Competition and Firm Recovery Post-COVID-19

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Abstract

This paper examines the impact of the COVID-19 crisis on the reallocation of economic activity across firms, and whether this reallocation depends on the competition environment. The paper uses the World Bank's Enterprise Surveys COVID-19 Follow-up Surveys for about 8,000 firms, including both small and large firms, in 23 emerging and developing countries in Europe and Central Asia, matched with 2019 Enterprise Surveys data. It finds that during the COVID-19 crisis, smaller firms were hit harder, and economic activity was reallocated toward firms with higher pre-crisis labor productivity. Countries with a strong competition environment experienced more reallocation from less productive to more productive firms than countries with a weak competition environment. The evidence also suggests that reallocation from low- to high-productivity firms during the COVID-19 crisis was stronger compared with pre-crisis times. Finally, the analysis shows that government support measures implemented in response to the crisis may have adverse effects on competition and productivity growth since support went to less productive and larger firms, regardless of their pre-crisis innovation.

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1. Introduction

The COVID-19 pandemic resulted in the deepest global recession since World War II (World Bank 2020a). The rapid spread of the disease and movement restrictions to contain the virus created sudden supply and demand shocks, leading to declines in output (Demirgüç-Kunt, Lokshin, and Torre 2021). These shocks were compounded by widespread uncertainty among businesses and concerns about the risks of increasing financial sector distress limiting access to credit (Bloom and others 2021; Buchheim, Krolage, and Link 2020; and World Bank 2021b).

How did firms fare? Previous work has documented the initial impacts of the COVID-19 crisis on businesses around the world (Aga and Maemir 2021; Balleer and others 2020; Bartik and others 2020; Bennedsen and others 2020; Crane and others 2021; Fairlie 2020; Liu, Wei, and Xu 2021; Wagner 2021). Across 51 countries, firms reported an average drop in sales of 49 percent (Apedo-Amah and others 2020), but the effects of the crisis were heterogenous. For example, small firms experienced larger drops in sales than large firms (Brucal, Grover, and Reyes Ortega 2021; De Nicola and others 2021; Karalashvili and Viganola 2021), which is a pattern that has also been documented for the 2008–2009 global financial crisis (OECD 2017a; OECD 2017b; Chen and Lee, 2023).

As argued by Schumpeter (1942), crises can result in "creative destruction." That is, they can play a cleansing role, by speeding up the reallocation of economic activity from less productive to more productive firms, leading to greater productivity and economic growth in the longer run (Caballero and Hammour 1994). However, it is not obvious whether a pattern of creative destruction will emerge from the COVID-19 crisis. The broad-based shock may simply result in widespread destruction (Bosio and others 2020; De Nicola and others 2021). Or, instead of shifting economic activity to the most productive firms, the crisis may reallocate activity to firms with greater market power or political connections, which could be detrimental to productivity growth (Di Mauro and Syverson 2020). The question of the impact of COVID-19 on firms and its implications for long-run economic growth is thus an empirical one.

This paper makes four contributions. First, it contributes to the nascent literature on firm size, productivity, and performance during the COVID-19 crisis, by providing evidence that economic activity was reallocated toward larger firms and those with higher pre-crisis labor productivity. Specifically, we examine the process of reallocation in emerging and developing economies during the COVID-19 crisis. We use data from the World Bank's Enterprise Surveys (ES) COVID-19 Follow-up Surveys for about 7,800 small and medium enterprises (SMEs) and 200 large firms,[1] in 23 countries in Europe and Central Asia (ECA), matched with 2019 ES data, to study the relationship between firm size, pre-COVID-19 labor productivity, and performance during the crisis as measured by changes in sales and employment, anticipating falling into arrears on outstanding liabilities, increased online business activity, and increases in remote work arrangements. Given the dominance of SMEs in

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1   Using the OECD SME definition of having less than 250 employees (OECD, 2017b).

our sample, our findings are especially well-suited to providing evidence on productivity and firm performance during the COVID-19 crisis for SMEs. Belitski and others (2022) summarize previous studies on the impact of the COVID-19 crisis on SMEs. Unlike our paper, most of these studies focus on high income countries. They find that SMEs were more impacted than large firms (see, for example, Belghitar, Moro, and Radić 2022; Dörr, Licht, and Murmann 2022; Fairlie and Fossen 2022; Liu and others 2022). Other related papers on firm productivity and the COVID-19 crisis include Kozeniauskas, Moreira, and Santos (2020) who analyze data from a survey of Portuguese firms conducted between April and July 2020, showing that higher productivity firms were more likely to remain open and less likely to cut employment. Using data from a survey of UK firms collected between July 2020 and August 2021, Bloom and others (2021) also show that higher productivity firms contracted hours worked less than lower productivity firms. Focusing on firm exit, Muzi and others (2022) use ES data for 31 countries and find that higher productivity firms were less likely to exit during the COVID-19 crisis.

Second, we investigate the role of the competition environment in the process of reallocation during the crisis. When markets are competitive, they do a better job of allocating resources toward more productive firms (Arnold, Nicoletti, and Scarpetta 2011; Brown and Earle 2002; Caballero 2008), which may be particularly relevant in a crisis. For example, in countries with a weak competition environment, market power and political connections, instead of productivity, may influence which firms do better during a crisis. Weak competition can also limit innovation and the ability to respond to shocks. Evidence from the United States suggests that firms respond more sluggishly to shocks now than they did decades ago, and regulatory barriers to business entry and expansion are important reasons for the increased sluggishness (Barrero, Bloom, and Davis 2020). We use the Bertelsmann Stiftung Transformation Index for 2019 to measure a country's competition environment – and several alternative measures in our robustness checks – and interact this index with pre-COVID-19 labor productivity in our analysis, controlling for firm size.

Third, our paper contributes to the literature that studies how economic crises more broadly defined affect the reallocation of economic activity between firms. Studies of earlier economic crises have found mixed evidence on reallocation of economic activity from less to more productive firms. Foster, Grim, and Haltiwanger (2016) study establishment-level data from the US Census Bureau for 1981 to 2010. They find increased reallocation from less productive to more productive establishments in recessions prior to the Great Recession, but the cleansing impact of earlier recessions attenuated during the Great Recession. Similarly, Hallward-Driemeier and Rjikers (2013) use Indonesian manufacturing census data from 1991 to 2001 to show that more productive firms were less likely to exit before the East Asian crisis, but this relationship weakened during the crisis. Using data for Colombian manufacturing firms from 1995 to 2004, Eslava and others (2010) show that credit constraints can limit the reallocation of economic activity from less to more productive firms during a financial crisis. We ask how reallocation during the COVID-19 crisis compares with

reallocation during the pre-crisis period. We use additional data from the 2019 ES to study the relationship between labor productivity in 2017 and growth of sales and employment between 2017 and 2018 and compare the findings with our results on reallocation during the COVID-19 crisis.

Fourth, our paper contributes to the nascent literature on the implications of government support measures enacted in the wake of the COVID-19 pandemic. Preliminary evidence from the literature suggests that government support measures helped firms weather the crisis and decreased the failure rates of SMEs (Albagli, Fernández, and Huneeus 2021; Cespedes, Chang, and Velasco 2021; Cirera and others 2021; Dörr, Licht, and Murmann 2022; Gourinchas and others 2021). However, there is little evidence on whether the support was allocated to the most viable firms. We examine what type of firms received government support during the COVID-19 crisis and assess whether the distribution of support measures may have hampered competition and slowed the recovery process. Many governments implemented broad support schemes to address the initial economic fall-out from the COVID-19 crisis and preserve jobs and firm-specific intangible capital (World Bank 2021b). The large economic shocks required quick action, making it difficult to target government support. The ES COVID-19 Follow-up Surveys show that the reach of government support measures varied widely across countries, but on average half the firms in our sample reported having received some government support during the pandemic.

Our findings can be summarized as follows:

–   The results show smaller firms were hit harder by the crisis and that economic activity was reallocated toward more productive firms during the COVID-19 crisis. Firms with high pre-crisis labor productivity experienced smaller drops in sales and employment than firms with low pre-crisis labor productivity. More productive firms were also more likely to adapt to the crisis by increasing remote work.
–   Countries with a strong competition environment experienced more reallocation from less productive to more productive firms than countries with a weak competition environment. This result is robust to using alternative measures of the competition environment. In countries with high competition, firms at the 10th percentile of the pre-crisis labor productivity distribution experienced an 18 percentage point larger drop in sales than firms at the 90th percentile; this difference is only 10 percentage points in countries with low competition. Similarly, in countries with high competition, firms in the 10th percentile of the labor productivity distribution were 15 percentage points more likely to decrease employment and 16 percentage points more likely to anticipate falling into arrears than firms in the 90th percentile. The corresponding differences in countries with low competition were 5 and 8 percentage points, respectively. In countries with high competition, the lowest productivity firms were 19 percentage points less likely to have increased remote work than the highest productivity firms; this difference was only 5 percentage points in countries with low competition.

- Investigating how reallocation during the COVID-19 crisis compares with pre-crisis reallocation, we find that the relationship between productivity and employment growth was stronger during COVID-19. More productive firms experienced lower sales growth than less productive firms pre-COVID-19, a pattern that was reversed during the crisis. Compared with less productive firms, more productive firms experienced higher employment growth pre-crisis, but to a lesser or equal extent than during the crisis. These findings are subject to the caveat that there are some limits to the comparability of the growth rates of sales and employment.

- Examining the determinants of receiving government support, we have three main findings. First, productive firms were less likely to receive any type of government support, even controlling for the drop in sales or employment experienced by the firm. Second, not only were smaller firms more adversely impacted by the COVID-19 crisis than larger firms, but smaller firms were also less likely to receive some types of government support than larger firms, even after controlling for firm productivity. This result could indicate that support was more likely to go to politically connected firms. Third, governments provided support to firms regardless of their pre-crisis level of innovation.

The paper is organized as follows. Section 2 presents the data and summary statistics. Section 3 describes the empirical strategy. Section 4 discusses the main results. Section 5 includes several robustness checks, and section 6 concludes.

2. Data and summary statistics

2.1 Enterprise surveys data

To measure firm performance and government support received during the COVID-19 crisis, we use data from the ES COVID-19 Follow-up Surveys.[2] The World Bank has collected one or two rounds of these surveys in 44 countries starting in May 2020. We use the latest available survey round for a country as of June 28, 2021. We conduct our main analysis on a sample of 23 emerging markets and developing countries in ECA to focus on a homogenous environment (see Table A1). The latest available surveys were completed between June 2020 and February 2021 for this sample of 23 countries. As a robustness check, we replicate the results for a global sample of 30 emerging and developing countries with the latest available surveys completed within the same time period (see Section 5.4).

The sampling frame for the ES COVID-19 Follow-up Surveys includes all firms that replied to the latest pre-COVID-19 ES, making it possible to link performance during the COVID-19 pandemic back to firm characteristics collected through the ES. The ES cover formal (registered) firms with five or

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2   More information on the ES COVID-19 Follow-up Surveys is available at https://www.enterprisesurveys.org/en/covid-19.

more employees and are designed to be nationally representative for the manufacturing and service sectors. For the countries in our sample, the most recent ES was conducted in 2019 or early 2020.[3]

The ES COVID-19 Follow-up Surveys ask firms about changes in performance during the crisis, as well as expectations for the next months. Table A2 provides the definitions of the variables included in our analysis. Table 1 presents the summary statistics. The number of observations varies across variables due to nonresponse. Firms reported that their sales dropped by an average of 24 percent during the COVID-19 crisis. The decline in the number of permanent full-time workers (13 percent) was more muted than the drop in sales, a pattern that was also observed by Apedo-Amah and others (2020). They argue that firms reduced their workforces proportionally less than their drop in sales in part because they relied on other mechanisms to adjust output and labor costs, including granting leave, reducing hours, and lowering wages.

Close to 34 percent of the firms have decreased their number of workers since December 2019. About 26 percent reported that they anticipated falling into arrears on outstanding liabilities in the next six months. To respond to the crisis, 28 percent of the firms started or increased online business activity, and 34 percent started or increased remote work arrangements.

The ES COVID-19 Follow-up Surveys also include questions on government support received during the pandemic. Governments in ECA enacted numerous measures to support firms, and many were directed to SMEs, according to the World Bank's SME-Support Measure Dashboard.[4] The five most common types of measures were new credit (26 percent of measures), fiscal relief (20 percent), wage subsidies (17 percent), payment deferrals (12 percent), and cash grants (7 percent). These five types of measures are also the ones captured in the ES COVID-19 Follow-up Surveys. These surveys show that the measure reaching by far the largest number of firms was wage subsidies, with 36 percent of firms receiving such subsidies (Table 1). The second most wide-reaching measure was cash transfers, followed by fiscal relief and payment deferrals. Although new credit was the most used measure, according to the World Bank's SME-Support Measure Dashboard, it reached only 5 percent of the firms. Altogether, 45 percent of the firms reported receiving some type of government support.

From the pre-COVID ES, we obtain our measure of productivity, as well as firms' background characteristics. We use labor productivity, defined as (log of) sales over total number of permanent full-time employees.[5] Labor productivity is preferred to total factor productivity due to limitations in measuring non-labor inputs in the ES (World Bank 2021a). Panel B in Table 1 displays summary statistics for the pre-COVID ES data. The average firm in our sample had 31 employees (2.65 in log units)

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3   For most countries, the surveys were completed before March 2020. For Romania, 92 percent of the interviews were completed before March 2020. Our results are similar when we exclude the 8 percent of observations from Romania that were collected in or after March 2020.

4   See https://dataviz.worldbank.org/authoring/SME-COVID19/Overview.

5   In calculating labor productivity, the outliers are eliminated by first log-transforming total annual sales and the number of permanent full-time employees, and then trimming at plus and minus three standard deviations from the mean, as described in World Bank (2021a).

and was 19 years old (2.79 in log units). About 98 percent of firms in the sample are SMEs. Only 21 percent of the firms had a female top manager. The sample includes few firms with at least 10 percent state or foreign ownership (1 and 8 percent, respectively). Less than half the firms reported that they innovated a product or process during 2017 to 2019 (40 percent) or had a loan (40 percent), but 65 percent owned a website. Most firms reported that their main market was local (44 percent) or national (44 percent) versus international (12 percent). Slightly over half the firms are in the service sector (53 percent), followed by manufacturing (26 percent) and retail (21 percent).

To examine how reallocation from less productive to more productive firms during the COVID-19 crisis compares with pre-crisis reallocation, we use additional data from the latest pre-COVID-19 ES. These surveys collected sales and employment data for the year of the survey (typically 2019) and two years prior (typically 2017). We calculate labor productivity for 2017, following the same procedure as for 2019. We extrapolate 2018 sales and employment as the simple average of the 2017 and 2019 values, to then calculate one-year growth rates, which are comparable to the sales and employment growth rates collected in the ES COVID-19 Follow-up Surveys.

Table 1 shows that the average log of labor productivity in 2017 was only slightly lower than in 2019 (10.47 and 10.51, respectively). On average, firms experienced positive sales growth from 2017 to 2018, at a rate of 9.21 percent. Employment also grew on average, but at a lower rate than sales (4.07 percent).

2.2 Competition environment

We use one main measure of the competition environment and report results for additional measures in the section on robustness checks. Our main measure of market organization is the 2020 Bertelsmann Stiftung Transformation Index (BTI), which surveys political and economic transformation around the world based on expert opinion for 2019. The measure captures the extent to which the fundamentals of market-based competition have been developed, with a maximum score (10) indicating that "market competition is consistently defined and implemented both macroeconomically and microeconomically. There are state-guaranteed rules for market competition with equal opportunities for all market participants. The informal sector is very small" (BTI 2020, 27). The minimum score (1) indicates that "market competition is present only in small segments of the economy and its institutional framework is rudimentary. Rules for market participants are unreliable and frequently set arbitrarily. The informal sector is large" (BTI 2020, 27).

We use three additional measures of the competition environment in the section on robustness checks. The first alternative measure is BTI competition policy, which captures the extent to which safeguards exist to protect competition and are enforced, with the maximum score (10) indicating that "comprehensive competition laws to prevent monopolistic structures and conduct exist and are strictly enforced" (BTI 2020, 28). A score of 1 indicates that "no legal or political measures are taken to

prevent monopolistic structures and conduct" (BTI 2020, 28). As such, it is a more narrowly defined measure of the competition environment.

The average score for ECA is 7 for BTI market organization and 8 for competition policy, with significant variation across countries (Table 2). For BTI market organization, a score of 7 corresponds to an assessment that "market competition has a strong institutional framework, but the rules for market competition are not consistent or always uniform for all market participants. The informal sector is small" (BTI 2020, 27). For BTI competition policy, a score of 7 signifies that "competition laws to prevent monopolistic structures and conduct exist, but are enforced inconsistently" (BTI 2020, 28). The Czech Republic, Estonia, and Slovenia all achieve the maximum score of 10 for both BTI measures. Croatia, Latvia, Lithuania, and Poland achieve a score of 10 for the competition policy measure. The competitive environment is least developed in Azerbaijan, which scores poorly (4) on both BTI measures. Belarus scores similarly poorly on market organization.

We use BTI market organization data for 2017 when examining reallocation in pre-crisis times. Overall, the scores are similar to the ones in 2019, with an average score of 7 for ECA and a similar pattern of variation across countries. The Czech Republic and Estonia achieve the maximum score of 10, while Azerbaijan and Belarus score poorly (4).

We also use two proxy measures for the size and influence of the state in the economy as alternative competition variables since they may influence the competition environment. Specifically, countries in which the state plays a relatively large and influential role in the economy may be less conducive to entrepreneurship and productive activity resulting in weaker competition environments (Shleifer and Vishny 1998). One proxy is the share of public sector employees in total employment, from the Worldwide Bureaucracy Indicators (World Bank 2020b).[6] This share averages 23.6 percent in ECA and ranges from 13.5 percent in Romania to 39.3 percent in Belarus.

The other proxy is the share of public banks in total banking sector assets, available from Anginer, Demirgüç-Kunt, and Mare (2020). A public bank is defined as a commercial bank in which the state has more than 50 percent ownership stake. A large body of literature suggests that public banks may be subject to government influence and that their existence may distort credit allocation, introducing inefficiencies (World Bank 2012). The 12 percent average for the region masks huge variation across countries. The share is as high as 66 percent in the Russian Federation and 64 percent in Belarus, but the share is 0 in 10 of the 23 countries in the sample.

Finally, in the section on robustness checks, we use log gross domestic product (GDP) per capita for 2019, from the World Bank's World Development Indicators database, to test whether the competitive environment just captures the level of economic development. On average, the ECA countries in our

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6   Local sources were used where Worldwide Bureaucracy Indicators were not available or outdated
    (Armenia, Azerbaijan, Belarus, Montenegro, North Macedonia, and the Russian Federation).

sample have a GDP per capita of about US$10,400 (9.25 in log units), ranging from about US$4,500 (8.14 in log units) in Moldova to about US$26,000 (10.16 in log units) in Slovenia.

3. Empirical strategy

3.1 Firm performance, productivity, and competition

We examine the relationship between firms' pre-crisis labor productivity and firm performance during the crisis by estimating the following regression specification:

$$
\begin{aligned}
Firm\,performance_{ijk} &= \beta_0 + \beta_1\,Productivity_{ijk} + \beta_2\,Productivity_{ijk}\,x\,Competition_k \\
&\quad + \beta_3\,FirmCharacteristics_{ijk} + S_j + C_k + \varepsilon_{ijk}
\end{aligned} \tag{1}
$$

where subscript i denotes each firm; j the sector of the firm; and k the country in which the firm is located. Similar specifications have been used by Kozeniauskas, Moreira, and Santos (2020) and Muzi and others (2022) to assess the impact of COVID-19 on firm performance. The dependent variable *Firm performance* is captured by one of six variables: percentage change in sales; percentage change in employment; decreased employment; anticipate falling into arrears; increased online activity; and increased remote work. We estimate all regressions using ordinary least squares. We chose a linear probability model since it is simpler than a nonlinear model and tends to yield similar marginal effects as a nonlinear model (Angrist and Pischke 2009). In addition, the interpretation of interaction terms is less clear in a nonlinear model (Ai and Norton 2003).[7]

Our two main variables of interest are *Productivity* and *Productivity x Competition*, an interaction term between labor productivity and country-level measures of competition, to examine whether the relationship between labor productivity and firm performance during the crisis varied with market competition. *Productivity* is proxied by pre-COVID-19 labor productivity, measured by sales per worker. *Competition* is captured by the variable BTI market organization (and additional variables in the robustness section). The country-level measures of competition are de-meaned, so that a value of zero corresponds to the average value of competition across countries. The coefficient of labor productivity in Table 3 thus represents the relationship between productivity and firm performance for a country with the average value of competition.

Firm Characteristics is a vector of firm-level controls and includes size (number of employees), age, gender of the top manager, innovated a product or process during 2017–19, state ownership, foreign ownership, line of credit or loan, owns a website, and location of main market (local, national, or international). The set of firm characteristics comprises a standard set of variables related to a firm's performance during crisis.[8] On the one hand, larger and older firms may weather a crisis better because

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7   Our results are similar if we use a probit model to estimate the regressions with binary outcome variables.
8   See, for example, Muzi and others (2022).

they are more established and have more resources, financial and organizational, to do so. They may also have strong political connections. On the other hand, smaller and younger firms may be nimbler and can thus more easily adjust their operations when faced with a crisis. More innovative firms may be more likely to adapt during a crisis. Firms with state or foreign ownership may be more resilient to crises by having access to more resources, connections, or know-how. At the same time, state ownership may make firms less adaptable in times of crisis. Firms with a line of credit or loan pre-crisis may have easier access to finance during a crisis, allowing them to mitigate its impacts. We control for the gender of the top manager as Liu, Wei, and Xu (2021) document that women-led businesses were more likely to close, close for a longer period, and anticipate falling into arrears than men-led businesses during the COVID-19 pandemic. We also control for owning a website. Wagner (2021) shows that firms with a website were more likely to survive during the pandemic, potentially because having an online presence allows firms to be in contact with potential customers even when in-person contact is restricted.

Finally, we control for the location of the firm's main market (local, national, or international) as movement restrictions due to the pandemic might have impacted firms with different main markets differently. Moreover, export-oriented firms may have been able to substitute sales at home with sales abroad during the negative demand shock at home given that, while global in scale, the COVID-19 crisis affected countries differently (Muzi and others 2022). Similarly, firms whose main market is national rather than local may have substituted sales as the COVID-19 crisis often affected regions within a country differently.

The variables S and C represent sector and country fixed effects, respectively.[9] The error term ε is clustered at the country level. The specification is estimated using sampling weights provided in the ES COVID-19 Follow-up Surveys to correct for unequal probability of selection as well as ineligibility. We rescale the sampling weights to give equal weight to all countries since the focus of our analysis is on competition, which is measured at the country level.

A potential challenge in our analysis of the relationship between firms' pre-crisis labor productivity and performance during the pandemic is endogeneity. Firm performance during the crisis might influence a firm's labor productivity. For example, George and others (2022) suggest that working remotely increases employees' self-reported productivity. As noted by Muzi and others (2022), the fact that all our explanatory variables, including labor productivity, come from the matched pre-COVID-19 ES data set should alleviate concerns about reverse causality.

It is also worth noting that firm performance as measured by increased remote work might be influenced by the prevalence of remote work pre-COVID-19, which Milasi and others (2021) show

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9   We chose to include country fixed effects since they control for differences in the economic and institutional environment across countries more broadly than including only certain country characteristics as controls. Our results are similar when we don't use country fixed effects and instead control for the main effect of competition, as well as measures of the economic and institutional environment: Log (GDP per capita), Doing Business indicators measuring various aspects of the business environment, and the BTI governance index.

varied considerably across countries and across sectors. The country and sector fixed effects included should alleviate concerns about biased results.

Another potential challenge is that a country's competitive environment may be correlated with other country characteristics that could influence the reallocation of economic activity from less to more productive firms. In addition to including alternative measures of competition (see Section 2.2), we therefore interact productivity with log GDP per capita instead of our measures of competition as a robustness test to check whether we just capture the level of economic development.

3.2 Government assistance, productivity, and firm characteristics

We examine the relationship between receiving any government assistance or different types of government assistance and firm characteristics by estimating the following regression specification:

$$
\begin{aligned}
Government\ Assistance_{ijk} \\
= \beta_0 + \beta_1\ Productivity_{ijk} + \beta_2\ FirmCharacteristics_{ijk} + S_j + C_k + \varepsilon_{ijk}
\end{aligned}
\tag{2}
$$

where subscript i denotes each firm; j is the sector of the firm; and k is the country in which the firm is located. The dependent variable is *Government Assistance* received by a firm, which is captured by one of six binary variables: received any government support and types of government assistance received (cash transfer, payment deferrals, new credit, fiscal relief, or wage subsidies). We estimate the regression using ordinary least squares.

Here our main variable of interest is *Productivity*, which is proxied as in specification (1) by pre-COVID-19 labor productivity, measured by sales per worker. *Firm Characteristics* is the same vector of firm-level controls as above, as we expect the firm characteristics that are correlated with firm performance during the COVID-19 crisis to be correlated with receiving government assistance to weather the crisis. The variables S and C represent sector and country fixed effects, respectively, and ε is the error term, which is clustered at the country level. The specification is estimated using rescaled sampling weights provided in the ES COVID-19 Follow-up Surveys to correct for unequal probability of selection and ineligibility.

The challenge in our analysis of the relationship between government assistance, productivity, and firm characteristics is that the data do not include detailed information on when exactly firms received government support, making it difficult to assess whether government support may have influenced firm performance. Furthermore, although we know which firms received government assistance, we do not know the criteria that made these firms eligible for such support. We also do not know how much government assistance firms receive which may influence the relationship between government assistance and firm productivity (Dvoulety and others 2021). As a robustness check, we include additional controls for the percentage change in

sales and employment, to control for the possibility that the firms that were impacted the most were more likely to receive support.

4. Results

4.1 Reallocation from less productive to more productive firms

The evidence in this section suggests that economic activity in ECA was reallocated toward more productive firms during the crisis, consistent with creative destruction. Table 3 displays the results of estimating equation 1. The coefficients on labor productivity show that firms with high pre-crisis labor productivity experienced statistically significantly smaller drops in sales and employment than firms with low pre-crisis labor productivity. More productive firms were also less likely to anticipate falling into arrears and more likely to adapt to the crisis by increasing remote work.

The magnitudes of the coefficients on labor productivity in Table 3 reveal that firms in the 10th percentile of the pre-crisis labor productivity distribution experienced a 13 percentage point larger drop in sales and a 9 percentage point larger drop in employment than firms in the 90th percentile.[10] Firms in the 10th percentile were also 11 percentage points less likely to have increased remote work than firms in the 90th percentile. Firms in the 10th percentile of the pre-crisis labor productivity distribution were 11 percentage points more likely to anticipate falling into arrears than firms in the 90th percentile.

Table 3 further shows that smaller firms were hit harder by the crisis. Firms in the 10th percentile of the pre-crisis employment distribution (1.61 log units, as shown in Table 1, corresponding to 5 employees) experienced an 8 percentage point larger drop in sales and a 5 percentage point larger drop in employment than firms in the 90th percentile (4.09 log units, corresponding to 60 employees).[11] Smaller firms were also more likely to anticipate falling into arrears and less likely to increase remote work than larger firms.

The results in Table 3 also indicate that firms with female top managers were hit harder by the crisis than firms with male top managers. State-owned firms experienced smaller drops in sales than privately-owned firms, although this is only statistically significant at the 10 percent level. A more significant difference appears in state-owned firms' lower ability to adjust to the crisis by increasing online activity and remote work. Firms that were more innovative in the pre-crisis period continued to innovate during the crisis, since they were more likely to increase their online activity and remote

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10   The 10th percentile of log labor productivity is 8.87, whereas the 90th percentile is 12.04 (Table 1). We multiply the difference between these two (3.18) by the coefficients on log labor productivity in Table 3 (4.138 and 2.776), to obtain a 13 percentage point difference in the change in sales and a 9 percentage point difference in the change in employment.
11   We multiply the difference between 4.09 and 1.61 (2.48) by the coefficients on log number of employees in Table 3 (3.117 and 1.907), to obtain an 8 percentage point difference in the change in sales and a 5 percentage point difference in the change in employment.

work. Finally, firms that primarily sell to the national market did better than firms that sell to the local market, and those with access to international markets were better able to increase remote work and anticipated lower arrears.

4.2 The role of competition

The importance of competition has been evident during the COVID-19 crisis. The coefficients on the interaction terms in Table 3 show how the relationship between labor productivity and firm performance depends on market competition. For example, the positive coefficient on "Log(labor productivity) * BTI market organization" in the first column in Table 3 indicates that the relationship between labor productivity and the drop in sales was stronger in countries with greater competition.

Overall, the coefficients on the interaction terms in Table 3 suggest that in ECA countries with more competitive markets, there was more reallocation of economic activity from less productive to more productive firms.

Figure 1 illustrates the findings from Table 3. In countries with high competition, the relationship between labor productivity and firm performance during the crisis is steeper than in countries with low competition. In countries with high competition, firms at the 10th percentile of the pre-crisis labor productivity distribution experienced an 18 percentage point larger drop in sales than firms at the 90th percentile; this difference is only 10 percentage points in countries with low competition. Similarly, in countries with high competition, firms in the 10th percentile of the labor productivity distribution were 15 percentage points more likely to decrease employment and 16 percentage points more likely to anticipate falling into arrears than firms in the 90th percentile. The corresponding differences in countries with low competition were 5 and 8 percentage points, respectively. In countries with high competition, the lowest productivity firms were 19 percentage points less likely to have increased remote work than the highest productivity firms; this difference was only 5 percentage points in countries with low competition.

4.3 Reallocation Pre-COVID-19

We now examine how reallocation during the COVID-19 crisis compares with pre-crisis reallocation. Panel A in Table 4 replicates the regressions in the first two columns in Table 3 for the pre-COVID-19 period. The specification here includes fewer controls since most of the controls in Table 3 were not collected for 2017. We control for number of employees, firm age, and sector.[12] To facilitate the comparison of the pre-COVID-19 and during COVID-19 effects, panel B in Table 4 shows the regressions from Table 3 with the reduced set of controls.

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12   We assume that the sectors did not change between 2017 and 2019.

The results in panel A in Table 4 show that more productive firms experienced lower sales growth pre-COVID-19, but they experienced higher employment growth. Comparing panels A and B, we find that the relationship between productivity and employment growth was weaker pre-COVID-19 than during COVID-19. This finding is subject to the caveat that the growth rates of employment do not always cover the same period since the growth rate during the pandemic is relative to employment in December 2019 and the ES COVID-19 Follow-up Surveys were conducted in different months during 2020 and 2021 (see Table A1). Nevertheless, unlike studies that compare reallocation during previous crises to non-crisis times in the United States and Indonesia (Foster, Grim, and Haltiwanger 2016; Hallward-Driemeier and Rjikers 2013), we find no evidence that reallocation of sales and employment from less to more productive firms decreased during COVID-19. On the contrary, this reallocation in ECA appears to have increased during COVID-19.

Other notable results in Table 4 are that younger and smaller firms in ECA grew faster pre-COVID-19 (consistent with the findings of Ayyagari, Demirguc-Kunt, and Maksimovic (2020) and Haltiwanger, Jarmin, and Miranda (2013)), while larger firms performed better than small firms and age was not correlated with growth during the pandemic. Countries with more competitive markets experienced more reallocation from less productive to more productive firms during COVID-19 but not before COVID-19.

4.4 Government assistance and firm characteristics

Table 5 shows the results from estimating equation 2 to examine the correlates of receiving government assistance. Three main findings emerge from this analysis.

First, more productive firms were less likely to receive any type of government support. Firms in the 10th percentile of the pre-crisis labor productivity distribution were 8 percentage points more likely to receive government support than firms in the 90th percentile. This result is consistent with Kozeniauskas, Moreira, and Santos (2020), who find that higher productivity firms in Portugal were less likely to receive government support, controlling for age, total income, and an indicator for whether the firm is located in the Lisbon region.

Second, smaller firms were less likely than larger firms to receive payment deferrals and fiscal relief. Firms in the 10th percentile of the pre-crisis employment distribution were 2 percentage points less likely to receive payment deferrals and 4 percentage point less likely to receive fiscal relief than firms in the 90th percentile. These differences are substantial when compared to the overall percentage of firms that received payment deferrals (8 percent, as shown in Table 1) and fiscal relief (9 percent). This result is in line with Cirera and others (2021), who find that across 60 countries, support was more limited for smaller firms than larger firms. This finding could indicate that

support was more likely to go to politically connected firms, which tend to be much larger than firms that are not politically connected. Before COVID-19, politically connected firms were more likely to receive subsidies (Francis, Hussain, and Schiffbauer 2018).

Third, pre-crisis innovation is not correlated with receiving any type of government support. Table 5 further shows that firms with a female top manager, firms that had a line of credit or loan, and firms that own a website were more likely to receive government support.

Taken together, we find that the broad support governments provided disproportionately went to less productive and larger firms, irrespective of their pre-crisis innovativeness. Less productive firms that stay in the market with the help of government support can stifle innovation and productivity growth in the recovery phase and beyond. The provision of more support to large firms can also increase industry concentration and market power.

5. Robustness checks

5.1 Measurement of competition

A challenge when estimating equation 1 is that competition is likely correlated with other country characteristics that could also influence reallocation from less to more productive firms. That is, the interaction term in equation 1 may not specifically capture the role of competition; it may capture the role of other characteristics, such as the level of economic development.

We conduct two robustness checks to address this concern. First, we show that our findings are similar when using three alternative measures of the competitive environment. Table A3 shows the results of estimating equation 1 when using the BTI competition policy measure. The coefficients on the interaction terms are similar to using the BTI market organization measure but only statistically significant for decreased employment and anticipating falling into arrears.

Public sector employment and ownership of banks can also affect competition. The results for these two measures are reported in Tables A4 and A5, respectively. Labor markets may be less competitive and dynamic when the share of public sector employment is high. Using the share of public employment as a proxy for competition reveals that a larger share of employment in the public sector was associated with reduced reallocation from lower productivity to higher productivity firms during the COVID-19 crisis. Public ownership of banks can limit dynamism in the economy by leading to less efficient allocation of credit. The coefficients on the interaction terms suggest that reallocation from lower productivity to higher productivity firms during the COVID-19 crisis was lower in countries with a larger share of government-owned banking sector assets.

Second, we use log GDP per capita instead of the BTI in the interaction term with labor productivity to test whether the BTI measures of competition just capture the level of economic development. The results in Table A6 provide little evidence that reallocation from less to more productive firms was greater in countries with higher GDP per capita. The interaction term is only statistically significant at the 10 percent level for one outcome variable: decreased employment. Higher productivity firms were less likely to decrease employment in countries with higher GDP per capita. However, GDP per capita does not mediate the correlation between productivity and change in sales, anticipation of falling into arrears, or probability of increased remote work.

The robustness checks in Tables A3 to A6 thus suggest that competition instead of economic development more broadly played a role in increasing reallocation from less to more productive firms during the COVID-19 crisis.

5.2 Controlling for the severity of COVID-19 restrictions

Another identification concern is that measures of competition may be correlated with a country's response to the crisis. For example, movement restrictions may have been more stringent in countries with a more competitive environment. We thus run a robustness test where we add an interaction term of labor productivity and a COVID-19 restrictions index to the specification in Table 3. Here, COVID-19 restrictions are measured by the number of days the Oxford COVID-19 Government Response Tracker's Stringency Index—which captures the strictness of "lockdown-style" policies that primarily restrict people's behavior along nine dimensions ranging from 0 to 100, with higher values indicating more restrictions[13]—was above 70 preceding the fieldwork start day of the ES COVID-19 Follow-up Surveys module in each country. Table A7 shows the results. The sample is smaller than in Table 3 because the COVID-19 restrictions index is not available for Armenia, Montenegro, and North Macedonia. Most of the main results in Table A7 are similar to those in Table 3, with the exception that the interaction of labor productivity and the BTI market organization measure is not statistically significantly correlated with the probability of increasing remote work. Thus, overall, the relationship between competition and reallocation from less to more productive firms during the crisis is not driven by differences in COVID-19 restrictions across countries.

5.3 Endogeneity of government assistance and productivity

A potential source of endogeneity when estimating the relationship between government assistance and productivity in Table 5 is that more productive firms may have been less likely to receive government support than less productive firms since the former experienced smaller drops in sales and employment. The ES data do not include detailed information on when firms received government support, making it difficult to assess whether a drop in sales/employment or

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13 Details on how the index is calculated are available at https://github.com/OxCGRT/covid-policy-tracker/blob/master/documentation/index_methodology.md.

government support came first. This timing issue is the reason why we do not control for drop in sales or employment in equation 2 (which we estimate in Table 5).

However, we conduct robustness checks where we add change in sales or employment to equation 2. The results are in Tables A8 and A9. They show that firms with larger drops in sales were more likely to receive government support, but for a given change in sales or employment, firms with lower labor productivity were still more likely to receive support.

5.4 Global sample

To examine whether our findings are specific to ECA countries, we replicate Tables 3 and 5 for the global sample of 30 countries for which all the data we use are available, thus adding seven countries outside ECA (listed in panel B in Table A1). This sample includes all countries for which pre-COVID ES data are available for 2018 to 2020 (with fieldwork completion dates in 2019 to 2020). While ES data are available for five additional countries (Cyprus, Greece, Italy, Malta, and Portugal), these countries are not covered by the BTI competition measure.

Table A10 replicates Table 3 with the global sample, and Table A11 replicates Table 5. Most of the main findings are similar. The global data show that economic activity was reallocated from less productive to more productive firms during the COVID-19 crisis. This reallocation was greater in countries with more competitive markets (Table A10). Government support went to firms with lower labor productivity, irrespective of their innovativeness (Table A11). The only different main finding in the global sample is that firm size is not correlated with the probability of receiving government support.

6. Conclusion

We use ES data to show that during the COVID-19 crisis, smaller firms were hit harder, and economic activity was reallocated toward more productive firms. More productive firms were also more likely to adapt to the crisis by increasing remote work. These findings suggest that the COVID-19 crisis has resulted in "creative destruction." However, as of June 2021, even highly productive firms reported losses in sales and employees (although these were smaller in magnitude than for low-productivity firms). Thus, the crisis will have a silver lining only if the release of resources by low-productivity firms is followed by increased growth in more productive firms during the recovery (Caballero and Hammour 2005).

We find that reallocation from low- to high-productivity firms was greater in countries with more competitive markets. This result is consistent with the previous literature showing that competitive markets are better at allocating resources toward more productive firms (Arnold, Nicoletti, and Scarpetta 2011; Brown and Earle 2002; Caballero 2008).

We also find that reallocation of sales and employment from low- to high-productivity firms during the COVID-19 crisis was stronger compared with pre-crisis times. This finding is subject to the caveat that there are limits to the comparability of the growth rates of employment for the two periods. Nevertheless, these results contrast with previous studies that find that reallocation from less to more productive firms during recent (non-COVID-19) crises was weaker than during non-crisis times (Foster, Grim, and Haltiwanger 2016; Hallward-Driemeier and Rjikers 2013).

Many governments implemented broad policy support schemes to address the economic fall-out from the COVID-19 crisis promptly and provide immediate relief to protect firms and workers from the worst effects. These government support measures and some exemptions to competition law and policies may be appropriate if they are temporary and designed to minimize the disruptive effects they can have on competition (Akcigit and others 2021; Pop and Amador 2020). Our analysis suggests that the government support measures implemented in ECA may have adverse effects on competition and productivity growth since they went to less productive and larger firms, regardless of their pre-crisis innovation.

Government policy measures aimed at supporting firms through the economic fall-out of the pandemic have also reignited concerns about propping up so-called "zombie firms"—firms that are unprofitable but remain in operation only because of cheap credit and debt forbearance (ECB 2021). Zombie firms may reduce economywide productivity by crowding out resources for new, more productive firms. In the wake of the global financial crisis, low interest rates and weak insolvency frameworks contributed to a significant increase in the share of zombie firms in several European countries (Acharya and others 2020). Government support measures enacted in response to the pandemic may have further increased that share.

As economies enter the economic recovery phase, it will be important for policy makers to phase out policy support measures as soon as appropriate and focus on fostering a competitive business environment while continuing to protect vulnerable households. Such an environment is key to a strong recovery, resilience to future crises, and sustainable, long-term economic growth.

An avenue for future research is to investigate the effects of government policy measures during the COVID-19 crisis on medium and long run firm performance. This research could shed light on whether the support measures had adverse effects on productivity growth, as suggested by our finding that support was more likely to go to less productive firms. A related question is whether the support measures have indeed propped up zombie firms as feared by some observers. Finally, to help inform the government response to future crises, researchers could try to examine the relative merit of firm support measures compared to financial support targeting employees and consumers.

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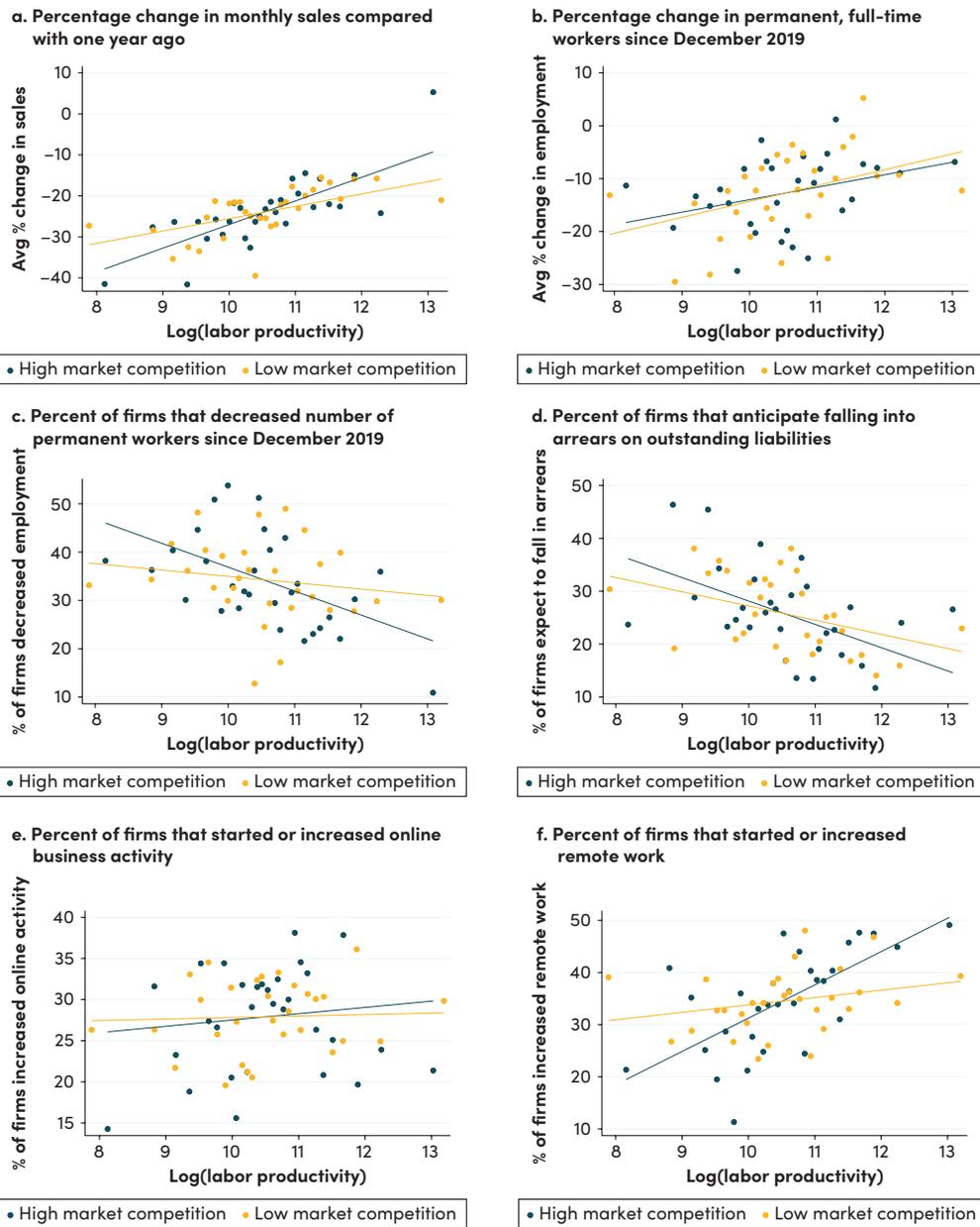
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Figures and tables

FIGURE 1. Firm performance, labor productivity, and BTI market organization index

a. Percentage change in monthly sales compared with one year ago

● High market competition ● Low market competition

b. Percentage change in permanent, full-time workers since December 2019

● High market competition ● Low market competition

c. Percent of firms that decreased number of permanent workers since December 2019

● High market competition ● Low market competition

d. Percent of firms that anticipate falling into arrears on outstanding liabilities

● High market competition ● Low market competition

e. Percent of firms that started or increased online business activity

● High market competition ● Low market competition

f. Percent of firms that started or increased remote work

● High market competition ● Low market competition

Sources: Authors' calculations based on the most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Bertelsmann Stiftung Transformation Index (BTI) 2020.

Note: Low or high market competition is defined as having a BTI market organization rating below or above the median across countries. BTI market organization is based on responses to the question: "To what level have the fundamentals of market-based competition developed?" The figure shows average values in 30 percentiles of log(labor productivity)—that is, the average *y*-value plotted against the average productivity in a bin/percentile range of productivity. The plots control for number of employees, firm age, gender of the top manager, innovation, state ownership, foreign ownership, access to credit or loan, ownership of a website, location of the main market (local, national, or international), sector, and country fixed effects—that is, both the *y*- and *x*-axis variables are residuals (with the mean added back in). The lines are estimated using the underlying data, not binned data, equivalent to estimating equation 1, but with high/low competition dummies (two interaction terms with productivity) instead of a continuous variable interaction term.

TABLE 1. Summary statistics from enterprise surveys data

Variable	Obs	Mean	SD	p10	p90	Min	Max
A. Enterprise Surveys COVID-19 Follow-up							
Percentage change in monthly sales relative to one year earlier	7,851	−23.98	33.38	−70.00	0.00	−100.00	300.00
Percentage change in number of permanent full-time workers since December 2019	6,860	−12.73	42.35	−60.87	13.33	−200.00	200.00
Reduced number of permanent full-time workers since December 2019	7,855	34.28					
Anticipate falling into arrears on outstanding liabilities in the next 6 months	7,497	25.77					
Started or increased online business activity	8,168	27.91					
Started or increased remote work arrangements for workforce	8,078	34.49					
Received government support	8,124	44.75					
Type of government support received							
Cash transfer	8,093	10.93					
Payment deferrals	8,088	7.92					
New credit	8,084	4.84					
Fiscal relief	8,081	8.98					
Wage subsidies	8,108	36.45					
B. Enterprise Surveys Baseline							
Log(labor productivity)	8,234	10.51	1.27	8.87	12.04	3.43	16.45
Log(number of employees)	8,234	2.65	1.03	1.61	4.09	0.00	8.62
Log(firm age)	8,234	2.79	0.59	1.95	3.37	0.69	4.61
Top manager female	8,234	0.21					
Innovated during 2017–19	8,234	0.40					
State ownership (10%)	8,234	0.01					
Foreign ownership (10%)	8,234	0.08					
Has line of credit or loan	8,234	0.40					
Owns a website	8,234	0.65					
Main market							
Local	8,234	0.44					
National	8,234	0.44					
International	8,234	0.12					

TABLE 1. (Continued)

Variable	Obs	Mean	SD	p10	p90	Min	Max
Sector							
Manufacturing	8,234	0.26					
Retail	8,234	0.21					
Other services	8,234	0.53					
C. Enterprise Surveys 2017 data							
Log(labor productivity)	7,383	10.47	1.27	8.83	11.98	1.88	15.78
Percentage change in sales (2017 to 2018)	7,223	9.21	25.31	−11.40	29.33	−66.59	199.60
Percentage change in employment (2017 to 2018)	6,522	4.07	16.02	−11.76	22.22	−61.22	182.09

Note: In our sample, the percentage of firms whose main market is local is the same as the percentage of firms whose main market is national (44 percent).

TABLE 2. Market organization, competition policy, public sector employment, share of public banks, and GDP per capita

Variable	Obs	Mean	SD	Min	Max
BTI market organization	23	7.26	1.79	4.00	10.00
BTI market organization (2017)	23	7.30	1.69	4.00	10.00
BTI competition policy	23	7.78	1.88	4.00	10.00
Public sector employment share	23	23.56	6.44	13.50	39.30
Public banks share	23	11.97	20.23	0.00	66.00
Log(GDP per capita)	23	9.25	0.60	8.41	10.16

Sources: Bertelsmann Stiftung Transformation Index (BTI) 2018, 2020; Worldwide Bureaucracy Indicators from World Bank 2020b; local sources where Worldwide Bureaucracy Indicators were not available or outdated (Armenia, Azerbaijan, Belarus, Montenegro, North Macedonia, and the Russian Federation); Anginer, Demirgüç-Kunt, and Mare 2020; World Bank World Development Indicators.

TABLE 3. Firm performance, labor productivity, and BTI market organization

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	4.138***	2.776***	−2.964***	−3.572***	0.443	3.402**
	(0.547)	(0.809)	(0.853)	(0.822)	(0.683)	(1.375)
Log(labor productivity) * BTI market organization	0.835**	0.040	−1.722***	−1.200***	0.266	1.338*
	(0.364)	(0.530)	(0.450)	(0.402)	(0.334)	(0.655)
Log(number of employees)	3.117***	1.907**	2.994**	−1.740***	−0.099	5.578***
	(0.598)	(0.876)	(1.179)	(0.585)	(1.032)	(0.895)
Log(firm age)	0.545	1.685	−1.877	−4.089*	−2.214**	0.977
	(1.708)	(1.519)	(1.701)	(2.355)	(1.006)	(1.631)
Top manager female dummy	−7.507***	−4.356**	4.057*	2.618	1.176	−0.102
	(2.020)	(2.089)	(2.294)	(2.587)	(3.511)	(2.193)
Innovated during 2017–19	1.297	0.419	−1.538	−0.490	8.733***	7.841***
	(1.466)	(2.774)	(2.736)	(1.645)	(2.334)	(1.909)
State ownership (10%)	7.858*	2.089	−4.971	7.744	−7.915**	−22.119**
	(4.307)	(2.707)	(7.352)	(4.664)	(3.317)	(8.504)
Foreign ownership (10%)	1.704	3.510	−2.722	−4.409	−0.337	11.303***
	(2.161)	(3.036)	(3.574)	(2.930)	(3.311)	(2.677)
Has line of credit or loan	−0.519	0.333	2.340	3.163	3.524**	−0.549
	(1.752)	(1.965)	(1.647)	(1.993)	(1.683)	(1.747)
Owns a website	−2.398	0.294	−1.240	−0.296	12.394***	8.361***
	(1.702)	(2.223)	(1.972)	(1.532)	(1.961)	(1.918)
National market dummy	5.164***	3.760**	−2.159	0.781	6.250***	10.793***
	(1.271)	(1.387)	(1.874)	(2.317)	(2.154)	(1.916)
International market dummy	3.179	1.937	1.956	−5.208*	0.634	8.104**
	(2.501)	(1.823)	(3.237)	(2.716)	(2.512)	(3.187)
Constant	−75.127***	−53.345***	66.000***	79.258***	6.569	−40.074**
	(6.028)	(9.875)	(10.198)	(10.357)	(7.059)	(14.710)
R^2	0.136	0.117	0.069	0.110	0.108	0.183
Number of observations	7,851	6,860	7,855	7,497	8,168	8,078

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Bertelsmann Stiftung Transformation Index (BTI) 2020.

Note: All regressions are ordinary least squares and include sector and country fixed effects. BTI market organization is based on responses to the question: "To what level have the fundamentals of market-based competition developed?" Change in employment is not available for the Russian Federation. BTI market organization is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

**$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE 4. Firm performance and labor productivity Pre-COVID-19

	Percentage Change in Sales	Percentage Change in Employment
Panel A: Pre-COVID-19 (2017 to 2018)		
Log(labor productivity)	−4.568***	1.841***
	(0.876)	(0.381)
Log(labor productivity) * BTI market organization	0.411	0.164
	(0.500)	(0.243)
Log(number of employees)	0.262	−1.849***
	(0.476)	(0.407)
Log(firm age)	−7.926***	−6.063***
	(1.319)	(0.758)
Constant	76.259***	6.602
	(9.133)	(4.451)
R^2	0.096	0.109
Number of observations	7,223	6,522
Panel B: During COVID-19 (2019 to 2020/2021)		
Log(labor productivity)	4.540***	3.296***
	(0.579)	(0.896)
Log(labor productivity) * BTI market organization	0.886**	0.101
	(0.376)	(0.504)
Log(number of employees)	3.643***	2.549***
	(0.600)	(0.786)
Log(firm age)	0.545	1.418
	(1.707)	(1.568)
Constant	−80.242***	−57.451***
	(5.932)	(8.968)
R^2	0.120	0.112
Number of observations	8,002	6,983

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Bertelsmann Stiftung Transformation Index (BTI) 2018, 2020.

Note: All regressions are ordinary least squares and include sector and country fixed effects. BTI competition policy is based on the question: "To what extent do safeguards exist to protect competition, and to what extent are they enforced?" Change in employment is not available for the Russian Federation. BTI competition policy is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level. Panel B replicates the results from Table 3 with the reduced set of controls that is available for the earlier period shown in panel A.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE 5. Government assistance and firm characteristics

	Any Type	Cash Transfers	Payment Deferrals	New Credit	Fiscal Relief	Wage Subsidies
Log(labor productivity)	−2.469***	−1.260**	−0.583	0.219	−0.649	−2.900***
	(0.845)	(0.562)	(0.412)	(0.447)	(0.422)	(0.855)
Log(number of employees)	0.659	−0.603	0.976**	−0.394	1.549**	1.296
	(1.514)	(0.503)	(0.382)	(0.382)	(0.699)	(1.382)
Log(firm age)	−0.905	−0.964	−1.353	0.112	−1.257	−1.200
	(1.663)	(1.037)	(1.010)	(0.583)	(0.781)	(1.960)
Top manager female dummy	5.198**	1.926	0.538	−1.035	1.628	5.745**
	(2.426)	(1.892)	(1.500)	(0.685)	(2.060)	(2.516)
Innovated during 2017–19	−0.472	0.259	−1.355	0.824	0.246	−0.238
	(1.777)	(0.975)	(1.309)	(0.934)	(1.174)	(1.652)
State ownership (10%)	5.245	0.351	5.339	−1.019	−1.819	−3.473
	(5.002)	(2.324)	(9.908)	(0.968)	(1.557)	(8.885)
Foreign ownership (10%)	−2.113	−3.874***	−0.136	−0.305	1.990	0.979
	(2.917)	(1.219)	(1.157)	(1.302)	(1.721)	(3.939)
Has line of credit or loan	4.279*	2.030	3.924***	3.483***	0.662	3.922*
	(2.126)	(1.369)	(1.381)	(1.199)	(1.409)	(2.013)
Owns a website	5.559**	0.578	1.472	0.118	0.345	6.185***
	(2.225)	(1.290)	(0.900)	(1.088)	(1.373)	(1.828)
National market dummy	−1.382	−1.216	−0.372	1.898***	0.610	−1.932
	(1.858)	(0.741)	(0.802)	(0.553)	(1.534)	(2.114)
International market dummy	1.322	0.639	−0.633	1.302	1.180	−4.304*
	(2.556)	(1.654)	(2.056)	(1.514)	(3.034)	(2.495)
Constant	65.864***	26.743***	13.368***	1.198	11.977*	61.401***
	(8.624)	(6.368)	(3.746)	(5.322)	(6.267)	(9.777)
R^2	0.215	0.173	0.059	0.055	0.130	0.224
Number of observations	8,124	8,093	8,088	8,084	8,081	8,108

Source: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia.

Note: All regressions are ordinary least squares and include sector and country fixed effects. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Appendix

TABLE A1. Completion dates of survey fieldwork for the world bank enterprise surveys

Country	ES Baseline	ES COVID-19 Round 1	ES COVID-19 Round 2
A. Baseline Sample			
Albania	May 2019	June 2020	—
Armenia	December 2020	April 2021	—
Azerbaijan	December 2019	May 2021	—
Belarus	April 2019	August 2020	—
Bosnia and Herzegovina	September 2019	March 2021	—
Bulgaria	March 2020	September 2020	December 2020
Croatia	November 2019	September 2020	January 2021
Czech Republic	March 2020	October 2020	February 2021
Estonia	January 2020	November 2020	February 2021
Georgia	January 2020	June 2020	November 2020
Hungary	March 2020	September 2020	February 2021
Kazakhstan	October 2019	March 2021	—
Latvia	January 2020	November 2020	February 2021
Lithuania	January 2020	October 2020	February 2021
Moldova	November 2019	May 2020	November 2020
Montenegro	July 2019	February 2021	—
North Macedonia	October 2019	November 2020	—
Poland	December 2019	August 2020	December 2020
Romania	June 2020	September 2020	December 2020
Russian Federation	July 2019	June 2020	—
Serbia	October 2019	February 2021	—
Slovak Republic	March 2020	October 2020	February 2021
Slovenia	November 2019	August 2020	December 2020
B. Expanded Sample			
Chad	May 2019	July 2020	—
Jordan	November 2019	August 2020	January 2021
Lebanon	April 2020	December 2020	—
Mongolia	May 2019	August 2020	February 2021
Morocco	January 2020	August 2020	February 2021
Mozambique	January 2019	January 2021	—
Zambia	March 2020	July 2020	February 2021

Note: — Not available. Dates shown are for the last completed survey for each round in a country. For Romania, 92% of the interviews were completed before March 2020. For Lebanon, 97% of the interviews were completed before March 2020.

TABLE A2. Variable definitions

Variable	Definition
Percentage change in monthly sales relative to one year earlier	Percentage change in monthly sales compared to the same month in 2019, as directly reported by firms.
Percentage change in number of permanent full-time workers since December 2019	Percentage change in permanent full-time workers since December 2019. The formula is: $((a_1 - a_0)/[(a_1 + a_0)/2]) * 100$; where a_1 = permanent full-time workers, end of last completed month, and a_0 = permanent full-time workers, end of December 2019.
Reduced number of permanent full-time workers since December 2019	Equals 100 if the firm reduced number of permanent full-time workers since December 2019 and 0 otherwise.
Anticipate falling into arrears on outstanding liabilities in the next 6 months	Equals 100 if the firm anticipates falling into arrears on outstanding liabilities in the next 6 months and 0 otherwise.
Started or increased online business activity	Equals 100 if the firm started or increased online business activity and 0 otherwise.
Started or increased remote work arrangements for workforce	Equals 100 if the firm started or increased remote work arrangements for workforce and 0 otherwise.
Received government support	Equals 100 if the firm received any national or local government assistance provided in response to the COVID-19 outbreak and 0 otherwise.
Cash transfer	Equals 100 if the government support received by the firm was a cash transfer and 0 otherwise.
Payment deferrals	Equals 100 if the government support received by the firm was a payment deferral and 0 otherwise.
New Credit	Equals 100 if the government support received by the firm was new credit and 0 otherwise.
Fiscal relief	Equals 100 if the government support received by the firm was fiscal relief and 0 otherwise.
Wage subsidies	Equals 100 if the government support received by the firm was wage subsidies and 0 otherwise.
Log(labor productivity)	Log of annual sales divided by the number of full-time permanent employees (2009 US$).
Log(number of employees)	Log of total number of full-time employees.
Log(firm age)	Log of number of years the firm has been operating.
Top manager female	Equals 1 if the firm's top manager is female and 0 otherwise.
Innovated during 2017–19	Equals 1 if the firm innovated a product or process in the last 3 years and 0 otherwise.
State ownership (10%)	Equals 1 if the firm is at least 10% state owned and 0 otherwise.
Foreign ownership (10%)	Equals 1 if the firm is at least 10% foreign owned and 0 otherwise.

Variable	Definition
Has line of credit or loan	Equals 1 if the firm has line of credit or bank loans and 0 otherwise.
Owns a website	Equals 1 if the firm has its own website and 0 otherwise.
Local market	Equals 1 if the firm's main product is sold mostly in same municipality where the firm is located and 0 otherwise.
National market	Equals 1 if the firm's main product is sold mostly across the country where the firm is located and 0 otherwise.
International market	Equals 1 if the firm's main product is sold mostly internationally and 0 otherwise.
Manufacturing	Equals 1 if the firm is in the manufacturing sector and 0 otherwise.
Retail	Equals 1 if the firm is in the retail sector and 0 otherwise.
Other services	Equals 1 if the firm is in the selected service sector, excluding retail, and 0 otherwise.
Percentage change in sales (2017 to 2018)	Percentage change in sales from 2017 to 2018. The formula is $((a_1-a_0)/[(a_1+a_0)/2])*100$, where a_1 = sales in 2018, extrapolated as the simple average of 2019 and 2017 sales, and a_0 = sales in 2017.
Percentage change in employment (2017 to 2018)	Percentage change in permanent full-time workers from 2017 to 2018. The formula is $((a_1-a_0)/[(a_1+a_0)/2])*100$, where a_1 = permanent full-time workers in 2018, extrapolated as the simple average of 2019 and 2017 sales, and a_0 = permanent full-time workers in 2017.

TABLE A3. Firm performance, labor productivity, and BTI competition policy

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	4.115***	2.736***	–2.992***	–3.705***	0.400	3.559***
	(0.635)	(0.946)	(0.967)	(0.827)	(0.647)	(1.145)
Log(labor productivity) * BTI competition policy	0.542	–0.105	–1.272*	–1.116**	0.073	1.337
	(0.397)	(0.655)	(0.659)	(0.440)	(0.378)	(0.923)
Log(number of employees)	3.108***	1.918**	3.022**	–1.710***	–0.096	5.535***
	(0.599)	(0.898)	(1.183)	(0.598)	(1.030)	(0.892)
Log(firm age)	0.484	1.714	–1.720	–3.943	–2.210**	0.756
	(1.726)	(1.563)	(1.698)	(2.354)	(0.987)	(1.640)
Top manager female dummy	–7.581***	–4.369**	4.190*	2.692	1.148	–0.191
	(2.028)	(2.084)	(2.317)	(2.582)	(3.510)	(2.207)
Innovated during 2017–19	1.266	0.402	–1.474	–0.489	8.713***	7.825***
	(1.479)	(2.788)	(2.744)	(1.637)	(2.328)	(1.914)
State ownership (10%)	8.121*	2.020	–5.589	7.116	–7.880**	–21.435**
	(4.345)	(2.692)	(7.314)	(4.622)	(3.370)	(8.667)
Foreign ownership (10%)	1.760	3.580	–2.770	–4.244	–0.262	11.105***
	(2.171)	(3.177)	(3.534)	(2.991)	(3.328)	(2.698)
Has line of credit or loan	–0.428	0.338	2.190	3.081	3.553**	–0.436
	(1.742)	(1.969)	(1.649)	(1.977)	(1.667)	(1.717)
Owns a website	–2.443	0.293	–1.162	–0.246	12.381***	8.309***
	(1.702)	(2.205)	(1.980)	(1.546)	(1.973)	(1.907)
National market dummy	5.143***	3.791**	–2.107	0.905	6.266***	10.660***
	(1.278)	(1.383)	(1.860)	(2.292)	(2.171)	(1.881)
International market dummy	3.248	1.949	1.806	–5.271*	0.665	8.183**
	(2.502)	(1.825)	(3.229)	(2.682)	(2.509)	(3.192)
Constant	–74.550***	–52.717***	65.459***	80.234***	7.208	–41.321***
	(7.037)	(10.896)	(12.499)	(10.614)	(6.737)	(12.992)
R^2	0.135	0.117	0.068	0.110	0.108	0.183
Number of observations	7,851	6,860	7,855	7,497	8,168	8,078

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Bertelsmann Stiftung Transformation Index (BTI) 2020.

Note: All regressions are ordinary least squares and include sector and country fixed effects. BTI competition policy is based on the question: "To what extent do safeguards exist to protect competition, and to what extent are they enforced?" Change in employment is not available for the Russian Federation. BTI competition policy is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A4. Firm performance, labor productivity, and public sector employment share

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	4.007***	2.763***	–2.636***	–3.382***	0.416	3.337***
	(0.573)	(0.750)	(0.915)	(0.795)	(0.686)	(1.053)
Log(labor productivity) * Public employment share	–0.149**	0.073	0.185**	0.164*	–0.069	–0.460**
	(0.057)	(0.051)	(0.084)	(0.095)	(0.082)	(0.203)
Log(number of employees)	3.132***	1.918**	2.936**	–1.773***	–0.098	5.577***
	(0.604)	(0.869)	(1.188)	(0.585)	(1.032)	(0.904)
Log(firm age)	0.614	1.696	–1.991	–4.210*	–2.193**	1.092
	(1.718)	(1.484)	(1.712)	(2.377)	(1.008)	(1.611)
Top manager female dummy	–7.583***	–4.390**	4.206*	2.705	1.174	–0.069
	(2.049)	(2.072)	(2.317)	(2.596)	(3.508)	(2.189)
Innovated during 2017–19	1.259	0.384	–1.402	–0.437	8.733***	7.902***
	(1.466)	(2.738)	(2.707)	(1.633)	(2.335)	(1.894)
State ownership (10%)	7.788*	2.080	–4.842	7.818	–7.938**	–22.283**
	(4.339)	(2.692)	(7.339)	(4.667)	(3.316)	(8.540)
Foreign ownership (10%)	1.962	3.546	–3.364	–4.804	–0.262	11.620***
	(2.170)	(2.966)	(3.546)	(2.904)	(3.299)	(2.702)
Has line of credit or loan	–0.552	0.389	2.310	3.171	3.498**	–0.788
	(1.747)	(1.978)	(1.664)	(1.971)	(1.679)	(1.682)
Owns a website	–2.468	0.306	–1.145	–0.177	12.365***	8.188***
	(1.676)	(2.210)	(2.029)	(1.504)	(1.985)	(1.891)
National market dummy	5.240***	3.798**	–2.311	0.727	6.249***	10.747***
	(1.299)	(1.371)	(1.915)	(2.328)	(2.152)	(1.982)
International market dummy	3.252	1.962	1.788	–5.288*	0.646	8.127**
	(2.506)	(1.802)	(3.228)	(2.701)	(2.512)	(3.233)
Constant	–72.816***	–52.938***	60.574***	75.813***	7.166	–37.696***
	(6.539)	(8.643)	(10.209)	(10.653)	(6.930)	(12.255)
R^2	0.135	0.117	0.066	0.109	0.108	0.186
Number of observations	7,851	6,860	7,855	7,497	8,168	8,078

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Worldwide Bureaucracy Indicators, World Bank 2020b; local sources where Worldwide Bureaucracy Indicators were not available or outdated (Armenia, Azerbaijan, Belarus, Montenegro, North Macedonia, and the Russian Federation).

Note: All regressions are ordinary least squares and include sector and country fixed effects. Change in employment is not available for the Russian Federation. Public sector employment share is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A5. Firm performance, labor productivity, and public banks share

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	3.910***	2.641***	–2.510**	–3.236***	0.371	3.022*
	(0.604)	(0.667)	(0.943)	(0.885)	(0.696)	(1.598)
Log(labor productivity) * Public banks share	–0.041**	–0.029	0.054**	0.055**	–0.003	–0.016
	(0.017)	(0.028)	(0.026)	(0.026)	(0.024)	(0.046)
Log(number of employees)	3.160***	1.909**	2.903**	–1.798***	–0.092	5.623***
	(0.597)	(0.863)	(1.187)	(0.572)	(1.034)	(0.913)
Log(firm age)	0.608	1.672	–1.999	–4.200*	–2.192**	1.096
	(1.714)	(1.509)	(1.695)	(2.384)	(1.012)	(1.648)
Top manager female dummy	–7.620***	–4.356**	4.260*	2.766	1.145	–0.251
	(2.041)	(2.075)	(2.316)	(2.591)	(3.505)	(2.185)
Innovated during 2017–19	1.228	0.431	–1.355	–0.402	8.708***	7.728***
	(1.457)	(2.749)	(2.711)	(1.641)	(2.326)	(1.888)
State ownership (10%)	7.649*	2.012	–4.644	8.014	–7.929**	–22.219**
	(4.347)	(2.716)	(7.315)	(4.748)	(3.352)	(8.374)
Foreign ownership (10%)	1.862	3.463	–3.216	–4.662	–0.232	11.851***
	(2.149)	(3.008)	(3.537)	(2.924)	(3.329)	(2.789)
Has line of credit or loan	–0.481	0.332	2.241	3.105	3.552**	–0.409
	(1.743)	(1.979)	(1.660)	(1.994)	(1.659)	(1.709)
Owns a website	–2.459	0.283	–1.150	–0.207	12.379***	8.272***
	(1.717)	(2.205)	(2.014)	(1.530)	(1.973)	(1.926)
National market dummy	5.294***	3.784**	–2.396	0.663	6.282***	10.969***
	(1.308)	(1.396)	(1.917)	(2.328)	(2.150)	(1.970)
International market dummy	3.302	1.964	1.718	–5.336*	0.671	8.282**
	(2.524)	(1.806)	(3.221)	(2.694)	(2.498)	(3.189)
Constant	–72.101***	–52.715***	59.623***	74.959***	7.536	–35.211*
	(6.148)	(8.141)	(9.568)	(10.985)	(7.001)	(17.167)
R^2	0.135	0.117	0.066	0.109	0.108	0.180
Number of observations	7,851	6,860	7,855	7,497	8,168	8,078

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; Anginer, Demirgüç-Kunt, and Mare 2020.

Note: All regressions are ordinary least squares and include sector and country fixed effects. Change in employment is not available for the Russian Federation. Public banks share is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A6. Firm performance, labor productivity, and GDP per capita

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	4.080***	2.778***	–2.862***	–3.436***	0.338	3.184*
	(0.669)	(0.941)	(0.904)	(0.949)	(0.633)	(1.578)
Log(labor productivity) * Log(GDP per capita)	1.705	0.049	–3.711*	–1.899	–0.335	1.527
	(1.077)	(1.867)	(1.973)	(1.427)	(1.523)	(2.152)
Log(number of employees)	3.108***	1.907**	3.021**	–1.746***	–0.085	5.586***
	(0.599)	(0.887)	(1.186)	(0.591)	(1.030)	(0.898)
Log(firm age)	0.545	1.687	–1.863	–4.136*	–2.177**	1.026
	(1.707)	(1.519)	(1.694)	(2.370)	(0.992)	(1.636)
Top manager female dummy	–7.602***	–4.361**	4.270*	2.786	1.144	–0.260
	(2.021)	(2.074)	(2.321)	(2.576)	(3.507)	(2.190)
Innovated during 2017–19	1.269	0.416	–1.464	–0.458	8.699***	7.751***
	(1.470)	(2.785)	(2.749)	(1.642)	(2.322)	(1.901)
State ownership (10%)	8.040*	2.090	–5.373	7.490	–7.958**	–21.961**
	(4.329)	(2.691)	(7.382)	(4.680)	(3.366)	(8.464)
Foreign ownership (10%)	1.765	3.514	–2.845	–4.617	–0.160	11.649***
	(2.183)	(3.172)	(3.545)	(3.018)	(3.325)	(2.786)
Has line of credit or loan	–0.410	0.335	2.125	3.042	3.557**	–0.388
	(1.751)	(1.976)	(1.660)	(1.976)	(1.664)	(1.715)
Owns a website	–2.372	0.294	–1.312	–0.283	12.368***	8.341***
	(1.696)	(2.252)	(2.024)	(1.535)	(1.972)	(1.932)
National market dummy	5.200***	3.762**	–2.245	0.741	6.295***	10.902***
	(1.272)	(1.389)	(1.837)	(2.319)	(2.166)	(1.958)
International market dummy	3.209	1.939	1.879	–5.271*	0.687	8.209**
	(2.502)	(1.842)	(3.203)	(2.697)	(2.516)	(3.207)
Constant	–74.479***	–53.296***	64.884***	77.609***	8.024	–37.376**
	(7.314)	(11.136)	(12.054)	(11.402)	(6.567)	(17.111)
R^2	0.135	0.117	0.067	0.108	0.108	0.181
Number of observations	7,851	6,860	7,855	7,497	8,168	8,078

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia; World Bank World Development Indicators.

Note: All regressions are ordinary least squares and include sector and country fixed effects. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A7. Firm performance, labor productivity, and BTI market organization, controlling for severity of COVID-19 restrictions

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	4.171***	2.627***	–2.773***	–3.115***	0.920	3.771***
	(0.630)	(0.764)	(0.900)	(0.708)	(0.692)	(1.126)
Log(labor productivity) * BTI market organization	0.914**	0.366	–1.907***	–1.005**	0.126	0.897
	(0.329)	(0.572)	(0.531)	(0.386)	(0.385)	(0.545)
Log(labor productivity) * COVID restrictions index	0.011	0.027*	–0.017	0.020***	–0.006	–0.040
	(0.012)	(0.014)	(0.012)	(0.005)	(0.006)	(0.024)
Log(number of employees)	2.773***	1.875*	2.586**	–1.632**	–0.096	5.425***
	(0.620)	(0.993)	(1.023)	(0.701)	(1.213)	(0.976)
Log(firm age)	1.496	2.117	–1.780	–5.235*	–1.839	0.926
	(1.905)	(1.690)	(1.888)	(2.555)	(1.119)	(1.868)
Top manager female dummy	–8.068***	–3.182	1.733	3.368	0.951	–0.352
	(2.202)	(1.996)	(1.989)	(2.824)	(3.961)	(2.260)
Innovated during 2017–19	0.359	–0.809	–1.012	0.277	9.026***	8.439***
	(1.468)	(2.984)	(2.784)	(1.781)	(2.528)	(2.054)
State ownership (10%)	7.587	1.997	–4.757	8.051	–8.886**	–21.033**
	(4.651)	(2.519)	(7.169)	(4.768)	(3.153)	(8.932)
Foreign ownership (10%)	0.500	3.629	–2.257	–4.290	–0.010	8.230***
	(1.928)	(3.459)	(3.888)	(3.127)	(3.437)	(2.163)
Has line of credit or loan	–1.066	–0.522	3.487*	3.900	3.571*	–1.078
	(1.892)	(2.171)	(1.703)	(2.257)	(1.863)	(1.973)
Owns a website	–1.377	–0.141	–0.505	–1.129	11.848***	9.689***
	(1.829)	(2.615)	(2.268)	(1.734)	(2.198)	(1.769)
National market dummy	6.050***	3.272**	–1.152	1.742	5.094**	11.472***
	(1.261)	(1.360)	(1.969)	(2.255)	(2.392)	(2.072)
International market dummy	4.302	1.620	2.303	–4.867*	–1.072	9.776***
	(2.738)	(1.961)	(3.504)	(2.679)	(2.587)	(3.385)
Constant	–77.081***	–51.520***	64.654***	78.998***	1.236	–45.035***
	(6.352)	(9.299)	(10.564)	(10.782)	(7.273)	(13.339)
R^2	0.145	0.127	0.075	0.123	0.112	0.172
Number of observations	7,208	6,220	7,215	6,835	7,458	7,367

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 20 countries in Europe and Central Asia; Bertelsmann Stiftung Transformation Index (BTI) 2020; and Oxford COVID-19 Government Response Tracker's Stringency Index 2021.

Note: All regressions are ordinary least squares and include sector and country fixed effects. BTI market organization is based on responses to the question: "To what level have the fundamentals of market-based competition developed?" The COVID-19 restrictions index is based on the number of days the Oxford COVID-19 Government Response Tracker's Stringency Index—which captures the strictness of "lockdown-style" policies that primarily restrict people's behavior along nine dimensions ranging from 0 to 100, with higher values indicating more restrictions—was above 70 preceding the fieldwork start day of the Enterprise Surveys COVID-19 Follow-up Surveys module in each country. The COVID restrictions index is not available for Armenia, Montenegro, and North Macedonia. Change in employment is not available for the Russian Federation. BTI market organization and the COVID restrictions index are centered on their respective means to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A8. Government assistance and firm characteristics, controlling for drop in sales

	Any Type	Cash Transfers	Payment Deferrals	New Credit	Fiscal Relief	Wage Subsidies
Log(labor productivity)	–1.880**	–1.118*	–0.304	0.220	–0.504	–1.984**
	(0.763)	(0.547)	(0.360)	(0.476)	(0.438)	(0.719)
Log(number of employees)	1.537	–0.444	1.354***	–0.269	1.710**	2.286
	(1.631)	(0.462)	(0.471)	(0.463)	(0.750)	(1.472)
Log(firm age)	–0.949	–1.254	–1.562	0.006	–1.097	–1.099
	(1.471)	(1.176)	(1.088)	(0.571)	(0.813)	(1.649)
Top manager female dummy	3.734	1.169	–0.013	–1.069	1.702	4.247
	(2.587)	(1.940)	(1.318)	(0.630)	(2.188)	(2.676)
Innovated during 2017–19	–0.154	0.487	–1.432	1.154	0.256	–0.233
	(1.887)	(0.942)	(1.202)	(0.957)	(1.261)	(1.842)
State ownership (10%)	6.272	0.945	5.188	–0.941	–2.173	–2.324
	(4.405)	(2.529)	(9.976)	(0.988)	(1.825)	(8.829)
Foreign ownership (10%)	–1.863	–3.772***	–0.652	–0.857	2.137	1.366
	(2.738)	(1.291)	(1.138)	(1.397)	(1.716)	(3.793)
Has line of credit or loan	4.349*	1.800	3.880***	3.390***	0.509	4.208**
	(2.098)	(1.368)	(1.205)	(1.177)	(1.436)	(1.958)
Owns a website	5.219**	0.024	0.571	0.052	0.669	5.670***
	(2.041)	(1.086)	(1.144)	(1.143)	(1.365)	(1.756)
National market dummy	–0.546	–1.099	0.013	1.728***	0.967	–1.147
	(1.750)	(0.878)	(0.727)	(0.485)	(1.637)	(1.974)
International market dummy	1.731	1.143	–0.734	1.392	1.147	–4.294*
	(2.511)	(1.836)	(1.909)	(1.532)	(3.099)	(2.264)
Average change in monthly sales compared to one year ago	–0.212***	–0.051**	–0.058**	–0.011	–0.032	–0.257***
	(0.050)	(0.020)	(0.023)	(0.020)	(0.024)	(0.048)
Constant	52.495***	24.823***	9.528**	0.838	8.440	43.602***
	(8.782)	(6.770)	(3.725)	(5.444)	(7.102)	(7.925)
R^2	0.236	0.171	0.066	0.053	0.135	0.256
Number of observations	7,772	7,748	7,744	7,741	7,736	7,760

Source: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia.

Note: All regressions are ordinary least squares and include sector and country fixed effects. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A9. Government assistance and firm characteristics, controlling for drop in employment

	Any Type	Cash Transfers	Payment Deferrals	New Credit	Fiscal Relief	Wage Subsidies
Log(labor productivity)	−2.753**	−1.586**	−0.644	0.176	−0.561	−3.148***
	(0.975)	(0.682)	(0.498)	(0.496)	(0.482)	(0.919)
Log(number of employees)	0.717	−0.578	0.860**	−0.313	1.427*	1.294
	(1.643)	(0.434)	(0.376)	(0.397)	(0.741)	(1.519)
Log(firm age)	−0.959	−1.422	−0.897	0.129	−1.501	−1.031
	(1.895)	(1.244)	(1.082)	(0.675)	(0.923)	(2.106)
Top manager female dummy	6.753**	2.399	0.704	−1.006	1.579	6.312**
	(2.773)	(2.143)	(1.491)	(0.736)	(2.267)	(2.862)
Innovated during 2017–19	−0.566	−0.107	−1.587	1.039	0.334	−0.132
	(1.923)	(1.258)	(1.364)	(1.059)	(1.219)	(1.722)
State ownership (10%)	4.920	0.424	5.346	−1.114	−1.080	−4.040
	(5.015)	(2.370)	(10.550)	(1.092)	(1.699)	(9.433)
Foreign ownership (10%)	−3.836	−3.044***	−0.667	−0.844	1.610	−0.638
	(2.966)	(0.957)	(1.293)	(1.185)	(1.624)	(3.729)
Has line of credit or loan	4.512**	2.500	4.099***	3.590**	0.483	3.624*
	(2.075)	(1.566)	(1.255)	(1.279)	(1.515)	(2.058)
Owns a website	6.230**	0.343	2.277**	0.241	0.628	6.431***
	(2.275)	(1.462)	(0.959)	(1.197)	(1.574)	(1.781)
National market dummy	−0.101	−1.378	−0.667	1.745**	0.663	−0.715
	(1.841)	(0.901)	(0.896)	(0.653)	(1.651)	(2.141)
International market dummy	1.695	0.035	−1.651	1.236	1.268	−3.991
	(2.836)	(1.699)	(1.826)	(1.597)	(3.094)	(2.532)
Percentage change of permanent full-time workers since December 2019	0.021	0.028**	0.007	−0.008	−0.012	0.001
	(0.027)	(0.012)	(0.011)	(0.010)	(0.021)	(0.015)
Constant	69.056***	32.152***	13.398***	1.305	11.888	64.081***
	(10.976)	(7.883)	(4.390)	(6.071)	(7.754)	(10.330)
R^2	0.206	0.178	0.065	0.055	0.137	0.211
Number of observations	6,792	6,771	6,767	6,765	6,757	6,779

Source: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 23 countries in Europe and Central Asia.

Note: All regressions are ordinary least squares and include sector and country fixed effects. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A10. Firm performance, labor productivity, and BTI market organization, expanded country sample

	Percentage Change in Sales	Percentage Change in Employment	Decreased Employment	Anticipate Falling into Arrears	Increased Online Activity	Increased Remote Work
Log(labor productivity)	3.261***	2.370***	–2.087***	–3.119***	0.446	2.410*
	(0.508)	(0.631)	(0.701)	(0.673)	(0.568)	(1.264)
Log(labor productivity) * BTI market organization	0.930***	0.322	–1.594***	–1.186***	0.201	1.215**
	(0.328)	(0.442)	(0.407)	(0.328)	(0.263)	(0.444)
Log(number of employees)	2.867***	1.480*	2.850**	–2.133***	0.721	5.154***
	(0.556)	(0.835)	(1.053)	(0.688)	(1.014)	(0.794)
Log(firm age)	0.755	1.915	–2.413	–3.328	–1.987**	0.057
	(1.582)	(1.383)	(1.563)	(2.162)	(0.926)	(1.544)
Top manager female dummy	–6.982***	–2.869	1.934	3.080	1.405	0.016
	(1.869)	(2.133)	(2.581)	(2.370)	(3.235)	(2.001)
Innovated during 2017–19	0.925	0.510	–2.013	–0.423	8.442***	8.075***
	(1.351)	(2.432)	(2.496)	(1.623)	(2.223)	(1.862)
State ownership (10%)	8.453**	4.637	–7.707	3.178	–4.040	–12.555
	(3.764)	(3.818)	(6.938)	(5.811)	(7.070)	(13.159)
Foreign ownership (10%)	1.918	2.450	–1.030	–3.069	0.442	11.589***
	(1.856)	(2.625)	(3.309)	(2.635)	(2.806)	(2.478)
Has line of credit or loan	–0.483	–0.527	3.076*	4.114**	3.871**	–0.719
	(1.623)	(1.867)	(1.590)	(1.888)	(1.746)	(1.551)
Owns a website	–2.464	0.530	–1.081	–0.924	10.647***	7.554***
	(1.661)	(1.938)	(1.775)	(1.499)	(2.145)	(1.785)
National market dummy	4.993***	3.641***	–1.155	0.869	5.228**	9.786***
	(1.110)	(1.226)	(1.776)	(2.053)	(2.050)	(1.839)
International market dummy	3.649	2.700	1.270	–5.334**	–0.624	7.099**
	(2.395)	(1.762)	(3.094)	(2.576)	(2.465)	(3.014)
Constant	–71.327***	–49.012***	63.574***	80.196***	7.054	–27.248*
	(5.567)	(8.989)	(9.527)	(9.133)	(6.145)	(13.650)
R^2	0.150	0.110	0.064	0.180	0.114	0.191
Number of observations	8,931	8,041	9,036	8,626	9,365	9,600

Sources: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 30 countries; Bertelsmann Stiftung Transformation Index (BTI) 2020.

Note: All regressions are ordinary least squares and include sector and country fixed effects. BTI competition policy is based on the question: "To what extent do safeguards exist to protect competition, and to what extent are they enforced?" Change in employment is not available for the Russian Federation. BTI competition policy is centered on its mean to facilitate interpretation of the coefficients. Standard errors are clustered at the country level.

***p < 0.01, **p < 0.05, *p < 0.1.

TABLE A11. Government assistance and firm characteristics, expanded country sample

	Any Type	Cash Transfers	Payment Deferrals	New Credit	Fiscal Relief	Wage Subsidies
Log(labor productivity)	−1.847**	−0.862	−0.437	0.312	−0.533	−2.387***
	(0.810)	(0.531)	(0.369)	(0.454)	(0.577)	(0.779)
Log(number of employees)	0.620	−0.407	0.553	−0.631	1.063	1.090
	(1.389)	(0.497)	(0.590)	(0.448)	(0.882)	(1.247)
Log(firm age)	−0.944	−0.876	−1.009	0.202	−0.863	−1.552
	(1.514)	(1.032)	(0.982)	(0.764)	(0.860)	(1.791)
Top manager female dummy	5.894**	2.698	1.932	0.112	3.274	6.518**
	(2.323)	(1.802)	(1.910)	(1.336)	(2.398)	(2.439)
Innovated during 2017–19	0.987	0.875	−0.094	1.084	1.325	0.582
	(1.982)	(1.085)	(1.577)	(0.909)	(1.352)	(1.540)
State ownership (10%)	2.245	−1.266	4.768	−0.659	−2.734	−5.244
	(4.804)	(2.656)	(8.597)	(0.968)	(2.760)	(8.121)
Foreign ownership (10%)	−2.751	−3.479***	−0.722	−0.551	2.385	0.331
	(2.517)	(1.038)	(1.135)	(1.194)	(1.537)	(3.334)
Has line of credit or loan	2.974	1.829	2.518	2.771**	−0.282	3.453*
	(2.413)	(1.383)	(1.701)	(1.256)	(1.491)	(1.908)
Owns a website	5.653**	0.749	1.157	−0.089	0.543	6.371***
	(2.067)	(1.160)	(0.863)	(0.979)	(1.372)	(1.769)
National market dummy	−2.733	−2.683**	−1.343	0.565	−0.827	−3.028
	(1.823)	(1.285)	(1.031)	(0.968)	(1.629)	(1.957)
International market dummy	−0.457	−0.800	−1.281	0.753	0.299	−6.069**
	(2.585)	(1.795)	(2.029)	(1.439)	(2.989)	(2.477)
Constant	58.933***	22.001***	13.456***	1.892	12.103*	56.921***
	(8.238)	(5.843)	(3.671)	(4.625)	(6.965)	(9.102)
R^2	0.213	0.164	0.063	0.054	0.131	0.222
Number of observations	9,309	9,274	9,259	9,255	9,256	9,285

Source: Most recent Enterprise Surveys COVID-19 Follow-up Surveys and Enterprise Surveys for 30 countries.

Note: Regressions include sector and country fixed effects. Standard errors are clustered at the country level.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.