The impact of the COVID-19 pandemic on women-led businesses*

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Abstract

The COVID-19 pandemic has struck businesses across the globe with unprecedented impacts. The world economy has been hit hard and firms have experienced a myriad of challenges, however, these impact have been heterogeneous across different firms. This paper examines one important dimension of heterogeneity of these impacts: the differential effect of the pandemic on women-led and men-led businesses. It draws on a unique sample of 45,000 businesses from 49 countries covering the months between April and September of 2020. We find that women-led micro-businesses, women-led businesses in the hospitality industry, and women-led businesses in countries more severely affected by the COVID-19 shock were disproportionately hit compared to businesses led by men. At the same time, women-led micro-firms are markedly more likely to report increasing the use of digital platforms, but we do not find statistically significant differences in the rate of investment in digital solutions. Finally, we also find that women-led businesses are less likely to have received some form of public support although they have been hit harder in some domains. In a crisis of the magnitude of the COVID-19 pandemic, evidence tracing the impact of the shock in a timely fashion is desperately needed to help inform the design of policy interventions. Our real-time glimpse into women-led businesses fills this need for robust and policy-relevant evidence, and due to the large country coverage of our data, we are able to identify patterns that extend beyond any one country, region, or sector at the cost of some granularity to test complex economic theories.

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1. Introduction

The COVID-19 pandemic has taken a profound toll on businesses across the globe. The dual shock of the coronavirus pandemic and government mandated economic shutdowns to contain the spread of the virus plunged the world economy into a deep recession in 2020 (Long and Ascent, 2020). All around the world, firms had to cope with a broad range of concurrent challenges, including suspensions of their in-person operations, mobility restrictions, a remote workforce, supply chain disruptions, and falling consumer demand.

While the impacts of the COVID-19 crisis are felt across the world, there is also evidence of considerable heterogeneity in the severity of firm-level impacts, both across and within countries Apedo-Amah et al. (2020). This paper focuses on one possible source of heterogeneity in the impact of COVID-19 on businesses–differences between firms led by men and firms led by women.

A focus on gender differences seems warranted given the extensive (pre-COVID-19) literature establishing gender as an important determinant of business performance, with female-owned or -managed firms typically registering lower levels of labor and total factor productivity than male-owned or managed firms (Aterido et al., 2011; Bardasi et al., 2011; Rijkers and Costa, 2012; Hallward-Driemeier, 2013; Bruhn and McKenzie, 2014; Alibhai et al., 2015; Campos et al., 2015; Gui-Diby et al., 2017; Munyegera and Precious, 2018; Islam et al., 2020). Moreover, a few recent studies suggest that the COVID-19 crisis has had a disproportionate impact on female entrepreneurs. Based on data for 488 small and growing businesses in emerging markets, ANDE (2020b) reports that women-led businesses were significantly more likely to shut down due to COVID-19 than men-led businesses. The Future of Business Survey (FBS), a data source for small- and medium-sized enterprises with a Facebook Business page, reports that businesses led by women were seven percentage points more likely to be closed at the time of the survey compared to businesses led by men (Facebook et al., 2020). Similar evidence of gender differences in the impact of COVID-19 on firms is available from country-level studies conducted in India and Bangladesh (ANDE, 2020a; Chawla et al., 2020; Jaim, 2020). Most of these studies, however, are either based on relatively small samples (typically covering a few hundred firms or even less) or, in the case of the FBS, a sampling approach that is not explicitly designed to be representative of a target population (Schneider, 2020). Therefore, caution must be exercised in generalizing the results from these case studies.

To the best of our knowledge, this paper provides the first global study of gender differences in the impacts of the COVID-19 crisis on firms drawing on a novel data set of around 45,000 businesses. Our analysis exploits firm surveys conducted between April and September 2020 under the World Bank's Business Pulse Survey (BPS) and Enterprise Survey (WBES) programs. These data cover businesses across 49 mostly low and middle-income countries. This database has been analyzed by Apedo-Amah et al. (2020) to document global firm-level impacts of COVID-19, but without any disaggregation by gender. We extend their analysis to shine a spotlight on the short-term (e.g. April to September) impacts of the COVID-19 crisis on women- and men-led businesses. Our analysis captures three broad areas of interest. First, impacts of COVID-19 on business performance measures (i.e. business closures, disruptions in supply channels, changes in sales revenues, financial risks and the owners' expectations about the future); second, responses to the crisis (i.e. adjustments in labor inputs, technology adoption and product innovation); and third, access to public support.

Our paper offers descriptive evidence of a differentiated effect of the pandemic on women-led businesses using robust and timely data that is comparable across countries and that covers critical dimensions of the operations of a firm. In a crisis of the magnitude of the COVID-19 pandemic, evidence tracing the impact of the shock in a timely fashion is desperately needed to help inform the design of policy interventions. Our real-time glimpse into women-led businesses fills this need for timely and policy-relevant evidence, even if the data is not well suited to examine the underlying channels potentially explaining the patterns we document (channels which likely vary across countries).

Our analysis shows statistically significant gender gaps in different measures of performance. Specifically, we find that women-led micro-businesses, women-led businesses in the hospitality industry (hotels and restaurants), and women-led businesses in countries more severely affected by the COVID-19 shock were disproportionately hit compared to businesses led by men–they resumed operations at a slower pace, exhibit a disproportionately high probability of reporting supply shocks, and report larger declines in sales revenues. In addition, women-led businesses in hospitality report a higher probability of falling in arrears.

Our analysis also suggests gender gaps in the potential responses to the shock. We do not find overall differences in their responses to reduce labor costs, but women-led micro-firms and women-led businesses in the hospitality industry are comparatively more likely to grant leaves to their employees or reduce their wages or hours. We find statistically significant gender gaps in the use of digital platforms (to the advantage of women), and this gap is specially large among micro-firms. In contrast, we find lower rates of investment in digital solutions among women-led firms. Finally, we also find that women-led businesses in countries more affected by the pandemic exhibit higher rates of product innovation compared to their male peers.

Finally, we document gender gaps in access to public support (to the disadvantage of women), and this gap is significant among micro-firms, among businesses in services other than retail, and among businesses in countries more severely affected by the shock.

This paper is organized as follows. Section 2 describes the survey and characteristics of the sample. Section 3 outlines the methodology used to assess gender differences in the firm-level impacts of COVID-19. Sections 4, 5 and 6 describe the empirical results, discussing gender differences in the impact of COVID-19 on business performance, responses to the crisis and access to public support, respectively. We conclude summarizing our key findings and highlighting some lessons for policy makers and future research in section 7.

2. Description of the survey and characteristics of the sample

This paper draws on the harmonized firm-level data in Apedo-Amah et al. (2020), which combines the first wave of the World Bank Business Pulse Surveys (BPS) and the COVID-19 follow-up of the World Bank Enterprise Surveys (WBES). This novel data set tracks the potential impact of the pandemic on the private sector on critical dimensions of business performance such as operations of the business, sales revenue, liquidity and insolvency, labor adjustments, adoption of technology, expectations and uncertainty about the future, and access to public support.

The BPS and WBES subsamples contain different pieces of information that we leverage to

classify businesses as male or female-led. The WBES data capture whether the firm's top manager is female and whether there are any women among the firm's owners. We define a firm as woman-led if at least one of these conditions is met - i.e. the business is managed by a women and/or has a female owner.[1] The BPS collect data on the gender of the person who responded to the survey questionnaire on behalf of the enterprise, typically but not always, the top manager of the businesses or one of its owners. We use this information to proxy for whether the business is led by a man or a woman.[2]

Our analysis covers around 45,000 businesses from 49 low-, middle-, and high-income countries in the six regions where the World Bank Group (WBG) is present.[3] The data includes micro, small, medium, and large businesses across five broad sectors–i.e. hospitality, manufacturing, retail and wholesale, other services, and others.[4] Businesses in the sample are largely formal, though informal firms are included in Cambodia, Senegal, South Africa, and Sudan. We focus on the short-term impact of the pandemic on women- vs men led businesses and constrain our sample to interviews conducted between April and September of 2020.

Even though the sampling frames for the BPS or the WBES follow-up are not nationally representative for men-led and women-led businesses, the harmonized data offers a comprehensive window into the differentiated impact of the pandemic on women entrepreneurs. Consistent with many other studies, the fraction of women-led businesses in our data is the highest in East Asia and Pacific and Latin America and the Caribbean (approximates 40%) and the lowest in the Middle East and North Africa and South Asia (only around 10%; see Table 1). In terms of firm traits, we find that the fraction of women-led businesses in our data is the highest in the hospitality industry (34%) and retail and wholesale (30%), and the lowest in agriculture, mining, construction, and utilities (17% on average)–thus confirming the stylized fact that women entrepreneurs are over-represented in the services sectors (e.g. Amin and Islam, 2014). Perhaps less intuitive is that our data show that the share of women-led businesses increases with firm size, from 25% among micro-firms to 29% among large firms, which is at odds with the often documented pattern than businesses led by women are

[1] Having a female owner does not rule out additional male owners.

[2] In cases where the survey respondent is neither the firm's owner nor manager, this information is missing in the BPS data. In the dataset harmonized by Apedo-Amah et al. (2020) there are eight countries–Colombia, Ghana, Indonesia, India, Liberia, Madagascar, Mali and the Philippines–where the gender and position of the respondent are not available or where someone other than the firm's owner or manager provided answers to the questionnaire. We drop these countries from the analysis to avoid any bias resulting from missing values for our main variable of interest. We also drop countries where one or more regressors is not available (Afghanistan, Armenia, and Comoros). In the remaining 49 countries, the share of observations without information on whether the firm is led by a woman or man is relatively small (7.6% on average, see Table A8). Moreover, when we drop these observations that contains no information on whether the firm is led by a woman or man, the distribution of observations in our new sample, across geographical regions, size categories, sectors, income class, and severity of the shock is very similar to the distribution of observations in the full sample (see Table A8), suggesting that the country-level datasets included in the analysis are not strongly biased due to missing values. Unfortunately, we cannot distinguish in our data between women as top managers and women as owners - though other studies suggest that gender gaps may be somewhat more pronounced if the comparison is based on management (e.g. Aterido and Hallward-Driemeier, 2011; Islam et al., 2020; Martínez-Zarzoso et al., 2017).

[3] The survey covers East Asia and Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North-Africa (MNA), South Asia (SAR), and Sub-Saharan Africa (SSA). Among high-income countries, our data set includes Cyprus, Greece, Italy, Poland, Romania, and Slovenia. See Table A1 in the appendix for a full list of countries.

[4] The hospitality sector includes accommodation and food preparation services. Other services includes services other than the hospitality industry and retail and wholesale such as transportation and storage services, information and communication services, and financial services. Others consists of Agriculture and mining, and Construction and utilities.

smaller than those led by men (e.g. Islam et al., 2020). These shares, however, are unconditional means, which are likely strongly influenced by the unequal distribution of male and female-led firms across countries and regions. To correct for the composition of the sample, our main empirical analysis (in sections 4 to 6) always includes a basic set of country-level control variables.

Table 1: Characteristics of the sample. Fraction of businesses and women-led businesses in each category.

	Fraction of total sample	Women-led (pp)	Men-led (pp)	Fraction of women-led
SAR	7.2	.5	6.7	7.2
ECA	41.4	13.4	28	32.4
MNA	15.5	1.7	13.8	11
LAC	8	3.2	4.8	39.9
EAP	3.1	1.2	1.9	40
SSA	24.6	6.7	17.9	27.1
Low and lower middle	55.5	12.2	43.4	21.9
Upper middle and high	44.3	14.6	29.7	33
Micro (0-4)	30.9	7.6	23.3	24.5
Small (5-19)	37.4	10	27.4	26.7
Med and large (20+)	31.6	9.2	22.3	29.3
Manufacturing	31.4	9	22.4	28.5
Retail and wholesale	26.7	8	18.6	30.1
Hospitality	7.2	2.5	4.7	34.3
Other services	19.3	4.6	14.6	24.1
Others	13.5	2.3	11.2	17.3
Total	100	26.8	73.2	26.8

3. Methodology

We report both unconditional and conditional estimates of gender differences in the impact of the COVID-19 pandemic on firm-level outcomes and responses. The unconditional gender gaps control for the timing of the survey and three country-level characteristics–the income level of the country (low and lower-middle, and upper-middle and high); the geographical region (EAP, ECA, LAC, MENA, SAR, and SSA); and the severity of the shock:

$$Y_i = \alpha + \beta W_i + \delta_m + \delta_r + \delta_s + \gamma t + \epsilon_i. \quad (1)$$

Y_i denotes the outcome variable of interest for firm i (for example, the self-reported percentage change in sales revenue the 30 days before the interview relative to the same period of 2019); W_i is an indicator that equals one if the owner or manager of the business is a woman and 0 otherwise; δ_m, δ_r, and δ_s denote fixed effects for income, region, and severity of the shock; and t is a control for timing of the interview relative to the beginning of the crisis.[5] These controls net out any effects that may arise from the unequal distribution of men- and women-led firms across regions and income-groups, or from differences across countries in the timing of the survey and severity of the COVID-19 shock. We still denote these estimates unconditional because–unlike the conditional estimates further below–they do not control for any firm-level traits that may drive gender gaps.

We estimate (1) using ordinary least squares (OLS) when the dependent variable is continuous, and using a Probit model when the dependent variable is binary. All our computations use the inverse of the number of observations in each country as weights (to give each country the same weight regardless of the sample size).

We use Google mobility trends around transit stations to proxy for both the peak and the severity of the first wave of the COVID-19 shock (Google, 2020; Apedo-Amah et al., 2020). The peak of the crisis corresponds to the peak in the mobility drop in each country, which occurred at varying dates in the Spring of 2019. The fixed effects for the timing of the interview measure the number of months before or after this peak.[6] To proxy for the severity of the shock we use the magnitude of the drop in mobility at the peak. More precisely, we sort countries into quartiles of the cross-country distribution of mobility drops at the peak. In our sample countries in the top 25% (for example Greece, Italy, South Africa) faced more severe shocks with drops of 73 to 88% relative to the February baseline than countries in the first quartile (such as Kenya, Mongolia, and Tanzania), which exhibited drops at the peak of 24 to 45% on average.

Our conditional estimates test whether the gender gap is larger among specific groups of businesses, for example, in particular sectors (e.g. hospitality) or among businesses of a particular size (e.g. micro or small). We also test whether gender differences vary with the severity of the shock (because countries more severely affected could exhibit larger increases in demand for caregivers which in turn could disproportionately affect women). The conditional specification introduces into (1) controls for the size and the sector of the business and in addition, interacts size, sector, income, and the severity of the shock with the indicator for whether the business is led by a woman:

$$Y_i = \alpha + \beta W_i + \delta_n + \delta_g + \delta_m + \delta_r + \delta_s + \beta_n(W_i \times \delta_n) + \beta_g(W_i \times \delta_g) + \beta_m(W_i \times \delta_m) + \beta_s(W_i \times \delta_s) + \gamma t + \epsilon_i, \quad (2)$$

where δ_n and δ_g denote size and sector fixed effects.

The estimated *unconditional* gender gaps β in (1) combine composition effects–which arise from the composition of the sample collected or from men- and women-led businesses operating in different sectors or having different sizes–and gender gaps that exist after controlling for these

[5] The control for the timing of the survey is the number of weeks between the date of the interview and March 11th, 2020 (the date when the World Health Organization declared COVID-19 a pandemic).

[6] For countries without coverage in the Google mobility data, mobility is predicted using data on the stringency of the lockdown restrictions in Hale et al. (2020). See Apedo-Amah et al. (2020) for details.

compositional characteristics (for example, due to some forms of discrimination or because women entrepreneurs were disproportionately affected by the increase in care demands due to school closures). In contrast, the *conditional* model in (2) estimates gender differences controlling for firms characteristics , hence net of the above composition effect. In addition, (2) allows us to test whether gender gaps are larger in some sectors relative to others and for some firm sizes. To estimate the gender gap in businesses of a specific size, for example, we use the fitted model to predict the average value of outcome Y_i over the full sample but conditioning on both size and whether the business is led by a man and a woman.[7] We show these estimates in the following sections and report whether the gender difference is statistically significant at the 95% confidence level, but the full set of results from ordinary least squares and the Probit estimations are available in the appendix.[8]

4. The shock

This section chronicles the impact of COVID-19 across five important dimensions of firm-level outcomes: business closures, disruptions in supply channels, sales revenues, financial risks, and the owners' expectations about the future. For each outcome, we first report unconditional gender gaps, followed by a more detailed discussion of conditional gender gaps, including industry- and firm-size specific results.

4.1 Business closures

At the onset of the COVID-19 shock (Spring of 2020) an estimated 70% of businesses were temporarily closed but 6 weeks after the peak (proxied using Google mobility trends around transit stations) this fraction averaged 25% and only 10% around week 15 (Apedo-Amah et al., 2020). The data suggests that women-led businesses resumed operations at a slower pace relative to men-led businesses (Table 2). The unconditional average predicted likelihood of operating regularly 6 weeks or more after the peak was 85.9% for men-led businesses and 84.5% for businesses led by a woman, a statistically significant difference of 1.4 pp. This gender gap declines but remains statistically significant if we control for firm size and sector (for a conditional difference of -1.1 pp), which shows that some of the difference between men- and women-led businesses in the probability to remain closed six weeks after the peak crisis reflects gender differences in firm size and the fact that male and female entrepreneurs tend to operate in different industries.

Further disaggregation of the results by firm size using the conditional estimates shows that the gender gap in temporary business closure is significant among micro-enterprises (-2.6 pp) and medium and large firms (-1.6 pp). In terms of sectors, we see that the gender gap is largest, and to the disadvantage of women, in the hospitality sector (-5.3 pp) followed by other services (-4.7 pp)–two sectors in which female entrepreneurs are disproportionately engaged. Conversely, there is a positive gender gap (to the disadvantage of men) among manufacturing enterprises (2.6 pp). Moreover, female entrepreneurs' disadvantage in the likelihood that their businesses remain closed

[7] We run our computations using STATA. We use the command `margins` to compute the gender gaps.

[8] Our preferred specification to disentangle price from composition effects is interacting our controls with gender dummies instead of using Oaxaca-Blinder decompositions because most of our controls are fixed effects, and in these instances the results from Oaxaca-Blinder decomopsitions are difficult to interpret and highly sensitive to the choice of omitted categories (Fortin et al., 2011).

is driven by countries that experienced severe shocks and large declines in mobility (third or fourth quartile, as per Google data). Among countries with less severe shocks, gender differences in the probability of businesses to remain closed are either not significant (first quartile) or to the disadvantage of male entrepreneurs (second quartile).

Table 2: Average predicted probability that the business is open or partially open 6 weeks or more after the peak of the crisis.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	85.9	84.5	-1.4	*
Aggregate cond	85.7	84.6	-1.1	*
Micro (0-4)	83.5	81.0	-2.6	*
Small (5-19)	84.0	84.5	0.4	
Med and large (20+)	89.1	87.5	-1.6	*
Manufacturing	84.4	87.1	2.6	*
Retail and wholesale	90.0	88.6	-1.4	
Hospitality	71.2	65.9	-5.3	*
Other services	86.4	81.7	-4.7	*
Others	87.9	87.4	-0.5	
Low and lower middle	84.5	83.2	-1.3	*
Upper middle and high	88.0	87.2	-0.8	
Q1 in mobility drop	84.0	84.2	0.2	
Q2 in mobility drop	84.7	86.7	2.0	*
Q3 in mobility drop	91.4	87.8	-3.6	*
Q4 in mobility drop	83.3	80.6	-2.7	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

4.2 Supply shocks

Overall, women-led businesses do not exhibit a higher likelihood of experiencing supply disruptions as a result of the COVID-19 shock (reductions in operating hours and/or reductions in the availability of inputs or raw materials). The average predicted probability of reporting supply shocks is around 72% for both men- and women-led businesses, regardless of whether we control for size and sector and include interactions in the conditional model (Table 3).

Examining particular sectors using the conditional estimates shows that the gender gap in supply

shocks is only statistically significant in the hospitality industry (9 pp), where the fraction of women entrepreneurs is disproportionately high. Across income groups, the gender gap is statistically significant and to the disadvantage of women in low and lower middle income countries (4.8 pp) whereas businesses in upper middle and high income countries exhibit a positive gender gap to the disadvantage of men (-4.2 pp). Finally, the gender difference in the likelihood of reporting supply shocks among businesses in countries with more severe shocks (in the top quartile of the mobility drop) is statistically significant and to the disadvantage of women (3.7 pp).

Table 3: Average predicted probability of reporting supply shocks.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	71.6	72.6	1.1	
Aggregate cond	71.9	72.7	0.8	
Micro (0-4)	71.0	68.6	-2.4	
Small (5-19)	73.4	75.0	1.6	
Med and large (20+)	70.9	72.7	1.8	
Manufacturing	72.1	73.4	1.3	
Retail and wholesale	73.0	72.4	-0.6	
Hospitality	73.5	82.5	9.0	*
Other services	71.6	72.2	0.6	
Others	68.6	67.5	-1.1	
Low and lower middle	68.6	73.5	4.8	*
Upper middle and high	75.9	71.8	-4.2	*
Q1 in mobility drop	71.8	70.7	-1.1	
Q2 in mobility drop	69.9	69.7	-0.2	
Q3 in mobility drop	72.1	73.1	1.0	
Q4 in mobility drop	74.3	78.0	3.7	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

4.3 Change in sales revenues

The negative impact of the pandemic on sales revenues has been large and widespread (Apedo-Amah et al., 2020) and women-led businesses report on average larger declines in sales revenue relative to men-led businesses (Table 4), which suggest a widening of the gender gap in enterprise performance during the crisis. The unconditional aggregate fitted difference is -2 pp, which declines

to -1.8 if we control for size and sector in the conditional estimation, which suggests that a fraction of the unconditional difference reflects differences between men and women in the size and industry of their businesses.

These results seem to be driven specifically by female led micro- and small businesses, businesses in hospitality and other services, female businesses in low and lower middle income countries, and businesses in countries more severely affected by the shock (above the median in mobility drop).

Among micro-businesses the gender gap averages -2.0 pp (to the disadvantage of women), and -2.3 among small firms. Across industries, the gap is -7.4 pp in the hospitality industry (mainly hotels and restaurants) and -2.7 pp in other services (such as ITC, financial services, professional services, personal care). In low and lower middle income countries, the decline in sales revenue is 3.5 pp larger among businesses led by women. Finally, among businesses in countries more affected by the COVID-19 shock (above the median in the mobility drop) the gender gap averages -4 pp in the third quartile and -3.2 pp in the fourth (to the disadvantage of women).

Table 4: Average predicted percentage change in sales relative to the same period of 2019.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	-43.2	-45.2	-2.0	*
Aggregate cond	-43.4	-45.2	-1.8	*
Micro (0-4)	-47.9	-49.9	-2.0	*
Small (5-19)	-45.1	-47.4	-2.3	*
Med and large (20+)	-38.7	-40.0	-1.3	
Manufacturing	-42.0	-43.5	-1.5	*
Retail and wholesale	-39.2	-39.8	-0.6	
Hospitality	-60.4	-67.8	-7.4	*
Other services	-46.8	-49.6	-2.7	*
Others	-41.2	-42.1	-1.0	
Low and lower middle	-43.2	-46.8	-3.5	*
Upper middle and high	-43.6	-42.8	0.8	
Q1 in mobility drop	-40.5	-41.9	-1.4	
Q2 in mobility drop	-45.7	-44.3	1.4	
Q3 in mobility drop	-40.7	-44.6	-4.0	*
Q4 in mobility drop	-46.7	-50.0	-3.2	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

4.4 Financial risks

The COVID-19 shock was associated with a sharp decline in firm liquidity as many firms reported severe difficulties in meeting their financial obligations (Apedo-Amah et al., 2020). The BPS and WBES surveys measure liquidity constraints and financial risks among firms using two questions that seek to capture the ability to meet their current financial obligations (e.g. rents, wages, interest payments, etc.) and the likelihood to be or soon fall into arrears.[9]

At the time of the interview, women-led businesses reported on average less cash available to cover their costs (Table 5). Men-led businesses report on average the predicted equivalent of 70 days of cash available to cover costs, whereas women-led businesses report only 61 days, a statistically significant gap. When controlling for size and sector using the conditional model, the difference remains statistically significant (and barely), indicating that most of the difference in available liquidity between men-led and women-led businesses does not reflect the selection of men and women into sizes and sectors.

The predicted gender difference in available liquidity is not statistically significant among micro-businesses but increases with the size of the firm to the disadvantage of women for larger firms– almost 9.5 fewer days among small firms; 12 fewer days among medium and large firms. Across sectors, we find that the predicted gender gap averages -10.4 days in hospitality and -7.9 days in other services, industries with a relatively high fraction of women entrepreneurs. In retail and wholesale the gap is statistically significant as well (-11.9). We do not find aclear pattern across severity of the shock.

Despite these important differences in the liquidity available to cover costs, women-led businesses are not on average more likely to report falling in arrears or expecting to fall in arrears. The average predicted gender gap is not statistically different from zero in either the unconditional or the conditional specification. However, this average effect is hiding important heterogeneity across sectors. Women-led businesses in hospitality are comparatively more likely to report falling in arrears (a statistically significant gap of 6.4 pp). We also find that the gap is large and significant and to the disadvantage of women among businesses in the third quartile of the mobility drop (3.7 pp), but not among countries in the top 25%.

[9]The two questions read (i)As of today, for how many days could this establishment continue paying all costs and payments with the cash available? (ii) Is it expected that this establishment will fall in arrears in any of its outstanding liabilities in the next 6 months?

Table 5: Average predicted number of days that the business can cover costs with the cash available.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	69.9	61.4	-8.4	*
Aggregate cond	69.1	60.8	-8.3	*
Micro (0-4)	66.8	67.8	0.9	
Small (5-19)	67.9	58.5	-9.4	*
Med and large (20+)	71.7	59.4	-12.3	*
Manufacturing	63.6	60.6	-3.0	
Retail and wholesale	72.4	60.4	-11.9	*
Hospitality	64.5	54.1	-10.4	*
Other services	68.0	60.1	-7.9	*
Others	80.5	67.1	-13.3	*
Low and lower middle	95.0	81.7	-13.3	*
Upper middle and high	27.9	27.6	-0.3	
Q1 in mobility drop	53.0	48.8	-4.2	
Q2 in mobility drop	76.9	58.8	-18.1	*
Q3 in mobility drop	79.0	75.0	-4.0	
Q4 in mobility drop	67.8	57.7	-10.1	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

One reason that different businesses may report different levels of liquidity problems could be driven by the fact that they have faced different demand shocks and experienced different levels of sales drop. We address this issue in Figure 1 where we show the correlation between change in sales revenue and the measures of financial fragility, after controlling for a number of confounding factors (i.e. size, sector, income group, and region, timing of the interview, and severity of the shock). The left panel shows that while on average businesses that experienced larger sales drop tend to have more liquidity problems, businesses led by women report significantly less cash available when experiencing a similar shock to sales revenue. The right panel shows that experiencing larger drops in sales revenue is associated with a disproportionately higher likelihood of falling in arrears if the business is led by a woman, that is, the estimated elasticity between the likelihood of falling in arrears and the percentage change in sales is larger among women-led businesses. The difference between men-led and women-led businesses in both panels is statistically significant. These results could reflect that women-led enterprises, due to a variety of constraints, often achieve lower levels

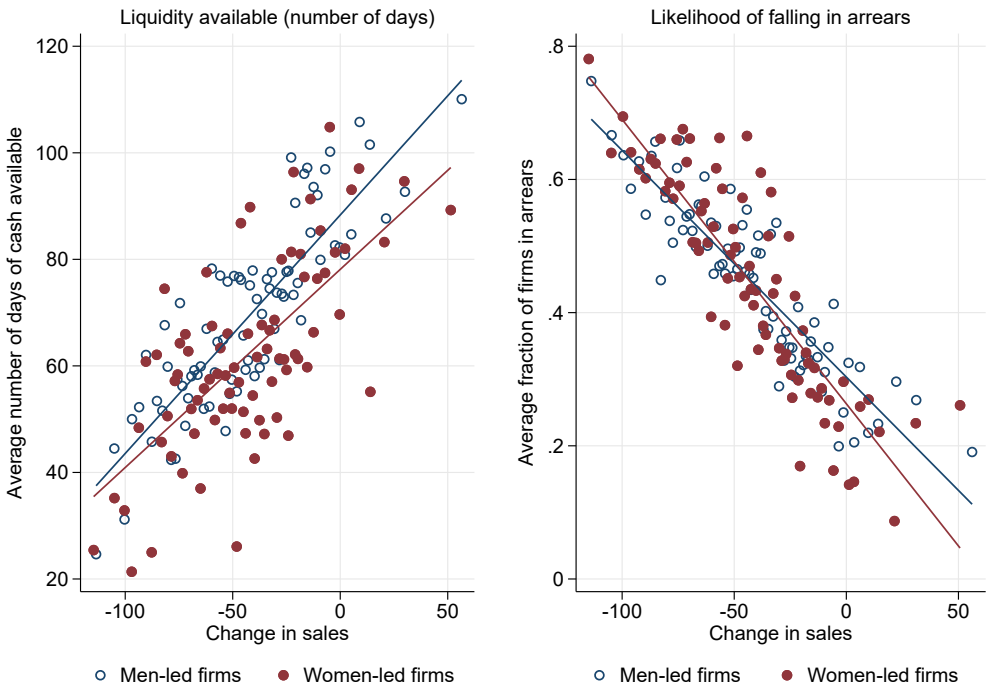
of productivity and profitability than men-led enterprises, which may have reduced their ability to accumulate savings and reserves prior to the onset of COVID-19 (e.g. Islam et al., 2020). They could also reflect the disproportionate deterioration in business performance (in terms of sales revenues, temporary business closures) that were experienced by women-led firms during COVID-19 and/or gender gaps in access to financial products, such as savings accounts.

Table 6: Average predicted probability of reporting falling in arrears or expecting to fall in arrears.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	44.7	44.7	-0.0	
Aggregate cond	44.8	45.2	0.4	
Micro (0-4)	45.2	45.3	0.1	
Small (5-19)	48.1	48.2	0.1	
Med and large (20+)	41.4	42.2	0.8	
Manufacturing	43.9	42.5	-1.5	
Retail and wholesale	43.7	41.2	-2.5	
Hospitality	51.6	58.0	6.4	*
Other services	43.9	47.7	3.9	
Others	46.4	50.4	4.0	
Low and lower middle	46.2	47.2	1.0	
Upper middle and high	42.6	42.1	-0.5	
Q1 in mobility drop	40.4	41.6	1.3	
Q2 in mobility drop	41.0	37.8	-3.2	
Q3 in mobility drop	47.0	50.6	3.7	*
Q4 in mobility drop	49.6	48.5	-1.1	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

Figure 1: Correlation between financial risks and change in sales revenue.



Note: Binned scatterplots. Computation use weights equal to the inverse of the number of observations in each country. Variables in both axes are residuals from linear projections on fixed effects for size, sector, income group, geographical region, timing of the survey, and severity of the shock.

4.5 Prospects about the future

The shock from COVID-19 pandemic was unexpected and generated high levels of uncertainty about the future (Altig et al., 2020). Economic agents are uncertain about several factors which are likely to shape future demand (including future travel patterns, type of public policy support, consumption and employment patterns, the levels of consumers and businesses confidence, as well as movement restrictions and health outcomes) and such high levels of uncertainty could significantly impact investment and slow down the recovery (Altig et al., 2020; Bernanke, 1983; Dixit et al., 1994).

In this section we explore gender gaps along two dimensions related to future prospects, i.e. sales growth expectations, and uncertainty about future sales growth. The survey asked respondents about their expectations about sales in the next 6 months under three scenarios - normal, optimistic and pessimistic scenarios. Respondent were then asked to assign subjective probabilities to the occurrence of each of these three scenarios. We construct a measure of sales growth expectations and uncertainty following the methods developed in Altig et al. (2020) and we estimate gender gaps for these measures.[10]

Our results suggest that on average, when we control for the characteristics of the firm, women-led businesses are slightly more optimistic about the future but not more uncertain (the difference

[10]We apply a variant of this method developed in Apedo-Amah et al. (2020) in this paper.

is not statistically significant). We present the results for expected sales growth in Table 7. When we control for a series of firm characteristics such as the size category and sector, we find that on average women-led businesses have higher expected sales growth of 2.2 pp relative to men-led ones. The results seem to be heterogeneous across different dimensions, and are driven by medium-sized and large businesses, businesses in manufacturing and the commerce sector, and businesses located in upper-middle and high income countries.

Table 7: Average predicted percentage growth in sales in the coming 6 months (relative to the same period of 2019).

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	-6.0	-4.0	2.0	*
Aggregate cond	-6.1	-3.9	2.2	*
Micro (0-4)	-4.3	-1.2	3.1	
Small (5-19)	-5.5	-3.9	1.7	
Med and large (20+)	-7.4	-4.7	2.7	*
Manufacturing	-5.8	-1.3	4.4	*
Retail and wholesale	-7.4	-1.0	6.4	*
Hospitality	-10.3	-9.5	0.8	
Other services	-5.0	-5.8	-0.8	
Others	-4.9	-7.0	-2.1	
Low and lower middle	-1.5	0.4	1.9	
Upper middle and high	-20.9	-17.7	3.2	*
Q1 in mobility drop	26.8	28.9	2.1	
Q2 in mobility drop	18.3	32.0	13.7	*
Q3 in mobility drop	-20.3	-17.9	2.5	
Q4 in mobility drop	-9.1	-11.6	-2.5	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

We also examine gender gaps in our uncertainty measure about future sales growth and present the results in Table 8. On average, we do not find statistically significant differences in uncertainty between women-led and men-led businesses in either the unconditional or the conditional models. Digging further into the unconditional results, Table 8 suggests that in countries more severely affected by the shock (top quartile) women-led businesses are comparatively more uncertain (4.5 pp).

Table 8: Average predicted uncertainty about sales growth.

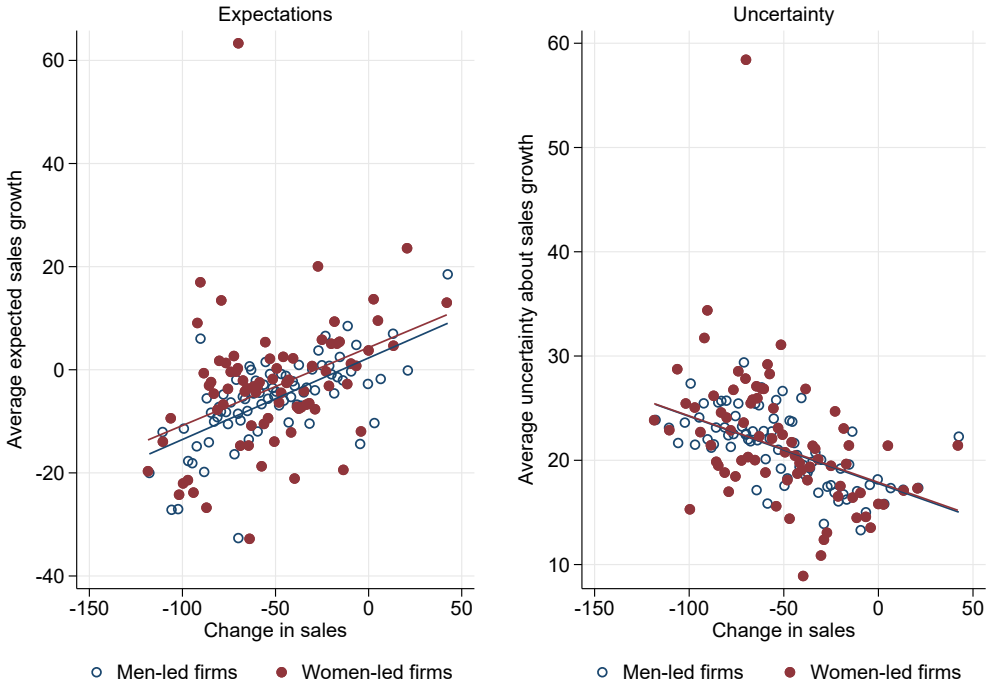
	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	21.1	21.3	0.2	
Aggregate cond	21.0	21.6	0.6	
Micro (0-4)	21.0	22.0	1.0	
Small (5-19)	21.6	21.9	0.4	
Med and large (20+)	20.4	21.1	0.8	
Manufacturing	21.3	22.3	1.0	
Retail and wholesale	18.6	20.3	1.7	
Hospitality	23.3	21.7	-1.7	
Other services	20.7	22.1	1.4	
Others	22.2	21.5	-0.8	
Low and lower middle	23.3	24.6	1.4	*
Upper middle and high	13.9	12.1	-1.8	*
Q1 in mobility drop	13.6	13.8	0.2	
Q2 in mobility drop	17.6	15.3	-2.3	
Q3 in mobility drop	22.9	22.9	-0.0	
Q4 in mobility drop	26.2	30.7	4.5	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

Prospects about future sales growth could be different because businesses faced different change in sales. To assess if this is the key driver of our results, in the left hand panel of Figure 2 we show the conditional correlation between expected sales growth and the change in sales.[11] The graph shows that for any given level of percentage changes in sales, women-led businesses have higher expectations of sales growth than men-led businesses (although the gender difference is not statistically significant).. In contrast, the right hand panel shows that men-led and women-led businesses exhibit the same average uncertainty for any given drop in sales revenues. Combined, these results suggest that the gender gaps in uncertainty could be driven by the larger drops in sales revenue among women-led businesses (Table 4), whereas the gender gaps in expected sales growth could be driven by a higher optimism among women.

[11]The figure controls for firm size, sector, income group, geographical region, timing of the survey and severity of the shock fixed effects.

Figure 2: Correlation between prospects about the future and change in sales revenue.



Note: Binned scatterplots. Computation use weights equal to the inverse of the number of observations in each country. Variables in both axes are residuals from linear projections on fixed effects for size, sector, income group, geographical region, timing of the survey, and severity of the shock.

5. Responses

The previous section described how the COVID-19 shock impacted women- and men-led businesses, and showed that female entrepreneurs were disproportionately affected along a number of key dimensions. In this section we analyse differences between women-led and men-led businesses in they ways they responded to the COVID-19 shock. We consider three types of responses to the crisis: labor adjustment (e.g. the probability to lay off workers or reduce working hours, wages or benefits), technology adoption (e.g. increased use of digital technology and investment in digital platforms) and product innovation (i.e. changes in the product and services mix of the firm).

5.1 Labor adjustments

The survey included a series of questions on the ways businesses have adjusted their labor costs on both the extensive–laying off workers–and intensive margins–reduction in wages and working hours, and granting paid and unpaid leave of absence.[12] Overall, businesses have adopted a combination of both approaches (Apedo-Amah et al., 2020) but the main adjustment across the world in the early months of the pandemic has been on the intensive margin. We examine gender differences in these adjustments in Table 9 and Table 10.

[12]Businesses are considered to have adjusted labour on the intensive margin if they report to have applied any of the three adjustments: grant leave of absence, reduce wages or benefits, or reduce hours worked.

Table 9: Average predicted probability of laying off workers.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	14.1	14.3	0.2	
Aggregate cond	14.0	14.7	0.6	
Micro (0-4)	10.0	10.3	0.3	
Small (5-19)	14.5	15.5	1.0	
Med and large (20+)	16.2	16.7	0.6	
Manufacturing	14.5	14.8	0.2	
Retail and wholesale	12.3	12.8	0.5	
Hospitality	19.2	18.9	-0.3	
Other services	14.1	15.7	1.6	
Others	13.2	14.1	0.9	
Low and lower middle	10.8	12.8	2.0	*
Upper middle and high	21.9	19.4	-2.4	*
Q1 in mobility drop	10.0	12.1	2.1	*
Q2 in mobility drop	15.5	13.1	-2.4	*
Q3 in mobility drop	21.0	22.5	1.5	
Q4 in mobility drop	11.8	12.4	0.6	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

On average, we do not find a statistically significant difference between women-led and men-led businesses in either the unconditional or the conditional predicted likelihood of laying off workers (although in some more narrow groups of businesses women-led businesses seem more likely to lay off workers). Similarly, we do not find a significant overall gap between men- and women-led businesses in the likelihood of adjusting their employment on the intensive margins in either the unconditional or the conditional model (see Table 10). However, when we examine particular groups of businesses, we find that these averages hide certain degree of heterogeneity across specific groups. Specifically, women-led micro-businesses are comparatively more likely to adjust their labor on the intensive margin (the statistically significant gap approximates 8.3 pp). Similarly, women-led businesses in the hospitality industry are 6 pp more likely to introduce leaves of absence or reduce wages or hours of their employees.

Table 10: Average predicted probability of reporting adjustments on the intensive margin.

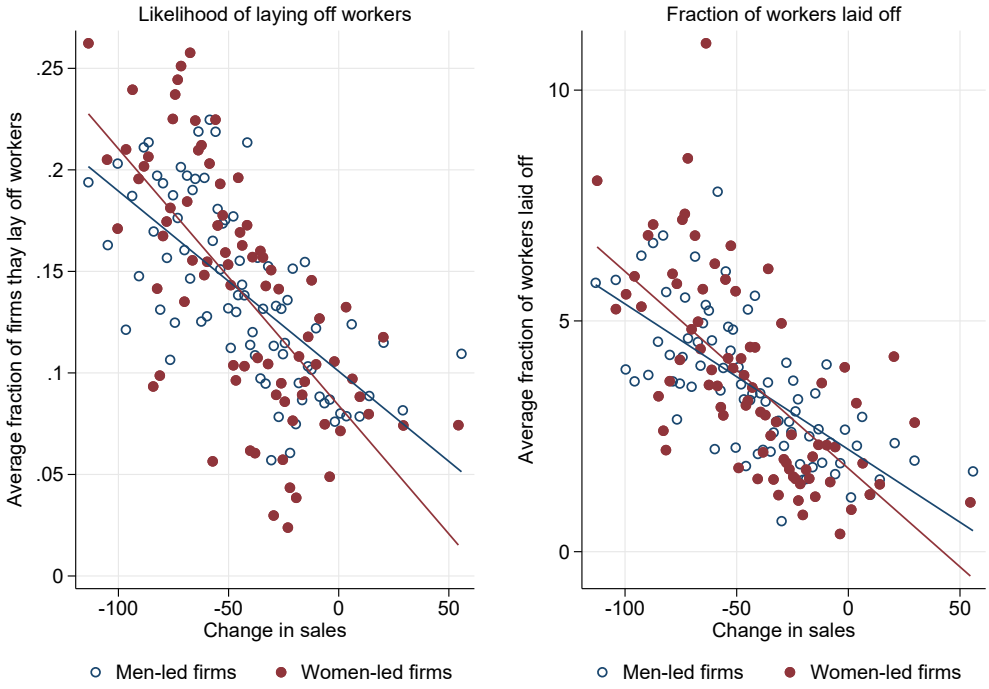
	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	45.5	46.6	1.1	
Aggregate cond	45.6	46.7	1.1	
Micro (0-4)	33.6	41.9	8.3	*
Small (5-19)	49.2	48.8	-0.4	
Med and large (20+)	49.7	47.7	-2.1	
Manufacturing	46.8	47.9	1.1	
Retail and wholesale	40.4	43.5	3.1	*
Hospitality	53.7	59.6	6.0	*
Other services	50.5	47.9	-2.6	
Others	41.8	41.3	-0.4	
Low and lower middle	43.0	43.5	0.5	
Upper middle and high	50.4	52.7	2.3	*
Q1 in mobility drop	33.7	34.7	1.0	
Q2 in mobility drop	49.4	50.1	0.7	
Q3 in mobility drop	52.4	54.3	2.0	
Q4 in mobility drop	48.7	49.4	0.6	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

In addition, women-led businesses adjust their labor force more decidedly relative to men-led businesses in response to drops in their sales revenue. In Figure 3 we explore the correlation between changes in sales revenue and the likelihood of laying off workers (left panel) and granting leave or reducing wages or hours (right panel) for men- and women-led businesses.[13] The results suggest that experiencing larger drops in sales revenue is associated with a larger likelihood of laying off workers or adjusting labor on the intensive margin (Apedo-Amah et al., 2020), but among those more severely affected by the crisis (with larger drops in sales) the increased propensity is even larger if the business is led by a woman (although the gender difference in the right panel is not statistically significant).

[13]The analysis corrects for variation in characteristics of the firm (size, sector, income group, and region), timing of the interview, and severity of the shock.

Figure 3: Correlation between likelihood of laying off workers and change in sales revenue.



Note: Binned scatterplots. Computation use weights equal to the inverse of the number of observations in each country. Variables in both axes are residuals from linear projections on fixed effects for size, sector, income group, geographical region, timing of the survey, and severity of the shock.

5.2 Technology adoption

In this section we examine gender gaps in technology adoption. Previous studies have tested whether women are more or less likely than men to use digital solutions (Fatehkia et al., 2018; EIGE, 2016; Ono and Zavodny, 2003), but it remains unexplored whether such potential gaps exist during periods of large unanticipated economic shocks.

In Table 11 we report both the unconditional and conditional estimates on the reported use of digital platforms in response to the pandemic. On average, women-led businesses are on average more likely than businesses led by men to report increasing the use of digital technology–a 2 pp gap favoring women in the unconditional estimates and 2.2 pp when we control for size and sector. This gender difference decreases with the size of the firm, from 10.4 pp among micro-firms–a markedly large gap–to -2.9 pp among businesses with 20+ employees.[14] Similarly, the gaps are statistically significant in retail and wholesale and manufacturing, where women owners and managers are 5.7 and 3.8 pp more likely than their male peers to adopt the use of digital platforms. Women-led businesses are also more likely to increase the use of digital technology in low and lower middle income countries.

The survey also includes a question on new investments in digital solutions. We test differences between men and women owners and managers in this variable in Table 12. The results suggest a

[14]These patterns could reflect gaps in the pre-pandemic levels of digital adoption between men- and women-led businesses.

statistically significant overall difference in investment rates of -1.9 in the unconditional specification and -1.7 in the conditional one.

Table 11: Average predicted probability of increasing the use of digital platforms.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	27.6	29.6	2.0	*
Aggregate cond	27.4	29.6	2.2	*
Micro (0-4)	17.2	27.6	10.4	*
Small (5-19)	26.1	28.7	2.6	*
Med and large (20+)	34.4	31.5	-2.9	*
Manufacturing	22.8	26.6	3.8	*
Retail and wholesale	29.3	35.0	5.7	*
Hospitality	27.5	24.8	-2.7	
Other services	35.7	34.2	-1.5	
Others	25.5	22.6	-2.8	
Low and lower middle	27.1	29.9	2.8	*
Upper middle and high	27.9	29.1	1.2	
Q1 in mobility drop	17.5	21.4	3.9	*
Q2 in mobility drop	32.1	30.4	-1.7	
Q3 in mobility drop	34.1	38.5	4.4	*
Q4 in mobility drop	26.7	28.7	2.0	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

Table 12: Average predicted probability of investing in digital solutions.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	16.4	14.5	-1.9	*
Aggregate cond	16.2	14.4	-1.7	*
Micro (0-4)	11.7	8.5	-3.2	
Small (5-19)	12.8	11.9	-0.8	
Med and large (20+)	21.3	18.8	-2.5	
Manufacturing	13.8	12.1	-1.7	
Retail and wholesale	17.2	14.0	-3.2	
Hospitality	15.5	16.3	0.9	
Other services	22.2	18.3	-3.9	
Others	13.3	14.1	0.9	
Low and lower middle	16.9	15.2	-1.7	
Upper middle and high	14.3	12.7	-1.7	
Q1 in mobility drop	10.5	7.9	-2.6	
Q2 in mobility drop	22.1	19.5	-2.6	
Q3 in mobility drop	14.2	11.7	-2.4	*
Q4 in mobility drop	16.3	17.6	1.3	

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

5.3 Product innovation

Across the world, an estimated 26% of businesses reacted to the crisis repackaging their mix of products and services (Apedo-Amah et al., 2020). Table 13 shows this fraction statistically differs between men- and women-led businesses only in the unconditional model. Focusing more narrowly on specific groups of businesses, however, we find that women-led businesses in manufacturing and in countries more severely affected by the shock were more likely to repackage their products and services. In manufacturing, women-led businesses are 3.9 pp more likely than businesses led by men to innovate on products. In countries that were severely hit by the crisis (above the median in mobility drop) the gap averages between 3 and 4.8 pp.

Table 13: Average predicted probability of repackaging the mix of products and services.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	27.3	28.8	1.5	*
Aggregate cond	27.5	28.3	0.9	
Micro (0-4)	27.6	25.0	-2.6	
Small (5-19)	25.6	26.4	0.8	
Med and large (20+)	29.2	31.0	1.8	
Manufacturing	25.4	29.2	3.9	*
Retail and wholesale	30.0	29.7	-0.3	
Hospitality	28.7	32.5	3.8	
Other services	31.7	28.9	-2.8	
Others	21.6	18.3	-3.2	
Low and lower middle	24.3	25.7	1.3	
Upper middle and high	31.2	31.4	0.2	
Q1 in mobility drop	38.4	34.6	-3.8	*
Q2 in mobility drop	31.5	28.4	-3.1	*
Q3 in mobility drop	19.5	22.4	3.0	*
Q4 in mobility drop	24.2	29.0	4.8	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

6. Access to public support

Countries around the globe responded to the COVID-19 shocks by enacting several policy measures directly aimed at supporting firms (Cirera et al., 2020). In this section we examine whether women managers and owners report access to public support at different rates relative to men. Table 14 summarizes our findings. On average, women-led businesses are approximately 2.0 pp less likely to report accessing public support relative to businesses led by men, and this gap does not vary between the unconditional and the conditional specification.

We unmask these average differences by focusing on specific groups of businesses. When we condition on the size of the firm, the gender gap remains statistically significant and to the disadvantage of women–micro-businesses led by women are on average 4.4 pp less likely to report access to public support, and this gap declines to -0.9 among larger firms (20+ employees). Across sectors, the gender gap averages -3.9 pp in hospitality and -3.6 in other services. Finally, the gender difference is also statistically significant and to the disadvantage of women when we condition on

the severity of the shock (but only in the bottom and top quartiles).

Table 14: Average predicted probability of reporting access to public support.

	Men-led businesses	Women-led businesses	Gender difference	Statistically significant
Aggregate uncond	26.0	23.9	-2.2	*
Aggregate cond	26.0	23.8	-2.2	*
Micro (0-4)	22.6	18.2	-4.4	*
Small (5-19)	25.5	23.0	-2.5	*
Med and large (20+)	27.9	27.0	-0.9	
Manufacturing	24.5	23.5	-1.0	
Retail and wholesale	24.1	22.4	-1.7	
Hospitality	37.0	33.1	-3.9	*
Other services	27.3	23.6	-3.6	*
Others	26.0	22.4	-3.5	*
Low and lower middle	17.1	14.5	-2.6	*
Upper middle and high	36.5	34.1	-2.4	*
Q1 in mobility drop	24.6	17.0	-7.6	*
Q2 in mobility drop	26.0	24.4	-1.6	
Q3 in mobility drop	23.2	23.4	0.2	
Q4 in mobility drop	29.8	27.4	-2.3	*

* indicates statistical significance of the gender difference at the 5% level. Averages over the full sample. Full set of results available in the appendix. The aggregate unconditional average is the estimate for β in Equation 1. The other predictions exploit the estimates for Equation 2. The aggregate conditional average is the predicted value of the outcome if every business in the sample were led by a man/woman. The predicted averages in the following rows condition on other characteristics of the business in addition to the gender of the owner or manager.

7. Concluding remarks

The global impact of the COVID-19 pandemic on economic growth and livelihoods has been unprecedented. Firms have faced a range of concurrent challenges, including suspensions of in-person operations and mobility restrictions, supply chain disruptions, and falling consumer demand. This work contributes to the emerging evidence of the severity of firm-level impacts, both across and within countries. Drawing on a large dataset covering over 45,000 firms across 49 mostly low and middle-income countries collected early in the pandemic, we examine the heterogeneous impact of this crisis on women versus men led businesses. This deep-dive into the gender differentiated impacts is motivated by existing evidence which shows that women-led firms select into different sectors and run businesses of different sizes relative male-owned or managed firms, and in addition, they have been shown to exhibit lower levels of labor and total factor productivity.

The main contribution of this paper is to provide a real-time glimpse at the business impacts of the unfolding coronavirus pandemic at a global scale, with a focus on differences between women and men-led enterprises. Due to the large country coverage of our data, we are able to identify patterns that extend beyond any one country, region or sector – and that will be important to track during the recovery phase. On the flipside, however, this bird's eye view implies that some granularity is lost and that we cannot easily test complex economic theories.

We examine three domains of outcomes. First, we examine seven measures related to the pandemic's impacts on business performance: business closures, disruptions in supply channels, changes in sales revenues, liquidity and insolvency, and expectations and uncertainty about the future. Second, we examine firm responses to the crisis: adjustments in labor inputs, technology adoption, and product innovation. And finally, we examine a measure of the firm's access to public support. In each case we present unconditional and conditional results, which control for the size and the sector of the business since we know there are significant differences by sex in these key traits. Conditional results sometimes, but certainly not always, differ from the raw (unconditional) results. For example, female-led firms are statistically less likely to have been open 6 weeks more from the peak of the crisis in the raw data, but this difference is smaller (though still significant) when controls are added.

At the aggregate level, women-led businesses have significantly less cash available to cover their costs (with a raw gap of 61 days that the business can carry costs compared to 70 for men), although only women-led firms in hospitality report being more likely to expect to fall into arrears. The estimated elasticity between the likelihood of falling in arrears and the percentage change in sales is larger among women-led businesses, consistent with them having lower savings and reserves prior to the onset of COVID-19 (as other studies show).

Despite differences in these outcomes, on average, women-led firms do not report making larger labor adjustments than their male counterparts. They are, however, more likely to have increased the use of digital platforms and to report product innovations (only in the unconditional specification), but they exhibit a lower probability of having made new investments in digital solutions. And although they have been hit harder in some domains, women-led businesses are less likely to have received some form of public support – both in the raw (unconditional data) and conditional on the firm size and sector, with the exception of medium sized firms.

These global findings, however, mask considerable heterogeneity in impacts by country types (by region, income level, and scope of shock) and by firm size and sector. This heterogeneity across contexts and types of firms suggest that targeting female businesses would require a more nuanced and careful approach across different contexts than just using targeting female led businesses across the board. In arguably simplistic terms, we find that women-led micro-businesses, women-led businesses in the hospitality industry, and women-led businesses in countries more severely affected by the COVID-19 shock were disproportionately hit compared to businesses led by men. Looking forward, these data offer an opportunity to drill down into specific sectors and country types to further understand how women and man-led firms have been impacted, where differences emerge, and how policies can target specific groups to facilitate a robust recovery.

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APPENDIX

Table A1: Countries covered in the analysis and fraction of women-led businesses in each sample.

		Sample size	Women-led
EAP	KHM	397	28.0
EAP	MNG	259	51.7
EAP	VNM	457	46.0
ECA	ALB	330	23.0
ECA	BGR	1,160	39.0
ECA	BLR	518	55.8
ECA	CYP	167	47.3
ECA	GEO	533	36.2
ECA	GRC	530	54.5
ECA	HRV	340	38.2
ECA	HUN	619	50.4
ECA	ITA	419	23.4
ECA	KGZ	936	53.8
ECA	MDA	274	47.5
ECA	POL	1,861	34.2
ECA	ROU	1,156	36.8
ECA	RUS	1,121	33.0
ECA	SVN	235	42.5
ECA	TJK	866	14.0
ECA	TUR	1,126	11.4
ECA	UZB	774	19.9
ECA	XKX	1,830	10.8
LAC	BRA	1,360	39.0
LAC	GTM	193	29.0
LAC	HND	159	58.5
LAC	NIC	180	38.3
LAC	SLV	383	41.3
MNA	DZA	393	4.6
MNA	JOR	470	21.1
MNA	MAR	780	19.9
MNA	PSE	1,896	6.8
MNA	TUN	2,612	9.7
SAR	BGD	798	12.4
SAR	LKA	453	11.5
SAR	NPL	491	8.6
SAR	PAK	489	2.3
SSA	CIV	522	13.8
SSA	GIN	103	11.6
SSA	KEN	1,450	21.7
SSA	NER	67	16.4
SSA	NGA	2,429	29.9
SSA	SDN	272	1.1
SSA	SEN	464	20.9
SSA	TCD	101	15.8
SSA	TGO	185	18.4
SSA	TZA	926	15.1
SSA	ZAF	1,815	34.4
SSA	ZMB	524	43.5
SSA	ZWE	786	44.4

Table A2: Unconditional estimates of gender gaps in the operational status; supply shocks, the probability of falling into arrears, and access to public support of businesses

	(1)	(2)	(3)	(4)
	Business is open	Supply Shocks	Falling into Arrears	Access to Public Support
Women	-0.069***	0.034	-0.001	-0.078***
	(0.026)	(0.022)	(0.024)	(0.023)
Upper Middle and High	0.198***	0.133***	-0.142***	0.673***
	(0.034)	(0.026)	(0.032)	(0.026)
ECA	0.881***	-0.673***	-0.837***	0.408***
	(0.049)	(0.046)	(0.048)	(0.045)
MNA	0.849***	-0.121**	-0.498***	0.105**
	(0.051)	(0.049)	(0.056)	(0.050)
LAC	0.556***	0.121**	-0.551***	0.004
	(0.051)	(0.057)	(0.056)	(0.055)
EAP	0.894***	-0.498***	-0.347***	0.661***
	(0.058)	(0.053)	(0.049)	(0.053)
SSA	0.485***	0.110**	-0.382***	-0.188***
	(0.037)	(0.045)	(0.039)	(0.049)
Q2 in mobility drop	0.019	-0.067**	0.002	0.102***
	(0.037)	(0.030)	(0.039)	(0.037)
Q3 in mobility drop	0.325***	0.022	0.201***	0.014
	(0.038)	(0.033)	(0.036)	(0.037)
Q4 in mobility drop	-0.086**	0.154***	0.250***	0.236***
	(0.036)	(0.035)	(0.036)	(0.038)
Constant	-0.567***	1.121***	0.430***	-1.557***
	(0.053)	(0.057)	(0.057)	(0.062)
Observations	36088	32214	22359	31900

Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table A3: Unconditional estimates of gender gaps in labor market adjustments, the use and investment in digital technology, and product innovation

	(1)	(2)	(3)	(4)	(5)
	Laid off Workers	Grant Leave, Reduce wages or hours	Use Digital Platforms	Invest in Digital solutions	Innovate on Products
Women	0.011	0.030	0.061***	-0.083*	0.046*
	(0.025)	(0.022)	(0.021)	(0.044)	(0.025)
Upper Middle and High	0.413***	0.234***	-0.028	-0.036	0.190***
	(0.031)	(0.028)	(0.027)	(0.056)	(0.030)
ECA	-0.375***	-0.509***	0.271***	0.435***	0.271***
	(0.049)	(0.041)	(0.044)	(0.089)	(0.053)
MNA	0.151***	0.122***	0.507***	-0.576***	-0.213***
	(0.051)	(0.042)	(0.044)	(0.124)	(0.059)
LAC	0.450***	-0.404***	0.855***	0.956***	0.192***
	(0.056)	(0.048)	(0.048)	(0.091)	(0.056)
EAP	0.252***	-0.317***	0.636***	0.143*	-0.331***
	(0.065)	(0.058)	(0.049)	(0.079)	(0.062)
SSA	0.593***	-0.024	0.400***	0.653***	0.342***
	(0.044)	(0.036)	(0.040)	(0.067)	(0.047)
Q2 in mobility drop	0.182***	0.355***	0.385***	0.490***	-0.212***
	(0.033)	(0.030)	(0.031)	(0.088)	(0.039)
Q3 in mobility drop	0.466***	0.495***	0.513***	0.192**	-0.538***
	(0.037)	(0.033)	(0.034)	(0.092)	(0.038)
Q4 in mobility drop	0.091**	0.407***	0.296***	0.258***	-0.345***
	(0.039)	(0.033)	(0.034)	(0.095)	(0.037)
Constant	-2.077***	0.522***	-1.371***	-1.752***	-0.446***
	(0.058)	(0.049)	(0.054)	(0.136)	(0.061)
Observations	35331	33970	34477	10814	23480

Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table A4: Unconditional Estimates of Gender gaps on impact of COVID-19 on Sales, Liquidity, expectations of sales growth and Uncertainty

	(1)	(2)	(3)	(4)
	Change in Sales	Available Liquidity	Predicted Sales Growth	Uncertainty of Prediction
Women	-2.013***	-8.417***	2.036*	0.224
	(0.538)	(1.449)	(1.090)	(0.507)
Upper Middle and High	1.938***	-64.739***	-20.534***	-8.203***
	(0.708)	(2.371)	(2.814)	(1.621)
ECA	24.752***	52.401***	52.533***	-3.209
	(1.212)	(3.272)	(3.729)	(2.088)
MNA	5.411***	6.522**	2.988	1.293
	(1.133)	(2.956)	(4.173)	(2.064)
LAC	10.342***	5.414*	103.876***	-6.194***
	(1.375)	(2.785)	(3.981)	(2.113)
EAP	19.502***	7.599**	21.962***	-11.164***
	(1.468)	(3.647)	(1.864)	(0.860)
SSA	8.378***	23.363***	17.534***	1.814*
	(1.009)	(2.683)	(1.898)	(1.018)
Q2 in mobility drop	-5.417***	21.227***	-7.024***	4.313***
	(0.712)	(1.961)	(2.016)	(0.914)
Q3 in mobility drop	-2.091***	25.828***	-46.772***	8.934***
	(0.786)	(2.306)	(1.624)	(0.803)
Q4 in mobility drop	-7.533***	13.631***	-35.819***	11.990***
	(0.777)	(1.876)	(2.615)	(1.525)
Constant	-79.202***	-1.798	49.534***	15.164***
	(1.209)	(3.259)	(2.278)	(1.114)
Observations	34899	26134	5958	5958

Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table A5: Conditional estimates of gender gaps in the operational status; supply, the probability of falling into arrears, and access to public support of businesses

	(1)	(2)	(3)	(4)
	Business is open	Supply Shocks	Falling into Arrears	Access to Public Support
Women	0.127	0.00256	-0.0118	-0.406***
	(0.096)	(0.086)	(0.099)	(0.103)
Small (5-19)	0.0233	0.0760**	0.0771*	0.106***
	(0.035)	(0.030)	(0.041)	(0.032)
Med and large (20+)	0.292***	-0.00575	-0.103**	0.189***
	(0.038)	(0.032)	(0.043)	(0.034)
Small (5-19) × Women	0.137**	0.135**	0.00220	0.0899
	(0.064)	(0.060)	(0.087)	(0.063)
Med and large (20-99) × Women	0.0291	0.137**	0.0160	0.154**
	(0.070)	(0.062)	(0.088)	(0.064)
Retail and wholesale	0.307***	0.0289	-0.00545	-0.0165
	(0.043)	(0.032)	(0.036)	(0.033)
Hospitality	-0.512***	0.0460	0.206***	0.410***
	(0.050)	(0.056)	(0.052)	(0.047)
Other services	0.0969**	-0.0143	-0.00262	0.0962**
	(0.042)	(0.036)	(0.040)	(0.037)
Others	0.177***	-0.107***	0.0671*	0.0507
	(0.044)	(0.036)	(0.039)	(0.038)
Retail and Wholesale × women	-0.217***	-0.0620	-0.0281	-0.0288
	(0.076)	(0.056)	(0.061)	(0.060)
Hospitality × women	-0.307***	0.295***	0.219**	-0.0736
	(0.087)	(0.099)	(0.090)	(0.082)
Other services × Women	-0.353***	-0.0250	0.147*	-0.0934
	(0.080)	(0.068)	(0.076)	(0.069)
Others × women	-0.161*	-0.0796	0.149*	-0.0941
	(0.095)	(0.078)	(0.083)	(0.081)
Upper Middle and High	0.186***	0.239***	-0.0983***	0.639***
	(0.041)	(0.032)	(0.038)	(0.031)
Upper middle and high × women	0.0210	-0.297***	-0.0407	0.0599
	(0.054)	(0.047)	(0.050)	(0.048)

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	Business is open	Supply Shocks	Falling into Arrears	Access to Public Support
ECA	0.853***	-0.753***	-0.840***	0.395***
	(0.054)	(0.049)	(0.051)	(0.048)
MNA	0.805***	-0.143***	-0.493***	0.0891*
	(0.055)	(0.052)	(0.060)	(0.052)
LAC	0.491***	0.0511	-0.518***	-0.00279
	(0.055)	(0.059)	(0.059)	(0.057)
EAP	0.851***	-0.580***	-0.354***	0.625***
	(0.063)	(0.056)	(0.052)	(0.056)
SSA	0.519***	0.0519	-0.403***	-0.222***
	(0.041)	(0.048)	(0.042)	(0.051)
Q2 in mobility drop	0.0302	-0.0595	0.0166	0.0513
	(0.045)	(0.037)	(0.047)	(0.045)
Q3 in mobility drop	0.423***	0.00971	0.178***	-0.0502
	(0.048)	(0.041)	(0.045)	(0.047)
Q4 in mobility drop	-0.0353	0.0799*	0.248***	0.180***
	(0.046)	(0.043)	(0.044)	(0.047)
Q2 in mobility drop × Women	0.0952	0.0281	-0.125	0.253***
	(0.088)	(0.070)	(0.081)	(0.087)
Q3 in mobility drop × Women	-0.234***	0.0697	0.0671	0.317***
	(0.084)	(0.070)	(0.072)	(0.084)
Q4 in mobility drop × Women	-0.130	0.169**	-0.0613	0.233***
	(0.083)	(0.075)	(0.072)	(0.087)
Constant	-0.808***	1.131***	0.411***	-1.662***
	(0.068)	(0.068)	(0.069)	(0.074)
Observations	35652	31497	22119	31492

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table A6: Conditional estimates of gender gaps in labor market adjustments, the use and investment in digital technology, and product innovation

	(1)	(2)	(3)	(4)	(5)
	Laid off Workers	Grant Leave, Reduce wages or hours	Use Digital Platforms	Invest in Digital solutions	Innovate on Products
Women	0.160*	0.226***	0.536***	-0.288	-0.101
	(0.087)	(0.076)	(0.078)	(0.302)	(0.110)
Small (5-19)	0.238***	0.444***	0.321***	0.057	-0.063
	(0.032)	(0.027)	(0.031)	(0.094)	(0.052)
Med and large (20+)	0.312***	0.458***	0.571***	0.423***	0.051
	(0.035)	(0.030)	(0.032)	(0.096)	(0.052)
Small (5-19) × Women	0.028	-0.253***	-0.285***	0.151	0.110
	(0.060)	(0.054)	(0.055)	(0.216)	(0.087)
Med and large (20-99) × Women	0.007	-0.297***	-0.452***	0.099	0.136
	(0.065)	(0.058)	(0.057)	(0.219)	(0.087)
Retail and wholesale	-0.110***	-0.177***	0.213***	0.152**	0.145***
	(0.039)	(0.031)	(0.031)	(0.061)	(0.038)
Hospitality	0.197***	0.191***	0.157***	0.077	0.106*
	(0.051)	(0.047)	(0.046)	(0.076)	(0.056)
Other services	-0.018	0.104***	0.401***	0.346***	0.197***
	(0.039)	(0.034)	(0.033)	(0.058)	(0.043)
Others	-0.064*	-0.139***	0.091**	-0.028	-0.131***
	(0.039)	(0.035)	(0.036)	(0.060)	(0.047)
Retail and Wholesale × women	0.014	0.056	0.035	-0.058	-0.131**
	(0.066)	(0.056)	(0.054)	(0.125)	(0.061)
Hospitality × women	-0.020	0.132	-0.215***	0.124	-0.010
	(0.091)	(0.081)	(0.080)	(0.150)	(0.091)
Other services × Women	0.062	-0.105	-0.176***	-0.061	-0.208***
	(0.075)	(0.065)	(0.063)	(0.126)	(0.077)
Others × women	0.034	-0.042	-0.220***	0.129	-0.238**
	(0.084)	(0.078)	(0.074)	(0.142)	(0.097)
Upper Middle and High	0.495***	0.207***	0.027	-0.116*	0.216***
	(0.037)	(0.033)	(0.033)	(0.063)	(0.036)
Upper middle and high × women	-0.197***	0.048	-0.050	-0.009	-0.040
	(0.051)	(0.045)	(0.044)	(0.102)	(0.050)

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	Laid off Workers	Grant Leave, Reduce wages or hours	Use Digital Platforms	Invest in Digital solutions	Innovate on Products
ECA	-0.501***	-0.634***	0.112**	0.522***	0.220***
	(0.053)	(0.044)	(0.047)	(0.090)	(0.056)
MNA	0.063	0.058	0.432***	-0.556***	-0.246***
	(0.054)	(0.044)	(0.046)	(0.125)	(0.061)
LAC	0.379***	-0.487***	0.727***	0.855***	0.123**
	(0.059)	(0.050)	(0.050)	(0.095)	(0.058)
EAP	0.118*	-0.425***	0.526***	0.151*	-0.353***
	(0.069)	(0.061)	(0.051)	(0.080)	(0.065)
SSA	0.571***	-0.090**	0.336***	0.651***	0.308***
	(0.046)	(0.038)	(0.042)	(0.070)	(0.049)
Q2 in mobility drop	0.289***	0.447***	0.495***	0.526***	-0.194***
	(0.040)	(0.035)	(0.038)	(0.096)	(0.049)
Q3 in mobility drop	0.511***	0.529***	0.551***	0.196*	-0.586***
	(0.044)	(0.040)	(0.043)	(0.102)	(0.048)
Q4 in mobility drop	0.105**	0.429***	0.328***	0.296***	-0.421***
	(0.048)	(0.040)	(0.043)	(0.108)	(0.048)
Q2 in mobility drop × Women	-0.235***	-0.015	-0.204***	0.068	0.013
	(0.078)	(0.068)	(0.069)	(0.213)	(0.081)
Q3 in mobility drop × Women	-0.067	0.019	-0.032	0.043	0.211***
	(0.073)	(0.066)	(0.068)	(0.208)	(0.076)
Q4 in mobility drop × Women	-0.092	-0.016	-0.089	0.221	0.257***
	(0.081)	(0.069)	(0.070)	(0.227)	(0.076)
Constant	-2.304***	0.268***	-1.865***	-2.041***	-0.463***
	(0.070)	(0.059)	(0.066)	(0.171)	(0.081)
Observations	34572	33216	33694	10613	23130

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table A7: Conditional Estimates of Gender gaps on impact of COVID-19 on Sales, Liquidity, expectations of sales growth and Uncertainty

	(1) Change in Sales	(2) Available Liquidity	(3) Predicted Sales Growth	(4) Uncertainty of Prediction
Women	-2.941	5.201	4.881	1.722
	(1.804)	(4.752)	(5.146)	(2.342)
Small (5-19)	2.822***	1.021	-1.260	0.529
	(0.685)	(2.090)	(2.190)	(1.059)
Med and large (20+)	9.278***	4.843**	-3.091	-0.669
	(0.754)	(2.276)	(2.318)	(1.077)
Small (5-19) × Women	-0.259	-10.324***	-1.405	-0.591
	(1.350)	(3.888)	(4.860)	(2.173)
Med and large (20-99) × Women	0.674	-13.188***	-0.397	-0.208
	(1.429)	(4.236)	(4.974)	(2.210)
Retail and wholesale	2.816***	8.768***	-1.609	-2.722***
	(0.735)	(2.132)	(1.554)	(0.809)
Hospitality	-18.423***	0.865	-4.527**	2.005*
	(1.245)	(2.855)	(2.072)	(1.064)
Other services	-4.816***	4.358*	0.774	-0.594
	(0.812)	(2.266)	(1.557)	(0.740)
Others	0.835	16.857***	0.896	0.912
	(0.866)	(2.706)	(1.537)	(0.707)
Retail and Wholesale × women	0.957	-8.920**	1.920	0.712
	(1.310)	(3.553)	(2.859)	(1.452)
Hospitality × women	-5.864***	-7.380	-3.629	-2.617
	(2.005)	(5.544)	(4.705)	(2.042)
Other services × Women	-1.219	-4.840	-5.224*	0.435
	(1.532)	(4.010)	(2.825)	(1.343)
Others × women	0.562	-10.323*	-6.545**	-1.743
	(1.794)	(5.478)	(3.115)	(1.421)
Upper Middle and High	-0.368	-67.120***	-19.376***	-9.347***
	(0.832)	(2.759)	(3.159)	(1.767)
Upper middle and high × women	4.335***	12.975***	1.343	-3.195***
	(1.115)	(2.924)	(2.315)	(1.057)

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	Change in Sales	Available Liquidity	Predicted Sales Growth	Uncertainty of Prediction
ECA	22.763***	51.487***	51.126***	-1.209
	(1.265)	(3.500)	(4.224)	(2.324)
MNA	2.968**	6.670**	3.978	2.931
	(1.176)	(3.116)	(4.251)	(2.081)
LAC	8.662***	6.500**	102.182***	-3.734
	(1.394)	(2.990)	(4.450)	(2.338)
EAP	15.998***	6.499*	21.199***	-11.181***
	(1.514)	(3.886)	(2.116)	(0.977)
SSA	9.410***	23.235***	17.366***	2.092*
	(1.051)	(2.909)	(2.054)	(1.082)
Q2 in mobility drop	-5.145***	23.908***	-8.496***	3.971***
	(0.827)	(2.455)	(2.118)	(0.953)
Q3 in mobility drop	-0.158	26.005***	-47.129***	9.282***
	(0.946)	(2.951)	(1.723)	(0.841)
Q4 in mobility drop	-6.198***	14.747***	-35.871***	12.564***
	(0.944)	(2.401)	(2.870)	(1.627)
Q2 in mobility drop $\times$ Women	2.780*	-13.908***	11.590*	-2.467
	(1.562)	(4.445)	(6.045)	(3.109)
Q3 in mobility drop $\times$ Women	-2.554	0.259	0.375	-0.219
	(1.556)	(4.512)	(3.086)	(1.321)
Q4 in mobility drop $\times$ Women	-1.823	-5.852	-4.640	4.265*
	(1.619)	(3.646)	(4.247)	(2.337)
Constant	-81.815***	-8.737**	51.681***	14.846***
	(1.399)	(3.986)	(2.886)	(1.458)
Observations	34126.000	25899.000	5952.000	5952.000

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table A8: Distribution of observations in the full sample and our sample.

Region	Percentage of observations in full sample	Distribution in sample used in analysis	Percentage of missing observations
EAP	2.8	3.0	0.1
ECA	39.8	40.4	7.5
LAC	6.0	6.2	6.1
MNA	18.2	16.7	16.2
SAR	6.6	7.1	2.9
SSA	26.6	26.7	8.5
Total	100.0	100.0	8.7
Large (100+)	10.1	9.5	14.0
Medium (20-99)	20.9	20.4	10.6
Micro (0-4)	32.9	33.3	7.5
Small (5-19)	36.2	36.8	7.2
Total	100.0	100.0	8.7
Hospitality	7.2	7.3	6.9
Manufacturing	30.7	31.0	8.0
Other services	20.7	20.1	11.4
Others	14.5	14.6	8.7
Retail and wholesale	26.9	27.0	8.2
Total	100.0	100.0	8.8
Low and lower middle	55.7	56.4	7.6
Upper middle and high	44.3	43.6	10.1
Total	100.0	100.0	8.7
Quartile 1 in mobility drop	13.5	13.6	7.7
Quartile 2 in mobility drop	35.2	34.8	10.0
Quartile 3 in mobility drop	32.7	31.6	11.7
Quartile 4 in mobility drop	18.6	20.0	2.2
Total	100.0	100.0	8.8