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ACT/EMP

# ► Determinants of Productivity Recovery and Business Resilience



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# ▶ **Determinants of Productivity Recovery and Business Resilience**

**June 2023**

Bureau for Employers Activities (ACT/EMP)  
International Labour Organization



# Preface

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In today's rapidly changing business environment, enterprises must navigate a range of complex challenges, including economic volatility, supply chain and technological disruptions. To succeed in this environment, firms must be both productive and resilient, able to adapt quickly to changing circumstances and to withstand shocks to their operations. However, the relationship between productivity growth and business resilience is not always straightforward, and the direction of causality between these two factors is the subject of ongoing debate.

There is a growing body of research exploring the relationship between productivity growth and business resilience. While there is no one-size-fits-all answer to this question, there is evidence to suggest that there is a positive relationship between productivity growth and business resilience.

On one hand, higher productivity can lead to greater business resilience, as firms with higher productivity tend to have more efficient processes and are better able to weather economic shocks. This is because productive firms can more easily adapt to changes in demand, costs, and supply chain disruptions, and may be better positioned to invest in new technologies and processes that improve their resilience.

On the other hand, there is also evidence to suggest that business resilience can promote productivity growth, as firms that are more resilient are better able to continue operating during times of disruption, and may be more likely to survive and grow over the long term. For example, resilient firms may be more likely to invest in research and development, adopt new technologies, or pursue new markets, all of which can lead to higher productivity over time.

It is likely that the relationship between productivity growth and business resilience is bidirectional, with each factor reinforcing the other. While there is no definitive answer to this question, empirical research suggests that both productivity growth and business resilience are important drivers of firm performance, and that firms that can improve their productivity and resilience are likely to be more successful over the long term.

In this study we aim to identify and analyse the main determinants of enterprise resilience and productivity recovery. To this end, the ILO Bureau for Employers' Activities conducted an extensive literature review and data analysis to provide insights into how businesses can boost their productivity and resilience.

Further, we highlight the importance of productivity recovery and business resilience for employer and business membership organizations (EBMOs) supporting their members in navigating the post-pandemic landscape. The pandemic has had a significant impact on EBMOs and their members, with many facing financial and operational challenges. Our report provides insights and recommendations to help EBMOs support their members efforts to improve their productivity and resilience in the months and years ahead.

In addition to building resilience and productivity recovery, there is a need for coordination and collaboration among EBMOs to support businesses in the aftermath of the pandemic. These organizations play a critical role in representing and advocating the interests of enterprises, particularly small and medium enterprises (SMEs), at the local, national and international levels. By providing a

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►► We hope that this report will serve as a valuable resource for business leaders, policymakers, EBMOs and others who are working to build a more resilient and productive economy in the wake of the pandemic.

platform for knowledge sharing, capacity building and policy advocacy, EBMOs can help businesses navigate the challenges posed or amplified by the pandemic and identify opportunities for growth and innovation. This report aims to contribute to this effort by providing evidence-based analysis and policy recommendations that can inform the work of EBMOs and support their efforts to promote business resilience and productivity recovery in the post-pandemic economic environment.

We hope that this report will serve as a valuable resource for business leaders, policymakers, EBMOs and others who are working to build a more resilient and productive economy in the wake of the pandemic. We remain at the disposal of our constituents to deepen this analysis and provide guidance in the pursuit of sustainable enterprises for decent job creation and inclusive economic growth.

I would like to express my heartfelt gratitude to the dedicated individuals who have contributed to the creation of this report. Samuel Asfaha, José Luis Viveros Añorve, and Sandra Aguilar-Gomez deserve special recognition for their unwavering commitment and exceptional efforts in drafting this comprehensive document. Their expertise and insights have been invaluable in shaping the content and ensuring its relevance. I would also like to extend my appreciation to Ward Rinehart for his meticulous editing and keen eye for detail, which have greatly enhanced the clarity and coherence of this report.

This collaborative endeavour would not have been possible without their contributions, which have undoubtedly made this report a valuable resource for anyone seeking to navigate the challenges of business resilience and productivity recovery. In closing, I hope that this report serves as a catalyst for fruitful discussions and practical solutions that foster the growth and resilience of businesses worldwide.

Deborah France-Massin



Director  
Bureau for Employers' Activities (ACT/EMP)  
International Labour Office

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# Executive Summary

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The COVID-19 pandemic is the most significant worldwide health and economic crisis since the Second World War. The International Labour Organization (ILO) has estimated that in the first three quarters of 2020, global labour income decreased by nearly 11% or \$3.5 trillion (ILO 2021a). In 2020, data from the World Bank shows that the real global GDP declined by 3.4%.

In an attempt to suppress the spread of COVID-19 infections, many countries partially or fully closed their borders and restricted the movement of people. Consequently, the production capacity of economies worldwide was impaired and supply chains were disrupted. What began as a production or supply side shock rapidly spilled over to the demand side, as people were locked down in their homes and workers were furloughed or laid off and lost income. Most businesses closed or were open for only limited hours. Even when businesses were operating, lower consumer demand reduced earnings, affecting both labour supply and demand.

Three channels for the economic impacts of the COVID-19 pandemic can be identified as critical: (i) an increase in trade costs that affected the movement of people and inbound tourism, along with industries linked to global supply chains; (ii) a negative supply-side productivity shock that cuts wages and corporate earnings, leading to reductions in consumption and investment; and (iii) policy responses, including health spending and fiscal stimulus through various macroeconomic policy instruments. Another critical channel for the pandemic's impact on firm performance was the deferment of investment in favour of increasing cash holding to build a financial buffer as uncertainties rose.

Conventionally, economists explain firms' closure during recessions with Schumpeter's (1942) creative destruction theory. According to the theory, small and less efficient firms find it harder to survive economic downturns and so exit the market. However, in the COVID-19 pandemic, all types of firms, including the efficient ones, reeled from the inability to do business.

Moreover, the creative destruction hypothesis has not held up well in developing countries due to credit constraints and high informality. The lack of access to credit stifles the expansion and growth of innovative and productive firms. Moreover, many inefficient and distressed firms in developing countries do not necessarily exit the market due to crisis but instead move into the informal sector, thereby impeding the potential for market "cleansing" and diminishing the scope for a well-functioning creative destruction process. The pandemic is projected to have increased informality and to have further slowed productivity growth in developing countries. Consequently, the pandemic is likely to have hurt efficient firms disproportionately due to their higher financial needs, which are hard to satisfy in the presence of credit constraints, and due to rising competition from informal firms that compete based on lower prices. For example, during the 1997 East Asian financial and economic crisis, productive firms exited the market disproportionately, revealing the weak relationship between firm productivity and firm survival in developing countries.

COVID-19 has accelerated some positive changes, such as the digitalization of production processes and the reinforcement of occupational safety and health (OSH) systems. However, the predominant long-term impact is likely to be disruptive, with a lasting impact on labour productivity due to adverse effect on human capital, infrastructure and investment, thus diminishing the rate of future economic and social development. For example, the cumulative loss of global output due to the pandemic could reach US\$11 trillion over the next five years.

Global output experienced a strong recovery in 2021 following the phasing out of most COVID-related restrictions. The recovery has been uneven among countries, however, and has been losing steam since the end of 2021. Moreover, labour market recovery has been lagging in many countries. Rising geopolitical and global economic uncertainty due to soaring energy and food prices and continuing global supply chain disruptions, linked mainly to the war in Ukraine and lockdowns in China, have contributed significantly to this. The ILO (2022a) reported that hours worked in the first quarter of 2022

stood 3.8 per cent below the level of the fourth quarter of 2019, a difference equivalent to a deficit of 112 million full-time jobs.

Enterprise resilience is a new focus of attention among employers. This is not only because of the COVID-19 pandemic and the huge losses in investment and labour productivity associated with other similar health crises but also due to increasing uncertainties linked to global geopolitical tensions and climate change. Although there is no single and unified definition of business resilience, business resilience can generally be understood as involving three dimensions or aspects: proactive resilience, adaptive resilience and reactive resilience. Proactive resilience refers to alertness, readiness and preparedness. Previous crisis experiences are among the important determinants of proactive resilience, as businesses that were hard-hit by a previous crisis are more likely to act proactively to mitigate the effects of a future crisis. Adaptive resilience refers to the ability to change and sustain operations in the face of a shock. Agility and capability for rapidly changing all aspects of business models and operations are key aspects of adaptive resilience. Reactive resilience refers to attributes that manifest after a disruptive event. This is the most common approach to resilience for SMEs, as they tend to think and plan in the short term, often reacting to internal and external stimuli.

Resilience is also described as a dynamic attribute reflecting corporate dynamism in response to changes in the external environment. Innovative responses through improvements and changes in business models and processes are crucial for firms' sustainability and resilience. The literature identifies three key assets as essential components of dynamic resilience. The first is firms' resourcefulness, notably, their material, social or intangible capabilities. The second, dynamic competitiveness, emphasizes the value of flexibility, robustness, networking or redundancy, or the degree to which some elements can be substitutable in the event of a disruption. The third asset is learning and culture; it highlights the role of leadership, collectivity and employee well-being. Loosely associated with these assets is the notion of mobilization of resources and capabilities.

Putting the different pieces together, business resilience can be understood as a dynamic attribute linked to a firm's organizational structure, business model and capabilities, which determine the firm's pre-crisis preparedness to identify and respond to a crisis, its ability to adapt during a crisis and its ability to evolve and, in some cases, even reinvent itself during or after a crisis. It implies initiating a very rapid and efficient response to minimize the consequences of a disruptive event and maintaining or regaining a dynamically stable state. In this regard, a firm's resilience can be measured

using one or a combination of indicators to gauge changes in the firm's level of employment, liquidity (including the firm's ability to access a loan or other forms of credit such as deferring payback on existing loans), productivity and other outcomes such as the preservation of market share, income and sales, and customer retention. Time to recovery or the speed of recovery is also often used as an important indicator of business resilience.

Barriers to doing business vary widely across regions and countries. While the pandemic has reached virtually every country in the world, policy instruments have varied across countries, partly due to differences in financial market development and digital inclusion. Pre-pandemic economic challenges such as sluggish economic growth, limited fiscal space and high debt levels have contributed to weak policy responses in developing countries. The literature reveals the need for balanced labour market regulation, as both rigid regulations and extremely lax regulations could have negative impacts on the productivity and survival of enterprises.

Access to credit is another critical factor for business resilience. Therefore, policies that relax financing constraints, such as wage subsidies, government-backed loan guarantees, microfinance programs, and

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►► Business resilience implies initiating a very rapid and efficient response to minimize the consequences of a disruptive event and maintaining or regaining a dynamically stable state.

tax incentives, are essential to preserve employment and productivity. In this regard the overall health of the financial sector is important for weathering a crisis and the recovery process. The better the initial or pre-crisis (that is, pre-COVID-19) condition of the financial sector, particularly in terms of liquidity, solvency and efficiency, the better it could withstand shocks coming from the real side of the economy. In fact, the macroeconomic context substantially affects firms' growth, resilience and recovery primarily through access to finance, which directly impacts investor sentiments and, hence, investment.

Governments' policy responses determined much of how economies felt the impacts of COVID-19. How far a country fell and how fast it recovered depended on the policy response. However, the COVID-19 pandemic posed a unique type of shock that rendered several conventional countercyclical policies ineffective. Stimulating demand through fiscal policy measures does not help if firms are constrained from producing due to sanitary restrictions or disruptions in supply chains. There was little room to subsidize interest costs in many countries, as interest rates were already close to zero. Hence, many governments, particularly in high-income countries, reverted to unconventional policies such as wage subsidies, "helicopter drops" of liquid assets, equity injections and loan guarantees aimed at providing liquidity to firms and fostering worker retention. The situation was harder for developing countries due to their limited fiscal space and the limited prospects of firms' and governments' for securing external financial responses during the pandemic, given the worldwide extent of the crisis.

A common challenge to fast and efficient policy responses is targeting. The literature review showed that a significant number of firms received support during the COVID-19 pandemic even when they had not experienced any negative shock, while an even larger share of firms with considerable revenue drop had no access to such support. However, there is a trade-off between the time and administrative costs of better targeting, on one hand, and the inefficiencies arising from the suboptimal selection, on the other. Mistargeting was a bigger and more serious problem in countries with weaker governance. The lack of institutional mechanisms in developing countries to effectively reach businesses and workers in the informal economy was a colossal challenge for policy responses. In some cases internal social unrest, riots and civil wars posed additional obstacles.

There are signs that the pandemic has changed long-term economic productivity patterns, with potentially differing implications for sectors such as manufacturing, services and information/communications. Nearly three quarters of businesses (73.0 per cent) encountered some or significant detrimental effect on the supply side, with nearly two-thirds (64.8 per cent) reporting the same on the demand side. One in every five businesses, however, reported increased demand for their products and services. For example, information technology (IT), telecommunications and pharmaceutical companies saw increased demand. In contrast, the hardest hit businesses included hotels, restaurants, businesses specializing in leisure activities, airlines and, to some extent, automobiles.

The impacts of the pandemic on the economic configuration and sectoral composition of countries will be transformative and long-lasting. Companies have changed their business models, whether with home services, appointments or online sales or by venturing into other sectors. While the pandemic has hurt many businesses, it has forced businesses to innovate and even reinvent themselves in order to survive. The push for innovation has even fostered the emergence of new businesses. There is also a significant emphasis on supply chain resilience, with many companies and governments diversifying their suppliers and promoting local sourcing. The war in Ukraine and the ensuing geopolitical crisis and disruptions in supply chains have contributed to this trend.

To achieve resilience, businesses need to adopt digital technologies and undertake profound strategic changes in business models. However, firms' ability to do these is linked to firm-level characteristics, such as age and size, structure and managerial practices. Micro, small and medium-sized enterprises are less prepared to manage shocks, as they have fewer resources at their disposal. Consequently, the pandemic disproportionately impacted them. They were also less able to recover than large firms. Organizational structure is also affects a firm's ability to survive a shock and the speed and extent of its recovery. Generally, firms with decentralised (or less hierarchical) management structures showed more resilience to shocks than their centralized rivals. The financial health of a firm also matters. In addition, a firm's ability to access finance depended on its own financial position as well as the profiles of its creditors; firms that have borrowed from less healthy lenders during pre-crisis periods are less likely to obtain loans in times of crisis than those borrowing from healthier lenders.

Digitization has emerged as a key pathway for business resilience during the COVID-19 pandemic. Firms, including SMEs, deploying information and communication technologies (ICT) and web technologies have fared better in revenues and productivity, lowered costs and created jobs. However, the pandemic has deepened the digital divide among firms, amplifying gains for businesses that cater to customers online, while companies reliant on more traditional models have suffered significant losses and struggled for survival. In fact, the COVID-19 pandemic is increasingly understood as the “great accelerator” of digital transformation. Hence, closing the digital divide between low- and middle-income countries, on one hand, and high-income countries, on the other, and expanding digital connectivity to marginalized individuals and enterprises, especially SMEs, have become pressing policy issues.

An empirical analysis was conducted using data from the World Bank COVID-19 Enterprise Surveys. The responses indicate that the COVID-19 pandemic had a severe impact on the surveyed enterprises. More than half (52.5 per cent) experienced a decline in sales, although only a little over one third had to shut down temporarily due to lockdown measures. Of those that did close, 52 per cent were small businesses. This global crisis revealed the vulnerability of enterprises to unpredictable events such as a pandemic. The surveyed enterprises reported that they could remain open for an average of eight weeks if their sales stopped. However, those that had to temporarily shut down due to lockdown measures could last only six weeks, with small businesses reporting only five weeks. This underscores the need for measures to support small enterprises in creating financial buffers to withstand unexpected events. It also emphasizes the importance of policies that enhance business resilience and continuity, especially during times of crises.

The ability of an economy to withstand shocks is influenced by the quality of the business enabling environment. The business environment encompasses a range of factors, including policies, laws, institutions and regulations that affect business operations. A flawed business environment can hinder productivity, reduce returns on investment and, ultimately, undermine the economic viability of enterprises, which can have adverse effects on employment and job creation. In this respect the data show that tax rates were the most significant impediment to the operations, affecting over one quarter of the surveyed enterprises. This was followed by an inadequately educated workforce (19.22 per cent), tax administration (7.53 per cent), practices of informal sector competitors (7.25 per cent) and political instability (5.78 per cent). For small business, the primary obstacle was tax rates, cited by almost 30 per cent, while about one fifth of large enterprises identified an insufficiently educated workforce as their main challenge.

Moreover, using a sample of 10,365 formal enterprises from 11 economic sectors in 19 countries, a *principal component analysis* (PCA) and three variations of *least absolute shrinkage and selection operator* (LASSO) regression were run to identify the most relevant drivers of resilience among 43 variables identified as explanatory variables. These variables were classified as assess macro, meso (sectoral) or micro barriers to business resilience.

The results from the PCA assessment suggest that the most significant factors affecting business sales resilience during the pandemic were micro-level barriers, which measure access to credit. A one-point increase in this index corresponds to a 1.6–1.7 percentage point decrease in sales. The next most important class of factors was macro-level barriers, which measures regulatory burdens, political instability, barriers to trade and lack of rules of law. A one-point increase in this index is correlated with a 1.2–1.4 percentage point additional decrease in sales. The enterprise characteristics index, which measures management practices and other factors such as business age and size, is also important. A one-point change in this index is associated with a one percentage point increase in sales.

We did not find a statistically significant relationship between business performance and meso-level barriers, which include barriers to access to infrastructure and the degree of competition that the enterprise faces. Furthermore, international enterprises were less affected by the pandemic, possibly because they are larger and have financial buffers and more diverse products and services. The impact on different industries varied, with hotels and restaurants experiencing a larger sales decline (22 percentage points) than manufacturing, retail, wholesale and construction.

The LASSO model, in contrast, shows that digitalization, using *having a website* as a proxy, is the most important enterprise-level characteristic for recovery. The pandemic has widened the digital divide, favouring enterprises that cater to customers online. SMEs that deploy ICT and web technologies can

increase revenue, lower costs, increase productivity and create jobs. We also found that high regulatory barriers to trade are the most important macro barrier affecting sales resilience. Informal competition also is among the most relevant predictors of enterprises' ability to maintain their sales during the pandemic. This finding serves as a reminder that governments play a crucial role in creating a conducive business environment, including promoting the formalization of informal economic units. The presence of informal economic units operating as unfair competition was identified as an obstacle to the survival of the enterprises analysed in our sample.

There is evidence to suggest that barriers to access to credit and to international markets, as well as belonging to the service sector, are among the strongest predictors of large economic damage from the pandemic.

Access to credit is crucial for businesses to survive and thrive, especially during difficult economic times such as those brought about by the pandemic. Businesses that had difficulty obtaining credit before the pandemic may have faced even greater challenges during the pandemic, as lenders became more risk-averse and credit became tighter. This lack of credit may have prevented some enterprises from adapting to the changing economic environment, leading to their closure or significant downsizing.

Similarly, international trade can play a vital role in the success of many enterprises, particularly those in the manufacturing and service sectors. The disruption of global supply chains and the slowdown in international trade caused by the pandemic may have disproportionately affected these businesses, leading to reduced revenue and even closure.

Finally, the service sector has been hit particularly hard by the pandemic due to lockdowns and social distancing measures. Many service businesses, such as restaurants and entertainment venues, were forced to close or to operate at reduced capacity for extended periods of time, leading to significant revenue losses.

Overall, enterprises that faced these barriers before the pandemic may have been more vulnerable to economic damage during the pandemic, making it important to address these issues to promote a more resilient and equitable economy going forward.

# Abbreviations

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<b>CGE</b>	computable general equilibrium
<b>CV</b>	cross-validation
<b>EBMO</b>	employers and business membership organizations
<b>ERM</b>	Enterprise Risk Management
<b>ES</b>	[World Bank] Enterprise Surveys
<b>GDP</b>	gross domestic product
<b>IATA</b>	International Air Transport Association
<b>ICT</b>	information and communication technology
<b>ILO</b>	International Labour Organization
<b>IMF</b>	International Monetary Fund
<b>IT</b>	information technology
<b>KPI</b>	key performance indicators
<b>LASSO</b>	Least Absolute Shrinkage and Selection Operator
<b>MSE</b>	mean squared error
<b>OSH</b>	occupational safety and health
<b>PCA</b>	principal component analysis
<b>SME</b>	small and medium-sized enterprise
<b>TFP</b>	total factor productivity
<b>UNWTO</b>	United Nations World Tourism Organization



# ▶ Introduction

# Introduction

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The COVID-19 pandemic is arguably the largest shock to the world economy since World War II. The International Labour Organization (ILO) estimates that global labour income declined nearly 11 per cent, or US\$3.5 trillion, in the first three quarters of 2020 alone (ILO 2021a). Data from the World Bank show that the size of the world economy (in terms of real global GDP) fell by 3.4 per cent in 2020. In particular, the euro zone and countries in Latin America and the Caribbean saw their real GDP decline by 6.4 per cent in 2020, while South Asia as a group saw its real GDP shrink by 5.2 per cent. Looking at individual countries, those that experienced the biggest real GDP decline include Argentina (-9.9 per cent), Mexico (-8.2 per cent), India (-7.3 per cent) and South Africa (-6.4 per cent). The shock to firms was massive and persistent, with sales globally down by 50 per cent during the first three months of the epidemic and still 27 per cent lower six to nine months after the onset of the crisis. With worldwide vaccine rollout, although unevenly distributed, and the phasing out of nationwide lockdowns and economy-wide workplace closures except for some countries in East Asia, global GDP growth in 2021 rebounded, with labour income surpassing the pre-crisis levels by 0.9 per cent (ILO 2022a).

Attempting to suppress the spread of the COVID-19 infection, many countries partially or fully closed their borders and restricted the movement of people. Data from the International Air Transport Association (IATA) show that, in response to the first wave of the pandemic, over 156 countries put in place some form of travel restriction, including denying entry, restricting visas or imposing mandatory quarantines; among these, 104 countries were closed entirely. Initially, restrictions on transportation and the movement of labour impaired the production capacity of economies and disrupted supplies. The shock rapidly spilled over to the demand side, as people were locked down in their homes, and workers were furloughed or laid off and lost income. Most businesses closed or were open for only limited hours; even when businesses were operating, lower consumer demand reduced earnings. The health crisis rapidly became a labour market crisis, affecting both labour supply and demand.

As the pandemic proceeded, a body of literature emerged providing insights into the critical channels through which COVID-19 affected economic activity. Park, Villafuerte et al. (2020) describe three channels for the economic impact of the COVID-19 pandemic: (i) an increase in trade costs that affected the movement of people and inbound tourism, along with industries linked to global supply chains; (ii) a negative supply-side productivity shock that cuts wages and corporate earnings, leading to reductions in consumption and investment; and (iii) policy responses, including health spending and fiscal stimulus through various macroeconomic policy instruments. Támara and Fernández-Diez (2020) conceptualized the pandemic as a shock that affects how labour and other inputs are organized and how supply and demand interact in different markets. In response to the new scenario, productive processes needed to be reorganized and markets must account for increased transaction costs. Limitations on the provision of labour services while restrictions were in place were central to the pandemic's economic effects.

The pandemic was also a massive relocation shock, in which there were winners and losers. In the United States of America, there were three new hires for every ten layoffs caused by the shock during the first three months of the pandemic (Barrero, Bloom et al. 2020a). These patterns are consistent with companies and governments moving resources into new activities that were urgently needed.

Conventionally, economists explain firms' closure during recessions with Schumpeter's (1934) creative destruction theory. According to the theory, small and less efficient firms find it hard to survive economic downturns and so exit the market. However, in times of such extreme economic distress as the COVID-19 pandemic brought, all types of firms, including the efficient ones, reeled from the inability to do business. Firms in most sectors faced significantly lower demand and rising economic uncertainty stretching for months or years.

COVID-19 will have considerable longer-term effects through what is known as hysteresis (Verhagen, Bohl et al. 2020). While it has accelerated some positive changes, such as the digitalization of production processes and reinforcement of occupational safety and health (OSH) systems, the predominant

long-term impact is likely to be disruptive, diminishing the rate of future economic and social development. COVID-19 is likely to create a lasting impact on labour productivity due to its adverse effect on human capital, infrastructure and investment (Djiofack, Dudu et al. 2020; Halmai 2021). Focusing on firm performance and drawing from the “real option theory”, Shen, Fu et al. (2020) argue that the most important channel via which the pandemic has affected firm performance is through the deferment of investment in favour of increasing cash holding to build a financial buffer as uncertainties rise.

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In 2020 the International Monetary Fund projected that the cumulative loss of global output due to the scars or hysteresis of the pandemic could reach US\$11 trillion over the next five years. Even though global output had experienced a strong recovery in 2021 following the phasing out of most COVID-related restriction, the recovery has been uneven among countries and has been losing steam since the end of 2021. Moreover, labour market recovery has been lagging in many countries. The ILO (2022a) reported that hours worked in the first quarter of 2022 stood 3.8 per cent below the level of the fourth quarter of 2019, a difference equivalent to a deficit of 112 million full-time jobs.

While the current pandemic constitutes an exceptional shock, identifying factors driving business resilience and, in particular, productivity recovery in the context of COVID-19 is of utmost relevance for two reasons:

- i. Research has documented that even relatively milder health crises, such as past epidemics, were followed by persistent losses in investment and labour productivity.
- ii. The pandemic has been portrayed as a once-in-a-lifetime situation, but geopolitical tensions and climate change have already increased economic and political uncertainties and the likelihood of other major global shocks. Soaring energy and food prices, supply chain disruptions and rising geopolitical tensions caused by the war in Ukraine have put further pressure on economies and labour markets.

This paper reviews the macro-, meso- and micro-level factors that drive business resilience. Chapter 2 presents a conceptual framework for understanding resilience and existing approaches to measuring it. Chapter 3 synthesizes the most important macro-level factors, including drivers in the business environment and development context. Chapter 4 presents research findings on the meso-level catalysts of business recovery. Sector-level vulnerabilities and demands for transformation, local economic conditions and supply-chain characteristics are reviewed. Chapter 5 reviews firm-level determinants of resilience. Firm age and size, structure, technology adoption and managerial practices are key aspects addressed. Finally, Chapter 6 succinctly discusses the existing empirical literature on business resilience and presents the methodologies used in the report: the principal component analysis and LASSO (Least Absolute Shrinkage and Selection Operator) regression method. Section 7 presents the empirical findings and discusses the key conclusions. It also makes suggestions for future research on business resilience.

Chapter

▶ 1



# 1. What is business resilience?

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Investigating businesses' resilience<sup>1</sup> in the COVID-19 pandemic, or the extent to which firms undertake changes and adjustments in this new regime, is crucial for policy design and guidance for employer and business membership organizations (EMBOs). When resources at the macro level are scarce, understanding the source, type and extent of firms' vulnerability and their chances of surviving a major jolt can help inform how and where to allocate resources strategically.

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►► The earliest and most voluminous economic literature on firm survival associates business resilience primarily with productivity.

The earliest and most voluminous economic literature on firm survival associates business resilience primarily with productivity. Since productivity is correlated with firm size and age, under this theory, which is commonly known as *creative destruction*, small and less efficient firms, as well as younger firms, have lower chances of surviving than their more efficient counterparts (Bosio, Jolevski et al. 2020). As such, the process of creative destruction during times of crisis was expected to play a "cleansing" role, in which resources from less efficient and non-productive firms get reallocated to more efficient and productive firms (see Caballero and Hammour, 1996, for a lucid discussion on the theory of creative destruction).

However, more recent empirical studies find that the process of creative destruction is weaker and less universal than expected. Many explanations have been advanced to explain this phenomenon. One of the principal explanations is that indiscriminate policy aid measures put in place by governments, in particular liquidity subsidies and loan guarantees, have allowed unviable firms – those in a weak financial position before the crisis – to survive. For example, Dörr et al. (2022) undertook insolvency gap analysis and estimated that about 25,000 micro and small enterprises in Germany that were in a weak financial position before the crisis avoided insolvency by taking advantage of Germany's generous liquidity subsidies. In a similar study, Eckert and Mikosch (2022) found that firm bankruptcies in Switzerland, relative to the pre-pandemic average, dropped significantly more in industries and cantons in which the share of firms that received COVID-19 loans was comparatively high. Protecting jobs and enterprises is central to minimizing the damage of the pandemic. However, better targeting of policy support to viable and productive enterprises is critical to minimize resource misallocation and expedite post-pandemic recovery. This is particularly important in developing countries where the fiscal space is narrow.

Moreover, the constructive destruction hypothesis has proven not to hold up well in the context of developing countries due to credit constraint and high informality. The lack of access to credit stifles the expansion and growth of innovative and productive firms (see, for example, Bloom, Bunn et al. (2020) and Barlevy (2003)). Moreover, many inefficient and distressed firms in developing countries do not necessarily exit the market due to crisis but instead move into the informal sector, thereby impeding the potential for market "cleansing" and diminishing the scope for a well-functioning creative destruction process (see Caballero and Hammou (2000) and Hsieh and Klenow (2018)). The main reason is that a large

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<sup>1</sup> The word "resilience" originates from the Latin *resilio*, which means going back, leaping or springing back, recoiling or rebounding. It began to be used in physics to describe materials' quality of resisting pressure, easily bending and regaining their original shape. However, human and social resilience are not limited to resisting but also allows us to rebuild and overcome despite difficulties. Resilience emerges from adversity and is the ability to continue to function well in these adverse situations; it is something positive that results from something negative, and it can be developed in organizations (Salanova 2020).

proportion of economic units in the informal economy are the result of necessity entrepreneurship, set up as a survival occupational choice.<sup>2</sup> Hence, they are not subject to creative destruction because they are not innovative firms. Thus, the pandemic is expected to increase informality and to further slow productivity growth in developing countries.

It is also documented that in developing countries shocks are likely to disproportionately hurt efficient firms. The two main reasons for this are that these firms have higher financial needs (Barlevy 2003), which are hard to satisfy in the presence of credit constraints, and that they face rising competition from informal firms that charge lower prices. Hallward-Driemeier and Rijkers (2013) analysed firm dynamics during the East Asian crisis and documented the disproportionate exit of relatively productive firms, revealing the weak relationship between firm productivity and firm survival in developing countries. Noteworthy, firms that entered during the crisis were, in fact, relatively more productive, which helped mitigate the crisis-driven reduction in aggregate productivity. In this context credit constraints and informality can be regarded as grave market imperfections that not only dampen the process of creative destruction but also threaten the survival of efficient firms during crisis.

In the business management literature, strategic planning has long been the main focus of research on businesses' response to crisis (Robinson 1983). By comparison, organizational resilience is a young paradigm with a scant literature and without a unifying definition (Herbane 2019). In other words, the early literature on resilience was more planning-centric, with its argument centring on the contention that, if a firm has a strategy to face a possible shock, then the firm is resilient.<sup>3</sup>

More recent strands of management literature have taken a more capability-centric approach, defining a firm as resilient if it has the capacity to adapt and recover successfully when facing adversity, stress or disturbance. Organizational resilience is defined as the ability to anticipate critical opportunities in emerging trends, constantly adapting and changing, rapidly bouncing back from disaster and remaining stable in a turbulent environment (Coutu 2002; Fiksel 2003; Fiksel 2006; Hamel and Valikangas 2003; Marcos and Macauley 2008; Stewart and O'Donnell 2007; Sutcliffe and Vogus 2003).

Norris, Stevens et al. (2008) propose defining resilience as "a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance." This conception of resilience as a dynamic condition also is proposed by several other scholars (Brown, Rovins et al. 2017; Supardi and Hadi 2020). Firms are resilient when they have a robust buffer of resources or can rapidly access adequate resources for counteracting a stressor's impacts and enabling a return to functionality by adapting to the changed environment (Norris, Stevens et al. 2008).

Finally, Enterprise Risk Management (ERM) is a management framework that has been increasingly used by large enterprises to proactively manage risks and uncertainties (Maraboutis et al. 2021). It includes methods and processes for identifying threats to, and opportunities to achieve, the organization's objectives, assessing the likelihood and magnitude of impact and determining a response strategy and a monitoring process. Executives struggle with business pressures that may be partly or completely beyond their immediate control, such as distressed financial markets; mergers, acquisitions and restructurings; disruptive technology change; geopolitical instabilities; and a rising price of energy. By identifying and proactively addressing risks and opportunities, enterprises protect and create value. Properly managed, ERM can drive growth and opportunity (Nocco and Stulz 2022; Poon et al. 2022).

## ► 1.1 Proactive, adaptive and reactive resilience

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In the business and supply chain literature (Brown, Rovins et al. 2017; Supardi and Hadi 2020), as well as in urban systems literature (Rippon, Bagnall et al. 2020), attributes of resilience are often categorized by their timing with respect to the disruption or event. For example, Ponomarov and Holcomb (2009)

<sup>2</sup> See Nichter and Goldmark (2009) and Poschke (2013) for insightful analysis.

<sup>3</sup> Yet, surveys of small and medium-sized enterprises (SMEs) have found that formal planning to enhance resilience is not mainstream (Blundel 2013; Coates, McGuinness et al. 2016; Herbane 2015; Mikušová 2013; Musgrave and Woodman 2013).

propose categorizing supply chain resilience into readiness, response and recovery dimensions. In general, business resilience can be understood as involving three dimensions or aspects: proactive resilience, adaptive resilience and reactive resilience.

### 1.1.1 Proactive resilience

Alertness, readiness and preparedness are characteristics of a firm's proactive resilience. This type of resilience refers to attributes and processes happening *before* a disruptive event. The literature on resilience underscores the need for consistent, proactive and ever quicker approaches to addressing change (Bolton 2004) before the case for change becomes urgently inevitable (Hamel and Valikangas 2003).

Previous crisis experiences are among the important determinants of a proactive resilience. The reason is that organizations that were hard-hit by a previous crisis are more likely to act proactively to mitigate the effects of a future crisis. The experience of a crisis (such as fire, flooding, power outage and so on) influence crisis management plans (Herbane 2015; Herbane 2019).

### 1.1.2 Adaptive resilience

The ability to change and sustain operations in the face of a shock characterizes adaptive/absorptive business resilience. Adaptation to new market forces through, among other things, agility and capability for changing rapidly all aspects of business models and operations can lead to resilience (Benoit et al. 2020). Research has shown that firms differ widely in their "adaptive capabilities", which is the ability to leverage and reconfigure internal and external resources in order to adapt to changes in the environment (Augier and Teece 2009). Beck, Flynn et al. (2020) found that, during the coronavirus outbreak, in emerging economies firms had to show flexibility vis-à-vis customers and stakeholders and shifted business operations to respond to pandemic needs. Moreover, Cefis and Marsili (2019) found that entrepreneurial firms not only have a better probability of survival but also enjoy a higher survival premium (or profitability) during and after the crisis. These findings are consistent with the results presented in Section 6 of this report: Firms that adjusted or converted their products and services in response to COVID-19, firms that introduced new products or services over the past three years and firms that conducted product or process innovation (introducing new or significantly improved processes) were likely to experience a smaller fall in sales during the pandemic. These are prime examples of how adaptive resilience looks in practice and how it impacts firms' recovery.

### 1.1.3 Reactive resilience

Responding, surviving and returning are abilities that define a business' reactive resilience; this is the most common approach to resilience for SMEs. This type of resilience refers to attributes that are manifested *after* the occurrence of a disruptive event. A large body of research has found that SMEs tend to think and plan in the short term; thus, they are often reacting to internal and external stimuli.<sup>4</sup> This becomes more prominent when their core business objective becomes survival (Ates and Bititci 2011; Bergman, Viljainen et al. 2006). Sutcliffe and Vogus (2003) suggest that an organization's capacity to absorb the impact of a threat and to adapt over the long term is a post-hoc indicator of resilience.

### 1.1.4 Resilience as a dynamic attribute

In most organizations managing change is a problematic endeavour. Studies have shown that two of every three initiatives for change fail, particularly in the face of crisis (Sirkin, Keenan et al. 2005). Some measures of resilience, however, reflect corporate dynamism in response to changes in the external environment. Innovative responses through improvements and continuous changes of business models and processes are crucial for firms' sustainability and resilience (Ates and Bititci 2011). These attributes are present before, during and after a crisis.

<sup>4</sup> See Supardi and Hadi (2020) for a systematic review of the literature on the resilience of SMEs.

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►► In general, business resilience can be understood as a dynamic attribute linked to a firm’s organizational structure, business model and capabilities, which determine the firm’s pre-crisis preparedness to identify and respond to a crisis, its ability to adapt during a crisis and its ability to evolve and, in some cases, even reinvent itself during or after a crisis.

Pal, Torstensson et al. (2014) proposed an SME resilience model, which stressed the significance of three key assets. The first is firms’ resourcefulness, notably, their material, social or intangible capabilities. The second, dynamic competitiveness, emphasizes the value of flexibility, robustness, networking or redundancy, or the degree to which some elements can be substitutable in the event of disruption. The third asset is learning and culture; it highlights the role of leadership, collectivity and employee well-being. Loosely associated with these assets is the notion of mobilization of resources and capabilities, with key potential benefits for industry and the surrounding stakeholders (Sainaghi et al. 2019). In general, business resilience can be understood as a dynamic attribute linked to a firm’s organizational structure, business model and capabilities, which determine the firm’s pre-crisis preparedness to identify and respond to a crisis, its ability to adapt during a crisis and its ability to evolve and, in some cases, even reinvent itself during or after a crisis.

## ► 1.2 Types of disruptions

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Resilience implies initiating a very rapid and efficient response to minimize the consequences of a disruptive event and maintaining or regaining a dynamically stable state (Golan, Jernegan et al. 2020). Datta (2017) proposes classifying disruptions into the following categories:

- a. Unexpected events: natural or anthropogenic disasters, unexpected rise or fall in demand, strategic vulnerability to technology changes, new competition, supplier failure, etc.;
- b. Internal practices: operational vulnerability due to optimization, processes and policies;
- c. Complexity: strategic vulnerability resulting from industry type, globalization, outsourcing, supplier dependency, technological intricacy involving increased interactions between parts and process stages.

Major economic disruptions, such as financial crises and deep recessions or natural disasters, wars and pandemics, are often associated with protracted decline in labour productivity (Bell and Lewis 2005; Dieppe 2020). Although the vast majority of disruptive events are climate-related natural disasters, health crises, such as pandemics and epidemics, have had colossal impacts on labour productivity. For example, as Dieppe (2020) underlined, the four major epidemic outbreaks that the world experienced during 2000–18<sup>5</sup> caused lasting scars, reducing labour productivity and output by a total of 4 per cent, as measured three years after each of these pandemics and added together. A similar study shows that the 2014 Ebola outbreak in West Africa resulted in a loss of US\$359 million in forgone output in Guinea,

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5 SARS (2002–03), MERS (2012), Ebola (2014–15) and Zika (2015–16).

Liberia and Sierra Leone alone (World Bank 2014). In all the above-mentioned cases, the adverse effects of the epidemics on investment due to elevated uncertainty have been identified as the main channel (Dieppe 2020; Lee and McKibbin 2004). They also had large and lasting social costs (see, for example, Huber, Finelli et al. (2018)).

In the case of the COVID-19 pandemic, firms experienced both supply and demand shocks. Challenges in accessing adequate supplies and retaining sufficient labour to stay in operation triggered the supply shock. The demand shock was driven by a) reductions in demand due to public health concerns and its impact on mobility, preventing people from reaching markets, especially in the service and consumer goods sectors, and b) declining incomes due to rising unemployment and underemployment.

## ► 1.3 Recovery of what? Indicators to measure resilience

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If resilience is understood as the capacity to adapt and recover when facing adversity, stress or disturbance, then the question arises of how to measure preparedness, adaptation and recovery. This section will provide an overview of the potential variables to be included in measures of resilience.

### 1.3.1 Employment

At the peak of the COVID-19 pandemic, the ILO warned that employment losses could reach 300 million jobs worldwide and that 1.6 billion workers in the informal economy were at immediate risk of seeing their livelihoods reduced (ILO 2021a). The recommended policy focus to deal with this catastrophe was to provide support to workers and households so that they could weather the income shock and to firms so that they could stay afloat and retain workers (Carranza, Farole et al. 2020). Hence, as an indicator of resilience, it is relevant to analyse what factors contributed to avoiding or reducing job losses.

Using survey responses from early April 2020 across nearly 500 firms in ten emerging markets, Beck, Flynn et al. (2020) found that the vast majority of firms had been adversely affected by COVID-19 and had reacted by reducing investment rather than payrolls. Similarly, Apedo-Amah, Avdiu et al. (2020) found that small and medium-sized firms in developing countries were able, for the most part, to hold onto workers despite seeing sales halved by the pandemic. This strategy makes sense. As Hevia and Neumeyer (2020) emphasized, the lessons learned from previous recessions have revealed that finding workers with the right skills and experiences during recovery from a major crisis is often a difficult and slow process.

### 1.3.2 Liquidity

In the wake of the COVID-driven supply and demand shocks, firms need to maximize liquidity in order to remain in business. One way to do this is to access additional working capital through a loan or other forms of credit or by deferring payback of existing loans. However, if shocks in the real economy are accompanied by a financial market shock as a result of increasing risk, access of firms – especially SMEs – to working capital as well as trade finance may be blocked precisely when most needed (Carranza, Farole et al. 2020).

Many businesses worldwide have struggled with cash flows. In the United States at the peak of the pandemics, firms on average had cash reserves to last anywhere between three weeks and six months. Restaurants, for example, had less than a month of cash on hand. Liquidity was the main constraint for the survival of many firms. While governments put in place policies to support enterprises' payment of workers, freeze interest payments on loans and extend new bank credit, other expenses – such as rent and the cost of materials – weighed on businesses. In mid-2021 the median firm in a low-income country had retained earnings and other financing resources sufficient to last from six weeks (retail) to 28 weeks

(manufacturing). In middle-income countries the median survival time ranged from seven weeks (in retail) to 11 weeks (manufacturing). When the decline in export demand is taken into account, the median survival time stood at 6–18 weeks in low-income countries, while it remained roughly the same – 7–11 weeks – in middle-income countries. These figures are slightly lower than those in 12 high- and middle-income countries across Africa, Central Asia, Europe, Latin America and the Middle East, which show that the projected survival time of small firms across industries ranged from eight weeks to 19 weeks (Bosio, Jolevski et al. 2020).

The importance of productivity growth to build financial buffers and to have liquidity to cope with shocks should also be underscored. This is a key issue because most micro and small firms in developing and emerging-market countries are in a low productivity trap. In the next section, we conduct a review of the impacts of the pandemic on firms' productivity and, in the rest of the paper, we focus on the determinants of productivity recovery.

### 1.3.3 Productivity

Enhancing an enterprise's productivity is essential to its sustainability.<sup>6</sup> As summarized in the 2020 report *Driving Up Productivity* (ILO 2020a), productivity is strongly linked to higher profits and growth for companies (Bloom, Eifert et al. 2013), higher wages (Lazear 2019; Stansbury and Sommers 2017), lower costs for consumers (Alm and Cox 2002) and lower levels of poverty (Byerlee, Diao et al. 2005). For these reasons, productivity recovery is one of the most important factors for business resilience. The COVID-19 global pandemic hit the world (with the notable exception of Asia) in the context of a sluggish productivity recovery dating back to the 2007–09 global financial crisis.

The pandemic exacerbated these pre-existing challenges to productivity. There are multiple channels through which the COVID-19 pandemic affected productivity, as highlighted in the economics and business literature. First, uncertainty about the pandemic's duration and the global economic landscape that would eventually emerge may have discouraged investment (Shen, Fu et al. 2020). Second, higher transaction costs originating from restrictions on the mobility of labour and goods and on production, limiting the allocation of resources within and across countries and sectors, worsened misallocation in the economy and lowered aggregate productivity growth (Apedo-Amah, Avdiu et al. 2020). Third, the COVID-19 crisis had implications for skills development and the skills system, which is a driving force of productivity. Fourth, mobility restrictions may slow workers' reallocation away from low-productivity firms and sectors to higher-productivity ones, which often involves relocation from rural to urban areas (Syverson and di Mauro 2020) and from informal to formal sectors. The net effect on firms and in the aggregate on countries will depend on their ability to tackle these challenges and seize the opportunities for transformation associated with the pandemic.

Bloom, Bunn et al. (2020) analysed the impact of COVID-19 on labour productivity and total factor productivity (TFP) in the United Kingdom. The results projected that COVID-19 could reduce TFP in the private sector, relative to what would otherwise have happened, by about 3 per cent on average between 2020 Q2 and 2021 Q2, peaking at 5 per cent in 2020 Q4. A positive "between-firm" effect partially offsets the negative "within-firm" effect as low-productivity sectors, and the least productive firms among them, are disproportionately affected and consequently make a smaller contribution to the economy.

The impact of COVID-19 on hourly labour productivity is estimated to be less negative than the impact on TFP. That is because hours worked dropped by around 40 per cent in 2020 Q2, which is a more considerable fall than the input share-weighted fall in capital (which dropped by 1 per cent in 2020 Q2). To gauge the effects over the medium term, the authors use responses to survey questions asking about the expected impacts of COVID-19 in 2022 and afterward. On this basis the authors estimated that the pandemic would reduce TFP by about 0.7 per cent over the medium term, equivalent to about one year of pre-pandemic productivity growth in the United Kingdom.

Bloom, Bunn et al. (2020) highlighted that the positive impact on productivity that was observed during the COVID-19 pandemic cannot be explained by the usual Schumpeterian process of creative destruction, in which higher productivity firms replace lower productivity firms. Instead, much of this is simply the

<sup>6</sup> Productivity is commonly defined as a ratio of a volume measure of output to a volume measure of input use (OECD 2001).

destruction of low productivity sectors. Industries such as accommodation and food and recreational services have experienced substantial contractions, while there was limited expansion in other sectors. So, while average productivity may have increased statistically, total economic output and overall welfare fell.

### 1.3.4 Other outcomes

Other measures of recovery have been proposed as relevant measures of resilience. A competitive company can generate profit and have a significant market share, making these two outcomes potential variables of interest when studying a firm's recovery. To be considered competitive, a company must use its resources and technical capability to produce the right products and services, with quality and appropriate price and in the correct number, so that it can effectively commercialize its products to the consumer market (Dresch, Collatto et al. 2018).

There is a robust literature on supply chain resilience that proposes a wide variety of proxies and indexes of resilience. Such proxies include preservation of market share, performance after disruption using backlog as a metric, product depreciation, readiness, expected disruption in cost, total direct losses in income and sales, customer retention (that is, cost of lost customers), delivery delay, fractional quantity loss and percentage of suppliers who lost capacity under disruption (see Golan, Jernegan et al. 2020). While this literature is focused on supply chain resilience, several of the outcomes proposed could be of interest when considering individual firms, too, especially if they are vertically integrated.

Finally, once the primary measures of a firm's performance are selected, relevant secondary measures account for the total losses when facing a crisis and firms' ability to minimize this cost. Several papers in the literature study time-to-recovery (either measured from past crises or expected in the current economic outlook) as one indicator for measuring resilience in empirical modelling and projections (for instance, Belhadi, Kamble et al. 2021; De Mel, McKenzie et al. 2012; Furceri, Loungani et al. 2020; Singh, Kumar et al. 2020). The time it would take for firms to return to their pre-shock levels of productivity, liquidity or size and the factors that determine that length of time, that is, time-to-recovery, is also a critical question for policymakers and business managers alike.

Chapter

# ▶ 2



## 2. Macro-level factors determining resilience

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### ► 2.1 Business environment

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Barriers to doing business vary widely across regions and countries. Globally, there is robust evidence that shows how addressing key components of the business environment can foster productivity growth. Bastos and Nasir (2004) found that competitive pressure is the most important aspect of investment climate in determining productivity growth at the country level. Thus, they concluded, improving the investment climate to create an environment conducive to investing and lending is where policymakers should first focus their reform efforts.

Recent work for the United States confirmed a slowdown in business dynamism, with declining job reallocations, firm turnover and entrepreneurial activities, including in such vibrant sectors as information and communications technologies. This decline may be driven by increased rigidities in the labour market or uncertainty that prevents firms from adjusting to shocks or investing (Cusolito and Maloney 2018). Kim and Loayza (2017) explored data from 65 countries and found that TFP can be significantly enhanced through innovation, education, market efficiency and better physical and institutional infrastructure.

In this section we synthesize the relevant literature on the determinants of the business environment and their role in business resilience, with emphasis on four key elements: a) political and macroeconomic conditions, b) existing constraints in the financial sector, c) investor sentiment and d) uncertainty and volatility. Finally, in the specific case of the COVID-19 pandemic, governments' responses affect the business environment and impact the survival of firms. The literature on COVID-19 policy on firms is included in Section 3.1.5.

#### 2.1.1 Political and macroeconomic conditions

While the pandemic has reached virtually every country in the world, policy instruments have varied across countries. Part of this variation comes from huge differences among countries in development levels of financial markets and digital inclusion. Such pre-pandemic economic challenges as sluggish economic growth limited fiscal space, and high debt levels also have contributed to weak policy responses in some countries. Several studies suggest that labour market regulations and policies governing firm dynamics can distort firm selection in periods of adverse shocks because they allow relatively inefficient firms to survive (Foster, Haltiwanger et al. 2008). As mentioned in the introduction to Chapter 2, this phenomenon was observed during the COVID-19 pandemic, where generous and indiscriminate policy responses allowed the survival of firms that were struggling in the years preceding the pandemic.

When not adequately flexible, labour market regulations can have a dampening effect on the survival of more productive firms during a crisis. Hallward-Driemeier and Rijkers (2013), examining firm survival in

►► Barriers to doing business vary widely across regions and countries. Globally, there is robust evidence that shows how addressing key components of the business environment can foster productivity growth.

Indonesia, found that being highly productive does not significantly improve a firm's chances of survival during a crisis. The main culprits for this are labour market imperfections, particularly high and rigid minimum wages. This finding adds nuance to the mainstream view that higher minimum wages drive out less productive firms, thus having a "cleansing" effect (see, for example, Osotimehin and Pappadà (2017) and Rizov, Croucher et al. (2016)). Therefore, caution in policy design is advisable, as labour regulation could distort the selection or allocation process of the market, and this effect is especially pronounced during periods of crisis.

However, nothing in the literature suggests the existence of a deterministic relationship between labour market regulations, on one hand, and firm survival and productivity, on the other (see, for example, Griffith and Macartney (2014) and Pessoa and Van Reenen (2014)). In fact, less flexible labour market regulations and a higher real wage could have a negative impact on productivity growth and survival of enterprises that rely on layoffs or wage flexibility to adjust their labour force during a crisis. Equally, less flexible labour market regulation and a higher real wage can stimulate firms to invest and innovate more to recover profits, positively affecting productivity and survival in the long run (see, for example, Griffith and Macartney (2014), Pessoa and Van Reenen (2014) and Riley and Bondibene (2017)).

## 2.1.2 Financial constraints

COVID-19-related lockdowns and other measures affecting enterprises and workers amounted to a massive productivity shock. Eliminating jobs in a pandemic may be inefficient. While most workers may be unproductive or less productive during the lockdown, eliminating jobs harms productivity in the recovery. Hence, most firms opted to retain workers even though the wage bill exceeded sales during the pandemic. However, many employers struggled to preserve jobs because of credit constraint that made paying the wage bill challenging (Céspedes, Chang et al. 2020). The link between firms' size (that is, collateral) and value plays an important role in the determination of firms' access to credit. In turn, the value of firms is determined by expectations of profitability and, therefore, of productivity during the recovery period. But profitability and productivity depend on a number of factors, including employment. These factors in turn could be limited by the firms' value. This implies that there can be amplification effects due to what is known as the "unemployment–asset price deflation loop"<sup>7</sup> (Fornaro and Wolf 2020). In this context Céspedes, Chang et al. (2020) argue in favour of policies that relax financing constraints, such as wage subsidies, equity injections and loan guarantees aiming to preserve employment and productivity.

The overall health of the financial sector matters for the recovery process. Támara and Fernández-Diez (2020) highlight that during the pandemic, financial stability was threatened due to reduced bank capital, as households and businesses experiencing income shocks faced problems servicing their debts. The better the initial or pre-crisis condition (pre-COVID-19) of the financial sector, particularly in terms of liquidity, solvency and efficiency, the better it could withstand shocks coming from the real side of the economy. Then, there is also the contribution of the financial sector to the dynamics of the real side of the economy during the initial stages of the crisis and in the recovery process.

Another major market failure hindering the survival of efficient firms is incomplete information. Financial institutions lack sufficient information to correctly evaluate credit merit, with the consequent rise of credit constraints (Bosio, Jolevski et al. 2020). Barlevy (2003) shows that, during times of economic distress and in the presence of credit constraints, efficient firms may be hurt disproportionately due to their higher financial needs. Similarly, using panel data and a randomized experiment, De Mel, McKenzie et al. (2012) assessed the effects of relief aid and access to capital on the recovery of Sri Lankan microenterprises following the December 2004 tsunami. Their results show that a lack of access to capital inhibits the recovery process; firms receiving randomly allocated grants recovered profit levels almost two years before comparable firms that did not receive grants. These results are consistent with the findings of Rajan and Zingales (1998), who, in the context of the East Asian crisis, documented that firms

<sup>7</sup> The unemployment–asset price loop refers to a vicious cycle situation because of the link between a firm's size and the credit limit it faces. As a firm gets smaller in size due to reducing its number of employees in a crisis, the firm's asset (or collateral) value may decrease due to lower productivity expectations in recovery. This, in turn, could reduce the credit limit for the firm, making it even more difficult for the firm to retain its employees, further dampening the asset value (collateral) and the credit limit.

operating in industries more dependent on external finance and with lower asset tangibility (high credit constraint) were more likely to exit during crisis. The effect of credit constraint is more pronounced on low-productive firms (Osotimehin and Pappadà 2017).

### 2.1.3 Investor sentiment

As shown in the previous section, the macroeconomic context substantially impacts firms' growth – or recovery — primarily through access to finance. Research has shown that the cost of external finance varies over time and affects investment and hiring (McLean and Zhao 2014). Investor sentiment, a key driver of private investment, can significantly influence the pace of the recovery. The financial crisis of 2007 to 2009 underscored the importance of understanding the effects of financial markets on the real economy. Evidence shows that the cost of external finance that small and medium-sized firms face varies with the business cycle and investor sentiment.

Naes, Skjeltorp et al. (2011) show that stock market liquidity in the United States is countercyclical. This means that stock market liquidity tends to dry up during periods of economic downturn due to a “flight to quality” – a situation in which investors sell stocks, especially riskier stocks, in favour of safer securities during recessions. The liquidity dry-up is most detrimental to small firms and firms with low credit ratings, which are more likely to need external finance during recession. For such firms, both investment and employment are more sensitive to the business cycle and investor sentiment (McLean and Zhao 2014).

High government debt can increase uncertainty about prospects for economic growth. Kose, Nagle et al. (2020) argue that investors may fear that high debt could eventually compel the government to raise taxes (including taxes on future investment returns), curtail growth-enhancing spending, crowd out productive investment (debt overhangs) or delay reforms that could support innovation and productivity growth.

### 2.1.4 Uncertainty and volatility

During major adverse events, a collapse in consumer expenditures often accompanies an increase in uncertainty, which makes economic transactions more difficult to accomplish (Bloom 2014) and puts firms' productivity and profits at risk. Also, businesses' relationships with buyers and suppliers become less reliable (Bosio, Dkankov et al. 2020).

Verhagen, Bohl et al. (2020) identify three sources of uncertainty in the post-COVID period. The first category consists of the fiscal and monetary implications of pandemic-period decisions. The second category of uncertainties includes many economic restructuring elements. Changes in expected levels of GDP per capita and trade patterns across sectors translate into changes in sectoral labour demand, including the relative shares of demand for skilled and unskilled labour. There is uncertainty about the effects on total labour demand, its breakdown into formal and informal components and the interaction of such changes with the labour force's educational and skill composition (related to societal attention to and spending on education and health).

The third category of uncertainties involves a variety of changes in socio-political behaviour. Perhaps the most important of these is the potential for increased societal instability, conflict and disruptive regime shifts, with profound consequences for productivity and business resilience. The epidemic had been unfolding in the face of an already unstable situation in some countries (Moyer and Kaplan 2020; UNHCR 2020). Moreover, the increasing geopolitical turmoil associated with the war in Ukraine, including soaring energy and food prices, is threatening to slow the pace of the post-COVID economic and productivity recovery.

### 2.1.5 COVID-19 government response

The policy response of governments determined much of how economies felt the impacts of COVID-19. How far a country falls and how fast it recovers depend on the policy response (Reinhart and Reinhart 2018). The results presented by Bosio, Jolevski et al. (2020) suggest that significant government response is warranted to prevent mass insolvency. However, during the COVID-19 pandemic, governments faced a unique type of shock that rendered several conventional countercyclical policies ineffective. Demanding

more goods from firms has no impact if firms are constrained from producing them due to sanitary restrictions or disruptions in supply chains. Raising government expenditures on goods does not help alleviate firms' bottlenecks, which are mostly financial. Lowering interest rates in a financially constrained equilibrium can relax credit limits. However, if the initial world interest rate is already close to zero, there is little room to subsidize interest costs (Céspedes, Chang et al. 2020).

Céspedes, Chang et al. (2020) propose that unconventional policies – wage subsidies, “helicopter drops” of liquid assets, equity injections and loan guarantees – if sufficiently large and suited to national circumstances to prevent the economy from overheating, can lead the economy to a high-employment and high-productivity equilibrium in the aftermath of a pandemic. Wage subsidies and helicopter drops help protect employment by providing firms with liquid resources to bypass binding finance constraints. In the case of large firms, equity injection – the government temporarily acquires ownership and control of firms in exchange for providing initial liquidity – leads to higher share prices, allowing the firm to borrow more.

Developed countries quickly used their financial capacity to respond to the COVID-19 pandemic with expansionary fiscal and monetary policies. By April 2020 the United States alone had spent over US\$6 trillion in COVID-19 response measures, while the European Union later introduced a US\$500 billion stimulus package. In contrast, according to the International Development Research Centre Report by Adeniran (2020), the total COVID-19 budget of African countries amounted to only US\$37.8 billion as of April 2020, with South Africa and Egypt accounting for 84 per cent of that amount. Most low-income countries lacked the financial capacity to respond meaningfully to the pandemic. Also, firms' and governments' prospects of securing external financial assistance were limited, given the worldwide extent of the crisis.

Changes in business models are not enough to foster firm survival. Massive government support is also required in this type of shock. According to a 2020 National Institute of Statistics and Geography survey of the pandemic's impacts on Mexican firms, without a change in revenues and a channelling of more support to them, 47.9 per cent of medium-sized and large companies expected to continue operating for three to 12 more months, in contrast with 41.3 per cent of SMEs and 37.2 per cent of micro enterprises. Moreover, 10.8 per cent of SMEs and 16.3 per cent of micro-enterprises expected to survive less than three months unless they received some sort of government support.

Several studies have put forward policy recommendations to help businesses survive the pandemic. Generally, these recommendations are aimed at providing liquidity to firms or fostering worker retention through employment subsidies. Carranza, Farole et al. (2020) propose two broad types of liquidity interventions, drawing examples from the 2008 financial crisis and the coronavirus crisis: a) injecting cash into firms through loans and b) shoring up existing cash flow through tax breaks or deferrals.

About half of the firms in the survey implemented by Flynn, Homanen et al. (2020) received or expected to receive government support, but this support was too sluggish for the situation. The authors find that firms in emerging markets often react faster than governments. A common challenge to fast and efficient policy responses is targeting. Freund (2020) finds that, during the COVID-19 pandemic, a significant number of firms received support even if they had not experienced any negative shock, while an even larger share of firms with considerable revenue drop had no access to such support. However, there is a trade-off between the time and administrative costs of better targeting, on one hand, and the inefficiencies arising from suboptimal selection, on the other. Mistargeting is bigger, and was a serious problem, in countries with weaker governance.

Bosio, Jolevski et al. (2020) list a series of responses that governments should take in a systemic crisis. The authors indicate that government's first role is to define rules that lead to efficient private restructuring efforts. The primary action is to suspend bankruptcy procedures, often dictating that non-monetary assets of firms get transferred to their secured creditors, mostly banks. However, this course of action is relevant only for countries where the practice of insolvency is established (about half of the countries in their sample). In others, the risk is a surge in foreclosure proceedings both in and outside of courts. Here, a response can proceed in two steps. First, governments – with the support of central banks – need to establish clear moratoriums on loan payments. The framework recommends renewable three-month

postponement periods for debt service filing without the need to classify such postponed claims as nonperforming.<sup>8</sup>

Second, governments need to establish and incentivize out-of-court workout frameworks. Workouts are non-statutory agreements between a debtor and creditors to ease the debtor’s debt burden so that it can maintain its business activities. Out-of-court workouts involve no judicial participation. These informal restructuring processes allow for flexible and confidential alternatives to insolvency and debt enforcement and can save viable firms by giving them much-needed breathing space. Private banks need incentives to do this, especially in countries where foreclosure is the primary outcome of illiquidity. One option is tax incentives.

Finally, it is crucial to underscore recovery measures that emphasize not only the quantity but also the quality of jobs. The ILO has proposed four pillars to define a policy framework in response to a crisis, such as the COVID-19 pandemic, that takes as its core principle guaranteeing decent work (ILO 2020b). Upholding key provisions of the standards summarized in Figure 1 (particularly those dealing with safety and health, working arrangements, protection of specific categories of workers, non-discrimination, social security and employment protection) ensures that workers, employers and governments can maintain decent work while adjusting to the socio-economic consequences of the pandemic.

► **Figure 1.** The ILO’s four-pillar policy framework for tackling the socio-economic impact of the COVID-19 crisis



Source: ILO. (2020b) A policy framework for tackling the economic and social impact of the COVID-19 crisis. *International Labour Organization Policy Brief Report.*

8 Some countries have applied measures compatible with this pathway. Examples found in Bosio, Jolevski et al. (2020) include the following: The Uzbek central bank has suggested that banks defer loan payments for firms in sectors affected by COVID-19. El Salvador adopted a three-month deferral on specific loans for firms affected by the pandemic (vehicle credit, credit card and mortgages). Microlenders in Egypt have been instructed to consider delays, on a case-by-case basis, of up to 50 per cent of the value of monthly instalments for affected clients. The Central Bank of West African States has set up a framework for banks and microfinance institutions to accommodate demands from firms with repayment difficulties.

## ► 2.2 Development context

Overall, the collapse in global economic activity was unprecedented across all countries and was particularly severe in most low- and middle-income emerging markets and developing economies (World Bank 2021). This was due to pre-pandemic trends and existing structural challenges in developing countries, as well as the lack of institutional and policy tools that could be used to implement macroeconomic policies aimed at reducing the economic costs of the pandemic. The dominance of informality, the existence of only a few jobs that could be done from home, and more limited state capacity made public-health oriented containment measures less effective and more disruptive for economic activity and livelihood.

Furthermore, limited fiscal space and limited access to international financial markets make economic support policies unaffordable and challenging to implement (Djankov and Panizza 2020). In some cases the existence of internal social unrest, riots and civil wars posed additional obstacles. Factors amplifying the crisis faced by low- and middle-income countries are summarized in Box 1.

These features of emerging economies have to be considered when designing recovery policy; existing institutions often lack mechanisms to effectively reach businesses and workers in the informal economy. Aggregate GDP in emerging markets and developing economies, including China, grew by 5.9 per cent in 2021, after a contraction of 2.6 per cent in 2020. However, lower global GDP growth was projected for 2022 due to the economic and political disruptions caused by lock-downs in parts of China, rising geopolitical turmoil, including the war in Ukraine, and uncertainties caused by potentially persistent high inflation triggering tight monetary policy responses.

In India over 80 per cent of urban casual workers are employed in establishments that are typically not enrolled in social security programmes, which were being used to provide relief during the lockdown. The organized sector in India is required to benefit many of the workers they employ informally. But most low-income urban workers fall through the cracks of these provisions, and almost none of them has access to any benefits at all (Dhingra 2020).

### Box 1. Crisis-amplifying factors for firms in low- and middle-income countries

- **Pre-existing high levels of poverty:** The trade-off between public health and economic survival is biased towards the latter in many regions of the world (Alon, Kim et al. 2020, Hevia and Neumeyer 2020). The share of workers and microentrepreneurs who simply cannot afford to stay at home is larger in these regions. Income risk is a first-order concern in many developing economies (Ray, Subramanian et al. 2020).
- **The large share of informal workers or workers employed in micro-firms:** It is estimated that informal employment accounts for about 70 per cent of jobs and 35 per cent of GDP in a typical developing economy, compared with about 15 per cent of GDP in advanced economies (World Bank 2020).
- **The small share of jobs that can be done from home:** The prevalence of jobs that can be done from home differs across countries. In particular, it varies systematically with the level of development, given changes in the sectoral and occupational structure of economies often associated with economic development (Gottlieb et al. 2020).
- **The large tourism sector in some countries:** The United Nations World Tourism Organization (UNWTO 2021) estimated that international tourist arrivals in 2020 would drop between 58 and 78 per cent, putting 100 to 120 million direct tourism jobs at risk. Some countries rely heavily on tourism. For instance, 40 per cent of the workforce in Belize is employed in the travel and tourism sector. These percentages are 21 per cent for Thailand and 18 per cent for Gambia.
- **Relatively small public sectors and tax revenue bases:** Many recovery plans proposed by the literature require substantial state capacity and well-developed tax and benefits infrastructure in place to carry out plans quickly and continue them over a sustained period. For example, targeting cash transfers based on incomes requires governments to have deep knowledge of who is poor and vulnerable and an infrastructure to reach them quickly. In developing economies state capacity to make such transfers is limited, and the cost of missing work is immense (Dhingra, 2020).

- **Limited fiscal space:** One important consequence of the limited fiscal space in developing countries is that governments have difficulties issuing debt to smooth the COVID-19 shock as they struggle to credibly commit future tax revenues to pay for fiscal expansion today (Hevia and Neumeier 2020).
- **Precarious access to international financial markets:** A country that adopts anti-virus policies is likely to run a current account deficit. The capacity to borrow, for both the government and the nation as a whole, becomes critical. Emerging market economies that are rationed out of capital markets may find that they cannot afford anti-crisis policies unless the rest of the world channels fresh resources to them (Céspedes, Chang et al. 2020).

In the sample used for Beck, Flynn et al.'s study of firms in emerging markets (2020), at least three of every four firms were adversely affected by the pandemic. Surprisingly, however, few firms expected to breach their covenants or saw a need to raise additional capital. However, these conclusions were obtained from surveys conducted in April 2020, at the beginning of the pandemic; the situation may have changed since then. The study also found that firms reacted primarily by reducing investment spending and much less through layoffs. Meanwhile, some firms cut back on executive compensation, and more firms expanded employee benefits than cut them. The large majority of firms acted before their governments imposed measures.

Djiofack et al. (2020) developed a computable general equilibrium (CGE) model to assess the impact of the pandemics in sub-Saharan Africa based on past experiences of similar crises, notably the 2014 Western Africa Ebola crisis. They predicted that COVID-19 is likely to have a lasting impact on labour productivity due to its adverse effect on human capital and infrastructure. In their optimistic scenario, where the disease is rapidly contained, African GDP would be permanently one per cent lower than in a no-COVID scenario. In the catastrophic scenario, where the crisis lasts more than 18 months, GDP would be 4 per cent lower for more than a decade. This, in fact, was the case.

The collapse in global output caused by the health measures that governments adopted to contain the spread of the COVID-19 virus has led to a drop in commodity prices, especially prices of oil and petroleum-related products. The spot price of Brent oil went from over US\$60 per barrel in December 2019 to \$20 in mid-April 2020. The International Energy Agency then projected subdued global oil demand and oil futures and did not expect the price per barrel to reach \$40 until the end of 2022 (IAEA 2020). However, there was a sharp reversal of the trend since April 2020, with the spot price of Brent oil steadily rising, albeit with sharp volatilities, to pass \$80 per barrel in October 2021. The dramatic rise of oil price, reaching over \$130 per barrel at one point, and rising inflation and geopolitical risks since the start of war in Ukraine pose a major threat to global economic recovery, productivity growth and business resilience.

## 2.2.1 Informality

One of the biggest challenges for policymakers in terms of business relief policies during the COVID-19 pandemic has been dealing with informality. More than 60 per cent<sup>9</sup> of the world's employed population earn their livelihoods in the informal economy. Yet, workers and businesses in the informal sector cannot take advantage of the various job retention schemes that governments offer or claim temporary unemployment benefits. Furthermore, owners of informal businesses have no recourse to credit guarantees or small-business grants, which have been popular as a crisis response. The concern is not only with the larger impact of the pandemic on the informal sector but also with its relative expansion. By adversely affecting the prospects for businesses, pandemics drive more firms or their activities into informality. Hence, increased informalization of firms, particularly small and medium-size enterprises, after the pandemic should be a major policy concern when designing stimulus programmes. Furceri, Loungani et al. (2020) look at the impact of pandemics and major epidemics from the past two decades and find a significant increase in the share of self-employment for about three years following an epidemic. The increase in the size of the informal economy is even longer-lasting in developing countries, where the formal sector is relatively small and opportunities for formal employment are few.

<sup>9</sup> Excluding agriculture, the global level of informal employment falls to 50.5 per cent.

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►► The prevalence of informality serves to entrench the impact of a crisis, such as the COVID-19 pandemic, leading to a severe economic contraction and a slow recovery.

informal. Asia and the Pacific (68.2 per cent) and the Arab States (68.6 per cent) have almost the same informality levels. For these countries transactions are mainly outside the government's fiscal reach, in terms of both taxes and transfers (Ray, Subramanian et al. 2020). In fact, recent research findings (see, for example, Elgin, Williams et al. (2022)) reinforce the observation that countries with a large informal sector generally follow a procyclical policy as opposed to a countercyclical one. As such, the prevalence of informality serves to entrench the impact of a crisis, such as the COVID-19 pandemic, leading to a severe economic contraction and a slow recovery.

The high prevalence of informality has implications for optimal COVID policies in developing countries. There is some debate on how governments should tackle the need for assistance of informal workers and businesses. On one hand, some governments are considering programmes that provide access to crisis assistance in return for firms turning formal. However, Bruhn (2012) argues that this transformation is unlikely to happen. Instead, she proposes that governments view informal businesses as providing subsistence livelihoods to poorer households. To improve their wellbeing during the crisis, these are best reached through standard cash transfer programmes. Countries with existing cash-transfer programmes can immediately broaden eligibility and increase the size of the benefit. This was done in India (Dhingra 2020). Similarly, Côte d'Ivoire established a fund of 100 billion Central African CFA francs (US\$167 million) to support its informal sector during the health crisis. The government of Egypt set up a payment of 500 Egyptian pounds (US\$31) per month for three months for workers in the informal sector (Bosio, Jolevski et al. 2020).

The weaker fiscal capacity and widespread labour market informality in developing countries have posed especially salient challenges in implementing blanket lockdowns. Alon, Kim et al. (2020) suggest that age-targeted lockdown policies, which focus on shielding elderly populations, are a much more effective option for developing economies, as they leverage their younger and less-susceptible people to focus limited resources on the most vulnerable parts of their populations. Another possibility, proposed by Carranza, Farole et al. (2020), is to work through microcredit organizations and informal business associations. Governments can use these organizations as intermediaries to provide liquidity to help informal businesses in their networks stay afloat during the crisis and facilitate recovery afterward.

Informality exists in all countries regardless of level of socio-economic development, although it is more prevalent in developing countries (ILO 2018). While informality status is a business characteristic, research has found that the structural conditions of the environment in which the firm operates disincentivize or even preclude firms from transitioning to the formal sector. In the Americas (40.0 per cent) and Europe and Central Asia (25.1 per cent), less than half of employment is informal. In contrast, in Africa 85.8 per cent of the labour force is

Chapter



3



# 3. Meso-level factors determining resilience

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The pandemic has induced a large decline in GDP that has been noticeably synchronous across countries. But the shock has also had uneven effects across sectors of the economy, with sectors where consumption involves the most social contact being the most affected. Beck, Flynn et al. (2020) find that sector variation is the strongest explanation of variation in the impact of the crisis and government support.

## ► 3.1 Sector-level determinants

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There are signs that the pandemic has changed long-term economic productivity patterns, with potentially differential implications for sectors such as manufacturing, services and information/communications. Supply and demand were badly affected during the pandemic. However, there were still some winners: Nearly three quarters of businesses (73.0 per cent) encountered some or significant detrimental effect on the supply side, with nearly two thirds (64.8 per cent) reporting the same on the demand side. One in every five businesses, however, reported an increased demand for their products and services. For example, information technology (IT), telecommunications and pharmaceutical companies saw increased demand. Other companies launched new products and services catering to different customer needs during the pandemic (BCI 2020).

In what sector a firm operates has been found to play a significant role on the firm's survival when revenue stops. These systematic sectoral differences in survival stem from inherent differences in profit margins (hence retained earnings). Bosio, Jolevski et al. (2020) find that firms in the manufacturing sector have longer survival times on average, of between 11 weeks (in lower-middle-income countries) and 28 weeks (in low-income countries). Retailers have the shortest survival time, with the median business running out of savings in about six and a half weeks without revenues.

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►► In what sector a firm operates has been found to play a significant role on the firm's survival when revenue stops.

### 3.1.1 Manufacturing

The COVID-19 pandemic could be a catalyst for adopting intelligent manufacturing that creates a *“safe working environment by using the automated manufacturing assets which are monitored by the networked sensors and controlled by the intelligent decision-making algorithms”* (Li, Wang et al. 2020). The authors argue that mixing automated manufacturing assets and human operators could make manufacturing more efficient and protect the workers' health through social distancing. Pinzaru, Zbucnea et al. (2020) have echoed this view.

Many organizations are looking to reshore manufacturing facilities to mitigate global supply chain disruption, with some countries offering incentives for domestic organizations to do this (BCI 2020). Belhadi, Kamble et al. (2021) contend that the manufacturing sector's recovery will depend largely on firms' ability to quickly re-mobilize their complex multi-country supply chains by mapping them and managing the risks. COVID-19 has exposed structural flaws in firms' approach to global manufacturing

and sourcing. Based on the authors' analysis, manufacturing firms would, in all likelihood, reshape their global business landscape.

Surprising transformations occurred during the critical time. Manufacturers have shifted towards making medical equipment to meet the enormous demand. For example, automobile manufacturers are making ventilators, testing kits and oxygen cylinders; the textile and fashion industry is making personal protection equipment, masks, gloves and hospital furnishing products; chemical factories are providing sanitizers, cleansers and oxygen; and hospital beds are created by transforming train bogies (Singh, Kumar et al. 2020).

Overall, given the adaptations and relocations in the manufacturing industry, the sector has great potential for a V-shaped scenario – that is, a fast recovery – with only moderate adverse effects in the long term (Belhadi, Kamble et al. 2021).

### 3.1.2 Tourism

Tourism is an important sector, accounting for 10 per cent of global gross domestic product and one in every ten jobs. International tourist arrivals fell by 22 per cent in the first quarter of 2020 (compared with 2019 figures), and the annual decline for the full year was 74 per cent (UNWTO 2021). Travel restrictions in many countries and the introduction of social distancing measures forced some tourism and hospitality businesses to shut down, placing over 100 million jobs at risk (Mekharat and Traore 2020). The effects of COVID-19 have been felt throughout the extensive tourism value chain, including airlines, hotels, restaurants, tour operators, food suppliers, farmers, retailers and a wide range of other small and medium enterprises.

Mekharat and Traore (2020) explore the factors in specific tourism destinations that contribute to pandemic-related vulnerability and the factors that support the resilience of the tourism sector (Box 2).

#### Box 2. Factors enhancing resilience in the tourism sector

- **Ability of the country to capture domestic and regional demand:** Thailand's tourism industry has shown resilience after past crises due to its large domestic clientele (with almost nine million departures in 2017) and a location that attracts tourists from China, Republic of Korea and Japan.

Geographical connectedness affects regional demand and can play an important role in the recovery of the tourism sector.

- **Private sector capacities – strength of hotel operators and the supply chain:** Large international operators are better positioned to adapt to and survive the pandemic. Hotel chains with substantial physical assets, brand value and, in some cases, diversification into other lines of business have a comparative advantage in recovering. Loyalty programmes also give large operators advantages and a higher chance of a successful recovery. Finally, when the health crisis is finally under control, supply chain resilience will be one of the critical factors for a speedy recovery of the tourism sector.
- **Ability to work with other sectors in the economy:** Partnering with insurance companies could provide medical insurance for those who book directly with hotels. Partnering with hospitals could offer alternative quarantine facilities or full-time medical access and testing for those staying in a hotel.

Source: Mehkarat and Tarore (2020).

Mooney and Zegarra (2020) build a Tourism Dependence Index, which assesses the impact of the crisis on global tourism, focusing on the specific case of Latin America and the Caribbean. It shows that the impact of the COVID-19 pandemic on tourism flows to the Caribbean was without precedent in terms of its speed and severity. This finding is not surprising, given that the Caribbean includes five of the ten most tourism-dependent countries globally. In Africa, tourism to South Africa fell by about 80 per cent following the COVID-19 outbreak and the situation further worsened when a nationwide lockdown was instituted. Kenya also witnessed a 55 per cent fall in tourist visits following the coronavirus outbreak.

### 3.1.3 Education

Education is one of the many sectors in which the rapid virtualization process is taking place (Leonardi 2020). Schools and universities are radically transforming education by switching to online e-learning forms and launching learning management systems (Tian, Zheng et al. 2020).

There are several potential benefits of virtualization in education in terms of skills development, building an adequately skilled workforce and promoting productivity growth and business resilience.

It can provide learners with access to a wide range of learning resources and opportunities that may not be available in a conventional classroom setting. Through e-learning platforms and virtual classrooms, learners can access online courses, webinars and other digital learning resources that can help them to develop new skills and knowledge. Additionally, virtualization can give learners the opportunity for self-paced learning, allowing them to develop skills and knowledge at their own pace.

The virtualization of education can help businesses build a more skilled workforce. By providing employees with access to e-learning resources and virtual training programmes, businesses can ensure that their workforce is adequately trained and equipped with the necessary skills to succeed in their roles. Additionally, virtualization can provide employees with opportunities for ongoing learning and professional development, allowing them to stay up-to-date with the latest industry trends and developments.

Virtualization also can help businesses promote productivity growth by allowing employees to access training and learning resources at their own convenience. This can help reduce the amount of time that employees spend for training away from their work and can improve their overall efficiency and productivity. Additionally, virtualization can help businesses reduce their training and development costs by eliminating the need for travel and physical training materials.

Finally, e-learning can help businesses build resilience by providing them with the ability to continue training and development activities even during periods of disruption or crisis. This can help businesses maintain continuity and ensure that their employees are better prepared to handle any challenges that may arise. Additionally, virtualization can help enterprises build a more agile workforce that can adapt to changing business needs and requirements.

### 3.1.4 Food industry

Nordhagen, Igbeka et al. (2021) surveyed 367 agri-food micro, small and medium-sized firms in 17 low- and middle-income countries, capturing early impacts of the pandemic on their operations. The great reduction in consumer mobility for grocery/pharmacy shopping had increased the probability of a severe impact. Some 94.3 per cent of respondents in these sectors reported that their firms' operations had been impacted by the pandemic, primarily through decreased sales as well as less access to inputs and financing in the face of limited financial reserves. The probability of being severely impacted, in the case of low- and middle-income countries, was significantly higher for smaller firms, those with less than US\$50,000 in annual turnover.

Grocery stores have been generally resilient despite the COVID-19 disruption, being some of the few businesses that added employees during the crisis. Surveys of consumers, grocers and restaurateurs indicate that restaurants, in contrast, are unlikely to regain the 60 cents of every food dollar that they received before the crisis (Redman 2020; Worstell 2020).

### 3.1.5 Sector-level demands for transformation

In the short run, limitations on the provision of labour services are a direct channel for the economic effects of COVID-19. Támara and Fernández-Diez (2020) argue that two key elements in the adjustment process are: (i) the introduction of new arrangements and technologies that would reduce the possibility of transmission of the virus while providing labour services and (ii) the expansion of lower-contact-intensity sectors to absorb labour released from the higher-contact-intensity sectors.

The impacts of the pandemic on the economic configuration and sectoral composition of countries will be transformative and long-lasting. Companies have changed their business models, whether with home services, appointments or online sales or by venturing into other sectors. While the pandemic has hurt many businesses, it has forced businesses to innovate and even reinvent themselves in order to survive. The push for innovation has even motivated new businesses to emerge. For instance, according to the Mexican Business Demographics Study of 2021, in Mexico 619,443 establishments were born between May 2019 and September 2020, accounting for 12.75 per cent of the country's business population, while around 1.6 million establishments died in the same period. According to data from the Mexican Association for Online Sales, as a result of the COVID-19 pandemic, six of every ten Mexican SMEs now sell on the internet. According to the survey, Facebook, websites, Instagram and WhatsApp are the main online sales channels for small businesses. After the pandemic the transfer online of entire sectors of the economy and administration may slow, but changes in habits, reduced operating costs and the infrastructure created will strengthen virtualization.

Businesses adhering to social distancing guidelines managed in several instances to argue to local governments that they should stay open during lockdown. Such was the case in several cities in the United States where farmers' markets adopted new procedures that met social distancing standards and reduced the potential for transmission of COVID-19. These procedures were propagated nationwide by the Farmers Market Coalition to inspire consumer confidence in traditional farmers' markets (Worstell 2020).

During the lockdown people spent more time online, building relationships with families, friends, work colleagues, brands or institutions through social media channels, streaming video and increasing overall screen time. Indeed, tech companies have reported higher engagement numbers on Facebook, Instagram and TikTok during the pandemic lockdown (Ion and Cismaru 2020). As a result, brands adjusted to the coronavirus global crisis by changing how they reach communities and adopting real-time and more dynamic communication.

## ► 3.2 Local economic factors

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Location is still a driver of potential productivity growth. Bloom, Hassan et al. (2020) show that access to new technologies in the United States is concentrated in geographic hubs. While, over time, technology adoption diffuses geographically, the initial hubs retain a disproportionate share of employment in the technology, particularly at the high-skill end of the spectrum. The authors show that local labour markets have an impact on the creation of technology hubs. These hubs are more likely to arise in areas with universities and high-skilled labour pools.

Besides the potential for logistical and commercial benefits from proximity to suppliers and customers, who their neighbours are matters to businesses. There are additional locational benefits that SMEs particularly can accrue from other organizations nearby. Industrial districts have been associated with knowledge spill-overs and imitation by firms in geographical proximity (Camison and Villar-López 2012). Within a hub-and-spoke network configuration of business incubators, firms with better quality relationships with hub organizations outperform other firms in knowledge exchange and internalization (Fang, Tsai et al. 2010). The role of incubators (Patton 2014) in enhancing the absorptive capacity of new technology-based firms further supports the proposition that location offers strategic and operational benefits to nascent businesses.

SMEs are more reliant on localized personal or social contacts than larger enterprises, but closer proximity enables improved information acquisition about market and competitor activity (Yew Wong and Aspinwall 2004). Location is not simply the locale for current and potential resources but also a significant factor in determining vulnerability or resilience. Businesses in the same locale may face the same natural hazard (such as flooding) and share the same critical infrastructure (power, water, telecommunications, and so on) that, if damaged, could result in disruption to the production and operational activities for all (Herbane 2019).

The virtualization shock experienced in the pandemic has differential impacts by location. De Fraja, Matheson et al. (2021) measure the shift towards work from home in the United Kingdom and its effect on local economies. Many workers can work from homes distant from the offices of their employers. The impacts of this transition are very heterogeneous: Economic activity is decreasing in productive city centres and increasing in residential suburbs. This phenomenon also moves workers (who are consumers of services) away from neighbourhoods with an ample supply of locally consumed services (such as restaurants, hotels or barber shops) to communities where these services is relatively scarce.

As locally consumed services are, by definition, geographically immobile in the short run, this suggests a possible geographic mismatch of supply and demand that may have consequences for aggregate employment in locally consumed services. Losses due to frictions, such as capacity constraints, will be lower if transitions to working from home are not concentrated in a small number of neighbourhoods. This last finding, in Fraja, Matheson et al. (2021), has implications for local economic recovery outside of the United Kingdom because the fraction of jobs that can be done from home varies widely across regions and sectors, potentially generating new frictions in local economies and mismatches in local labour markets.

### 3.2.1 Deglobalization in the post-COVID era

Through a greater diversity among trade and treaty partners, globalization has the potential to increasing resilience to foreign shocks and supply chain disruptions. There are productivity benefits from the social and political dimensions of globalization, as well as its economic dimensions (Kirchner 2020). However, a dilemma exists, as globalization could also increase the risk to external shocks. On one hand, recessions,

virtualization of communication and the growing need for coordination of epidemic, health and medical activities among countries can force national governments and international organizations to strengthen cooperation on a global scale. On the other hand, deglobalization tendencies may take over. The pandemic is likely to leave lasting scars through a possible retreat from international trade and supply linkages. Deglobalization has been described as a process of diminishing the economic interdependence and integration among states. Lee and Park (2020) and Kirchner (2020) suggest that, with COVID-19-driven deglobalization, local factors may become increasingly important for business resilience. Kirchner (2020) contends that re-establishing international connectedness can help boost productivity in ways consistent with increased resilience to global shocks.

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►► The post-pandemic debate about how to build greater resilience to shocks has highlighted global interconnectedness as a potential source of economic vulnerability.

The post-pandemic debate about how to build greater resilience to shocks has highlighted global interconnectedness as a potential source of economic vulnerability. Kirchner (2020) argues, however, that the greater vulnerability comes not from international connectedness, but rather from poor governance and low incomes. His results show that globalization is associated with higher incomes due to its effects on productivity and through increased international discipline on domestic institutions, leading to better governance.

A survey conducted by the Business Continuity Institute (BCI 2020) found that 57.2 per cent of the respondent organizations intended to diversify their supplier base post-pandemic, with East Asia set to become the most prominent casualty; most want to reduce their reliance on supplies from that region. The survey found that 29.9 per cent of the respondents plan to source less from East Asia, with a further 13.2 per cent sourcing less from China specifically. The survey also found that local sourcing will become more mainstream: two thirds of organizations (66.2 per cent) plan to source goods more locally in the post-pandemic period, with one fifth (20.8 per cent) reporting plans to move a considerable number of suppliers locally.

## ► 3.3 Supply chain characteristics

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The epidemic has damaged supply chains. Strategies to predict such impacts in different time horizons can support supply chain performance and mitigate adverse effects (Ivanov 2020). The COVID-19 outbreak is forcing supply networks to operate with different and robust approaches to resilience. Intertwined supply networks (highly interconnected and resilient networks) need to be viable to guarantee long-term survivability of firms in supply chain, and of economies more broadly, especially in exceptional events (Ivanov and Dolgui, 2020).

In a report on supply chain resilience, the Business Continuity Institute (BCI) identified the top five consequences of supply chain disruption: loss of productivity, customer complaints, increased cost of working, loss of revenue and impaired service (Alcantara and Riglietti 2015).

Diverse and resilient supply chains create productivity-enhancing opportunities to offset expected overall productivity losses from external shocks. Supply chains may be restructured in ways that increase their diversity and improve resilience. Firms can join global value chains that promote trade, foreign direct investment and knowledge transfer and, ultimately, support productivity growth. A key objective is to create flexible, redundant and real-time supply chains in order to dynamically re-allocate demand and supply (Ivanov and Das 2020).

Sharma, Luthra et al. (2020) developed a framework for enhancing the resilience of supply chains in and after the COVID-19 pandemic. They define resilience as the ability to withstand a disruption and recover performance. Using a methodology designed to select the most relevant variables for supply chain survival by surveying experts, they found that resilience, viability, real-time information, order fulfilment/just-in-time, stability, data analytics, collaboration, integration and demand forecasting are the key factors for companies to survive in pre-and post-COVID-19 scenarios. Viability is the ability of the supply chains to manage and survive in a disruptive environment through redesigning and replanning of structures. Stability is the ability to fulfil demand in a changing environment.

The shape of the recovery path for a supply chain affects both the length of recovery time and the financial impact of the disruption.<sup>10</sup> Belhadi, Kamble et al. (2021) suggested that the service sectors, such as airlines, which have been particularly affected by a sharp demand shock in the initial months of the global outbreak, were likely to witness a U-shaped disruption. The U-shape entails an extended time to recovery and, consequently, a high financial impact. In contrast, manufacturing supply chains have great potential for a V-shaped scenario, with only moderate impact in the long term. Their finding shows that this difference between the two sectors is partly due to differences in supply chain resilience. However, it is difficult to quantify the extent to which supply chain disruptions account for the difference in recovery between the sectors.

Datta (2017) emphasizes the collaborative nature of resilience and argues that supply chain collaboration reduces disruption risks through better communication, trust, collaborative sourcing decisions and information sharing. Furthermore, information sharing improves response time and builds new business opportunities. Similarly, Datta's results (2017) point to proper design of sourcing contracts as essential for building resilience in supply chains. Good practices in designing sourcing contracts include proactive approaches for developing good relationships based on trust with current suppliers in anticipation of future supply-side disruptions and developing plans for communicating with and training employees and suppliers to handle supply disruptions in anticipation of future incidents. This involves clear distribution and coordination responsibility for different problem solving and recovery actions.

Belhadi, Kamble et al. (2021) identify various supply chain resilience strategies proposed in previous studies and classify them as either proactive or reactive strategies. Box 3 summarizes those that are most critical.

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<sup>10</sup> The time-to-recover is the time needed for a supply chain to regain its usual level of performance, while financial impact is the total of performance loss (direct and indirect) during a disruption.

### Box 3. Proactive versus reactive strategies for supply chain resilience

#### Proactive strategies

**1. Digital connectivity:** Digital technologies such as the internet of things, blockchain technology and digital twin technology are proving to have great potential to enhance supply chain resilience through high connectivity, accuracy and transparency.

**2. Supply chain automation:** This refers to systematizing physical and information workflow across the supply chain to improve processes.

**3. Localization/regionalization of sourcing:** Sourcing (and processing) are localized within the same region to meet local demand and reduce supply chain integration. Hence, the disruption risk could be contained within the area, as there is no spill-over of a risk incident from one region to another.

**4. Integrated supply chain risk management:** Firms at every tier of the supply chain should work together closely to meet shared objectives of foreseeing, predicting and preventing potential threats to the supply chain.

#### Reactive strategies

**1. Lifeline maintenance:** The transportation system and lifeline should be maintained during disruptions, as their loss would affect the manufacturing sector's entire supply chain.

**2. BDA-driven and real-time information system:** Using Big Data Analytics (BDA) capabilities to collect, process and extract meaningful insights from real-time data across the overall supply chain to support suitable and timely decision-making.

**3. Virtual marketplaces:** Development of a digital marketplace for delivering products and services.

**4. Supply chain collaboration:** Firms at every tier of the supply chain work together closely to meet shared objectives of recovery and help each other to mitigate disruptive impact.

**5. Inventories and reserve capacity:** Supply chains use inventory and reserve capacity to mitigate the adverse effects caused by the disruption.

**6. Business continuity plans:** Business continuity planning is of the utmost importance to create processes and systems of prevention and recovery to deal with potential disruption in the supply chain.

Chapter

▶ 4



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Under the imperative of agile resilience, businesses must act today in five major areas: recovering and sustaining revenue, redefining operations, rethinking organization, accelerating digitalization and adapting marketing strategies.

## 4. Firm-level factors determining resilience

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Under the imperative of agile resilience, businesses must act today in five major areas: recovering and sustaining revenue, redefining operations, rethinking organization, accelerating digitalization and adapting marketing strategies. Some changes are here to stay, while others will be abandoned in favour of returning to old habits or shifting towards new innovative practices. The adoption of new technologies and profound strategic changes in business models will take time and is linked to firm-level characteristics, such as age and size, structure, digitization, the workplace and productivity, and managerial practices. This section reviews these characteristics.

### ► 4.1 Age and size

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Firm age and size are positively correlated with productivity (Bosio, Jolevski et al. 2020). According to the conventional view, recessions improve overall resource allocation by driving out less productive firms, which are usually the smaller and younger firms. This theorized process is known as the *cleansing effect*. In contrast, major shocks such as the COVID-19 pandemic could destroy productive firms, and this adverse impact could sometime outweigh the cleansing effect. For example, Ouyang (2009) provides evidence that times of economic distress destroy high-productivity firms during their infancy. This is mainly because new firms lack access to finance to weather economic distress. Using statistics on entry, exit and productivity differentials, Ouyang finds that the destructive effect on high-productivity firms in their infancy outweighs the cleansing effect and results in lower average productivity during recessions.

A firm holds much of its productive capital in the workers it has recruited, hired and trained. If the crisis forces an entrepreneur to lay off those workers, the firm's future productivity will suffer (Céspedes, Chang et al. 2020). During times of crisis, firms' ability to avoid layoffs and survive may depend on their ability to obtain credit, but banks will typically ask for collateral. Smaller firms often do not have assets that they can pledge. Larger firms find that the value of the physical and financial assets they hold is severely depressed at a time of great uncertainty, weakening their collateral value (Céspedes, Chang et al. 2020).

Globally, SMEs account for the bulk of firms and employment, in particular in developing countries. For instance, in Mexico, of the total of 4.9 million business establishments in the country, 99.8 per cent are micro-enterprises or SMEs. Micro, small and medium-size enterprises have fewer effective instruments

at their disposal to manage shocks. Consequently, size differences lead to significant disparities in the impacts of the pandemic on firms' sales and profits.

Globally, 10 to 15 per cent of businesses managed to retain or expand sales during the pandemic, while the majority of firms saw their sales and income shrink substantially. On average, large firms (100+ workers) saw sales declines of less than 40 per cent, while micro and small firms experienced a decline in sales of 50 per cent or more (Freund 2020). Furthermore, firm size is also found to directly affect business recovery after a shock, with small firms least able to recover from crisis, such as natural disasters (Corey and Deitch 2011). Following up with the Mexican example, the hit that SMEs have taken during the pandemic has caused the closure of more than 1 million (20.8 per cent) of the SMEs in the country, according to a survey by the Mexican National Statistics Institute. Definitive closures cost 3 million jobs, while the businesses that continue to operate reduced employment by 1.15 million. Thus, a total of 4.15 million jobs were lost. The three sectors that have suffered the most from the closures are private non-financial services (24.9 per cent), commerce (18.9 per cent) and manufacturing (15 per cent) (MND 2020).

Firm size is also linked to the type of preparedness that firms have. The enterprise-wide business continuity management (BCM) systems that have become commonplace among large firms are rarely found among SMEs. BCM is a formal process through which organizations establish specific structures, roles, processes and resources to anticipate and respond to acute operational interruptions (Herbane 2013; 2019). The lack of BCM means that most SMEs have been hit by COVID-19 without having in place any strategy for responding to it (UNIDO 2020). Moreover, in the absence of BCM, most SMEs now find themselves working out their recovery without a pre-existing plan to guide their actions.

## ► 4.2 Firm structure

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The internal organization of firms serves as an important channel through which macroeconomic shocks affect firm performance and, ultimately, growth.

As discussed in section 4.2, location and local networks still matter greatly. Since it is impossible to aggregate all the local knowledge of economic actors in a given business environment, it is more efficient to allow individual employees to make choices based on their local information. The literature has shown a positive correlation between decentralization and efficient utilization of human capital, on one hand, and information technology, on the other (Bresnahan, Brynjolfsson et al. 2002; Caroli and Van Reenen 2001). Aghion, Bloom et al. (2016), in a case study of the United States, found that, during periods of economic crisis, decentralized firms outperformed their centralized rivals in terms of survival chances as well as in growth of sales, productivity and profits. Product churn (meaning the number of people that stop buying the product, that is, the "churn") rises sharply during recessions, when establishments both destroy some existing products and create new ones. Decentralization shields firms from industry-level increases in product churn. Aghion, Bloom et al. (2016) also found that firms subjected to large negative shocks are more likely to decentralize, even though organizational change is slow.

The financial structure of a firm also matters. In times of crisis, creditor profiles are essential. Some studies have shown that acquisitions by foreigners usually take place at heavily discounted prices (that is, "fire-sales"), resulting in a net transfer of wealth from the economies experiencing crisis (Pulvino 1998). Even high-productivity companies in economies experiencing crisis could lose value and end up liquidated or sold piecemeal. An illustrative example is Indonesia, where corporate sector debt was largely owed to foreign investors before the onset of the East-Asia crisis in 1997–98 (Claessens, Djankov et al. 2000). If these private initiatives prove insufficient for acceptably resolving distress, the government's second role lies in providing direct assistance to keep firms operating (Claessens, Djankov et al. 2000). Similarly, Alfaro and Chen (2012) find that multinational subsidiaries fared better on average than local enterprises with similar economic characteristics. Among multinational subsidiaries, establishments sharing stronger vertical production and financial linkages with the parent companies exhibit greater resilience. Moreover, in contrast to the crisis period, the effect of foreign ownership and linkages on establishment performance was insignificant in non-crisis years (Alfaro and Chen, 2012).

A large body of literature shows that the health of the banking sector can significantly impact the investment and employment outcomes of enterprises outside the financial sector.<sup>11</sup> Chodorow-Reich (2014) and Chodorow-Reich and Falato (2022) found that firms that borrowed from less healthy lenders during pre-crisis periods had less likelihood of obtaining loans in times of crisis than those borrowing from healthier lenders. Such enterprises would generally find themselves having to switch to borrowing from less constrained banks at a higher interest rate and reducing employment by more compared with pre-crisis clients of healthier lenders. The employment effect was particularly strong for small and medium-size firms.

## ► 4.3 Digitalization and adoption of new technologies

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Digitization has emerged as a key pathway for business resilience during the COVID-19 pandemic. According to the International Telecommunication Union (ITU), which is the United Nations Special Agency for information and communication technologies, the number of active internet users stood at 5.3 billion in 2022 – 66 per cent of the world’s population. Compared with 2019, the number of people using the internet had increased by 17 per cent, suggesting a “COVID connectivity boost”.<sup>12</sup> Nonetheless, the pandemic has deepened the digital divide among firms, amplifying gains for businesses that cater to customers online, while companies reliant on more traditional models have suffered significant losses and struggled for survival. A recent study using firm-level data for the Middle East and Central Asia revealed that digitally enabled firms registered on average 4 percentage point less decline in sales during the pandemic than digitally unable firms with otherwise similar characteristics (Abidi et al. 2002). There is still immense further potential for enterprises to leverage and gain benefits from the internet. According to Nottebohm, Manyika et al. (2012), SMEs deploying information and communication technologies (ICT) and web technologies have increased revenues and productivity, lowered costs and created jobs. A digitalization process already underway before 2020 has been invigorated by consumers’ desire for direct delivery of food and more direct value chains to minimize COVID-19 exposure (Ricker and Kardas-Nelson, 2020). Generally, the COVID-19 pandemic is increasingly understood as the “great accelerator” of digital transformation (see, for example, Amankwah-Amoah, Kahn et al. (2021) and Scarlat et al. (2022)).

A mid-2020 survey led by Apedo-Amah, Avdiu et al. (2020) in partnership with the World Bank found that about 34 per cent of firms had started to or had increased their use of the internet, social media and digital platforms; 17 per cent had invested in new equipment, software or digital solutions in response to the pandemic. Hence, the COVID-19 crisis has accelerated digital adoption, which could lead to productivity gains in the future. Prior research has also demonstrated the potential productivity gains from moving to remote work (Bloom 2014; Bloom, Liang et al. 2015) and that employees place a high value on working remotely (Mas and Pallais 2017, 2020).

In fact, in the United States, Bartik, Cullen et al. (2020) found that one third of firms that had employees switch to remote work believe that remote work will remain more common at their company even after the COVID-19 crisis ends. These estimates suggest that at least 16 per cent of American workers will switch from professional offices to working at home at least two days per week due to COVID-19. This would represent a dramatic and persistent shift in workplace norms around remote work and has implications for companies, employees and policymakers alike. A similar workplace transformation is also taking place in Africa with an increased adoption of hybrid work, meaning partly at home and partly in the office, among formal-sector enterprises (ILO 2022b). An increased ability to work from home would likely influence decisions ranging from where people live to where companies locate, and so it has the potential to reduce demand for and reshape the nature of commercial real estate. More broadly, the shift to remote work caused by the COVID pandemic is testing industries’ ability to adapt and is likely to have implications for the nature of work and the measurement of productivity in the years to come.

11 See, for example, Amiti and Weinstein (2018); Bentolila et al. (2018); Chodorow-Reich (2014); Chodorow-Reich and Falato (2022); Gan (2007); and Peek and Rosengren (2000).

12 ITU (2021). Measuring digital development: facts and figures. Geneva: ITU Publications.

As part of the Oxford University Digital Pathways Paper Series, Banga and te Velde (2020) developed a framework for understanding the first- and second-order effects of the pandemic on the digital economy, focusing on low- and middle-income countries. The authors identify four digital economy segments (digital infrastructure, ICT and ICT-enabled services, e-commerce and online work). They underline the critical importance for inclusive recovery of leveraging digital transformation. Digital transformation is also suggested as a foundation for future business resilience (Abidi et al. 2022). Hence, responsive policies are needed not only to close the digital divide between low- and middle-income countries, on one hand, and high-income countries, on the other, but also to expand digital connectivity to marginalized individuals and enterprises, especially SMEs. Such policies include support to firms to transition to digital platforms, including business-to-consumer (B2C) and business-to-business (B2B) platforms (Carranza, Farole et al. 2020).

## ► 4.4 Workplace changes and productivity

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In some advanced economies, research has found that working from home has not significantly altered productivity. Etheridge and Spantig et al. (2020), using data from a survey of individuals in the United Kingdom, found that, on average, productivity at home is not significantly different from that in the workplace. In a survey conducted in the United States, Barrero, Bloom et al. (2020b) found that most respondents who have adopted working at home report higher productivity than their expectation before the pandemic. In what it termed “unexpected surprises” that arise from COVID-related workplace changes, the ILO (2022a) found that productivity has increased for 46 per cent of the enterprises it surveyed in Africa, while for 39 per cent of the surveyed enterprises productivity had remained the same. Companies that performed better in the pandemic exhibited some important common characteristics in terms of digital adoption (Deloitte 2020), such as technology preparedness (virtualization, cloud technology) and improved cybersecurity, including identity and access management.

Using data from a survey of individuals in Japan, Morikawa (2020) shows that the productivity of employees adopting home working arrangements during the COVID-19 pandemic is, on average, 30–40 per cent lower than that in the office. In surveys on small and large businesses in the United States, Bartik, Cullen et al. (2020) find that employers think there has been less productivity loss from remote working among better educated and higher paid industries. Small firms were mostly pessimistic, reporting an average productivity change of -0.198 (on a -1 to 1 scale, with 0 representing no change). However, the average scale masks significant heterogeneity, as 29 percent of the respondents thought that workers had become more productive by staying home. Surprisingly, approximately 60 per cent of employees at larger firms can telecommute. Morikawa (2021) expands on the previous work on Japan and, in a firm-level survey, finds that across industries mean productivity when working from home, compared with working in the office, is highest in the information and telecommunications industry, at 80.3 per cent, with the figures for other industries ranging from 62.6 per cent to 69.5 per cent. The average productivity at home, according to self-reports by employers, is 68.3 per cent of that in the office.

### 4.4.1 Barriers to technology adoption and working at home

While the pandemic has facilitated innovation and technology adoption, firms face several challenges in implementing digitalization and remote work and in responding to shifting and emerging consumer demands. Andrews, Nicoletti et al. (2020) show that technology adoption depends on both incentives and capabilities. Diffusion of high-speed broadband internet correlates positively with technology adoption. Low managerial quality, lack of ICT skills as well as policies curbing market access, competition in services, flexibility in hiring and firing and availability of venture capital are associated with lower rates of digital technology adoption. The complexity and cost of technology are important factors in technology adoption, especially by SMEs (Bhardwaj, Garg et al. 2021).

Firms that operate in an environment with low levels of digitalization tend to have fewer incentives to adopt new technology. In these contexts the policy environment can be a relevant catalyst of adaptation

to workplace changes. Fiscal incentives may promote the adoption of technologies needed to support remote working and/or business-to-business and business-to-consumer interchanges (Carranza, Farole et al. 2020). However, new digital technologies are introduced within existing technology infrastructures, which means that the digitally literate can better adapt to new technologies, while the digitally excluded need support to catch up (Roberts, Farrington et al. 2015).

The share of employment that can be done at home varies significantly with countries' incomes: in urban areas this share is only about 20 per cent in low-income countries, compared with about 40 per cent in rich ones. The ability to work from home depends foremost on the nature of a job. Essentially, if a job requires the use of machinery (or other infrastructure) or physical interaction with colleagues or customers, it is less likely to be done from home. Gottlieb, Grobovšek et al. (2020) find limited ability to work from home particularly among workers in services and sales occupations and in occupations most prevalent in manufacturing. Not surprisingly, the majority of the self-employed in poor countries also have limited ability to work from home. Research has also found that remote work is much more common in industries with better educated and better-paid workers (Bartik, Cullen et al. 2020; Gottlieb, Grobovšek et al. 2020).

Using a task-exclusion approach and data on occupational characteristics from the US Occupational Information Network (O\*NET), Dingel and Neiman (2020) developed a framework to measure how much work could potentially be done from home. In particular, they define whether an occupation can be carried out at home based on information on 38 task attributes of an occupation. Their approach consists of excluding work from home when certain conditions are true. For example, an occupation is classified as not permitting work from home if workers lift heavy loads, use or repair particular types of machinery or do not use email at work.

The feasibility of working from home is not always an all-or-nothing question. It is, in many cases, a matter of how much productivity is lost when working remotely, which can be substantial for some occupations and sectors.

The Dingel and Neiman survey asked multiple-choice questions about factors negatively affecting the adoption and productivity of working from home. The top answers were the following: "Some tasks cannot be conducted at home" (76.1 per cent); "Poor telecommunication environment at home relative to the workplace" (60.8 per cent); "Rules and regulations that require some tasks to be conducted in the office" (57.7 per cent); and "Loss of immediate communication that is only possible through face-to-face interactions with colleagues at the workplace" (46 per cent).

Finally, limited access to technology may be an obstacle for firms to adopt work at home policies. Many firms, mainly micro and small ones, do not have access to new technologies for a number of reasons, including low productivity/low profitability and, consequently, lack of access to credit. The findings of Apedo-Amah, Avdiu et al. (2020) suggest that small firm size is also an obstacle to implementing digital innovations in the face of a crisis. While 29 per cent of small firms increased the use of digital platforms during the pandemic and 13 per cent reported investing in digital solutions, for large firms these percentages rise to 41 per cent and 26 per cent, respectively. Interestingly, other innovation types present smaller gaps, with the percentage of firms innovating into health products (10 per cent) and other products (22 per cent) being roughly the same for all firm sizes.

## ► 4.5 Managerial practices

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Human resources management has gone beyond its traditional function in the management of labour to a more strategic role that views employees as assets who contribute to business sustainability and strengthen organizations, especially during prolonged downturns (Ngoc Su, Luc Tra et al. 2021). Research has found that differences in management practices are largely reflected in differences in productivity among enterprises and countries (Bloom and Van Reenen 2010). Firms with "better" management

practices tend to have better performance on a wide range of dimensions: They are larger and more productive, they grow faster, and they have higher survival rates.

Decompositions of productivity growth in the United States show that a large fraction of recent growth occurred in those producing IT or intensively using IT. While European countries had a similar productivity acceleration as the United States in IT-producing sectors (such as semiconductors and computers), they have failed to achieve comparable levels of productivity growth in the industries that use IT intensively – predominantly market service sectors, including wholesale, retail and financial services. A potential explanation for this gap, known as the US management hypothesis, is that it is not the US environment per se that matters; rather, the way firms are managed in the United States enables better exploitation of IT (Bloom, Sadun et al. 2012).

Analysis by Bloom, Sadun et al (2012) aims to test whether the US management hypothesis has validity by examining US-owned organizations' IT performance in a European environment. Using a rich compilation of different data sources and their own international management practices dataset, the authors find that foreign affiliates of US multinationals have higher productivity from their IT capital than non-US multinationals (and domestic firms) and that they are more IT-intensive. The authors show that American firms have higher scores on "people management" promotions, rewards, hiring and firing. These management practices account for most of the output elasticity of IT of US firms. Their findings suggest that people management practices enable US firms to better exploit IT.

Management practices correlate systematically with firm structure (Bloom and Van Reenen, 2010). Private equity firms are better managed than government, family and privately owned firms and have management like that of publicly listed firms. This is true in both developed and developing countries. Interestingly, private equity-owned firms have strong people management practices (hiring, firing, pay and promotions) but even stronger monitoring of management practices (lean manufacturing, continuous improvement and monitoring). Plant managers working in private equity-owned firms also report greater autonomy from headquarters over sales, marketing and new product introduction, which is consistent with the literature on firm structure presented in section 5.2.

Herbane (2013) finds that firms' responses to crisis are, most of the time, a hybrid between formulated and emergent approaches. Central, directive decision-making and top-down, command-and-control type management style are prevalent in SMEs. This kind of behaviour is encouraged because SME managers often own the company or have personal investment in the business (Ates and Bititci 2011).

The large-scale adoption of digitalization and remote working will require essential changes in organizational cultures and management models. In the case of organizations being able to pivot towards working digitally, remote collaborations are considered the most probable new norm for the future, as agreed by 78 per cent of managers responding to the Pricewaterhousecoopers CEO Panel Survey of June–July 2020 (PwC 2020a). This evolution has led to new organizational approaches. Some of these approaches have proved to be effective and, therefore, can be kept for the future. However, managers of remote teams have encountered various challenges in coordinating employees working from home, such as communication issues, fear of 24/7 reporting and burnout, lack of human interaction, loneliness and bad health and safety habits. This might be a key reason that CEOs all over the world state that they intend to develop in the future a more flexible and employee-oriented workforce through digitization, increase the share of remote workers and invest in employee health and wellness programs (Pinzaru, Zbucea et al. 2020).



Chapter

▶ 5

# 5. Empirical assessment of business resilience and recovery from the COVID-19 pandemic

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In this chapter we use the framework constructed from the literature review presented in chapters 2-5 to classify the drivers of business resilience and empirically estimate their weight in business resilience and recovery. We use the World Bank Enterprise Surveys (ES), which are comparable, ongoing surveys in 46 countries. Recently, the third round of the ES follow-up survey, the COVID-19 Business Pulse Survey (COV-BPS), collected data on the impact of the COVID-19 pandemic on businesses for a subset of these countries. Including countries that have data available for the three iterations of the COVID ES, we have a sample of 10,365 formal enterprises, most of which are small (46.02%) and medium (33.46%), from 11 economic sectors<sup>13</sup> in 19 countries<sup>14</sup> (Table 1 and Figure 2). These surveys re-interviewed the respondents of recently completed ES to collect information about closures (temporary or permanent) and changes in sales, employment, and finance, along with policy responses, expectations and other topics.

► **Table 1.** Surveyed enterprises by size

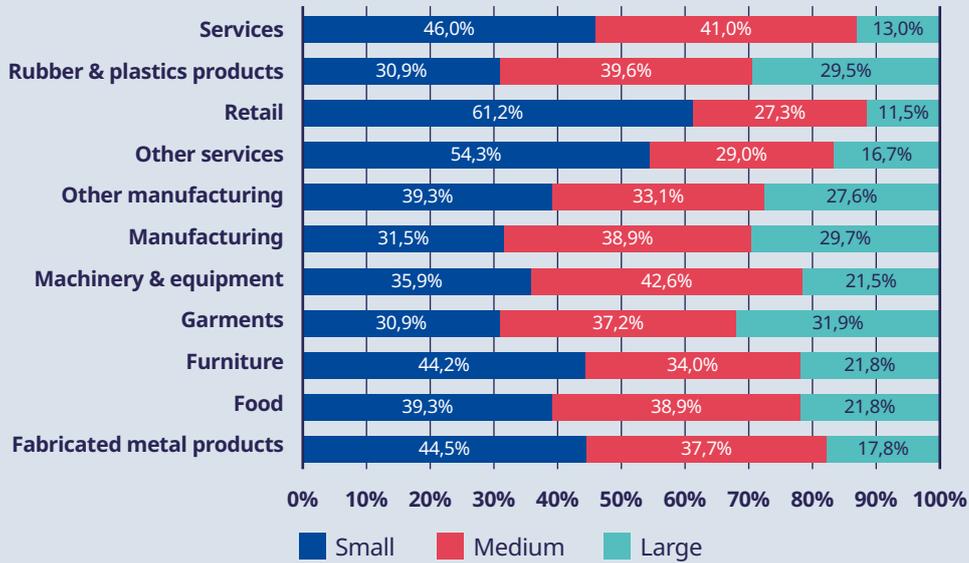
Size (no. of employees)	Frequency	Percent	Cumulative
Small (<20)	11,782	46.02	46.02
Medium (20-99)	8,568	33.46	79.48
Large (100+)	5,254	20.52	100
<b>Total</b>	<b>25,604</b>	<b>100</b>	

Source: Own elaboration with data from the World Bank Enterprise Surveys.

<sup>13</sup> The economic sectors include fabricated metal products, food, furniture, garments, machinery and equipment, manufacturing, other manufacturing, other services, retail, rubber and plastics products, services.

<sup>14</sup> The 19 countries are: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Italy, Jordan, Latvia, Lithuania, Malta, Moldova, Morocco, Poland, Portugal, Romania, Slovak Republic, Slovenia.

► **Figure 2.** Surveyed enterprises by size and sector

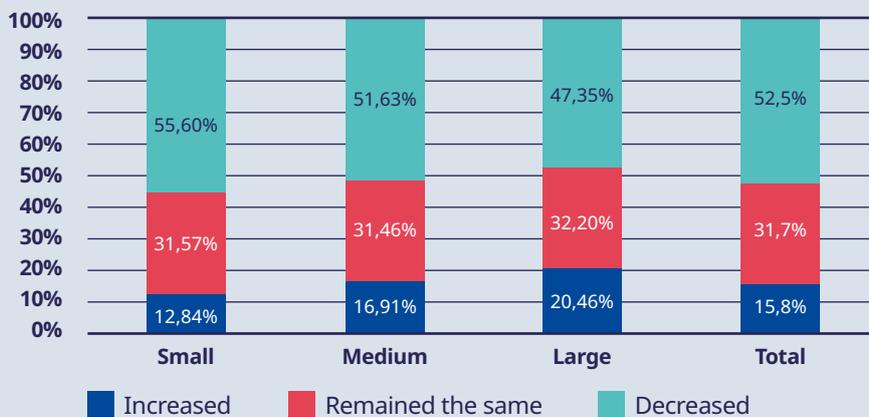


Source: Own elaboration with data from the World Bank Enterprise Surveys.

Surveyed enterprises were hard-hit by the COVID-19 pandemic. More than half of surveyed enterprises (52.5 per cent) reported a fall in sales (Figure 3), even though only over one third had to close temporarily due to lockdown measures. Among those that closed, 52 per cent were small enterprises.

The global pandemic also revealed the vulnerability of enterprises to cope with black swan events. Surveyed establishments reported being able to remain open 8 weeks if their sales stopped. Those that had to close temporarily because of lockdown measures reported remaining open an average of 6 weeks without sales, among which small enterprises reported 5 weeks. This testifies to the need to devise measures to help small enterprises create financial buffers to face and withstand unexpected events, and, above all, policies to enhance business resilience and business continuity, particularly in times of crises.

► **Figure 3.** Impact of the COVID-19 pandemic on business sales



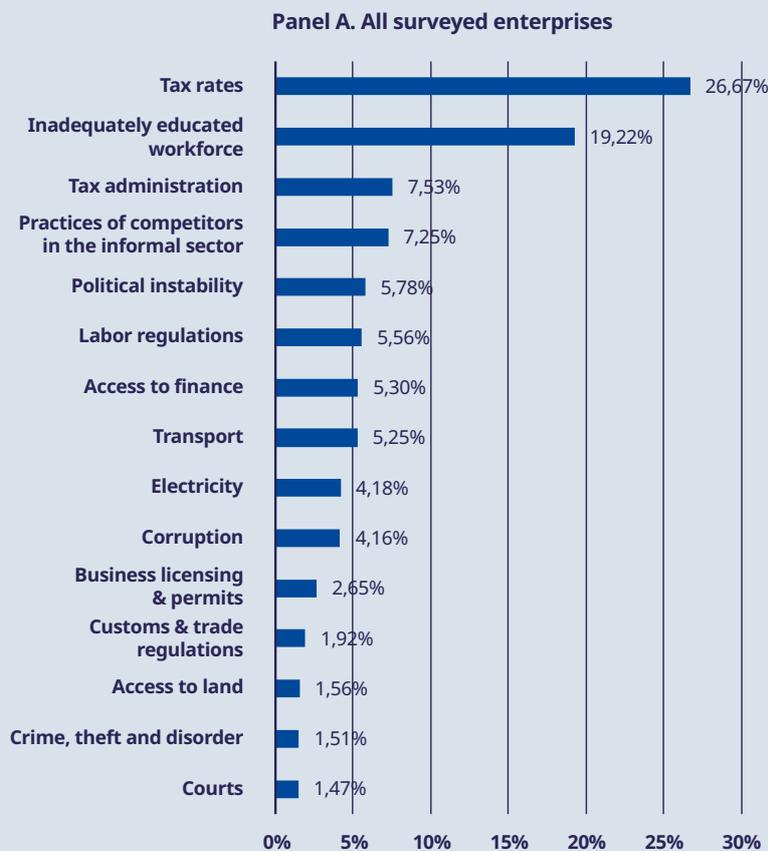
Source: Own elaboration with data from the World Bank Enterprise Surveys.

►► The preparedness and resiliency of a country’s economy are a function of the quality of the business enabling environment. The business environment is a complex mix of policy, legal, institutional and regulatory conditions that affect business activities.

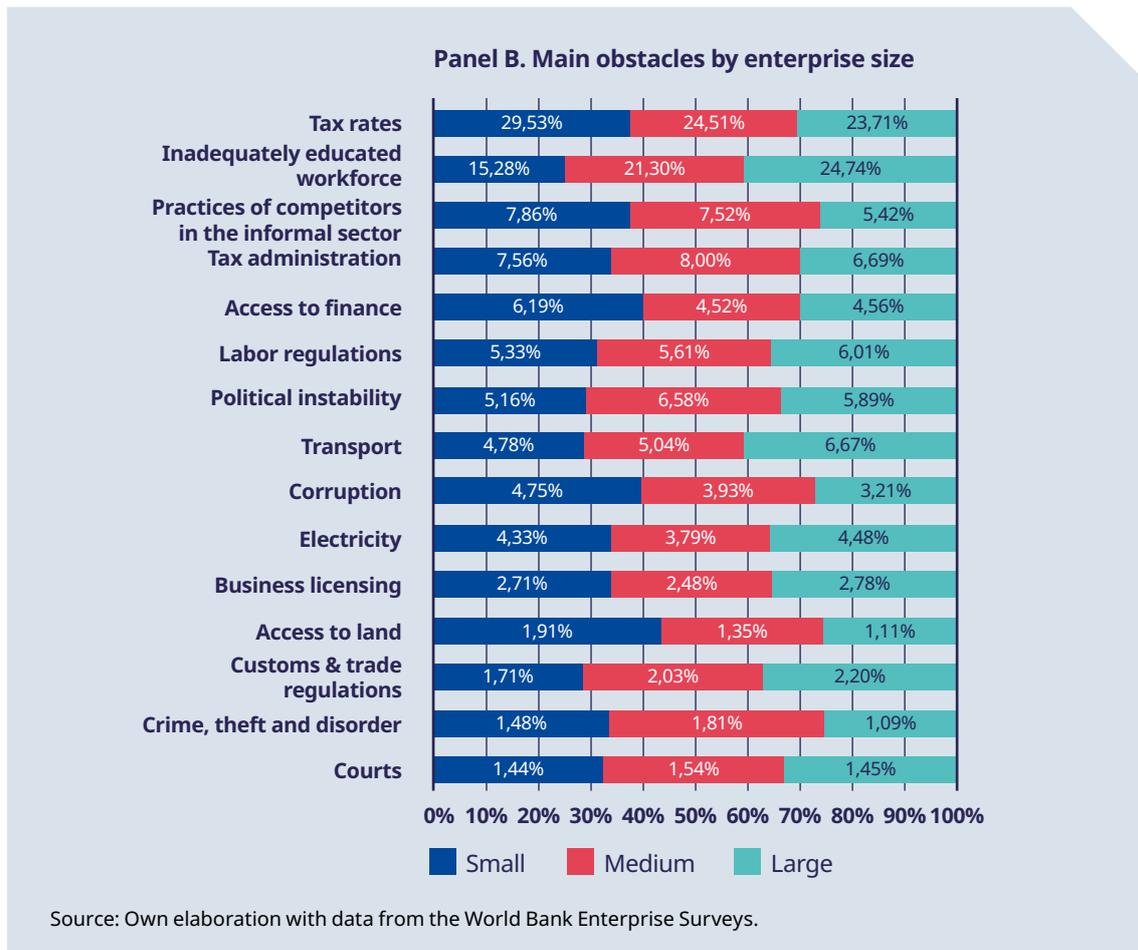
The preparedness and resiliency of a country’s economy are a function of the quality of the business enabling environment. The business environment is a complex mix of policy, legal, institutional and regulatory conditions that affect business activities. A faulty business environment hinders productivity and returns on investment and, by doing so, the economic viability of enterprises, which in turn has an impact on employment and job creation (ILO, 2021b). In this respect over one quarter (26.67 per cent) of surveyed enterprises reported that tax rates are the main obstacle affecting their operations, followed by an inadequately educated workforce (19.22 per cent), tax administration (7.53 per cent),

practices of competitors in the informal sector (7.25 per cent) and political instability (5.78 per cent) (Figure 4, Panel A). Among small enterprises the most common obstacle was tax rates, mentioned by nearly 30 per cent, whereas for large enterprises an inadequately educated workforce appears as the most common challenge, cited by about nearly one quarter (Figure 4, Panel B).

► **Figure 4.** Biggest obstacles affecting business operations



Source: Own elaboration with data from the World Bank Enterprise Surveys.



## ► 5.1 Methodological considerations to measure business resilience and its drivers

This section distills the methodological insights from the existing literature on business resilience and productivity recovery. First, section 6.1.1 summarizes methodological approaches and considerations when measuring business resilience, with an emphasis on survey-based approaches and questions used. Then, section 6.2 compares the potential approaches to convert multi-dimensional measurements of resilience into a single index.

### 5.1.1 Measuring business practices

As highlighted in Section 5, firms with better management practices tend to perform better on a wide range of dimensions: They are larger, more productive, grow faster and have higher survival rates (Bloom and Van Reenen 2010). Bloom and Van Reenen (2007) developed a survey methodology to measure management practices. They used an interview-based evaluation tool that defines and scores 18 basic management practices from 1 (“worst practice”) to 5 (“best practice”). This evaluation tool can be broadly interpreted as attempting to measure management practices in three areas: (i) monitoring—how well do companies monitor what goes on inside their firms and use this information for continuous improvement; (ii) targets—how well do companies set the right targets, track the right outcomes and take appropriate action if the two are inconsistent; (iii) incentives—how well do companies promote and

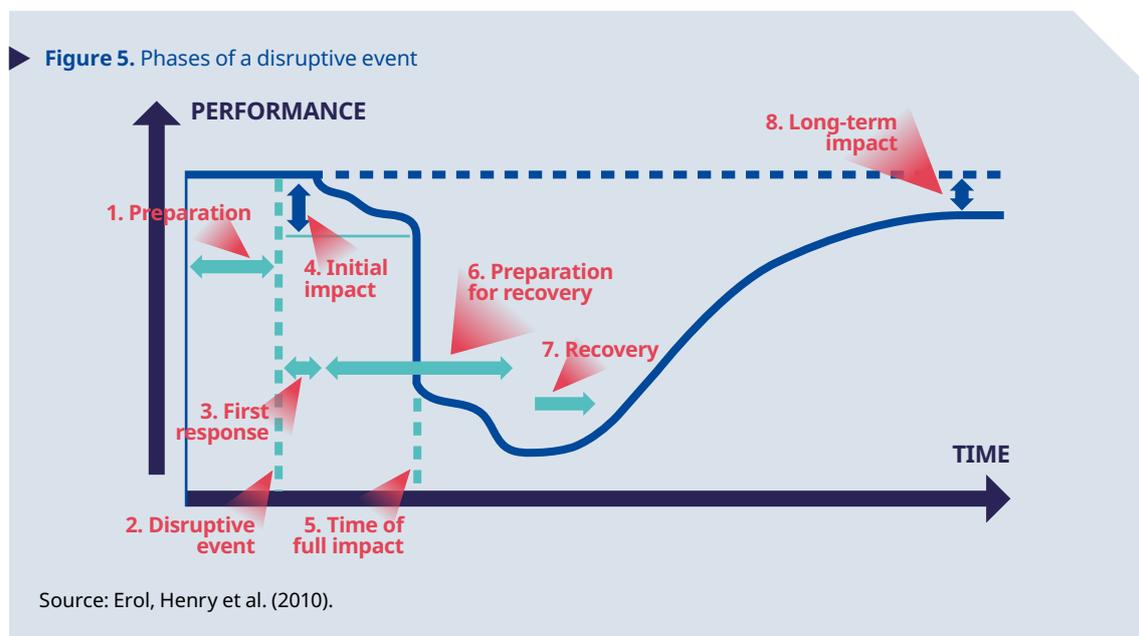
reward employees based on performance and try to hire and retain the best employees. The survey was addressed to plant managers, who are senior enough to have an overview of management practices but not so senior as to be detached from day-to-day operations.<sup>15</sup>

## 5.1.2 Surveying business uncertainties

Section 3.1 highlighted the role of perceived uncertainty in making transactions more difficult to accomplish (Bloom 2014) and businesses' relationships with buyers and suppliers less reliable (Bosio, Dkankov et al. 2020). Uncertainty is proposed as one of the macro factors that can affect business resilience. However, measuring uncertainty can be quite complex, since it is a combination of perceptions, volatility in the system and resources. Altig, Baker et al. (2020) applied a holistic and interdisciplinary approach to measure uncertainty during COVID-19 by analysing implied stock market volatility, newspaper reports of policy uncertainty, Twitter chatter about economic uncertainty, private and public companies' subjective uncertainty about business growth, forecasters' disagreement about future GDP growth, and a model-based measure of macro uncertainty. Indexes of subjective uncertainty that Altig et al. used to calculate subjective uncertainty included the United States monthly panel Survey of Business Uncertainty (SBU) and the United Kingdom monthly Decision Maker Panel (DMP).

## 5.1.3 Measuring resilience outcomes

Measuring resilience requires identifying key performance indicators (KPI). This literature review has identified productivity, firm size, liquidity, preservation of market share, product depreciation and crisis-preparedness as relevant performance indicators. Time-to-recovery (Belhadi, Kamble et al. 2021; De Mel, McKenzie et al. 2012; Furceri, Loungani et al. 2020; Singh, Kumar et al. 2020) is potentially the single most relevant secondary outcome. Erol, Henry et al. (2010) argue that adaptive capacity can be a meaningful measure for resilience only if the time dimension is considered – for example, the time between the disruptive event and the system's first response to that event, or the time between the first impact and full recovery, both illustrated in Figure 5 and Box 4.



<sup>15</sup> This paper focuses on quantifying the drivers of business resilience. However, other research suggests that some relevant aspects may be very context-specific, and capturing them requires a qualitative approach. For instance, Ates and Bititci (2011) collected information on firms' management of change through semi-structured, face-to-face interviews with 232 senior managers (that is, managing director/general manager and direct reports). They then proceeded to identify the topics and the managerial practices that most preoccupied SME managers.

#### Box 4. Phases of a disruptive event

To measure recovery time, we need well-defined start and stop points. The start point could either be (a) the occurrence of the disruption or (b) when the disruption affects the enterprise – although in some cases these could happen at the same time (for example, a factory being hit by an earthquake). Different definitions of the start and stop points could generate different conclusions when comparing different firms, sectors and locations.

Finally, Erol, Henry et al. (2010) note that the level of vulnerability to potential disruptions can also be an indicator of enterprise resilience. It is important to note that an enterprise that is resilient to one kind of disruption may not be as resilient to another type of disruption. This leads us to a possible definition of a measure of the overall resilience of an enterprise; this could be a function of the resilience of the enterprise to various disruptions.

## ► 5.2 Empirical design to assess drivers of business resilience

As mentioned, the data used for this study come from the COVID-19 Business Pulse Survey (COV-BPS), designed by the Firms, Entrepreneurship and Innovation team at the World Bank. This was a modular phone/online survey explicitly created to collect information on how firms, and particularly SMEs, had been affected by the COVID-19 shock. The survey used a standardized questionnaire to capture the effects of the pandemic on firms through each of four distinct channels of impact – supply, demand, financial and uncertainty – as well as firms' adjustment strategies and their views on public support programmes to mitigate the effects of the pandemic.

Using the data of countries with three iterations of the COVID ES, we constructed a dataset covering 10,365 firms in 19 countries. The survey consists of more than 125 questions about the firms, out of which we identified 43 potentially relevant predictors of business resilience in line with the literature reviewed in chapters 3-5. These variables include 10 macro-level factors, 11 meso-level factors and sector variables and 22 firm characteristics. These variables and their classifications as macro barriers, meso barriers, micro barriers, and enterprise characteristics are described in detail in Appendix Table A1. We then applied principal component analysis (PCA) and three variations of least absolute shrinkage and selection operator (LASSO) regression to empirically identify the most relevant drivers of resilience among the 43 variables identified as potentially relevant predictors.

### 5.2.1 Principal component analysis and factor analysis

In a first approach, we use PCA (Abdi and Williams 2010; Wold et al. 1987). PCA is a method that is often used to reduce the dimensionality of large data sets by transforming a large set of variables into a smaller one that still contains most of the information in the large set. There are four categories of variables in the dataset, presented in Equation 1: macro-level barriers to resilience  $MacroIndex_{it}$ , meso-level barriers to resilience  $MesoIndex_{it}$ , micro-level barriers to resilience  $MicroIndex_{it}$  and firm-level characteristics  $\theta_i$ . For each category of factors, we use PCA to derive a single index that captures the variation in this group of variables. For instance, the meso index is obtained as the first component of a PCA applied to five variables addressing whether the firm faces barriers including difficulties in access to 1) land, 2) electricity and 3) transport and 4) high overall competition and 5) high competition from informal firms.

Once the indexes were generated using PCA, the following equation was estimated:

$$\Delta Sales_{it} = \beta_0 + \beta_1 MacroIndex_{it} + \beta_2 MesoIndex_{it} + \beta_3 MicroIndex_{it} + \beta_4 FirmIndex_{it} + \beta_5 I_i + \gamma_i + \theta_i + \alpha_t + \varepsilon_{it} \quad (1)$$

Equation 1 includes the four indexes described above, plus sector-fixed effects  $\gamma_i$ , date-fixed effects  $\alpha_t$ , a dummy variable to indicate whether the firm sells in international markets  $I_i$  and country-fixed effects

$\theta_i$ . The dependent variable  $\Delta Sales_{it}$  is the difference in sales between the time of the interview (in 2020) with respect to same date a year before, that is, before the pandemic started.

This equation is used to estimate the correlation between firm's performance during the pandemic and these broad sets of predictors. The results of this estimation are presented in section 6.3.1.

## 5.2.2 LASSO

LASSO regression was introduced to improve the prediction accuracy and interpretability of regression models.<sup>16</sup> It selects a reduced set of known covariates for use in a model. LASSO seeks to maximize prediction accuracy through the simplest model possible and simultaneously avoid overfitting. This dual objective is achieved by forcing the sum of the absolute value of the regression coefficients to be less than a fixed value; this forces certain coefficients to zero, excluding them from affecting prediction. Consider a sample consisting of  $N$  cases, each of which consists of  $p$  covariates and a single outcome. Let  $y_i$  be the outcome – in this case change in sales – and let  $x_i := (x_{i1}, x_{i2}, \dots, x_{ip})$  be the covariate vector for the  $i$ th firm, including the macro, meso and micro factors presented in Table A1. Then, the objective of LASSO is to solve:

$$\min_{\beta_0, \beta} \left\{ \sum_{i=1}^N (y_i - \beta_0 - x_i^T \beta)^2 + \lambda \sum_{j=1}^p |\beta_j| \right\} \quad (2)$$

Here  $\beta_0$  is the constant coefficient,  $\beta := (\beta_1, \beta_2, \dots, \beta_p)$  is the coefficient vector; and  $\lambda$  is a parameter that determines how much we want to limit the number of covariates to be included in the model that predicts resilience. The larger the  $\lambda$ , the more restrictive is the model, and fewer variables are selected.

Section 6.3.2 presents the results of this procedure using three variable selection methods: cross-validation (CV), adaptive LASSO and a plugin estimator. CV selects the  $\hat{\lambda}$  that minimizes an estimate of the out-of-sample prediction error. Adaptive LASSO performs multiple LASSOs, each with CV. After each LASSO, variables with zero coefficients are removed, and remaining variables are given penalty weights designed to drive small coefficients to zero. Thus, adaptive LASSO typically selects fewer covariates than CV. The plugin method was designed to achieve an optimal sparsity rate. It tends to select a larger  $\lambda$  than CV and, therefore, fewer covariates in the final model. Table A2 in the Appendix shows the performance of the three models in terms of accuracy of predictions in a test sample (measured as mean squared error (MSE)) and explanatory power (R-squared)). Based on the results in this table, we use the adaptive model as our preferred specification and proceed to analyse it in the rest of section 6.3.2.

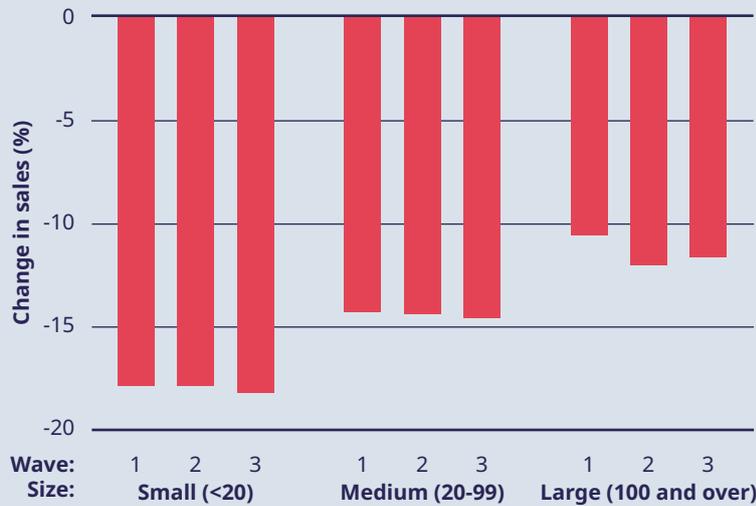
## ► 5.3 Results

### 5.3.1 Impacts of the COVID-19 pandemic on firms, by sector and size

The COVID-19 pandemic affected firms of all sizes, sectors and locations. The average firm in our sample experienced a total decrease of 15 per cent in sales (averaging over three waves of the epidemic). Consistent with the literature reviewed in Chapter 5 (Corey and Deitch 2011; Freund 2020), Figure 6 shows that small firms were the hardest hit, and the negative effects persisted throughout the three waves analysed. The empirical finding shows that smaller and medium-sized enterprises, which represent the majority of firms and account for most employment, have fewer effective instruments at their disposal to manage shocks.

<sup>16</sup> LASSO was introduced by Tibshirani (1996). See also Tibshirani (2011).

► **Figure 6.** Impacts of the pandemic on businesses' sales, by size



Data source: World Bank Enterprise Surveys (2020-2021).

Note: Sample is limited to 10,365 firms in 19 countries with data available for the three iterations of the World Bank COVID Enterprise Surveys.

The impacts of the pandemic on enterprise sales also vary widely by sector. Figure 7 shows that, predictably, the most affected sector was the hotel and restaurant industry. These results are important because tourism accounts for 10 per cent of global gross domestic product and one in every ten jobs. Moreover, the effects of the drop in demand were felt throughout the extensive tourism value chain, including airlines, hotels, restaurants, tour operators, food suppliers, farmers, retailers and a wide

►► The impacts of the pandemic on enterprise sales also vary widely by sector. Figure 7 shows that, predictably, the most affected sector was the hotel and restaurant industry. These results are important because tourism accounts for 10 per cent of global gross domestic product and one in every ten jobs.

range of other small and medium-size enterprises. The more than 30 per cent decrease in profits in the hotel and restaurant sectors shown in Figure 7 reflects a 60-80 per cent total decline in expenditure in international tourism in 2020 (UNWTO 2021).

The analysis by sector in Figure 7 shows that no recovery to pre-pandemic levels was observed for any sector during the three waves analysed. It also highlights some interesting divergences: While the wholesale sector shows a weak recovery pattern, the construction sector sinks deeper over time, reaching a 20 per cent decrease in sales in the third wave of the survey, which was conducted between May 2020 and August 2021.

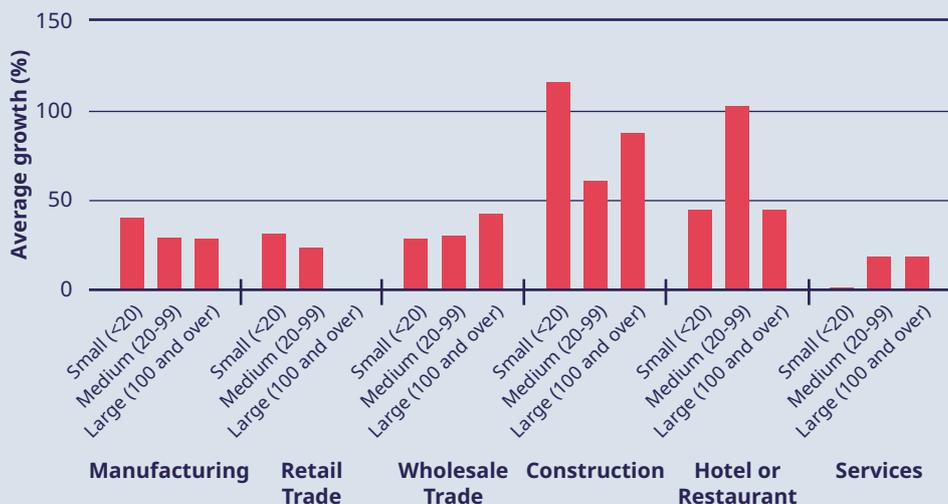
► **Figure 7.** Impacts of the pandemic on businesses' sales, by sector



Data source: World Bank COVID Enterprise Surveys (2020-2021).  
 Note: Sample is limited to 10,365 firms in 19 countries with data available for the three iterations of the World Bank COVID Enterprise Surveys.

Interestingly, the firms in our sample experienced an average increase of 8 per cent in the number of employees. This increase has two complementary explanations: First, while 60 per cent of firms in the sample reduced or maintained their number of workers, the 40 per cent that grew hired a large number of workers, as shown in Figure 8. This figure shows that, for some subsectors and size categories, firms almost doubled their number of employees compared with the pre-pandemic level. Second, the average 8 per cent increase could reflect survivorship bias; it is hard to obtain insights from firms that closed, and so we draw conclusions from the firms that survived the pandemic. This is a data limitation of this research and other similar research of this nature.

► **Figure 8.** Among firms adding workers, average percentage growth in the number of workers, by sector and firm size



Data source: World Bank COVID Enterprise Surveys (2020-2021)  
 Note: Sample is limited to firms that experienced a positive change in the number of workers, subject to data availability in the three iterations of the World Bank COVID Enterprise Survey.

### 5.3.2 Principal component analysis

Section 6.2.1 presented an empirical strategy to estimate the relative predictive power of macro, meso, and micro factors on business resilience. This regression model answers the question: Which groups of factors explain most of the firm-level differences in sales recovery during the pandemic? Table 2 presents the results. In columns (1) and (2), the standard errors are clustered at the country level, while in column (3) they are robust to heteroskedasticity. Most coefficients are robust to these alternative specifications and to the inclusion of country and date fixed effects (columns (2) and (3)). The micro barriers (which measure barriers to accessing credit) have the heaviest weight in sales resilience, with a one-point increase in the index correlated with a 1.6-1.7 percentage point decrease in sales during the pandemic, an 11 per cent effect with respect to the sample mean (15.4 percentage point decrease). The next category in coefficient magnitude is the macro-level index (which measures regulatory burdens, political instability, barriers to trade and lack of rules of law): A one-point increase in the macro barriers index is correlated with a 1.2-1.4 percentage point additional decrease in sales, amounting to 9 per cent of the sample mean. The firm characteristics index captures better management practices and other baseline firm descriptors, such as age and size. A one-point change in this index is correlated with a one percentage point increase in sales – or a 6 per cent less severe fall. The results do not indicate a statistically significant correlation between meso-level barriers and firm performance. Meso-level barriers include barriers to access to infrastructure and the degree of competition that the firm faces. Table A1 in the appendix presents a more detailed description of the variables in the indexes and the type of barriers that they attempt to measure.

Two more results from Table 2 are worth highlighting: First, international firms were much less hit by the pandemic in terms of sales. International firms may have a better possibility to adapt because they are much larger, have financial buffers and have a more diverse set of products and services. A second potential explanation is that, given that the pandemic hit different regions at different times, the international firms had more space to buffer these impacts and smooth out their losses over time. The second element to highlight is the impact by sector, which for retail, wholesale and construction disappears once we have included in the regression all the other relevant variables. The base sector for this comparison is the manufacturing sector. Hence, Table 2 presents evidence suggesting that the impact on retail, wholesale and construction was not different from the impact on manufacturing in a statistically significant way. By comparison, hotels, restaurants and other services experienced a much larger fall. Being in the hotels and restaurant sector is correlated with a 22 percentage point fall in sales. The results of the analysis presented in Table 2 are displayed graphically in Figure 9. Figure 10 presents the results of the same regression model described in section 6.2.1 and Table 2, but with survey respondents' expectations of future default as the dependent variable.

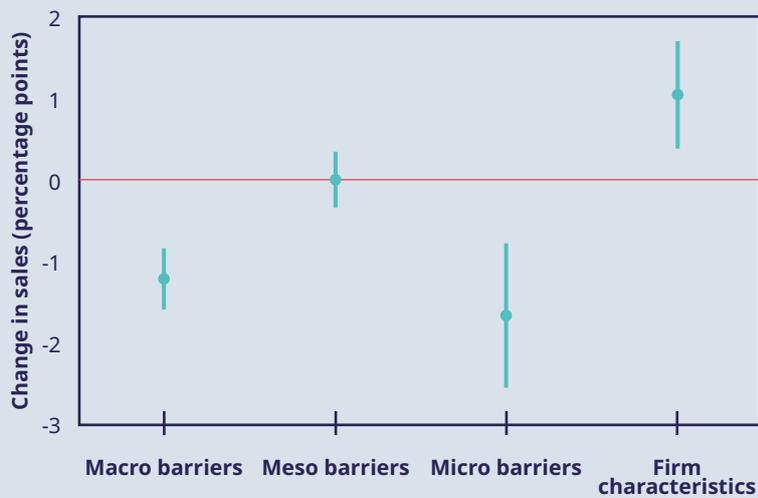
► **Table 2.** Best predictors for business sales resilience

	Sales resilience		
	(1) CV	(2) adaptive LASSO	(3) plugin
Macro barriers index	-1.395*** (0.106)	-1.214*** (0.179)	-1.214** (0.611)
Meso barriers index	0.504 (0.342)	0.00498 (0.163)	0.00498 (0.833)
Micro barriers index	-1.755*** (0.496)	-1.662*** (0.421)	-1.662* (0.872)
Firm characteristics index	1.368*** (0.161)	1.050*** (0.316)	1.050 (0.898)
International firm index	5.059** (2.037)	5.800** (2.376)	5.800** (2.328)

	Sales resilience		
	(1) CV	(2) adaptive LASSO	(3) plugin
<b>Sector (Base=Manufacturing)</b>			
Retail	-1.116	-1.415**	-1.415
	(0.769)	(0.532)	(2.249)
Wholesale	-3.105	-2.955	-2.955
	(7.059)	(6.604)	(3.474)
Construction	-1.627	-1.886	-1.886
	(2.126)	(1.752)	(2.766)
Hotels and restaurants	-21.68***	-22.01***	-22.01***
	(3.830)	(3.668)	(4.038)
Services	-5.848***	-6.060***	-6.060**
	(1.747)	(1.420)	(2.527)
Observations	12,528	12,528	12,528
R-squared	0.052	0.182	0.182
Country fixed effects	NO	YES	YES
Year-month fixed effects	NO	YES	YES
Standard errors	Cluster-country	Cluster-country	Robust

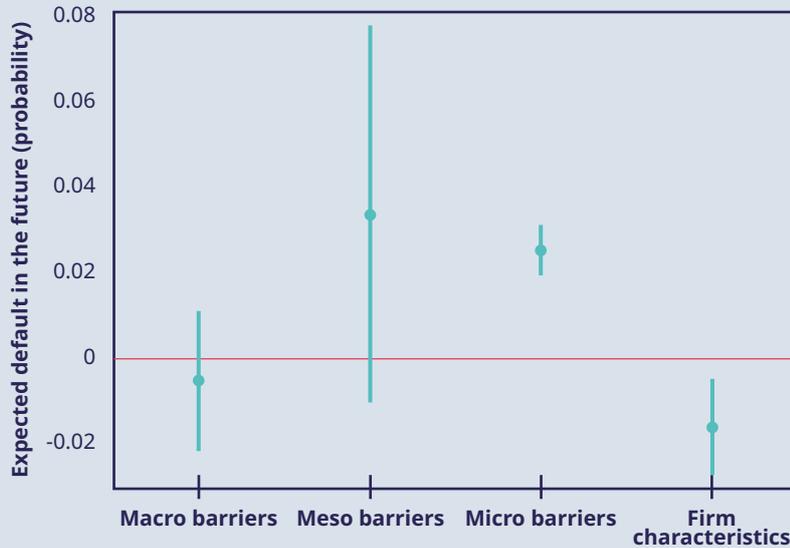
Note: Robust standard errors shown in parentheses. \*\*\* =  $p < 0.01$ , \*\* =  $p < 0.05$ , \* =  $p < 0.1$ . Sample is limited to 10,365 firms in 19 countries with data available for the three iterations of the World Bank COVID Enterprise Survey. Sales resilience is measured as the average change in sales with respect to pre-pandemic times. The construction of the indexes is detailed in section 6.2.1. Detailed variable descriptions are listed in Appendix Table A1.

► **Figure 9.** Best predictors for business sales resilience



Note: Sample is limited to 10,365 firms in 19 countries with data available for the three iterations of the World Bank COVID Enterprise Survey. Sales resilience is measured as the average change in sales with respect to pre-pandemic times. The construction of the indexes is detailed in section 6.2.1. Detailed variable descriptions are listed in Appendix Table A1.

► **Figure 10.** Best predictors for business future expectations



Note: Sample is limited to 10,365 firms in 19 countries with data available for the three iterations of the World Bank COVID Enterprise Survey. This plot presents the results of the same regression model described in Section 6.2.1 and Table 2, but with survey respondents' expectations of future default as the dependent variable. The construction of the indexes is detailed in section 6.2.1. Detailed variable descriptions are listed in Appendix Table A1.

### 5.3.3 LASSO

The results of the principal component analysis shed light on the factors that are linked to the trajectories of sales during the COVID pandemic. However, PCA indexes have limitations, as they could omit important variation in the individual variables that construct the index. The macro index captures 51 per cent of the total variation in the individual variables that comprise it. The meso index captures 34 per cent, and the micro barriers and firm characteristics capture roughly one third of the variation of the individual variables included in each index. For these reasons, it is useful to compare the results presented in the previous section with those of another strategy that assesses the significance of each of the variables individually.

The LASSO method, described in section 6.2.2, does that: It selects the variables that explain most of the variance in enterprise sales resilience while trying to keep the simplest possible model. The number of variables to be included in the LASSO model is determined by the simplicity assumption that is imposed. The more simplicity required (that is, the simpler the model will be), the fewer will be the variables to be included.

Table 3 shows the variables ordered by their relevance. The results are consistent with the results of the PCA in many ways. Among all the firm characteristics, being in the hotels and restaurant sector is the single most important predictor of fall in sales during the pandemic. Second, several variables related to financial inclusion and access to credit appear among the top predictors of sales resilience in the LASSO model. This is consistent with the results of the PCA analysis, which identified micro barriers as the second most important factor. High regulatory barriers to trade are the most important macro barrier affecting sales resilience. Informal competition is also among the most relevant predictors of businesses' ability to maintain their sales during the pandemic. This result is a reminder of the role of governments in fostering an enabling business environment, including in facilitating the formalization of informal businesses. The presence of informal firms operating as unfair competition was an important obstacle for the survival of the firms analysed in our sample.

The results of the LASSO model offer additional insights on the variables driving firms' recovery. For instance, digitalization (proxied as having a website) is the single most important firm-level characteristic. In a world with 5.3 billion active internet users – 66 per cent of the global population – digitalization of firms' communication and product/service delivery is key. The results in Table 3 are consistent with the literature review presented in section 5.3: The pandemic has deepened the digital divide among firms, amplifying gains for businesses that cater to customers online, while companies reliant on more traditional models struggle to survive. Deploying ICT and web technologies helps SMEs increase their revenue, lower costs, increase productivity and create jobs (Nottebohm, Manyika et al. 2012).

A survey led by Apedo-Amah, Avdiu et al. (2020), using the first round of the World Bank Enterprise Survey dataset that is used for this paper, found that the shock has accelerated digital adoption. Around 22 per cent of firms said that they had increased their use of the internet compared with the previous year, while 8 per cent of firms reported starting to use the internet, including social media and digital platforms. Furthermore, 17 per cent of firms reported investing in new equipment, software or digital solutions in response to the pandemic. The results in Table 3 complement the findings of Apedo-Amah, Avdiu et al. (2020), showing that the adoption of these new digital solutions is among the top predictors for firm survival, even when including 42 other firm characteristics into the model.

► **Table 3.** Best predictors of business sales resilience

Variables	Cross-validated	Plugin	Adaptive	Type
<b>Sector = Hotels and restaurants</b>	x	x	x	Sector
Has a website	x	x	x	Micro
High informal competition	x	x	x	Meso
Constraints prevented firm from applying for a loan <sup>1</sup>	x	x	x	Micro
High regulatory barriers to trade <sup>2</sup>	x		x	Macro
High barriers to transport	x		x	Meso
Establishment has a credit line/loan from a financial institution	x		x	Micro
High barriers in access to finance	x		x	Micro
Firm size	x	x	x	Micro
Personal loans used to finance establishment activities	x		x	Micro
High crime, theft and disorder <sup>3</sup>	x	x	x	Macro
New products/services introduced over last 3 years	x	x	x	Micro
<b>Sector = Services</b>	x		x	Sector
Per cent of female ownership	x		x	Micro
<b>Sector = Wholesale</b>	x		x	Sector
Adjusted/converted production/services in response to COVID-19	x		x	Micro
High competition <sup>4</sup>	x		x	Meso
High regulatory burden from business licensing/permits	x		x	Macro
High regulatory burden from labour regulations	x	x	x	Macro
Firm has formal training programmes	x		x	Micro
Experienced loss of products due to theft	x		x	Macro
Process innovation <sup>5</sup>	x		x	Micro
High administrative burden from taxes	x			Macro
International firm	x			Micro

Variables	Cross-validated	Plugin	Adaptive	Type
<b>Sector = Construction</b>	x			Sector
Per cent of international sales	x			Micro
<b>Sector = manufacturing</b>	x			Sector
Diversification <sup>6</sup>	x			Micro
Has a bank account	x			Micro
Number of variables selected	29	8	21	

Notes: Table compares results of cross-validated, plugin and adaptive LASSO; 46 variables were included in the pool of potential predictors of resilience. The last row indicates the number of variables selected by each model. Since we had theoretical predictions about the relevance of labour regulations, these were included in all the models.

1 Constraints include unfavourable interest rates, collateral requirements were too high, size of loan and maturity were insufficient or firm did not think that their application would be approved.

2 Variable measures how much customs and trade regulations were perceived as an obstacle by the firm (=1 if moderate or high).

3 Variable measures how much crime, theft and disorder were perceived as an obstacle by the firm (=1 if moderate or high).

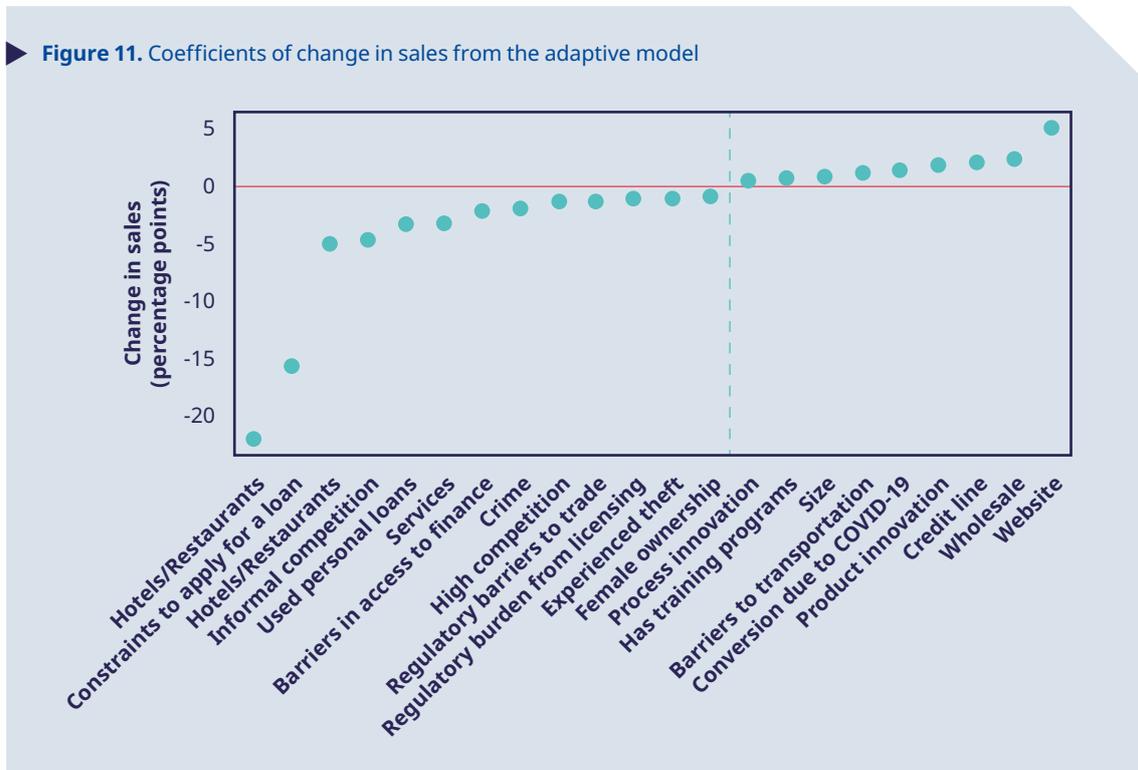
4 Variable=1 if number of competitors was more than nine or "too many to count".

5 Variable=1 if during the three preceding years, the establishment introduced new/significantly improved processes.

6 Variable=1 if share of sales from main product/service.

Figure 11 presents the coefficients estimated from regression analysis using the variables shown in the adaptive model in Table 3. The coefficients are sorted by magnitude. The dots on the left of the vertical line (and below the horizontal line) show variables that are negatively correlated with business resilience (measured as cumulative change in sales during the pandemic). The dots on the right side of the vertical line (and above the red horizontal line) show variables that have a positive correlation with business resilience. The distance of the dot from the horizontal line shows the magnitude of the impact associated with the variable. In this case, being in the hotels/restaurants sector is found to be the strongest negative predictor of sales resilience, while having a website is the most positive predictor.

► **Figure 11.** Coefficients of change in sales from the adaptive model



# ▶ Conclusions



# Conclusions and a research agenda for business resilience

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The results in section 6.3 provide several insights of utmost policy relevance: First, barriers in access to credit and to international markets, as well as belonging to the service sector, are the strongest predictors of large economic damage from the pandemic. Kirchner (2020), in his report for the University of Sydney titled “Globalisation and labour productivity in the OECD: What are the implications for post-pandemic recovery and resilience?”, concludes that increased focus on economic sovereignty in the wake of the pandemic should not come at the expense of international connectedness, as this will tend to weaken productivity, incomes and governance, reducing rather than enhancing resilience. The consistent effect of access to credit implies that governments need to foster policies and programmes that solve liquidity constraints in times of uncertainty. Furthermore, employers may be unable to preserve jobs during the pandemic because of frictions that limit the credit needed for paying the wage bill (Céspedes, Chang et al. 2020). If the COVID pandemic is similar to other crises, lack of access to capital can have a lasting effect on firms (De Mel, McKenzie et al., 2012; Hallward-Driemeier and Rijkers, 2013). A related policy implication is to address financial institutions’ lack of information, which prevents firms from obtaining access to credit during crisis. In some contexts, especially in developing countries and during times of hardship, financial institutions lack sufficient information about firms to correctly evaluate credit merit, with a consequent rise of credit constraints for all firms (Bosio, Jolevski et al. 2020).

## ► A research agenda on business resilience

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There is a large and rapidly growing literature on the economic effects of COVID-19 in advanced economies (for summaries, see Baldwin and Baldwin and di Mauro 2020a, 2020b). Most of Baldwin and di Mauro’s evidence and that used in previous reviews has come from advanced economies (Beck, Flynn et al. 2020). In contrast, this paper examines the drivers of resilience at a broader scale, greater geographical diversity and a more extended time frame than previous research and, thus, contributes to policy conclusions about business resilience to COVID – or other wide-reaching crises – that may be more widely applicable. However, detailed research to look at each of these drivers in a wider variety of settings is required.

In Chapter 6 we conducted an empirical assessment of the drivers of business resilience. Besides the implications discussed above in this section, our findings raise a series of questions for future research and policy debates:

**Additional obstacles for female-owned businesses:** Women’s jobs are 1.8 times more vulnerable to this crisis than men’s jobs, Madgavkar, White et al. (2020) find that, while women make up 39 per cent of global employment, they accounted for 54 per cent of overall job losses during the pandemic. Similarly, female owners of small businesses face additional systemic obstacles that may hinder the ability of their firms to recover in the aftermath of a crisis. Compared with “regular” recessions, which affect men’s employment more severely than women’s employment, the employment drop related to social distancing measures greatly affected sectors with high female employment shares. Madgavkar, White et al. (2020) showed that both digital and financial inclusion, notably access to credit from financial

institutions and access to mobile banking, are closely related to women's presence in the labour force. The gender gap in financial inclusion has been an obstacle to participation in government stimulus and relief programmes. In countries with large informal sectors, this gender gap in financial inclusion translates into a gender gap in firms' liquidity and survival. For instance, in India over one third of women who run businesses lack the accounts through which key cash transfers are made (Dhingra, 2020). Self-employed women and women who own micro and small businesses face an exacerbated risk of closure.

For female entrepreneurs, the pandemic made the balancing act between work and family an impossible challenge in many regions. Closures of schools and day care centres massively increased needs for childcare (and schooling) at home, having a huge impact on working mothers, since this work is still done predominantly by women in most of the world. Our results show that firm survival is negatively correlated with female firm ownership. This is consistent with the obstacles described above hindering the recovery of female-owned businesses. It is crucial for future research to address this disproportionate impact and design smart policies that take into account existing systemic gender disparities.

**Fostering firm digitalization and technology adoption:** In Chapter 5 we highlighted how the pandemic deepened the digital divide among firms, amplifying gains for businesses that cater to customers online while companies reliant on more traditional models struggle to survive. We find that having a website is a strong predictor of business recovery, but there is immense potential for enterprises to leverage and gain benefits from the internet beyond this specific variable; more research is needed on how businesses affected by the crisis can connect with the 5.3 billion active internet users. While the pandemic has created many opportunities for innovation and technology adoption, firms face several challenges in implementing digitalization and remote work and in responding to shifting and emerging consumer demands.

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Given data availability and the scope of our model, of course we cannot cover all the issues raised in the abundant literature on business resilience. We have identified a series of themes that need future research for a better understanding of the best policies to support enterprises in their resilience processes:

**Creative destruction:** As described in previous sections, in the literature there is a conflict between how conventional models relate initial firm productivity and resilience to crisis and the empirical evidence from past crises, such as the global financial meltdown of 2008–9 and the East Asian crisis of 1997–8. Given the unprecedented nature of the COVID-19 crisis, it is yet to be seen whether there will be a cleansing effect favouring the survival of more productive firms and what will be the micro, meso and macro obstacles to this process.

**Sustainability:** Queiroz, Ivanov et al. (2020) raise questions for future research on whether sustainability solutions can reinforce businesses' resilience in the face of crisis. More research is needed on the potential role of sustainable operations models to assist vulnerable supply chains, especially in the developing economies, to minimize the supply effects (for example, shortages, abusive pricing). Similarly, investigation is needed into how circular economies can contribute to reducing the effects of production and supply shortages in global supply chains.

Before the pandemic consumers in the developed world took for granted that their basic needs, such as food and shelter, could be easily met through the wide availability of various products and services. Consumers were "spoilt" with "choice overload". The shift towards socially and environmentally sustainable production and consumption would lead to more rational and ethical purchases. In this framework companies might consider more "social-value co-creation" by adopting social objectives within business activity (Pinzaru, Zbucnea et al. 2020). Another dimension to consider is the corporate social responsibility strategy. He and Harris (2020) assert that the "COVID-19 pandemic offers a great opportunity for businesses to shift towards more genuine and authentic corporate social responsibility and contribute to addressing urgent global social and environmental challenges". Future research should also investigate whether adopting more ethical and environmentally sound practices favoured firm survival during the pandemic and afterward.

**Management:** As shown by Bloom, Sadun et al. (2012), digital investments, to be effective, need to be complemented by organizational changes. More data are required to know whether firms are making

these organizational changes. Similarly, data on firm investments in management and organization in response to the pandemic are still scarce. As discussed in this review, working from home and the digitalization of several processes are elements of business resilience. There is evidence on the factors driving the increase in working from home in the United States, where the practice will be permanently adopted in many firms. Barrero, Bloom et al. (2020b) identify five mechanisms behind this persistent shift to working from home: better-than-expected experiences working from home, investments in physical and human capital enabling working from home, diminished stigma, reluctance to return to pre-pandemic activities and innovation supporting working from home. However, these results are for the United States only and cannot be extrapolated to other countries, in particular to regions that have larger obstacles to technology adoption, as described in sections 5.3 and 5.4.

**The future of virtual work:** Because the literature lacks good and consistent measures of the productivity of working from home, simulation studies have assumed arbitrary figures for such productivity, such as 50 per cent or 70 per cent relative to working at the workplace. More research is needed to understand the actual at-home productivity for different firm sizes, sectors and countries. On this same topic, firm-level surveys that enable researchers to identify sector-level differences in the feasibility of working from home have been conducted mostly in advanced economies (Dingel and Neiman 2020; Morikawa 2020, 2021).

In conclusion, COVID-19 has transformed the business environment and the conditions required for productivity growth. Our data show sluggish recovery in sales, but they also show that there are winners and losers, and that impacts are strongly heterogeneous across sectors. Our analysis suggests important lines of research and policy debate, including how to better include women in COVID recovery and, in general, in transitions required for business growth. It also raises questions on management, and how employer and business membership organizations can foster innovation that promotes productivity growth and expansion in the scale of firms. Micro enterprises have been the largest casualty of the pandemic, but they are also the fuel that powers the engine of the global economy and sustains the livelihoods of nine of every ten people on the planet.

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# Appendix

► **Table A1.** Variable names and descriptions

Variable name	Description	Sub-category	Category
Theft loss	In last year, were products lost in transit due to theft?	Rule of law	<b>Macro barriers to resilience</b>
thefts	Losses due to theft, robbery, vandalism or arson experienced in last fiscal year (=1 if >0)	Rule of law	
courts_obstacle	How much are courts an obstacle as perceived by the firm? (=1 if moderate or high)	Rule of law	
crime_obstacle	How much are crime, theft and disorder an obstacle as perceived by the firm? (=1 if moderate or high)	Rule of law	
poli_instab	How much is political instability an obstacle as perceived by the firm? (=1 if moderate or high)	Rule of law	
trade_obstacle	How much are trade regulations a perceived obstacle by the firm (=1 if moderate or high).	Barriers to trade	
time_regulations	What per cent of senior management time was spent in dealing with government regulations?	Regulatory burden	
tax_admin_burden	Administrative burden from taxes (=1 if moderate or high)	Regulatory burden	
licensing_burden	Regulatory burden from business licensing/permits (=1 if moderate or high)	Regulatory burden	
labour_reg_burden	Perceived high burden from labour regulations (=1 if moderate or high)	Regulatory burden	
elec_obstacle	How much of an obstacle: electricity to operations of this establishment? (=1 if moderate or high)	Access to infrastructure	<b>Meso barriers to resilience</b>
transport_obstacle	How much of an obstacle: transport to operations of this establishment? (=1 if moderate or high)	Access to transport	
high_competition	Is =1 if number of competitors is more than nine or "too many to count".	Exposure to competition	
informal_competition	Does this establishment compete against unregistered or informal firms?	Exposure to competition	
access_land	How much of an obstacle is access to land to operations of this establishment? (=1 if moderate or high)	Access to enough land	
z_age_firm	Age of firm in years, standardized	Firm's age	<b>Firm characteristics</b>
z_size_firm	Size of firm in number of employees, standardized	Firm's size	
female_manager	Is the top manager female?	Management practices	
z_female_own	Female ownership categories (standardized)	Management practices	
training	Were there formal training programmes for permanent, full-time employees in last year?	Management practices	

Variable name	Description	Sub-category	Category
website	Establishment has its own website	Management practices	<b>Firm characteristics</b>
started_online	Started or increased business activity online during the pandemic?	Management practices	
z_diversification	Diversification (standardized)	Diversification	
z_inter_sales	Per cent of non-international sales (standardized)	Diversification	
z_international_sales	Per cent of material inputs and supplies of foreign origin in last fiscal year (standardized)	Diversification	
COVID_conversion	Has this establishment adjusted or converted, partially or fully, its production or the services it offers in response to the COVID-19 outbreak?	Responses to crisis	
local_firm	Main market is local; main product sold mostly in same municipality where establishment is located	Degree of internationalization	
national_firm	Main market is national; main product sold mostly across the country where establishment is located	Degree of internationalization	
international_firm	Main market is international	Degree of internationalization	
break_loss	Firm experienced loss due to breakage or spoilage in last year	Management practices	
innov_prod	Variable=1 if, during last three years, establishment Introduced new/significantly improved products	Innovation	
innov_process	Variable=1 if, during last three years, establishment Introduced new/significantly improved processes	Innovation	
bank_account	Has a bank account	Financial inclusion	
credit_line	Establishment has a line of credit or loan from a financial institution	Financial inclusion	
personal_loans	Outstanding personal loans used to finance establishment's business activities?	Financial inclusion	
obstacle_credit	Constraints include: unfavourable interest rates, collateral requirements were too high, size of loan and maturity were insufficient, or firm did not think that their application would be approved	Financial inclusion	
obst_finance	How much of an obstacle is access to finance? (=1 if moderate or high)	Financial inclusion	
manufacturing	Manufacturing sector	<b>Sector of main product/service</b>	
retail	Retail sector		
wholesale	Wholesale sector		
construction	Construction sector		
hotels_rest	Hotels and restaurants		
services	Service sector		

Note: Column (1) displays the variable name used in the dataset. Column (2) shows the question used to elicit information for that variable. Some questions have been summarized/simplified for clarity. Column (3) shows the sub-category in which the variable was included, to better illustrate the type of obstacle that is being proxied with each variable. Column (4) shows the classification as a macro-, meso- and micro-barrier, as well as firm-level characteristics and sector indicator variables, as included in the model described in Section 6.2.1. Section 6.3.2 presents the results of this model.

► **Table A2.** Model out-of-sample predictions quality: Mean squared error (MSE) and R-squared

Name	train_test	MSE	R-squared	Observations
<b>cv</b>				
	1	880.1822	0.0544	7,371
	2	879.8294	0.0550	7,413
<b>plugin</b>				
	1	906.4609	0.0418	10,776
	2	923.2981	0.0479	10,781
<b>adaptive</b>				
	1	905.0067	0.0631	7,729
	2	905.9121	0.0602	7,790

Note: Adaptive LASSO performs multiple LASSOs, each with CV. After each LASSO variables with zero coefficients are removed, and the remaining variables are given penalty weights designed to drive small coefficients to zero. Thus, adaptive LASSO typically selects fewer covariates than CV. The plugin method was designed to achieve an optimal sparsity rate. It tends to select a larger  $\lambda$  than CV and, therefore, has fewer covariates in the final model.



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