

## 1. Introduction

COVID-19 presented an unprecedented shock to firms around the world. In response, governments put in place a range of fiscal and financial support measures to keep businesses afloat and limit the economic fallout.<sup>2</sup> Which firms benefited from policy support? How effective were firms' self-coping strategies and government support measures in alleviating liquidity constraints, reducing uncertainty, and allowing firms to survive? Was the impact heterogeneous across policies and adjustment strategies? Answers to these questions are critical to understand the reallocation channels at work and to design better policies that can help smooth the impact of future shocks.

In this paper, we address these questions by relying on a large-scale representative survey of enterprises in Vietnam, a dynamic emerging market economy. Although Vietnam was among the top performing countries in 2020 due to its early and decisive pandemic containment policies, the corporate sector was hit hard. Business sales plunged by 60 percent in the first four months of 2020 (GSO, 2020). In response, the government of Vietnam introduced wide-ranging measures to support affected firms. Fiscal support for firms (estimated at around 3.7 percent of GDP in 2020) largely took the form of tax cuts and deferrals (IMF, 2021). In addition, a credit support package of around 3.9 percent of GDP comprising loan restructuring and interest rate reductions was also rolled out in early 2020.

We exploit two waves of an enterprise survey conducted in 2020 to examine the impact of COVID-19 on firms and evaluate the efficacy of government support. The survey provides information on the impact of the pandemic on businesses as well as firm access to policy support by size, sector and firm ownership, including self-reported constraints for over 100,000 firms in each round. Further, the survey includes information on self-coping adjustments undertaken by firms. We first empirically examine how the likelihood of receiving support differs by firm characteristics and economic performance. We then examine the likelihood of firm survival in light of government support measures and various self-coping strategies adopted by firms. Finally, we examine how the likelihood of adopting digitalization varies across firms and sectors.

Our findings reveal that policy take-up rates were initially low mainly due to tight eligibility criteria and cumbersome procedures.<sup>3</sup> Results from a probit regression model show that the likelihood of receiving policy support was generally higher for contact-intensive sectors and larger firms compared to other sectors and firms. We also find evidence that fiscal support

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<sup>2</sup> According to the IMF, fiscal measures introduced since January 2020 amounted to 16.4 percent of total global GDP; of which, almost 40 percent were in the form of below-the-line measures. IMF Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 pandemic (<https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>)

<sup>3</sup> As the pandemic progressed, firms in Vietnam seem to have used government support policies better, with more firms reporting having received some support from the government in September 2021 compared to 2020 (World Bank, 2022).

helped reduce uncertainty and allowed both large and small firms to remain afloat, but the size bias was particularly pronounced for credit policies. Controlling for firm size and industry, the likelihood of receiving policy support was not significantly associated with changes in sales during the crisis, or with pre-pandemic weaknesses. However, we find evidence that support was tilted towards firms reporting larger employment losses and those with higher pre-pandemic productivity. These results suggest that the effectiveness of the support package was mixed.

Our paper also sheds lights on the effectiveness of firms' self-coping strategies. Adjustment along the extensive margin by ceasing operations was limited. Instead, firms initially adjusted along the intensive margin (e.g., by granting leave, reducing working hours). The nature of adjustment, however, shifted from short-term employment responses in the early stage of the pandemic to longer-term measures (e.g., layoffs, developing new products, services or processes, transforming their supply chain, and becoming more digital) as the pandemic progressed. Among firm's self-coping strategies, measures to reduce labor costs were most effective in alleviating liquidity constraints, but larger firms also focused on developing new products, services or processes, and transforming their supply chain. Both small and large firms resorted to digitalization to manage the fallout, but the likelihood of investing in digitalization was higher for less productive firms and those experiencing sales losses, particularly in contact-intensive sectors.

Our paper is related to studies that examine firm-level impacts and the *ex ante* effectiveness of government support using pre-pandemic data. Gourinchas et al. (2020, 2021) estimate the impact of the crisis on business failures among European SMEs and evaluate government support using a cost minimizing theoretical framework. Shivardi and Romano (2020) use firms' balance sheet data from Italy; Miyakawa et al. (2021) use a simulation exercise to estimate firm exits in Japan. Kroeger et al. (2021) use similar simulations to infer the impact of COVID-19 on Vietnamese firms using the corporate census data. In this paper we assess whether support actually reached intended beneficiaries, identify reasons for not accessing policy support, and link policies with firm performance.

Our paper is more closely related to recent studies that explore the effectiveness of policy support and self-coping strategies using direct evidence from pandemic-related surveys. Cirera et al. (2021) using firm-level data for 120,000 firms in 60 developing countries, find that policy support has been limited to a small number of firms. Apedo-Amah et al. (2020) using the same data show that a large number of firms worldwide increased the use of digital platforms or invested in new digital solutions in response to the pandemic. Other studies have focused on advanced or large emerging market countries. Dai et al. (2020) document revenue loss, business closures, and layoffs in China; Bartik et al. (2020), and Fairlie (2020) provide evidence for the United States; Harasztosi et al. (2022) for a sample of European countries; and Lalinsky and Pal (2022) for Slovakia. Our paper focuses on firm characteristics and the effectiveness of

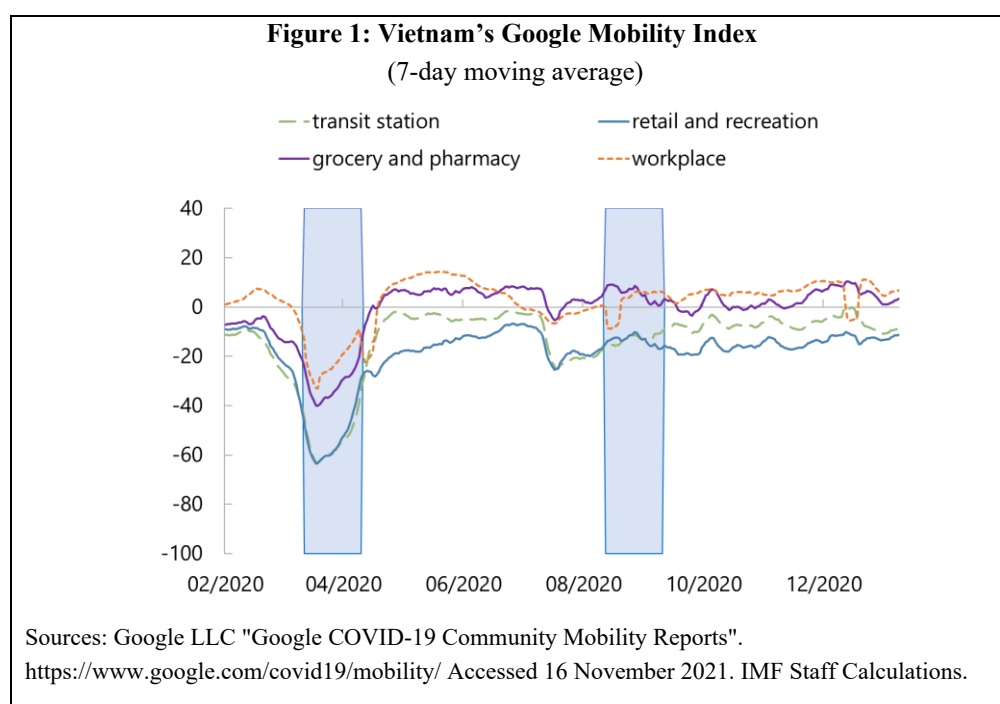
government support using evidence from a large-scale, representative COVID-19 survey in a developing economy.<sup>4</sup>

The remainder of the paper proceeds as follows. Section 2 describes the dataset and methodology used for the empirical analysis. Section 3 presents stylized facts. Section 4 presents the results of the empirical analysis, while Section 5 concludes.

## 2. Data and Empirical Approach

### Survey Description

To assess the impact of COVID-19 on firms, two waves of the COVID-19 Enterprise Survey were conducted in 2020 by the General Statistics Office (GSO) of Vietnam. The survey was first carried out in April 2020, and the second wave in September 2020. Figure 1 plots the Google mobility index in 2020-21, with shaded areas indicating the periods when the two rounds of the survey were conducted. As shown in the figure, economic activity fell sharply as strict containment measures were implemented during the first survey round in April. By September, most containment measures had been lifted, and domestic activity rebounded strongly. However, while the domestic economy fared well, other trading partners struggled with infection surges and lockdowns. This translated into lower external demand and supply chain disruptions, disproportionately impacting larger, export-oriented firms.



<sup>4</sup> Beck et al (2020) survey 630 listed firms across ten emerging market economies, including Vietnam, to gauge how firms responded to the pandemic. By contrast, our survey covers both listed and non-listed firms and is nationally representative.

The purpose of the survey was to evaluate the impact of COVID-19 on firm operations and to assess awareness of and access to government support. The survey was announced and distributed online for all formal enterprises who were either operating or had temporarily ceased operations. The survey was conducted over 10 days on a voluntary basis, but care was taken to ensure that it was broadly representative. The survey covered 126,000 firms and 162,000 firms in April and September, respectively, accounting for 20 percent of the total formal enterprises in the country. As can be seen in Table 1, the survey sample is broadly representative with 91.6 percent of the sample comprising micro and SMEs, tracking closely the firm distribution in the national corporate census.<sup>5</sup> Importantly, the two rounds of survey allow us to construct a panel of approximately 25,000 firms to examine firm survival.

The surveys contain detailed information on firm characteristics including ownership, size, industry, and location and the impact of the pandemic on revenues, employment, input shortages, and access to consumption markets. In addition, the surveys capture information on adjustments to cope with the fallout, including changing operating status/business scales, layoffs, change in key products, and adoption of digitalization as well as access to policy support.

## Empirical Approach

We employ a number of empirical approaches to evaluate the impact of policy support and firm's own coping strategies. In the baseline estimation strategy, we estimate the likelihood of the firm receiving policy support using a probit regression:

$$\text{Probit}(\text{Support}_i) = \alpha + \beta \Delta \text{Sales}_i + \delta \Delta \text{Labor}_i + \lambda \text{Productivity}_i + \\ + \vartheta \text{Industry}_i + \gamma \text{Size}_i + \theta \text{Ownership}_i + \varepsilon_i \quad (1)$$

where  $\text{Support}_i$  takes the value of 1 if firm  $i$  received policy support and 0 otherwise, where we also differentiate between types of support.  $\Delta \text{Sales}_i$  is the change of sales of firm  $i$  in the first 9 months of 2020 compared to same period in 2019;  $\Delta \text{Labor}_i$  is the change in the number of employees at firm  $i$  in the first 9 months of 2020 compared to same period in 2019;  $\text{Productivity}_i$  is firm  $i$ 's labor productivity in 2019, calculated as total sales of firm  $i$  in 2019 over the total number of employees.  $\text{Industry}$ ,  $\text{Size}$  and  $\text{Ownership}$  are dummy variables capturing firm industry, size and ownership, respectively.

Firms comprise eight sectors and different sizes based on the number of employees: micro firms with less than 10 employees, small firms with 10 to 49 employees, medium firms with 50 to 199 employees, and large firms with 200 or more employees. Firm ownership is broken down into three types, namely private enterprises, state-owned enterprises (SOEs), and foreign direct

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<sup>5</sup> The total number of registered firms in Vietnam is about 800,000, of which 97 percent are SMEs. One important caveat has to do with the nature of voluntary surveys and selection, as worse-off firms could have had greater incentive to fill out the questionnaires than firms that fared well.

investment (FDI) or export-oriented firms. The regressions are run for the second survey wave as government policy support was first announced in early April, around the time the first survey was implemented.

As a second step, we empirically examine the effectiveness of policy support and self-coping strategies in addressing firms' liquidity stress proxied by the likelihood of firm survival using a probit model, and covering the smaller sample of 25,000 firms. Assessing rigorously the impact of policies and self-coping strategies is complex as the fact that a firm has access to policy support or survived cannot be considered exogenous. As a result, instead of just simply capturing actual operating status, we consider firms' expectations of remaining in operation if COVID-19 was prolonged as a proxy for firms' perceived liquidity conditions. Specifically, firms in the April 2020 round were asked what they expected to do with their business—to continue normal operations, downscale, suspend operations, or enter into bankruptcy—if COVID-19 lasted until end-2020Q2, 2020Q3, and end-Q4 2020. Actual business operations are then confirmed in the second survey round in September. Thus, we are able to compare the actual outcome versus the expectation of remaining fully operational, which can be interpreted as to what extent perceived liquidity stress was alleviated following policy support and self-coping strategies.<sup>6</sup> We run the following regression:

$$Probit(\Delta operating\ status_i) = \alpha + \beta \Delta Sales_i + \delta \Delta Labor_i + \lambda Productivity_i + \mu X_i + \gamma Industries_i + \theta Size_i + \tau Ownership_i + \epsilon_i \quad (2)$$

Our dependent variable ( $\Delta operating\ status_i$ ) takes the value 1 if firm  $i$  in April expected to downscale or suspend operations or file for bankruptcy if COVID-19 lasted until end of 2020Q3 but actually remained fully operational by September 2020, and takes the value of 0 if there is no difference between a firm  $i$ 's expectation of remaining fully operational and the actual outcome or if the firm expected to be fully operational even if COVID-19 lasted until end of 2020Q3 but in fact was forced to downscale, suspend, or file for bankruptcy by September of that year.<sup>7</sup>

In terms of explanatory variables,  $\Delta Sales_i$  is the change in sales growth between the September and April surveys for firm  $i$ ;  $\Delta Labor_i$  is the change in employment growth between the two survey dates for firm  $i$ ;  $Productivity_i$  captures firm  $i$ 's pre-crisis productivity in 2019;  $X_i$  denotes a vector of dummy variables comprising policy support and firm self-coping strategies which takes value 1 if firm  $i$  received policy support or adopted self-coping strategies and 0 otherwise. The coefficient  $\mu$  is of interest as it indicates whether receiving policy support or adopting self-coping strategies (controlling for policy support) helps firms improve their operating status compared to expectations. As before *Industry*, *Size* and *Ownership* are dummy

<sup>6</sup> In this sense, we are capturing whether there is a clear relationship between overall government support and the expectations about future revenues at the firm level (see also, Cirera et al., 2021).

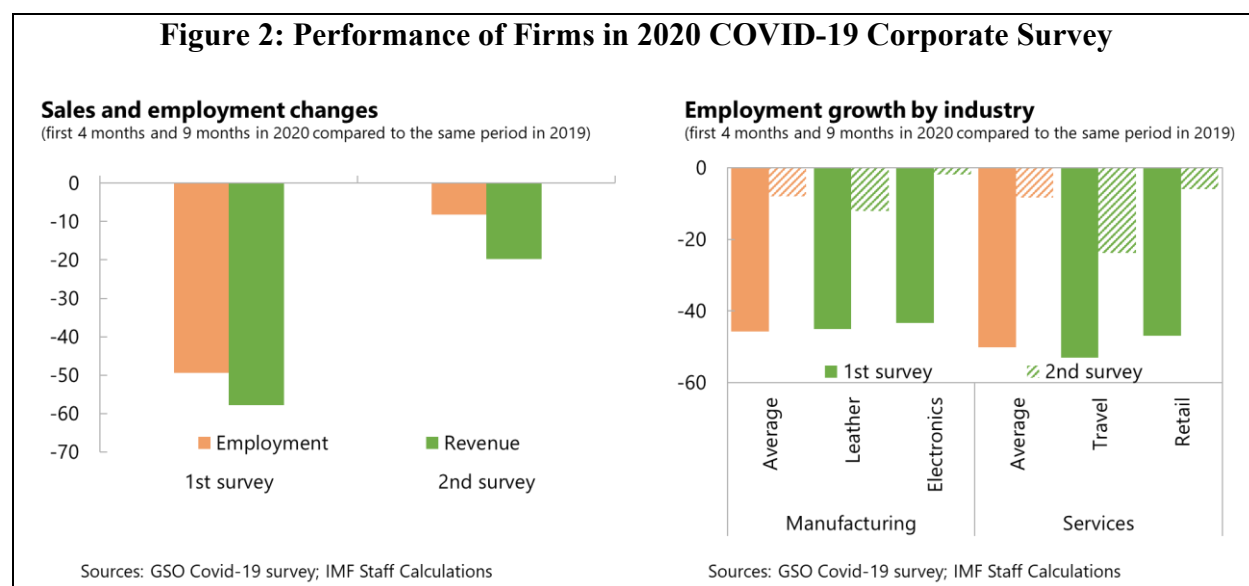
<sup>7</sup> While government support could also be helpful for firms that predicted that they would remain fully operations and actually did so, the effectiveness of policy support is expected to be marginal in this case.

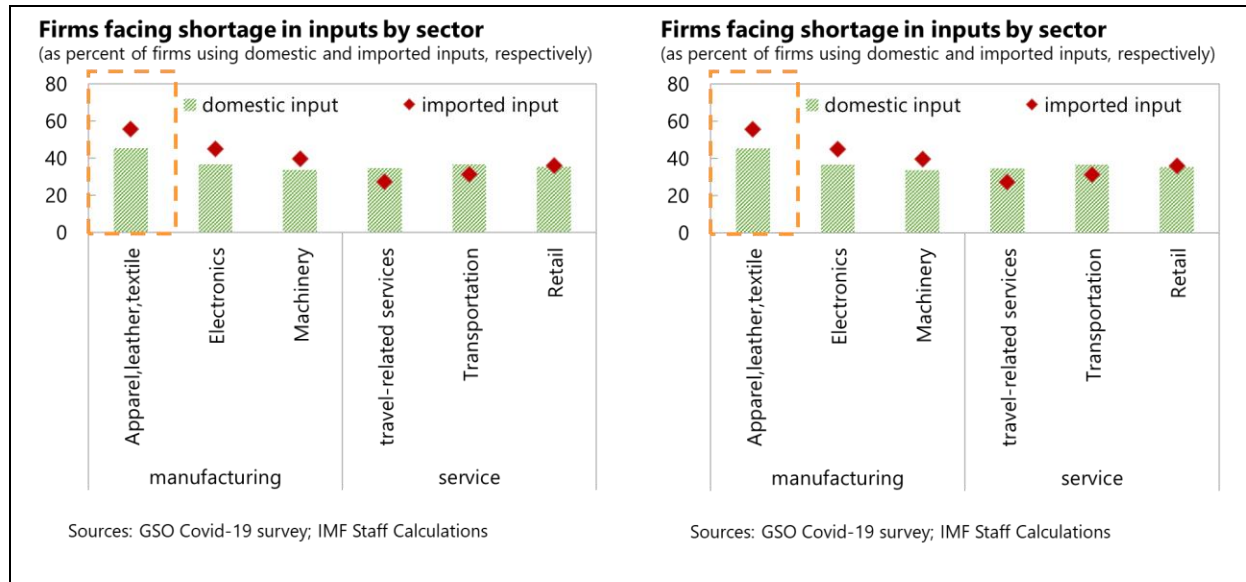
variables. Similar probit models are considered for different types of policy support and adjustment along external and internal margins.

### 3. Survey Results at First Glance

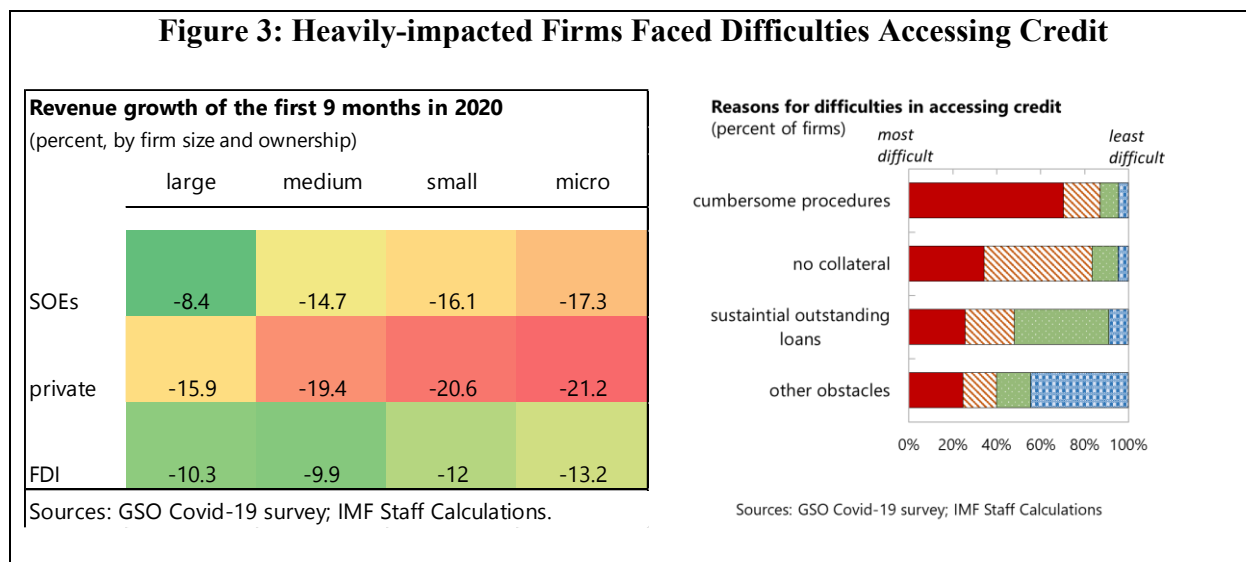
#### Impact of COVID-19 on Business Activities

Descriptive analysis shows that Vietnamese firms were hit hard during the pandemic. Strict containment measures put in place in early 2020 (when the first round of Vietnamese COVID-19 Enterprise Survey was conducted) dampened business activity. As shown in Figure 2 (upper-left panel), sales and employment dropped by close to 60 and 50 percent in the first 4 months of 2020, respectively, compared to the same period of 2019. The scale of impact is comparable to that seen in other emerging market economies (Apedo-Amah, 2020). Domestic activity improved around the time the survey was conducted in September 2020, with a notable recovery of sales and employment, led by high-tech sectors such as electronics (Figure 2, upper-right panel). However, the speed of recovery was heterogeneous even within the manufacturing and services sectors. For instance, low-value added leather and textile manufacturing were hit harder than electronics during the second survey reflecting pervasive input shortages and the steep fall in demand as these sectors are heavily dependent on external demand from the US and Europe. Similarly, contact-intensive travel continued to suffer from the severe impacts of the pandemic even in the second survey (Figure 2, lower panels).



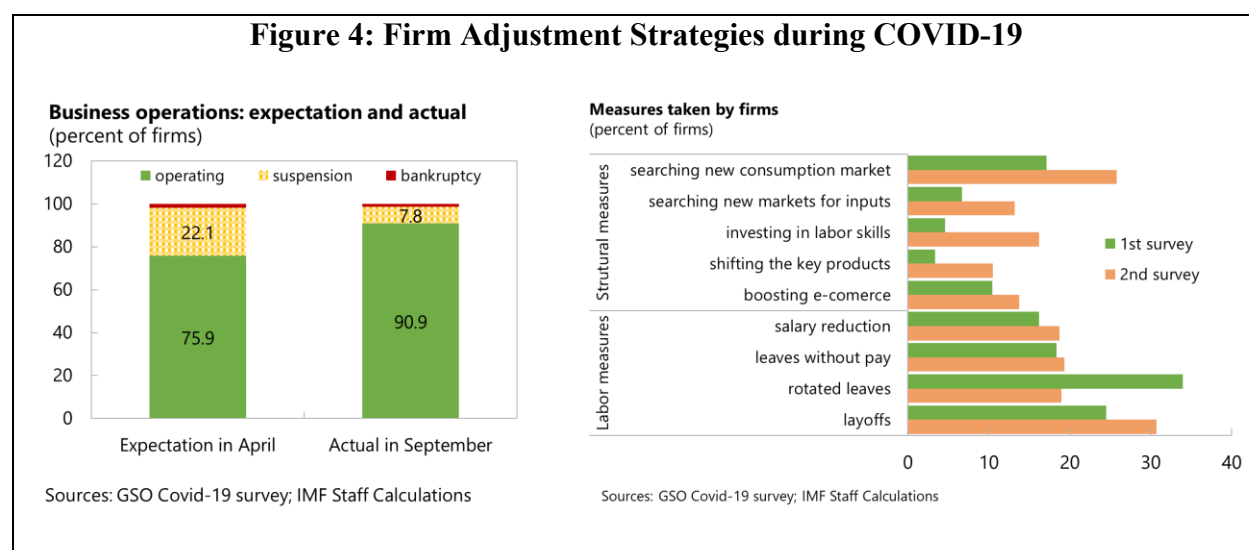


Firms that entered the pandemic with weaker balance sheet conditions were more severely impacted. Prior to COVID-19, contact-intensive sectors and smaller private firms had weaker balance sheet positions compared to large SOEs and FDI firms (Kroeger et al., 2020). The divide in performance intensified during the pandemic. Revenue shortfalls for private and smaller firms in 2020 were almost twice as large as for other types of firms. This suggests that smaller firms were precisely the ones that would require liquidity support once the pandemic hit. However, 91 percent of micro firms reported facing difficulties in accessing credit, compared to 83 percent of large firms, mainly due to cumbersome procedures and lack of collateral (Figure 3, right chart).



## Response to the Crisis: Self Coping Strategies and Government Support

To cope with the impact of COVID-19, firms adjusted both along the extensive and intensive margins. About 25 percent of firms surveyed in April 2020 expected to close down operations if the pandemic lasted until 2020Q3. However, as of September 2020, about 10 percent of the surveyed firms had closed down operations (Figure 4, left chart). The employment response to the shock was initially dominated by adjustments along the intensive margin, with most firms providing granted leave or reducing working hours or wages, and only a small number of firms laying-off workers. However, the nature of adjustment shifted over time. At the peak of lockdowns in April, firms adjusted by reducing labor costs—24.5 percent along the extensive margin through layoffs, and 34 percent through rotated leave. As the pandemic progressed, more firms shifted from granting leave to laying off workers. Once the economy reopened, adjustments took the form of input and consumption market diversification and adoption of digital solutions.



One important coping strategy was the adoption of digital solutions by firms. Figure 5 shows that SMEs that largely cater to the domestic market made greater use of e-commerce through digital platforms as compared to large firms. Large firms, on the other hand, invested in new equipment, software or digital solutions in response to the pandemic.



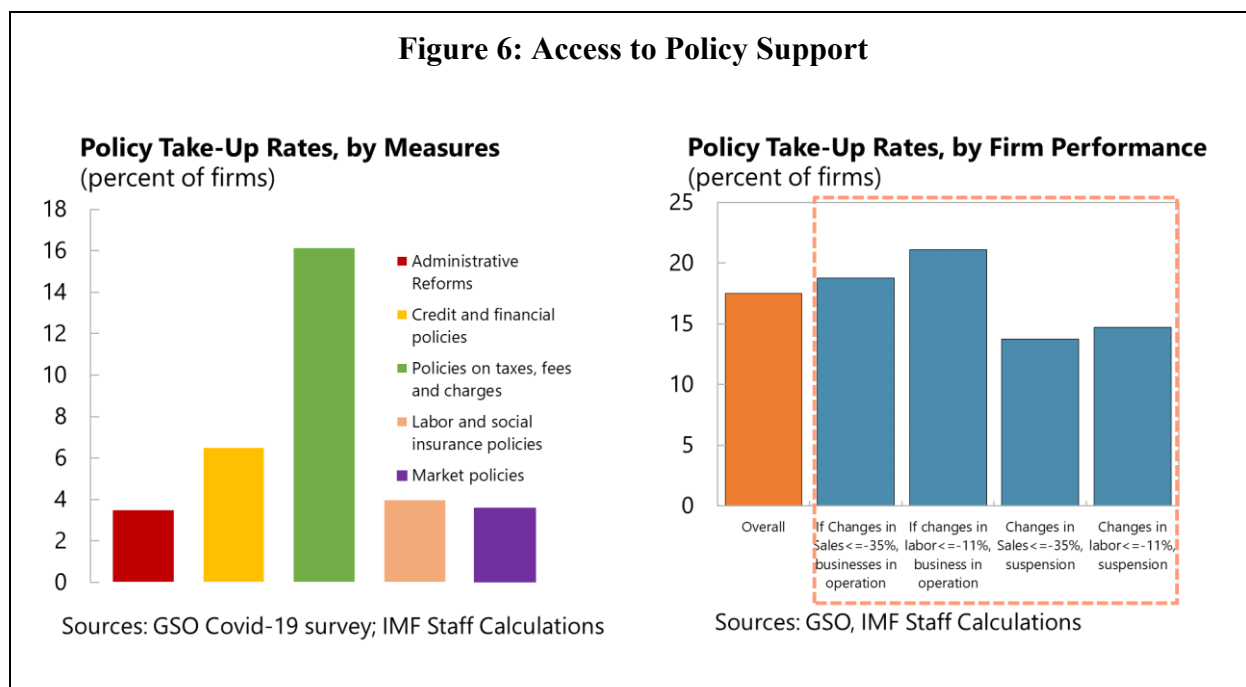
**Figure 5: Engagement in Digitalization and E-commerce by Firm Size**



Note: Y-axis is in percent. Investment shows the share of firms invested in new IT equipment, technology, software or digital solutions during COVID. Sales denotes the ratio of digital-based sales revenue to total revenue (in the first 9 months of 2020). Sources: GSO COVID-19 survey; IMF staff calculations.

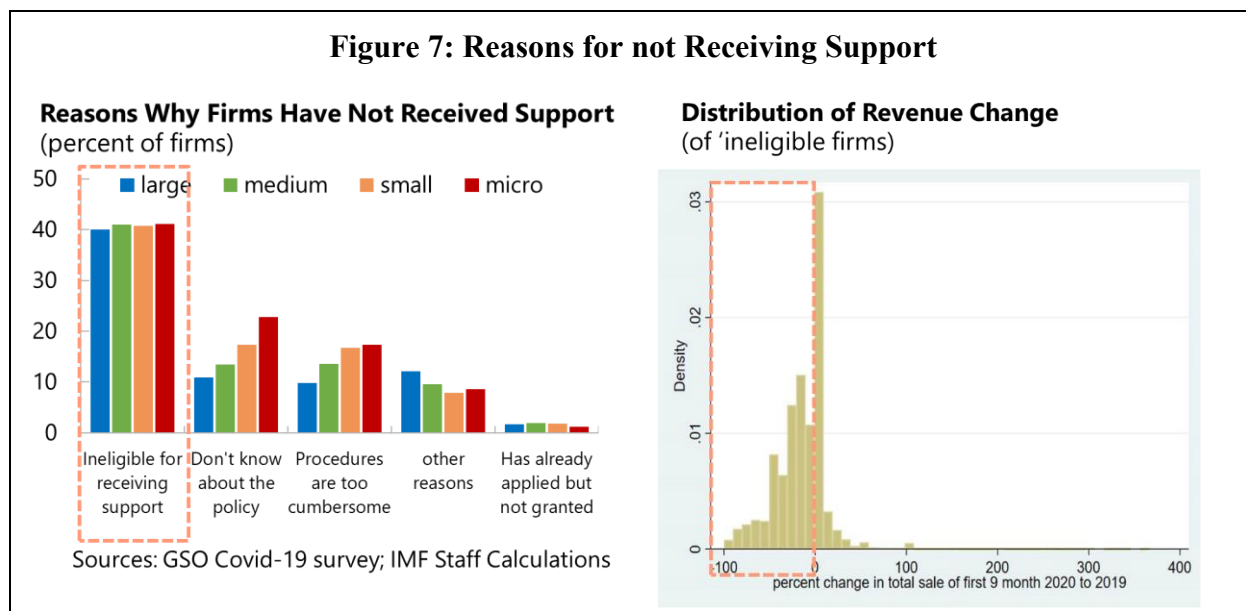
In addition, the government put in place support measures encompassing five main areas: (i) tax cuts and deferrals (deferrals of corporate income tax payment, land rental payment or excise tax payment, lowering fees and charges); (ii) credit policies (deferral of credit payments, suspension of interest payments, rollover of debt, access to new credit, and loans with subsidized rates); (iii) labor and social insurance policies (suspension of social security contributions, wage subsidies); (iv) administrative reforms (simplifying administrative procedures, business cost reduction); and (v) market policies (support with input/output diversification). However, the policy take-up rate—around 17 percent, on average—was low, with fiscal policies exhibiting the highest take-up followed by credit policies (Figure 6, left chart). We zoomed in on the most affected firms by examining the bottom 25 percentile of either sales growth or employment loss to see if policy take-up rates were higher for the most vulnerable group (Figure 6, right chart). Take-up rates ranged from 18 percent to 21 percent for the lowest quantile group of firms that remained operational but suffered the largest decline in revenue or layoffs. Interestingly, take-up rates were even lower (13-14) percent for firms that suspended operations and were in the lowest quantile in terms of sales declines or layoffs.

**Figure 6: Access to Policy Support**



Ineligibility was the most important reason cited by firms for not being able to access policy support. Most firms that did not receive any support reported lack of eligibility as a major constraint, although a majority of these firms also reported experiencing a decline in revenue (Figure 7). In addition, smaller firms surveyed also reported cumbersome procedures and lack of information regarding support policies as key impediments to access.

**Figure 7: Reasons for not Receiving Support**



## 4. Empirical results

### Likelihood of Receiving Government Support

The baseline estimation results for the probit model describing the likelihood of receiving government support (see Section 2) are presented in Table 2. We show marginal effects that tell us how our dependent variable changes when a specific explanatory variable changes, while other covariates are assumed to be held constant at their mean values. Column (1) of Table 2 shows the overall likelihood of receiving government support, while columns (2-6) report the likelihood of receiving specific types of support: tax cuts and deferrals, credit, labor and social insurance, administrative reforms; and market policies, respectively.

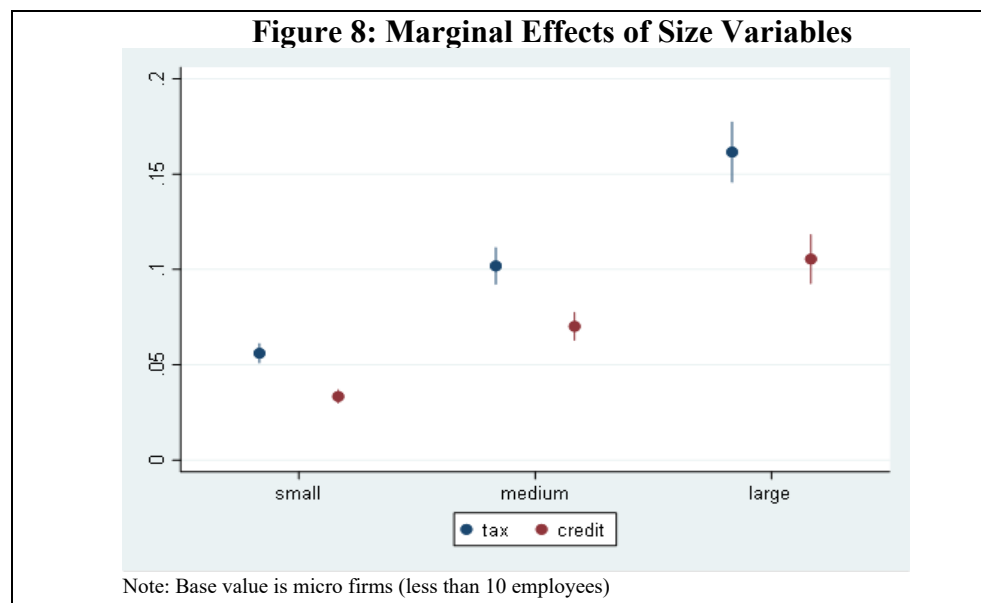
Our results show that firms experiencing larger employment losses have a higher probability of receiving COVID-19 government support across all five policy areas regardless of the inclusion of alternative explanatory variables. The coefficients on the employment variable is negative and statistically significant for all types of support, indicating that employment loss is associated with an increase in the probability of receiving support, and that maintaining employment was a priority during the pandemic. However, we find that support was not necessarily tilted towards firms experiencing sales (revenues) losses. Instead, we find that more productive firms and those reporting higher sales growth were more likely to receive credit and other types of support. This finding is similar to Cirera et al. (2021) who show that in many emerging market economies, firms that did not experience sales drop benefited from support while firms experiencing large negative shocks did not have access to public support.

In terms of sectors, we find that support was tilted to firms in contact-intensive services. As shown in Table 2, being in the hospitality sector (accommodation and restaurant) increased the likelihood of receiving support by 6.3 percent for overall support compared to low-value added manufacturing such as textile, apparel, and leather. This is led by tax measures, and, to a lesser extent, labor and credit measures. Travel-related services also faced a higher likelihood of receiving support for tax and credit measures compared to manufacturing.

Domestically oriented firms, largely in the services sectors, were more likely to receive all types of support compared to SOEs. Export-oriented FDI firms, however, were less likely to receive tax and credit support, a result that is statistically significant. The latter likely reflects the stronger performance of FDI firms during the crisis.

The likelihood of receiving the support package was generally higher for large firms. Overall, large firms were 18.5 percent more likely than micro firms to access government support (Table 2, column 1). The size bias is particularly large for fiscal and credit support measures followed by other policies (Figure 8). This is likely a result of policy design. As noted in Figure 7, smaller firms were more likely to report collateral requirement and cumbersome administrative procedures as key constraints to accessing credit. Similar, tax deferrals, mainly for the corporate

income tax, were designed to *de jure* benefit all firms but in fact only firms that were profitable before the pandemic, which tended to larger (Kroeger et al., 2020), could qualify.<sup>8</sup>



To further investigate possible differences in access to support by firm size, we divide firms into two groups—"small" which includes both micro and small firms and "large" comprising medium and large firms. We also introduce interaction terms of business performance with the firm size dummy in the regressions. As reported in Table 3, the coefficients of the interaction term between the size dummy and sale and employment losses have a significant and negative sign in most instances. Our findings suggest that larger firm have a higher probability of receiving support not only due to their size and the associated lower barriers in accessing policy support, but also the weight placed on their business performance when support was granted. Specifically, a 1 percent decline in the number of employees increases the likelihood of receiving tax support by 0.01 percent for smaller firms and by 0.05 percent (the total effect) for larger firms.

### Effectiveness of Government Support

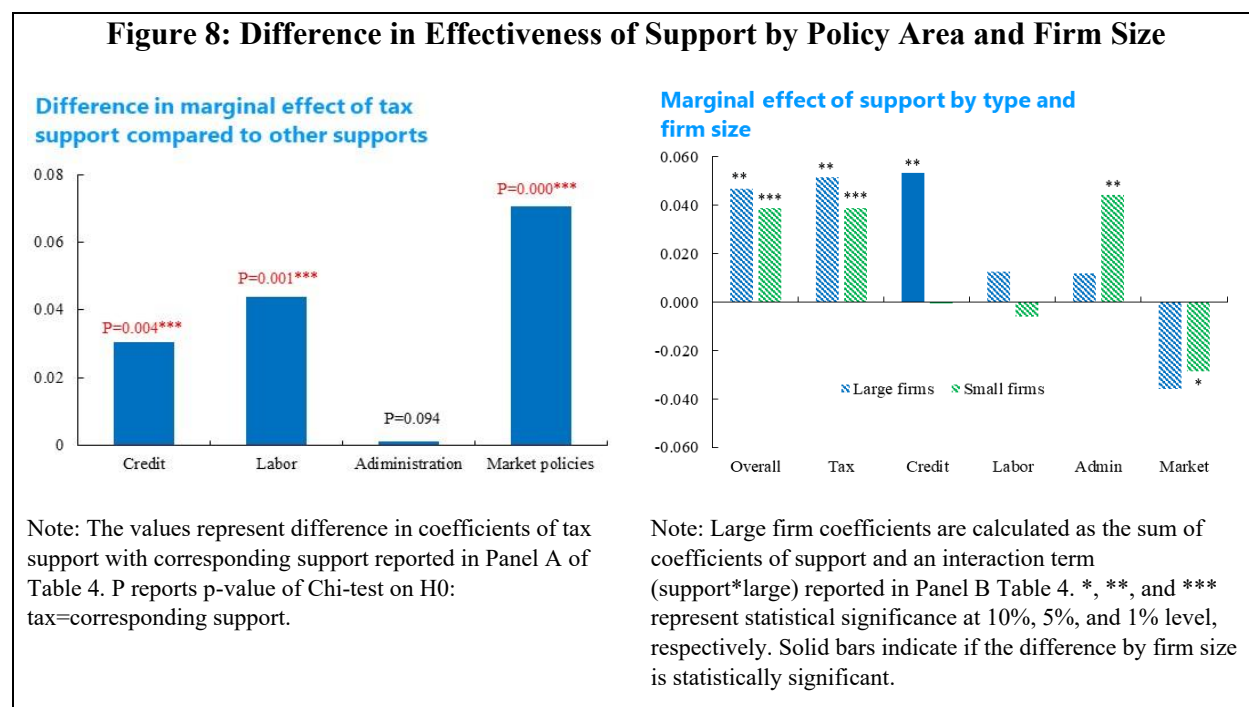
In this section, we test the effectiveness of government support in addressing firms' expectations of remaining in operations using a probit model described in Equation (2). Columns (1, 4, 7) of Table 4 reports the marginal effects of the likelihood of firms staying afloat on account of government support policies for all firms and separately for large and small firms, while other columns introduce firm self-coping strategies as explanatory variables.

<sup>8</sup> Deferrals of corporate income tax were largely conditional on firm profitability, which was found to be low even before the pandemic. Kroeger et. al (2020) found that earnings before tax and interest (EBIT) to total asset ratios were related to firm size, and were 3.24 percent for large firms, 1.76 percent for medium firms, 0.92 percent for small firms and 0 percent for micro firms.

The results reported in Table 4 show that the coefficients on government support and self-coping strategies dummies are positive, statistically significant, and large across all specifications. In particular, adopting self-coping strategies increased the likelihood of a firm remaining operational by 7-9 percent compared to around 4 percent for receiving government support. This suggests that both approaches were broadly effective in reducing pessimism and keeping firms operational, a result that holds for both large and small firms.

We next turn to the heterogeneous impact of different government support measures. Table 5 reports the likelihood of remaining operational across the five policy areas. Our results suggest that tax cuts and deferrals and administrative reforms (lower regulations and logistic costs) had a positive and statistically significant in alleviating liquidity stress (Columns 2, 5) compared to other policies (see also Figure 9, left panel). The statistically insignificant results for labor and social insurance policies is not surprising as the overall size of these measures was small, and criteria for accessing these policies more cumbersome (IMF, 2021). The lack of statistical significance of the credit variable suggests that credit access was a constraint for some firms.

We investigate this by examining heterogeneity by firm size. Specifically, we introduce an interaction term between credit support and the large firm dummy. The results, shown in Panel B of Table 5, suggest that the effectiveness of credit measures in alleviating liquidity constraints depends on firm size, with loan restructuring, interest rate reductions and other such policies benefitting larger firms (see also Figure 9, right panel). Smaller firms, which are either not bankable or face high collateral requirements, had limited access to credit support measures as also shown in the regression estimates in Table 2.



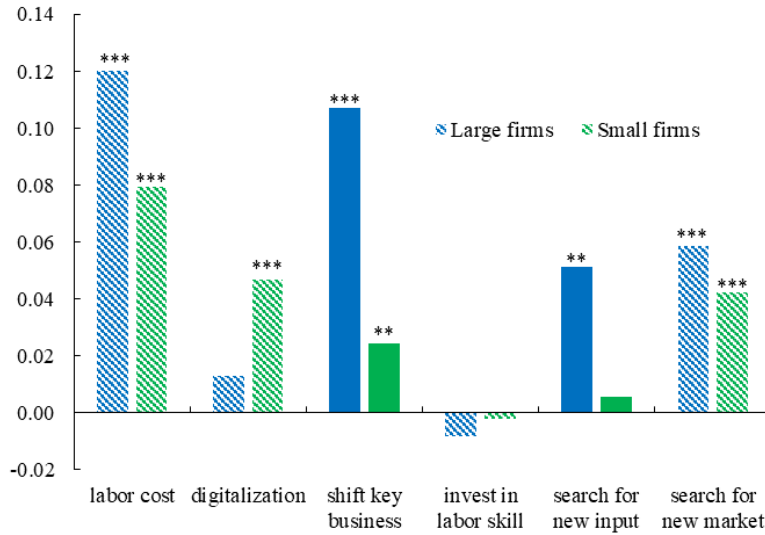
The size bias in credit policies is concerning as smaller firms entered the pandemic with weaker balance sheet conditions than larger firms (Kroeger et al., 2020). Cirera et al. (2021) also show that there is potential mismatch between the demand for and access to support policies across countries, with access to credit the most preferred policy but tax support the main policy offered in low-middle-income countries.

### **Effectiveness of Firm Adjustment Strategies**

In this section we focus on the question that relates to the effectiveness of firms' own adjustments undertaken in response to the pandemic, specifically actions taken to reduce labor costs, develop new products, services or processes, transform their supply chain, and become more digital. Table 6 reports marginal effects of probit regressions that consider the effectiveness of various firm self-coping strategies, controlling for government support. Most self-adjustment measures proved effective in helping firms improve their operating situation. Panel A in Table 6 shows that reducing labor cost, engaging in digitalization, shifting key products lines or searching for new consumption markets helped alleviate liquidity constraints. In contrast, investing in labor skills or sourcing new markets for input goods are not statistically significant. Overall, adjustment along the employment dimension, that is cutting labor costs by laying off workers, reducing salaries, or granting leave without pay, was most effective in alleviating liquidity stress. Firms that reduced labor cost were 8 percent more likely to remain in operations compared to other firms, controlling for firm performance.

We next examine if the effectiveness of different adjustment strategies varied by firm size. Panel B in Table 6 introduces an interaction term for large firms (where large includes firms with 50 or more employees). The results suggest that while both large and small firms coped by reducing labor costs, and investing in digitalization, shifting key product lines and searching for new input sources in the face of supply chain disruptions helped alleviate liquidity strains for larger firms (Figure 10).

**Figure 9: Effectiveness of Coping Strategies by Type (marginal effects)**



Note: Large firm coefficients are calculated as sum of coefficients of coping strategy and an interaction term (strategy\*large) reported in Panel B Table 5. \*, \*\*, and \*\*\* represent statistical significance at 10%, 5%, and 1% level, respectively. Solid bars indicate if the difference by firm size is statistically significant.

### What Firms Engaged in Digitalization?

The crisis has strengthened the case for firms around the world to digitalize, deeper and faster. In this section we focus on the characteristics of firms that used a range of digital solutions as a response to the COVID-19 pandemic in Vietnam.

Table 7 shows the results explaining the likelihood of increasing digitalization. In all the estimations, sales losses are associated with higher investment in digitalization, increasing the likelihood to digitalize by around 2 percentage points (column 1). However, firms that experienced employment losses were less likely to digitalize. Furthermore, investment in digitalization decreases with pre-crisis productivity. This result comes after conditioning on the sector in which the firms operate as well as firm ownership and firm size. Hence, in the same sector, with the same ownership and same size, the less productive firms are more likely to digitalize further. This dynamic may contribute to narrowing productivity gaps as digitalization is likely to foster productivity.

We also find evidence that government policy support helped spur technology adoption (column 2). Firms that received policy support are more likely to digitalize, although the overall effect is small (0.4-08 percent).

We next investigate the nature of digital solutions deployed by exploiting information in the survey on how firms intensified their use of internet services (columns 3-6). Specifically, this includes using digital solutions to: (i) strengthen internal administration and management, (ii) strengthen production, including manufacturing process, supply chain management, and distribution chain management, (iii) improve marketing, and (iv) using e-commerce (sales, after-sale services and payment method).

The results reported in Columns 3-6 of Table 7 suggest that firms that were able to maintain or increase employment had a higher likelihood of using digital solutions to strengthen production and rely on e-commerce, whereas firms with low pre-crisis productivity and firms experiencing larger sales losses in contact-intensive sectors such as hospitality and retail, relied to a greater extent on using digital solutions for marketing purposes.

## **5. Concluding Remarks**

Relying on a novel dataset covering more than 120,000 nationally-representative firms in Vietnam in 2020, this paper contributes to the debate about policies to support businesses through the COVID-19 pandemic, and the effectiveness of adjustment strategies.

The paper's results show that while firms from the most adversely affected sectors, those suffering large employment losses, and more productive firms had a higher likelihood of receiving policy support. However, support was not conditioned on sales losses, suggesting that the more vulnerable, smaller firms had more limited access to policy support, in part, reflecting tight eligibility criteria and cumbersome administrative procedures. Further, while tax cuts and deferrals alleviated liquidity constraints for both small and large firms, credit support was tilted towards larger firms that typically have access to bank credit.

Our paper also sheds lights on the effectiveness of firms' self-coping strategies in helping them stay afloat during the pandemic. Measures to reduce labor costs along the extensive and intensive margins were most effective in helping firms of all types alleviate short-term liquidity constraints, but adjustment also took other forms. Our results also suggest that digitalization could play an important role in closing productivity gaps across firms in the post-pandemic world.

From a policy perspective, our results highlight gaps that need to be addressed to bolster financial inclusion and improve the reach, targeting, and effectiveness of policy support to combat future shocks. After avoiding the liquidity crunch during the temporary halt of the economic activity in 2020, there is a clear need for new policy tools to support corporate solvency (IMF, 2021). Policy makers can design targeted policies supporting resource allocation towards the sectors most in need. Finally, while businesses are increasingly inclined toward adopting digital investments in a post-pandemic world, technological readiness in terms of digital infrastructure and skills will be crucial.



Table 1: Descriptive Statistics by Firm Size, Industry, and Ownership

	Wave 1 (April 2020)		Wave 2 (September 2020)		Both waves	
	Number of firms	Share of sample	Number of firms	Share of sample	Number of firms	Share of sample
<b>Firm size</b>						
Micro	87985	69.5	100,098	69.0	16,198	63.7
Small	27259	21.5	31,372	21.6	6,184	24.3
Medium	7782	6.1	9,111	6.3	2,047	8.1
Large	3539	2.8	4,471	3.1	983	3.9
<b>Industry</b>						
Agriculture & Mining	6028	4.8	3,827	2.6	1,004	4.0
Manufacturing	24416	19.3	26,836	18.5	4,655	18.3
Services	96121	75.9	114,389	78.9	19,753	77.7
<b>Ownership</b>						
Private	117838	93.1	136,885	94.4	23,470	92.4
SOE	3081	2.4	1,156	0.8	713	2.8
FDI	5646	4.5	7,011	4.8	1,229	4.8

Table 2: Marginal Effects of Likelihood of Receiving Support

Support policy	(1) Overall	(2) Tax	(3) Credit	(4) Labor and insurance	(5) Administration	(6) Market policies
<b><i>Business performance</i></b>						
revenue_change	0.000171 (0.00383)	-0.00261 (0.00373)	0.0109*** (0.00253)	0.00240 (0.00203)	0.00703*** (0.00186)	0.00863*** (0.00191)
employee_change	-0.00660 (0.00505)	-0.00976** (0.00490)	-0.0116*** (0.00334)	-0.0202*** (0.00266)	-0.00508** (0.00248)	-0.0125*** (0.00257)
productivity	0.0910* (0.0546)	0.0524 (0.0528)	0.0925*** (0.0306)	-0.0861 (0.0602)	-0.00306 (0.0328)	0.00674 (0.0299)
<b><i>Firm size (base group=micro)</i></b>						
small	0.0645*** (0.00266)	0.0561*** (0.00257)	0.0335*** (0.00178)	0.0128*** (0.00137)	0.00807*** (0.00128)	0.00893*** (0.00129)
medium	0.123*** (0.00508)	0.102*** (0.00490)	0.0702*** (0.00374)	0.0220*** (0.00264)	0.0144*** (0.00240)	0.0201*** (0.00254)
large	0.185*** (0.00822)	0.162*** (0.00804)	0.105*** (0.00655)	0.0289*** (0.00432)	0.0217*** (0.00393)	0.0371*** (0.00447)
<b><i>Ownership (base group=SOEs)</i></b>						
private	0.0321*** (0.01000)	0.0247** (0.00989)	0.0217*** (0.00549)	0.0155*** (0.00446)	0.0107** (0.00443)	0.0126*** (0.00426)
FDI	-0.0251** (0.0105)	-0.0345*** (0.0103)	-0.0145** (0.00567)	-0.00376 (0.00466)	0.00268 (0.00471)	-0.00461 (0.00442)
<b><i>Industry (base group=Textile, Apparel, Leather)</i></b>						
Agriculture and Mining	-0.0299*** (0.00831)	-0.0356*** (0.00799)	-0.00570 (0.00541)	-0.0226*** (0.00461)	-0.0105** (0.00445)	-0.0148*** (0.00454)
Electronics and machinery	-0.00975 (0.00947)	-0.0137 (0.00918)	0.00211 (0.00627)	-0.0149*** (0.00537)	-0.00604 (0.00504)	-0.00477 (0.00538)
Other manufacturing	0.00162 (0.00648)	-0.00115 (0.00631)	0.00641 (0.00415)	-0.00820** (0.00386)	-0.00770** (0.00352)	-0.00357 (0.00368)
Hospitality	0.0630*** (0.00828)	0.0556*** (0.00805)	0.0157*** (0.00532)	0.0340*** (0.00523)	1.72e-05 (0.00435)	-0.00566 (0.00440)
Other services	0.0105* (0.00629)	0.0122** (0.00613)	-0.00367 (0.00398)	-0.0172*** (0.00373)	-0.00981*** (0.00343)	-0.0183*** (0.00354)
Retails	-0.0121* (0.00633)	-0.0136** (0.00616)	-0.00264 (0.00404)	-0.0198*** (0.00376)	-0.0116*** (0.00346)	-0.0136*** (0.00359)
Travel	0.0299*** (0.00719)	0.0276*** (0.00701)	0.0137*** (0.00465)	-0.00778* (0.00416)	-0.00574 (0.00383)	-0.00998** (0.00394)
Observations	145,052	145,052	145,052	145,052	145,050	145,052

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 3: Marginal Effects of Firm Size and Likelihood of Receiving Support  
(with interaction term)

Support policy	(1) Overall	(2) Tax	(3) Credit	(4) Labor and insurance	(5) Administration	(6) Market policies
<b>Business performance</b>						
revenue_change	0.00609 (0.00405)	0.00340 (0.00393)	0.0151*** (0.00270)	0.00549** (0.00214)	0.00786*** (0.00196)	0.0107*** (0.00202)
employee_change	-0.00929* (0.00531)	-0.0115** (0.00515)	-0.0135*** (0.00355)	-0.0199*** (0.00280)	-0.00690*** (0.00261)	-0.0130*** (0.00272)
productivity	0.0942* (0.0551)	0.0564 (0.0532)	0.0903*** (0.0308)	-0.0627 (0.0561)	-0.00280 (0.0327)	0.0106 (0.0286)
<b>Firm size</b>						
large	0.0959*** (0.00421)	0.0788*** (0.00413)	0.0479*** (0.00261)	0.0122*** (0.00232)	0.0123*** (0.00201)	0.0161*** (0.00208)
<b>Business performance*firm size dummy</b>						
revenue_change*large	-0.0226* (0.0123)	-0.0272** (0.0121)	-0.0201*** (0.00756)	-0.0221*** (0.00656)	-0.00424 (0.00593)	-0.0141** (0.00603)
employee_change*large	-0.0342** (0.0170)	-0.0369** (0.0166)	-0.0110 (0.0105)	-0.0131 (0.00876)	0.0101 (0.00826)	-0.00251 (0.00816)
productivity*large	-0.377 (0.564)	-0.530 (0.565)	0.220 (0.310)	-0.970** (0.490)	0.00758 (0.271)	-0.417 (0.356)
<b>Ownership (base group=SOEs)</b>						
private	0.0122 (0.0107)	0.00542 (0.0106)	0.0137** (0.00611)	0.0115** (0.00495)	0.00907** (0.00462)	0.00898* (0.00468)
FDI	-0.0326*** (0.0113)	-0.0428*** (0.0111)	-0.0178*** (0.00633)	-0.00571 (0.00517)	0.00240 (0.00493)	-0.00613 (0.00488)
<b>Industry (base group=Textile, Apparel, Leather)</b>						
Agriculture and Mining	-0.0384*** (0.00857)	-0.0434*** (0.00823)	-0.00962* (0.00570)	-0.0234*** (0.00471)	-0.0121*** (0.00455)	-0.0168*** (0.00466)
Electronics and machinery	-0.0126 (0.00989)	-0.0161* (0.00959)	0.00108 (0.00670)	-0.0143** (0.00559)	-0.00708 (0.00520)	-0.00515 (0.00561)
Other manufacturing	-0.00538 (0.00673)	-0.00745 (0.00654)	0.00321 (0.00442)	-0.00841** (0.00394)	-0.00923** (0.00362)	-0.00511 (0.00380)
Hospitality	0.0464*** (0.00842)	0.0408*** (0.00818)	0.00692 (0.00547)	0.0308*** (0.00524)	-0.00269 (0.00440)	-0.00895** (0.00447)
Other services	-0.000654 (0.00651)	0.00221 (0.00634)	-0.00949** (0.00423)	-0.0187*** (0.00380)	-0.0118*** (0.00352)	-0.0209*** (0.00364)
Retails	-0.0311*** (0.00652)	-0.0304*** (0.00635)	-0.0127*** (0.00426)	-0.0227*** (0.00382)	-0.0145*** (0.00353)	-0.0171*** (0.00368)
Travel	0.0177** (0.00740)	0.0168** (0.00720)	0.00752 (0.00488)	-0.00926** (0.00423)	-0.00787** (0.00391)	-0.0125*** (0.00404)
Observations	145,052	145,052	145,052	145,052	145,050	145,052

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Large firm is a dummy variable taking the value of 1 if the firm has 50 or more employees, and 0 otherwise.

Table 4: Effectiveness of Government Support and Self-coping Strategies (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Improvement in operation status	All firms			Large firms			Small firms		
Revenue_change	0.00498 (0.00899)	0.00933 (0.00899)	0.0103 (0.00898)	-0.0792*** (0.0265)	-0.0781*** (0.0266)	-0.0762*** (0.0265)	0.0163* (0.00955)	0.0212** (0.00955)	0.0220** (0.00955)
Employee_change	0.0416*** (0.00895)	0.0519*** (0.00900)	0.0519*** (0.00899)	-0.00611 (0.0270)	0.00183 (0.0272)	0.00220 (0.0272)	0.0466*** (0.00948)	0.0573*** (0.00953)	0.0573*** (0.00953)
Productivity	0.000603** (0.000242)	0.000590** (0.000241)	0.000594** (0.000241)	-0.000476 (0.00123)	-0.000560 (0.00123)	-0.000520 (0.00123)	0.000659*** (0.000252)	0.000649*** (0.000251)	0.000651*** (0.000252)
Support policy	0.0437*** (0.00782)		0.0401*** (0.00781)	0.0457** (0.0194)		0.0419** (0.0194)	0.0429*** (0.00852)		0.0394*** (0.00851)
Coping strategy		0.0762*** (0.00761)	0.0744*** (0.00762)		0.0699*** (0.0256)	0.0656** (0.0256)		0.0776*** (0.00798)	0.0760*** (0.00798)
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	25,412	25,412	25,412	3,030	3,030	3,030	22,382	22,382	22,382

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Large firms include large and medium firm size, while small firms include small and micro firm size. Fixed effects control for industry, firm size (in columns 1-3), and firm ownership.

Table 5: Effectiveness of Government Support by Policy Area (Marginal Effects)

**Panel A**

Dependent variables	(1)	(2)	(3)	(4)	(5)	(6)
	Improvement in operation status compared to expectation					
Support policy	Overall	Tax	Credit	Labor and insurance	Administration	Market policies
Revenue_change	0.0103 (0.00898)	0.0102 (0.00898)	0.00935 (0.00899)	0.00931 (0.00899)	0.00965 (0.00899)	0.00939 (0.00899)
Employee_change	0.0519*** (0.00899)	0.0520*** (0.00899)	0.0519*** (0.00900)	0.0518*** (0.00900)	0.0521*** (0.00900)	0.0516*** (0.00900)
Productivity	0.000594** (0.000241)	0.000596** (0.000242)	0.000590** (0.000241)	0.000590** (0.000241)	0.000592** (0.000241)	0.000588** (0.000241)
Coping strategy	0.0744*** (0.00762)	0.0744*** (0.00762)	0.0759*** (0.00762)	0.0763*** (0.00761)	0.0756*** (0.00761)	0.0769*** (0.00762)
Support policy	0.0401*** (0.00781)	0.0408*** (0.00800)	0.0101 (0.0120)	-0.00285 (0.0145)	0.0397** (0.0165)	-0.0296* (0.0151)
Fixed effects	Y	Y	Y	Y	Y	Y
Observations	25,412	25,412	25,412	25,412	25,412	25,412

**Panel B**

Dependent variables	(1)	(2)	(3)	(4)	(5)	(6)
	Improvement in operation status compared to expectation					
Support policy	Overall	Tax	Credit	Labor and insurance	Administration	Market policies
Revenue_change	0.0103 (0.00898)	0.0102 (0.00898)	0.00934 (0.00899)	0.00933 (0.00899)	0.00963 (0.00899)	0.00938 (0.00899)
Employee_change	0.0519*** (0.00899)	0.0521*** (0.00899)	0.0519*** (0.00900)	0.0518*** (0.00900)	0.0521*** (0.00900)	0.0516*** (0.00900)
Productivity	0.000594** (0.000241)	0.000596** (0.000242)	0.000590** (0.000241)	0.000590** (0.000241)	0.000591** (0.000241)	0.000588** (0.000241)
Coping strategy	0.0744*** (0.00762)	0.0744*** (0.00762)	0.0759*** (0.00762)	0.0763*** (0.00761)	0.0756*** (0.00761)	0.0769*** (0.00762)
Support policy	0.0389*** (0.00847)	0.0390*** (0.00866)	-0.000293 (0.0134)	-0.00569 (0.0158)	0.0443** (0.0178)	-0.0284* (0.0165)
Large	0.0552*** (0.0191)	0.0551*** (0.0190)	0.0565*** (0.0184)	0.0634*** (0.0181)	0.0654*** (0.0181)	0.0658*** (0.0182)
Support policy*Large	0.00802 (0.0218)	0.0126 (0.0226)	0.0536* (0.0304)	0.0185 (0.0401)	-0.0321 (0.0473)	-0.00742 (0.0419)
Fixed effects	Y	Y	Y	Y	Y	Y
Observations	25,412	25,412	25,412	25,412	25,412	25,412

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Large is a firm size dummy, taking value 1 if a firm is large or medium size, and 0 otherwise. Fixed effects control for industry, firm size (only in Panel A) and firm ownership.

Table 6: Effectiveness of Firm Self-coping Strategies By Type (Marginal Effects)

**Panel A**

Dependent variables	(1)	(2)	(3)	(4)	(5)	(6)
	Improvement in operation status compared to expectation					
Coping strategy	labor_cost	digitalization	key_business	labor_skill	new_input	new_market
Revenue_change	0.0174* (0.00901)	0.00445 (0.00898)	0.00515 (0.00898)	0.00509 (0.00899)	0.00499 (0.00899)	0.00595 (0.00898)
Employee_change	0.0647*** (0.00909)	0.0409*** (0.00895)	0.0425*** (0.00895)	0.0415*** (0.00895)	0.0417*** (0.00895)	0.0431*** (0.00895)
Productivity	0.000661*** (0.000244)	0.000607** (0.000241)	0.000606** (0.000241)	0.000603** (0.000242)	0.000600** (0.000241)	0.000574** (0.000239)
<b>Coping strategy</b>	0.0838*** (0.00654)	0.0427*** (0.00861)	0.0333*** (0.00927)	-0.00304 (0.00792)	0.0124 (0.00875)	0.0443*** (0.00689)
Support policy	0.0442*** (0.00779)	0.0422*** (0.00782)	0.0433*** (0.00781)	0.0439*** (0.00783)	0.0432*** (0.00782)	0.0404*** (0.00783)
Fixed effects	Y	Y	Y	Y	Y	Y
Observations	25,412	25,412	25,412	25,412	25,412	25,412

**Panel B**

Dependent variables	(1)	(2)	(3)	(4)	(5)	(6)
	Improvement in operation status compared to expectation					
Coping strategy	labor_cost	digitalization	key_business	labor_skill	new_input	new_market
Revenue_change	0.0173* (0.00901)	0.00435 (0.00899)	0.00508 (0.00898)	0.00509 (0.00899)	0.00483 (0.00899)	0.00594 (0.00898)
Employee_change	0.0647*** (0.00909)	0.0409*** (0.00895)	0.0424*** (0.00895)	0.0415*** (0.00895)	0.0416*** (0.00895)	0.0431*** (0.00895)
Productivity	0.000661*** (0.000244)	0.000607** (0.000241)	0.000609** (0.000242)	0.000604** (0.000242)	0.000601** (0.000241)	0.000574** (0.000239)
<b>Coping strategy</b>	0.0792*** (0.00691)	0.0469*** (0.00920)	0.0242** (0.00982)	-0.00214 (0.00858)	0.00563 (0.00947)	0.0423*** (0.00732)
Support policy	0.0437*** (0.00779)	0.0423*** (0.00782)	0.0433*** (0.00781)	0.0439*** (0.00783)	0.0433*** (0.00782)	0.0404*** (0.00783)
Large	0.0273 (0.0217)	0.0682*** (0.0186)	0.0530*** (0.0184)	0.0649*** (0.0190)	0.0511*** (0.0189)	0.0543*** (0.0197)
<b>Coping strategy*Large</b>	0.0410** (0.0198)	-0.0338 (0.0261)	0.0831*** (0.0300)	-0.00602 (0.0221)	0.0455* (0.0243)	0.0163 (0.0202)
Fixed effects	Y	Y	Y	Y	Y	Y
Observations	25,412	25,412	25,412	25,412	25,412	25,412

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. *Large* is a firm size dummy, taking value 1 if a firm is large or medium size, and 0 otherwise. *Labor\_cost*, *digitalization*, *key\_business*, *labor\_skill*, *new\_input*, and *new\_market* refer to coping strategies of cutting labor cost, engaging in digitalization, shifting key products/services, investing in labor skill, searching for new market for inputs, and searching for new consumption market, respectively. Fixed effects control for industry, firm size (only in panel A), and firm ownership.

Table 7: Likelihood of Adopting Digitalization (marginal effects)

	(1)	(2)	(3)	(4)	(5)	(6)
	Digitalization	Digitalization	Administration	Production	Marketing	E-commerce
<b>Business performance</b>						
revenue_change	-0.0181*** (0.00351)	-0.0181*** (0.00351)	0.00147 (0.00148)	-0.000685 (0.00109)	-0.0113*** (0.00208)	-0.00271 (0.00223)
employee_change	0.0115** (0.00454)	0.0116** (0.00454)	0.000381 (0.00196)	0.00482*** (0.00140)	0.000654 (0.00265)	0.00625** (0.00288)
productivity	-0.125* (0.0735)	-0.125* (0.0733)	0.0246 (0.0167)	0.00615 (0.0135)	-0.402*** (0.0867)	-0.0294 (0.0424)
receiving support		0.00853*** (0.00238)	0.00420*** (0.000985)	-0.000345 (0.000751)	0.00613*** (0.00138)	-0.00118 (0.00153)
<b>Firm size (base group=micro)</b>						
small	0.0112*** (0.00236)	0.0106*** (0.00236)	0.00621*** (0.00103)	0.00242*** (0.000753)	-0.00419*** (0.00135)	0.00601*** (0.00152)
medium	0.0256*** (0.00428)	0.0244*** (0.00428)	0.0130*** (0.00201)	0.00300** (0.00133)	-2.34e-05 (0.00245)	0.00889*** (0.00278)
large	0.0492*** (0.00680)	0.0474*** (0.00678)	0.0266*** (0.00365)	0.00694*** (0.00221)	-0.00295 (0.00359)	0.0167*** (0.00450)
<b>Ownership (base group=SOEs)</b>						
private	0.00319 (0.0106)	0.00280 (0.0106)	-0.0158*** (0.00535)	0.00537** (0.00225)	0.0139** (0.00572)	0.00788 (0.00628)
FDI	-0.00641 (0.0111)	-0.00626 (0.0111)	-0.0150*** (0.00550)	0.00253 (0.00241)	0.0139** (0.00620)	-0.00284 (0.00659)
<b>Industry (base group=Textile, Apparel, Leather)</b>						
Agriculture and Mining	-0.0113 (0.00720)	-0.0111 (0.00721)	-0.00111 (0.00287)	0.00378 (0.00304)	-0.0181*** (0.00377)	0.00364 (0.00443)
Electronics and machinery	0.0388*** (0.00895)	0.0389*** (0.00895)	0.00302 (0.00331)	0.00892** (0.00375)	0.00730 (0.00519)	0.0173*** (0.00557)
Other manufacturing	0.0152*** (0.00561)	0.0152*** (0.00561)	0.00175 (0.00217)	0.00290 (0.00219)	0.00130 (0.00330)	0.0105*** (0.00335)
Hospitality	0.0271*** (0.00695)	0.0265*** (0.00695)	-0.00344 (0.00257)	-0.00914*** (0.00231)	0.0271*** (0.00440)	0.00735* (0.00410)
Other services	0.0150*** (0.00540)	0.0149*** (0.00540)	0.0107*** (0.00214)	-0.00732*** (0.00206)	0.00530* (0.00319)	0.00186 (0.00317)
Retails	0.0500*** (0.00550)	0.0501*** (0.00551)	0.00313 (0.00213)	-0.00401* (0.00209)	0.0161*** (0.00326)	0.0337*** (0.00331)
Travel	0.0105* (0.00610)	0.0103* (0.00610)	0.00769*** (0.00253)	-0.00695*** (0.00222)	0.00618* (0.00362)	-0.000581 (0.00355)
Observations	145,052	145,052	145,052	145,052	145,052	145,052

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

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