-Amah et al., 2020). These trends mirror experiences of local firms during the Ebola epidemic which spread across West Africa in 2014-2016 (Bowles et al., 2016; Casey et al., 2017; Dizo-Conteh, 2016).

To the authors' knowledge, no study has assessed the impact of the Covid-19 pandemic and related containment measures on the African food and beverage manufacturing industry. One study focuses on micro and small agri-food companies across 17 low and middle income countries, including some African countries, but for the most part does not disaggregate between different types of firms e.g. engaged in processing, distribution and crop farming (Nordhagen et al., 2021). The present study differs from this study in a number of ways: It focuses specifically on food and beverage processing companies, covers all sizes of companies, uses a large sample size that is representative of the entire sector in the study countries, and is based on data from two survey rounds (rather than one).

Thereby, this study fills an important research gap. For better external validity, the sample of companies in the four countries was drawn so as to reflect the structure of the respective countries' food and manufacturing sector in terms of company size, ownership and type of industry. This approach also allows for a comparison of firms' status by size and sub-sector. Two rounds of surveys were conducted, including a large panel, which enables an assessment of impacts over time. The study also has a strong policy focus. It offers insights on the key constraints faced by the companies to assist decision-makers to implement appropriate short-term measures as well as systemic measures to prevent negative impacts of possible future pandemics or similar economy-wide shocks.

<sup>&</sup>lt;sup>1</sup> Number of infections are based on data of the Johns Hopkins University (2021). The high numbers in South Africa can at least partially be explained by considerably more extensive testing in the country (according to data collected by Hasell et al. (2020).

This study seeks to address the question how Covid-19 related containment measures are impacting African food and beverage manufacturing companies and their staff. The focus is placed on containment measures rather than the disease itself because research from previous epidemics has shown that it is such measures that cause most of the macro-economic impacts (Bowles et al., 2016; Casey et al., 2017; de la Fuente et al., 2020; Gatiso and Wossen, 2015; Himelein and Kastelic, 2015). The study countries include Nigeria, South Africa, Kenya and Ethiopia to reflect a diversity of economic contexts, Covid-19 incidence rates and containment measures.

The remaining paper is divided into four sections. Section 2 provides an overview of the literature related to the impact of the Covid-19 pandemic on firms. Section 3 elaborates on the methodology used in this study and describes the profile of the food and beverage manufacturing sector in the four study countries. Section 4 presents the results of the study. Potential impacts on revenues are assessed via changes in operational status and production costs (inputs). Employment impacts are assessed through staff-related measures implemented by the companies to cope with the shock. To account for the global nature of the Covid-19 pandemic, we also asked specifically about the impacts of foreign governments' measures. Finally, we present the most frequently raised policy measures that firms would like their governments to implement to help them cope with the fallout of the pandemic. Section 5 summarizes the results, highlights limitations of the study and presents areas for future research.

# 2 Literature review

## 2.1 Impacts on firms' operations and sales

Evidence of firm-level impacts of the Covid-19 pandemic in low-income countries has already started to emerge. An analysis of firms in 51 low- and middle-income countries using data collected between April and August 2020 highlights a number of impacts across all companies (Apedo-Amah et al., 2020). The data show that many companies were initially hit hard but managed to recover to some extent within a few months. Thus, while firms experienced a drop in sales of 60-75 percent in the first four weeks after the peak of the outbreak, almost 90 percent of business were open after ten weeks and sales had increased again, albeit still 43 percent lower than prior to the outbreak. Similarly to the findings during the EVD epidemic, smaller firms are more likely to be affected by closures and reductions in sales.

Nordhagen et al. (2021) find that the vast majority of agri-food firms (94 percent) across 17 low- and middle-income countries have been negatively affected, for instance in terms of reductions in sales and difficulties in procuring inputs and accessing finance (as of May 2020). Processing firms are among those that most frequently reported negative impact on firm operations (60 percent of 216 surveyed micro and small firms), but also among firms that most frequently reported stable or increased production (53 percent). Among all surveyed firms, 13 percent had stopped production and 82 percent had decreased production. Note that these findings exclude medium and large firms.

In **Kenya**, most of the agricultural and manufacturing firms remained open in May, but many suffered losses in sales (World Bank, 2020a). Thus, 93 percent of all firms saw their sales cut

by half, on average, compared to their 2019 levels and only 2 percent reported an increase. Actual sales reductions varied greatly across firms, however, from 90 percent for the bottom 10 percent of firms to 10 percent for the top 10 percent. In contrast, the research established that larger firms were better able to weather the pandemic; the 90th percentile of the large firms did not report sales reductions.

Country-specific results for **South Africa** by Apedo-Amah et al. (2020) show a drop in sales of 78 percent on average across all firms in May (ranging widely from between -40 and -100 percent), the largest drop among the 51 countries studied. Another study found that over two thirds of South African companies surveyed in April and June had been negatively affected by the pandemic (68 percent) while 8 percent reported positive impacts (Beck et al., 2020).

Among the four study countries, the most detailed assessment of firm-level impacts has been undertaken in **Ethiopia** and the survey rounds partially correspond to those of this study. While a direct comparison is not possible because the data are not disaggregated by sector, aggregated data for industrial firms can be reported and compared (World Bank, 2020b). In May, firms had started to slowly recover compared to the onset of the pandemic and companies were operating. In May, industrial firms had started to slowly recover compared to the onset of the pandemic in Ethiopia and more companies were operating partially (26 percent) or fully (48 percent) compared to early April (43 percent partially and 21 percent fully). Earnings were still low, however, and 55 percent of industrial firms did not earn any revenue while 26 percent of these firms were still closed. By October, close to two thirds of industrial firms were operating fully again (63 percent). Average monthly revenues had increased almost fivefold compared to April but remained substantially below the previous year's level. Seventeen percent of industrial companies were still closed and many of these are expected to close down permanently.

## 2.2 Impacts on employment at the level of the firm

In terms of employment effects, the cross-country study by Apedo-Amah et al. (2020) shows that that large drops in sales also translated into large reductions in employment: for every 1 percentage point decline in sales, employment reduced by 0.077 percentage point. Overall, companies more frequently adjusted to the shock by reducing working hours rather than laying off workers. Strategies differed by firm size, however. While larger firms were more likely to lay off employees (at 26 percent likelihood) compared to micro (12 percent), small (19 percent) and medium sized (22 percent) firms, they were also more likely to grant leave (53 percent) compared to micro (27 percent), small (45 percent) and medium-sized (50 percent) firms. Most firms implemented multiple strategies simultaneously.

At the aggregate level across all agri-food firms surveyed by Nordhagen et al. (2021), i.e. including but not limited to food processing, 44 percent of enterprises faced difficulties in paying their staff while 20 percent reported challenges in securing staff.

Country-specific studies also point to limited employment effects. In **Kenya**, the impacts of the Covid-19 restrictions on employment were found to be small relative to the high revenue losses experienced by the firms (World Bank, 2020a). In **South Africa**, companies had mostly opted to reduce investments rather than wages to cope with the shock (Beck et al., 2020). Specifically, 72 percent of companies reported reducing investments in response to the

pandemic while 71 percent had continued paying employees even if the service was disrupted.

In May, **Ethiopian companies** had mainly adjusted to the situation by granting (primarily paid) leave to their employees rather than laying off staff which was only reported by 4 percent of companies (Bundervoet et al., 2020a). Large firms were more likely than the micro firms to grant leave (Abebe et al., 2020). The low number of lay-off is a result of the State of Emergency directive which prohibits firms from laying off workers. Negative employment effects could nevertheless be seen in the form of companies' reluctance to hire new workers. Once the State of Emergency was lifted on 8 September, layoffs temporarily increased, but fell back to 2 percent in October (Bundervoet et al., 2020b). Three quarters of firms were fully staffed in that month (up from 61 percent in April) (Bundervoet et al., 2020c). Similar to South Africa, Ethiopian companies also reduced investments; 37 percent of industrial firms had decided to cancel or postpone investments at the beginning of the pandemic (Abebe et al., 2020).

## 2.3 Impacts firms' access to raw materials

Evidence on the impact of Covid-19-related containment measures on firms' ability to procure raw materials is limited. Half of all agri-food firms surveyed by Nordhagen et al. (2021) report that they had struggled to access inputs, but the data are not broken down by types of firm.

Across all **Kenyan** firms, just over half of the surveyed companies (54 percent) reported decreases in the availability of inputs (in June/August) which affected exporting companies in particular (World Bank, 2020a). Agricultural sector output remained strong, however.

In **Ethiopia**, access to raw material for firms became more difficult over time. While around 11 percent of industrial companies (not specifically food and beverages) struggled to obtain inputs in May (Bundervoet et al., 2020a), one third of these firms were affected by low supply in October and more than half reported high raw material prices (53%) (Bundervoet et al., 2020b).

## 2.4 COVID-19 containment measures in the study countries

Even though the severity of the pandemic remained low in the early months of 2020, as measured by the number of confirmed cases (Figure 1)<sup>2</sup>, all of the study countries started putting in place containment measures already in late January; substantial restrictions only began in mid-March (Figure 2). The countries began easing restrictions again in June. Thus, while containment measures implemented by the countries are largely comparable within survey rounds, they differ quite substantially between rounds. Specific measures are outline in Table 1.

<sup>&</sup>lt;sup>2</sup> It has to be noted that the testing capacity was also low right after the outbreak of the Covid-19 pandemic, as measured by the number of tests performed in each of the study countries.



Figure 1: Confirmed Covid-19 cases in the four study countries (1 March – 31 December 2020)

Note: Due to substantial differences in the number of confirmed COVID-19 cases in the four countries, confirmed cases in Kenya, Ethiopia and Nigeria are shown on the primary y-axis and confirmed cases in South Africa on the secondary y-axis. Data source. Johns Hopkins University (2021), downloaded 26 January 2021.

Figure 2: Stringency index for governments' Covid-19 containment measures



Note: The Stringency Index is calculated as the mean score of nine metrics, each taking a value between 0 and 100. A higher score indicates a stricter response (i.e. 100 = strictest response).

Data source: Hale et al. (2020), downloaded 26 January 2021.

Table 1: Specific measures implemented in the four study countries

	Round 1 (May 2020)	Round 2 (Sept/Oct 2020)
Movement restrictions	All countries restricted in- country movements of people	Ethiopia continued to restrict in- country movements, remaining countries recommended restricting movement
Workplace closures	All countries closed some workplaces or required work from home (S. Africa and Nigeria closed all but essential workplaces in April (food processing exempt)	All countries only recommended closing work places (or work from home), Ethiopia only in October.
Restaurant closures	Closed in S. Africa and Nigeria (deliveries allowed), open in Kenya (closed in April) and Ethiopia	Open in all countries (in Nigeria on 19 Oct only)
Alcohol sale	All sales banned in S. Africa; bars closed in Kenya, Ethiopia and Nigeria	Sales allowed in all countries; bars open in Kenya, S. Africa and Ethiopia, closed in Nigeria
Closure of public transport	Only Ethiopia partly closed public transport and restricted the carrying capacity of the remainder by 50%, the remaining countries advised against using it	Ethiopia lifted restrictions in late-Oct, Nigeria and S. Africa dropped recommendation in late-Sep
International travel	Most countries closed the border (in Ethiopia only for travellers from high-risk zones)	Quarantine upon arrival in all countries (in S. Africa from October)
Income support	Ethiopia provided no income support, the remaining countries provided <50% of lost salary	Ethiopia provided no income support, S. Africa <50% and Nigeria and Kenya >50% of lost salary

Source: Authors' own elaboration based on data from Andam et al., 2020; Columbia University, 2020; Government of Ethiopia, 2020; Government of South Africa, 2020; Hale et al., 2020; Ministry of Health, 2020; Presidential Task Force on COVID-19, 2020a, 2020b

# 3 Data and methods

## 3.1 Data and methodology

This study was designed to monitor the early impacts of Covid-19 pandemic and related containment measures on the operations of the food and beverages manufacturing sector in four countries: Ethiopia, Kenya, Nigeria and South Africa. The choice of the four countries would capture the heterogeneity of firms in the sector, the local conditions relevant to the studied sectors, and the socio-economic contexts in which these firms operate. We expect that the variety of contexts captured in our survey would be reflected in the various impacts of the pandemic on firms in Africa.

The analysis covers a sample of 896 registered firms, i.e. 248 in Ethiopia, 149 in Kenya, 287 in Nigeria and 212 in South Africa (Table 2). The sampling procedure involved two steps. First, for each country, a list of all registered firms in the food and beverage manufacturing sector was established based on information obtained from public and private sources (see the list of sources in the Appendix). Second, in Kenya, Nigeria and South Africa, we randomly selected a sample of firms using stratified sampling with proportional allocation. Strata were defined based on company size, ownership and type of industry. In Ethiopia, we attempted to interview all the listed firms. To account for these differences, we apply sampling weights throughout the analysis.

The data collection process was implemented in two rounds: a first round between the end of April and beginning of June 2020 and a second round in September-early November 2020. A total of 833 companies were interviewed in the first round, and a randomly selected sub-sample of 502 in the second round; out of those, 438 companies were interviewed in both rounds. The details of the sample selection process for the second round are provided in the Appendix. The data we collected is based on self-reported and subjective assessments of the Covid-19 impacts by the firms collected from high level expert respondents, i.e. firm owner or manager, or any other most knowledgeable person identified with the firm. We analyse the data through descriptive statistics. Because of the descriptive nature of our analysis, and because it relies on self-reported impacts, our findings do not imply causality.

	Total Sample		Ethiopia		Kenya		Nigeria		South Africa	
	Number	%	Number	%	Number	%	Number	%	Number	%
Firms surveyed in:										
Round 1 only	395	44.1	33	13.3	55	36.9	176	61.3	131	61.8
Round 2 only	63	7	n.a.	n.a.	35	23.5	28	9.8	n.a.	n.a.
Both rounds	438	48.1	215	86.7	59	39.6	83	28.9	81	38.2
Number of firms	896 248		149		287	287		212		
Total number of ob	servations	in:								
Round 1	833		248		114		259		212	
Round 2	501		215		94		111		81	

Table 2: Number of companies surveyed in the two rounds

Source: Authors' own elaboration.

#### 3.2 Non-response and attrition

The quality of our data might be compromised if the survey non-response is not random. The non-response can take either the form of a unit non-response, where sampled units do not participate in the survey, or item non-response, where a sampled unit answer some, but not all questions (Zanutto and Gelman, 2015). In case of our study, the item non-response is negligible; on the other hand, unit non-response, and the risk of bias it implies, is challenging, especially since the outcome variables in our analysis, i.e. the impacts of the Covid-19 pandemic and related containment measures on firms' operations, might be correlated with firm's non-response. In particular, our analysis could underestimate the rate of business closures.

The analysis of non-response in our survey suggests that the risk of bias was minimal in the first round, but it was relatively higher in the second round. The difference between the rounds might stem from the fact that in the first round, the questionnaire was very short, and the interview time did not exceed 10-15 minutes per company. In the second round, the questionnaire on Covid-19-related impacts was administered together with a questionnaire related to a separate research project. That latter questionnaire took, on average, three times longer to complete.

In the first round, the unit non-response rate was at 5 percent, equivalent to 42 companies, an extremely low rate compared to other surveys. In all cases, we were able to contact these companies, and therefore know that they were operating at the time of the survey. The non-response rate was much higher in the second round, although still within a range usually observed in business surveys (Tomaskovic-Devey et al., 1994). Importantly, since we attempted to interview a subsample of firms in both rounds, this resulted in high attrition rate between the rounds, i.e. 30.5 percent.

However, a comparison of attritors and non-attritors indicates that both groups are largely similar with respect to basic characteristics and outcomes reported in the first round; even though there are few statistically significant differences with respect to the share of domestic private sector companies; share companies and joint ventures; share of companies in the grain mill industry; and finally, share of companies who reported being operating with reduced production volumes in the first round (see Table A1 in the Appendix). It seems little plausible that these few differences significantly bias our estimations. Besides, whenever a company randomly selected for the second round could not be interviewed, a replacement company randomly drawn from the same strata was interviewed, to the extent possible. This process ensures that the structure of our initial sample is preserved and thus attrition should not affect the results of our analysis.

The only exception might be the share of business closures reported in the second round; especially if the attrition itself results from the fact that companies were either temporarily or permanently closed, potentially due to the Covid-19, at the time of the survey. However, only 3 percent of attritors were not interviewed in the second round because of their temporary business closure; and an additional 4 percent could not be re-contacted which suggests that these firms might have been closed as well. The remaining attritors simply refused to participate in the survey. The attrition bias, while present, is thus not as large as initially expected.

While we refrain from imputing missing data for attritors due to insufficient information we have about those companies at the baseline, we address the risk of attrition bias by recalibrating some of our results with the assumption that those attritors who could not be contacted were indeed not operating at the time of the second round of the survey.

#### 3.3 Food and beverages sector profile

Table 3 presents the basic characteristics of the surveyed firms, i.e. firm size, ownership and industry type<sup>3</sup>. Note that we checked that the firms' characteristics we observe in our sample reflect the characteristics of the full population of firms in the four countries.<sup>4</sup> As expected, we observe a large heterogeneity across firms in the food and beverage manufacturing sector over several key features.

With regard to firm size, the total sample is roughly equally distributed between micro or small, medium and large enterprises; micro and small ones are only slightly more numerous. However, a closer examination of the data shows that two countries stand out in terms of the distribution of firms by size-class: in Ethiopia, micro and small enterprises, at 55 percent, dominate the food and beverage manufacturing sector. In Kenya, large enterprises are instead dominant, amounting to 45 percent of all firms in the sector. We expect that had informal or non-registered firms been also included in our sample, we would observe a much higher share of micro and small companies.

Most of the food and beverages manufacturing companies are privately-owned and mainly domestic. Foreign companies (excluding joint ventures and share companies) constitute a very small share of food and beverages firms (12 percent). On the other hand, 80 percent of foreign companies are medium-sized or large companies (in almost equal proportion) suggesting that their market share in terms of production or sales might be higher than simply looking at the number of firms would imply.

In terms of industry types, all subsectors are relatively well represented although a higher proportion of the firms operate in the grain and mill products and beverages segments - more than 20 percent each. There is much heterogeneity between countries. In Ethiopia, half of all firms operate in the grain mill products industry while the meat and dairy industries are very small (around 2 percent of all firms each). On the other hand, in South Africa, the meat and dairy industries are much bigger (close to 14 and 11 percent of all firms respectively), while the grain mill products industry constitutes less than 10 percent of firms.

<sup>&</sup>lt;sup>3</sup> For industry type, we use the classification from the Standard Industry Classification (SIC).

<sup>&</sup>lt;sup>4</sup> Results not reported here.

## Table 3: Descriptive statistics

	Total Sa	mple	Ethio	oia	Keny	'a	Nigeria		South Africa	
	Number	%	Number	%	Number	%	Number	%	Number	%
Company size										
Micro & Small	316	35.3	136	54.8	27	18.1	82	28.6	71	33.5
Medium	308	34.4	74	29.8	51	34.2	115	40.1	68	32.1
Large	272	30.4	38	15.3	71	47.7	90	31.4	73	34.4
Ownership										
Private sector, domestically-owned	635	70.9	150	60.5	119	79.9	196	68.3	170	80.2
Private sector, foreign-owned	107	11.9	4	1.6	12	8.1	83	28.9	8	3.8
Government-/State-owned	14	1.6	8	3.2	6	4.0	n.a.	n.a.	n.a.	n.a.
Private sector, share companies or										
joint ventures	140	15.6	86	34.7	12	8.1	8	2.8	34	16.0
ndustry type										
Meat Products	55	6.1	5	2.0	4	2.7	17	5.9	29	13.7
Dairy Products	51	5.7	4	1.6	10	6.7	14	4.9	23	10.9
Canned, Frozen, and Preserved Fruits,										
Vegetables, and Food Specialties	58	6.5	9	3.6	18	12.1	10	3.5	21	9.9
Grain Mill Products	196	21.9	123	49.6	21	14.1	31	10.8	21	9.9
Bakery Products	73	8.2	24	9.7	16	10.7	21	7.3	12	5.7
Sugar and Confectionery Products	56	6.3	10	4.0	15	10.1	16	5.6	15	7.1
Fats and Oils	70	7.8	15	6.1	11	7.4	31	10.8	13	6.1
Beverages	194	21.7	26	10.5	27	18.1	102	35.5	39	18.4
Miscellaneous Food Preparations and										
Kindred Products	143	16.0	32	12.9	27	18.1	45	15.7	39	18.4
No of observations	896		248		149		287		212	

Source: Authors' own elaboration

# 4 Results

In this section, we present the main findings emerging from the survey implemented in the months directly following the outbreak of the Covid-19 pandemic across African countries. Since food and beverage manufacturing can be considered an essential sector, especially its food component, we could expect that it is less affected, and also less targeted in the first place, by various measures implemented by the respective governments than other sectors. In parallel, as demand for food, especially in poor countries, is relatively inelastic, especially in case of staple foods (Melo et al., 2015), we do not expect any sudden drop in demand. We expect, instead, that many companies might have witnessed serious disruptions in supply chains as a result of containment measures, especially relative to the movement of goods and persons.

An important caveat is that we look at the early stages of the pandemic and related containment measures; and accordingly, the expected impacts as presented above refer to the short run only. In the long run, the impacts might be much more severe, and of different nature. In particular, consumer demand might reduce, and consumption patterns might change toward staple foods as a result of increase in poverty. Indeed, the Covid-19 pandemic was estimated to increase extreme poverty by between 88 and 115 million people in 2020 (WB, 2020); and these estimates were further raised to between 119 and 124 million at the beginning of 2021. The income losses were found to be further compounded by food price increases. Unfortunately, we do not have data to assess to which extent food and beverage manufacturing firms raised prices of their products during the Covid-19 and passed the burden of the pandemic onto the final consumers.

## 4.1 Status of operations

The picture emerging from our data suggests that food and beverage manufacturing firms turn out to be rather resilient in the context of the Covid-19 pandemic (Figure 3). Overall, 87 percent of firms were operating in May, even though most of them (65 percent of all firms) had reduced production volumes. The residual, that is 13 percent of firms, ceased their operations, but largely only temporarily. South Africa reported the highest proportion of firms operating as usual (34 percent compared to 19 percent in the total sample) even though the country also reported a substantial number of business closures (12 percent<sup>5</sup>). Nigeria, on the other hand, was hardest hit: 22 percent of companies ceased operations, either temporarily or permanently, and only 5 percent were operating as usual.

Despite the early repercussions of the Covid-19 pandemic and related containment measures reported in May 2020, we observe a rapid recovery, with a substantial improvement in the status of operations in the second round of the survey, in line with the results found in the previous literature (Apedo-Amah et al., 2020). In September 2020, 92 percent of firms were operating, and the share of firms 'operating as usual' almost doubled, compared to the first round. This fast recovery is visible in Nigeria where the share of firms operating as usual went from 5 percent in May to 33 percent in September, and the share of companies which ceased

<sup>&</sup>lt;sup>5</sup> The 12 percent refer to temporary business closures. No permanent business closures were reported in South Africa during the survey.

operations from 22 percent to 8 percent. This recovery might be attributable to the significant easing of regulations in all the countries in our sample during the second round of the survey (Figure 2).



Figure 3: Impact of Covid-19 on firms' operations in food and beverage manufacturing sector

Source: Authors' own elaboration. Full sample.

Since our data reports a high attrition rate between the two rounds, we conduct an additional set of analyses to check the robustness of our results. First, we include in the analysis only firms present in both rounds. We find that the results remain largely unchanged (not reported here) which suggests that the fast recovery we observe in the total sample was not due to potential differences in the sample composition across rounds. Second, we account for the 3 percent of attritor companies who were temporarily closed at the time of the second round; and the 4 percent who we were not able to recontact in the second round by assuming they were temporarily closed. This is a plausible assumption considering that in each case, several attempts were made to get in touch with the companies by our survey team. We compare our baseline results for the second survey round with the results accounting for the attritors in Table 4 below. Had these attritors been closed in the second round, the share of business closure would be twice higher than in our baseline results, at 9 percent of companies. We treat these figures as the upper bound for business closures in the second round.

#### Table 4: Impact of Covid-19 on firms' operations: accounting for attritors

	Baseline results	Accounting for attritors	
	(Percent of companies)		
	(1) (2)		
We are operating as usual	35.5	34.8	
We are operating, but had to reduce production volumes	53.1	52.0	
We had to temporarily close the company	7.6	9.0	
We have permanently closed the company	0.2	0.2	
We are operating and have increased production	3.6	3.5	
No of observations	501	512	

As a result of the corona pandemic, which of the following options best descri	bes your
current state of operations?	

Note: In column (2), 11 attritors are added to the actual sample and considered under "We have temporarily closed the company" option.

Source: Authors' own elaboration. Full sample.

We are concerned that the overall positive outlook emanating from Figure 3, and in particular the significant improvement in the second round might result from the average effects while hiding important heterogeneity of impacts at the firm level. We therefore conduct a detailed analysis based on a sub-sample of firms interviewed in both rounds of the survey to check the most common transition patterns in the state of operations between May and September 2020 (Table 5). Doing this, we find that close to half of the companies reported a change in the state of operations between the two rounds, which indicates a relatively rapid adjustment to the Covid-19 shock among the firms over such a short period of time. More than half of those experienced an improvement in their situation, i.e. by moving back from operating with reduced production volumes to operating as usual, or by moving from being temporarily closed to operating with reduced production volumes. Almost a third (or 13 percent of all firms observed in both rounds) experienced instead a deterioration in their situation, i.e. by moving from operating as usual to operating with reduced production volumes, or by moving from operating with reduced production volumes to being temporarily closed. Fifty-one percent of the companies reported no changes between the two rounds; most of them were operating with reduced production volumes in both rounds.

The list of containment measures implemented in the four study countries (Table 1) indicates that specific measures targeted alcoholic products, either by directly banning alcohol sales, as in the case of South Africa, or by closing bars, as in the case of Ethiopia, Kenya and Nigeria. In our sample, over 30 percent of beverage manufacturers produce alcoholic products, and were therefore directly affected by these policy measures. Figure 4 shows that the beverage sector was much harder hit, especially in the first round when the alcohol-related measures were in force, which led to a higher number of business closures compared to the figures observed in the food sector (see more details on business closures in section 4.3). However, the beverage sector largely recovered by the second round. This is also visible when looking at the transition patterns for beverage manufacturers surveyed on both rounds: these

patterns broadly resemble those observed among the food manufacturers; albeit with a higher share of companies moving from being temporarily closed to operating with reduced production volumes.

Share of companies		Round	State of operations
51%		-	No change between R1 and R2
49% Out of those:			Change in status between R1 and R2
	46%		Operating with reduced production volumes
			Operating as usual
	8%		Temporarily closed
			Operating with reduced production volumes
			Operating as usual
1070		R2	Operating with reduced production volumes
	۵%	R1	Operating with reduced production volumes
9%		R2	Temporarily closed

Table 5: Most common transition patterns between the first and the second round

Note: Only the most common transitions are shown here.

Source: Authors' own elaboration. Panel sample (N=438).

Figure 4: Impact of Covid-19 on firms' operations: food versus beverage manufacturing firms



Source: Authors' own elaboration. Panel sample (N=438).

Figure 5: Impact of Covid-19 on firms' operations in food and beverage manufacturing sector by firm size



Source: Authors' own elaboration. Panel sample (N=438).

We observe that small companies are less resilient to the Covid-19 shock than other firms. Not only were they harder hit at the initial stages of the pandemic, they also had lower capacity to recover than the larger firms (Figure 5). This is in line with what has been found in other studies (Abebe et al., 2020; Apedo-Amah et al., 2020; Casey et al., 2017). Based on the evidence emanating from our data, disruptions in the supply chain are one of the principal mechanisms through which the Covid-19 affected firms in the food and beverage manufacturing sector. We expect that large firms that have better established and better functioning supply chains would prove less vulnerable to such disruptions.

Figure 5 suggests that not only the larger firms in the food and beverage manufacturing sector are more resilient to shocks, they also have a higher capacity to take advantage of the rapidly changing environment by increasing production volumes. Even though the share of firms which responded to the Covid-19 by increasing production is small, 4 percent in the first round and 5 percent in the second round among firms interviewed in both rounds<sup>6</sup>, this share was 9 percent in the second round for the large firms. These figures point to a limited, yet existing,

<sup>&</sup>lt;sup>6</sup> The figures are similar for the total sample (not reported here).

potential among the food and beverage manufacturing firms to respond to adverse shocks by targeting perceived growth opportunities.

Looking at business closures in more detail (Figure 6), we observe that the beverage sector was particularly affected by the Covid-19 pandemic and related containment measures. In May 2020, close to a quarter of companies in that segment were either temporarily or permanently closed, compared to 10 percent of companies in the food sector. The situation was particularly dire for the South African beverage companies, with 38 percent of business closures in the first round, which was directly related to the ban on alcohol sales introduced by the South African government at the beginning of the pandemic. However, the beverage sector reported a remarkable recovery by the time of the second round, with the share of reported business closures falling to 7 percent in total sample, and 17 percent in South Africa.



Figure 6: Business closures

Source: Authors' own elaboration. Full sample.

In order to understand the extent to which business closures were a result of the Covid-19 pandemic and related containment measures, we asked companies why they ceased operations<sup>7</sup>. A number of companies indicated a combination of factors, some of which are not necessarily attributable exclusively to the Covid-19 pandemic. We can say with certainty that 9 percent of business closures were not related to the pandemic and containment measures, as indicated by the companies. If we subtract this share from the figures presented in Figure 3, we arrive at the lower bound of our estimations of business closures directly due

<sup>&</sup>lt;sup>7</sup> This information is only available for the first survey round, however.

to the Covid-19 pandemic, i.e. 12 percent of all companies in the first round, and 7 percent in the second round.

## 4.2 Costs of sourcing raw materials

We investigate to which extent the Covid-19 pandemic and related containment measures affected prices of raw materials among firms which continued operating during the survey. Figure 7 shows that a large majority of firms in the food and beverage manufacturing sector (68 percent in the first round and 77 percent in the second round) reported raw material price increases. A small number of companies reported both increases in some prices and decrease in others. Fewer small firms reported increases in prices compared to medium and large firms. Looking at the specific industries within the food and beverage manufacturing sector, we observe that bakery products and grain mill products were affected to a greater extent than other industries, especially in the first round. The meat industry, on the other hand, was hit by rising prices of raw materials in the second round, with 77 percent of firms reporting such increases.



Figure 7: Changes in prices of raw materials during Covid-19

Source: Authors' own elaboration. Full sample.

The impact on prices of raw materials was the highest in Nigeria where close to 95 percent of companies reported such increases already in May 2020. On the other hand, the share of companies that reported price increases in the first round was visibly smaller in South Africa,

where Trade and Industry Minister Ebrahim Patel set out guidelines on 19 March to prevent excessive price increases known as price gouging. However, the situation clearly deteriorated by the second round and the share of companies reporting increases in the price of raw materials almost doubled, from 41 percent in the first round to 68 percent in the second round. A similar trend, albeit at a much lower scale, was observed in Kenyan and in Nigerian firms.



Figure 8: Changes in prices of raw materials and procurement costs during the Covid-19

Source: Authors' own elaboration. Full sample.

#### 4.3 Workers

We also examined how workers in the food and beverage manufacturing sector were affected by the Covid-19 pandemic and related measures. The general outlook in Figure 9 seems rather positive. Companies largely tried to save jobs and prevent redundancies, and employees either worked as usual or worked in shifts to ensure social distancing. Over time, the share of firms where workers worked as usual increased from 27 percent in the first round to 41 percent in the second round, while the share of firms where social distancing measures were implemented slightly decreased.

The relatively high share of firms where workers were on paid leave in the first round might come as a surprise. This finding is largely driven by firms in Ethiopia (Figure 10), where the government passed a regulation forbidding redundancy during the State of Emergency

imposed to contain the Covid-19 pandemic. We are not able to control whether all firms which reported sending workers on paid leave indeed complied with this regulation; however, the results are in line with Bundervoet et al. (2020a) for a broader sample of manufacturing firms.



Figure 9: Impact of Covid-19 and related containment measures on workers

Source: Authors' own elaboration. Panel sample (N=438).

On the other hand, we observe a much more negative trend in parallel, that of increasing redundancies and salary reductions in the second round compared to the first round. Note that the results in Figure 9 are based on firms surveyed in both rounds to ensure comparability. Even though the share of companies which laid off workers is lower than that of companies where workers were reported to have been working as usual or in shifts, the upward trend over time is worrisome. The share of such companies increased threefold within a period of four months, from 4 percent in May to 12 percent in September. Looking at countries in our sample (Figure 10), we observe that only Ethiopia managed to keep redundancies low. In the remaining countries, many more firms laid off workers by the second round: 10 percent in South Africa, 15 percent in Kenya, and 18 percent in Nigeria. The deterioration over time was also stark in Nigeria, with the share of firms that laid off workers rising six-fold over such a short period of time. In Kenya and Nigeria, the share of companies which reduced their workers' salaries was also relatively high in the second round, at 22 and at 28 percent respectively.

#### Figure 10: Impact of Covid-19 and related containment measures on workers

#### Round 1:



Round 2:





Surprisingly, we do not find any consistent differences between small and large firms with respect to the impacts on workers. Similar shares of both small and large companies laid off workers; however, more large firms reduced workers' salaries. Workers in the beverage sector turn out to bear the strongest adverse impacts of the Covid-19 pandemic; for example, the share of companies that laid off workers by the second round was 11 percent in the food sector and 16 percent in the beverage sector.

#### 4.4 Cross-border transactions

We analyse how various measures implemented by foreign governments could potentially have affected the food and beverage manufacturing sector. This information is available in the first round only. The extent of the impacts is expected to depend on the companies' participation in global and regional supply chains. Table 6 below indicates that more than 60 percent of firms reported to have been affected by such measures. In Nigeria and Kenya, this share is even higher, at 70 percent or more; but it is much lower in Ethiopia, at 41 percent. These differences are partially due to different levels of export orientation. Only 14 percent of food and beverage manufacturing firms in Ethiopia are engaged in exports, against 64 percent of Kenyan firms or 57 percent of South African firms.

	Firms affected by foreign governments' measures	Exporting firms*
	(share of all firms)	
Ethiopia	41%	14%
Kenya	70%	64%
Nigeria	73%	28%
South	649/	<b>F 7</b> 0/
Africa	04%	57%
Total	63%	36%

Table 6: Impacts of measures implemented by foreign governments and trade profile of firms

No of observations: 833

\*Based on the data for firms surveyed in both rounds

Source: Authors' own elaboration. Round 1 only.

The figures in Table 6 suggest that various measures implemented by foreign governments affected firms in our sample via channels other than exports. This is striking in the case of Nigeria where less than a third of firms export their products, but more than 70 percent declared to be affected by foreign governments' measures. The potential explanation is the relatively high dependency on imported inputs. Figure 11 provides shows that among the Nigerian firms affected by foreign governments' measures, the highest share, 62 percent, reported a reduction in their import of inputs. Lower import of inputs was also often reported by Ethiopian and Kenyan firms (around 40 percent of firms affected by foreign governments' measures). Delays and new administrative requirements at the border seem to have added to the burden. Interestingly, a higher share of Ethiopian firms reported disruptions in labour markets whereby workers were unable to come to work because of cross-border movement restrictions.





Source: Authors' own elaboration. Round 1 only.

On the other hand, the share of firms experiencing a drop in exports was slightly lower, at 28 percent of affected firms (or 17 percent of all firms) compared to other cross-border issues firms were exposed to. However, for Kenya the proportion of firms reporting falling exports was more prevalent than in other study countries – 54 percent of affected firms (or 39 percent of all firms). This might be the outcome of Kenya's food sector having strong linkages with overseas customers. Around half of Kenyan businesses (or 71 percent of affected firms) also experienced delays at the borders. However, not all exporting firms where affected equally: the affected exporting firms report much higher shares of total sales to the European Union, or other non-African markets. The unaffected exporting firms mainly export within Africa only

## 4.5 Policy demands by firms

In the first round of the survey, companies were asked to name up to two policy measures that they would like their government to implement to help them in the current situation. In the first part of the analysis, percentage figures show the share of all measures mentioned by all companies, while in the country-specific analysis the percentage figures refer to shares of measures demanded by companies within that country.

In general, companies mainly called for practical and business-survival interventions rather than broader stimulus packages or fundamental reforms (Figure 12). Demands for financial support, in particular tax reductions, low-interest loans and direct assistance, were most common (30 percent of all measures called for). Requests for direct assistance were most prevalent among South African firms while companies in the other three countries most frequently demanded tax reductions. Measures to improve access to raw materials ranked second highest among firms' policy demands (17 percent), in particular increasing domestic supplies, controlling prices and facilitating imports. Revisions of general Covid-19 related policies were mentioned almost as frequently (16 percent), notably to ease the lockdown. Responses in the four countries show interesting differences in this regard, however. While most companies in Kenya, South Africa and Nigeria demanded an easing of the lockdown, most Ethiopian firms would have preferred additional measures to prevent the spread of Covid-19. Among general Covid-19 related measures, the fair implementation of existing rules without harassment was also a high priority in Nigeria and South Africa. Only a few companies (6 percent) did not call for any measures (notably in Kenya and in South Africa).



Figure 12: Policy measures proposed by the surveyed companies

Source: Authors' own elaboration. Round 1 only.

Priorities differed noticeably between the four countries. **Ethiopian companies** frequently called on their government to facilitate access to raw materials (41 percent of measures demanded by Ethiopian companies), in particular wheat, with a focus on increasing domestic supplies and controlling prices. While a sizeable share of **Nigerian companies** also called for assistance in input procurement (14 percent), their demands focused mainly on facilitating imports. However, the need for financial support featured considerably higher on Nigerian

companies' priority list (50 percent), mainly in the form of tax reductions and low-interest loans. **South African companies** most frequently called for revisions to general Covid-19related measures (36 percent), notably an easing of the lockdown. Other priorities included measures to facilitate transportation, trading and marketing of goods (17 percent, esp. opening restaurants and bars) and financial support (17%, esp. direct assistance). Demands by **Kenyan companies** were most diverse. The majority of firms in that country would have liked measures to facilitate transportation, trading and marketing of goods (24 percent, especially easing border restrictions), revisions to general Covid-19-related measures (22 percent, esp. easing the lockdown), and the implementation of staff-related measures (18 percent, esp. better access to protective equipment).

# 5 Discussion and conclusion

Our study shows that food and beverage manufacturing companies in the four African countries turn out to be relatively resilient to such shocks as the Covid-19 pandemic, at least in the short run. It also shows, however, that the impacts are highly heterogeneous and dynamic.

Most companies in the sector managed to continue operating throughout the pandemic. For many of them the situation had improved by October as restrictions were being eased in all four countries. However, most companies were still operating with reduced production volumes in October and consequently lower revenues. Around 7-15% of companies had temporarily or permanently ceased operations by October, mainly as a result of government measures (such as lockdowns), challenges in procuring raw materials or drops in demand, for instance from restaurants of bars. The beverage sector in South Africa suffered most among the sub-sectors, in particular in May when the ban on alcohol sales had forces many companies to pause or even cease production.

Smaller companies were more affected by the Covid-19 pandemic and related containment measures than larger firms. This is in line with what has been found by other researchers, as cited above. They were hit harder initially and found it more difficult to recover. Nevertheless, at least a small share of these companies had managed to adapt to the shock by introducing new products, showing that they are more flexible in their product range. Larger companies, in contrast, were more likely to adapt by expanding production of existing products rather than introducing new ones (albeit also only a small share).

Difficulties in procuring raw materials at reasonable prices were widely felt among the companies and in many cases the situation deteriorated over time. Firms often had to pay higher prices for raw materials as well as higher costs to procure these inputs. Nigerian companies proved most vulnerable due to their strong reliance on imported inputs. Among the sub-sectors, manufacturers of bakery and grain mill products which relied on imports of wheat were particularly affected. Firms' demands from their governments reflect the differences in the local economies. Ethiopian firms saw responsibility for ensuring supplies and price controls rest with their government while Nigerian companies focused their demands on financial resources and import easing.

In general, companies tried to hold on to their workers and many moved to shift work to comply with requirements for social distancing. However, the situation deteriorated somewhat over time. By October, more firms were laying off workers or cutting salary (although still only the minority of firms). Employees were least affected in Ethiopia where the government had put in place regulations to prevent redundancies. The largest impact was felt in the beverage sector which is, as noted above, also experienced the greatest difficulties. The size of the company does not seem to matter very much with regard to employment impacts, at least in terms of strategies used by firms. We did not assess the actual number of employees affected in our survey, however.

Unsurprisingly, the more internationally oriented the economy, the more affected the companies were by foreign governments' measures, either because these measures impacted on the imports of inputs (especially Nigeria) or on the exports of products (especially Kenya). Many affected firms also had to deal with higher administrative burdens at the border or with delays, which increased costs. As a result, many exporting firms saw their exports drop, in particular those exporting to countries outside Africa. This is also reflected in the companies' policy demands. Nigerian companies where particularly concerned with facilitating imports of inputs while Kenyan companies most frequently called for marketing- and trade-related measures.

Calls for financial support, better access to raw materials and revisions to general Covid-19 related policies were most frequently heard from companies. There are interesting differences between countries though, likely reflecting different pathways through which companies were affected. Nigerian companies appear to suffer most from a lack of financial resources which they would like to see address through tax reductions and low-interest loans rather than through direct financial assistance. Ethiopian companies, on the other hand, seem to struggle most with procuring raw materials and were calling their government to actively remedy the situation. South African firms would above all have liked to see Covid-19 related restrictions to be have been dismantled while Kenyan companies were looking for a bundle of measures to support their operations and their workers.

A number of caveats need to be mentioned which may affect the validity of our findings. First, the conclusions are based on the subjective assessment of respondents rather than verifiable data. Also, the descriptive analysis does not allow for any claims of causality between the Covid-19 pandemic, related containment measures and observed impacts. It is also not possible to distinguish between the actual impacts of the Covid-19 pandemic and related measures and the effects of higher levels of uncertainty among firms. Moreover, we observe high attrition rates between the two rounds. While our analysis suggests that these may not have biased our results significantly, such bias cannot be discarded. Finally, the survey was limited to formal firms.

Further research is needed to assess the impacts of the Covid-19 pandemic and related containment measures on the informal sector which continues to play an important role in the food and beverage manufacturing sector of many African economies (AGRA, 2019). To fully assess employment effects, more research is also needed to assess the number of workers affected, actual incomes lost as a result and availability of social safety nets. Similarly, actual losses incurred by the companies and investment curtailed through these would need to be quantified. In addition, further research on the pathways through which the impacts occur would help to develop targeted policies that minimize risks both to the health of the

population as well as the wider economy, taking into account the heterogeneity of contexts. Finally, as shown here, the situation is very dynamic. Longitudinal studies are therefore needed to monitor impacts over time.

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# Appendix

List of all sources used to compile company listings

Nigeria	Manufacturing Association of Nigeria NG Contacts (Directory) VConnect (Directory) General web searching
Kenya	Kenya Association of Manufacturers Kenya Private Sector Alliance Chamber of Commerce Ministry of Trade General web searching
South Africa	Who Owns Whom Brabys' list Membership lists of South African business associations General web searching
Ethiopia	Policy Studies Institute Survey (formerly Ethiopian Development Research Institute) Central Statistical Agency

#### Sample selection in the second round

For the second round of the survey, a subsample of companies was randomly selected from the companies interviewed in the first round. The random selection process ensured that the structure of the initial sample was preserved and that the population of firms in the food and beverage manufacturing sector was reflected in the sub-sample drawn for the second round. In case of a unit non-response among the target sub-sample, a replacement procedure was in place and consisted of randomly drawing a replacement unit from the same strata, with the same stratification as described in the methodology section of the paper. The replacement took place in two steps: first, replacement companies were randomly drawn from among other companies interviewed in the first round but not included in the target sub-sample; second, if the first replacement companies could not be interviewed either, then replacement companies were drawn from a remaining list of companies not interviewed in the first round. In both cases, the replacement companies were taken from the same strata as the target company. In case of Nigeria, we had to drop 27 companies from the target subsample due to the deteriorating security situation in some parts of the country. Note that only in Ethiopia, we attempted to interview in the second round all firms from the first round.

# Table A1: Analysis of attritors

	Non-attritors	Attritors	Difference
Company size			
Micro & Small	42.3	37.3	5.0
Medium	31.2	36.1	-4.9
Large	26.5	26.6	-0.1
Ownership			
Private sector. domestically-owned	66.6	81.0	-14.4***
Private sector, foreign-owned	7.0	5.1	1.9
Government-/State-owned	2.0	1.9	0.1
Private sector, share companies or joint ventures	24.5	12	12.5**
Industry type			
Meat Products	3.6	7.6	-4.0
Dairy Products	5.0	3.8	1.2
Canned, Frozen, and Preserved Fruits, Vegetables, and			
Food Specialties	5.0	8.9	-3.9
Grain Mill Products	33.4	21.5	11.9**
Bakery Products	9.5	10.8	-1.3
Sugar and Confectionery Products	5.8	6.3	-0.5
Fats and Oils	8.6	6.3	2.3
Beverages	15	19.6	-4.6
Miscellaneous Food Preparations and Kindred Products	13.9	15.2	-1.3
Status of operations in the first round			
We are operating as usual	18.9	23.4	-4.5
We are operating, but had to reduce production volumes	68 5	57.0	11 5**
We had to temporarily close the company	8.0	15 /	_/ 9
We have permanently close the company	0.8	1 2	-0.4
We are operating and have increased production	0.8	1.2	-0.4
volumes	3.9	5.7	-1.8
Number of observations	359	158	

Note: Figures presented as shares of all companies. Source: Authors' own elaboration.