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The effects of COVID-19 on employment, labor markets, and gender equality in Central America

Abstract

This study considers the economic impact of coronavirus disease 2019 (COVID-19) on commercial enterprises in four Central American countries – El Salvador, Guatemala, Honduras, and Nicaragua. At the time of analysis, neither the pandemic nor its economic consequences had fully run their course. It is not, therefore, a definitive analysis, but it is important to try to draw important lessons as soon as possible. The main focus of the study was the initial impact on labor markets. The analysis was based on World Bank Enterprise Surveys undertaken before the outbreak of COVID-19 and follow-up surveys on the effects of the pandemic, also undertaken by the World Bank (*Source*: Enterprise Surveys, The World Bank, http://www.enterprisesurveys.org). These were combined with data on both government containment measures and rates of morbidity and mortality. The use of enterprise data to analyze labor market issues has some limitations but also many strengths. The data are useful for analyzing the consequences for gender equality in employment. Since the demand for labor is a derived demand, firm-level data provide a clear link to labor market effects. The pandemic has caused a significant loss in sales for many firms. This has created a loss of liquidity, which, in turn, has caused some firms to reduce employment, working hours, and wages. Government containment measures necessary to save lives, such as temporary workplace closures, have added to the burden for both firms and employees. The study starts by using the surveys to identify the important stylized facts. Although some issues are already well documented anecdotally through media reports, this method provides a more evidence-based approach. It also helps identify several issues, such as the impact on gender equality, which has received less journalistic attention. The study is further supported by a regression analysis (ordinary least squares and seemingly unrelated regression equations models) of several key outcomes (changes in sales, employment, the share of females in employment, and expectations of firm survival). A limitation of such an analysis at any enterprise level is heterogeneity and, consequently, a risk of sample selection bias. To provide robustness checks, we use a matching approach. The results suggest that a significant proportion of surviving firms are vulnerable to permanent closure. The ability of firms to retain labor depends on sales, which are affected by both the pandemic itself and the government containment measures. Only a small proportion of firms have received government support, and

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there is evidence that it could help both firm survival and the retention of labor. There is some doubt whether the four countries have the institutional capacity to provide effective support. If such doubts prove well founded, then support may need to be externally driven.

1 Introduction

The coronavirus disease 2019 (COVID-19) pandemic has not yet fully played out in the four Central American countries covered in this study (El Salvador, Guatemala, Honduras, and Nicaragua), as in other parts of the world. Nor have the full economic consequences yet become clear. This means that there is an important opportunity to learn lessons from the earlier stages of the pandemic. There is plenty of anecdotal evidence from media reports and some evidence from macroeconomic data on the gross domestic product (GDP) and unemployment and the like, but little more. To date, there are few evidence-based, scientific studies of the effects on firms.

At the time of writing, these four countries did not include any country with a very high number of deaths from COVID-19 (in relation to population), experienced by some South American countries. Neither do any of the four countries have unusually low mortality rates. They can be seen as fairly typical of small developing countries in this respect.

This study relates most closely to the still relatively small but growing literature that looks at the economic effects of COVID-19 by studying the impact on firms. It focuses on the impact on labor and, as such, overlaps with studies that are based on labor rather than firm data. The key direction of this paper is to use firm-level data to analyze how the pandemic has resulted in changes in labor demand and to track their consequences. In this respect, it differs from the limited existing literature, which focuses on the impact either on firms or directly on labor. Its original contribution is to the very small number of studies that empirically examine the impact of COVID-19 on labor as a consequence of the impact on firms in the first instance.

A consequence of this approach is that the study overlaps and contributes to the small number of studies that consider the differential impacts of COVID-19 – for instance, by firm size, by sector, and by gender. It finds important differences in the impact for smaller firms, different sectors, and, related to the unequal effects by sector, to females.

A few studies have considered the efficacy of government support to firms. This paper offers some further evidence on this issue and, in particular, examines whether the institutional capacity for effective support can be taken for granted. As such, it contributes to the growing literature on policy and governance aspects.

This study uses World Bank Enterprise Surveys (http://www.enterprisesurveys.org) undertaken before the outbreak of COVID-19 and two follow-up enterprise surveys on the effects of the pandemic, also conducted by the World Bank for each country. These were combined with data on government containment measures and on morbidity and mortality rates. The focus of this study is on the impact on labor markets. There are some weaknesses in using firm-level data to capture labor market effects. For example, the data capture well the impact on gender equality in labor markets but are not well suited to capture the impact on other forms of inequality. However, there are also considerable advantages in using enterprise data. The demand for labor is a derived demand. With the arrival of COVID-19, some firms experienced a substantial loss of sales. This created a loss of liquidity, which meant that some were unable to sustain earlier levels of employment. The enterprise data allow us to understand this process better. It also allows us to better understand that the impact on labor is not just that on employment. Cuts in wages and hours of work, for instance, were introduced by some firms. Temporary firm closures resulted in a substantial economic cost. Gender equality was also affected.

The analysis presented in this study starts with a presentation of the stylized facts emerging from the World Bank surveys of enterprises. This is much longer than would be normal because the stylized facts of the effects of the pandemic on firms in Central America (or elsewhere) are still emerging. A number of important points serve to provide a basis for anecdotal evidence from media reports, but there are also many issues that have not been so well covered by the press. The effects on gender equality in employment, the prevalence of wage cuts, and the impact on enterprise debt are all issues that have received less media focus. For these reasons, more attention than usual has been devoted to the stylized effects.

The study also undertakes an econometric analysis. Some of this confirms the utility of looking at labor demand as a derived demand – that the consequence of reduced demand for products or services is a reduced demand for labor. This, in turn, not only leads firms to reduce employment but also to, for instance, reduce hours of work. Government containment measures to save lives, including temporary workplace closures, have often had a statistically significant effect on sales and, both directly and indirectly, on labor.

2　Review of Literature

The COVID-19 pandemic outbreak led to an unprecedented disruption in most industry sectors (Donthu and Gustafsson, 2020). Studies examining the economic impact of the pandemic unanimously agree that small businesses were adversely affected (World Trade Organization [WTO], 2020). Small firms were in particular heavily affected due to their financial fragility and limited access to commercial financing (Bartik et al., 2020). A host of studies document the negative impact on small firms in terms of revenue loss, production and employment, business closures, layoffs, liquidity, and gender inequality (see, e.g., Dai et al., 2020; Apedo-Amah et al., 2020; Bartik et al., 2020; Humphries et al., 2020; Adams-Prassl et al., 2020; Borland and Charlton, 2020; Fairlie, 2020a,b; Cirera et al., 2021; Bachas et al., 2021; Webster et al., 2021; Khamis et al., 2021).

Studies that examine the labor market impact of COVID report a negative impact of the pandemic on production and employment. For example, Apedo-Amah et al. (2020) find that firm sales declined by >70% during the first wave and that employment was negatively affected, especially for micro and small businesses (those with <20 employees). Bloom et al. (2019) find that smaller firms reported the largest sales drops compared to the larger online firms. In the context of owners, the authors find female and black owners reported significantly larger drops in sales. Studies analyzing the employment effects find that the less-educated, younger, and female workforce has been particularly adversely affected (see Bureau of Labor Statistics, 2020; Costa Dias et al., 2020; Borland and Charlton, 2020). Alon et al. (2020, 2021) find that unemployment or firm inactivity may result in labor market scarring, with an adverse impact on female labor market participation and career progression, as well as knock-on effects in pay and pensions.

There is growing literature on the impact by regions and countries, which reports that larger firms experienced smaller revenue losses than smaller firms. For example, Bachas et al. (2021) examine the impact on formal firms in Honduras and find that sectors that were subject to stricter containment measures experienced higher revenue losses. Neilson et al. (2021) examine the impact on employment in Latin America and report large negative impacts for

small and informal firms because smaller firms may face greater challenges in receiving government aid due to difficulties in accessing, processing, and distilling the available information, or due to the time and effort required to apply to support programs.

Governments have designed various measures to support businesses in addressing the negative impact of the COVID-19 shock. Specific measures, such as tax deferrals, direct cash transfers, or interest-free loans, have been announced to provide temporary liquidity support. Other measures include government-guaranteed bank loans and equity-like injections, and these are aimed to address the problem of insolvency of smaller firms. A growing body of literature has examined the effectiveness of government policies and the choice of different policy instruments used to support businesses in addressing the impact of COVID-19 (see Cui et al., 2020; Chen et al., 2020; Granja et al., 2020; Chetty et al., 2020; Alberola et al., 2021; Furceri et al., 2021; Osada et al., 2021). In a recent note, the International Monetary Fund (IMF; 2021) suggests that combining job retention and worker reallocation support schemes can mitigate the negative and unequal employment impacts of the pandemic, although this is country specific.

Studies that explore the implications of government financial support for affected firms comment on how the pandemic has affected the liquidity of firms (see Banerjee et al., 2020; Bircan et al., 2020; Schivardi and Romano, 2020; De Vito and Gomez, 2020; Nicholas et al., 2021). For our study, the most relevant work is by Cirera et al. (2021), which uses World Bank Enterprise Surveys to assess the effectiveness of various policies in developing countries and how these measures supported businesses in addressing the negative impact of COVID. This study finds that smaller firms, especially those owned by women in sectors such as hospitality, had limited access to support measures and experienced the largest decline in sales. An interesting finding is that firms in low-income countries are more likely to lose from mistargeting of support schemes. An explanation for mistargeting is linked with weak governance and implementation capacity of these countries. Studies focusing on the quality of governance in the COVID-19 context find evidence that better governance has been associated with stronger national resilience to the pandemic (Chien and Li, 2020, pp. 9; Baris and Pelizzo, 2020, pp. 218). Others also report a negative association between the COVID-19 mortality rate and effectiveness of government schemes (Serikbayeva et al., 2020). Frey et al. (2020) contend that democracies have mounted more effective responses to control the spread of COVID-19.

Other country-specific studies that examine the effectiveness of government support programs in China, Italy, Portugal, and the United States present mixed results (see Cororaton and Rosen, 2020; Granja et al., 2020; De Marco, 2020; Cui et al., 2020; Kozeniauskas et al., 2020). For example, Cui et al. (2020) and Chen et al. (2020) find that governmental policies in China, which include payroll tax mitigation and deferral of social insurance contributions, supported firms to mitigate the negative effects of the pandemic. Others, however, find that financial support policies by the government in the United States were not as effective (Granja et al., 2020; Chetty et al., 2020).

The debate on the choice of policy instruments used by governments to address the supply-side shocks, which in turn influenced aggregate demand and output, is still evolving. Guerrieri et al. (2020) suggest that monetary policy instruments are more effective compared to standard fiscal stimulus since monetary measures directly address the short-term liquidity constraints of firms. Chetty et al. (2020), however, find that traditional macroeconomic tools

that aimed to stimulate aggregate demand and provide liquidity to businesses may have diminished the capacity of firms to restore employment due to the health concerns of the pandemic.

3 Overview of Combined Enterprise Survey Database and Stylized Facts

As with many research studies, this section both details data sources and provides a descriptive summary of the data. At one level, the stylized facts of the impact of the pandemic are familiar from extensive media reporting, but, to date, little systematic evidence has been available. The media reports newsworthy stories, which are not necessarily typical. More systematic analysis is needed to assess whether these give a reliable picture. This section includes a much-extended summary of the data in order to provide a set of stylized facts about the impact of COVID-19 on enterprises from Central America, facts that are based on systematic survey evidence provided by World Bank Enterprise Surveys.

Since the focus of the paper is on employment, labor markets, and gender equality, the summary of the data starts with employment (Section 3.2 on "Employment") and then other labor market effects (Section 3.3: "Other impacts on labor"). Gender differences are covered within these sections. The demand for labor is a derived demand. The pandemic has an impact on enterprises, which results in changes in their demand for labor. One advantage of using enterprise data is that this link can be analyzed. Section 3.4 on "Enterprise survivability" considers the extent to which COVID-19 has affected the ability of remaining firms to survive, and Section 3.5 ("Government support") probes the extent to which government support has been provided. Another feature that has threatened the ability of some firms to survive is the loss of sales, resulting in a loss of liquidity. Section 3.6 on "Liquidity and credit" examines the losses of sales and liquidity and considers the extent to which firms have been able to access credit to survive. Finally, Section 3.7 – "Key obstacles to business" – considers the main obstacles to business reported by firms in the enterprise surveys conducted before the onset of the pandemic. This section provides a link between the enterprise surveys and the analysis of institutional capacity provided in Section 7 of this study.

3.1 Sources and composition

The database combined the data obtained from several sources. Firstly, World Bank Enterprise Surveys conducted before the pandemic – El Salvador (2016), Guatemala (2017), Honduras (2016), and Nicaragua (2016) – were combined with two follow-up COVID-19 surveys for the same sample of firms as the enterprise surveys. Round 1 of the COVID-19 follow-up surveys was conducted in June and July 2020 and Round 2 from November 2020 to early January 2021. For each country, data from two further sources at the country level (but varying on a daily basis) were added to the combined survey data for each country.

The first of these were data on the strength of government measures to contain the pandemic, taken from the containment and health index and its component indexes produced by the Blavatnik School of Government, Oxford *COVID-19 Government Response Tracker | Blavatnik School of Government (ox.ac.uk)* The second were morbidity and mortality data for the COVID-19 pandemic obtained from *Coronavirus Pandemic (COVID-19) – Statistics*

and Research – Our World in Data Both sets of data are at the country level at daily intervals. Although they do not, of course, vary by firm, they are capable of significant variation over time. For each enterprise, they were matched with the precise dates of their Round 1 and Round 2 COVID-19 follow-up interviews. The final step was to combine the resulting data files for each country into a single "regional" file.

The sample of enterprises responding to the original enterprise survey comprised a total of 1,427 firms (excluding those who reported no sales or employees). Of these, 808 responded to the Round 1 COVID-19 follow-up survey, and 827 responded to the Round 2 survey. Further information on the World Bank Enterprise Surveys and the follow-up COVID surveys can be found here: *Enterprise Surveys Indicators Data – World Bank Group.*

3.2 **Employment**

Table 1 reports the changes in employment for the sample of enterprises (compared to December 2019).

Unsurprisingly, there is a substantial reduction in employment reported by firms in both the Round 1 and Round 2 surveys. Losses in female employment are almost invariably higher than for overall employment at the time of the Round 1 surveys and higher for all countries other than El Salvador at the time of Round 2. In El Salvador, small firms have suffered greater

Table 1 Change in employment by country, firm size, and gender: full-time permanent employees compared to December 2019

	COVID follow-up: Round 1		COVID follow-up: Round 2	
	All (%)	**Female (%)**	**All (%)**	**Female (%)**
El Salvador	**−8.9**	**−9.1**	**−11.6**	**−7.0**
Small	−11.9	−15.5	−48.4	−46.3
Medium	−3.3	−12.6	−10.9	−14.7
Large	−9.8	−7.8	−7.6	−3.1
Guatemala	**−15.7**	**−25.6**	**−9.0**	**−16.7**
Small	−22.7	−36.9	6.6	11.1
Medium	−30.9	−55.4	−31.0	−64.0
Large	−10.7	−16.0	−4.2	−8.6
Honduras	**−21.9**	**−30.2**	**−15.2**	**−17.2**
Small	−28.7	−25.8	−17.0	−7.5
Medium	−24.1	−34.4	−18.5	−19.4
Large	−18.5	−28.3	−12.1	−16.6
Nicaragua	**−8.8**	**−9.2**	**−11.9**	**−23.0**
Small	−10.6	−39.9	−9.3	6.8
Medium	−15.9	−16.2	−17.0	−41.9
Large	−6.2	−6.2	−10.8	−21.1
Full sample	**−11.7**	**−14.3**	**−11.5**	**−12.8**

Notes: *COVID follow-up Survey 1 (June–July 2020); follow-up Survey 2 (November 2020–January 2021).

COVID, coronavirus disease.

losses in employment than larger ones, but in all the other three countries, employment in medium-sized firms has been hit the hardest.

Table 2 reports a similar analysis but by sector and gender.

These data show a huge loss of employment for the hospitality sector at the time of the Round 1 survey, with an overall reduction of 41% overall and an almost complete loss of female employment. By Round 2, these employment reductions were high (26% overall and 30% of females) but less extreme. Other sectors experienced a much greater loss of employment by Round 2: fabricated metal products (which also reported large reductions in employment in Round 1) reported an overall reduction of 20% but 96% of females; nonmetallic mineral products reported a loss of 46% overall but 93.5% of females. A number of sectors reported increases in employment compared to the rate before the pandemic – at Round 2, these included textiles, chemicals, plastics and rubber, and electronics. Media reports have suggested that the effect

Table 2   Change in employment by sector and gender: full-time permanent employees compared to December 2019

	COVID follow-up: Round 1		COVID follow-up: Round 2	
	All (%)	**Female (%)**	**All (%)**	**Female (%)**
Food	−12.1	−11.0	−9.8	−22.8
Tobacco	−5.0	−10.2	7.6	−4.8
Textiles	−12.8	−15.3	6.6	6.0
Garments	−20.4	−25.2	−10.3	−26.2
Leather	−15.7	−16.7	−4.0	−15.1
Wood	−14.0	−12.0	−10.8	−30.0
Paper	−1.9	−51.1	−2.8	−22.4
Publishing, printing	−16.3	−24.4	−24.8	−16.6
Chemicals	3.0	6.2	2.1	4.7
Plastics and rubber	2.8	2.4	8.5	6.1
Nonmetallic mineral products	−8.6	−28.6	−46.4	−93.5
Fabricated metal products	−39.3	−60.3	−20.0	−95.7
Machinery and equipment	−12.3	0.0	−21.0	−16.7
Electronics	0.0	0.0	23.7	19.1
Transport machinery	−18.0	0.0	−15.4	−8.0
Furniture	−20.6	−24.0	−18.5	−14.3
Construction	−18.6	−17.0	−24.8	10.7
Servicing of motor vehicles	−15.9	−24.0	−23.4	−5.7
Wholesale	−0.5	−14.5	−22.0	−13.0
Retail	−15.6	−17.0	−21.8	−52.2
Hotels, restaurants etc.	−41.0	−94.2	−26.0	−30.2
Transport services	−9.4	−16.8	−7.7	−25.0
IT services	−15.4	−17.8	−26.2	−20.5
All sectors	**−11.7**	**−14.3**	**−11.5**	**−12.8**

Notes: *COVID follow-up Survey Round 1 (June–July 2020); follow-up Survey Round 2 (November 2020–January 2021).

COVID, coronavirus disease; IT, information technology.

of COVID-19 on firms is much more sector specific than would be typical for a more normal economic downturn. These data confirm this insight.

There are two important points with respect to the interpretation of Tables 1 and 2. Firstly, the data report changes in full-time permanent employment. Similar data were not collected for temporary, part-time, or casual labor. It is impossible to know, but one might expect job security to be weaker for these groups and, if so, for these data to underreport the full effect on employment.

A second key point is that the data only include those firms that survived long enough to report some employment at the time of the two follow-up COVID surveys. These surveys did ask firms who participated in the earlier enterprise survey whether they had permanently closed as a result of COVID-19. Very few (25 firms) responded accordingly, but only 827 firms (58% of the original enterprise sample) completed the Round 2 follow-up survey. Some of the approximately 600 "missing" firms may have chosen to not cooperate, some may have permanently closed as a result of circumstances unrelated to COVID-19, but it is likely that there were a number of firms that permanently closed as a result of COVID-19 and could not be contacted. The loss of employment from these permanent closures is not included.

Overall, the changes in full-time permanent employment for surviving firms since December 2019 would have been sufficient to generate serious concern had events been the result of a typical recession. That they are likely to understate the true picture shows that employment (including the impact on gender equality) is an important feature of the economic consequences of the pandemic for Central America.

The surveys allowed us to clearly identify the implications for gender equality in employment. The use of enterprise data to analyze the impact of COVID-19 has many advantages, but they do not otherwise identify many key characteristics of employees, which would allow a wider discussion of the impact on equality. The original enterprise surveys (but not the COVID-19 follow-ups) did contain information on skill categories and the proportion of workers at certain education levels. We calculated the "implied" effect on different categories of employees by, for instance, each firm, assuming that they employed workers in the same proportion at the time of the COVID-19 follow-up surveys. That is, firms that employed a high proportion of skilled production or university-educated workers were assumed to have continued to do so. The results are presented in Table A1. In general, they suggest that the least-skilled and least-educated workers faced marginally smaller reductions in employment than others.

3.3 Other impacts on labor

As discussed earlier, the survey does not provide sufficient evidence to analyze permanent firm closures. In any case, the main impact of such closures would be on employment and not on other labor aspects. Temporary workplace closures are different because any loss of labor time is, by definition, not permanent. They do, however, impose substantial costs, which must be borne by one or more of employees, firms, or the government. Table 3 provides information on temporary closures and the implied loss of labor time (the number of weeks the firm was closed multiplied by the number of its full-time permanent employees). All of the four sample countries recorded workplace closures at the time of the first COVID-19 survey, but only El Salvador and Guatemala reported such closures at the time of the second survey.

At the time of the first COVID-19 survey, firms for all four countries reported an average temporary closure of just >5 weeks, implying an overall loss of just >322,000 labor weeks for the sample. Average firm closures were lowest for Nicaragua (1.7 weeks) and highest for Honduras (7.8 weeks), although the total number of lost labor weeks was the highest for El Salvador. The longest average temporary closures were recorded for the textiles and garment sectors (an average of just >8 weeks in both cases) and the lowest was for the food industry (just <2 weeks). For each country, temporary closures were, on average, the longest for small firms and the shortest mainly were for large ones.

At the time of the second survey, there were no recorded workplace closures for Honduras or Nicaragua, so the data in Table 3 are for El Salvador and Guatemala only. Across both these countries, an average of further temporary closures of 2.9 weeks was reported, with an implied loss of just <159,000 labor weeks. For El Salvador, further closures by the second COVID-19 survey were longer for large firms, and for Guatemala, the longest closures were for medium-sized firms. There were no reported further temporary closures for three sectors – wood, nonmetallic mineral products, and electronics. The highest reported temporary closure was for information technology (IT) services, but this may reflect the scope for remote working in that sector. Garments and construction were subject to the next highest average periods of closure (5.7 weeks and 4.8 weeks, respectively).

Table 4 provides details of furloughs, expressed as a percentage of full-time permanent employees, for both all employees and females. Again, all four countries reported furloughs in the first COVID-19 survey, but neither Honduras nor Nicaragua did in the second survey.

At the first COVID-19 survey, the proportion of females furloughed was lower in the sample (17%) than for all employees (21%). The highest proportion of furloughs (for all employees) was recorded for Guatemala (just <30%) and the lowest for Nicaragua (just <11%). With the exception of Guatemala, furloughs were more prevalent in small firms. For females, the highest proportion furloughed was again in Guatemala (21%) and the lowest in Nicaragua (10%). At the time of the first survey, there was considerable variation in the proportion of both all workers and females subject to furloughs. For all employees, the highest furlough rates were for textiles, garments, and hospitality and, for females, in the garments and hospitality industries.

At the second COVID-19 survey, furloughs were only recorded for El Salvador and Guatemala. El Salvador exhibited a higher proportion of female furloughs (11.7%) than for all employees (10.3%). For Guatemala, the proportion of females was very slightly lower than for all employees (5.4% against 5.5%). For the two countries combined, the proportion of additional furloughs at the Round 2 survey was higher for females than for all employees (8.8% compared to 8.4%). Sectors with high rates of furloughs at Round 2 included tobacco, machinery, and hospitality. For each of these, the proportion of females furloughed was significantly higher than for all employees.

Table 5 provides details on the proportion of firms that cut either wages or hours of work, or both.

Overall, about 26% of firms reduced the salaries or wages of their employees, and almost a third (32.4%) reduced the hours of work. Cuts in wages were most prevalent in Guatemala and least common in Nicaragua. Reductions in working hours were most prevalent in Honduras and least used in Guatemala. Wage cuts were most prevalent in some manufacturing sectors (transport, machinery, nonmetallic mineral products, and garments) and in construction.

Table 3 Total weeks of temporary firm closures*

	Round 1 COVID-19 survey		Round 2 COVID-19 survey	
	Average	**Labor weeks**	**Average**	**Labor weeks**
	Weeks closed	**Lost****	**Weeks closed**	**Lost****
A. By country and firm size				
El Salvador	**6.32**	**213598**	**2.89**	**102291**
Small	7.23	20048	2.63	36601
Medium	5.22	24614	2.74	49116
Large	5.33	168936	3.57	16574
Guatemala	**4.18**	**47756**	**2.92**	**55205**
Small	5.03	4639	2.73	32310
Medium	3.78	13751	3.13	17205
Large	3.41	29366	3.04	5690
Honduras	**7.81**	**46655**		
Small	9.31	7582		
Medium	6.91	17548		
Large	4.63	21525		
Nicaragua	**1.68**	**14350**		
Small	2.74	1723		
Medium	1.05	2491		
Large	0.83	10136		
B. By sector*				
Food	1.99	8091	3.64	26547
Tobacco	2.83	20696	3.69	25415
Textiles	8.33	34020	2.70	29913
Garments	8.13	102594	5.71	136
Leather	6.00	1315	3.80	671
Wood	4.13	290	0.00	0
Paper	3.80	665	2.50	3990
Publishing, printing	5.61	3603	1.47	2073
Chemicals	2.10	2895	3.60	652
Plastics and rubber	3.44	4770	2.65	2303
Non-metallic mineral products	5.44	6872	0.00	0
Fabricated metal products	7.47	6606	2.17	5705
Machinery and equipment	6.00	4893	1.14	1544
Electronics	6.00	18570	0.00	0
Transport machinery	7.20	1200	3.20	32
Furniture	9.60	11977	2.25	20465
Construction	6.66	8858	4.80	3449
Servicing of motor vehicles	4.34	10179	2.22	4879
Wholesale	3.55	20696	2.60	4750
Retail	5.41	40703	2.69	12239
Hotels, restaurants etc.	6.22	7942	3.06	1621
Transport services	2.85	3576	2.62	1672
IT services	7.60	1348	9.33	10940
Full sample	5.08	322359	2.89	158996

Notes: *El Salvador and Guatemala only at the second COVID survey (November 2020–January 2021).

**Total weeks of full-time permanent employees.

COVID, coronavirus disease; IT, information technology.

Table 4   Workers furloughed as a % of full-time permanent employees*

	Round 1 COVID-19 survey		Round 2 COVID-19 survey	
	All (%)	**Female (%)**	**All (%)**	**Female (%)**
A. By country and firm size				
El Salvador	20.2	18.2	10.3	11.7
Small	26.9	23.4	6.9	7.4
Medium	11.3	9.1	16.1	15.8
Large	14.7	17.8	9.6	13.7
Guatemala	29.9	21.1	5.5	5.4
Small	27.2	25.9	6.9	8.9
Medium	22.4	17.8	2.6	2.2
Large	42.4	18.1	7.0	4.3
Honduras	24.4	19.9		
Small	25.9	20.4		
Medium	24.0	21.8		
Large	19.9	13.0		
Nicaragua	10.9	10.3		
Small	14.9	16.0		
Medium	9.3	8.1		
Large	4.9	3.2		
B. By sector*				
Food	12.2	10.1	4.6	5.1
Tobacco	9.5	9.5	47.6	56.5
Textiles	50.5	12.1	3.6	3.1
Garments	36.8	41.6	0.9	14.9
Leather	19.0	20.0	0.5	0.0
Wood	16.8	8.3	1.2	2.9
Paper	20.0	25.0	21.5	33.9
Publishing, printing	22.2	17.7	5.5	8.5
Chemicals	0.9	0.0	0.3	0.3
Plastics and rubber	13.6	16.2	5.6	2.9
Non-metallic mineral products	33.1	29.5	0.0	0.0
Fabricated metal products	29.6	14.7	9.2	7.6
Machinery and equipment	15.5	15.4	42.9	51.2
Electronics	0.0	0.0	0.0	0.0
Transport machinery	27.3	20.0	0.3	0.5
Furniture	35.9	24.2	7.0	5.9
Construction	24.0	20.3	21.3	20.7
Servicing of motor vehicles	16.1	16.7	16.1	11.4
Wholesale	11.9	11.1	2.2	0.4
Retail	16.4	14.3	5.8	7.0
Hotels, restaurants etc.	37.6	37.4	30.2	52.3
Transport services	13.4	10.4	6.2	8.0
IT services	18.3	22.1	1.6	0.0
Full sample	20.9	17.3	8.4	8.8

Notes: *****El Salvador and Guatemala only at the second COVID survey (November 2020–January 2021).

COVID, coronavirus disease; IT, information technology.

Table 5　Proportion of responding firms who cut wages or hours for at least some workers

	Wages (%)	Hours (%)
A. By country and firm size		
El Salvador	25.4	32.5
Small	28.3	30.0
Medium	19.5	32.0
Large	26.7	38.1
Guatemala	34.0	24.0
Small	53.3	26.7
Medium	25.0	15.0
Large	26.7	33.3
Honduras	31.6	40.4
Small	30.9	41.8
Medium	26.1	34.8
Large	53.8	53.8
Nicaragua	22.9	29.6
Small	22.4	31.0
Medium	22.2	32.2
Large	25.8	19.4
Full sample	**26.3**	**32.4**
B. By sector		
Food	21.0	32.0
Tobacco	20.0	20.0
Textiles	23.5	11.8
Garments	31.3	29.7
Leather	10.0	40.0
Wood	33.3	16.7
Paper	33.3	16.7
Publishing, printing	27.3	36.4
Chemicals	27.3	22.7
Plastics and rubber	10.0	20.0
Non-metallic mineral products	40.0	33.3
Fabricated metal products	19.0	19.0
Machinery and equipment	21.1	26.3
Electronics	0.0	0.0
Transport machinery	50.0	50.0
Furniture	31.4	45.1
Construction	35.3	32.4
Servicing of motor vehicles	25.5	27.7
Wholesale	26.4	35.8
Retail	26.0	38.3
Hotels, restaurants etc.	26.8	29.3
Transport services	28.2	33.3
IT services	20.0	0.0
Full sample	**26.3**	**32.4**

Note: IT, information technology.

Reductions in working hours were also most common in manufacturing (leather, transport, machinery, and furniture).

3.4 Enterprise survivability

Table 6 provides details of the average number of weeks that a firm would be expected to survive with no sales. By country, the average expected survival time varies from just <8 weeks to just >9 weeks. This should be compared to temporary firm closures that have already occurred (see Table 3). On average, the expected firm survival times under fresh closures are greater than the lengths of previous temporary closures but not markedly so. Being able to rely on external finance markedly improves country averages by somewhere between 2 weeks and 4 weeks. The expected times vary considerable by sector, with manufacturing (leather, machinery, and transport equipment) predicting some of the lowest expected survival times. Construction, despite being harder hit by past temporary closures, has relatively high projected survival times.

The key point here is that these figures are averages. Compared to past temporary closures, it is reasonable to suppose that there would plenty of survivors from another, similar round. However, it is also clear that there would also be a number of nonsurvivors for which temporary closures would become permanent. Minimum survival times vary by sector, from 0 weeks to 8 weeks with no sales and from 0 weeks to 15 weeks with no sales and external finance.

Table 7 examines the changes in the value of firm sales from the time of the second COVID-19 survey (mainly November and December 2019) and the same months in 2020. Overall, the (unweighted) average change in sales for firms was a reduction of just less than one quarter of their sales from 1 year previously. Several sectors had a majority of firms whose sales were 50% or lower than that 1 year previously – garments, wood, furniture, and hospitality. In general, small firms faced proportionately larger losses of sales than larger ones. At the country level, the average proportionate change in sales was comparable for three of the four countries but was markedly higher for Honduras.

Two sectors exhibited a modest average gain in sales – tobacco and electronics. All other sectors recorded an average reduction in sales. Particularly large average reductions (≥39%) were recorded for garments, wood, construction, and hospitality.

3.5 Government support

Across the full sample, just more than three quarters of the firms had neither received nor expected to receive government support. Firms with some foreign ownership were substantially less likely to have received or to be expecting to receive government support. A much higher proportion of firms (almost 40%) in El Salvador had either received or expected to receive government support. This compares to 15% in Guatemala, just >10% in Honduras and just > 6% in Nicaragua. A number of sectors that reported proportionately large falls in sales (Table 7) – garments, wood, construction, and hospitality – had varying degrees of support. Of the firms in the garment sector, fewer firms than the overall average (68% compared to 77%) had either received or expected to receive government support. Firms in the construction (82%) and wood (87.5%) sectors were more likely to not receive or expect support and firms in hospitality were only marginally less likely to be nonrecipients (72%) (Table 8).

Table 6 Expected survival times of firms

	Average number of weeks that firms could survive with	
	No sales*	**No sales + finance****
A. By country and firm size		
El Salvador	**7.69**	**12.29**
Small	5.85	12.48
Medium	10.05	12.64
Large	8.51	11.46
Guatemala	**9.42**	**11.85**
Small	9.63	11.05
Medium	9.63	13.67
Large	8.89	10.87
Honduras	**8.20**	**10.28**
Small	9.20	10.45
Medium	7.24	10.27
Large	7.18	9.50
Nicaragua	**8.53**	**12.69**
Small	6.91	7.92
Medium	8.06	14.95
Large	12.59	14.41
Full sample	**8.30**	**12.00**
B. By sector		
Food	6.41	14.38
Tobacco	23.60	15.60
Textiles	7.13	11.44
Garments	7.85	12.08
Leather	4.25	6.71
Wood	5.43	7.33
Paper	8.80	11.20
Publishing, printing	6.23	9.04
Chemicals	6.25	9.00
Plastics and rubber	12.73	13.64
Nonmetallic mineral products	7.06	10.33
Fabricated metal products	7.88	18.82
Machinery and equipment	5.11	7.22
Electronics	11.50	15.00
Transport machinery	4.40	10.80
Furniture	5.23	10.00
Construction	13.12	25.79
Servicing of motor vehicles	6.65	11.87
Wholesale	9.40	12.95
Retail	7.38	9.27

(*Continued*)

Table 6   Continued

	Average number of weeks that firms could survive with	
	No sales*	**No sales + finance****
Hotels, restaurants etc.	7.39	11.68
Transport services	7.35	10.00
IT services	5.86	8.86
Full sample	**7.65**	**12.00**

Notes: *Keeping the cost structure as it is now, how many weeks would this establishment be able to remain open if its sales stopped as of today?

**How many additional weeks could this establishment continue paying all costs and payments (such as payroll, suppliers, taxes, or loan repayment) relying on the external sources of finance that this establishment has access to?

IT, information technology.

The reasons for not receiving government support are set out in Table 9. A lack of awareness of the available support was modest (<20% of firms) for El Salvador and Guatemala but more substantial in Honduras (31%) and Nicaragua (24%). Nearly 30% of firms in El Salvador, but much lower proportions in Honduras and Nicaragua, were ineligible for support. An important reason in both El Salvador and Guatemala was that firms had no need for support.

Table 10 summarizes the enterprise responses to the most-needed support measures. Tax reductions or deferrals were by far the most preferred option in all countries other than in El Salvador (and still the second most popular option there). Access to new credit was the most preferred option in El Salvador but more of a minority choice in the other countries. In none of the countries were either wage subsidies or technical support popular choices by enterprises.

3.6   Liquidity and credit

As the enterprises in the sample of Central American firms typically experienced significant reductions in sales revenues (Table 7), an inevitable consequence is that they faced a loss of liquidity, affecting the ability of firms to survive the COVID-19 crisis. Table 11 shows that nearly 60% of firms experienced a decrease in liquidity. A much lower proportion of firms with some foreign ownership (48%) experienced a decrease in liquidity. In each of the four countries, small firms were much more likely to face decreases in liquidity than larger ones. A very high proportion of firms in publishing and printing, transport machinery, wood, and paper experienced decreased liquidity. No firms in the tobacco or electronics sectors reported decreased liquidity. Of the service sectors, hospitality had by far the highest proportion of firms (70%) that experienced decreased liquidity.

Credit is an obvious response to a temporary lack of liquidity and, equally obviously, enables firms to survive, thereby sustaining higher levels of employment than would otherwise be the case. Table A2 provides details of the average changes in debt between January and September 2020. Across the full sample, the average effect was an increase in debt of 6.3%, but there were important variations. Firms with some foreign ownership reported no change in their debt. Smaller firms typically reduced their debt over this period. It is not immediately apparent why this was so. Although it is not a topic covered in this paper, it would be

Table 7   Changes in firm sales

Average percentage change in firm sales compared to same month in 2019*		
	Unweighted (%)	**Sales weighted (%)**
A. By country and firm size		
El Salvador	**−23.3**	−9.8
Small	−31.4	−12.6
Medium	−18.4	−10.0
Large	−12.9	−9.6
Guatemala	**−24.0**	**−10.3**
Small	−34.8	−30.5
Medium	−22.6	19.4
Large	−10.3	−17.7
Honduras	**−33.7**	**−26.3**
Small	−39.7	−23.6
Medium	−29.6	−23.1
Large	−23.3	−31.2
Nicaragua	**−22.9**	**3.4**
Small	−37.8	−23.6
Medium	−15.5	−4.6
Large	−16.0	5.1
Full sample	−24.8	−4.4
B. By sector		
Food	−19.5	−5.3
Tobacco	4.5	8.0
Textiles	−14.8	−11.5
Garments	−45.9	−27.2
Leather	−31.0	−1.5
Wood	−42.0	−29.9
Paper	−16.4	5.3
Publishing, printing	−33.2	−33.2
Chemicals	−7.5	8.6
Plastics and rubber	−4.8	0.7
Nonmetallic mineral products	−28.2	−9.0
Fabricated metal products	−12.1	−13.8
Machinery and equipment	−36.3	8.3
Electronics	10.0	18.0
Transport machinery	−18.8	−25.0
Furniture	−26.5	−15.3
Construction	−39.2	−56.8
Servicing of motor vehicles	−24.6	−28.5
Wholesale	−15.5	−6.8
Retail	−22.9	−1.1

<div align="right">(Continued)</div>

Table 7   Continued

Average percentage change in firm sales compared to same month in 2019*		
	Unweighted (%)	**Sales weighted (%)**
Hotels, restaurants etc.	−49.5	−45.1
Transport services	−14.8	−3.5
IT services	−32.5	−32.1
Full sample	−24.1	−4.4

*Notes:**From the second COVID follow-up survey conducted from .
November 2020 to January 2021.
COVID, coronavirus disease; IT, information technology.

interesting to know whether this reflected decisions by small firms to reduce leverage or decisions by lenders based on perceptions of increased risk arising from the pandemic.

As Table 12 shows, a significant proportion of firms (32%) applied for a loan since the outbreak of the pandemic. In Guatemala and Nicaragua (and to some extent in Honduras), the proportion of small firms applying for a loan was much lower than that of larger firms. Sectors with a high proportion of firms applying for loans included the manufacturers of paper and transport machinery (60% in both cases).

Table A3 provides a summary of the main reasons for not applying for a loan, given by those firms who did not seek a loan, and the outcomes of the application for those that did. Unsurprisingly, the most common reason for nonapplication was that the firm had no need. Small but nontrivial proportions of firms did not apply because of complex procedures, a belief that the application would not succeed, or because interest rates were unfavorable. In three of the four countries, ≥75% of loan applications were approved in full or in part. The exception – El Salvador – had 45% of applications still in progress at the time of the second COVID-19 follow-up survey.

3.7 Key obstacles to business

Table 13 presents the responses by firms to the question on potential obstacles to doing business in the original enterprise surveys. That is, they reflect the problems perceived by businesses before the outbreak of COVID-19. It is likely that such problems have not been since eliminated and coexist with those added by the pandemic.

Reading down the columns shows that, in each country, political instability and corruption were rated as among the most serious obstacles to business overall. In El Salvador and Guatemala, crime was relatively highly rated. In Guatemala and Honduras, the courts were ranked as one of the higher obstacles, and tax (rates and administration) was perceived as a problem in Honduras. Overall, these responses suggest that the capacity of local institutions to safely see firms through the COVID-19 crisis may be imperfect.

3.8 Summary of key stylized facts for Central America

It is impossible to tell for certain from the available data, but a large number of firms were "missing" from the original enterprise surveys when both COVID-19 follow-ups were conducted. It

Table 8   Recipients of government support (at time of the second COVID survey)

	Support		
	Received (%)	**Expected (%)**	**Neither (%)**
Full sample	**19.2**	**4.0**	**76.8**
Wholly domestic owned	20.4	4.5	75.1
Foreign owned (part or full)	12.7	1.6	85.7
Female top manager	20.0	3.4	76.6
Male top manager	19.0	4.1	76.9
A. By country and firm size			
El Salvador	**32.7**	**7.2**	**60.2**
Small	32.5	9.8	57.7
Medium	51.0	6.9	42.2
Large	10.7	2.4	86.9
Guatemala	**12.4**	**2.6**	**85.0**
Small	13.3	0.0	86.7
Medium	12.2	2.0	85.7
Large	11.4	6.8	81.8
Honduras	**9.5**	**0.9**	**89.7**
Small	0.0	0.0	100.0
Medium	17.0	2.1	80.9
Large	23.1	0.0	76.9
Nicaragua	**5.0**	**1.1**	**93.9**
Small	6.8	0.0	93.2
Medium	2.2	2.2	95.5
Large	9.4	0.0	90.6
B. By sector			
Food	21.6	6.9	71.6
Tobacco	0.0	0.0	100.0
Textiles	23.1	3.8	73.1
Garments	24.0	8.0	68.0
Leather	12.5	25.0	62.5
Wood	0.0	12.5	87.5
Paper	0.0	0.0	100.0
Publishing, printing	32.3	3.2	64.5
Chemicals	20.0	4.0	76.0
Plastics and rubber	16.7	0.0	83.3
Nonmetallic mineral products	12.5	12.5	75.0
Fabricated metal products	11.8	0.0	88.2
Machinery and equipment	33.3	0.0	66.7
Electronics	0.0	0.0	100.0
Transport machinery	20.0	20.0	60.0
Furniture	24.3	5.4	70.3
Construction	14.7	2.9	82.4

(Continued)

Table 8　Continued

	Support		
	Received (%)	**Expected (%)**	**Neither (%)**
Servicing of motor vehicles	9.8	4.9	85.4
Wholesale	14.5	1.8	83.6
Retail	20.5	1.9	77.6
Hotels, restaurants etc.	25.0	2.8	72.2
Transport services	17.1	2.4	80.5
IT services	14.3	0.0	85.7

Note: COVID, coronavirus disease; IT, information technology.

Table 9　Reasons for not receiving government support (percentage of firms)

	El Salvador (%)	**Guatemala (%)**	**Honduras (%)**	**Nicaragua (%)**
Not aware	17.6	12.3	30.8	24.3
Too cumbersome or costly to apply	10.0	13.8	7.7	3.0
Not eligible	29.5	12.3	5.8	2.4
Do not expect to get it because of lack of right connections	2.4	1.5	6.7	10.7
Applied but not received it	7.6	7.7	5.8	3.0
No need of support	24.8	38.5	15.4	15.4
Other reason	4.8	13.1	26.0	39.6
Nonresponse	3.3	0.8	1.9	1.8

is likely that COVID-19 did result in a significant number of firm closures, with a resulting loss of employment. For those firms that did survive, there were significant reductions in employment, and this reduction was greater for females than for all employees. Unsurprisingly, retail and hospitality recorded larger-than-average employment losses as did several manufacturing sectors.

The effects on labor markets were not restricted to employment. Workplace closures were associated with large numbers of lost labor weeks and a high number of workers furloughed. Presumably, furloughs were linked to temporary closures, but these would, at best, affect the sharing of the cost of lost labor weeks, not the total loss. A substantial minority of firms either cut wages or working hours or both.

Firms' predictions of the number of weeks that they would survive without sales are, on average, longer than the average length of temporary closures. It is clear that many firms could survive further temporary closures, but it is also clear that this is far from the case for all firms. On average, firms have lost about 24% of their sales since December 2019, with the figure being much higher for sectors such as construction, garments, and hospitality. Unsurprisingly, close to 60% of firms report a decrease in liquidity as a result of COVID-19.

Ultimately, a loss of liquidity threatens the survival of firms. There are two main routes by which firms can survive without sufficient sales – government support or private finance. Nearly 77% of our sample had neither received nor expected to receive government support.

Table 10　What would be the most-needed government measures to support this business over the COVID-19 crisis?

Round 2 survey	
	% of respondents
El Salvador	
Cash transfer	11.9
Deferral of credit payments, utility bills, rent, or mortgage; suspension of interest payments; or rollover of debt	11.6
Access to new credit	32.2
Tax reductions or tax deferrals	24.3
Wage subsidies	10.6
Support (technical assistance or subsidies) for adoption of digital technologies	4.7
Other measures	4.7
Guatemala	
Cash transfer	5.9
Deferral of credit payments, utility bills, rent, or mortgage; suspension of interest payments; or rollover of debt	10.2
Access to new credit	18.2
Tax reductions or tax deferrals	44.9
Wage subsidies	7.0
Support (technical assistance or subsidies) for adoption of digital technologies	4.3
Other measures	9.6
Honduras	
Cash transfer	8.3
Deferral of credit payments, utility bills, rent, or mortgage; suspension of interest payments; or rollover of debt	14.0
Access to new credit	10.2
Tax reductions or tax deferrals	55.4
Wage subsidies	4.5
Support (technical assistance or subsidies) for adoption of digital technologies	3.8
Other measures	3.8
Nicaragua	
Cash transfer	5.3
Deferral of credit payments, utility bills, rent, or mortgage; suspension of interest payments; or rollover of debt	15.0
Access to new credit	15.0
Tax reductions or tax deferrals	56.1
Wage subsidies	3.2
Support (technical assistance or subsidies) for adoption of digital technologies	0.5
Other measures	4.8

Note: COVID, coronavirus disease.

Table 11　Changes in liquidity since the outbreak of COVID-19 (percentage of firms)*

	Liquidity		
	Increased (%)	Same (%)	Decreased (%)
Full sample	10.9	29.8	59.3
Wholly domestic owned	10.4	28.2	61.4
Foreign owned (part or full)	13.6	38.4	48.0
Female top manager	11.0	26.7	62.3
Male top manager	10.9	30.5	58.6
A. By country and firm size			
El Salvador	12.9	26.4	60.6
Small	9.8	20.7	69.5
Medium	11.9	27.7	60.4
Large	20.5	36.1	43.4
Guatemala	11.1	31.4	57.5
Small	3.3	28.3	68.3
Medium	16.3	34.7	49.0
Large	15.9	31.8	52.3
Honduras	8.7	25.2	66.1
Small	3.6	19.6	76.8
Medium	15.2	26.1	58.7
Large	7.7	46.2	46.2
Nicaragua	8.3	37.8	53.9
Small	5.1	30.5	64.4
Medium	11.2	33.7	55.1
Large	6.3	62.5	31.3
B. By sector			
Food	11.8	30.4	57.8
Tobacco	0.0	100.0	0.0
Textiles	19.2	34.6	46.2
Garments	4.0	20.0	76.0
Leather	0.0	25.0	75.0
Wood	0.0	12.5	87.5
Paper	20.0	0.0	80.0
Publishing, printing	0.0	10.0	90.0
Chemicals	28.0	40.0	32.0
Plastics and rubber	0.0	58.3	41.7
Nonmetallic mineral products	12.5	18.8	68.8
Fabricated metal products	17.6	11.8	70.6
Machinery and equipment	0.0	22.2	77.8
Electronics	0.0	100.0	0.0
Transport machinery	0.0	0.0	100.0
Furniture	8.1	27.0	64.9

(*Continued*)

Table 11   Continued

	Liquidity		
	Increased (%)	Same (%)	Decreased (%)
Construction	14.7	23.5	61.8
Servicing of motor vehicles	12.2	31.7	56.1
Wholesale	12.8	35.8	51.4
Retail	11.3	33.1	55.6
Hotels, restaurants etc.	10.8	18.9	70.3
Transport services	14.6	34.1	51.2
IT services	0.0	57.1	42.9

Notes: *At time of the second COVID survey.
COVID, coronavirus disease; IT, information technology.

Some sectors, of course, do not need support, but sectors such as construction and hospitality, which faced large losses in sales, have average or greater-than-average proportions of firms without support.

About one third of firms in the sample had submitted applications for loans, of which more than one half were approved in full in three of the four countries. The exception (El Salvador) had >40% of applications still under consideration. A majority of firms did not apply for loans because they did not need them. Overall, COVID-19 must have increased the risk faced by lenders, but there is evidence that finance has been available to a significant proportion of applicants. It is less clear that the same could be said of government support.

Firms, when asked in the Round 2 survey, most consistently ranked tax reductions or deferrals as a preferred means of government support. In the earlier enterprise surveys, they identified political instability and corruption as the most serious obstacles to business.

Overall, the COVID-19 crisis is still temporary even if deeper and more prolonged than any recent economic downturn. The focus of the paper on labor, and, in particular, employment, means that the hoarding of labor by firms is the key. This, in turn, requires firms to be able to survive in the presence of significantly reduced sales. The demand for labor is a derived demand, and a key strength of firm-level data is that they clarify the link between firm survival and labor demand.

4   Methodology

The idea that one tests a clearly specified and detailed theoretical model, although sound in principle, has long been impractical. For some time, the empirical researcher has needed to do more to estimate the underlying data-generating process. This is particularly the case for the effects of COVID-19 on firms. Much of the available information is anecdotal. Since it is unprecedented in living memory, there is neither a clearly specified theory nor a substantial body of previous research on which to base an empirical specification. In consequence, this study adopts a general-to-specific approach – see Campos et al (2005) – which has been widely

Table 12   Proportion of firms applying for a loan

Since the outbreak of COVID-19	%
Full sample	31.9
Wholly domestic owned	33.3
Foreign owned (part or full)	24.0
Female top manager	32.2
Male top manager	31.8
A. By country and firm size	
El Salvador	39.0
Small	39.3
Medium	38.4
Large	39.0
Guatemala	26.3
Small	15.9
Medium	30.6
Large	36.4
Honduras	38.3
Small	28.6
Medium	52.2
Large	30.8
Nicaragua	19.0
Small	10.2
Medium	21.6
Large	28.1
B. By sector	
Food	28.2
Tobacco	0.0
Textiles	23.1
Garments	34.7
Leather	12.5
Wood	12.5
Paper	60.0
Publishing, printing	32.3
Chemicals	48.0
Plastics and rubber	33.3
Nonmetallic mineral products	6.3
Fabricated metal products	44.4
Machinery and equipment	44.4
Electronics	0.0
Transport machinery	60.0
Furniture	31.4
Construction	26.5

(*Continued*)

Table 12   Continued

Since the outbreak of COVID-19	%
Servicing of motor vehicles	35.0
Wholesale	37.6
Retail	32.1
Hotels, restaurants etc.	32.4
Transport services	24.4
IT services	28.6

Note: COVID, coronavirus disease; IT, information technology.

Table 13   Perceived main obstacles to doing business (average scores)

	El Salvador	Guatemala	Honduras	Nicaragua	All countries
Electricity supply	1.2	1.1	2.0	1.5	1.4
Telecommunications	1.0	1.1	1.6	1.1	1.1
Transport	1.2	1.6	1.6	1.0	1.3
Customs	1.1	1.5	1.8	1.3	1.3
Access to land	0.9	1.2	1.0	0.6	0.9
Crime, theft, and disorder	2.1	2.1	1.8	0.8	1.8
Access to finance	1.3	1.3	1.5	1.0	1.3
Tax rates	1.8	1.7	2.6	1.3	1.8
Tax administration	1.4	1.5	2.2	1.2	1.6
Business licensing	1.2	1.4	2.0	1.2	1.4
Political instability	2.1	2.6	2.2	1.3	2.1
Corruption	2.1	2.9	2.5	1.6	2.3
Courts	1.6	2.0	2.0	1.2	1.7
Labor regulations	1.1	1.6	1.6	1.1	1.3
Taken from the original enterprise survey					
No obstacle = 0					
Minor obstacle = 1					
Moderate obstacle = 2					
Major obstacle = 3					
Very severe obstacle = 4					

used elsewhere. In so doing, we note, from Hoover and Perez (1999), that general-to-specific modeling is both distinct from and, in many circumstances, a superior approach compared to data mining.

In practice, this meant including a long list of variables in our first specification from the original enterprise surveys, follow-up COVID-19 enterprise surveys, data on government containment measures, and medical data on morbidity and mortality. Those variables that were found to be jointly statistically insignificant were eliminated, leaving a specific model. It is these specific models that are reported throughout. In some cases, variables that are individually statistically insignificant are reported. The reason is that they were jointly significant with one or more other variables.

Our initial approach was to specify ordinary least squares (OLS) regression models for each of the four key dependent variables:

- The number of weeks that the firm would expect to survive with no sales.
- The percentage change in firm sales (from 2019).
- The percentage change in full-time permanent employees from December 2019.
- The percentage change in the share of females in full-time permanent employment (also from December 2019).

Each specification was tested for heteroskedasticity and, where necessary, robust standard errors were used.

However, separate OLS regressions do not perhaps provide the best representation of what theory is available. Labor is a derived demand. For example, government containment measures affect the sales of the enterprise in the first instance. This leads to a change in the labor demand by the enterprise. To better capture this process, estimates using a "seemingly unrelated regression equations" (SURE) model were used – see Zellner (1963). Firstly, a two-equation model with the proportionate change in sales as the first dependent variable and the proportionate change in full-time permanent employment as the second dependent variable was estimated. A second two-equation model was also estimated with, again, the percentage change in sales as the first dependent variable and the percentage change in the share of females in full-time permanent employment as the second.

One methodological limitation of regression models with surveys of individual enterprises is that such data are prone to heterogeneity and, hence, a risk of sample selection bias. One solution to this is to use a matching estimator as, at least, a robustness check. In this study, we used the inverse-probability-weighted regression adjustment (IPWRA) estimator, applied by Cattaneo (2010) and Cattaneo et al. (2013). This model allows for more than one treatment variable. In practice, more than two is unduly complex, but two treatments enable interactions between them to be modeled. The model, like most matching estimators, estimates a treatment model that estimates the probability of observing the treatment given different characteristics of relevance. The inverse probabilities resulting are then used as weights for a regression model of the outcome variable.

The IPWRA estimator has been shown to have some important properties. Hirano et al. (2003) showed that IPRWA is a "doubly robust" estimator. That is, if either one of the treatment or outcome models is incorrectly specified, then it remains a consistent estimator. Of course, if both are incorrectly specified, it is not. It was also shown by King and Nielsen (2019) that the IPWRA estimator had lower bias than other alternatives.

In this study, IPWRA was used as a robustness check on, in particular, the effects of a number of independent variables that were often found to be not statistically significant in the regression models. The two (0,1) treatment variables in each case were as follows:

- The firm had started or increased (a) online sales and (b) remote working.
- The firm experienced (a) decreased liquidity and (b) increased debt.
- (a) some foreign ownership and (b) a female top manager.

5 Regression Analysis

5.1 OLS regression

Table 14 presents the results of OLS regressions for the four key dependent variables:

- The number of weeks that firms would expect to survive if they were to have no sales. This gives a measure of the vulnerability of the firm to permanent closure and, hence, loss of employment.
- The percentage change in sales from 2019. This variable is a measure of changes in demand for the final product or service, relevant since labor is a derived demand.
- The percentage change in full-time permanent employees since December 2019, measured at the time of the second COVID-19 survey.
- The percentage change in the share of females in full-time permanent employment since December 2019.
- Employment losses in the sample. The share is used to assess potential gender bias in these losses.

The estimation followed a general-to-specific approach, and it is the results of the specific model that are reported. The results include some variables that were not individually significant but were found to be jointly significant with other variables that were similarly insignificant on an individual basis.

The expectations of firms in the context of the length of their survival time without sales were found to be related to a number of variables. Expected survival time was found to be positively related to the change in sales, as one might expect, but this effect was only significant at the 90% confidence level and of a small magnitude. A much more powerful and statistically significant (at 99% confidence) was the negative effect of changes in debt. It suggests that increases in debt as a consequence of COVID-19 substantially reduce the length of time that firms believe they can survive. Two further variables that have a negative effect, but which are only statistically significant at 90% confidence, were the following: (a) developing online delivery; and (b) a female top manager. It is not clear whether the latter effect reflects either greater pessimism among female top managers or whether their firms face a tougher reality than those of males. Another strong and statistically significant effect on expected survival is the stringency of government workplace closures. Unsurprisingly, the tougher the government closures are, the lower is the expected survival time of firms.

As one might expect, the change in sales was statistically significantly and positively correlated (at 99% confidence) with both expected survival times and changes in employment. The causality, of course, is likely to be from sales changes to labor changes or survival expectations. Foreign ownership was found to have a modest but statistically significant (95%) positive effect on the change in sales. As one might expect, there are negative and statistically significant correlations between sales changes and (a) the number of weeks that the firm was closed and (b) furloughs. Both, almost by definition, should be associated with fewer sales. More quixotic is the relationship between different government containment measures and sales. In general, one would expect that the tougher the government restrictions, the worse are the firm sales. The results suggest this to be the case for stay-at-home restrictions and public transport closures,

Table 14 OLS regression results

Dependent variable	Expected weeks of survival with no sales			% change in sales since 2019			% change in FT permanent employees since Dec 2019			% change in the share of females in FT permanent employment		
Independent variables	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t
% change in sales since 2019	0.019*	0.010	1.81				0.003***	0.001	4.99	0.002	0.002	1.37
Expected weeks of survival with no sales				0.200**	0.093	2.15	0.002*	0.001	1.6			
% change in FT permanent employment since Dec. 2019	1.342	0.954	1.41	14.120***	3.181	4.44				−0.197**	0.103	−1.91
% change in debt in Jan–Sept 2020	−2.966***	1.101	−2.69							0.039	0.045	0.86
% of foreign ownership	−1.868*	1.061	−1.76	0.085**	0.040	2.12				0.005	0.007	0.71
Started or increased delivery (0,1)							7.795	2.726	2.86	−0.102	0.145	−0.70
Started or increased online sales (0,1)										0.183	0.182	1.00
Female top manager (0,1)	−1.604*	0.942	−1.70							0.073	0.088	0.83
Online sales as a % of total sales	0.040	0.033	1.23	−0.180***	0.063	−2.83				0.003	0.003	1.03
No government support (0,1)	2.101*	0.767	2.74									
Firm applied for loan (0,1)							0.051	0.041	1.23			

(Continued)

Table 14 Continued

Dependent variable	Expected weeks of survival with no sales			% change in sales since 2019			% change in FT permanent employees since Dec 2019			% change in the share of females in FT permanent employment		
Independent variables	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t
Exports as a % of total sales							0.001	0.000	1.56	−0.003	0.005	−0.69
Number of weeks closed				−1.468***	0.208	−7.04						
Proportion of employees furloughed	−2.242*	1.183	−1.89	−15.707***	4.289	−3.66	0.452**	0.230	1.97			
Labor intensity – labor as a share of total cost	2.991**	1.443	2.07							−0.046	0.164	−0.28
Containment and health index										−0.041	0.041	−1.00
Government workplace closures – stringency	−9.862**	4.672	−2.11	15.527**	7.444	2.09	0.185**	0.094	1.96	−0.289*	0.171	−1.69
Stay-at-home restrictions – stringency				−15.781***	4.608	−3.42				0.588	0.444	1.32
Closures of public transport – stringency				−46.252***	10.951	−4.22				0.392	0.362	1.08
Total COVID-19 cases per million	0.004*	0.002	1.84				−0.00004**	0.000	−2.12			
Total COVID-19 deaths per million	−0.067	0.046	−1.46	0.148***	0.045	3.27	0.008	0.007	1.06	0.008	0.007	1.06

(Continued)

Table 14 Continued

Dependent variable	Expected weeks of survival with no sales			% change in sales since 2019			% change in FT permanent employees since Dec 2019			% change in the share of females in FT permanent employment		
Independent variables	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t	Coefficient	Robust standard error	t	Coefficient	Robust standard error.	t
Transport machinery sector (0,1)	−5.551***	0.826	−6.72									
Transport sector (0,1)	1.938	1.266	1.53	19.436***	5.542	3.51						
IT services sector (0,1)	−6.490	2.237	−2.90									
Garment sector (0,1)							−0.149**	0.058	−2.58			
Chemical sector (0,1)				15.396**	7.252	2.12						
Rubber and plastics sector (0,1)				22.680***	7.508	3.02						
Nonmetallic mineral products sector (0,1)										1.115*	0.662	1.68
Constant	2.434	1.821	1.34	−32.045***	3.469	−9.24	−0.029	0.043	−0.67	0.163	0.430	0.38
Number of observations	386			618			626			285		
F	2.81	(15, 370)		10.03	(16, 601)		11.64	(8, 617)		1.76	(17, 267)	
Probability > F	0.0004			0			0			0.0338		
R^2	0.1022			0.2107			0.1312			0.1006		
Adjusted R^2	0.0658			0.1897			0.1199			0.0433		
RMSE	9.468			31.104			0.42401			0.91075		

Notes: * Significant at 90%, ** at 95%, and *** 99% confidence levels.
COVID, coronavirus disease; FT, full time; IT, information technology; OLS, ordinary least squares; RMSE, root mean square error.

both of which have negative and statistically significant (at 99%) coefficients. A perverse result is that the coefficient for workplace closures is positive and significant.

As expected, the effect of a change in sales on the change in employment was found to be positive and statistically significant (at 99% confidence), but the magnitude was lower than expected. The coefficient for the share of workers furloughed was positive, statistically significant, and of some magnitude. This suggests that furloughs have been effective in helping to preserve employment.

The regression for the share of females in employment was statistically complex. The results include a number of variables that were individually statistically insignificant but which are jointly significant. The likely explanation is that many of these variables interact – e.g., stay-at-home restrictions, online sales, and delivery – and are multicollinear. This notwithstanding, the main variables affecting the share of females in employment are those one would expect – the change in overall employment and workplace closures. The effect of employment changes on the share of females was negative and statistically significant (at 95% confidence). This suggests that losses in employment have fallen more heavily on males and had the effect of modestly increasing the share of females. It is likely that this has been driven by gender segregation and the fact that a number of manufacturing sectors have been hard hit. Government workplace closures also had a negative and statistically significant effect on the share of females. Again, this is likely to be related to gender segregation, with services being more prone to closures.

5.2 **SURE model**

The OLS regression results suggest that the change in firm sales is an important determinant of the change in employment. This is not a remarkable proposition. COVID-19 typically resulted in a decrease in sales (fall in product demand), which resulted in a loss of liquidity. This, in turn, resulted in a loss of employment (fall in labor demand). For these reasons, a two-equation SURE model was used to provide some thorough insights.

Table 15 reports the results of the SURE model linking the proportionate change in sales with the proportionate change in full-time permanent employees. As with the OLS regressions, the results reported are those after working from general to specific.

For the change in sales, the following variables exhibited a positive and statistically significant positive effect: developing deliveries; and foreign ownership. The following variables had a statistically significant negative effect: the share of online sales in the total sales, temporary closures, furloughs, stay-at-home restrictions and public transport closures. Most of these are as one might expect, but the negative effect of online sales presumably reflects the difficulties of the retail sector. The equation for the change in sales repeats the perverse result of the OLS equation of a positive effect of the level of stringency of government workplace closures on the change in sales.

For the change in employment, as with the OLS equation, the main statistically significant effects are positive – for the change in sales and for the proportion of workers furloughed. As before, they suggest that improved sales and furloughs save jobs.

Since the effects on gender equality are an important feature of this study, a second SURE model was estimated, linking the change in firm sales to the change in the share of females in the share of full-time permanent employees of the enterprise. As before, the underlying reasoning is the link between product demand and labor demand. The proportionate change in the share of females in employment was used rather than changes in the number of females, in

Table 15 SURE estimation for changes in sales and employment

	Observations	RMSE	R^2	χ^2	P-value
% change in sales since 2019	615	31.2941	0.1782	133.61	0.000
% change in FT permanent employment (since December 2019)	615	0.4233	0.1305	96.64	0.000
	Coefficient	Standard error	z	P > z	
(a) % change in sales since 2019					
Expected weeks of survival with no sales	0.233*	0.125	1.86	0.063	
Started or increased deliveries (0,1)	7.685***	2.725	2.82	0.005	
% of foreign ownership	0.088**	0.041	2.15	0.032	
Share of online sales in total	−0.172***	0.067	−2.56	0.010	
Number of weeks of temporary closure	−1.622***	0.226	−7.17	0.000	
% of workers furloughed	−9.560**	4.301	−2.22	0.026	
Stringency of government workplace closures	17.557*	9.872	1.78	0.075	
Stringency of stay-at-home restrictions	−17.193***	5.955	−2.89	0.004	
Extent of public transport closures	−50.386***	13.491	−3.73	0.000	
Total COVID-19 deaths per million	0.155***	0.049	3.18	0.001	
Chemical sector (0,1)	16.573**	7.559	2.19	0.028	
Plastics and rubber sector (0,1)	23.315**	10.605	2.2	0.028	
Transport sector (0,1)	18.890**	8.885	2.13	0.033	
Constant	−34.324***	3.769	−9.11	0.000	
(b) % change in FT permanent employment					
Expected weeks of survival with no sales	0.002	0.002	1.1	0.271	
% change in sales since 2019	0.003***	0.001	5.64	0.000	
Firm applied for loan (0,1)	0.049	0.037	1.31	0.190	
Exports as a % of total sales	0.001	0.001	1.05	0.296	
% of workers furloughed	0.458***	0.057	7.99	0.000	
Stringency of government workplace closures	0.183	0.123	1.48	0.138	
Total COVID-19 cases per million	−0.00004*	0.000	−1.79	0.073	
Garments sector (0,1)	−0.153**	0.069	−2.21	0.027	
Constant	−0.021	0.048	−0.43	0.667	

Notes: * significant at 90%, ** at 95%, and *** at 99% confidence levels.

COVID, coronavirus disease; FT, full time; RMSE, root mean square error; SURE, seemingly unrelated regression equations.

order to identify any gender biases involved. Again, the results after working from general to specific are reported in Table 16.

Since the equation for the change in sales yields conclusions similar to those of both the OLS regression and the preceding SURE model, no further comment is offered. As with the OLS regression, numerous variables in the equation for the female share in firms are collinear and, hence, are individually insignificant but jointly significant. Surprisingly, the change on employment is not statistically significant at 90% or higher confidence level, but it is negative and only just outside (significant at 88% confidence). Both online sales and foreign ownership were found to be both positive and statistically significant at 95% confidence.

Table 16 SURE estimation for changes in sales and the share of females in employment

	Observations	RMSE	R^2	χ^2	P-value
% change in sales since 2019	302	29.747	0.210	80.650	0.000
% change in female share in employment	302	0.872	0.087	28.190	0.003
(since December 2019, FT permanent employees)					

	Coefficient	Standard error	z	P > z	
(a) % change in sales since 2019					
Expected weeks of survival with no sales	0.218	0.167	1.31	0.19	
Started or increased deliveries (0,1)	10.5765***	3.823	2.77	0.01	
% of foreign ownership	0.067	0.064	1.04	0.30	
Share of online sales in the total	−0.194**	0.097	−2.00	0.05	
Number of weeks of temporary closure	−2.221***	0.414	−5.37	0.00	
% of workers furloughed	−11.818*	6.353	−1.86	0.06	
Stringency of government workplace closures	20.128	15.445	1.30	0.19	
Stringency of stay-at-home restrictions	−21.220**	8.913	−2.38	0.02	
Extent of public transport closures	−61.621***	19.831	−3.11	0.00	
Total COVID-19 deaths per million	0.1999***	0.070	2.84	0.00	
Chemical sector (0,1)	27.697***	10.860	2.55	0.01	
Plastics and rubber sector (0,1)	39.221***	15.521	2.53	0.01	
Transport sector (0,1)	27.660**	11.596	2.39	0.02	
Constant	−36.796***	5.570	−6.61	0.00	
(b) % change in the share of females in FT permanent employment					
% change in full-time permanent employees	−0.200	0.128	−1.57	0.12	
% change in sales since 2019	0.002	0.002	1.00	0.32	
% change in debt (January–September 2020)	0.058	0.084	0.69	0.49	
Online sales as a % of total	0.216**	0.104	2.08	0.04	
% of foreign ownership	0.005**	0.002	2.43	0.02	
Exports as a % of total sales	−0.003	0.002	−1.33	0.19	
Overall containment index	−0.035	0.029	−1.18	0.24	
Stringency of stay-at-home restrictions	0.363	0.271	1.34	0.18	
Stringency of restrictions on internal movements	−0.297*	0.160	−1.86	0.06	
Total COVID-19 deaths per million	0.007	0.004	1.59	0.11	
Nonmetallic mineral products sector (0,1)	0.793**	0.369	2.15	0.03	
Constant	0.083	0.314	0.26	0.79	

Notes: *significant at 90%, **at 95%, and ***99% confidence levels.

COVID, coronavirus disease; FT, full time; OLS, ordinary least squares; RMSE, root mean square error; SURE, seemingly unrelated regression equations.

6 Inverse-Probability-Weighted Regression Adjustment

As is often the case with enterprise surveys, there is a likely problem with heterogeneity and, hence, potential sample selection bias in our method. For this reason, we used a matching approach (inverse-probability-weighted regression adjustment [IPWRA]) as a robustness check on several important conclusions arising from the regression analyses. Table 17 reports

Table 17   IPWRA analysis for online sales and remote working

IPWRA Analysis - decreased liquidity and increased debt				
Outcome		**Absolute effects**		
		Liquidity decreased	**Debt increased**	**Both**
Expected survival with no sales (weeks)	ATT	−5.850**	−3.583	−6.556**
	standard error	(2.179)	(2.699)	(2.991)
		Relative effects		
		Liquidity loss versus debt increase	**Only liquidity loss versus both**	**Only raised debt versus both**
	ATT	2.121	−0.3232	−2.509**
	standard error	(2.428)	(0.929)	(1.205)
Outcome		**Absolute effects**		
		Liquidity decreased	**Debt increased**	**Both**
Change in sales from December 2019 (%)	ATT	−30.289***	−1.102	−27.681***
	standard error	(3.818)	(4.703)	(4.362)
		Relative effects		
		Liquidity loss versus debt increase	**Only liquidity loss versus both**	**Only raised debt versus both**
	ATT	28.612***	3.416	−26.933***
	standard error	(3.782)	(2.935)	(3.639)

Notes: Robust standard errors are in parentheses.
*Significant at **95%, and ***99% confidence level.
ATT, Average Treatment Effect for the Treated Group; IPWRA, inverse-probability-weighted regression adjustment.

the results of the IPWRA analysis of the effects of (a) new or increased online sales and (b) new or increased remote working on, firstly, the expected survival times of firms and, secondly, the proportionate change in sales of the enterprise.

The results suggest that there is a statistically significant (95% confidence) and positive effect of remote working on the expected survival times of firms. Especially, those firms that introduced or extended remote working exhibited significantly higher survival times compared to firms that developed neither remote working nor online sales. There was no similar statistically significant effect for online sales. This is most likely attributable to online selling being most likely to have strong effects only for those firms that sell direct to consumers. Remote working is available to a much wider range of sectors.

With respect to the effect on the percentage change in sales, neither online sales nor remote working had a statistically significant effect compared to firms that developed neither. However, the absolute effects show that firms which developed both did have statistically significantly (99% confidence) higher changes in sales compared to those that developed neither. The relative effects suggest that firms which developed only online sales, but not remote working, experienced significantly (95% confidence) greater changes in sales than those that developed both. In summary, the evidence suggests that remote working had a positive effect on

Table 18   IPWRA analysis for liquidity and debt

IPWRA analysis – started or increased (a) online sales and (b) remote working				
Outcome		**Absolute effects**		
		Online sales	**Remote working**	**Both**
Expected survival with no sales (weeks)	**ATT**	0.577	2.721**	1.431
	standard error	(2.028)	(1.283)	(1.003)
		Relative effects		
		Online sales versus remote	**Only online sales versus both**	**Only remote working versus both**
	ATT	2.736	1.288	−1.496
	standard error	(2.119)	(1.821)	(1.277)
Outcome		**Absolute effects Guate**		
		Online sales	**Remote working**	**Both**
Change in sales from December 2019 (%)	**ATT**	−0.504	5.736	8.303**
	standard error	(3.779)	(3.779)	(3.848019)
		Relative effects		
		Online sales versus remote	**Only online sales versus both**	**Only remote working versus both**
	ATT	5.334	8.856**	5.475
	standard error	(4.255)	(3.767)	(4.280)

Notes: Robust standard errors are in parentheses.
Significant at **95%, and ***99% confidence level.
ATT, Average Treatment Effect for the Treated Group; IPWRA, inverse-probability-weighted regression adjustment.

the expected survival times of firms and that developing online sales, unsurprisingly, had a positive effect on the change in sales.

A similar analysis of the effect of online sales and remote working on changes in employment and the share of females in employment was undertaken. The results are not reported as no statistically significant effects could be found.

Table 18 reports a similar analysis of the effects of (a) decreased liquidity and (b) increased debt on, again, expected firm survival times and the proportionate change in sales.

The results find a statistically significant (at 95% confidence) negative effect of decreased liquidity on the expected survival times of firms, compared to firms that experienced decreased liquidity or increased debt. Likewise, the combined effect of both decreased liquidity and increased debt had a stronger and statistically significant (also at 95% confidence) negative effect on expected survival times compared to those enterprises that experienced neither.

With respect to the treatment effects upon the change in sales, the results suggest a powerful and statistically significant effect (at 99% confidence) between decreased liquidity, both individually and in combination with increased debt, and the percentage change in sales. Correlation is not causality. The study does not assert that decreased liquidity causes a loss of sales. The reverse is clearly the case. What it does show clearly is that the reverse effect is both

statistically significant and powerful. Unsurprisingly, a loss of sales is very strongly associated with a loss of liquidity.

Again, a similar analysis was run on both the proportionate change in employment and on the proportionate change in the share of females in employment. As with the earlier analysis, no statistically significant results were obtained.

7 Institutional Capacity and Quality

The evidence presented in this study builds on anecdotal evidence from the media in many parts of the world. COVID-19 has created a deep and prolonged decrease in sales. This threatens firm survival through a loss of liquidity. In some cases, this results in permanent firm closure, with a loss of both employment and capital. In other cases, firms have, to date, survived by reducing employment, cutting wages and hours, and applying furloughs. The COVID-19 crisis may be prolonged, but it is not permanent. Retention of labor provides a strong rationale for providing temporary support to firms. Only a small proportion of firms in our sample from four Central American countries had received any support (see Table 8).

This raises a question as to whether the governments of these countries are well placed to provide appropriate support. The World Governance Indicators (World Bank) define six measures of governance:

- Control of corruption
- Political stability and the absence of violence or terrorism
- Rule of law
- Government effectiveness
- Regulatory uality
- Voice and accountability

For each of these measures, the data reported include two indicators, which are reported in Table 19. The first "estimate" fits a normal distribution to all the countries surveyed. Values therefore range from approximately –2.5 to +2.5, with a mean of zero. Higher values imply good governance and lower values poor. The second measure gives the percentile rank of the country with the full sample of countries. The best-performing countries receive values close to 100 and the worst closer to zero.

Against all six measures, almost all the countries have a negative "estimate"; in some cases, substantially negative values are observed. The only exceptions are El Salvador for regulatory quality and for voice and accountability. These negative scores mean that the sample of countries is systematically worse, sometimes substantially worse, than the world "average" in terms of governance indicators. In terms of the percentile rank, almost all of the countries are ranked <50, the midpoint of the ranking. Again, the same two exceptions apply to El Salvador. In some cases, the rankings are particularly low. The lowest is Nicaragua's ranking of 9.6 for rule of law. This means that roughly 90% of countries do better than Nicaragua on this measure.

In governance terms, generally, these data imply that the four countries are below typical world standards. Small emerging economies face particular difficulties, so this is not intended to be judgmental. Nonetheless, it does suggest that they may not be able to deliver effective

Table 19   World governance indicators (2019)

Control of corruption		Government effectiveness	
(a) Estimate		**(a) Estimate**	
El Salvador	−0.553	El Salvador	−0.465
Guatemala	−0.898	Guatemala	−0.677
Honduras	−0.808	Honduras	−0.612
Nicaragua	−1.122	Nicaragua	−0.771
(b) Percentile rank		**(b) Percentile rank**	
El Salvador	32.692	El Salvador	35.577
Guatemala	18.750	Guatemala	26.442
Honduras	23.077	Honduras	30.288
Nicaragua	12.500	Nicaragua	21.635
Political stability and absence of violence		**Regulatory quality**	
(a) Estimate		**(a) Estimate**	
El Salvador	−0.127	El Salvador	0.022
Guatemala	−0.546	Guatemala	−0.225
Honduras	−0.531	Honduras	−0.493
Nicaragua	−1.035	Nicaragua	−0.689
(b) Percentile rank		**(b) Percentile rank**	
El Salvador	42.857	El Salvador	56.250
Guatemala	25.238	Guatemala	44.231
Honduras	27.143	Honduras	34.135
Nicaragua	13.333	Nicaragua	25.000
Rule of law		**Voice and accountability**	
(a) Estimate		**(a) Estimate**	
El Salvador	−0.762	El Salvador	0.138
Guatemala	−−1.052	Guatemala	−0.313
Honduras	−1.009	Honduras	−0.552
Nicaragua	−1.176	Nicaragua	−1.077
(b) Percentile rank		**(b) Percentile rank**	
El Salvador	23.558	El Salvador	51.724
Guatemala	13.942	Guatemala	35.468
Honduras	15.385	Honduras	31.034
Nicaragua	9.615	Nicaragua	19.212

Note: *Estimate – normal distribution, minimum value of −2.5 and maximum of +2.5. Significant at **95%, and ***99% confidence level.

support to see firms through the COVID-19 crisis. A greater role for regional or international agencies may be needed. This need not necessarily require the provision of support directly to firms. For example, provision of guarantees for commercial loans could be a way to work through the financial crisis.

8 **Conclusions**

At the heart of this analysis is an account of the way in which COVID-19 has affected employment in Central America, which is well documented from many parts of the world. The pandemic has caused a large drop in demand for the products or services of many firms but not in all sectors. The lack of sales creates liquidity problems for the affected firms, reducing the demand for labor. This has resulted in permanent firm closures of some firms and, in some cases, in reductions in demand for labor by survivors or, as a consequence, of temporary workplace closures. This may be familiar, but, so far, there has been too little scientific and evidence-based analysis as opposed to anecdotal information.

At the time of writing, very few studies independent of the World Bank umbrella had yet to make use of the World Bank's excellent enterprise studies. The study provides an insight into the potential uses of this valuable resource for researchers. Much of the existing information on the microeconomic impact of COVID-19 is anecdotal, and the use of survey evidence to identify key stylized facts is in itself an important contribution.

The results of the study make important contributions to the limited but growing literature on a diverse set of issues. The IPWRA analysis provides evidence on the importance of digitalization as a response to the problems of COVID-19. Other evidence highlights that the economic impact falls unevenly by sector and, importantly, that this unevenness by sector also results in a disproportionately adverse effect on working women.

The evidence presented here is not conclusive, but it seems likely that there have been substantial employment losses from permanent closures of firms. Of the surviving firms, there is evidence that many are vulnerable to further losses of sales and that without adequate support from the government or the financial sector, there could be further permanent closures of firms. The study also shows that surviving firms have significantly reduced employment. This is linked to falling sales and the consequent decreases in liquidity. For retention of labor and in order to build economic recovery, these issues would need to be addressed.

Losses in employment are by no means the only impact on labor markets in Central America. Temporary closures and furloughs impose substantial costs on firms, employees, or those providing support. Cuts in wages and hours of work have also been imposed by a number of firms. The effects on gender inequality have been driven by gender segregation and the uneven effects of COVID-19 by sector. In our sample, losses of employment were significantly higher for females.

Some measures taken by firms have been effective in improving the prospects of firm survival. The study finds remote working to have had positive effects. Developing online sales did not have overall statistically significant effects, presumably because it is only an option for a limited number of sectors.

Government measures to contain COVID-19, although necessary to save lives, do have a strong adverse effect on firms, in particular, on workplace closures. Only a small proportion of firms report having received government support. Without such support, continued losses of sales threaten liquidity and the ability of firms to survive at all or to survive without further employment losses. Unchecked, these would threaten prospects for rapid and effective recovery from the economic effects of COVID-19. Reference to published indicators of good governance

cast some doubt on whether the four countries possess the institutional capacity to deliver the necessary support unaided.

As is often the case, this study raises questions for further research. Permanent closures of firms are, most likely, a cause of substantial losses of employment. The COVID-19 follow-up surveys had a large proportion of missing firms among the firms that had responded to the earlier enterprise survey. It is likely that many of these could not be contacted because they had permanently closed. It would be an important addition to knowledge to be able to understand what could have reasonably been done to see the enterprise failures through the crisis. The analysis presented here could only cover those firms that survived up to the two surveys.

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Appendix

Table A1   Change in full-time permanent workers from December 2019 by skill category and education*

A. By skill category

Country/firm size	Nonproduction	Production workers		
	Workers (%)	Skilled (%)	Semiskilled (%)	Unskilled (%)
El Salvador	**−2.8**	**−4.4**	**6.3**	**0.6**
Small	−24.3	−22.7	−20.8	−30.7
Medium	−14.1	−11.9	−13.2	−18.2
Large	−1.3	−2.1	8.6	2.7
Guatemala	**−8.5**	**3.8**	**−14.2**	**6.6**
Small	−21.9	−28.5	−25.1	−19.7
Medium	−36.4	−38.1	−38.7	−34.4
Large	−2.4	9.9	−7.4	15.1
Honduras	**−18.8**	**−18.7**	**−15.6**	**−15.5**
Small	−8.1	−7.5	−5.1	−12.0
Medium	−22.3	−21.8	−31.7	−21.1
Large	−17.6	−18.0	−10.3	−11.6
Nicaragua	**−19.4**	**−14.4**	**−26.3**	**−23.2**
Small	8.3	−5.4	35.1	−8.6
Medium	−2.5	−0.6	2.5	−4.5
Large	−22.1	−18.5	−30.5	−25.8
Full sample	**−6.9**	**−4.8**	**−5.0**	**−3.0**

B. By education

Country/firm size	All (%)	Education level	
		University (%)	Secondary (%)
El Salvador	−23.2	−23.4	−25.3
Small	−54.8	−74.2	−53.4
Medium	−29.7	−25.2	−33.1
Large	−17.1	−14.4	−19.2
Guatemala	−28.1	−27.1	−33.5
Small	−45.8	−19.2	−59.9
Medium	−43.7	−36.3	−48.8
Large	−22.3	−24.9	−26.9
Honduras	−39.1	−36.3	−39.7
Small	−34.7	−38.3	−36.9
Medium	−21.5	−23.1	−20.0
Large	−55.5	−47.5	−57.0
Nicaragua	−18.1	−25.8	−23.8
Small	−39.7	−59.9	−46.7
Medium	−26.3	−21.8	−27.1
Large	−14.0	−22.8	−20.9
Full sample	−25.0	−26.3	−28.2

Notes: *As at the time of the second COVID-19 survey (November 2020–January 2021): calculated assuming same proportions of each category as in the enterprise survey.

COVID, coronavirus disease.

Table A2   Average change in debt between January and September 2020

Full sample (%)	6.3
Wholly domestic owned (%)	10.4
Foreign owned (part or full) (%)	0.0
Female top manager (%)	9.8
Male top manager (%)	6.2
A. By country and firm size (%)	
El Salvador	3.2
Small	−11.6
Medium	0.4
Large	5.6%
Guatemala	−2.5
Small	−17.3
Medium	−4.4
Large	−1.0
Honduras	−0.5
Small	−7.7
Medium	8.0
Large	−9.6
Nicaragua	21.1
Small	−8.2
Medium	−13.7
Large	25.7
B. By sector (%)	
Food	−3.5
Tobacco	−18.2
Textiles	−0.3
Garments	47.0
Leather	−1.9
Wood	−0.6
Paper	−0.7
Publishing, printing	−19.5
Chemicals	25.4
Plastics and rubber	−0.4
Nonmetallic mineral products	−6.6
Fabricated metal products	4.0
Machinery and equipment	6.1
Electronics	0.0
Transport machinery	12.4
Furniture	6.7
Construction	−17.3
Servicing of motor vehicles	−4.7
Wholesale	21.2
Retail	−7.4
Hotels, restaurants etc.	8.9
Transport services	−10.0
IT services	−35.5

Note: IT, information technology.

Table A3   Main reason for not applying for a loan and the outcomes of loan applications (% of firms by country)

	El Salvador (%)	Guatemala (%)	Honduras (%)	Nicaragua (%)
A. Reasons for not applying				
No need for a loan – establishment had sufficient capital	56.7	71.3	56.3	49.7
Application procedures were complex	8.6	4.3	9.9	5.5
Interest rates were not favorable	5.7	4.3	9.9	12.4
Collateral requirements were too high	1.0	0.9	2.8	7.6
Size of loan and maturity were insufficient	0.5	0.9	0.0	0.0
Did not think it would be approved	7.1	6.1	7.0	8.3
Other measures	19.0	12.2	14.1	16.6
Nonresponse	1.4	0.0	0.0	0.0
B. Outcome of loan application				
Application still in process	44.7	12.2	11.4	5.9
Application was approved in full	40.2	70.7	68.2	55.9
Application was approved in part	9.1	9.8	6.8	23.5
Application was rejected	4.5	7.3	9.1	11.8
Application was withdrawn	1.5	0.0	4.5	2.9