COVID-19 and Sub-Saharan Africa Firms: Impact and Coping Strategies

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ABSTRACT Drawing on a representative survey of firms in 38 countries, eight of which are in Sub-Saharan Africa (SSA), this paper documents the impact of COVID-19 and firms’ coping strategies in SSA, benchmarking with other regions. The paper shows that the impact of the pandemic is more pronounced in Sub-Saharan Africa compared with other regions. This disproportionate impact is not explained by differences in sectoral composition and other firm characteristics, but likely by the level of development. This underscores the important economic and structural contexts that predate the pandemic in understanding the differential impact. Contrary to expectations, the findings show that businesses in Sub-Saharan Africa are more likely to adjust their operations or products and services to adapt to the shock than those in other regions. However, firms in the region lag in leveraging digital technologies, remote working, and e-commerce, compared with those in other regions.

KEYWORDS: COVID-19; firms; Sub-Saharan Africa; enterprise surveys; impact; response

JEL CLASSIFICATION CODES: D22; G01; L25; O10

1. Introduction

The COVID-19 pandemic and some of the public health measures to contain its spread have resulted in major disruptions to the global economy. For businesses in low-income economies, like those in Sub-Saharan Africa (SSA), this shock comes on top of existing structural challenges facing businesses. Firms in SSA are predominantly small, more likely to be credit constrained and had limited cash flows prior to the pandemic – characteristics that are likely to make them vulnerable to even small shocks, let alone a systemic shock of this scale. This is compounded by the fact that governments lack the financial and organizational resources needed to provide the type of support and safety nets that developed economies marshalled to mitigate the impact of the shock on the private sector (Loayza & Pennings, 2020; Stiglitz, 2020). The pandemic-induced disruption appears to have pushed the region into the first recession in 25 years (Calderon et al., 2020) and is feared to jeopardize SSA’s nascent private sector.

On the other hand, while the pandemic is not yet over and has already exacted a toll on lives, emerging evidence suggests that the health impact in the region is milder than originally predicted (Maeda & Nkengasong, 2021). Evidence also shows that containment measures were relatively less strict and eased sooner than in other parts of the world. Taken together, these
findings suggest that firms in the region may have been affected less severely than those in other regions. Perhaps consistent with this view, in a macro-level study, Deaton (2021) finds that international income inequality decreased following the pandemic primarily since less developed economies were less affected by the pandemic compared with developed economies.

Yet not much is known empirically on the specific nature and magnitude of the impact of the crisis on firms in SSA, as well their coping strategies and how firms in SSA compare relative to other regions. Understanding the magnitude of the impacts and the types of businesses that are most affected is central in designing sound policy interventions to mitigate the effects of the shock and for planning for the post-COVID-19 economic recovery. Against these backdrops, this paper uses a rapid business survey conducted by the Enterprise Analysis Unit of the World Bank Group in 38 countries, eight of which are in SSA, to document the multi-faceted impact of the pandemic on the private sector in the region, focusing on key measures of performance, financial health, and how firms have been adjusting to counter the impact of the disruptions. These surveys are conducted as follow-ups by re-interviewing firms that were covered in each country’s most recently completed standard World Bank Group Enterprise Surveys (ES), thus providing a rich set of baseline information. Chad, Guinea, Mozambique, Niger, Somalia, Togo, Zambia and Zimbabwe are the eight countries for which the World Bank Enterprise Survey follow-up data is available as of the write-up of this paper. We address two central questions. First, on top of documenting the nature and magnitude of the impact, we explore whether firms in the region are disproportionately affected by the pandemic-induced disruptions compared with their peers in other regions. Second, we document how firms in SSA responded to mitigate the impacts of the shock, examining whether firms in the region are different from those in other regions in their coping strategies.

To preview our results, we show that the impacts of the pandemic are large and uneven within and across countries, with firms in SSA hit the hardest. We find that the pandemic induced contractions in firm-level sales and employment are significantly higher in SSA than in other regions. Similarly, firms in the region are more likely to experience liquidity and cash flow challenges than in other regions. This disproportional impact on SSA firms is not explained by differences in sectoral composition and firm characteristics. Consistent with other studies, we also find that the impact of the pandemic varies across sectors, firms, and countries, with businesses in customer-facing sectors, such as hospitality and related services, affected the most. However, contrary to expectations, we find that businesses in SSA are more likely to adjust their operations, products, or services to adapt to the shock than those in other regions, even compared to firms in other economies with comparable income levels. However, firms in the region lag in terms of leveraging technology, particularly on use of e-commerce and remote work arrangements.

This paper contributes to the emerging and rapidly growing literature on the economic impacts of COVID-19 on businesses (e.g., Amin & Viganola, 2021; Apedo Amah et al., 2020; Bachas, Brockmeyer, & Semelet, 2020; Bartik et al., 2020; Chetty, Friedman, Hendren, & Stepner, 2020; Muzi, Jolevski, Ueda, & Viganola, 2021). The paper is closely related to Bachas et al. (2020) who utilize administrative corporate tax records from 10 low- and middle-income economies and show that that firms in poorer countries are relatively less impacted on different dimensions. Our paper builds on the results of these studies by providing the first detailed analysis of the impact on SSA firms using short business surveys.

This paper is organized as follows. Section 2 briefly summarizes the COVID-19-focused follow-up business surveys. Section 3 presents the main results and Section 4 concludes.

2. Survey and data

The Enterprise Analysis unit of the World Bank Group (WBG) has been conducting a rapid survey of businesses as part of the Bank’s effort to understand the impact of the pandemic on
the private sector. These surveys are conducted as follow-up surveys on recently completed standard WBG Enterprise Surveys (ES) in several countries. These short surveys re-contact all establishments sampled as part of the standard World Bank Group ES and are designed to provide quick information on the impact and adjustments that COVID-19 has brought about in the private sector.

The universe of inference, as in standard ES, is all registered establishments with five or more employees that are in one of the following activities defined using ISIC Rev. 3.1: manufacturing (group D), construction sector (group F), services sector (groups G and H), transport, storage, and communications sector (group I) and information technology (division 72 of group K). These surveys have been conducted in 38 countries across the world, eight of which are in Sub-Saharan Africa. The paper uses these data sets for a total of 38 countries (eight countries in SSA and 30 in other regions) for which this survey has been conducted by the Enterprise Surveys Unit; Table S.1 in the Supplementary Materials presents the list of countries and comparators included in the analysis.

3. Results

The pandemic unleashed a multi-pronged shock on businesses in SSA as elsewhere, disrupting demand and supply sides. This section documents some of the salient empirical patterns based on the COVID-19 follow-up surveys for these countries; we focus on how the pandemic impacted key measures of firm performance and coping strategies, benchmarking results for SSA with other regions. We group the discussion of the key results along two broad themes. First, we present the impact of the shock on key firm performance measures, including sales, employment, and financial health. Second, to better understand how firms in the region adapted in response to the shock, we look at firms’ coping strategies. We focus on key adjustments taken to counter effects of the shock including adapting their products, services, or means of delivery to evolving customer demand, as well as the use of technology, such as e-commerce and work-from-home arrangements.

3.1. Impact of COVID-19-induced disruptions

As we noted above, the pandemic’s immediate impacts involved the widespread suspension of business operations, and supply chain disruptions. For instance, among the eight countries in SSA in our sample, about 60 per cent of firms reported suspending operations at some point leading up to the date of data collection (Figure A1), on average for about two months. This prevalence of closure ranges from about 90 per cent in Chad and Zimbabwe to just 28 per cent in Togo. The prevalence of temporary closures of operations could be impacted by the stringency of containment measures put in place, which varies across the eight SSA countries in our sample (Figure S.1 in the Supplementary Materials). In our data, the prevalence of temporary closures in SSA is not only high, but almost twice that of ECA (36%), although slightly lower than that of the MENA (67%) and LAC (79%) regions. Disruptions to demand, and in the availability of input/raw materials and merchandise for resale is also pervasive in the region. Among the eight SSA countries, 82 per cent of firms experienced a decline in sales compared to the same month in 2019 (Figure A2). Similarly, 81 per cent of firms experienced disruptions to their supply of inputs and raw materials. The impact of the shock on sales and employment, two of the most closely watched variables, has also been substantial. For instance, close to 90 per cent of firms in SSA reported that their sales contracted compared to the pre-COVID levels. Among the eight countries, sales fell on average by 45 per cent compared to the same month in 2019, with the value ranging from 56 per cent in Niger to 32 per cent in Somalia. Median sales growth is negative in all the eight countries in SSA (blue colour in Figure 1). Importantly, while public containment measures were relatively less stringent in the eight countries compared with...
those in other regions, the decline in sales is more prevalent and deeper in SSA compared with other regions.

A similar pattern is observed on employment. Almost all surveyed firms in these countries experienced a decline in the number of full-time workers compared with pre-pandemic levels. On average, employment declined by 22 per cent between the eight countries. The magnitude of employment contraction varies across countries, ranging from 40 per cent in Guinea to 10 per cent in Zimbabwe. Further, between 57 per cent (Chad) and 94 per cent (Niger) of firms report reducing employee hours compared to the same month in the previous year. The level of required workforce reduction and the ability of firms to do so also depends on the country’s institutional context, particularly labour regulations. Some firms may also opt to reduce working hours rather than retrenching employees to avoid loss of skilled and experienced employees.

The results above show that, overall, the impact appears to be higher in SSA compared with other regions. We turn to a regression analysis to formally test whether the shock has systematic differential impact within SSA:

\[
y_{isc} = \beta_0 + \beta_1 SSA + \eta_s + \beta_2 Z_{isc} + \epsilon_{isc}
\]  

(1)

Where \( y \) denotes different outcome variables including percentage change in sales and employment compared to pre-COVID levels, permanent closure, liquidity/cashflow shortages, adjusted production/services, started or increased e-commerce and delivery or carryout, and started or increased remote work arrangement for its employees, for firm \( i \) in country \( c \) in sector \( s \). Variable SSA is a dummy variable that is equal to one if a firm is in Sub-Saharan Africa and 0 otherwise. Sampling weights are used in all estimations.6
The coefficient of interest $\beta_1$ captures the average impact on SSA firms compared to those in other regions. In addition to the SSA dummy, we sequentially include various controls to account for sector fixed-effects, captured by $(\gamma_s)$ as well as other potential confounders of the regional differences captured by firm-specific characteristics, measured by a vector of firm-specific controls ($Z_{isc}$), such as size, age, ownership, exporting status, credit constraint, and competition with informal businesses. $\epsilon_{isc}$ is the error term that captures unexplained variation in $y$.

To capture changes in employment, we follow Davis, Haltiwanger, and Schuh (1998) and use the arc-percentage change by comparing employment post-COVID against the baseline employment and divided by the average of the two:

$$\text{EmpGrowths}_{isc} = \frac{(\text{PostCovid}_{isc} - \text{PreCovid}_{isc})}{0.5(\text{PostCovid}_{isc} + \text{PreCovid}_{isc})}$$

This allows the inclusion of firms with zero full-time permanent employees in the computation. The value ranges from $-2$ (for firms going from positive full-time permanent employees in the pre-COVID period to zero after COVID) and $+2$ for those moving from zero to positive. 

Table A.1 provides the list and descriptions of variables used in the regression, while Table A.2 provides the descriptive statistics.

Table 1 reports OLS regression results for the percentage changes in sales (Panel A), employment (Panel B) and hours worked per week (Panel C) as dependent variables by sequentially adding different controls in the regression. In column 1 we present estimates of a basic regression for sales, employment, and reduction in hours worked on an SSA dummy variable controlling for just the time of the COVID follow-up survey. The estimated SSA dummy coefficient is negative and significant for sales and change in employment (and positive and significant for reduction in hours worked), suggesting that the pandemic has had a disproportionately negative impact on firms in SSA compared to those in other regions.

It has been widely documented that the impact of the pandemic varies by sector, with businesses in customer-facing sectors, such as hospitality and related services, among the most affected (Vavra, 2020). Thus, differences in sectoral composition can generate differential impact in SSA if firms in the region are concentrated in the most directly exposed sectors. To account for differences in sectoral composition across countries, in column 2 we include sector fixed effects. The SSA dummy is still negative and significant for sales and employment (and positive and significant for reduction in hours worked), buttressing the finding that the impact has been disproportionately higher in SSA. The disproportionate impact on SSA may be explained by differences in firms’ characteristics in SSA relative to other regions. To investigate whether the various firm characteristics increase the exposure of SSA firms, we control for firm-specific factors, such as size, age, foreign ownership, exporting status, measure of pre-COVID credit constraint, and gender and experience of the top manager. This, however, does not change the results (column 3); the coefficient of the SSA dummy remains negative and significant at the 1 per cent level for both sales and employment and positive and significant for reduction in hours worked. Controlling for the measure of stringency of the COVID-19 related containment measures does not also change the result (column 5).

The other regions in our sample are composed of countries at different levels of development, while our sample countries for SSA are lower income economies. Because of the pre-existing structural challenges firms in lower-income economies face, the effects of the shock could be magnified compared to higher income economies. To account for this, we limit the comparator countries to lower income economies (columns 6 and 7 in Table 1 for the three dependent variables). Interestingly, the result changes once we do so; the coefficient of the SSA dummy becomes insignificant for both sales growth and employment. This means that the sales and employment impact of the shock was higher in lower income economies than in higher-income economies regardless of whether they are in SSA or elsewhere. The story is different for the
Table 1. Impact of COVID on sales and employment

| Controls | Sector FE | Stringency measures | Survey week |
|----------|-----------|---------------------|-------------|
| Panel A  | No        | No                  | No          |
| Dependent variable: percentage change in sales |
| Africa   | (0.019)   | (0.019)             | (0.019)     |
|          | -0.137**  | -0.137**            | -0.137**    |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.123     | 0.123               | 0.123       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.137     | 0.137               | 0.137       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.117     | 0.117               | 0.117       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.149     | 0.149               | 0.149       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.033     | 0.033               | 0.033       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.028     | 0.028               | 0.028       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.018     | 0.018               | 0.018       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.011     | 0.011               | 0.011       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.009     | 0.009               | 0.009       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.008     | 0.008               | 0.008       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.007     | 0.007               | 0.007       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.006     | 0.006               | 0.006       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.005     | 0.005               | 0.005       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.004     | 0.004               | 0.004       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.003     | 0.003               | 0.003       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.002     | 0.002               | 0.002       |
|          | (0.012)   | (0.012)             | (0.012)     |
| | Panel B  | No        | No                  | No          |
| Dependent variable: percentage change in employment |
| Africa   | (0.019)   | (0.019)             | (0.019)     |
|          | -0.117**  | -0.117**            | -0.117**    |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.114     | 0.114               | 0.114       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.111     | 0.111               | 0.111       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.107     | 0.107               | 0.107       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.104     | 0.104               | 0.104       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.101     | 0.101               | 0.101       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.098     | 0.098               | 0.098       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.095     | 0.095               | 0.095       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.092     | 0.092               | 0.092       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.089     | 0.089               | 0.089       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.087     | 0.087               | 0.087       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.085     | 0.085               | 0.085       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.083     | 0.083               | 0.083       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.081     | 0.081               | 0.081       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.079     | 0.079               | 0.079       |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.077     | 0.077               | 0.077       |
| | Panel C  | No        | No                  | No          |
| Dependent variable: increased total hours worked per week (dummy) |
| Africa   | (0.019)   | (0.019)             | (0.019)     |
|          | -0.227**  | -0.227**            | -0.227**    |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.208**   | 0.208**             | 0.208**     |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.195**   | 0.195**             | 0.195**     |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.182**   | 0.182**             | 0.182**     |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.170**   | 0.170**             | 0.170**     |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.158**   | 0.158**             | 0.158**     |
|          | (0.012)   | (0.012)             | (0.012)     |
|          | 0.146**   | 0.146**             | 0.146**     |
| Notes: The dependent variables are percentage change in sales (Panel A), percentage change in employment (Panel B), and a dummy whether a firm reduced total hours worked per week (Panel C). The omitted sector is 'other services' and the control region group are 30 countries from ECA, MENA, and LAC. The firm-level controls are firm size, age, exporting status, foreign ownership, top manager’s experience, gender of the top manager, financial constraint, and competition with informal firms. *, **, and *** indicate statistical significance at the 10, 5, and 1 per cent level.
change in hours worked where the coefficient of the SSA dummy is positive and significant, suggesting that firms in SSA are 12 percentage points more likely to reduce the weekly hours of their workers compared to those in other low income economies located in other regions. Taken together with the result for change in employment, this result may suggest that firms in the region are more likely to accommodate the impact of the shock via reduction in hours operated rather than by retrenching their employees. This could be a reflection of differences in labour market regulations, mainly as it relates to ease of retrenching workers, between SSA and other lower income economies in our sample.11

To gauge whether there are differences based on firm characteristics in the extent to which firms were impacted by the pandemic in SSA relative to other countries, we interact several firm-level characteristics with the SSA dummy controlling for country fixed effects. The results are reported in Table A.3. Columns 1 and 2 present the results for changes in sales, 3 and 4 for changes in employment and 5 and 6 for changes in total hours worked. Consistent with expectations, the impact on sales is negative and significant for businesses operating in the hospitality sector compared with those in other sectors. Given the global nature of the shock, export-oriented firms were significantly negatively affected compared with non-exporters. Despite the shock, it is interesting that older firms and foreign-owned firms have seen a smaller percentage decline in sales compared with younger and locally owned firms. The smaller negative effect on foreign firms could be due to their access to diversified markets as they may have better access to foreign markets, know-hows and resources (Boddin, Raff, & Trofimenko, 2017; Lall & Mohammad, 1983). Credit constrained firms are likely to experience a higher decline in sales, which is also consistent with other studies (Amin & Viganola, 2021). Similarly, businesses that compete with informal businesses have also experienced significant decline in sales compared to those that do not face such competition, consistent with findings by (Amin, 2021; Amin & Okou, 2020) who documented an adverse effect of informal competition on the growth of formal firms prior to the pandemic. Interestingly, smaller firms have seen a smaller percentage decline in sales compared to larger firms. This may reflect the differential impact of the COVID-19 restriction measures on firms depending on the geographic size of the market served (Nordhagen et al., 2021). The limit on consumer mobility during the containment measures is likely to entail substantial loss in customer base for larger firms that generally serve a larger geographic area; this loss may not be drastic for smaller firms that generally serve a relatively smaller area. In fact, smaller firms could benefit from the mobility restrictions as customers settle, for instance, for a local grocery store than a faraway modern supermarket because of the restriction on travel and logistical reasons as people avoid public transportation.12 None of the coefficients of the interaction term between the SSA dummy and firm-level variables is significant (column 2).

Turning to the change in employment (columns 3 and 4), businesses in manufacturing, retail, wholesale, and construction have seen improvements in the number of full-time permanent employees compared to those in other services category (largely comprised of IT, Transpiration and related), while smaller firms and those whose top manager is female saw significant decline in their number of employees. Another notable result is the negative impact of credit constraint and competition with informal businesses on employment growth and hours worked, consistent with well-documented findings of the impact of credit constraint (Amin & Viganola, 2021) and competition from informal businesses (Amin & Okou, 2020) on employment growth in the formal sector. In terms of hours worked (columns 5 and 6), businesses in the manufacturing, and hotel and restaurant industry are more likely to reduce hours operated while smaller firms are less likely to do so. Foreign-owned firms are also less likely to reduce the hours worked, consistent with our finding that these firms were less affected in terms of sales (column 1 and 2). For both measures of employment, however, the interaction term of the SSA dummy is insignificant, suggesting that the impact does not vary by firm type or sector in SSA as compared to other regions.
We now turn to the discussion of the impact of the shock on the financial health of the businesses, measured by three key variables: 1) experiencing cash-flow and liquidity shortages, 2) vulnerability to exit, and 3) permanent closure. The survey asks several questions to elicit information on the nature and magnitude of COVID’s impact on firm finances, covering topics such as liquidity and cash flow, the ability to honour existing commitments with suppliers, landlords, and government agencies, as well as the ability to buffer shocks.

Between the eight SSA countries, close to 87 per cent of the businesses faced liquidity and cash flow shortages because of the pandemic, ranging from 96 per cent of firms in Togo and Guinea to 80 per cent in Mozambique (Figure A4). The proportion of firms facing liquidity and cash flow shortages is higher in SSA compared with other regions—57 per cent in ECA, 76 per cent in MNA and 81 per cent in LAC.13 Perhaps because of the pervasiveness of cash flow challenges in the region, slightly over half of the businesses in SSA have consequently delayed payment to suppliers, landlords and tax authorities. This is substantially higher than the corresponding figure for ECA (32%), but roughly similar to LAC (54%) and lower than MNA (61%).

A relatively small fraction of firms was confirmed to have permanently closed at the time of the survey. Except for Chad and Zambia, where, respectively, about 6 and 3 per cent of firms confirmed to have permanently gone out of business, in the rest of SSA, <1 per cent of businesses initially surveyed in the pre-COVID ES were permanently closed as of the follow-up survey (see Figure A6). In Niger, Togo and Zimbabwe, for instance, not a single establishment was confirmed permanently closed since the outbreak of the pandemic. Only 1 per cent of all firms in our SSA sample were permanently closed. This is smaller than the corresponding figure in MNA (8%) and ECA (2%) but roughly in line with LAC (0.9%).

While only a few firms have so far confirmed to have permanently closed, the pandemic may have increased underlying vulnerability of the businesses to exit in the future, should containment measures be extended or further tightened. To gauge this, the survey asks firms how many more weeks the business can survive (meeting its financial obligations) if sales stopped now. The results reveal a stark level of vulnerability of firms in the region (Figure A5). For instance, a median-size firm in Niger, Togo, Zambia, and Zimbabwe can survive for just four weeks from the day their sales stop. Between the eight countries, about 70 per cent of the firms can stay afloat for a maximum of two months if their sales stop as of the date of the survey. Therefore, a significant number of firms appear to be vulnerable to going out of business if the pandemic and the associated policy restrictions persist for a long period of time. Firms in SSA can survive for eight weeks from the day their sales stop. This is smaller than the corresponding number in ECA (10 weeks) and MNA (14 weeks) but higher than LAC (7 weeks) (see Figure A5).

As we did above for sales and employment impact, we present regression results for the three measures of financial well-being (Table 2), focusing on whether firms in SSA are disproportionately affected. We will also examine other key drivers of firm financial fragility. Panel A provides regression results for measures of liquidity and cash flow shortages, a dummy variable taking a value of 1 if the firm experienced cash flow or liquidity shortages since the start of the pandemic, and zero otherwise. As columns 1–5 show, firms in SSA are more likely to experience cash-flow shortages following the pandemic; depending on the specification, businesses in the region are 10–27 percentage points more likely to experience liquidity challenges compared to their peers in other regions. Restricting the comparator countries to lower income economies does not change the key result, although the size of the SSA dummy coefficient becomes smaller (columns 6 and 7). This perhaps suggests that SSA firms have limited resources or savings to absorb the effects of the shock.

However, vulnerability to exit as well as permanent closure are not particularly higher in SSA. The coefficients for the SSA dummy become significant when the sample of comparator countries is restricted to lower income economies (Panels B and C, columns 6 and 7), suggesting
that firms in the region are in fact less vulnerable to exit from the business and less likely to have permanently closed compared to those in lower-income economies in other regions. This is somewhat counter-intuitive given that firms in the region are significantly disproportionately affected in terms of sales and employment (as reported in Table 1) and are more likely to experience liquidity and cashflow shortage (Panel A in Table 2) compared with other low income economies. Several possible reasons could underlie the difference. For instance, the lower exit rates observed in SSA compared with other lower income economies could be a result of differences in regulations governing resolving insolvencies and bankruptcies. If these regulations are such that resolving bankruptcies takes longer in SSA compared to those in other lower income economies, firms that sustained similar shock to their sales may exit their businesses at different ease and speed. It could also be that business owners in SSA do not have better options than staying open and weather out the shock. The result for the measure of vulnerability could be explained by the fact that this measure is self-reported information about firms’ outlook about the future, and the negative coefficient of the SSA dummy may be capturing that firms in the region are more optimistic about their future compared with those in other low income economies. Nevertheless, understanding why firms in SSA are more optimistic is itself an interesting question, but beyond the scope of this paper.

We also assess the differential impact on financial health by firm characteristics in SSA by interacting firm-level variables with the SSA dummy. The results are reported in Table A.4. The likelihood of experiencing cashflow and liquidity shortages varies widely by sector and firm characteristics within a country (Table A.4). Firms in the manufacturing sector and those in the hospitality sector are more likely to experience liquidity shortages as are credit constrained firms, consistent with the fact that these groups experienced a significant decline in sales. Foreign-owned firms are less likely to experience a liquidity shortage, while small, export oriented and female managed firms are more likely to experience one. These results are consistent with an array of studies exploring performance differential among female vs. male managed firms (e.g., Islam, Gaddis, Palacios López, & Amin, 2020; Liu, Wei, & Xu, 2021), and foreign vs. domestic owned firms (e.g., Waldkirch, 2014).

There are some variations in vulnerability to exit across sectors (Table A.4). Businesses in the hotel and restaurant sector are more likely to exit in the hypothetical case where sales stop; this is consistent with the finding earlier that businesses in this sector are more likely to experience a decline in sales and experience liquidity shortages. Female-managed firms and those with more experienced top managers are more likely to exit after a sudden stop of sales, while small, older, export-oriented firms, and those in the construction sector are less likely to do so. The likelihood of permanent closure is higher among firms in the manufacturing, wholesale, retail, hotel, restaurant, and construction sectors compared with those in other service sectors. It also tends to be higher among exporters (consistent with the result of the impact on sales as reported in Table 1), female-managed firms (consistent with other studies (e.g., Torres, Maduko, Gaddis, Iacovone, & Beegle, 2021) and younger firms. The higher vulnerability and rate of closure of firms with experienced managers is somewhat counter-intuitive since such firms are more likely to better navigate the crisis. However, this is perhaps consistent with a view that managers with long tenure in general tend to be reluctant to change their strategies, the opposite of what is required to navigate crises, such as the COVID-19 induced disruptions (Finkelstein & Hambrick, 1990). By and large, none of the coefficients of the interaction terms with the SSA dummy is significant, for both vulnerabilities to exit and permanent closure.

3.2. Sink or swim? Firms’ adjustments and mitigation strategies

By the time of the survey, which was about six months into the outbreak of the pandemic, only 2 per cent of firms in the eight countries in SSA received some form of government support to help them navigate the crisis. This is in stark contrast with other regions where a significant
Table 2. Impact of the pandemic on financial well-being of the business

| Controls | No (1) | Sector (2) | Firm (3) | Sector and firm (4) | COVID stringency (5) | No (6) | Sector and firm (7) |
|----------|--------|------------|----------|---------------------|----------------------|--------|---------------------|
| Panel A: Dependent variable: decreased liquidity or cash flow since the pandemic (dummy) | | | | | | | |
| Africa | 0.267*** | 0.248*** | 0.226*** | 0.202*** | 0.166*** | 0.100*** | 0.108*** |
| (0.024) | (0.025) | (0.034) | (0.033) | (0.035) | (0.031) | (0.034) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | No | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.947*** | 0.940*** | 0.859*** | 0.791*** | 0.974*** | 0.905*** | 0.834*** |
| (0.048) | (0.083) | (0.130) | (0.147) | (0.156) | (0.051) | (0.129) |
| Observations | 14254 | 14224 | 11469 | 11469 | 11190 | 3672 | 3175 |
| R-squared | 0.035 | 0.062 | 0.059 | 0.090 | 0.092 | 0.018 | 0.075 |
| Panel B: Dependent variable: vulnerability | | | | | | | |
| Africa | −0.002 | −0.002 | 0.028 | 0.023 | −0.011 | −0.056** | −0.052** |
| (0.017) | (0.018) | (0.022) | (0.023) | (0.023) | (0.022) | (0.025) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | No | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.336*** | 0.314*** | 0.388*** | 0.394*** | 0.558*** | 0.728*** | 0.616*** |
| (0.031) | (0.043) | (0.065) | (0.078) | (0.084) | (0.047) | (0.069) |
| Observations | 10774 | 10745 | 8762 | 8762 | 8601 | 2959 | 2535 |
| R-squared | 0.015 | 0.037 | 0.041 | 0.066 | 0.071 | 0.127 | 0.142 |
| Panel C: Dependent variable: permanently closed since the pandemic (dummy) | | | | | | | |
| Africa | −0.001 | −0.002 | −0.005 | −0.007 | 0.000 | −0.030** | −0.027** |
| (0.008) | (0.007) | (0.011) | (0.011) | (0.011) | (0.013) | (0.013) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | No | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.001 | −0.012 | −0.005 | −0.025 | −0.060 | 0.005 | 0.049 |
| (0.015) | (0.018) | (0.030) | (0.032) | (0.039) | (0.016) | (0.092) |
| Observations | 15060 | 15060 | 12072 | 12072 | 11792 | 3921 | 3380 |
| R-squared | 0.001 | 0.006 | 0.022 | 0.026 | 0.026 | 0.007 | 0.023 |

Notes: The dependent variables are: a dummy equal to 1 if a firm experienced a decrease in liquidity or cash flow since the pandemic (Panel A), is as the inverse of average duration of survival if sales dropped to zero (Panel B), and is a dummy equal to 1 if a firm is confirmed permanently closed since the pandemic (Panel C). The omitted sector is ‘other services’ and the control group are 30 countries from ECA, MENA, and LAC. The firm-level controls are: firm size, age, exporting status, foreign ownership, manager’s experience, gender of the top manager, financial constraint, and competition with informal firms. *, ** and *** indicate statistical significance at the 10, 5, and 1 per cent level.
share of firms have received direct government supports. For instance, for our sample of coun-
tries, the percentage of firms receiving some form of assistance ranged from 49 per cent in ECA, 8.9 per cent in LAC, and 24 per cent in MENA (Figure A8). In effect, as far as direct
government support is concerned, firms in SSA appear to be left to fend for themselves to navi-
gate the crisis, with minimal tangible financial support from the government.

Firms take several measures on their own to counter the impact of the crisis. The often-dis-
cussed adjustment in the context of COVID-19 disruption is re-purposing, where firms adjust
their operation to evolving demand. There is anecdotal evidence of alcohol manufacturing com-
panies producing hand sanitizers and textile and garments companies making face-masks
(López-Gómez, Corsini, Leal-Ayala, & Fokeer, 2020). Many businesses have also adjusted their
mode of operations, for instance, allowing employees to work remotely where possible, deliver-
ing goods and services instead of on-site service, etc.

Survey respondents were asked several questions to gauge some of these adjustments. One of
these is whether firms adjusted or converted production or services in response to the pandemic.
Among the firms in our sample of SSA countries, 53 per cent have made such adjustments,
which is interestingly higher than the share of firms in other regions. Similarly, about 20 per
cent of the firms in SSA have started or increased delivery and/or online business activities in
response to the pandemic. This is slightly lower than the average for ECA, and almost half that
of LAC and MNA (see Figure A7).

Not all businesses have the capability to adjust their operations in response to such a sudden
and systemic shock. The ability to adapt and leverage technology depends on firms’ capabilities,
but also on the country’s level of development. For instance, effective utilization of e-commerce
and remote work requires, among other things, a well-developed internet infrastructure and
wider access by the population. Except for Zimbabwe and Guinea where, respectively, 27 and
18 per cent of the population has internet access, for the remaining six countries in our sample
this figure is <15 per cent (WDI, 2019). Coupled with other structural challenges, this would
make these adaptations much more difficult for firms in SSA, broadly confirmed by the regres-
sion results reported in Table 3.

As Panel A of Table 3 shows, SSA firms are more likely to adjust or convert production in
response to the pandemic. Firms in SSA are about 20 percentage points more likely to re-pur-
pose their products or services compared to those in other regions. Restricting the comparator
countries to lower income economies does not change the result. This could perhaps be that the
types of products produced or services rendered by firms in the region are less specialized and
technically complex (i.e., further from the technology frontier) compared with those in other
economies such that it is relatively easier to re-purpose or adjust to meet evolving demand due
to pandemic. It could also mean that adjusting product or services may be more of a necessity
to cope with the disruptions in SSA given the limited government supports and the pervasiv-
eness of liquidity shocks.

The results are somewhat mixed in terms of leveraging digital technology. Businesses in SSA
are not significantly different from those in other regions in terms of delivering their goods or
services to consumers, or use of e-commerce compared to those in other regions. However, if
the comparator countries are restricted to lower income economies, the coefficient for the SSA
dummy is negative and significant, indicating that firms in the region are 9 percentage points
less likely to employ online sales and delivery. While more data is needed to fully explain, the
seemingly counterintuitive result may suggest that convergence in digitization is faster in low-
income countries in other regions than it is for lower income economies in SSA (Ragoussis &
Timmis, 2022). This perhaps reflects the rudimentary state of Internet penetration and Internet
infrastructure in SSA compared to other regions (WDI, 2019). SSA firms are also significantly
less likely to have started or increased remote working arrangements for their employees since
the pandemic, suggesting that firms in the region lag significantly in adopting digital technology
as part of their adaptation to the pandemic. As noted above, these results could be a reflection

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Table 3. Repurposing and leveraging technology to mitigate the impact of the pandemic

| Controls | Full sample | Low-income only |
|----------|-------------|-----------------|
|          | No (1) | Sector (2) | Firm (3) | Sector and firm (4) | COVID stringency (5) | No (6) | Sector and firm (7) |
| **Panel A: Dependent variable is adjusted or converted production/services** | | | | | | |
| Africa | 0.178*** | 0.182*** | 0.195*** | 0.192*** | 0.141*** | 0.219*** | 0.213*** |
| (0.027) | (0.029) | (0.038) | (0.039) | (0.041) | (0.035) | (0.040) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | Yes | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.340*** | 0.326*** | 0.446*** | 0.418*** | 0.684*** | 0.091* | 0.419*** |
| (0.042) | (0.073) | (0.129) | (0.135) | (0.146) | (0.049) | (0.142) |
| Observations | 14680 | 14650 | 11521 | 11521 | 11242 | 3681 | 3183 |
| R-squared | 0.001 | 0.002 | 0.016 | 0.018 | 0.020 | 0.052 | 0.114 |
| **Panel B: Dependent variable is increased online and delivery activity** | | | | | | |
| Africa | 0.060** | 0.049* | −0.001 | −0.007 | −0.049 | −0.088** | −0.085** |
| (0.026) | (0.028) | (0.035) | (0.035) | (0.038) | (0.035) | (0.039) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | Yes | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.588*** | 0.607*** | 0.746*** | 0.770*** | 0.977*** | 0.415*** | 0.600*** |
| (0.046) | (0.076) | (0.130) | (0.141) | (0.149) | (0.059) | (0.140) |
| Observations | 14696 | 14666 | 11529 | 11529 | 11250 | 3693 | 3194 |
| R-squared | 0.021 | 0.033 | 0.033 | 0.045 | 0.047 | 0.006 | 0.032 |
| **Panel C: Dependent Variable is Started or increased remote work arrangement for its workforce** | | | | | | |
| Africa | −0.074*** | −0.076*** | −0.070** | −0.066** | −0.102*** | −0.047 | −0.036 |
| (0.024) | (0.025) | (0.033) | (0.032) | (0.034) | (0.031) | (0.033) |
| Sector FE | No | Yes | No | Yes | Yes | No | Yes |
| Firm controls | No | No | Yes | Yes | Yes | No | Yes |
| Stringency measures | No | No | No | Yes | Yes | No | No |
| Survey week | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.539*** | 0.638*** | 0.587*** | 0.727*** | 0.905*** | 0.380*** | 0.735*** |
| (0.045) | (0.074) | (0.112) | (0.124) | (0.136) | (0.055) | (0.140) |
| Observations | 14671 | 14641 | 11511 | 11511 | 11232 | 3689 | 3190 |
| R-squared | 0.022 | 0.035 | 0.043 | 0.056 | 0.057 | 0.005 | 0.075 |

Notes: The dependent variables are: a dummy equal to 1 if a firm converted its production or services in response to COVID (Panel A), a dummy equal to 1 if a firm started or increased business activity online, and started or increased delivery or carry-out of goods or services (Panel B), and a dummy equal to 1 if a firm started or increased remote work arrangement for its workforce (Panel C). The omitted sector is ‘other services’ and the control group is 30 countries from ECA, MENA, and LAC. The firm-level controls are: firm size, age, exporting status, foreign ownership, manager’s experience, gender of the top manager, financial constraint, and competition with informal firms. * *, **, and *** indicate statistical significance at the 10, 5, and 1 per cent level.
of the low Internet infrastructure level in SSA compared with other low income economies. The Internet penetration rate (a proxy for Internet infrastructure) in SSA of 29 per cent in 2019 is less than half the level of low income economies in other regions (WDI, 2019).

Finally, we report estimates for firm-specific characteristics controlling for country fixed effects and interaction terms with the SSA dummy in Table A.5. The adjustment varies widely by sector and firm attributes. Businesses in the manufacturing, wholesale, retail, hotel and restaurant, and construction sectors are more likely to adjust their product or services compared with those in other service sectors. Perhaps required by the need to adjust to the global demand shock, exporters are more likely to adjust their product or services compared with non-exporters. Consistent with expectations, smaller firms are less likely to re-purpose their products or services. While the likelihood of leveraging technology varies by firm attributes, none of the coefficients of the interaction term of the SSA dummy is significant.

4. Conclusion

The COVID-19 pandemic and the public health measures implemented to contain its spread have resulted in major disruptions to the economic system worldwide. For businesses in low-income economies, this comes on top of existing structural challenges facing the private sector. This is particularly so for SSA where governments lack required financial resources and organizational infrastructure to provide the type of support and safety nets that developed economies marshalled to mitigate the impact of the shock on the private sector (Loayza & Pennings, 2020; Stiglitz, 2020). Further compounding the issues in SSA is the fact that firms are predominantly small, more likely to be credit constrained and have limited cash flows prior to the pandemic.

Against these backdrops, this paper uses a rapid business survey conducted by the Enterprise Analysis Unit of the World Bank Group in several countries to document some of the salient features of the impact of the shock on the region’s private sector. We document that the pandemic has inflicted widespread and deep shocks on the private sector in the region. Temporary closures were much more prevalent in the region. About 60 per cent of firms in the region report suspending operations at some point since the pandemic, on average for about seven weeks, indicating lost revenue for almost two months. Disruptions to demand and supply have also been much more prevalent in the region. This coupled with limited support and safety nets from the government means that the shock has substantially impacted key financial indicators of businesses in the region. Sales contracted on average by about 45 per cent compared to the same month in 2019; employment declined by 22 per cent compared to the pre-COVID level, and over 87 per cent of firms report experiencing liquidity/cashflow shortages.

Not only are these impacts high in absolute terms, but we also show that they are much more severe in SSA than for other regions. The negative impact on sales and employment is significantly higher in SSA compared with other regions. Consistent with the fact that firms in SSA are structurally more precarious and have limited resources to buffer such sudden shocks, firms in the region are more likely to experience liquidity and cashflow shortages than those in other regions.

We do find one silver lining; contrary to expectations, businesses in SSA are more likely to adjust their operations to adapt to the shock than those in other regions, even compared to those firms in economies with comparable income levels. However, firms in the region lag in terms of leveraging technology; for instance, compared with other regions, firms in SSA are 10 percentage points less likely to have started or increased remote work arrangements for their employees.

There are several interesting avenues for future research on this; three of them are apparent. One of these is expanding the sample of countries in the region. Although they cover
geographically different parts of the region, the study covers just eight countries. A logical next step, which we hope to do as more data becomes available, is to see if the results hold as the sample of countries covered in the region increases with the availability of more data. A second avenue for future research relates to the recovery process. With improved access to vaccines and as restrictions are eased, the hope is that the economy will begin to recover. It would be interesting to examine the nature and speed of the recovery process for firms in the region and if and how it differs from those in other regions. Finally, the interesting but counterintuitive finding that firms in SSA are more likely to adjust their operation than those in other regions is worth exploring to better understand its key drivers.

Notes

1. According to the World Bank’s Enterprise Surveys, SSA firms are 35 percent smaller than those in other locations.
2. In fact, according to a recent COVID-19 focused business survey conducted by the Enterprise Analysis Unit of the World Bank, only 3 per cent of firms in SSA have received some form of government support for COVId-19 relief compared with 60 per cent for ECA, 15 per cent for LAC and 30 per cent MNA. Firms in SSA are in effect left to either sink or swim.
3. The list of countries with this survey can be found here: https://www.enterprisesurveys.org/en/covid-19 Anonymized firm-level data and survey documentation including questionnaires can be found from the ES website: https://bit.ly/3bFHIVB.
4. Similar surveys have been conducted for additional countries in SSA (https://www.worldbank.org/en/data/interactive/2021/01/19/covid-19-business-pulse-survey-dashboard). However, as of the write-up of this paper, the firm-level data for these surveys are not available. In addition, these additional surveys don’t have pre-COVID baseline information. Consequently, our sample of countries is restricted to those covered by the Enterprise Analysis Unit’s follow-up survey, for which anonymized firm-level data has been published following the tradition of the World Bank Group Enterprise Surveys data.
5. We use index of stringency of containment measures compiled and produced by Oxford University’s COVID-19 policy response tracker. Data and documentation can be found at: https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker.
6. In all estimations, we use sampling weights computed for the ES COVID-19 follow-up surveys, an adjusted version of the standard ES sampling weights to account for firms that may have existed since the ES and those that have become ineligible. For the regression where dependent variable is permanent closure, we use the standard ES weights. The model is also estimated by using re-scaled sampling weights in order to minimize the results being driven by countries with large sample size. The results are broadly unchanged (see Tables S.4–S.6 in the Online Appendix).
7. We control for survey period in all specifications since data collection period is staggered across countries, coinciding with different stages of the pandemic.
8. For binary dependent variables, the specification is estimated using a linear probability model and a logit model. The results using both specifications are nearly identical. For ease of interpretation, we present the results for linear specifications in the main text, and provide estimates of the logit model in the Online Appendix (see Tables S.2 and S.3).
9. The lower income category also includes economies that are classified as lower-middle income economies; hence two of the countries in our sample, Zambia and Zimbabwe, that are lower-middle income countries also fall in to the lower income classification.
10. We re-run the same regression with all controls by comparing SSA and low-income countries vs. high-income economies. The results confirms that the effects of the shock is significantly higher for firms in lower income economies compared with those in higher-income economies regardless of whether they are in SSA or elsewhere; see Online Appendix Table S.7.
11. For instance, redundancy costs are higher in SSA and South Asia regions compared to high income economies. In Zambia, one of the countries in our sample, redundancy costs is about 20 months of salary for an employee being retrenched after 10 years in the business (Word-Bank, 2020). Adoption of employment protection rules are also on the rise in SSA, particularly in the Francophone countries (Kudzordzi, 2019).
12. While this result is robust to controlling for host of firm-level control variables (including sectoral composition, age, access external finance etc.), full explaining this interesting result is left for future research.
13. Within SSA, Somalia and Togo are among the most significantly affected. Interestingly, while about 90 per cent of firms in Chad and Somalia report facing liquidity and cash flow shortages, only about 15 per cent of firms in Chad delayed payment to service providers compared to about 90 per cent of firms in Somalia.
Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are freely available for download from the Enterprise Surveys website (https://login.enterprisesurveys.org/content/sites/financeandprivate-sector/en/signin.html). The STATA do file to generate all results presented in the paper are available from authors upon request.

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Appendix

A. Variable definitions and summary statistics

| Variable | Definition |
|----------|------------|
| Dependent variable from ES COVID-19 follow-up | Percentage change in monthly sales compared to the same month in 2019, as directly reported by firms. |
| Percentage change in sales | Percentage change in monthly sales compared to the same month in 2019, as directly reported by firms. |
| Percentage change in employment | Percentage change in full-time permanent employment for the last completed month compared with the month right before the COVID-19 outbreak. |
| Decreased total hours worked per week | A dummy variable which equals to 1 if a firm decreased total hours worked per week since the pandemic, and 0 otherwise. |
| Decreased liquidity or cash flow since the pandemic | A dummy variable which equals to 1 if a firm experienced a decrease in liquidity or cash flow since the pandemic, and 0 otherwise. |
| Vulnerability | This variable is defined as the inverse of the number of weeks a firm can remain operating in the hypothetical scenario where sales stop right away. The higher the value of this variable, the more likely that the firm would exit the business if sales stops right away. |
| Exit | A dummy variable equals to 1 if a firm was confirmed permanently closed, and 0 otherwise. |
| Adjusted or converted production/services | A dummy variable equals to 1 if a firm converted its production or services in response to COVID, and 0 otherwise. |
| Increased online and delivery activity | A dummy variable equals to 1 if a firm started or increased business activity online, and started or increased delivery or carry-out of goods or services, and 0 otherwise. |
| Started or increased remote work arrangement for its workforce | A dummy variable equals to 1 if a firm started or increased remote work arrangement for its workforce, and 0 otherwise. |
| Explanatory variables from the ES baseline Small | A dummy variable equals to 1 if a firm employs <20 workers, and 0 otherwise. |

(continued)
| Variable                        | Definition                                                                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Exporter                       | Dummy equal to 1 if a firm directly exports to foreign markets and 0 otherwise                                                          |
| Foreign                        | A dummy variable equal to 1 if foreign individuals, companies or entities own 10 per cent or more of the firm and 0 otherwise.            |
| Female top manager             | A dummy equal to 1 if top manager is female, and 0 otherwise.                                                                          |
| Manager’s experience           | (log of) number of years of experience the top manager of the firm has worked in similar industry.                                     |
| Credit constrained             | A dummy variable equals 1 if a firm is financially constrained, and 0 otherwise, following (Kuntchev, Ramalho, Rodriguez-Meza, & Yang, 2013). |
| Informal firms                 | A dummy variable equals 1 if a firm identifies practices of competitors in the informal sector as a major constraint, and 0 otherwise. |
| Manufacturing                  | A dummy variable equals 1 if a firm is in the manufacturing sector, and 0 otherwise.                                                      |
| Wholesale and retail           | A dummy variable equals 1 if a firm is in the wholesale or retail sector, and 0 otherwise.                                               |
| Hotels and restaurants         | A dummy variable equals 1 if a firm is in the hotels or restaurants sector, and 0 otherwise.                                             |
| Construction                   | A dummy variable equals 1 if a firm is in the construction sector, and 0 otherwise.                                                      |
| Other services                 | A dummy variable equals 1 if a firm is in the other service sectors, and 0 otherwise.                                                     |
| Survey week                    | The time during which the COVID-19 Follow-up ES was conducted.                                                                           |
| Stringency index               | The level of COVID-19 stringency measure implemented in each country, compiled and produced by Oxford University’s COVID-19 policy response tracker [https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker](https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker) |
Table A.2. Summary statistics

| Variable                                                                 | Full sample | SSA          |
|--------------------------------------------------------------------------|-------------|--------------|
|                                                                         | Obs  Mean   | p50 Min Max  | Obs  Mean   | p50 Min Max  |
| 1. ES COVID-19 follow-up                                               |             |              |             |              |
| Percentage change in sales                                             | 14092 -0.247 | -.2 -1 1     | 1595 -0.470 | -.5 -1 .9   |
| Percentage change in employment                                        | 13002 -0.057 | 0 -2 2       | 1664 -0.151 | 0 -2 2      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
| Decreased liquidity or cash flow since the pandemic                    | 14614 0.572  | 1 0 1        | 1722 0.867  | 1 0 1       |
| Exit if sales stopped (weeks)                                          | 11657 8.031  | 6 0 24       | 1298 7.162  | 5 0 24      |
| Decreased total hours worked per week                                  | 14632 0.440  | 0 0 1        | 1719 0.733  | 1 0 1       |
B. Additional figures

Figure A1. Share of firms temporarily closed and duration of closures.  
*Source*: World Bank’s enterprise surveys COVID-19 follow-up surveys.

Figure A2. Share of firms that experienced disruption to demand and supply chain.  
*Note*: Mozambique is excluded from the left panel since the survey did not cover change in demand due to the pandemic.  
*Source*: World Bank’s Enterprise Surveys COVID-19 Follow-up Surveys.
Figure A3. Employment before and after COVID-19.
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.

Figure A4. Percentage of firms experiencing decline in liquidity and cash flow.
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.
Figure A5. Vulnerability to exit.
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.

Figure A6. Permanent closure and vulnerability to exit.
Note: Somalia is excluded from the left panel since most of the firms interviewed for the COVID-19 survey are those without baseline ES, which makes meaningful estimation of exit rate difficult.
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.
Figure A7. Adjustment to economic shock caused by COVID. 
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.
Figure A8. Firms that received or expect to receive COVID-related government support. 
Source: World Bank’s enterprise surveys COVID-19 follow-up surveys.
### Table A.3. Impact of COVID on sales and employment, interaction with African dummy

|                        | Percentage change in sales | Percentage change in employment | Decreased total hours worked per week |
|------------------------|----------------------------|---------------------------------|--------------------------------------|
|                        | (1)                        | (2)                             | (3)                                  | (4)                        | (5)                        | (6)            |
| Small                  | 0.015**, 0.015**           | -0.023**, -0.023**              | -0.063**, -0.062**                   |                           |                           |                |
|                        | (0.007)                    | (0.007)                         | (0.006)                              | (0.006)                    | (0.011)                    | (0.011)        |
| Log age                | 0.018***, 0.018***         | 0.006, 0.007                    | -0.035***, -0.036***                |                           |                           |                |
|                        | (0.005)                    | (0.005)                         | (0.004)                              | (0.004)                    | (0.009)                    | (0.009)        |
| Exporter               | -0.025**, -0.024**         | -0.026***, -0.025***            | 0.092***, 0.092***                  |                           |                           |                |
|                        | (0.011)                    | (0.011)                         | (0.009)                              | (0.009)                    | (0.018)                    | (0.018)        |
| Female top manager     | 0.041**, 0.042**           | -0.005, -0.008                  | -0.116***, -0.125***                |                           |                           |                |
|                        | (0.020)                    | (0.021)                         | (0.017)                              | (0.018)                    | (0.034)                    | (0.035)        |
| Manager's experience   | 0.010, 0.009               | -0.007, -0.007                  | 0.010, 0.009                         |                           |                           |                |
|                        | (0.006)                    | (0.006)                         | (0.006)                              | (0.006)                    | (0.011)                    | (0.011)        |
| Financially constrained| -0.072***, -0.073***       | -0.013**, -0.013**              | 0.125***, 0.127***                   |                           |                           |                |
|                        | (0.006)                    | (0.007)                         | (0.006)                              | (0.006)                    | (0.011)                    | (0.011)        |
| Informal firms         | -0.012*, -0.012*           | -0.038***, -0.038***            | 0.037***, 0.038***                   |                           |                           |                |
|                        | (0.006)                    | (0.006)                         | (0.005)                              | (0.005)                    | (0.011)                    | (0.011)        |
| Manufacturing          | -0.006, -0.006             | 0.041***, 0.042***              | -0.019, -0.018                       |                           |                           |                |
|                        | (0.009)                    | (0.009)                         | (0.008)                              | (0.008)                    | (0.016)                    | (0.016)        |
| Wholesale and retail   | -0.010, -0.010             | 0.030***, 0.031***              | 0.007, 0.008                         |                           |                           |                |
|                        | (0.009)                    | (0.009)                         | (0.008)                              | (0.008)                    | (0.015)                    | (0.015)        |
| Hotels and restaurants | -0.273***, -0.273***       | -0.011, -0.009                  | 0.247***, 0.251***                   |                           |                           |                |
|                        | (0.013)                    | (0.013)                         | (0.011)                              | (0.011)                    | (0.021)                    | (0.021)        |
| Construction           | -0.016, -0.016             | 0.016*, 0.017*                  | -0.019, -0.019                       |                           |                           |                |
|                        | (0.010)                    | (0.010)                         | (0.009)                              | (0.009)                    | (0.017)                    | (0.017)        |
| Small × SSA dummy      | -0.114                     | -0.002                         | -0.024                               |                           |                           |                |
|                        | (0.074)                    | (0.055)                         | (0.116)                              | (0.116)                    | (0.068)                    | (0.092)        |
| Log age × SSA dummy    | -0.015                     | -0.023                         | 0.068                                |                           |                           |                |
|                        | (0.057)                    | (0.044)                         | (0.092)                              | (0.092)                    | (0.203)                    | (0.203)        |
| Exporter × SSA dummy   | -0.105                     | -0.167*                        | -0.009                               |                           |                           |                |
|                        | (0.129)                    | (0.096)                         | (0.203)                              | (0.203)                    | (0.013)                    | (0.103)        |
| Foreign × SSA dummy    | -0.003                     | 0.062                          | 0.103                                |                           |                           |                |
|                        | (0.096)                    | (0.070)                         | (0.148)                              | (0.148)                    |                           |                |
Table A.3. (Continued)

|                                | Percentage change in sales | Percentage change in employment | Decreased total hours worked per week |
|--------------------------------|-----------------------------|---------------------------------|--------------------------------------|
|                                | (1)                         | (2)                             | (3)                                  | (4)                                  | (5)                             | (6)                             |
| Female top manager × SSA dummy | 0.117                       | -0.001                          | 0.106                                | 0.069                                | 0.106                           | 0.034                           |
|                                | (0.095)                     | (0.069)                         | (0.052)                              | (0.147)                              | (0.052)                         | (0.147)                         |
| Manager’s experience × SSA dummy | -0.001                      | 0.001                           | 0.003                                | 0.003                                | 0.004                           | 0.005                           |
|                                | (0.069)                     | (0.069)                         | (0.108)                              | (0.108)                              | (0.069)                         | (0.108)                         |
| Financially constrained × SSA dummy | 0.106                       | 0.059                           | -0.138                               | 0.014                                | -0.138                          | 0.014                           |
|                                | (0.067)                     | (0.052)                         | (0.108)                              | (0.108)                              | (0.052)                         | (0.108)                         |
| Informal firms × SSA dummy     | -0.021                      | 0.040                           | -0.065                               | 0.014                                | -0.065                          | 0.014                           |
|                                | (0.069)                     | (0.052)                         | (0.108)                              | (0.108)                              | (0.052)                         | (0.108)                         |
| Manufacturing × SSA dummy      | 0.018                       | -0.108                          | -0.058                               | -0.058                               | -0.058                          | -0.058                          |
|                                | (0.125)                     | (0.094)                         | (0.196)                              | (0.196)                              | (0.196)                         | (0.196)                         |
| Wholesale and retail × SSA dummy | 0.007                       | -0.078                          | -0.058                               | -0.058                               | -0.058                          | -0.058                          |
|                                | (0.114)                     | (0.086)                         | (0.178)                              | (0.178)                              | (0.178)                         | (0.178)                         |
| Hotels and restaurants × SSA dummy | 0.012                       | -0.177**                       | -0.260                               | -0.260                               | -0.260                          | -0.260                          |
|                                | (0.138)                     | (0.103)                         | (0.215)                              | (0.215)                              | (0.215)                         | (0.215)                         |
| Construction × SSA dummy       | -0.024                      | -0.025                          | 0.13                                 | 0.013                                | 0.131                           | 0.019                           |
|                                | (0.148)                     | (0.109)                         | (0.225)                              | (0.225)                              | (0.225)                         | (0.225)                         |
| Country FE                     | Yes                         | Yes                             | Yes                                  | Yes                                  | Yes                             | Yes                             |
| Survey week                    | Yes                         | Yes                             | Yes                                  | Yes                                  | Yes                             | Yes                             |
| Constant                       | -0.666***                   | -0.668***                       | -0.083**                             | -0.083**                             | 1.266***                       | 1.270***                       |
|                                | (0.045)                     | (0.045)                         | (0.040)                              | (0.040)                              | (0.076)                         | (0.076)                         |
| Observations                   | 11075                       | 11075                           | 10188                                | 10188                                | 11478                           | 11478                           |
| R-squared                      | 0.193                       | 0.194                           | 0.038                                | 0.039                                | 0.128                           | 0.128                           |
Table A.4. Impact of the pandemic on financial well-being of the business, interaction with African dummy

| Decreased liquidity or cash flow since the pandemic | Vulnerability | Permanently closed since the pandemic |
|--------------------------------------------------|--------------|-------------------------------------|
|                                                  | (1)          | (2)                                 | (3) | (4) | (5) | (6) |
| Small                                            | 0.036***     | 0.035***                            | -0.016*** | -0.016*** | 0.011*** | 0.011*** |
|                                                  | (0.011)      | (0.011)                             | (0.006) | (0.006) | (0.003) | (0.003) |
| Log age                                          | -0.008       | -0.008                              | -0.030*** | -0.031*** | -0.016*** | -0.016*** |
|                                                  | (0.009)      | (0.009)                             | (0.005) | (0.005) | (0.003) | (0.003) |
| Exporter                                         | 0.074***     | 0.075***                            | -0.070*** | -0.070*** | -0.001     | -0.001     |
|                                                  | (0.018)      | (0.019)                             | (0.009) | (0.009) | (0.005) | (0.005) |
| Foreign                                          | -0.097***    | -0.109***                           | -0.031*   | -0.031*   | 0.011      | 0.012      |
|                                                  | (0.034)      | (0.035)                             | (0.017) | (0.018) | (0.010) | (0.010) |
| Female top manager                               | 0.056***     | 0.056***                            | 0.035***  | 0.035***  | 0.020**    | 0.020**    |
|                                                  | (0.011)      | (0.011)                             | (0.006) | (0.006) | (0.003) | (0.003) |
| Manager’s experience                             | 0.002***     | 0.002***                            | 0.003**   | 0.003**   | 0.001**    | 0.001**    |
|                                                  | (0.001)      | (0.001)                             | (0.000) | (0.000) | (0.000) | (0.000) |
| Financially constrained                         | 0.127***     | 0.129***                            | 0.002     | 0.002     | 0.006*     | 0.006*     |
|                                                  | (0.011)      | (0.011)                             | (0.006) | (0.006) | (0.003) | (0.003) |
| Informal firms                                   | 0.088***     | 0.088***                            | -0.006    | -0.006    | 0.026***   | 0.026***   |
|                                                  | (0.011)      | (0.011)                             | (0.006) | (0.006) | (0.003) | (0.003) |
| Manufacturing                                    | -0.035**     | -0.035**                            | -0.018**  | -0.019**  | 0.009*     | 0.009*     |
|                                                  | (0.016)      | (0.016)                             | (0.009) | (0.009) | (0.005) | (0.005) |
| Wholesale and retail                             | 0.001        | 0.002                               | -0.026*** | -0.026*** | 0.028**    | 0.028**    |
|                                                  | (0.015)      | (0.015)                             | (0.008) | (0.008) | (0.004) | (0.004) |
| Hotels and restaurants                           | 0.298***     | 0.301***                            | 0.084***  | 0.084***  | 0.032**    | 0.032**    |
|                                                  | (0.021)      | (0.021)                             | (0.011) | (0.011) | (0.006) | (0.006) |
| Construction                                     | -0.013       | -0.012                              | -0.048*** | -0.049*** | 0.017**    | 0.017**    |
|                                                  | (0.017)      | (0.017)                             | (0.009) | (0.009) | (0.005) | (0.005) |
| Small × SSA dummy                                | 0.052        |                                   | 0.034     |          | 0.003     |          |
|                                                  | (0.117)      | (0.063)                             |          |          | (0.035) |          |
| Log age × SSA dummy                              | -0.035       |                                   | 0.013     |          | 0.013     |          |
|                                                  | (0.092)      | (0.046)                             |          |          | (0.026) |          |
| Exporter × SSA dummy                             | -0.066       |                                   | 0.093     |          | 0.010     |          |
|                                                  | (0.204)      | (0.125)                             |          |          | (0.063) |          |
| Foreign × SSA dummy                              | 0.172        |                                   | -0.017    |          | -0.009    |          |
|                                                  | (0.149)      | (0.081)                             |          |          | (0.045) |          |
| Female top manager × SSA dummy                   | -0.105       |                                   | -0.006    |          | -0.024    |          |
|                                                  | (continued)  |                                    |          |          |          |          |
|                                      | Decreased liquidity or cash flow since the pandemic | Vulnerability                  | Permanently closed since the pandemic |
|--------------------------------------|---------------------------------------------------|--------------------------------|-------------------------------------|
|                                      | (1)                                               | (2)                           | (3)                                 |
| Manager’s experience × SSA dummy      | (0.146)                                           | (0.084)                        | (0.043)                             |
|                                      | (0.005)                                           | (0.003)                        |                                     |
| Financially constrained × SSA dummy  | −0.138                                            | −0.005                         | −0.005                              |
|                                      | (0.108)                                           | (0.058)                        |                                     |
| Informal firms × SSA dummy           | −0.041                                            | 0.032                          | −0.023                              |
|                                      | (0.110)                                           | (0.056)                        |                                     |
| Manufacturing × SSA dummy            | −0.064                                            | 0.058                          | 0.008                               |
|                                      | (0.197)                                           | (0.100)                        |                                     |
| Wholesale and retail × SSA dummy     | −0.065                                            | 0.037                          | −0.009                              |
|                                      | (0.180)                                           | (0.091)                        |                                     |
| Hotels and restaurants × SSA dummy   | −0.269                                            | −0.046                         | −0.008                              |
|                                      | (0.216)                                           | (0.114)                        |                                     |
| Construction × SSA dummy             | −0.053                                            | 0.147                          | −0.008                              |
|                                      | (0.226)                                           | (0.122)                        |                                     |
| Country FE                          | Yes                                               | Yes                           | Yes                                 |
| Survey week                         | Yes                                               | Yes                           | Yes                                 |
| Constant                             | 1.286***                                          | 1.285***                      | 0.106***                            |
|                                      | (0.076)                                           | (0.077)                        | (0.041)                             |
| Observations                        | 11469                                             | 11469                         | 8762                                |
| R-squared                           | 0.106                                             | 0.107                         | 0.098                               |

COVID-19 and Sub-Saharan Africa firms
Table A.5. Repurposing and leveraging technology to mitigate the impact of the pandemic, interaction with African dummy

|                         | Adjusted or converted production/services | Online and delivery | Started or increased remote work arrangement |
|-------------------------|------------------------------------------|--------------------|-----------------------------------------------|
|                         | (1)                                      | (2)                | (3)                                           |
| **Small**               | -0.018                                   | -0.017             | 0.023**                                       |
|                         | (0.011)                                  | (0.011)            | (0.011)                                       |
| **Log age**             | 0.014*                                   | 0.014*             | -0.017**                                      |
|                         | (0.009)                                  | (0.009)            | (0.008)                                       |
| **Exporter**            | 0.031*                                   | 0.032*             | 0.048***                                      |
|                         | (0.018)                                  | (0.018)            | (0.017)                                       |
| **Foreign**             | 0.011                                    | 0.010              | 0.050                                         |
|                         | (0.033)                                  | (0.034)            | (0.032)                                       |
| **Female top manager**  | 0.010                                    | 0.010              | 0.017*                                        |
|                         | (0.010)                                  | (0.010)            | (0.010)                                       |
| **Manager’s experience**| -0.002***                                | -0.002***          | -0.001***                                     |
|                         | (0.001)                                  | (0.001)            | (0.000)                                       |
| **Financially constrained** | 0.044***                                   | 0.044***           | -0.048***                                     |
|                         | (0.011)                                  | (0.011)            | (0.011)                                       |
| **Informal firms**      | 0.043***                                 | 0.042***           | 0.022**                                       |
|                         | (0.010)                                  | (0.010)            | (0.010)                                       |
| **Manufacturing**       | 0.014                                    | 0.015              | -0.003                                        |
|                         | (0.016)                                  | (0.016)            | (0.015)                                       |
| **Wholesale and retail** | 0.033**                                   | 0.033**            | 0.002                                         |
|                         | (0.015)                                  | (0.015)            | (0.014)                                       |
| **Hotels and restaurants** | 0.098***                                   | 0.100***           | 0.006                                         |
|                         | (0.020)                                  | (0.021)            | (0.020)                                       |
| **Construction**        | 0.032**                                  | 0.033**            | -0.127***                                     |
|                         | (0.016)                                  | (0.016)            | (0.016)                                       |
| **Small × SSA dummy**   | -0.114                                   |                    | -0.108                                        |
|                         | (0.113)                                  |                    | (0.111)                                       |
| **Log age × SSA dummy** | -0.024                                   |                    | -0.006                                        |
|                         | (0.090)                                  |                    | (0.088)                                       |
| **Exporter × SSA dummy** | -0.058                                   |                    | 0.005                                         |
|                         | (0.198)                                  |                    | (0.194)                                       |
| **Foreign × SSA dummy** | -0.001                                   |                    | 0.031                                         |
|                         | (0.145)                                  |                    | (0.141)                                       |
| **Female top manager × SSA dummy** | 0.037                                   |                    | 0.072                                         |
|                         | (0.142)                                  |                    | (0.139)                                       |
|                         |                                         |                    | -0.098                                        |
|                         |                                         |                    | (0.129)                                       |

(continued)
|                             | Adjusted or converted production/services | Online and delivery | Started or increased remote work arrangement |
|-----------------------------|------------------------------------------|---------------------|-----------------------------------------------|
| (1)                         | (2)                                      | (3)                | (4)                                           | (5)               | (6)               |
| Manager’s experience × SSA dummy | 0.001                                    | −0.001             | −0.001                                         |                   |                   |
|                             | (0.005)                                  | (0.005)            | (0.005)                                       |                   |                   |
| Financially constrained × SSA dummy | −0.015                                  | 0.006              | 0.047                                         |                   |                   |
|                             | (0.105)                                  | (0.103)            | (0.096)                                       |                   |                   |
| Informal firms × SSA dummy | 0.064                                    | 0.075              | 0.065                                         |                   |                   |
|                             | (0.107)                                  | (0.105)            | (0.098)                                       |                   |                   |
| Manufacturing × SSA dummy  | −0.150                                    | −0.087             | −0.169                                        |                   |                   |
|                             | (0.191)                                  | (0.186)            | (0.174)                                       |                   |                   |
| Wholesale and retail × SSA dummy | −0.109                                  | −0.136             | −0.103                                        |                   |                   |
|                             | (0.174)                                  | (0.170)            | (0.159)                                       |                   |                   |
| Hotels and restaurants × SSA dummy | −0.186                                  | −0.113             | −0.020                                        |                   |                   |
|                             | (0.210)                                  | (0.205)            | (0.192)                                       |                   |                   |
| Construction × SSA dummy   | −0.097                                    | −0.040             | −0.060                                        |                   |                   |
|                             | (0.219)                                  | (0.214)            | (0.200)                                       |                   |                   |
| Country FE                  | Yes                                      | Yes                | Yes                                           | Yes               | Yes               |
| Survey week                 | Yes                                      | Yes                | Yes                                           | Yes               | Yes               |
| Constant                    | 0.780***                                 | 0.781***           | 0.659***                                      | 0.661***          | 0.317***          | 0.317***          |
|                             | (0.074)                                  | (0.074)            | (0.072)                                       | (0.072)           | (0.068)           | (0.068)           |
| Observations                | 11521                                    | 11521              | 11529                                         | 11529             | 11511             | 11511             |
| R-squared                   | 0.065                                    | 0.065              | 0.086                                         | 0.086             | 0.103             | 0.103             |

Table A.5. (Continued)