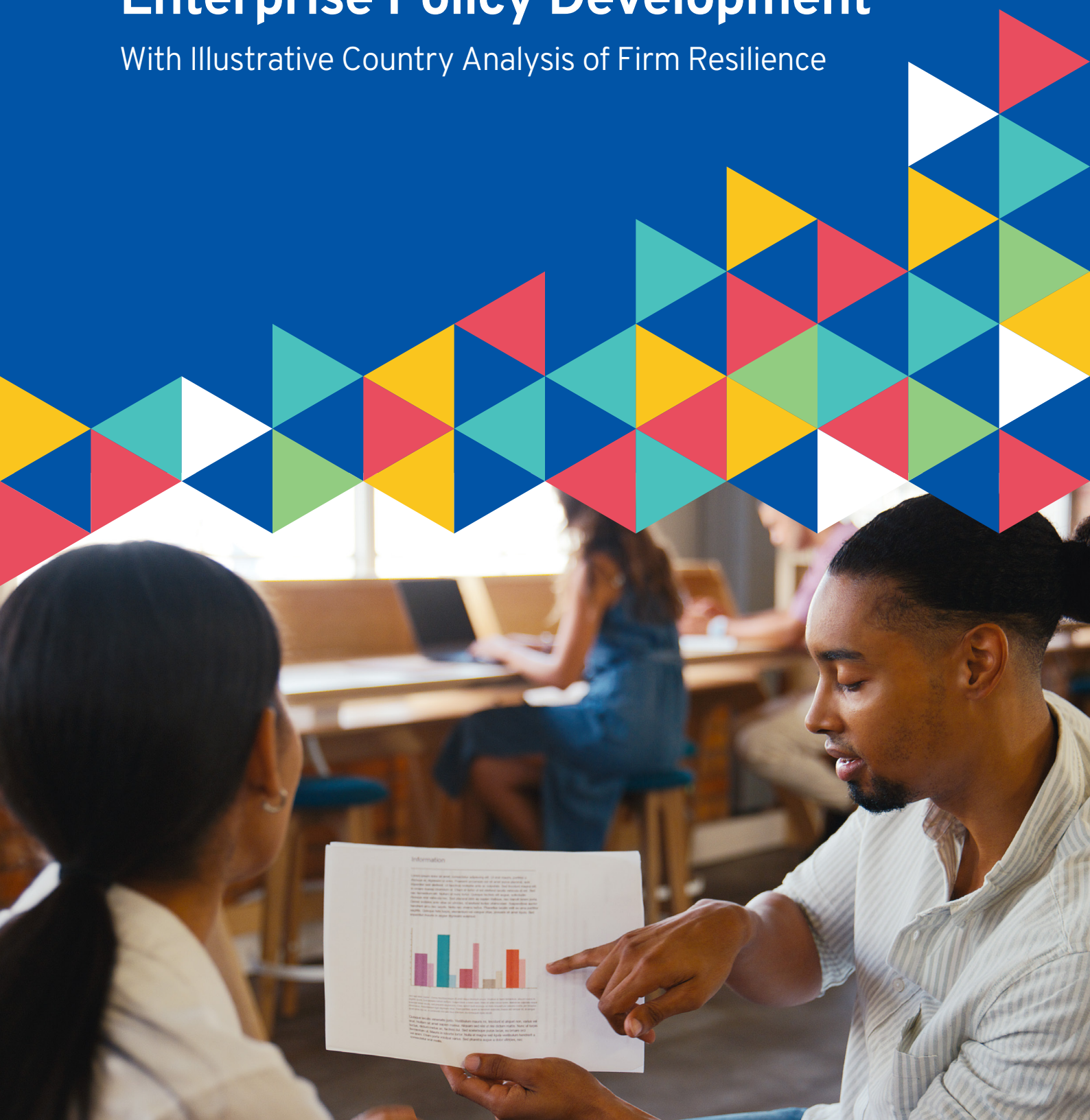




International
Labour
Organization

► Using Firm-level and Integrated Data Sources for Enterprise Policy Development

With Illustrative Country Analysis of Firm Resilience





► **Using Firm-level and Integrated Data Sources for Enterprise Policy Development**

With Illustrative Country Analysis of Firm Resilience

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► Foreword

Evidence is crucial for effective policymaking. Policies are more likely to succeed when they are based on a better understanding of labour markets, business dynamics and economic trends. Evidence-based policymaking helps ensure that interventions are well targeted, efficient, and impactful. In addition, robust evidence provides an important baseline against which policy progress can be monitored and evaluated.

This topic is directly relevant to the ILO's work on promoting sustainable enterprises, promoting decent work and inclusive labour markets. The ILO Resolution concerning small and medium-sized enterprises and decent and productive employment creation emphasizes the role of an enabling environment, defined through a set of interrelated conditions that influence enterprise performance and employment outcomes. Analysing these conditions, towards informing and building advocacy for policy reform, requires robust and complementary evidence, and contributes to more informed social dialogue.

In this context, firm-level data is particularly valuable when policies aim to boost productivity, reduce firm mortality, promote formalization or foster innovation. They complement labour force data in providing critical insights into how enterprises respond to specific circumstances and how policies can shape enterprise practices in ways that promote creation of quality jobs. Expanding the use of enterprise surveys complements existing data sources and enables a more comprehensive understanding of economic activity by capturing both enterprises performance and their labour market dynamics.

Each of three primary data sources of firm dynamics — enterprise surveys, household surveys and administrative data — offers distinct advantages. This report explores the role of these various data sources. Part 1 provides an overview of aforementioned data sources, highlighting both their distinct strengths and limitations. It also examines mixed methods approaches — that is, the combined use of enterprise surveys, household surveys and administrative records — to enable researchers to analyse a wide range of business dynamics and performance outcomes, including productivity, working conditions, job satisfaction, survival and growth. It demonstrates how integrating multiple data sources contributes to more integrated policy solutions and improved tracking of different dimensions of firm behaviour.

Part 2 contains three illustrative country cases from Colombia, Ecuador and Brazil, demonstrating how establishment data can be used to analyse firm behaviour — in this case, firm resilience in the face of economic shocks. Together, these chapters highlight the importance of diverse data sources for enterprise analysis. It is hoped that this study will encourage governments and policymakers to make more effective use of their establishment data for policymaking purposes.

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► Table of contents

► Foreword	iii
► List of acronyms and abbreviations	ix
► Executive summary	x
Part I Data sources for enterprise analysis: An overview	1
► Introduction	3
► Administrative data	4
► Household surveys	7
► Enterprise surveys	8
Classification of enterprise surveys by purpose	9
Enterprise surveys focusing on economic outlook	9
Enterprise surveys focusing on the labour market	11
Enterprise surveys with statistical scope	12
Surveys of MSMEs	12
Panel surveys versus cross-sectional surveys	13
Cross-country comparison	13
► Relevant research areas	15
► Review of the literature based on surveys and administrative data	21
Household characteristics	21
Firm characteristics	21
Access to finance	22
GVC participation during economic shocks	22
Benefits and risks associated with GVC participation	23
Informality	23
Working conditions	24
Job mismatch, wages and job satisfaction	25
► Conclusions	26
► References	28
► Annex: Strengths and weaknesses of different data sources	30

Part II Country analysis of firm-level data with application to decent work and crisis resilience	31
► Overview	33
► Literature on firm resilience during the COVID-19 pandemic	35
Digitalization	35
Firm size	35
Firm age	36
Industrial sector	36
Liquidity, innovation and supply chains	37
Underexplored issues	37
► Comparison of three types of enterprise surveys	39
► References	41
► Chapter 1. Two-step small-business survey linked to household surveys: A case study using Colombia's Encuesta de Micronegocios (EMICRON)	42
Introduction	42
Sampling design	43
Analysis	44
Economic activity and informality	44
Business age	45
Employment	46
Firm's performance and labour productivity	47
Economic sector and productivity	51
Impact of COVID-19	52
Conclusions	59
References	59
► Chapter 2. Structural surveys for national accounting purposes: Ecuador's Encuesta Estructural Empresarial (ENESEM)	61
Introduction	61
Sampling design	62
Data and descriptives	63
Firm size	63
Productivity	63
Predictors of resilience	65
Workforce loss and recovery	70

Analysis of resilience	74
Sales losses and recovery	74
Workforce loss and recovery	79
Conclusions	81
References	82
► Chapter 3. Administrative employer-employee data: Brazil's Relação Anual de Informações Sociais (RAIS)	83
Introduction	83
Sampling	84
Data and empirical approach	84
Analysis	85
Firm mortality and Lazarus firms	85
Determinants of Lazarus recovery	88
Employment growth determinants	90
Conclusions	92
References	93
► Concluding remarks	94

► List of tables

► Table 1. Comparison of enterprise surveys	40
► Table 2. Differences in firm performance across formality status, number of workers and ICT use	50
► Table 3. Sector of economic activity within quintiles of labour productivity	51
► Table 4. Differences in labour productivity by sector of economic activity	52
► Table 5. Estimated change in monthly sales relative to the previous year, by perceived qualitative change in last month	57
► Table 6. Qualitatively reported change in sales, by sector of economic activity	57
► Table 7. Added value and added value per worker	63
► Table 8. Variables selected as potential predictors of firm resilience	66
► Table 9. Yearly descriptives, all firms	68
► Table 10. Year-to-year loss and recovery, descriptive statistics	69
► Table 11. Attrition in the ENESEM	70
► Table 12. Drop in workforce below 100%, descriptive statistics	73
► Table 13. Loss in real sales in 2020	77
► Table 14. Recovery in real sales by 2021	78
► Table 15. Workforce drop by 100%	80
► Table 16. Mortality rate	86
► Table 17. Share of Lazarus firms	87
► Table 18. Post-crisis rehiring	88
► Table 19. Binomial logistic regression of Lazarus recovery on firm-level predictors (odd ratios)	89
► Table 20. Binomial logistic regression of employment growth on firm-level predictors (odd ratios)	91

► List of figures

► Figure 1. Business age, in percentage of a given age group	45
► Figure 2. Share of firms by number of workers (other than owner)	46
► Figure 3. By formality: Distribution of added value and labour productivity	48
► Figure 4. Distribution of added value and labour productivity by use of ICT	49
► Figure 5. Impact on average net sales	53
► Figure 6. Change in monthly sales relative to 2019	54
► Figure 7. Change in net sales relative to 2019, by enterprise features	55
► Figure 8. Change in net sales relative to 2019, by sector of economic activity	56
► Figure 9. Change in the number of workers relative to January 2020	58
► Figure 10. Value-added by sector of economic activity in the year 2022 (in US\$10,000)	64
► Figure 11. Firm loss and recovery of workforce levels, relative to 2019	71
► Figure 12. Average sales relative to 2019 levels, by enterprise features	75
► Figure 13. Trends in firm mortality	86
► Figure 14. Trends in the revival of Lazarus firms	87

► List of acronyms and abbreviations

COVID-19	Coronavirus Disease 2019
DANE	Departamento Administrativo Nacional de Estadística (Colombia)
ECLAC	Economic Commission for Latin America and the Caribbean
EMICRON	Encuesta de Micronegocios (Colombia)
ENESEM	Encuesta Estructural Empresarial (Ecuador)
EU	European Union
GEIH	Gran Encuesta Integrada de Hogares (Colombia)
GVC	Global Value Chain
ICT	Information and Communications Technology
ILO	International Labour Organization
IMF	International Monetary Fund
INEC	Instituto Nacional de Estadística y Censos (Ecuador)
INEI	Instituto Nacional de Estadística e Informática (Peru)
ISIC	International Standard Industrial Classification
LFS	Labour Force Survey
MSME	Micro, Small and Medium-Sized Enterprise
OECD	Organisation for Economic Co operation and Development
RAIS	Relação Anual de Informações Sociais (Brazil)
R205	Employment and Decent Work for Peace and Resilience Recommendation, 2017 (No. 205)
SME	Small and Medium-Sized Enterprise
UNCTAD	United Nations Conference on Trade and Development
VAT	Value Added Tax

► Executive summary

Analysing the business environment requires a comprehensive understanding of enterprise performance, labour market dynamics and economic trends. Firm-level data is an important source of information in this regard, as it provides insights into how businesses operate, grow and respond to changing conditions. By capturing key aspects such as productivity, employment and business behaviour, these data support more informed economic analysis and policymaking.

Evidence-based policymaking ensures that interventions are targeted, efficient and effective. Whether the goal is boosting productivity, reducing firm mortality, promoting formalization or fostering innovation, firm-level data is an important source of information, including on labour and skills demand. Enterprise and establishment surveys, complemented by household surveys and administrative records, help governments craft policies based on a better understanding of labour markets, business dynamics and economic trends.

The first part of this report explores the role of enterprise and establishment surveys, household surveys and administrative data in analysing enterprise performance. Enterprise surveys provide detailed information on employment, productivity, investment, innovation, access to finance and workplace practices. They also capture qualitative aspects such as business environment constraints, management practices and working conditions, which are often unavailable from other sources. Household surveys complement enterprise surveys by capturing informal employment, self-employment and household-based economic activities that are typically excluded from traditional enterprise surveys.

The report highlights how countries increasingly combine and link enterprise surveys, household surveys and administrative records to strengthen economic and labour market analysis. Administrative records, such as business registers, tax records and social security databases, are used as sampling frames for enterprise surveys, linked with survey data and combined with other administrative sources to generate employer-employee data and analyse changes in the labour market over time. Economic censuses can be used as benchmarks for surveys and administrative data. Integrating these sources allows policymakers to build a more comprehensive, accurate and policy-relevant understanding of economic and labour market dynamics.

When combined and used effectively, these data sources contribute to the creation of structural business statistics that are crucial for understanding the size, performance and composition of businesses across industries. They cover areas such as employment, productivity and business size, which are vital for national accounts and labour market analysis. They also provide sector-specific information on growth trends, investments and capacity utilization, supporting macroeconomic forecasting and the analysis of structural change.

The report discusses different types of enterprise and establishment surveys and their respective objectives. Some surveys focus on economic performance and structural or cyclical shifts in the economy, while others focus on labour market dynamics from a demand-side perspective, including wages, working conditions, job vacancies and skill demand. Surveys of MSMEs and informal businesses provide insights into formality, productivity, obstacles to performance and access to public support programmes. The report also discusses methodologies such as two-step surveys and 1-2-3 surveys, which combine household and enterprise data to better capture informal economic activities.

The report reviews how these data sources are used to analyse key research areas, including business demography, resilience, informality, productivity and labour market dynamics. Administrative and longitudinal firm data have shown that young firms tend to create more jobs but face higher failure rates, while larger and older firms are generally more stable. Enterprise surveys help identify productivity gaps, labour market mismatches and differences in working conditions across sectors and firm sizes.

Combining survey and administrative data strengthens the analysis of business growth, labour demand and structural change.

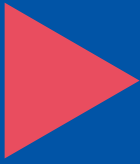
The second part of the report applies this framework to the analysis of firms' resilience during the COVID-19 pandemic. Labour Force Surveys are widely used for labour market analysis but provide only limited insights into firms and the demand side of the labour market. Enterprise surveys and administrative firm data complement these sources by uncovering the performance of enterprises and their labour market dynamics.

To illustrate the utility of these data sources, the report presents three country case studies based on different survey designs and administrative datasets. Colombia relies on the Encuesta de Micronegocios (EMICRON), an enterprise survey focusing on small and informal businesses. The analysis shows that informal microenterprises were particularly vulnerable to COVID-19, but firms using digital tools exhibited greater resilience. Ecuador relies on the Encuesta Estructural Empresarial (ENESEM), a structural enterprise survey mainly used for national accounting purposes. The analysis highlights that firms with greater diversification and investment in worker benefits were more likely to recover from pandemic-induced shocks. Brazil uses the Relação Anual de Informações Sociais (RAIS), an administrative dataset with employer-employee links, to analyse workforce restoration and firms that recovered after carrying out complete workforce layoffs.

Across the three country cases, smaller firms faced greater vulnerability than larger firms. Larger firms with international exposure experienced more significant initial losses but often recovered more quickly. Technology adoption also played an important role in resilience and recovery. At the same time, the analysis highlights important structural and sectoral differences across countries, underlining the need for tailored policy interventions.

Together, these chapters highlight the importance of diverse but complementary data sources in enterprise analysis. The report underscores the value of combining enterprise and establishment surveys, household surveys and administrative data to strengthen economic research and policymaking. Greater utilization and integration of these data sources would support more evidence-based policies that promote sustainable growth, inclusivity and labour market stability. It is hoped that this study can encourage governments and policymakers to leverage their establishment data more effectively for policymaking purposes.





Part I

**Data sources for enterprise analysis:
An overview**





► Introduction

Analysing the business environment is crucial for evidence-based policymaking, ensuring that interventions are targeted, efficient, and effective. Whether the goal is boosting productivity, reducing firm mortality, promoting formalization or fostering innovation, firm-level data is an important source of information on labour and skills demand. It helps governments craft policies that drive sustainable economic development.

For the business environment analysis, researchers rely on various data sources, including enterprise surveys, household surveys and administrative records (such as business registers, tax records, social security data, economic censuses, customs trade data). Each of these sources provides unique insights, but at the same time also presents limitations. Administrative data ensures broad coverage of business activities over time, but lacks qualitative depth and (with the exception of censuses) is often limited to the formal sector. Enterprise surveys offer direct firm-level data, including qualitative insights, such as management practices and workplace policies, innovation and business environment constraints and challenges. This helps in identifying areas for policy intervention.

Administrative data can be used as a sampling frame for enterprise surveys. Household surveys can also be used as a baseline for enterprise surveys. Combining enterprise surveys with household surveys is an effective way to capture data on informal firms that would typically be overlooked by traditional enterprise surveys alone. These methodologies allow for more comprehensive data, especially in regions with large informal sectors. Integrating these sources has allowed policymakers to build a more comprehensive, accurate and policy-relevant understanding of economic and labour market dynamics, and thus support more effective development strategies.

When combined and used effectively, these data sources contribute to the creation of structural business statistics that are crucial for understanding the size, performance and composition of businesses across different industries. They cover areas such as employment, productivity and business size, which are vital for national accounts and labour market analysis. These same data sources can be applied to other important areas, particularly in macroeconomic forecasting and the construction of input-output (I-O) tables. They offer detailed sector-specific information on growth trends, investments and capacity utilization — insights that help policymakers forecast future economic conditions, monitor business cycles, and plan for sectoral shifts. Moreover, input-output tables, built on these data, provide insights into how industries interact and how economic flows move within and between sectors, helping to inform decisions on industrial strategy and investment priorities.

The first part of this report explores the role of different sources of data for the analysis of enterprise performance, namely household surveys, administrative databases and enterprise surveys. It discusses the strengths and limitations of each of these data sources, and how they can be effectively integrated with other data sources to enhance economic analysis and policymaking. Sections 2 and 3 focus respectively on household surveys and administrative databases and discuss how they can be used for the analysis of firms' performance. Section 4 focuses on enterprise and establishment surveys and classifies them by the scope for which they are conducted. Section 5 identifies potential research directions. Section 6 analyses the literature to identify contributions to the analysis of firms' performance relying on household surveys, administrative data and enterprise/establishment surveys. Section 7 concludes.

► Administrative data

Administrative data refers to information collected by government agencies, public institutions or regulatory bodies for non-statistical purposes (such as taxation, business registration or employment records). These data sources can be repurposed for statistical analysis to study enterprise dynamics, including entry, exit, employment and financial performance.

Administrative data for enterprises comes from various sources, including business registers, tax records, social security and employment data, economic censuses and customs data.

Business registers are official databases maintained by national statistical offices or government agencies. They list all legally registered businesses, including basic firm characteristics (name, location, sector, size, ownership). Some examples include Eurostat Business Register (for the European Union), the Companies House (for the United Kingdom), the Central Business Register (for Spain) and the Business Dynamics Statistics (for the United States).

Business registers include all registered businesses, but not unregistered informal firms. They allow longitudinal tracking for the analysis of firm dynamics over time (births, exits, growth). They provide limited financial and operational details as they typically lack firm performance indicators like profits or innovation.

In recent years, statistical institutions have generally invested resources to build or further improve statistical business registers to make them a suitable sampling frame for specific enterprise surveys. For this reason, they are updated frequently. However, since the main objective is to serve as a survey sampling frame, they usually do not cover a great number of variables. For the same reason, most statistical institutions do not publish the corresponding data, restricting their use to external researchers.¹ However, they often carry through and publish studies based on these data. It is also possible to combine the information from the business register with other administrative data, so that linked employer-employee data can be generated on the short-term changes in the labour market. For example, based on linked employer-employee information from tax sources and the business register, New Zealand publishes quarterly data on employment and earnings, including variables such as firm size, industry, age and gender.

Registers may be used as sampling frames for surveys and are often designed for multiple purposes, such as taxation or regulation. However, they sometimes contain limited information on employment and related topics. In exceptional cases, some countries — such as Australia with its Business Longitudinal Analysis Data Environment — combine information from multiple sources to include a wide range of variables relevant to business performance.

Another source of administrative data is tax records. Tax authorities collect financial and operational data from firms through corporate income tax returns, value-added tax (VAT) filings and other business-related tax documents.

Examples of tax records data include the Internal Revenue Service (IRS) Corporate Tax Data for the United States, the VAT Taxpayer Database for European countries and the Sistema Público de Escrituração Digital (SPED) for Brazil.

Since firms have strong incentives to report financial data accurately, tax records offer a high degree of reliability. Moreover, they are regularly updated (annually or even quarterly). However, while tax records provide information on turnover, profits and expenditures, they do not include qualitative aspects (for

¹ One exception is Uruguay, where information from this type of register (Directorio de Empresas y Establecimientos) on the number of enterprises and workers is published by industry and enterprise size group. Another exception in Brazil where, among others, employment composition data (by gender, education, status) are considered.

example, management practices and innovation). Another limitation is that some firms may attempt tax evasion, leading to biased data. Finally, tax records only capture registered businesses, which means they often exclude informal firms.

Social security databases contain records on employment, wages and contributions to pension systems, collected from firms and workers. Some examples include the RAIS (*Relação Anual de Informações Sociais*) for Brazil, the Social Security Earnings Records for the United States and the National Institute for Social Security (INPS) data for Italy.

Social security databases provide detailed employment data, capturing workforce characteristics, wages and social contributions. This information is updated regularly, at least annually. However, these databases exclude informal workers, since they do not account for employment in unregistered firms. Moreover, they provide limited business financial information because the focus is on employment rather than firm performance.

Social security institutions have (potentially) relatively detailed information on individuals who have formal jobs, while the information on the corresponding enterprise is scarce. Thus, these sets of data are a useful instrument for the analysis of (formal) labour demand, but they permit only limited connections to firm-level characteristics, typically restricted to industry classification.² Recently, a growing number of statistical institutions (such as in Chile, Ecuador and Uruguay) have begun publishing data based on information provided by social security institutions as they increasingly recognize the value of labour market research. But again, beyond the information published by the social security institutions themselves, the scope of available data is limited. Specifically, the data of the registers themselves are generally not easily accessible to external users. There is also the issue of international comparability in the case of direct surveys, due to differences in national legislation and reporting requirements across countries.

Economic censuses are large-scale surveys conducted periodically (typically every five or ten years) to collect detailed firm-level data, including for formal and informal businesses. Some examples include the US Economic Census, India's Economic Census and China's Industrial Census.

Economic censuses can be used as a benchmark for survey and administrative data. They are useful for policy planning as they provide a snapshot of business dynamics at a given point in time.

In addition, censuses are crucial for constructing national input-output tables, which are fundamental tools for economic analysis and policymaking as well as for compiling national accounts. Census data is used to populate regional input-output tables, which are an extension of national input-output tables but focus on a subnational level, such as a state, province or economic region. These tables allow economists to model how spending in one industry stimulates demand in others, forming the basis for local multiplier calculations to capture the economic interdependence within a region (ILO 2025).³ The main advantage is that they cover all sectors, providing a broad view of the economy, including small and informal firms.⁴

² The value of this source on (formal) labour demand is limited by the fact that changes in the number and composition of registered workers do not only reflect changes in labour demand, but also the impact of policies to foster the transition to formality and changing strategies of enterprises along the business cycle.

³ Enterprise surveys are also a valid instrument for input-output tables, although they have some limitations. Enterprise surveys are often sample-based, while censuses cover all firms and establishment and thus provide complete industry-by-industry transaction matrices needed for robust input-output tables. Moreover, many enterprise surveys focus on formal enterprises, whereas censuses (especially labour force and economic censuses) can provide better estimates of the informal economy — data that is crucial in many developing regions.

⁴ Some censuses are economy-wide, while others cover a specific sector, generally manufacturing (for instance, Kenya 2018, Pakistan 2015–16). Problems with accessibility and lack of responses (for example, Bhutan 2018–19) tend to prevent the complete coverage of economic units.

The issues covered by these censuses vary widely. For example, the 2013 Economic Census of Bangladesh did not include quantitative questions regarding the enterprises' economic performance. In contrast, the Economic Census of Bhutan 2018–19, the Census of Industrial Production 2018 of Kenya and the Census of Economic Activities 2016–17 of Malawi carried a wide range of quantitative questions about economic data, labour force and the enterprise itself.

However, censuses are conducted only once every several years and can thus lead to outdated information. Extensive time and financial resources are also required to carry them out.

► Household surveys

Household surveys are structured data collection exercises conducted at the household level to gather socioeconomic, demographic and labour market information. They are often conducted by national statistical agencies, international organizations or research institutions. Unlike enterprise surveys, which focus on registered businesses, household surveys capture micro and home-based activities, including informal businesses and self-employment.

There exist different types of household surveys. Labour Force Surveys (LFS) collect data on employment, unemployment, wages and job conditions. They can help identify self-employed workers and informal firms. Some examples include the Labour Force Survey (EU-LFS) conducted across EU member countries, the Current Population Survey (CPS) for the United States and the Encuesta Nacional de Empleo (ENE) for Chile. Household Income and Expenditure Surveys (HIES) measure household income, consumption and poverty levels. They can help identify entrepreneurial households and informal business activities. An example is the Living Standards Measurement Study (LSMS) conducted by the World Bank.

Household surveys are used to identify self-employed individuals or informal workers and follow-up enterprise surveys are subsequently conducted with these businesses to gather more specific information on their operations, income and challenges. Informal Economy Surveys are conducted in various countries. Illustrative examples include the EMICRON (Encuesta de Micronegocios) in Colombia, which uses a two-step methodology to integrate household and enterprise surveys. The Kenya Integrated Household Budget Survey (KIHBS) identifies informal business owners, and the data is supplemented with a Special Survey of Informal Enterprises (SSIE) to capture their performance, challenges and income. The ENOE (Encuesta Nacional de Ocupación y Empleo) in Mexico and the LIMA Survey (Labour and Informality in Metropolitan Areas) of Peru provide insights into informal business owners and informal employment dynamics in major urban centres. India's Informal Sector Survey combines household-level data with enterprise-level data from the Annual Survey of Industries (ASI) to provide insights into both formal and informal sectors. The Vietnam Household Living Standards Survey (VHLSS) identifies individuals involved in self-employment or running small businesses and follow-up enterprise surveys are conducted with these businesses to capture their economic activities, workforce size and income generation. This method ensures that households engaged in informal economic activities (like home-based businesses) are included in the data collection process. The survey results are combined with tax records and business registration data to create a more comprehensive portrait of the economy.

► Enterprise surveys

Enterprise surveys are a data collection method that gathers information from businesses or other economic units (establishments) to measure various aspects of economic activity. Unlike household surveys, enterprise surveys target firms, factories, service providers or other production units.

Enterprise surveys can be conducted at a single point in time (cross-sectional) or regularly within the same establishment (longitudinal panel surveys). They can be conducted for different purposes, including analysing economic performance and growth, labour market dynamics, business structure, small business challenges, sector-specific trends and improving statistical registers. These aspects are discussed in more detail later in this section.

Enterprise surveys provide valuable information on businesses' perspectives and challenges. They are a crucial source of economic and business data, providing detailed insights into the structure, performance and dynamics of firms across various industries. They collect information on key aspects such as employment, revenue, investment, productivity, innovation, access to finance and human resource policies, helping policymakers, researchers, and businesses understand the factors that drive economic growth and competitiveness. They often provide disaggregated data by industry, firm size and geographic location, allowing for sectoral analysis that is crucial for targeted policies.

One of the primary advantages of enterprise surveys is their ability to capture firm-level information, which is often unavailable from other sources. Administrative data, such as business registers, tax records and social security data, offers valuable long-term and large-scale information but may miss qualitative aspects like business constraints, managerial practices and investment decisions. Moreover, administrative data typically focuses on registered enterprises. But with the application of some specific methodologies (such as 1-2-3 survey and two-step surveys), establishment surveys can sometimes capture information about informal businesses, which are a significant part of many economies.

Although enterprise surveys provide valuable firm-level insights, they have limitations. First, they are often based on self-reported data, which may suffer from biases (for example, social desirability bias and recall bias). They are subject to non-response bias, where certain types of firms may be underrepresented. Enterprise surveys typically focus on formal businesses and registered establishments, which may leave out a significant portion of the workforce, such as those employed in small, unregistered or informal enterprises. Second, enterprise surveys are typically more costly and time-consuming to conduct than the collection of administrative data. Third, enterprise surveys have limited coverage as they rely on samples rather than data that captures the entire business population through a census. While well-designed sampling methodologies can yield results that are broadly representative, these surveys often lack the scale needed to produce reliable estimates for specific subgroups or sectors. Moreover, they are subject to sampling variability, which can affect the precision and reliability of the findings.

To overcome these limitations, enterprise surveys can be combined with household surveys and administrative data (for instance, business registers, tax records, social security and employment data, economic censuses and customs data). Household surveys help capture unregistered businesses. Business registers and tax records improve the accuracy of firm entry, exit and financial data. Employment and social security records enhance the labour-market dimension of firm performance. Economic censuses provide a comprehensive structural overview of the economy. Administrative records and census data also allow for data at a finer level of disaggregation, since no sampling variability is involved.

Therefore, the combination of enterprise surveys with household surveys, labour force data, and administrative records provides a richer understanding of labour market dynamics and working conditions. This helps policymakers design better policies for workforce development, fair employment

and business competitiveness. Below are examples of how these sources have been integrated or used together in various countries.

RAIS (Relação Anual de Informações Sociais) is an administrative dataset maintained by the Brazilian Ministry of Labour. It is collected through a mandatory enterprise survey, where firms report detailed information on employment, wages and workforce characteristics. RAIS serves as a hybrid source, combining the depth of a survey with the comprehensiveness of administrative data. RAIS is often used alongside PNAD (National Household Sample Survey) to cross-check employment statistics and better understand formal versus informal labour markets.

The US Longitudinal Business Database is built from administrative tax data (IRS and Social Security records), but incorporates survey information from the Census Bureau's Business Register and the Annual Business Survey (ABS). It enables the tracking of firms' growth, exit and innovation patterns. The Business R&D and Innovation Survey (BRDIS), which collects qualitative data on innovation, is linked to the Longitudinal Business Database (LBD), helping analyse the impact of R&D investment on firm performance.

China's Annual Survey of Industrial Enterprises (ASIE) is a detailed enterprise survey covering firms with annual revenue above a certain threshold. It is linked to administrative tax and customs data, allowing researchers to analyse export performance, firm productivity and policy effects.

Classification of enterprise surveys by purpose

Establishment surveys may be conducted for different purposes. They are classified by their scope and main focus. However, even surveys conducted with a similar focus may vary from one another because they use different sampling methods. Since all types of surveys have strengths and limitations, the selection of the most appropriate surveys to be used depends on the key research questions.

Enterprise surveys focusing on economic outlook

The most frequently done enterprise surveys are those aiming to capture enterprises' economic performance in order to analyse structural or cyclical shifts in the economy or across specific sectors/industries. They provide essential data that informs policy decisions, economic forecasts, and strategic planning. These surveys facilitate the monitoring of economic trends, the assessment of policy impacts and the identification of areas requiring intervention or support.

Firms generally have quite detailed accounting information, as this may include data on their production processes. In addition to quantitative data, qualitative information is frequently generated, for example, on the application of digital technologies.

In this first group of enterprise surveys, employment information is usually quite limited. It is often restricted to the number of workers (maybe with a few differentiations such as gender and employment status), remuneration or labour costs.

Moreover, because of their objectives, such surveys often exclude microenterprises and informal enterprises. The sample design guarantees an over-representation of large-size businesses to adequately capture the main indicators of economic sectoral performance. Thus, the largest firms are generally covered in the form of a census (entering into the survey sample with a probability of 1), and other large and medium firms are also treated with a relatively high sampling probability.

Some surveys are used to analyse the structure of the economy as a whole or one or more of its industries. For example, surveys used to update a country's national account base are often conducted irregularly, given their cost and complexity. Examples can be found in Ghana, Kenya, Morocco, Mozambique, Myanmar, Nepal and Thailand. An example of these surveys for the EU countries is the Community Innovation Survey (CIS), conducted every two years. The CIS survey focuses on collecting

data about innovation activities within enterprises. Conducted across EU member states, the CIS gathers information on product and process innovations, innovation expenditures and the impact of innovation on business performance.

Surveys can be conducted at an annual or shorter frequency (such as monthly, quarterly or biannually). Annual surveys can be interpreted, on the one hand, as an instrument that may be used as a follow-up for these structural measurements, identifying continuous structural changes, and on the other hand, as an input for the calculation of annual economic growth. Examples of annual surveys are those implemented in Brazil, Chile, Colombia, Cyprus, Dominican Republic, Ecuador, Fiji, India, Korea, Kuwait, Malaysia, New Zealand, Peru, the Philippines, Sri Lanka and Uruguay.

Short-term surveys (with a monthly, quarterly or biannual frequency), generally with industry-specific coverage, normally provide a limited number of variables. But even so, they may be a useful tool for macroeconomic policymakers interested in the analysis of the business cycle. In addition, short-term surveys also include qualitative information useful for the identification of relevant trends in production, and thus for the future evolution of the economy.

Examples of these surveys are those conducted in Colombia, Malaysia, Mexico, Panama, Peru, Saudi Arabia and Uruguay. Other examples are from EU countries, which are required by Regulation 2019/2152 to provide a wide range of data derived from establishment surveys, with Eurostat coordinating the programme. A first one is the Joint Harmonised EU Programme of Business and Consumer Surveys, managed by the European Commission's Directorate-General for Economic and Financial Affairs (DG ECFIN), which conducts regular harmonised surveys across different economic sectors, including manufacturing, construction, retail trade and services. The collected data aids in short-term economic forecasting and analysis of economic developments within the European Union. Another example of this type of survey for EU countries is the Survey on the Access to Finance of Enterprises (SAFE), conducted twice a year. A collaborative effort between the European Commission and the European Central Bank, the SAFE survey monitors developments in the access to finance of small and medium enterprises (SMEs). It provides insights into financing conditions, challenges faced by enterprises and the effectiveness of financial support measures.

Short-term surveys generate relevant information for research, for example on the differentiated performance of different business segments (for instance, by industry or size), while annual surveys are useful instruments for the analysis of structural change within sectors and/or in the economy as a whole.

Although surveys in this first group focus on a country's general economic outlook — and not specifically on the labour market — they also provide information on employment and wages, albeit principally from an economic (national accounts) or business perspective (labour cost). Annual surveys often cover additional labour market issues, such as the composition of the labour force (by employment status, gender and skill level). Other issues frequently included in the questionnaires are whether workers are directly hired by the enterprise or are employed by other firms, as well as working hours,⁵ paid hours (including overtime hours paid) and contractual issues (permanent versus temporary workers, full-time versus part-time workers). Thus, these surveys provide useful elements to analyse structural change in the labour market, although they provide a limited view of the economy as they do not account for informal workers and workers in micro and small enterprises.

Other surveys are conducted with a more specific focus than a country's economic outlook.

Some surveys measure sentiment on the country's macroeconomic outlook, especially inflation and growth. These surveys are typically organized by central banks and do not cover many additional indicators. A well-known qualitative survey is the World Bank's enterprise survey, which identifies country-specific obstacles that impede the improvement of businesses' performance. Similarly, the

⁵ However, hours worked (or actual hours worked) may be better captured via household or individual surveys, which include data on hours worked that were not paid for, or hours paid for but where no work was done.

“Enquête auprès des entreprises” of Morocco covers issues of business climate and performance obstacles, among others.

Many countries conduct special surveys to get information on specific issues relevant to their economies’ future outlook. Generally, these are not carried out regularly. Among these are surveys on innovation or, more specifically, information technology (for example, in Kenya in 2016 and since 1994, the National Survey of Innovation in Malaysia that focuses on the manufacturing and services sectors). During COVID-19, many countries implemented special surveys on the impact of the pandemic.

Enterprise surveys focusing on the labour market

A second group of surveys collect labour market variables. This type of enterprise survey aims to generate information on the labour market from a demand-side perspective. These surveys cover a broader range of labour market indicators (quantitative and qualitative). They measure not only variables such as wages and hours worked, but also job vacancies and skill demand, which are crucial for measuring the health of the labour market, its ability to generate decent employment opportunities and identify shifts in labour demand and skills requirements/shortages. Involuntary separations — or subcomponents like lay-offs and dismissals — are also measured through enterprise surveys in countries such as the United States and Singapore. These refer to terminations initiated by the employer, often due to redundancy, restructuring or performance issues. Including such variables in enterprise surveys offers valuable insights into labour market dynamics and employer responses to economic shocks. Some surveys, such as the Encuesta Nacional de Empleo Urbano (ENEU) in Mexico, include questions about workers who are hired by other firms, such as subcontractors or outsourced personnel.

But in these surveys, information on the economic and financial characteristics of enterprises (sales, expenses, exports and imports, among others) is usually limited. At times, the industry that an enterprise belongs to is the only differentiating variable. Another limitation is that these surveys are unable to capture the unemployed and persons outside the labour force and have limited ability in collecting data on self-employed persons. Moreover, some establishments may under-report the number of contract or remote employees if the businesses do not consider them part of their workforce.

The collected information is crucial for monitoring the labour market situation and informing policy formulation and implementation. These surveys are less frequently done than those focusing on a country’s general economic outlook. Two types of these surveys can be differentiated.

The first group includes surveys that cover structural issues and are conducted irregularly or with relatively large gaps between waves. Among these are the EU surveys on the structure of earnings and labour costs, which are implemented in EU member countries every four years, as well as the biannual survey on wages and labour and employment in the Philippines. Some of these surveys focus on the characteristics of labour demand and, especially skill demand (such as in Chile and Costa Rica). Chile has, in addition, an irregularly conducted survey on a broad set of employment conditions and labour relations that has interviews not only with businesses but with workers and trade union representatives.

The second group includes high-frequency surveys that, similarly as the economic short-term surveys mentioned above, contribute to the analysis of the business cycle — but in this case from a labour-market perspective. They are carried out monthly (for instance, the Job Openings and Labour Turnover Survey in the United States, the Vacancy Survey in the United Kingdom, the Canadian survey of employment, payments and hours and the Chilean survey on wages and labour costs) or quarterly (for instance, the Survey of Quarterly Employment Statistics of South Africa, the Bolivian survey on wages and remunerations, the Quarterly Employment, Salaries and Wages Survey in Malaysia and the Quarterly Employment Surveys in India and New Zealand). The survey on labour market turnover in the Philippines is conducted less frequently, or twice per year.

Enterprise surveys with statistical scope

A third group of surveys is designed with the specific scope of improving statistical instruments for the measurement of enterprise activities. Statistical institutes worldwide are investing resources in developing and maintaining statistical business registers, which provide the sampling frame for enterprise surveys. In some countries (like New Zealand and Tanzania), specific surveys contribute to the elaboration or updating of these registers.

Surveys of MSMEs

Although small business surveys are a type of enterprise survey, like those previously described, their objectives differ. Rather than contributing to the analysis of broader economic or labour market trends at the national level, they focus on identifying issues within a specific segment of the economic and employment structure. As a result, they typically include questions on formality and informality, obstacles to performance, access to public support programmes and other relevant topics. As these surveys tend to focus on structural issues, they are generally not carried out with regular frequency.

For their sampling, they may draw on an existing frame (for example, the surveys on the productivity and business demography of micro, small and medium enterprises (MSMEs) in Mexico) or construct the sample in a special process (for instance, the surveys in Bolivia and Myanmar).

To cover microenterprises (with or without employees) and include also those small businesses operating in informality, some countries have implemented two-step surveys. The first step helps identify self-employed workers (without employees) and microentrepreneurs (with employees). Then, as a second step, respondents in the sample are asked questions regarding their economic activities. These two-step surveys are implemented with regular frequency, for example, the Encuesta de Micronegocios (EMICRON) in Colombia and the Encuesta Nacional de Microempresas de los Hogares (ENAMEH) in Costa Rica. In South Africa, the two-step Survey of Employers and the Self-Employed (SESE) is carried out every four years and focuses on informal businesses that are not registered for VAT. In the case of the survey on the informal sector in Mozambique, (informal) microentrepreneurs are asked about their economic activities as part of a household survey, which is conducted in a single step. Finally, to include both registered and unregistered MSMEs, Kenya implements a business register-based sample alongside a household survey, using different questionnaires for each.

Another effective methodology for identifying and including MSMEs, including those operating informally, is the 1-2-3 survey. The 1-2-3 survey is a methodological approach used to capture both household-level data and informal sector business data in a single integrated survey. The goal is to collect more comprehensive and accurate information about informal activities. This approach is commonly used in countries where informal work and businesses are significant, but often not captured by traditional surveys like labour force surveys or censuses. Countries like Brazil, Colombia, Senegal and some African and Latin American countries have used or adapted this model to improve their understanding of the informal economy.

The “1-2-3” refers to the three main components of the survey. The first is the household module, which collects data on income, consumption and employment status for each household member. This module often includes information on informal work, such as street vending, domestic work or casual labour. The second component is the informal sector module, which gathers data on informal enterprises’ production, sales and income as well as the working conditions of people running or working in those businesses. The third is the individual employment module, which focuses on individuals’ formal and informal employment, including self-employment, casual labour and household-based employment.

By capturing informal business activity and income, 1-2-3 surveys can be used to adjust estimates for the non-observed economy, which is often excluded from national accounting systems.

Panel surveys versus cross-sectional surveys

Surveys can be conducted regularly with overlapping samples (panel surveys) or at a single point in time (cross-sectional surveys).

Cross-sectional surveys conducted at a single point in time provide a snapshot of business conditions. They are useful tools for descriptive analysis and policymaking, and they have the advantage of being simpler and less expensive than longitudinal surveys. However, they cannot track changes over time.

Carrying out repeated surveys of the same establishment over time provides valuable microdata because this allows longitudinal analysis to be done, along with the tracking of changes and the capturing of trends, business dynamics and structural changes⁶.

In the case of regular surveys, it is not explained whether and how the sample changes in sequential exercises (system of rotation of enterprises/establishments) and whether it is possible to establish meaningful panels. However, two issues must be taken into account in this respect.

First, in many surveys (especially the ones with a primary interest in economic and financial issues), the enterprises or establishments to be surveyed are selected based on a combination of a census (for larger enterprises, to capture the bulk of a sector's performance) and a stratified and probabilistic sample for smaller units. This implies that larger enterprises are necessarily part of the survey in all its consecutive waves. Depending on how the survey sampling is done, there is a potential limitation in that the results of the longitudinal analysis may not be representative of all establishments in the economy. If the survey samples large enterprises with a probability of one, for instance, then panel data would likely be representative of only large establishments and not SMEs.

Second, especially in surveys that are done more frequently (monthly or quarterly) — but to a lesser degree in annual ones — it is improbable that completely new samples are built for each survey wave. It can therefore be assumed that in these cases, a rotation system is applied that maintains the selected enterprises in the sample for a defined number of survey waves and replaces them afterwards with another one with similar characteristics. Thus, in many cases, if access to microdata is granted, it is probably possible to work with panel data not only for large enterprises, but also for smaller ones.

Finally, while many surveys are implemented regularly (annually, quarterly, monthly), some are carried out irregularly due to a lack of resources and the corresponding dependency on external financing. While these surveys may provide important information on the structural aspects of enterprises and employment, they do not contribute to dynamic analysis, for example on resilience in adverse circumstances.

Cross-country comparison

Some enterprise surveys, especially those conducted by institutions like the World Bank, follow standardized methodologies that enable cross-country comparisons and benchmarking. Nevertheless, cross-country comparisons of enterprise data are often challenging due to issues such as differences in data collection methods, definitions and economic structures.

Several factors may complicate the comparability of enterprise survey data.

First, some countries report data at the enterprise level (company-wide), while others focus on individual establishments (specific locations). These may hinder comparisons across sectors and countries. The choice of enterprise versus establishment reporting entity can be crucial, for instance, in a situation of multi-activity enterprises. In such a case, the enterprise's industry would be based on the dominant

⁶ As a caveat, it should be kept in mind that the dropout of participants may reduce data quality.

business activity, but the use of establishment-level information provides a better reflection of the various business activities and other quantitative data within the enterprise.

Second, countries use different classification systems (such as the North American Industry Classification System (NAICS) in the United States, Nomenclature of Economic Activities (NACE) in the European Union and ISIC globally) that may not align perfectly with one another. However, this issue is mitigated when national classifications are aligned with the International Standard Industrial Classification (ISIC) and correspondence tables are available to facilitate comparisons.

Third, there is high variability in data collection methodology, which can affect comparability. Some countries rely on census surveys, while others use sample surveys or administrative records. This affects, for instance, the sector coverage, which varies from a survey that is limited to a specific industry to (rarely) one that addresses the complete range of economic activities. Moreover, surveys differ in the size of the enterprises they cover as well as other characteristics of their samples. Some surveys focus exclusively on medium and large enterprises, while others include all size groups but restrict their coverage to formal or registered firms. There are also surveys that in principle cover all enterprise sizes — typically those with at least one employee — but in practice still leave informal microenterprises under-represented. In addition, certain surveys are specifically designed for MSMEs and may or may not include self-employed workers without employees.

In addition, most of these surveys consider only workers of enterprises (of different employment status, including unpaid workers, owners and apprentices) and exclude other workers (self-employed ones without employees, unpaid workers in family businesses without employees, persons employed by households and, frequently, also public sector employees). This can lead to significant biases and gaps in economic and labour market analysis, especially in those countries (and sectors) where the incidence of informality is particularly high. Excluding informal workers from surveys creates a misleading picture of employment, wages and economic productivity, leading to ineffective policies and social inequalities.

Fourth, cultural, political and institutional factors also contribute to making comparison more difficult. In some regions, businesses may under-report data due to tax avoidance concerns or a lack of record-keeping. Moreover, countries with weaker statistical institutions may have data quality issues, limiting the reliability of comparisons.

Finally, legal and privacy restrictions complicate cross-country comparison. Some countries have strict data confidentiality laws that limit access to detailed establishment data. Only the statistical institutions of some Latin American countries offer free access to the datasets of the surveys of interest. Some other countries establish (on their websites) a channel through which this access can be requested. In some cases, the specific research project must be presented for consideration by the corresponding institution. In others, access to microdata must be paid for. However, in most countries, the possibility of external use of microdata is not even mentioned on the institutions' websites.

► Relevant research areas

This section presents the key information that can emerge from enterprise data, both surveys and administrative data. It also identifies key research issues that such data can address. On their own, enterprise, administrative and household surveys each provide valuable insights. However, in countries that combine different data sources, their integration greatly enhances analytical potential by offering a fuller picture of economic activity. Also, the literature review in the next section shows how these data sources have been used in practice.

One important research area is business demography, which is often studied through measures such as firm birth and death rates. This is mostly done with administrative data, namely business registers, which offers a number of advantages. First, such data guarantees comprehensive coverage since it includes all registered businesses, ensuring that data on firm mortality is representative and avoids the self-selection bias common in surveys. Second, it provides longitudinal data, making it possible to track firm entry, survival and exit over time and throughout firms' lifespans. Third, it is typically reliable and accurate since it is updated whenever a new enterprise is created or an existing one is closed (though some delays may occur).

For policymakers, this information is essential for monitoring entrepreneurial dynamics, assessing business resilience and identifying structural changes in the economy. A growing number of countries take advantage of business registers to study business demography. Data on enterprise creation and closures, broken down by firm size or by industry, allows researchers to analyse patterns of structural change as well as the resilience of businesses under different macroeconomic conditions. However, the scope of this research is constrained by the limited number of variables usually included in registers. Below are examples of countries that rely on administrative data to analyse business demography, as well as cases where surveys complement registers or serve as the primary source of information.

The Statistical Institute of Perú publishes a quarterly report on business demography drawn from the Directorio General de Empresas y Establecimientos, which relies on data provided by the tax administration. New Zealand's annual report on business demography draws on the country's Statistical Business Register. The Tunisian Statistical Business Register is a useful source for the analysis of business demography, among others. In Brazil, annual reports on business demography, based on data from enterprise registers, are available. These also use information from the Ministry of Labour and enterprise surveys.⁷ In Korea, administrative data (from business registration as well as tax data) are used for an annual publication on business demography.

Other countries conduct regular enterprise surveys to analyse business demography. Since its Economic Census 2019, Mexico has carried out two surveys among MSMEs that aim to identify the frequency and characteristics of closures and creation of this type of business.⁸ In Chile, the National Statistics Institute has prepared the microdata of the Annual Manufacturing Survey in a way that researchers can carry out business demography studies.

Enterprise surveys that have included modules on the COVID-19 pandemic provided important insights into business resilience or how firms cope with crises. By linking information on firms' adjustment measures (such as use of digital tools and reliance on public support programmes) to the structural characteristics of enterprises, these surveys make it possible to study resilience and recovery in detail. This level of analysis is difficult with stand-alone COVID-specific surveys, which often lacked key firm information. A particularly useful approach would be to connect firms' reported impacts with their expectations regarding first, their performance during the health emergency and second, the prospects

⁷ High-growth enterprises are asked additional questions in the enterprise surveys.

⁸ The surveys were also used to update the business register.

of returning to pre-crisis performance levels. Such evidence has proven to be highly valuable for policy, helping governments design targeted support measures for enterprise and protect employment.

Associated with business demography is the analysis of gross job flows — that is, the losses and gains in employment resulting from firm entry, exit, expansion and slowdown. The United States, for example, publishes data on how business cycles translate into employment expansion and contraction every quarter. This allows valuable insights into the relationship between firm behaviour and employment outcomes.

A crucial area of research is informality. In much of the world, especially in developing countries, a large share of economic activity is informal. In many cases, data on informal businesses is hard to obtain because they are absent from official or credible sources. Data from MSME surveys (or censuses) can potentially provide information on informality. For instance, some surveys include questions on different aspects of formality (such as registration, accounting practices) or ask owners of informal businesses to explain their reasons for not registering. These provide useful information that makes it possible to identify obstacles to formalization and give advice on policy instruments that can foster the transition to formality. But because conducting surveys that collect data about the informal sector can be costly, such surveys tend to be either infrequent, entirely lacking in many countries or only achievable by integrating enterprise and household surveys.⁹

Another important area of research is productivity analysis. Firm-level data on workforce skills, technology adoption and investment in research and development, helps identify factors affecting business performance. All enterprise surveys collect information on a firm's industry or sector, and the results are usually presented by industry when a limited set of variables are covered.¹⁰ Therefore, enterprise surveys provide an extremely useful instrument for sectoral or industrial analysis.¹¹ When viewed over time, the data allows for productivity comparison across industries and firm sizes as well as for assessments of structural economic change. Complementing survey results with administrative data, such as tax records or social security contributions, further sharpens the analysis by allowing more precise evaluation of economic efficiency and business growth.

Labour productivity at the national or industry level is usually calculated by combining GDP and employment data (such as levels and hours worked) from household surveys. However, household surveys capture total employment, including both formal and informal workers. Since informal workers tend to have lower productivity, their inclusion can lower national and industry-level productivity estimates. Moreover, informal workers often work in low-productivity sectors, such as small-scale agriculture, retail trade and domestic services. This can lead to an underestimation of productivity in formal sectors when using economy-wide data. Enterprise surveys address this limitation by focusing on formal-sector businesses, offering valuable, complementary insights into productivity analysis and sectoral differences that household data alone cannot provide.

Moreover, enterprise surveys are particularly useful in assessing the impact of technological and structural change on productivity. In countries with a large or expanding informal sector, economy-wide data can distort total productivity measurements, making it harder to detect how formal firms adjust to new technologies and innovate.

⁹ For a more efficient measurement, the World Bank, through its Informal Sector Enterprise Survey, adopted a sampling methodology called Adaptive Cluster Sampling. For more details, see Gemechu et al. (2022).

¹⁰ Another generally available disaggregation is by territory (such as state, province).

¹¹ There are some surveys limited to a specific sector (manufacturing, trade or services), while others have a broader sectoral coverage (for example, excluding only public administrations, households as employers and certain services). Agriculture is frequently excluded because of factors such as the specific characteristics of its production processes, the large proportion of informal units and the remoteness of many production sites.

Labour productivity can be calculated directly from survey data or indirectly by combining data on value added with the number of workers or hours worked. This allows the tracking of productivity gaps across industries and firm sizes, while monitoring changes over time. With longer time series, it also becomes possible to analyse productivity changes within industries and structural shifts between industries. Such distinctions allow policymakers to design effective industrial and labour market policies.

Enterprise surveys often collect information on a wide range of factors affecting productivity, including firm size and age, ownership, workforce quality and composition, technology use, innovation and access to finance. For instance, larger and older firms may have better access to capital and experience, leading to higher productivity. Foreign-owned firms often have higher productivity due to better technology and management practices. Higher workforce skills and education levels can be linked to productivity gains, as do firms using digital tools and automation. Investment in research and innovation can drive productivity. Conversely, productivity is often lower in firms with limited credit access.

Enterprise surveys help identify productivity gaps between industries and between business size groups and monitor changes over time.¹² When longer time series are available, it becomes possible to analyse structural change, distinguishing improvements within industries from shifts across industries. Comparing productivity changes across industries can reveal which sectors are leading in efficiency and which are lagging, helping policymakers target support where it is most needed to enhance competitiveness and business performance.

Enterprise surveys are a tool for analysing labour market dynamics, specifically job creation, destruction and turnover. Their main value lies in their frequency and timeliness, giving up-to-date insights across a broad range of establishment types. Whilst coverage is often limited to formal establishments, these surveys provide up-to-date insights into labour demand conditions and identify early signs of change and structural shifts in employment. They typically provide estimates on employment levels, earnings, labour costs, hours worked, job vacancies, labour turnover and retrenchments. Some examples are the Malaysian Quarterly Employment, Salaries and Wages Survey and the Philippines' Labor Turnover Survey, which provides regular data on hiring, lay-offs and vacancies. Similarly, Singapore's Labour Market Survey, conducted quarterly by the Ministry of Manpower's Manpower Research and Statistics Department, captures indicators on job creation, destruction and turnover by looking into recruitment rate, resignation rate, temporary lay-offs, short work weeks, retrenchments and vacancies.

Despite their usefulness, the availability and comparability of data across countries remain limited due to differences in definitions, concepts and methodologies. For example, retrenchment data is collected through establishment surveys in some countries, such as Singapore and the United States, while others, such as Australia and the United Kingdom, rely on labour force surveys. Terminology also varies, so that concepts such as retrenchment, redundancies and lay-offs are often used with slight variations in definitions and coverage. Some countries report only a consolidated figure that combines retrenchments with other types of involuntary separations or discharges. The frequency of reporting also differs significantly across countries. These inconsistencies make it challenging to conduct a global analysis of labour demand shifts and to identify which groups are most vulnerable to business cycle fluctuations or structural changes.

To analyse labour dynamics (and specifically job creation, destruction and turnover), enterprise surveys can be complemented with administrative sources, such as social security registers. These registers are increasingly used to track labour market dynamics. For example, the National Institute of Statistics of Chile calculates job flow rates with information provided by the Superintendence of Social Security. Another potent source is linked employer-employee data, as in the case of New Zealand, which connects firm-level dynamics with worker-level outcomes.

¹² The World Bank's Enterprise Survey covers this issue for many countries in its regular survey waves.

Employment-focused establishment surveys would include information on working conditions and decent work. Typical questions include contract type (permanent, temporary, seasonal, casual, full-time, part-time), working hours and overtime, wages (which enable wage gap analysis and its evolution), training activities,¹³ flexible work arrangements, inclusion and diversity practices, occupational safety and health measures and unionization. These indicators provide evidence for assessing job quality alongside labour demand.

Occupational data is frequently included in establishment surveys, though the level of detail varies significantly across countries. In some cases — such as in Ghana, Peru, and Uruguay — these surveys typically use a simple binary occupational classification that distinguishes between “production workers” and “others”.¹⁴ In contrast, other countries, including Morocco, Ecuador, Fiji and Malaysia, adopt a more detailed occupational breakdown in their establishment or enterprise surveys. These classifications often align with international standards such as the International Standard Classification of Occupations (ISCO), which commonly use ISCO-88 or ISCO-08 frameworks. This approach allows for more granular analysis of occupational structure within establishments, facilitating better policy design and labour market assessment.

Occupation is indeed a key variable that adds valuable analytical depth to establishment surveys. When included, it significantly enhances indicators such as wage growth, turnover, training, and working conditions. Disaggregating results by occupation — especially when using international standard classifications — can reveal differentiated impacts across skill levels and job types, which are often masked in aggregate data. This is particularly important in dynamic labour markets where wage pressures, automation risks or access to employer-supported training can vary widely by occupation. However, collecting occupation data from establishments at such a granular level can pose operational challenges. It increases the complexity of survey instruments, lengthens response times, and raises costs, especially for smaller firms with limited human resources (HR) reporting systems. These trade-offs often lead countries to either simplify occupational breakdowns or report them using broader categories. A practical example of a compromise approach can be seen in Singapore’s Employer-Supported Training Survey, which presents data separately for PMETs (Professionals, Managers, Executives, and Technicians) and non-PMETs. While it is not a detailed occupational classification, this dichotomy provides a useful lens for understanding differences in training access and investment between higher- and lower-skilled groups. It highlights how even a limited occupational breakdown can yield meaningful insights while keeping data collection manageable.

Some enterprise surveys capture workplace practices and HR policies such as flexible work arrangements, provision of family-friendly measures, diversity and inclusion practices and occupational safety and health policies. An example is the European Working Conditions Survey (EWCS), conducted by the Eurofound, which gathers data from both workers and employers to assess working conditions, occupational safety and HR policies across European countries. An example at the global level is the World Bank Enterprise Survey. The Philippine Statistics Authority conducts the Decent Work Survey, which captures indicators related to workplace safety, social protection and labour rights. The Better Work programme, run by the International Labour Organization (ILO) and the International Finance Corporation (IFC), collects data from both factory managers and workers in industries such as garment manufacturing (for example, in Vietnam, Bangladesh and Indonesia).

A possible limitation of workplace-focused surveys is the risk of underreporting. Firms may be reluctant to report negative practices or admit the absence of human resource policies. Moreover, workplace policies may be in place but not implemented in practice.

¹³ Again, sometimes this issue can be covered indirectly, through the corresponding expenses reported by the enterprise.

¹⁴ Production workers refer to individuals directly engaged in the core productive process of the establishment, such as machine operators, assemblers and other manual labour roles. Non-production workers (or “others”) encompass supervisory staff, administrative personnel, professionals, sales workers and management.

These surveys highlight the importance of incorporating both establishment and worker perspectives to make a more accurate assessment of workplace conditions. Combined with other sources of data, enterprise surveys provide insights on labour market mismatches — situations where workers' skills, expectations and preferences do not align with employer demand. Understanding these mismatches is critical in designing training and employment policies. Below are examples of types of mismatches.

The first type is a skills mismatch. Enterprise surveys may capture firms' difficulties in finding qualified workers, at the same time that labour force surveys show high unemployment among individuals with similar skills. This contrast reveals a skills mismatch.

A growing number of countries are implementing special enterprise surveys to identify skills demand and training needs.

Countries in Latin America, such as Chile and Costa Rica, have introduced surveys that track training practices and assess the effectiveness of existing national training systems. Related to this issue, Canada's Job Vacancy and Wage Survey provides quarterly data on staff requirements (including education and experience), type of contract and pay. The United Kingdom's Employer Skills Survey, conducted every two years, provides an in-depth view of the skills challenges that employers face within their existing workforce and during recruitment. It captures information on skills gaps, hard-to-fill vacancies, training provided, and engagement with public skills initiatives. Similarly, Singapore's annual Job Vacancy Survey offers detailed insights into labour demand. It identifies positions employers are trying to fill, occupations in demand, difficulties faced in filling those positions and whether vacancies arise from business expansion or replacement needs.

These surveys are invaluable for tracking long-term skills shortages even when unemployment is low. Altogether, they are essential for diagnosing labour market imbalances, monitoring skills mismatches across sectors, occupations and regions and supporting skills forecasting as well as evidence-based policies on training, education and workforce development.

The second type is a mismatch in expectations. When combined with household surveys, enterprise surveys, can highlight potential mismatches between workers' and employers' expectations. For instance, differences between worker wage expectations (reported in household surveys) and employer pay scales (reported in enterprise surveys) highlight potential mismatches. Similarly, if workers report limited career growth while employers cite difficulty retaining talent, this may indicate a mismatch in career expectations. Finally, data on voluntary quits, employee dissatisfaction and employer concerns about high turnover can reveal workplace dynamics. Such insights can inform policies aimed at improving job quality, career development and strategies for employee retention.

Enterprise surveys provide limited information on participation in global supply chains. In some surveys, enterprises are asked whether they export or import — but not always with quantitative data — or whether they are engaged in international trade more generally, without distinguishing between exports and imports. This restricts the ability to analyse how deeply firms are integrated into international production networks.

However, there are a few notable exceptions. Enterprise surveys in the European Union feed into a broader set of business statistics on globalization, covering foreign affiliates, foreign direct investment, global value chains (GVCs) and international trade in goods and services. In the context of GVCs, experimental efforts are underway to collect data on contractual arrangements, sourcing strategies, changes in employment, and motivations and barriers firms face when engaged in international sourcing.

Several countries outside Europe have also expanded enterprise surveys to capture globalization. Since 2019, Mexico's annual surveys of manufacturing, trade and non-financial services have included a section on "International Connections", which inquires about contracts or cooperation agreements with firms outside the country. In another survey, manufacturing SMEs are asked whether they supply exporting firms or foreign-owned companies. Malaysia's Survey of Outward Foreign Affiliates collects

information on the exports and imports of Malaysian firms' overseas affiliates. Phase 2 of Ghana's Integrated Business Establishment Survey asks about receipts from contract work where customers provide or finance the raw materials, although it does not specify whether these customers are foreign.¹⁵

Another relevant dimension captured in many enterprise surveys is ownership structure, specifically the participation of foreign capital. Questions on foreign ownership are frequently included in establishment surveys.

In response to the pandemic, several statistical institutions — including those of Canada, Chile, Colombia, Dominican Republic, Malaysia and the Philippines — incorporated temporary COVID-19 modules into their regular surveys. The survey topics varied widely, making cross-country comparisons difficult. For instance, questions focused on the pandemic's impact on business processes, adjustments in operations such as shorter working hours, remote work, lay-offs, firms' expectations, the role of public measures. The 2020 EU Global Value Chains Survey included questions on the effects of COVID-19 on international sourcing, turnover, access to raw materials and intermediate goods, transport and shifts in sales channels, such as to e-commerce.

In addition, many countries carried out special COVID-19 enterprise surveys.¹⁶ The World Bank led a major coordinated effort where it ran multiple waves of surveys in 79 countries. This initiative combined its Business Pulse Survey with a tailored version of its regular Enterprise Survey (entitled "Enterprise Survey Follow-up on COVID-19"). These surveys collected information on the pandemic's impact on sales, employment (hiring and lay-offs), absences, working hours, wages, arrears, use of digital platforms, remote work and access to public assistance (including credit, transfers, payment deferrals, tax relief, wage subsidies).¹⁷

Other countries, such as Kenya, Peru and Malaysia, conducted independent COVID-19 enterprise surveys. Some of them covered businesses in general, others focused on MSMEs. While the scope of these surveys varied, common themes were the impact on the business performance or sales, the channels of impact (such as reduced demand, access to inputs and financial services), workforce adjustments (for instance, lay-offs, temporary suspensions, reduced working hours and wages, and remote work), organizational adjustments (temporary closure of activities, shift to e-commerce, reduction of investment, renegotiation of debts and payments), access to support measures (subsidies, tax adjustments, credits), the need for further support, and firms' expectations (future measures considered necessary, their resilience under prolonged adverse conditions, and likelihood of recovery). The information generated by these surveys is mostly qualitative, but provides valuable insights into how businesses navigated the crisis and anticipated their recovery. Comparing impacts across different business categories is challenging, however, since many of these surveys disaggregate results only by sector and, in some cases, by firm size. This constrains deeper analysis of differential impacts on, for example, women-owned firms, exporters or firms with specific workforce characteristics.

Finally, another relevant area that enterprise surveys can address is the growth of information and communications technology (ICT) activities, both within ICT firms and across the broader economy. Surveys can capture data on the use of ICT, such as in digital equipment, e-commerce, ICT-related expenses.¹⁸ In some surveys, this information can be linked to changes in the occupational structure, shedding light on how digitalization is affecting jobs and skills demand. An example is Peru's Annual Economic Survey, which collects data on ICT infrastructure, internet access and use, e-commerce, ICT training and research and development investment (INEI 2020).

¹⁵ Similarly, Kenya's MSME survey has a question on contractual arrangements regarding inputs received by clients.

¹⁶ For example, Argentina, Colombia, Fiji, Kenya, Malaysia, Mexico, Mozambique, Morocco, Peru and Sri Lanka.

¹⁷ Data are available by country, industry and firm size.

¹⁸ As already noted, some countries have a specific survey on the use of ICT. Malaysia has a specific questionnaire for ICT firms, as part of its Quarterly Survey of Services and its Annual Economic Survey.

► Review of the literature based on surveys and administrative data

The study of firm performance — covering productivity, profitability, survival and growth — is an essential input to understanding economic development, job creation and income growth. Analysing firm dynamics is essential for designing effective economic policies that foster innovation, competition and sustainable growth. Researchers have relied on the three primary data sources discussed earlier in this report: administrative data, household surveys and enterprise surveys. Each source has its strengths and weaknesses, but using them together enhances the robustness of firm-level analysis.

The literature review in this section examines how academic studies have used these data sources to link enterprise and household characteristics to firm-level outcomes including productivity, working conditions, job satisfaction, survival and growth.

Household characteristics

Many studies use household surveys to analyse factors that affect business performance, especially among microenterprises. These surveys capture household characteristics that influence enterprise growth and sustainability such as human capital, access to resources and the socio-economic background of the household head.

Grimm, Krüger, and Lay (2011) provide one of the most influential studies in this area, using data from Ghana's Living Standards Survey (GLSS). Their research demonstrates that household characteristics — such as education, the employment status of the household head, and household income — significantly influence the growth and success of microenterprises. They argue that human capital plays a particularly important role: higher levels of education lead to better management practices, improved profitability and greater resilience to external shocks.

Similarly, Banerjee et al. (2015) explore how household income and education influence the survival and growth of microenterprises in India. Their findings suggest that household income plays a pivotal role in the financial stability of enterprises, with wealthier households better able to absorb business losses and reinvest in growth. Furthermore, they find that education enhances managerial skills, which in turn supports business survival and long-term success.

Firm characteristics

The dynamics of firm survival and growth are central to understanding firm performance, and much of the literature explores how factors like firm size and age contribute to outcomes such as profitability and resilience. For this line of analysis, firm-level data allows researchers to link firm characteristics directly to performance outcomes.

Haltiwanger, Jarmin, and Miranda (2013) provide critical insights into how firm size and age affect job creation and survival rates. Using administrative data from the US Census Bureau, their study reveals that young firms are disproportionately responsible for job creation, despite their higher mortality rates. In contrast, older firms tend to have more stable growth patterns but contribute less to net job creation. This finding challenges the traditional view that older, larger firms are the main drivers of long-term economic growth.

Similarly, Ayyagari, Demircuc-Kunt, and Maksimovic (2014) used enterprise survey data from 54 countries to examine how financing constraints affect firm growth. Their study shows that smaller firms, which often face greater challenges in accessing financing, are more vulnerable to economic downturns and are less likely to survive. However, larger firms, with better access to credit, exhibit greater resilience and profitability, especially in emerging economies where financial markets are less developed.

Access to finance

Access to finance is a recurring theme in the literature on firm performance. Studies consistently show that financial constraints limit firms' ability to expand, increase productivity, or invest in innovation. The lack of access to formal credit often forces small firms to rely on informal sources of capital, which can be costly and unstable.

Banerjee et al. (2015) also discuss the importance of access to credit in the survival and growth of microenterprises in India. Their study emphasizes that microenterprises with better access to formal credit outperform those reliant on informal loans. However, they also highlight that even within the formal sector, credit access remains highly unequal, with many small firms still unable to obtain the necessary financing to expand.

GVC participation during economic shocks

Participation in global value chains can significantly influence a firm's ability to navigate economic downturns and disruptions. Baldwin (2011), analysing administrative data from the Canadian Longitudinal Survey of Manufacturers, finds that firms involved in GVCs are more resilient to economic shocks due to their exposure to a diversified set of international markets. The study reveals that these firms tend to have longer survival rates and exhibit better growth trajectories than those that are not connected to GVCs, as they can weather fluctuations in domestic markets by tapping into global demand.

Kaplinsky and Morris (2001) also examine the relationship between GVCs and firm survival, focusing on small and medium-sized enterprises (SMEs) in developing countries. Using enterprise surveys from several Latin American countries, their research demonstrates that firms integrated into global supply chains are more likely to survive economic shocks due to their access to international markets and technologies. However, they emphasize that small firms often face barriers such as high entry costs, limited access to credit and the need for compliance with international standards, which can hinder their participation in GVCs.

Sachs and Shatz (2011) examine the resilience of firms in the global automotive supply chain during the 2009 economic downturn. They use administrative data from the US Census Bureau and the Bureau of Economic Analysis. Their findings suggest that firms integrated into global supply chains were more resilient during the downturn, as they had greater access to diverse markets and customers. These firms were able to adjust their production levels in response to changing demand and hence adapted more effectively than firms that were not connected to GVCs.

In the electronics sector, Lee and Chen (2019) examine the resilience of firms during the 2008 global financial crisis, using enterprise survey data from Taiwan. Their study finds that firms that diversified their customer base and engaged with multiple lead firms were better able to recover from the crisis. These firms' resilience was attributed to their ability to tap into different markets and adjust quickly to shifts in demand, while firms that relied heavily on one customer or market struggled to survive the crisis.

Lebastard, Matani, and Serafini (2023) examine how the COVID-19 pandemic affected exporting firms in the context of GVCs, using monthly transaction-level customs/trade data covering the universe of French exporters over 2018–21. They find that firms deeply embedded in GVCs and relying on foreign-sourced inputs experienced larger drops in exports and higher exit risk from export markets during the pandemic, compared with non-GVC firms. However, the study also finds that GVC firms whose sourcing was more diversified across different countries were less severely hit. This supports the idea that input-source diversification enhances supply-chain resilience.

Benefits and risks associated with GVC participation

Gereffi, Humphrey, and Sturgeon (2005) analyse enterprise surveys and case studies from the apparel industry in several developing countries. They find that firms embedded in global supply chains are more likely to benefit from technological spillovers, access to international markets and improved management practices. These linkages result in higher productivity and profitability compared to firms that remain outside of GVCs.

In the automotive sector, Sako (2014) examines data from enterprise surveys conducted in Japan and Europe to assess how GVC participation affects firm performance. The study finds that firms linked to multinational corporations experience higher levels of productivity and profitability due to access to cutting-edge production technologies and global market networks. However, firms in lower tiers of the supply chain are often dependent on lead firms' strategies, which can constrain their ability to innovate independently.

Informality

OECD (2016) provides a comparative study of firm resilience during economic downturns, using enterprise survey data. Their research highlights that formal firms are better equipped to withstand economic shocks, owing to better access to financial resources, a more skilled workforce, and a stronger ability to innovate. In contrast, informal firms often survive by reducing labour costs and scaling back investment — strategies that over time limit their ability to grow.

The issue of informality is closely linked to firm productivity and resilience. Generally, informal firms face unique challenges, including limited access to finance, higher vulnerability to economic shocks and lower productivity. However, the literature shows that some informal firms manage to survive and even thrive in adverse conditions.

Alvarez and González (2019), using administrative data from Colombia, examine the role of firm formalization on productivity. They find that formal firms, which have access to formal credit and government support, exhibit higher productivity and profitability than informal firms. This is because formal firms are more likely to invest in technology, employee training and other productivity-enhancing measures. However, while informal firms have lower productivity and profitability compared to formal firms, they are often more resilient in the short term due to lower operating costs and greater flexibility.

Using multiple data sources (such as the World Bank Enterprise Surveys, national census and household surveys, tax and business registration records), La Porta and Shleifer (2014) provide evidence that informal firms are significantly less productive than formal ones. Most are run by entrepreneurs with lower levels of education and operate with little capital or innovation.

The role of informal firms in GVCs has been a subject of growing interest, as many firms in global supply chains remain informal. While informality presents challenges, it can also offer opportunities for growth and integration into global networks.

Cattaneo, Gereffi, and Staritz (2010) explore the relationship between informality and GVC participation using enterprise surveys from countries in Latin America and Africa. They argue that while informal firms often face significant challenges — such as limited access to finance, low productivity and poor working conditions — they can still participate in GVCs, particularly as subcontractors or lower-tier suppliers to larger firms. Their study suggests that informal firms in GVCs have the potential to upgrade their capabilities, improve their productivity and eventually formalize their operations, leading to higher growth.

Pellegrin, Zappalà, and Denni (2017) investigate the role of informal firms within GVCs using enterprise surveys from Latin American countries such as Brazil and Argentina. Their findings show that informal firms often struggle with accessing capital and tend to have lower survival rates. However, they also find that some informal firms succeed by leveraging flexible labour practices and responding rapidly to market changes. While these firms are resilient in the short term, their ability to grow and scale is limited without formalizing their operations.

Working conditions

The literature on wages and working conditions frequently links firm performance to worker satisfaction and productivity. Larger firms tend to provide better wages and working conditions, which, in turn, support higher productivity and lower employee turnover.

Ayyagari, Demircuc-Kunt, and Maksimovic (2014) show that firms in developing countries with access to financial resources are more likely to provide higher wages and better working conditions. This not only improves worker productivity but also lowers employee turnover and enhances firm resilience. The study suggests that policies aimed at improving access to finance for SMEs can significantly improve wages and productivity.

Grimm, Krüger, and Lay (2011) similarly highlight the role of working conditions in microenterprise success. Their study shows that firms with better working conditions tend to have higher productivity, as employees are more motivated and efficient. They find that improving working conditions, even in small enterprises, can have a significant positive impact on firm performance.

The quality of employment within GVCs varies significantly, depending on a firm's position in the supply chain. Domestic firms linked to multinational enterprises generally offer better wages and working conditions, though these benefits are not evenly distributed.

Barrientos, Gereffi, and Rossi (2011) analyse working conditions within the global apparel supply chain in several developing countries, using enterprise surveys and interviews with workers and managers. Their study finds that firms that are directly linked to lead firms tend to provide better wages and working conditions. However, lower-tier suppliers often face poor labour conditions and low wages. The study suggests the need for stronger labour standards throughout the supply chains.

Similar patterns are observed in the electronics sector. Using enterprise surveys and interviews with workers in China and India, Frederico and Graham (2018) show that while large firms at the top of the GVC offer better wages and working conditions, smaller firms in the lower tiers often face considerable pressure from lead firms to cut costs, resulting in poor working conditions and lower wages. These studies underline that without responsible purchasing and labour practices, participation in GVCs can deepen existing inequalities in the labour market.

Brown, Dehejia, and Robertson (2018) analyse how participation in the Better Work programme affects firm-level performance in the garment sector using enterprise-level data from Better Work factory assessments and surveys covering costs, productivity, profits and compliance. They find that in Vietnam and Indonesia, participation is associated with higher productivity, improved business terms and ultimately higher profits, despite some increases in labour costs due to better compliance. In Jordan, firms initially experience higher costs and lower profits but at the industry level, see signs of long-term

gains linked to improved country reputation. Overall, the study concludes that improving working conditions can align with better firm performance, but their effects differ by context.

Job mismatch, wages and job satisfaction

The relationship between skill mismatches and job satisfaction has gained greater attention in the literature. Studies suggest that aligning workers' skills and job requirements is crucial for enhancing productivity, reducing turnover and ensuring equitable labour market outcomes.

Using data from the European Labour Force Survey, Nedelkoska and Quintini (2018) distinguish between two types of job mismatches — skill mismatches, where workers' qualifications exceed or fall short of job requirements, and task mismatches, where the tasks performed by workers do not align with their skills. The study reveals that both types of mismatches negatively affect wages and job satisfaction, with overqualified workers facing wage penalties and higher turnover. Furthermore, workers in mismatched jobs reported lower levels of job satisfaction, suggesting that job mismatches can lead to a less engaged workforce.

Employer surveys also provide valuable insights into job mismatches. McGuinness et al. (2009) analyse employer and employee survey data from the United Kingdom and find that job mismatches are associated with lower wages and job satisfaction. Overqualified workers — or those who possess skills that exceed job requirements — were found to be particularly at a disadvantage as they experience significant wage penalties and lower job satisfaction compared with well-matched workers. These findings point to misalignments between workers' skills and job requirements, which can reduce job satisfaction and efficient use of human capital in the labour market.

Green and Zhu (2010) use data from the UK's British Household Panel Survey (BHPS) to show that job mismatches not only affect wages but also have a detrimental effect on workers' job satisfaction. Workers who perceive themselves as overqualified for their jobs tend to report lower job satisfaction levels and are more likely to seek alternative employment. This finding highlights the broader implications of job mismatches for both employees and employers, as dissatisfied workers are more likely to leave their jobs, leading to higher turnover and reduced organizational stability.

► **Conclusions**

Accurate and reliable data are essential for understanding labour markets, business dynamics, and economic trends. Three primary data sources — enterprise surveys, household surveys, and administrative data — each offer distinct advantages but also have specific limitations. To address the weaknesses inherent in each data source, a mixed-method approach that integrates these different types of data is critical for producing comprehensive and reliable economic analysis (see Annex).

Enterprise surveys collect sector-specific data directly from businesses, providing valuable insights into firm performance, productivity, labour demand, employment patterns, wages, job flows and working conditions. These surveys capture a wealth of information about formal sector enterprises, but typically exclude household-based economic activities, itinerant businesses and others without fixed premises. As such, they would often exclude informal workers and self-employed individuals

To complement this, household surveys cover individuals within sampled households, capturing their labour market activities and household-level characteristics. This perspective makes it possible to capture microenterprise activities, including informal businesses and self-employed individuals. This design makes it possible to capture informal employment, self-employment and household-based economic activities that are typically excluded from enterprise surveys. Taken together, both enterprise and household data provide a more holistic view of labour markets. Enterprise surveys offer firm-level data, while household surveys capture informal employment and individual worker characteristics.

Administrative data, such as tax records, business registries and social security databases, is another important data source for large-scale and long-term analysis of employment, firm dynamics and economic trends. These data typically cover the formal sector, however, which can lead to an underestimation of total employment and economic activities, particularly in economies with a large informal employment. Additionally, administrative data, while valuable for tracking employment, income levels and business demographics, does not provide detailed insights into business performance, productivity or investment behaviour, as they are primarily collected for regulatory and administrative purposes. Researchers also face challenges in accessing this data due to legal and bureaucratic hurdles. However, combining administrative data with enterprise surveys and household surveys can overcome these limitations. For instance, linking firm survey responses with tax data can improve accuracy and reduce self-reporting biases, while linking social security or tax records with household surveys can enhance the accuracy of income measurement and help track labour market transitions.

When integrated, these data sources play a critical role in shaping economic analysis, policy development and decision-making. Enterprise surveys with predominantly economic objectives collect detailed financial and operational data to support the compilation of national accounts, the construction of input-output tables and macroeconomic forecasting. They provide sector-specific data on growth trends, investment patterns and capacity utilization. These surveys often target medium and large enterprises, focusing on formal sector activities. While their economic focus provides a wealth of structural information, they typically offer limited labour market data restricted to employment counts, wages, and costs. Examples include structural business surveys and short-term economic surveys aimed at tracking economic cycles.

Conversely, labour market-oriented enterprise surveys prioritize employment characteristics, offering nuanced data on job types, skill demands and working conditions. They also contribute to creating structural business statistics, such as employment figures, productivity and business size, which are vital for national accounts and labour market analysis. Moreover, enterprise surveys help identify barriers to business growth, such as regulations, finance and infrastructure, while also informing policies on gender equality, innovation and sustainability.

These surveys often include microenterprises and informal businesses, making them essential for studying labour demand in underrepresented economic segments. Subtypes include microenterprise surveys, which delve into informality, productivity and access to public support programmes, and two-step surveys that integrate household data to capture household-based economic activities.

Despite their shared goal of capturing enterprise-level dynamics, these survey types differ in scope, target populations and data availability. This diversity necessitates careful selection of data sources based on specific research questions, especially when comparing datasets across countries. The choice of data should be guided by the purpose of the analysis. If the aim is to assess the economic outlook or macroeconomic trends, using administrative data is the most suitable option, particularly for sampling large firms. When the focus shifts to MSMEs, including those operating informally, household surveys are more effective as sampling frames because they can capture unregistered, home-based and mobile businesses. For studies requiring national-level profiling across both formal and informal sectors, it is advisable to draw on comprehensive data sources such as censuses or integrate multiple data sources to ensure comprehensive coverage. Finally, if frequency and cost efficiency are priorities, administrative sources offer a practical option, provided they have sufficient coverage of the relevant population.

The combined use of enterprise surveys, household surveys and administrative records has enabled researchers to examine a wide range of business dynamics and performance outcomes. Enterprise data, for example, has been used to assess how financial constraints limit firms' ability to expand or innovate, and to analyse the performance of firms integrated into global value chains. Administrative and longitudinal firm data have shed light on business demography, showing that young firms tend to create more jobs but face higher failure rates, whereas larger, older firms are more stable but contribute less to job creation. Analyses combining administrative and enterprise data have demonstrated that formal firms are generally more productive and profitable, but informal firms thrive due to their flexibility and lower operating costs. Finally, linking employer and worker data often through matched enterprise and household surveys has allowed researchers to explore the effects of mismatches on wages, job satisfaction and turnover, which affects both firm efficiency and labour market stability.

Future research and statistical efforts should focus on expanding the use of firm-level data to provide a more nuanced understanding of firm dynamics and decent work outcomes, including strengthening the linkages between existing data sources. Greater utilization and integration of these data would enable more evidence-based policies that promote sustainable growth, inclusivity and labour market stability.

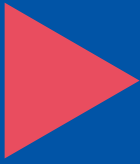
► References

- Aga, Gemechu A., David C. Francis, Filip Jolevski, Jorge Luis Rodriguez Meza, and Joshua S. Wimpey. 2022. "Surveying Informal Businesses: Methodology and Applications". Policy Research Working Paper No. 9905. Washington, DC: World Bank.
- Alvarez, Roberto, and Andrés González. 2019. "The Impact of Firm Formalization on Productivity: Evidence from Colombia". *Journal of Development Economics* 140: 18–33.
- Ayyagari, Meghana, Asli Demirgüç-Kunt, and Vojislav Maksimovic. 2014. "Financing of Firms in Developing Countries: The Role of the Financial Sector". *Journal of Financial Economics* 114(3): 297–314.
- Baldwin, Richard. 2011. "Trade and Industrialization after Globalization's 2nd Unbundling: How Building and Joining a Supply Chain Are Different and Why It Matters". NBER Working Paper No. 17716. Cambridge, MA: National Bureau of Economic Research.
- Banerjee, Abhijit, Esther Duflo, and Rachel Glennerster. 2015. "The Role of Household Income and Education in Microenterprise Success: Evidence from India". *American Economic Journal: Applied Economics* 7(3): 121–145.
- Barrientos, Stephanie, Gary Gereffi, and Arianna Rossi. 2011. "Economic and Social Upgrading in Global Production Networks: A New Paradigm for a Changing World". *International Labour Review* 150(3–4): 319–340.
- Brown, Drusilla K., Rajeev Dehejia, and Raymond Robertson. 2018. "The Impact of Better Work: Firm Performance in Vietnam, Indonesia and Jordan". Better Work Discussion Paper 27. ILO.
- Cattaneo, Olivier, Gary Gereffi, and Cornelia Staritz, eds. 2010. *Global Value Chains in a Post-Crisis World: A Development Perspective*. World Bank.
- Frederico, Matthew, and George Graham. 2018. "The Political Economy of Global Supply Chains in the Electronics Industry". *Global Networks* 18(2): 161–183.
- Gereffi, Gary, John Humphrey, and Timothy Sturgeon. 2005. "The Governance of Global Value Chains". *Review of International Political Economy* 12(1): 78–104.
- Green, Francis, and Yu Zhu. 2010. "The Role of Job Mismatches in the Determination of Wages: Evidence from the UK". *British Journal of Industrial Relations* 48(2): 249–272.
- Grimm, Johannes H., Jens Krüger, and Jann Lay, J. 2011. "Microenterprise Growth and Household Characteristics: Evidence from Ghana's Living Standards Survey". *World Development* 39(4): 453–465.
- Haltiwanger, John C., Ron S. Jarmin, and Javier Miranda. 2013. "Who Creates Jobs? Small vs. Large vs. Young". *Review of Economics and Statistics* 95(2): 347–361.
- ILO. 2025. *Reference Guide on Employment Impact Assessment*. 2nd ed. Geneva: International Labour Office.
- INEI (Instituto Nacional de Estadística e Informática). 2020. *Tecnologías de Información y Comunicaciones en las Empresas 2018*. Lima: INEI.
- Kaplinsky, Raphael, and Mike Morris. 2001. *A Handbook for Value Chain Research*. Ottawa: International Development Research Centre.
- La Porta, Rafael, and Andrei Shleifer. 2014. "Informality and Development". *Journal of Economic Perspectives* 28(3): 109–126.

- Lebastard, Laura, Marco Matani, and Roberta Serafini. 2023. "GVC Exporter Performance During the COVID-19 Pandemic: The Role of Supply Bottlenecks". ECB Working Paper Series 2766.
- Lee, Chien-Wen, and Shih-Hui Chen. 2019. "Global Supply Chains and Firm Resilience: Evidence from the 2008 Global Financial Crisis". *Journal of International Business Studies* 50(4): 553–577.
- McGuinness, Seamus, Peter J. Sloane, and Mark P. Taylor. 2009. "Employer-Employee Mismatch and Its Effects on Wages and Job Satisfaction". *Labour Economics* 16(3): 347–361.
- Nedelkoska, Ljubica, and Glenda Quintini. 2018. "The Relationship between Job Mismatches and Labour Market Outcomes: Evidence from Europe". OECD Social, Employment and Migration Working Papers No. 219. Paris: OECD Publishing.
- OECD. 2016. "Business Dynamics and Productivity Growth: A Global Perspective". *OECD Economic Studies* 51(1): 87–112.
- Pellegrin, Julia, Federica Zappalà, and Marco Denni. 2017. "Informal Firms in Global Value Chains: The Case of Latin America". *World Development* 95: 50–64.
- Sachs, Jeffrey D., and Howard J. Shatz. 2011. "The Resilience of Global Value Chains in the Automotive Industry during the 2009 Economic Crisis". *Global Economic Review* 40(3): 267–284.
- Sako, Mari. 2014. "Global Value Chains and Labor Standards: Can Firms in the Supply Chain Be Effective Agents for Change?" *Industrial Relations Research Journal* 45(1): 4–24.

► Annex: Strengths and weaknesses of different data sources

	Strengths	Weaknesses
Enterprise surveys	• detailed information on firm performance, employment, wages and productivity • usefulness for industry-specific analysis and economic planning • accurate capture of formal sector trends	• frequent exclusion of the informal sector and unregistered workers • possible self-reporting bias, since firms may misreport for regulatory reasons • high costs and time consumption
Household surveys	• capture of both formal and informal employment, including self-employed workers • demographic details available (age, gender, education, among others), allowing for social analysis • usefulness for analysing income distribution, poverty and labour market participation	• limited business-level insights (such as revenue, investment, productivity) • possible recall bias, where individuals may misreport income or employment status • high costs and need for large sample sizes for accuracy
Administrative data (Government records like tax filings, social security, business registers, censuses)	• high accuracy and wide coverage since it is based on official records • cost-effectiveness, as it uses existing data rather than new surveys • usefulness for long-term tracking and policy design	• limited coverage to the formal sector, excluding informal workers and businesses (except for censuses) • lack of flexibility due to data collection primarily for administrative purposes; access restrictions; for economic censuses, lack of real-time insights and outdated information



Part II

**Country analysis of firm-level data
with application to decent work and
crisis resilience**





► Overview

Labour Force Surveys (LFS) are a widely used source of data for quantitative labour research. They are often based on household surveys and provide rich information on individuals' characteristics, their labour market participation and employment conditions. However, they allow only limited insights into firms, the demand side of the labour market. In this sense, enterprise surveys and administrative firm data can be an important complement to LFS and other common sources of workers' information. They can be used to gain a broader understanding of economic activity by uncovering the performance of enterprises and their labour market dynamics. Next to LFS, they can therefore be a key resource to inform policies for sustainable development.

Broadly, enterprise surveys can be categorized by their primary objectives. Structural enterprise surveys are designed for generating macroeconomic indicators and sectoral analysis. Other surveys can be targeted toward studying labour market dynamics from the demand-side perspective. Moreover, samples for enterprise surveys can be selected from household survey responses, and this allows the inclusion of micro and small enterprises operating in the informal sector. In addition, data collected for administrative purposes, such as tax and social security records or business registries, offer another important source of enterprise information for large-scale and long-term analysis of employment, firm dynamics, and economic trends, offering high accuracy and comprehensive coverage. Each type serves unique purposes and comes with distinct methodologies and scope, making them valuable for diverse analytical needs.

To illustrate the utility of enterprise surveys and administrative data in labour market analysis, this document presents three case studies that leverage distinct types of datasets to explore resilience in the context of the COVID-19 pandemic. Resilience is the capacity of a system, community, or society to withstand, absorb, adapt to and recover from the impact of hazards in a timely and effective manner (ILO 2017). This includes maintaining and restoring essential structures and functions through effective risk management. In this sense, restorative resilience is the concrete ability to rebuild capacities after a crisis.

Business resilience is often categorized into three key dimensions: proactive, adaptive and reactive resilience, each corresponding to a different stage of response to a disruptive event (ILO 2023). Proactive resilience refers to a firm's alertness and preparedness before a crisis — influenced by prior experiences — that enable it to take pre-emptive actions. Adaptive resilience reflects a firm's ability, often through agility and innovation, to pivot and sustain operations during a crisis and mitigate the impact of shocks. Reactive and restorative resilience involve a business's ability to survive and recover after a disruption, which is common among small and medium enterprises (SMEs) that tend to react to crises in the short term. Hence, resilience is a dynamic attribute tied to a firm's resources, competitiveness and learning culture, shaping its overall ability to manage and adapt to change.

The COVID-19 pandemic constituted an unprecedented shock to the global economy, profoundly affecting firm operations, employment and supply chains. Understanding the factors that contribute to firm resilience is critical for designing future-proof economic policies. A resilient private sector is critical not only for economic recovery but for preparedness for future crises. Structural reforms that embed resilience into business ecosystems will be key to navigating the post-pandemic global economy.

This report explores the factors influencing firm responses and outcomes during the crisis in three countries, Colombia, Ecuador and Brazil. Each of these country-based case studies demonstrates how different survey designs offer unique perspectives on resilience, reflecting the surveys' respective objectives and coverage. The surveys from Colombia and Ecuador were selected for analysis because they were accessible to the public and represent two very different types of surveys. The analysed data from Brazil, while not publicly available, is widely used in the literature due to its worker-firm links.

For Colombia, the report looks at the Encuesta de Micronegocios (EMICRON), an enterprise survey with a focus on small and informal businesses. Its data sheds light on the challenges and opportunities faced by microenterprises, particularly regarding digitalization. The case study based on EMICRON data reveals that Colombia's informal microenterprises were particularly vulnerable to COVID-19, but those utilizing digital tools exhibited greater resilience.

For Ecuador, the report analyses data from the Encuesta Estructural Empresarial (ENESEM), a traditional structural enterprise survey used mainly for national accounting purposes. The case study based on ENESEM data highlights that formal firms with greater diversification and investment in worker benefits were more likely to recover from pandemic-induced shocks in Ecuador.

The Brazilian *Relação Anual de Informações Sociais* (RAIS) is a rich administrative dataset from which employer-employee links can be identified. It provides a unique perspective on workforce restoration, highlighting the critical role of formal employment systems in post-crisis recovery. The study using RAIS emphasizes the existence of "Lazarus" firms, which were able to recover following the complete lay-offs of their workforces, showcasing the capacity of Brazil's formal sector for restorative resilience. Key determinants included firm age, sector and geographic location.

Together, these case studies demonstrate the importance of tailoring the use of surveys to specific analytical goals, enabling a comprehensive understanding of resilience and labour market dynamics. By leveraging the strengths of diverse survey designs, researchers can provide a more comprehensive and nuanced analysis that policymakers can use to develop targeted strategies to enhance economic and labour market resilience in the face of future challenges.

Before turning to the country case studies, the next section reviews the emerging literature on firm resilience during the COVID-19 pandemic. This review serves to contextualize the report's empirical findings and to assess the extent to which they align with or diverge from existing evidence, while critically examining the strengths and limitations of previous studies, their specific focus areas and their methodological approaches. It then presents and compares the three data sources used in the analysis, discussing their respective strengths and limitations, their coverage and thematic focus as well as the methodological designs that underpin them.

► Literature on firm resilience during the COVID-19 pandemic

This section reviews the emerging literature on firm resilience during the COVID-19 pandemic. This serves to contextualize our empirical findings and compare our results to existing evidence. By synthesizing insights from studies on digitalization, global value chain participation, firm size and sectoral dynamics, we aim to situate our analysis within the broader academic and policy discourse. The literature not only offers valuable benchmarks for interpreting resilience outcomes but also highlights key mechanisms and heterogeneities that the case studies seek to explore.

Digitalization

Digitalization emerged as a central mechanism enabling business continuity during the pandemic lockdowns. Firms with pre-existing digital infrastructure or rapid uptake of digital tools were better positioned to maintain operations, access customers and manage remote work environments. Key technologies included cloud computing, e-commerce platforms, digital payment systems and remote collaboration tools.

Empirical studies confirm this link. DeStefano, Kneller, and Timmis (2022), analysing UK firm-level data, show that firms employing digital technologies were significantly more resilient, exhibiting higher survival rates and lower employment losses. Similarly, Apedo-Amah et al. (2020) document that digital adoption facilitated earlier reopening and reduced revenue losses among firms in sub-Saharan Africa.

Despite its benefits, digitalization was not universally accessible. SMEs, particularly in developing countries, faced significant barriers such as limited infrastructure, high costs and skill shortages. This digital divide exacerbated pre-existing inequalities in firm performance and resilience.

Firm size

Firm size and sectoral characteristics significantly influenced resilience outcomes. While large firms generally had more liquidity and access to credit, they were sometimes less agile. SMEs were disproportionately affected, often lacking the financial buffers and digital tools necessary for adaptation. Firm size has emerged as a key determinant of resilience during the COVID-19 pandemic. A wide body of empirical research indicates that smaller firms were disproportionately affected by the crisis due to their limited financial buffers, reduced access to digital tools and weaker integration into support networks. In contrast, larger firms often had more diversified operations, superior access to credit and public support schemes as well as greater capacity to absorb prolonged revenue losses.

Bartik et al. (2020), using survey data from over 5,800 small US businesses, found that a significant share had less than one month of cash on hand and faced high uncertainty about future operations. Similar patterns were documented by Juergensen, Guimón and Narula (2020) in Europe, where SMEs were more likely than larger firms to lack the administrative capacity to access emergency support or to transition to digital platforms. The IMF (2021) further supports this view, noting that smaller firms experienced higher exit rates and had limited ability to invest in adaptive strategies such as digital transformation or supply chain reconfiguration.

Studying firms across more than 100 countries, Apedo-Amah et al. (2020) reported that smaller businesses were more likely to close temporarily and suffer steeper revenue declines, especially where institutional support was weaker. However, the literature also recognizes that small firms can sometimes display agility in adapting business models quickly, although this is often constrained by

financial and digital capacity. Focusing on the United States, Chetty et al. (2020) observed sharp declines in small business revenue and employment, especially in service sectors, underscoring the structural vulnerability of micro and small enterprises.

Overall, the evidence suggests a positive correlation between firm size and resilience during the pandemic, largely due to economies of scale, better resource endowments and institutional embeddedness. However, this relationship is nuanced by sector, geography and the existence and effectiveness of policy interventions.

Firm age

Firm age has emerged as a significant factor shaping firms' capacity to withstand the economic disruptions caused by the COVID-19 pandemic. A growing body of empirical research suggests that younger firms — typically defined as those five years old or less — were substantially more vulnerable to the shock compared to their older counterparts. This vulnerability is largely attributed to structural disadvantages such as limited cash reserves, underdeveloped customer bases and restricted access to credit and government support schemes.

Apedo-Amah et al. (2020) found that younger firms were more likely to close temporarily or permanently, particularly in developing economies. Their limited financial buffers and, more generally, their weaker institutional integration into the financial system left them less equipped to absorb revenue losses or secure relief. Similarly, Fairlie (2020), analysing US data from the Current Population Survey, documented particularly high exit rates among startups and recently established small businesses in the early stages of the pandemic. These firms were not only less likely to access formal financing but had fewer established relationships with suppliers, creditors and customers, all of which proved critical in navigating uncertainty.

Additional evidence from Europe supports these findings. Juergensen, Guimón, and Narula (2020) highlight that young SMEs in the European Union, especially in the service sectors, were less resilient than older firms. Their lack of accumulated managerial experience, combined with higher fixed costs relative to revenue, constrained their ability to adapt to rapidly changing operating conditions. Furthermore, early-stage firms often fell through the cracks of emergency policy measures, either because they lacked the documentation or history required for eligibility or because aid was skewed toward larger or more established businesses.

In a related contribution, Sedláček and Sterk (2020) argue that the disruption to the pipeline of new firm creation during COVID-19 may have lasting macroeconomic effects. Their analysis suggests that the decline in startup activity could hinder long-term employment growth and productivity, underlining the importance of supporting the survival and recovery of younger firms during and after crisis periods.

Taken together, these studies highlight the need to consider firm age — alongside size, sector, and digital capacity — as a key axis of heterogeneity in understanding resilience. While young firms often embody entrepreneurial dynamism and innovation potential, they are also structurally fragile and therefore more exposed to systemic shocks like COVID-19.

Industrial sector

Sectoral variation in the impact of COVID-19 was highly pronounced, with some industries experiencing severe disruptions and others demonstrating notable resilience or even growth. Sectors such as hospitality, tourism and transport were among the hardest hit due to their direct exposure to mobility restrictions, lockdowns and social distancing measures. For instance, ILO (2021) and OECD (2020) report significant job losses and firm closures in accommodation, food services and air travel, with demand plummeting in these high-contact sectors. In contrast, industries related to information technology,

e-commerce and logistics witnessed substantial growth during the pandemic, fuelled by the accelerated shift to remote work, online shopping and home delivery. According to research by Baldwin and Tomiura (2020), digitally intensive sectors were better positioned to continue operations and even expand market share. Similar conclusions are drawn by DeStefano, Kneller, and Timmis (2022), who show that firms in the IT and e-commerce sectors in the United Kingdom maintained employment and outperformed their non-digital counterparts. These patterns underscore the sector-specific nature of resilience, driven by both the type of activity and its compatibility with remote or digital operation.

Liquidity, innovation and supply chains

Financial health played a pivotal role in firms' ability to cope with the impact of COVID-19. Firms with better access to emergency credit, government support schemes or internal liquidity were more likely to survive. IMF (2021) and OECD (2020) emphasize the critical importance of liquidity provision in preventing widespread firm exit.

Innovation and the ability to pivot business models proved essential as well. Firms that repurposed production (for instance, turning to manufacturing PPE), diversified products or embraced new delivery models often outperformed peers. Gupta, Gregoriou, and Healy (2021) show that innovation during the crisis was positively correlated with both short-term performance and long-term competitive positioning.

COVID-19 revealed structural vulnerabilities in global supply chains. Just-in-time production and high reliance on geographically concentrated suppliers (notably in China and Southeast Asia) led to severe input disruptions. Firms embedded in complex and rigid GVCs were more likely to experience production halts and delays.

UNCTAD (2021) reports that 94 per cent of Fortune 1000 companies experienced supply chain disruptions. The sectors most affected included automotive, electronics and pharmaceuticals. Miroudot (2020) argues that the problem lies not in the globalization of supply chains per se, but in the lack of flexibility and visibility within these networks.

In response, many firms began reconfiguring supply chains through strategies such as nearshoring, dual sourcing and increasing inventory buffers. However, Baldwin and Tomiura (2020) caution against assuming that reshoring increases resilience, emphasizing that redundancy must be balanced with cost and efficiency considerations.

Firm resilience to COVID-19 was multi-dimensional, shaped by digital capability, financial health, sectoral exposure and supply chain structure. Policymakers aiming to foster resilient firms should support SME digital transformation, expand access to emergency finance, promote innovation and business model flexibility and encourage supply chain diversification and risk management.

Underexplored issues

Despite the rapidly expanding literature on firm resilience during the COVID-19 pandemic, several critical issues remain underexplored and warrant further investigation. First, while much of the early literature focused on immediate survival, recent research has shifted toward understanding long-term structural resilience, defined not only as recovery from a shock but the capacity to adapt, transform and thrive under persistent uncertainty.

Second, there is growing interest in how resilience intersects with broader structural and social dynamics. For example, gender remains an underexplored factor. Women-led enterprises were often more vulnerable during the pandemic due to sectoral concentration (for example, retail and services), limited access to finance and disproportionate care responsibilities. Yet, they also displayed adaptive strategies that merit deeper investigation.

Third, informality is another critical research frontier. Informal enterprises, which constitute a significant share of economic activity in many developing countries, were often excluded from formal support mechanisms. Their resilience strategies, ranging from informal credit networks to rapid mobility across sectors, are poorly documented in current literature.

Lastly, there is a notable convergence between pandemic resilience and climate-related resilience. The pandemic has underscored the importance of systemic risk management and adaptive capacity across crises. Firms that had invested in environmental sustainability and supply chain traceability were often better equipped to navigate disruptions. Future research should further explore the synergies between green transitions and economic resilience.

► Comparison of three types of enterprise surveys

The following chapters illustrate the use of enterprise surveys by presenting case studies for three countries that employ three types of datasets to assess firm resilience to the COVID-19 pandemic. The table below presents a comparative analysis of these three distinct enterprise surveys, each designed to capture unique aspects of economic resilience, business structure and labour dynamics in Colombia, Ecuador and Brazil. These surveys — Colombia's Encuesta de Micronegocios (EMICRON), Ecuador's Encuesta Estructural Empresarial (ENESEM) and Brazil's Relação Anual de Informações Sociais (RAIS) offer diverse strengths and limitations, reflecting their specific focus areas and methodological designs (see Annex of Part 1).

EMICRON exemplifies a two-step survey that links household data to microenterprise analysis. It focuses on informal micro-businesses, providing critical insights into informality, productivity and the adoption of digital technologies. EMICRON stands out for its focus on informal microenterprises, a critical yet often overlooked segment of the economy. By using a two-step survey approach linked to household data, it captures detailed insights into micro-business dynamics, particularly informality, productivity and the adoption of digital technologies. Its ability to analyse the impacts of systemic shocks like the COVID-19 pandemic on these small economic units is a key advantage. However, its scope is limited to microenterprises, and its self-reported answers increase noise and potential measurement error.

In contrast, ENESEM, a structural enterprise survey, targets medium and large registered firms. It examines predictors of resilience such as diversification and technology adoption. Ecuador's ENESEM offers a comprehensive dataset that facilitates the analysis of structural changes and sectoral performance. This survey is well-suited for assessing workforce retention because it provides critical insights into the formal economy. However, its exclusion of informal enterprises limits its applicability to broader economic contexts where informality plays a significant role.

Brazil's RAIS, a rich administrative dataset that links employer and employee records, offers a longitudinal view of workforce dynamics. RAIS leverages linked employer-employee administrative records to analyse firm-level resilience through workforce dynamics. Its unique focus on firm mortality and restorative resilience — exemplified by the concept of "Lazarus" firms that recovered after losing their workforce — provides a granular view of recovery patterns in the formal sector. RAIS is distinguished by its high-quality data and longitudinal capabilities, but its coverage is confined to the formal economy and thus excludes a substantial portion of Brazil's labour market.

Each survey brings valuable tools and methodologies for analysing economic resilience and enterprise dynamics, tailored to their respective national contexts. While EMICRON excels in capturing the nuances of the informal sector, ENESEM and RAIS provide detailed analyses of formal enterprises and thus offer complementary perspectives. Together, these surveys underscore the importance of diverse data sources in the understanding and strengthening of economic systems, especially in the face of crises.

► **Table 1. Comparison of enterprise surveys**

	Two-step small business survey linked to household survey	Structural enterprise survey for national accounting purposes	Administrative employer-employee data
	<i>Colombian Encuesta de Micronegocios (EMICRON)</i>	<i>Ecuadorian Encuesta Estructural Empresarial (ENESEM)</i>	<i>Brazilian Relação Anual de Informações Sociais (RAIS)</i>
Potential for analysis	• impact of COVID-19 on microenterprises	• dynamic analysis of firm-level outcomes	• firm-level restorative resilience through workforce revival
	• productivity and informality correlation	• predictors of resilience using sectoral and firm-level variables	• trends in workforce restoration after crises
	• digital technology adoption and productivity	• workforce retention and restoration	• employment growth post-crisis
Advantages	• focuses on (informal) microenterprises often omitted in surveys	• has comprehensive data on registered businesses	• has detailed linked employer-employee data
	• includes a comprehensive set of questions on business formality, quality of employment and social protection	• has a panel structure that allows analysis of structural changes over time	• has accurate data with institutional quality control mechanisms
	• has dynamic insights from retrospective questions	• has sector-specific resilience analysis	• has longitudinal tracking of firms and workforce
Disadvantages	• limited to micro-businesses	• excludes informal enterprises	• excludes informal businesses and workers
	• has self-reported answers that increase noise and potential measurement error	• uses a sampling design that limits comparisons of the firm population year-on-year, and has an unbalanced panel structure	• for similar reasons, transitions between formal and informal work are not observed
	• uses cross-sectional sampling limits dynamic analysis		
Indicators used to explore resilience	• informality rates (tax registration, social contributions)	• sales loss and recovery	• Lazarus firms (revival post-closure)
	• employment formality	• workforce retention and restoration	• firm survival and workforce restoration
	• digital technology usage	• resilience profiles based on workforce retention	• employee attributes (tenure, education, wages)

► References

- Apedo-Amah, Marie. Christine, Besart Avdiu, Xavier Cirera, M. Cruz, E. Davies, A. Grover, L. Iacovone, et al. 2020. "Unmasking the Impact of COVID-19 on Businesses. Firm Level Evidence from Across the World". World Bank Policy Research Working Paper No. 9434.
- Baldwin, Richard, and Eiichi Tomiura. 2020. *"Thinking Ahead about the Trade Impact of COVID-19"*. In *Economics in the Time of COVID-19*, edited by Richard Baldwin and Beatrice Weder di Mauro. Paris and London: CEPR Press.
- Bartik, Alexander W., Marianne Bertrand, Zoe B. Cullen, Edward L. Glaeser, Michael Luca, and Christopher T. Stanton. 2020. The Impact of COVID-19 on Small Business Outcomes and Expectations. *Proceedings of the National Academy of Sciences* 117(30), 17656–17666.
- Chetty, Raj, John N. Friedman, Nathaniel Hendren, Michael Stepner, and the Opportunity Insights Team. 2020. "How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-time Economic Tracker Based on Private Sector Data". NBER Working Paper No. 27431.
- DeStefano, Timothy, Richard Kneller, and Jonathan Timmis. 2022. "Firm-level Digital Adoption and Resilience During the COVID-19 Crisis: Evidence from the UK". OECD Productivity Working Papers.
- Fairlie, Robert W. 2020. "The Impact of COVID-19 on Small Business Owners: Evidence from the First Three Months after Widespread Social-distancing Restrictions". *Journal of Economics & Management Strategy* 29(4): 727–740.
- Gupta, Arpit, Andros Gregoriou, and John Healy. 2021. "Firm-level Innovation during COVID-19 and Resilience: Evidence from Global Stock Markets". *Finance Research Letters* 101928.
- ILO. 2021. *ILO Monitor: COVID-19 and the World of Work. Seventh edition*.
- IMF. 2021. "Firm Exit during the COVID-19 Pandemic: Aggregate Implications and Policy Responses". IMF Working Paper No. 21/75.
- Juergensen, Jill, José Guimón, and Rajneesh Narula. 2020. "European SMEs amidst the COVID-19 Crisis: Assessing Impact and Policy Responses". *Journal of Industrial and Business Economics* 47(3): 499–510.
- Miroudot, Sébastien. 2020. "Resilience versus Robustness in Global Value Chains: Some Policy Implications". *VoxEU*. 18 June 2020. <https://cepr.org/voxeu/columns/resilience-versus-robustness-global-value-chains-some-policy-implications>.
- OECD. 2020. *COVID-19: SME Policy Responses*. OECD Policy Note.
- OECD. 2021. *The Digital Transformation of SMEs*.
- Sedláček, Petr, and Vincent Sterk. 2020. "Startups and Employment following the COVID-19 Pandemic: A Calculator". CEPR Discussion Paper No. DP14730.
- UNCTAD. 2021. *Global Value Chain Transformation in the Wake of COVID-19*.

► Chapter 1.

Two-step small-business survey linked to household surveys: A case study using Colombia's Encuesta de Micronegocios (EMICRON)

► Key takeaways:

- Targeting micro businesses identified from household surveys is a fruitful method for sampling them, especially those operating informally.
- This targeted approach provides a more detailed look at the business performance of micro enterprises and self-employed workers as well as their working conditions.
- Even with cross-sectional sampling, retrospective questions allow for dynamic analysis, which can be used to assess resilience to shocks.
- The analysis of survey data for Colombia shows that there is a correlation between firm performance and enterprise formality as well as the use of information and communication technology.
- The COVID-19 pandemic inflicted losses on most micro enterprises, though the nature of the shock allowed less productive firms and firms in agriculture to circumvent its economic impact more easily.

Introduction

Small economic units contribute significantly to employment across the globe. They account for 94 per cent of employment in low-income countries, 90 per cent in lower-middle-income countries, and 56 per cent in upper-middle-income countries (ILO 2021a).¹⁹ Yet an important challenge in labour and enterprise statistics is precisely the coverage of the smallest economic units, most of which operate in household-based economic activities. To address this gap, two-step enterprise surveys have been developed and implemented. The first step usually involves conducting a household survey, which could be an existing household labour force survey, to identify microentrepreneurs — that is, all independent workers without employees or with up to nine of them. In the second step, these individuals are asked detailed questions about their economic activities.

In this chapter, we exemplify the usage of two-step surveys by providing a snapshot of the population of microenterprises in Colombia and a brief analysis of the impact of COVID-19 on them. For this, we examine data from the Micro-business Survey (Encuesta de Micronegocios - EMICRON), a specialized two-step survey conducted by the National Statistical Institute of Colombia. We observe that 77 per cent of enterprises covered by the EMICRON are informal and of long operational history and most of them are one-person businesses. The EMICRON data documents that more than 90 per cent of workers employed by or owning microenterprises are working informally, measured by the absence of contributions to health insurance and pension. Formalization status and usage of information and communication technologies are important predictors of firm performance and labour productivity,

¹⁹ Estimated figure that includes the self-employed.

although they do not provide a clear-cut distinction given the substantial overlap in these measures across formalization and digitalization status. A total of 40 per cent of microenterprises operate in the service sector, followed by those in retail (27 per cent) and agriculture (22 per cent).

The COVID-19 pandemic inflicted deep losses among microenterprises in Colombia, although there is a lot of variation in the magnitude of the impact and the pace of post-pandemic recovery across types of firms. Larger micro-businesses experienced smaller losses than smaller ones, but so did less productive and informal firms and those operating in agriculture. This may be due to the uneven impact of COVID-19 restrictions on consumption across different sectors.

Overall, a broad picture can be drawn based on this form of two-step survey focused on microenterprises. The sampling procedure based on the household survey opens the door for researchers and policy makers to forms of economic production that are often neglected in traditional enterprise surveys. As the analysis reveals, a nuanced examination of microenterprises is possible in terms of their performance trends and the effect of larger shocks like the COVID-19 pandemic, using two-step surveys like the EMICRON. Importantly, due to the inclusion of retrospective questions, even dynamic assessments can be done at the firm level despite the cross-sectional nature of the survey.

Sampling design

The sample of the EMICRON is a subsample of the “Gran Encuesta Integrada de Hogares” (GEIH), the general household survey of Colombia, which covers more than 300,000 households every year (DANE 2022). Based on the occupation and micro-business modules of the GEIH, independent workers without employees (own-account workers) and employers of micro-businesses are identified. Micro-businesses are defined as those having a maximum of nine workers, including the owner. The yearly sample of the EMICRON consists of approximately 85,000 formal and informal economic units, although the sample declined in absolute size in 2020 due to the limitations imposed by the sanitary measures to prevent the spread of COVID-19.

A large portion of informal enterprises are self-employed individuals who have a very limited number of workers and/or operate within household production. Consequently, the EMICRON provides critical insights into business units operating under informal conditions, most of which are not captured by regular business surveys, and are likewise not present in administrative data and regular enterprise surveys. This is of great importance given the weight of the informal sector in emerging economies like Colombia.

The following analysis takes the yearly EMICRON waves between 2019 and 2022. The EMICRON provides a useful source to assess the impact of COVID-19 on microenterprises, thanks to the introduction in 2020 of an additional module with questions inquiring about the firms’ situation in the context of the pandemic.

The EMICRON targets firms in the following sectors: agriculture, livestock, forestry and fishing; mining and quarrying; manufacturing; construction; trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food services; real estate and other services. It explicitly excludes all business units dedicated to the supply of electricity, gas, steam, water distribution, air transport, financial and insurance activities, public administration and defence and activities of individual households as employers. Geographically, it covers 24 departments of Colombia and the central district of Bogotá and excludes Arauca, Casanare, Vichada, Guainía, Guaviare, Vaupés, Putumayo y Amazonas, which are predominantly rural departments within the country.

Analysis

Economic activity and informality

In terms of economic activity, most Colombian micro-businesses operate in the services and retail/vehicle-repair sectors, accounting for 47 per cent and 30 per cent of these sectors, respectively (with very stable shares across years). Firms performing agriculture and extractive activities follow with 12 per cent and manufacturing and waste management, 11 per cent.

It is important to note that the focus of the EMICRON on microenterprises allows researchers and practitioners to look more closely into the informal sector, which is traditionally composed of micro and small enterprises (GIZ and ILO 2014; ILO 2023).

To assess this for Colombia, we focus on registration with tax authorities as a simple measure of informality, which is in line with international statistical standards on the informal economy (ICLS 2023) and widespread across the literature (Fajnzylber et al. 2011)²⁰. In what follows, all analyses referring to the informality of economic units are based on this indicator. At the same time, informality is associated with various levels of protection against personal and economic risks and can thus happen in various degrees and dimensions, some of which are also covered by the data collected in the EMICRON (see box 1).

On average, between 2019 and 2022, 77 per cent of the population of micro-businesses were informal firms. Micro-businesses in agriculture and extractive activities are the most informal ones, comprising 94 per cent of the firms in this sector. Informality rates across the remaining three sectors are, on average, very similar to one another: 69 per cent in retail and vehicle repair, 72 per cent in manufacturing and waste management and 73 per cent in the service sector.

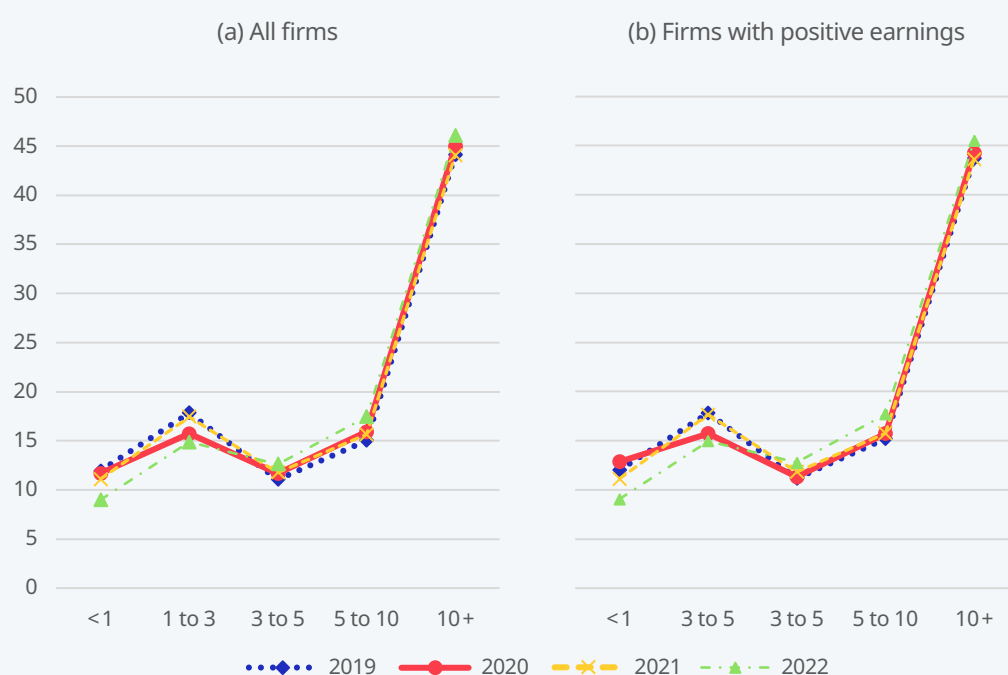
²⁰ In the module on business characteristic of the EMICRON, the first question reads “¿El negocio o actividad tiene Registro Único Tributario (RUT)?” (Does the business have a Unique Tax Registry?), with a binary response set for ‘yes’ or ‘no’.

Business age

Approximately 45 per cent of Colombian micro-businesses have been operating for more than a decade.²¹ Nearly 11 per cent are less than one year old, 17 per cent between one and three, 12 per cent between three and five and 16 per cent between five and ten. This age structure remained stable before, during and after 2020 despite the pandemic (figure 1). This is true both for the entire sample of enterprises and those with positive yearly earnings (for example, total sales net of total costs), as seen in figure 1b.

Perhaps the major change in the age structure is a recent drop in the prevalence of very young businesses (between zero and three years old) and an increase in the share of those three years or older, essentially a shift towards an older population of micro-businesses. Whether this shift represents a real restructuring due perhaps to a lower micro-business birth rate, or whether it is a mere symptom of temporal volatility, will be seen in newer waves of data.

► Figure 1. Business age, in percentage of a given age group



Note: Each panel shows the age distribution of microenterprises in Colombia for the years 2019, 2020, 2021 and 2022, among all firms (a) and firms with positive earnings (total sales net of total costs) in the respective year (b). Each connected dot shows the share of the population that report having been operating for the time range plotted in the horizontal axis.

Source: EMICRON (2019, 2020, 2021, 2022)

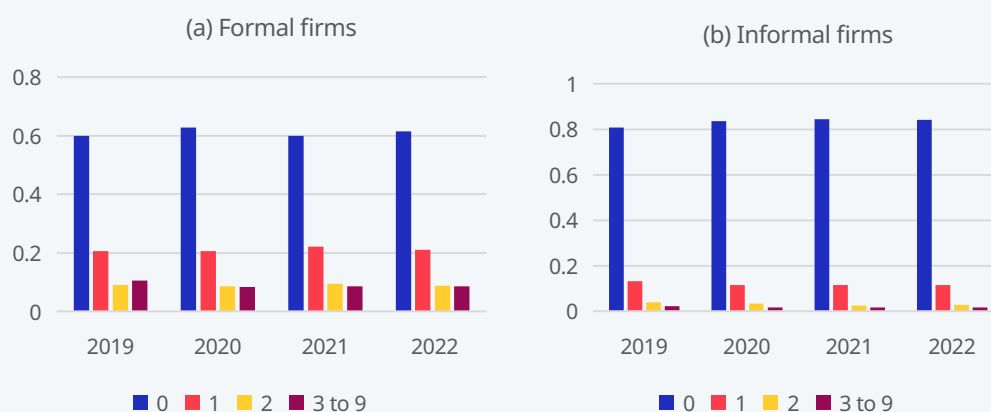
²¹ The question in the EMICRON reads: *¿Cuánto tiempo lleva funcionando el negocio o actividad?* (For how long has the business or activity been operating?)

Employment

Number of workers

Most micro-businesses in Colombia are one-person firms, meaning they have no workers except for the owner (figure 2)²². Even within micro-businesses, there are significant differences in the number of workers between formal and informal firms. On average, 60 per cent of formal firms have no workers, 20 per cent have one, 9 per cent have two and another 9 per cent have between three and nine. In contrast, more than 80 per cent of informal micro-businesses do not have employees. Only 12 per cent have one and less than 5 per cent have two or more.

► Figure 2. Share of firms by number of workers (other than owner)



Note: The figure shows the share of firms by number of workers (other than the owner) for the years 2019, 2020, 2021 and 2022. The shares are based on the population of formal firms (panel a) and informal firms (panel b).

Source: EMICRON (2019, 2020, 2021, 2022)

Formal employment

The EMICRON allows us to zoom into the working conditions of microentrepreneurs and their employees, as it includes a module where business owners are asked about their own working conditions and those of each worker. For instance, we can identify the formality of employment based on whether an employee is paid health insurance and pension contributions by the employer (see box 1). Almost all workers in micro-businesses — 90 per cent on average — work informally. This figure shows almost no variation in the years between 2019 and 2022. This situation is prevalent even among formal firms and is not substantively different for firms reporting positive earnings.

Other indicators for the quality of employment available in the EMICRON include the type of contract (temporal or permanent), wage levels, health and pension contributions, social contributions like unemployment insurance and paid insurance against work accidents and other social contributions to education and recreational activities.

²² The questionnaire asks about the quantity of different types of workers: (a) paid workers, (b) partners and (c) unpaid workers or family. The enterprise number of workers is the sum of responses to these three categories.

► Box 1: Measurement of informality in the EMICRON

Enterprise formality

The analysis presented in this case study focuses on registration with tax authorities as an indicator of enterprise informality. However, different degrees and dimensions of enterprise formalization exist, all of which operationalize the definition of informal enterprises as those not complying with government regulation (GIZ and ILO 2014; ILO 2021b). Next to registration with tax authorities, other indicators are registration with local and/or national authorities, compliance with social contributions (Fajnzylber et al. 2011) or registration for relevant municipal licenses (Bruhn and McKenzie 2013).

The Encuesta de Micronegocios (EMICRON) includes a module of ten questions that allows a differentiated look at informality (DANE 2022).

The questions cover accounting method, registry with some trade chamber, registry as a juridical person, current validity of registration, registry with any authority and type of authority (municipality, agricultural institute, ministry, among others).

Employment formality

Moreover, the EMICRON allows for the assessment of formal employment as a dimension separate from enterprise formality. Although formal employment precludes enterprise formality and most informal workers are employed by informal firms (ILO 2021b), these are two dimensions of the informal economy that need to be regarded separately. In the module about employed personnel, the EMICRON asks separately, and for every individual worker in the micro-business, whether the firm owner paid pension, health and social contributions. This also allows the disaggregation of different degrees of informal employment, although the EMICRON samples show that most firms that do not pay any one of these contributions also do not pay the others (DANE 2022).

Firm's performance and labour productivity

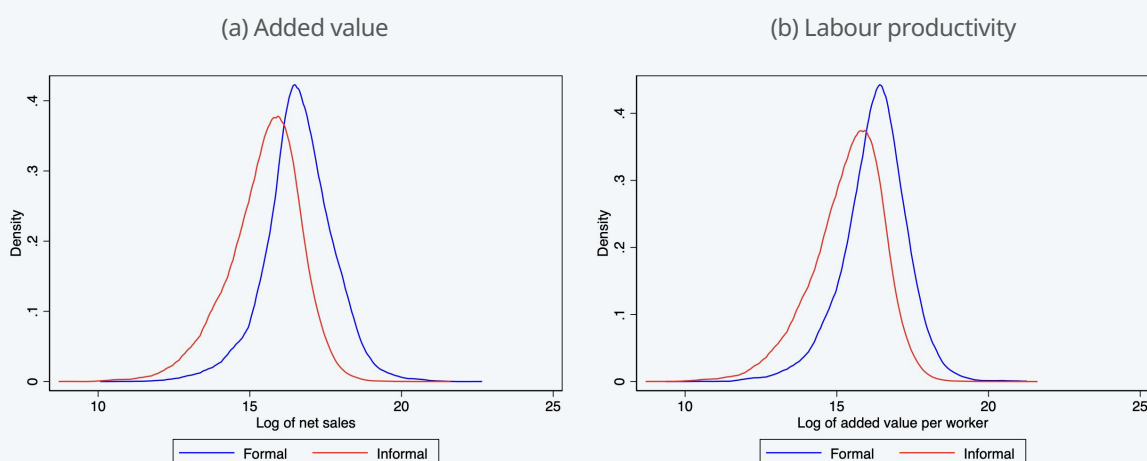
Informality and productivity

A broadly discussed aspect in the literature and policy debates about microenterprises is their productivity, especially when they operate informally (GIZ and ILO 2014; ILO 2021b). There are different views in the literature relating to productivity and informality. Some authors argue that informal firms are entrepreneurs that decide to avoid burdensome and costly regulation despite being similarly productive as formal firms and on this basis, advocate for the deregulation of firm entry (De Soto 1998). Another strand of the literature (known as the “exit” view) understands informality as the only state in which some unproductive firms can survive, concluding that stronger enforcement would decrease informality and make space for more productive enterprises to grow and emerge in the formal sector (La Porta and Shleifer 2008). A third view looks at informal entrepreneurship as a survival alternative to a lack of decent wage employment in the formal economy (Perry et al. 2007). Thus, many workers choose entrepreneurship as a means of securing their livelihoods despite lacking the skills to start and run a business efficiently (Bruhn and McKenzie 2013; Ishengoma and Kappel 2005).

Evidence has established each of these views as descriptions of different sections of the informal enterprise sector, with the largest share of informal firms belonging to the latter view, also known as the “dual economy view” (GIZ and ILO 2014). The fact described above — that more than 80 per cent of Colombia's informal micro-businesses are one-person enterprises — is consistent with this characterization.

In the universe of micro-businesses, we observe a clear correlation between formality (see box 1) and the firm's added value, as well as its labour productivity. We measure added value as total yearly sales in the reference year, net of total yearly costs²³. Labour productivity is the ratio of net sales to the total number of workers. Figure 3 shows how the distribution of both measures of performance is shifted to the right for formal enterprises. This means that their output-to-input ratios are higher, and that their workers are, on average, more productive. However, in line with the “exit” view, we observe substantial overlap between formal and informal firms. This overlap suggests that, at the edge between formality and informality, many informal micro-businesses are as productive as their formal counterparts and nevertheless operate at the margins of public regulation.

► **Figure 3. By formality: Distribution of added value and labour productivity**



Note: Both panels show kernel density plots of the natural logarithm of net sales (panel a) and labour productivity (panel b), by firm formal status (see box 1). Kernel densities are computed using a bandwidth of 0.2.

Source: EMICRON (2022)

²³ The EMICRON asks about the value of sales for different categories of business activities (industrial, retail and services). Within each of these categories, there are subcategories that make it possible to carry out a disaggregated analysis of firm performance by forms of value creation.

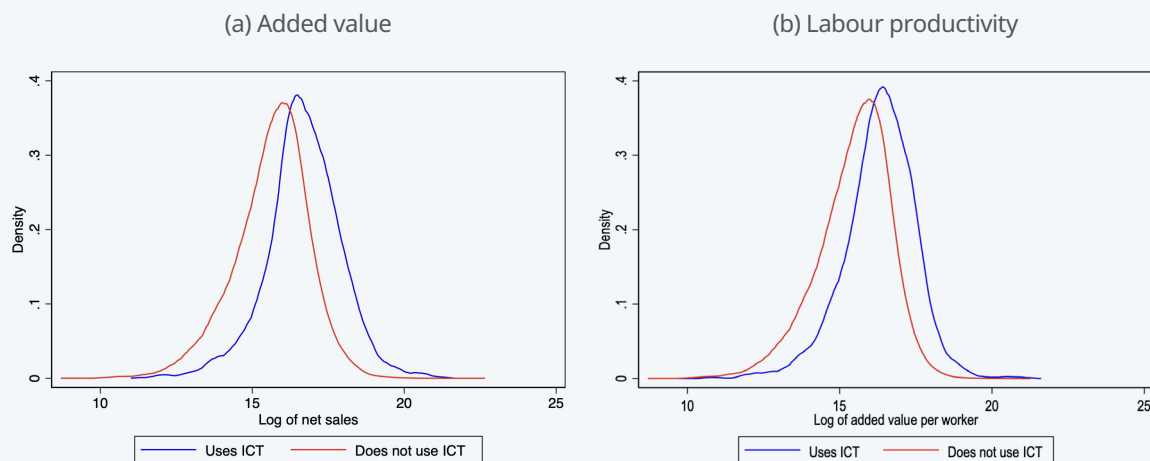
Technology and productivity

Closely related to firms' performance is their use of information and communication technology (ICT). It has been widely recognized that the adoption of digital technologies by micro and small enterprises (MSEs) is essential for them to increase resilience and productivity (OECD 2017). Supporting more resilient and productive MSEs, in turn, contributes to sustainable and equitable development, especially given their economic weight and role as a source of livelihood in low- and middle-income countries (ILO 2021a). Establishment data like the EMICRON provides evidence for continuous monitoring and research on the outcomes of technology adoption. Specifically, the EMICRON asks microentrepreneurs whether they use computers and/or tablets — the most general and widespread form of ICT that enables the use of other, more specific applications — for their business activities.

As a snapshot of this, the plots in figure 4 suggest a positive correlation between the use of digital technologies and firm performance and labour productivity. The plot shows the distribution of the firm's added value (a) and labour productivity (b) by use of ICT. This pattern coincides with the one observed above for formalization status.

Again, the overlap is not negligible, indicating that an important share of microenterprises that use general ICTs in their operations have equal performance levels as other enterprises without ICT use. This is consistent with the general observation in the literature that increases in productivity from the adoption of digital technologies largely depend on the complementary internal capabilities of firms (such as skills and organization) and their environment, with the latter being particularly important for MSEs (ILO 2021a).

► Figure 4. Distribution of added value and labour productivity by use of ICT



Note: Both panels show kernel density plots of the natural logarithm of net sales (panel a) and labour productivity (panel b), by firm use of ICT, measured by whether the firm employs computers or tablets in its business. Kernel densities are computed using a bandwidth of 0.2.

Source: EMICRON (2022).

Table 2 confirms the patterns illustrated in figure 3 and figure 4. In general, formal micro-businesses perform better than informal ones, and this difference is statistically significant and economically substantial. This is true when measuring performance as yearly net sales as well as when dividing this figure by the number of workers, coming closer to an account of value added per worker. Similarly, the differences between formal and informal firms are persistent across firms of different sizes and firms with differences in ICT use.

► **Table 2. Differences in firm performance across formality status, number of workers and ICT use**

	Formal		Informal		t-test formal versus informal Difference
	Mean	Standard deviation	Mean	Standard deviation	
Log of yearly net sales	16.53	1.1	15.57	1.14	-0.96***
Log of net sales per worker	16.19	1.03	15.46	1.13	-0.72***
N	17855		58040		75895
Number of workers (other than the owner)					
0 workers					
Log of yearly net sales	16.27	0.99	15.5	1.13	-0.77***
Log of net sales per worker	16.27	0.99	15.5	1.13	-0.77***
N	11552		50755		62307
1 worker					
Log of yearly net sales	16.78	1.05	15.92	1.12	-0.86***
Log of net sales per worker	16.09	1.05	15.23	1.12	-0.86***
N	3660		5521		9181
2 workers					
Log of yearly net sales	17.11	1.1	16.26	1.19	-0.85***
Log of net sales per worker	16.02	1.1	15.17	1.19	-0.85***
N	1380		1180		2560
3 to 9 workers					
Log of yearly net sales	17.54	1.21	16.56	1.27	-0.98***
Log of net sales per worker	15.96	1.2	15.04	1.26	-0.92***
N	1263		584		1847
ICT use					
Uses ICT					
Log of yearly net sales	16.37	1.05	15.55	1.14	-0.82***
Log of net sales per worker	16.07	1	15.44	1.13	-0.63***
N	11961		55786		67747
Does not use ICT					
Log of yearly net sales	16.85	1.13	16	1.11	-0.85***
Log of net sales per worker	16.42	1.06	15.89	1.1	-0.53***
N	5894		2254		8148

Note: The table shows averages and standard deviations for the natural logarithm of yearly net sales (added value) and yearly net sales (in Colombian pesos) per worker (labour productivity) across formal and informal firms and by number of workers and ICT usage, respectively. Column 5 shows the difference between formal and informal firms of the corresponding subgroup. Asterisks indicate a statistically significant difference at standard levels of significance: * 0.1 ** 0.05 *** 0.01.

Source: EMICRON (2022)

Economic sector and productivity

Table 3 reveals substantial differences in labour productivity across different sectors of economic activity²⁴. Microenterprises in the agriculture and mining sectors are overrepresented among the lowest quintiles of labour productivity. In contrast, service providers populate the upper quintiles of productivity with a higher-than-average concentration. Similarly, but to a lesser degree, retail and repair businesses are relatively more productive than enterprises in other sectors. Manufacturing and waste management businesses are evenly distributed across productivity levels. Table 4, which presents the average net sales per worker, reinforces the patterns of firm performance distribution observed in table 3. The average net sales per worker is the lowest for agriculture and the highest for retail and services, both among formal and informal firms. Moreover, in connection to the previous discussion, table 4 shows that formal businesses have higher productivity than informal ones, even across industrial sectors.

► Table 3. Sector of economic activity within quintiles of labour productivity

Quintile of labour productivity	01 Crop and animal production, mining and quarrying	02 Manufacturing and waste management and remediation	03 Wholesale and retail trade; repair of motor vehicles and motorcycles	04 Services
1	37.8	11.1	24.3	26.8
2	36.1	10.1	23.8	30.1
3	25.3	9.8	24.2	40.7
4	12.4	10.5	27.3	49.9
5	6.6	10.0	31.2	52.2
Total shares	22.4	10.1	27.0	40.5

Note: The table shows the population shares (in %) in each sector of economic activity for each quintile of firm labour productivity. Labour productivity is measured as the ratio of net sales to the total number of workers. Sectors are categorized according to ISIC rev. 4.

Source: EMICRON (2022)

²⁴ Sector is defined based on 12 categories of ISIC Rev. 4 for which respondents are asked from which kind of activity in the set of categories most of their earnings come. The National Statistical Institute of Colombia provides an aggregated categorization of these 12 sectors into four, and this is the one presented below (DANE 2022).

► Table 4. Differences in labour productivity by sector of economic activity

	Formal		Informal		t-test formal versus informal Difference
	Mean	Standard deviation	Mean	Standard deviation	
01 Crop and animal production, mining and quarrying	15.85	1.14	15.08	1.1	-0.77***
N	771		9071		9842
02 Manufacturing and waste management and remediation	16.02	1.01	15.09	1.18	-0.92***
N	2022		6295		8317
03 Wholesale and retail trade; repair of motor vehicles and motorcycles	16.15	1.07	15.42	1.17	-0.73***
N	6311		14876		21187
04 Services	16.29	0.99	15.69	1.05	-0.59***
N	8746		27785		36531

Note: The table shows a comparison of the natural logarithm of labour productivity by sector of economic activity and formal status. Labour productivity is measured as the ratio of net sales to the total number of workers (in Colombian pesos). Sectors are categorized according to ISIC rev. 4. Subgroups of businesses are compared by their average net sales per worker and the corresponding standard deviation. Column 5 shows the difference between formal and informal firms of the corresponding subgroup. Stars indicate a statistically significant difference for common levels of significance: * 0.1 ** 0.05 *** 0.01.

Source: EMICRON (2022)

Impact of COVID-19

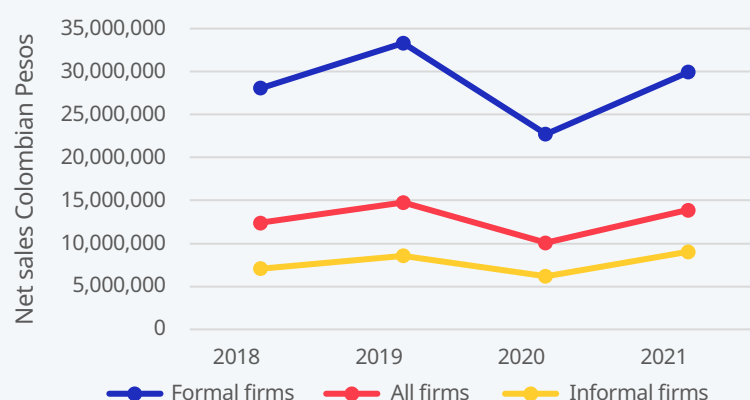
The COVID-19 pandemic led governments to impose sanitary restrictions that affected businesses' ability to operate and, most importantly, severely constrained demand. This was true for any type of business, yet microenterprises were particularly vulnerable in this regard as they mostly operate in services or retail activities, where physical contact is unavoidable and restrictions were thus particularly binding.

In Colombia, the pandemic restrictions led to substantial turnover losses, as revealed by the regular module data from the EMICRON, where firms are asked about their total yearly sales and costs in the previous years. Figure 5 plots average levels of net sales for every year between 2018 and 2021. The average drop in revenue in the pandemic year 2020 is substantial and equivalent to a 32 per cent loss from the previous year. The relative loss was smaller than average among informal enterprises, amounting to 28 per cent relative to the year before.

In addition to the yearly value of sales and costs in the year before the survey, the EMICRON asks firms to report their monthly sales and costs for the previous month before the survey and for the same month of the previous year.²⁵ This allows us to approximate dynamic effects even with cross-sectional data. In other words, instead of looking only at changes in average sales, we can estimate at the firm level how sales declined from one year to the other, even though we cannot track individual firms across time. This is valuable, allowing us to examine with more nuance how a firm's turnover was affected by the pandemic.

²⁵ The specific calendar month varies by firm, as the data for the EMICRON is collected throughout the year.

► Figure 5. Impact on average net sales



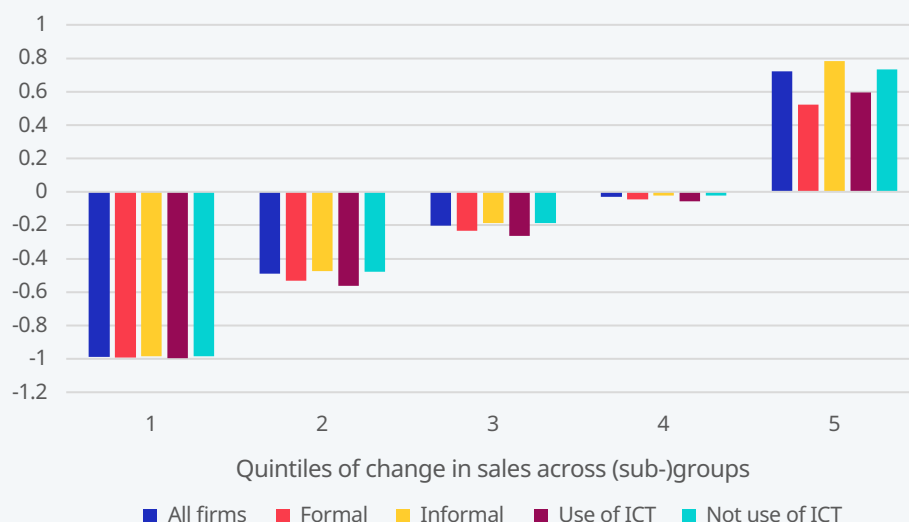
Note: The figure shows the average net yearly sales in the reference year, the previous year to the year of interview, for the years 2018, 2019, 2020 and 2021. Net sales are defined as the total value of yearly sales net of yearly costs and liabilities. Time series are shown for all firms and disaggregated by formality status.

Source: EMICRON (2019, 2020, 2021, 2022)

In figure 6, we group firms in quintiles according to the change in their monthly sales between 2019 and 2020 and look at the average individual change in sales within quintiles. For comparison, we also look at heterogeneity by formality and ICT usage within each quintile.

Losses were substantive: 60 per cent of microenterprises in Colombia lost, on average, at least 20 per cent in sales compared to the year before. The magnitude of sales decline reached up to 100 per cent on average across the 20 per cent of firms with the largest losses. Towards the middle field of impact, average losses were approximately 50 per cent and 20 per cent, respectively, for the second and third quintiles. Within this section of the population of microenterprises, there is not much variation across formality levels or ICT use.

► Figure 6. Change in monthly sales relative to 2019



Note: The figure shows the average change in monthly net sales between 2019 and 2020 among quintiles of the distribution of change in sales as well as by formality and ICT usage within each quintile. Monthly net sales are measured as the difference between the value of monthly revenues and monthly costs. Firms are asked to report their monthly sales and costs for the previous month before the survey and for the same month of the previous year. The specific calendar month varies by firm, as the data for the EMICRON is collected throughout the year.

Source: EMICRON (2020)

At the other end of the spectrum, however, we document positive changes in sales between 2019 and 2020 for at least 20 per cent of Colombian micro-businesses that on average saw an increase by about 70 per cent in their net sales. But within this group, there are larger differences across types of firms. Informal firms and those not using digital technologies reported a larger increase in sales relative to formal firms and those using some form of ICT.

Losses were larger among smaller firms, reaching up to 25 per cent on average for one-person businesses and 14 per cent for those with one single worker besides the owner (figure 7, panel a). The mirror image is visible for post-COVID recovery. Larger firms experienced larger growth rates in sales from 2020 to 2021, compared to smaller firms.

Generally, older firms experienced larger losses but also stronger rates of recovery than younger ones, although the group of firms three to five years old presents an exception to this pattern (figure 7, panel b). Firms with higher levels of labour productivity and net revenues perceived larger relative losses in 2020 (relative to 2019) and slower rates of recovery moving into 2021 (figure 7 panels c and d). The least productive firms even achieved net sale gains in 2020, a striking yet consistent observation with the fact that informal and non-digitalized microenterprises experienced smaller losses (figure 7, panels e and f).

► Figure 7. Change in net sales relative to 2019, by enterprise features

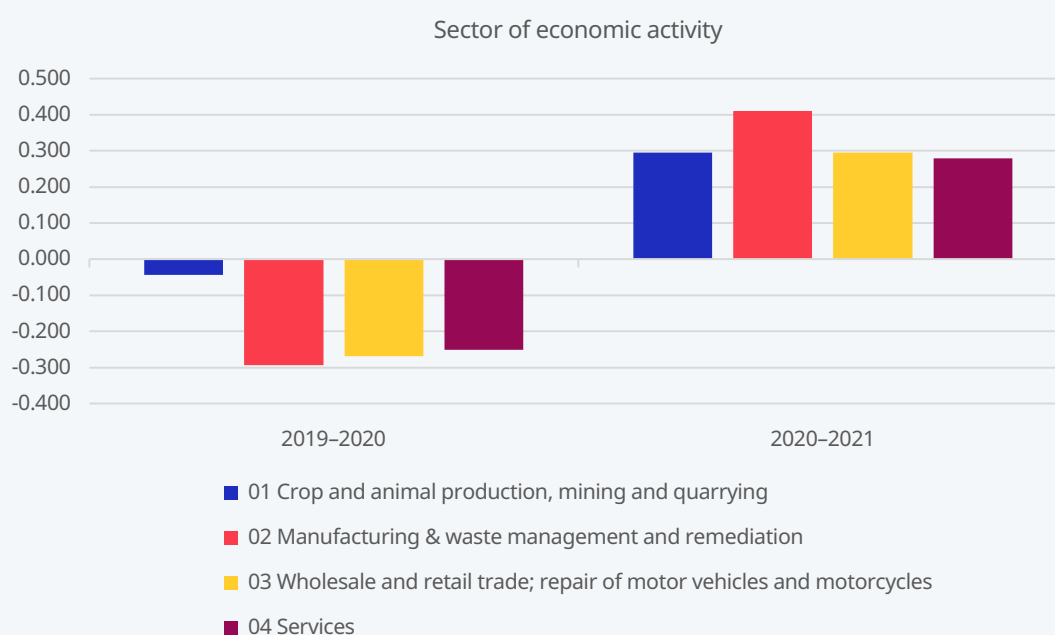


Note: Each panel of the figure shows the average change in net sales between 2019 and 2020 and between 2020 and 2021, respectively, for different subpopulations of firms.

Source: EMICRON (2020, 2021)

In terms of sector of economic activity, average losses among firms dedicated to agriculture and mining are below 5 per cent, while the losses of firms in other sectors average between 25 per cent and 29 per cent (figure 8). Agricultural micro-businesses are among the least productive firms (table 3 and table 4), which suggests that the positive growth in net sales observed at the lowest quintile of labour productivity and net sales is driven by increases in net sales among firms in this sector. The largest gains between 2020 and 2021 were experienced by firms in the manufacturing sector, which is consistent with the jump in consumption growth rates observed in Colombia for durable goods in the first months of 2021 (Arias-Rodríguez et al. 2023).

► **Figure 8. Change in net sales relative to 2019, by sector of economic activity**



Note: This shows the average change in net sales between 2019 and 2020 and between 2020 and 2021, respectively, for firms in different sectors of economic activity. Sectors are categorized according to ISIC rev. 4.

Source: EMICRON (2020, 2021)

Within the COVID-specific module included in the EMICRON 2020, firms are asked a qualitative question about how they perceive the change in sales in the last month compared to the same month of the previous year. Table 5 shows, for every possible response, the average quantitatively estimated change in sales, based on the values reported by the firm, among the firms that gave that qualitative response.

The pattern is relatively consistent across measures: firms indicating a perceived increase in sales have, on average, sales that are about 45 per cent higher than during the same month of the previous year. However, the average for firms reporting that sales remained equal is also positive. Among firms reporting a decrease and those owners who did not operate in the previous month, the average change is consistently negative.

► **Table 5. Estimated change in monthly sales relative to the previous year, by perceived qualitative change in last month**

Qualitative change (last month)	Estimated monthly change relative to the previous year	Standard deviation	N
Increased	0.452	0.003	141,848
Remained equal	0.286	0.014	538,737
Decreased	-0.395	0.001	2,236,462
Did not work last month	-0.787	0.001	308,507
Do not know	-0.074	0.029	35,581

Note: The table shows the average change in net sales between 2019 and 2020 among firms according to their response to the qualitative question of how they perceived sales to have changed relative to the previous year.

Source: EMICRON (2020)

Agricultural businesses are overrepresented among firms reporting qualitatively that their sales increased or remained equal to those of 2019. Table 6 reports that 43 per cent of firms in agricultural activities report that their sales in 2020 were equal to or higher than those in 2019. In contrast, only 22 per cent of the entire sample of firms report this type of change. This substantiates the conjecture that the gains in sales during the pandemic year among the least productive firms are driven by firms in agriculture.

► **Table 6. Qualitatively reported change in sales, by sector of economic activity**

Sector of economic activity	Increased	Remained equal	Decreased	Did not work	Do not know	Total
01 Crop and animal production, mining and quarrying	8.2	34.6	52.0	3.4	1.8	22.4
02 Manufacturing and waste management and remediation	3.5	12.7	70.0	12.6	1.2	10.1
03 Wholesale and retail trade; repair of motor vehicles and motorcycles	3.6	11.7	74.8	9.3	0.6	27.0
04 Services	3.1	11.4	71.2	12.6	1.7	40.5
Total	4.5	17.4	67.2	9.5	1.4	

Note: The table shows the response shares (in %) of qualitatively reported changes in net sales between 2019 and 2020 for firms within different sectors of economic activity. Sectors are categorized according to ISIC rev. 4.

Source: EMICRON (2020)

Supporting this explanation is the fact that agricultural businesses stood out as an exception to the pandemic's effects in at least two respects. First, the nature of their operations does not require physical proximity between humans, and, in any case, it is carried out in external settings, which makes their business activities less vulnerable to social distancing regulations. Second, and most importantly, the provision of food supplies was essentially uninterrupted in most parts of the world, since it was part of activities deemed essential. Hence, demand for agricultural (perishable) products did not drop as did demand for other types of (non-perishable) goods and services (Arias-Rodríguez et al. 2023). Furthermore, National Accounts data even registers a slight increase in demand for food supplies

(Arias-Rodríguez et al. 2023). The latter is reasonable considering that consumption of “non-essential” goods was forcibly reduced, thereby easing budget constraints among those sections of the market whose income was not substantially impacted by the pandemic and leading, in turn, to a redirection of consumption towards agricultural products like food. This change in consumption patterns could therefore explain the positive impact on net sales that we observe above for the least productive firms, most of which operate in agriculture.

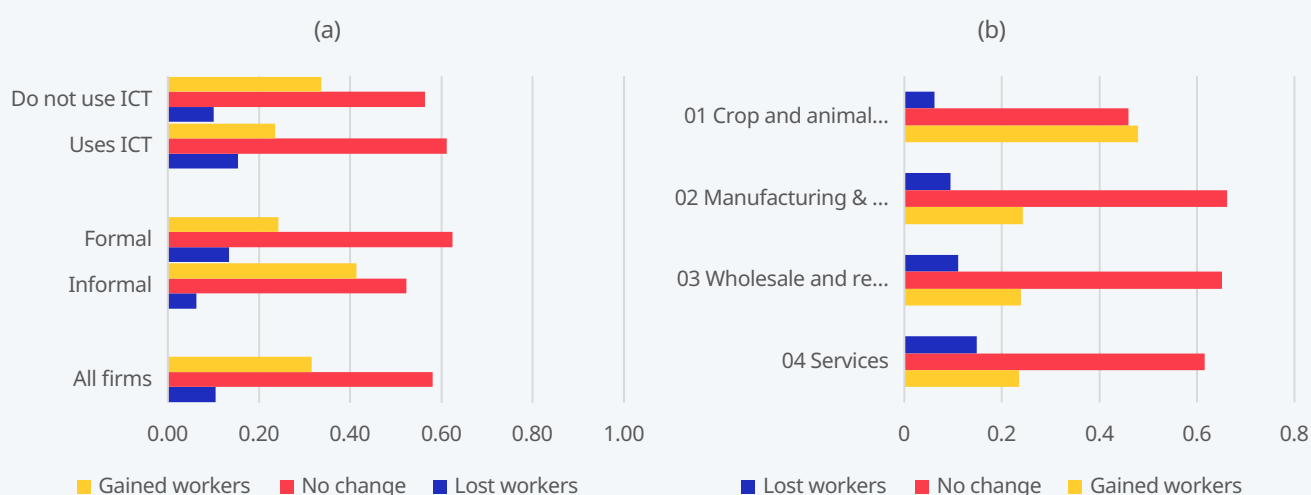
Overall, however, a positive picture of firm resilience arises. While we cannot assess whether the same firms that experienced losses during the pandemic also experienced gains afterwards, the aggregate results for both periods indicate that recovery was possible for all kinds of enterprises, even for those that experienced major losses.

But there is an important caveat. The same percentage increase from 2020 to 2021, similar to the loss from 2019 to 2020, does not represent a recovery to pre-pandemic levels. This is because firms started in 2020 with a smaller base, so that the same relative change in this period does not correspond to the same absolute loss in the pandemic year.

Change in the number of workers

As with previous analysis of change in sales, most firms experienced no change in their number of workers, while a small share decreased their number of workers, especially in the formal sector (figure 9). A large share of firms increased their number of workers in 2020 relative to the beginning of the year, mostly of them being informal micro-businesses. Panel b of figure 9 reflects, as in the previous analysis, that this pattern is mostly driven by an increase of workers among micro-businesses operating in the agricultural and mining sectors. The latter is consistent with the patterns observed above, where agricultural firms experienced the highest gains in sales during the pandemic period.

► **Figure 9. Change in the number of workers relative to January 2020**



Note: The figure shows the shares of firms by category of estimated change in the number of workers between January 2020 and the month of data collection. Values are displayed by ICT use and formality (panel a) and sector of economic activity (panel b). Sectors are categorized according to ISIC rev. 4.

Source: EMICRON (2020)

Conclusions

The two-step survey method, exemplified by the EMICRON, provides critical insights into microenterprises that are often overlooked in standard surveys. This enables detailed analysis of economic trends and the impact of major shocks like the COVID-19 pandemic. This approach is valuable for researchers and policymakers to understand and better support the informal sector and micro- and small enterprises in general, as well as the creation of more decent work.

The EMICRON survey shows that 77 per cent of covered enterprises are informal, most of them being long-established, one-person businesses. Informal employment is prevalent, with 90 per cent of workers in microenterprises working without formal contracts. Key factors that influence firm performance and productivity include formalization and the use of information and communication technologies, though significant overlap exists between different levels of these factors.

Microenterprises account for 40 per cent of the service sector, followed by retail at 27 per cent and agriculture at 22 per cent. The pandemic severely impacted micro-businesses in Colombia, where less productive firms and those in agriculture experienced smaller losses compared to more productive firms in other sectors. This differential outcome is attributed to the inherent resilience of agricultural businesses to the specific shocks of the pandemic, where operations were less constrained by social distancing measures and continued demand for essential food supplies. Thus, while increased formality and digital adoption are linked to heightened resilience, the nature of the agricultural sector and its demand patterns enabled it, under these circumstances, to offset the disadvantages of informality.

References

- Arias-Rodríguez, Fernando, Luis I. Lozano-Espitia, Clark Granger-Castaño, Diego Vásquez-Escobar, Carmiña O. Vargas-Riaño, Norberto Rodríguez-Niño, and Andrés Sánchez-Jabba. 2023. "Dinámica y determinantes del consumo de los hogares en Colombia durante la postpandemia del COVID-19". *Borradores de Economía*, Número 1242.
- Bruhn, Miriam, and David McKenzie. 2013. "Entry Regulation and Formalization of Microenterprises in Developing Countries". World Bank Policy Research Working Paper 6507.
- DANE (Departamento Administrativo Nacional de Estadística). 2022. "Encuesta de Micronegocios (EMICRON), metodología general". Documento Técnico, dirección de metodología y producción estadística.
- De Soto, Hernando. 1989. *The Other Path: The Invisible Revolution in the Third World*. New York: Harper and Row Publishers.
- Perry, Guillermo, William F. Maloney, Omar Arias, Pablo Fajnzylber, Andrew Mason, and Jaime Saavedra. 2007. *Informality: Exit and Exclusion*. Washington, DC: World Bank.
- Fajnzylber, Pablo, William F. Maloney and Gabriel V. Montes Rojas. 2011. "Does Formality Improve Micro-firm Performance? Quasi-experimental Evidence from the Brazilian SIMPLES Program". *Journal of Development Economics* 94(2).
- GIZ/ILO. 2014. *Enterprise Formalization: Fact or fiction?*
- ICLS. (21st International Conference of Labour Statisticians). 2023. Resolution I: Resolution concerning statistics on the informal economy.
- ILO. 2011. *Statistical Update on Employment in the Informal Economy*.
- ILO. 2021a. *Small Goes Digital: How Digitalization Can Bring About Productive Growth for Micro and Small Enterprises*.
- ILO. 2021b. *Enterprise Formalization: An Introduction*.

ILO. 2023. *Women and Men in the Informal Economy: A Statistical Update*.

Ishengoma, Esther, K., and Robert Kappel. 2005. *Formalisation of Informal Enterprises: Economic Growth and Poverty*. GTZ.

La Porta, Rafael, and Andrei Schleifer. 2008. "The Unofficial Economy and Economic Development". *Brookings Papers on Economic Activity* 39(2): 275–363.

OECD. 2017. *Enhancing the Contributions of SMEs in A Global and Digitalised Economy*.

► Chapter 2. Structural surveys for national accounting purposes: Ecuador's Encuesta Estructural Empresarial (ENESEM)

► Key takeaways:

- Structural enterprise surveys are commonly used to collect input for national accounts and, therefore, contain a rich variety of detailed firm-level information.
- They can be used to analyse links between sales, costs, supply chains, employment, labour force composition, working conditions and use of technology, among others.
- Time-invariant unique firm identifiers facilitate dynamic analysis and allow for the use of panel-data methodologies.
- The use of structural enterprise data from Ecuador shows that firms with strong links to global supply chains experienced deeper declines in sales during the pandemic, although they also managed to return to pre-pandemic performance levels and beyond, over the longer term.
- Smaller, less productive firms and firms with a smaller share of permanent-contract workers experienced bigger losses in sales and a more delayed recovery.
- More export-oriented firms and those with a higher share of permanent workers initially had more difficulties in retaining and restoring their workforces after lay-offs.

Introduction

The COVID-19 pandemic has left profound economic scars, with global job losses equivalent to up to 495 million full-time jobs in the second quarter of 2020 (ILO, 2020). Understanding the factors driving business resilience and productivity recovery is critical, especially as the world faces geopolitical tensions and potential global shocks. Structural enterprise surveys offer a valuable opportunity to analyse these resilience factors. Designed to generate data for national accounts, these surveys typically focus on larger businesses to capture key sectoral performance indicators. They therefore serve as instruments for monitoring structural changes, and as inputs for calculating economic growth. In addition, they provide rich data on employment, wages and the composition of the labour force, making them essential tools for understanding dynamics in labour demand and productivity.

Ecuador's Structural Enterprise Survey (Encuesta Estructural Empresarial - ENESEM), conducted annually by Ecuador's National Institute of Statistics and Censuses (INEC), exemplifies such a structural survey. Targeting enterprises across various sectors, including manufacturing, mining, construction, commerce, and services, the ENESEM offers critical insights into the country's economic landscape. This case study analyses the ENESEM to showcase how structural enterprise surveys can be used to explore key drivers of resilience in the face of the challenges brought by the COVID-19 pandemic.

Sampling design

The sampling frame of the ENESEM is drawn from the national business registry²⁶, which includes all enterprises in Ecuador that met at least one of the following conditions: (a) They registered sales in the national tax agency and/or (b) they registered employees to the social security administration and/or (c) declared taxed within the registry of simplified tax filing, which covers smaller businesses. From within the registry, firms are categorized by the size of their workforce and the value of annual sales. The classification is based on the following criteria:

- Large enterprises:
 - Sales of US\$5,000 or more
 - Workforce of 200 persons or more
- Medium B
 - Sales between US\$2,000 and US\$5,000
 - Workforce of 100 to 199 persons
- Medium A
 - Sales between US\$1,000 and US\$2,000
 - Workforce of 50 to 99 persons
- Small enterprises
 - Sales between US\$100 and US\$1,000
 - Workforce of 10 to 49 persons
- Micro-businesses
 - Sales under US\$100
 - one to nine businesses

Using expansion factors included in the data, the selected sample can be used for estimations that are representative of the national universe of registered firms. The sample is stratified by economic sectors and firm sizes. Within every sectoral stratum, large enterprises enter the sample with a probability of 1. Medium- and small-sized enterprises are selected randomly within the strata. Therefore, a firm's absence in the ENESEM dataset does not necessarily reflect its inactivity. Rather, a firm's disappearance from the sample could also mean that the firm reduced its workforce and, therefore, does not enter the survey with full probability. For this reason, the INEC made an exception in the year 2021. It allowed firms that were classified as large in 2020 to enter the ENESEM sample in 2021 with full probability, as if they were large, even if they shrank from large to medium B size, to better track them throughout the COVID-19 pandemic (INEC 2024b).

Surveyed firms receive a time-invariant unique firm identifier that allows for longitudinal analysis. Therefore, the ENESEM can be used to construct a firm-year panel.

²⁶ Registro Estadístico de Empresas (REEM)

Data and descriptives

Firm size

Using the respective weights, the sample of the ENESEM is representative of all registered (that is, formal) firms in Ecuador. This population is composed mostly of small and medium-sized enterprises (SMEs), measured by the size of their workforce. Together, SMEs make up nearly 70 per cent of all registered firms. About 20 per cent of firms are large. Micro firms represent less than 10 per cent of the universe of the ENESEM, an important contrast to Colombia's EMICRON (Chapter 2), which is designed specifically to capture micro-businesses that go under the radar of traditional structural enterprise surveys like the ENESEM due to their prevalent informal status.

Productivity

Table 7 displays the value added by the industrial sector in 2022 in logs and we report here the US dollar values. The sector with the highest levels of value-added in Ecuador is by far the mining sector, averaging US\$96.4 million. This lead is visible as well in terms of value-added per worker, where firms in the mining industry produce a net of US\$233,500 per worker. Mining is followed by manufacturing (US\$10.4 million of value-added) and services (US\$8.6 million). In terms of value-added per worker, however, figure 11 shows that the service sector ranks above manufacturing with a much larger relative gap. The service sector averages approximately US\$96,400. Manufacturing, the sector with the lowest value-added per worker, averages at US\$37,800. At the bottom of the list in absolute terms are the retail and construction sectors. On average, retail produces US\$3.8 million in value-added, but US\$56,000 in value-added per worker. Construction produces an average US\$4.5 million in absolute value-added and US\$69,000 relative to the number of workers. In terms of value-added per worker, both sectors show higher levels than manufacturing.

► Table 7. Added value and added value per worker

	Mean	Standard deviation
All		
Log of added value	14.56	1.5
Log of added value per worker	10.39	0.96
N	3,842	
Manufacturing		
Log of added value	15.25	1.33
Log of added value per worker	10.32	0.68
N	722	
Mining		
Log of added value	15.16	2.26
Log of added value per worker	10.76	1.54
N	121	

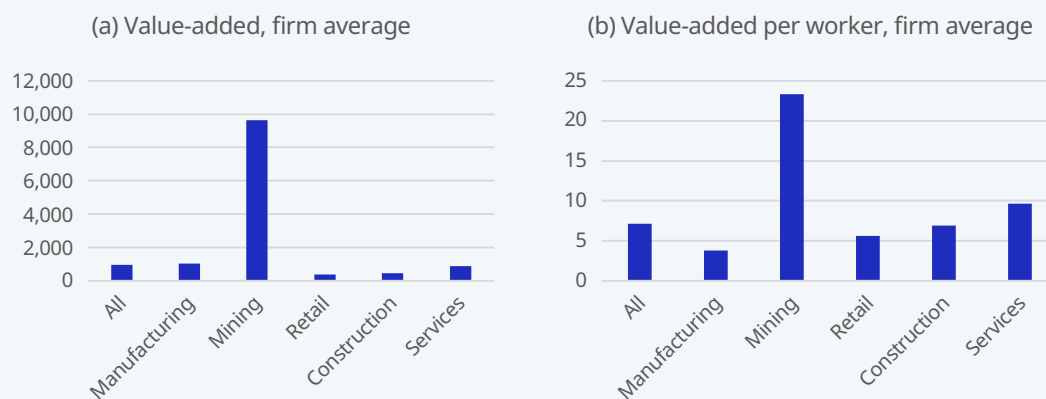
► Table 7. Added value and added value per worker (Cont.)

	Mean	Standard deviation
Retail		
Log of added value	14.05	1.38
Log of added value per worker	10.42	0.89
N	1,696	
Construction		
Log of added value	14.27	1.54
Log of added value per worker	10.26	1.13
N	153	
Services		
Log of added value	14.86	1.39
Log of added value per worker	10.38	1.09
N	1,150	

Note: The table shows the natural logarithm of average value added and value added per worker at the firm level and its standard deviations, by sector of economic activity.

Source: ENESEM (2022)

► Figure 10. Value-added by sector of economic activity in the year 2022 (in US\$10,000)



Note: This figure shows the absolute value added by sector of economic activity in US\$10,000 for the year 2022. Panel (a) displays the within-sector firm-level average of total value added, and panel (b) shows the within-sector firm-level average of the quotient of total value added divided by the number of workers in the firm.

Source: ENESEM (2022)

Predictors of resilience

We aim to identify the key factors that influenced firm resilience during the COVID-19 pandemic. The literature has identified a set of important determinants of business resilience that can be grouped as macro-, meso- and firm-level factors (ILO 2023). Macro- and meso-level determinants are those that influence a firm's environment, like political and macroeconomic stability and the sector-specific shape of supply chains. Firm-level factors are those that are within the immediate agency of the firm: age and size, internal organization, technology adoption and managerial practices.

We concentrate on firm-level predictors of resilience that can be measured using the extensive set of variables available in the ENESEM, selected based on the determinants reviewed in the ILO (2023). Table 8 lists and describes the 13 selected firm-level variables. Age and number of workers describe the firm's maturity and size. We use the ratio of spending on "other" benefits to total spending on benefits to workers as a proxy for spending on training. Note that this is a residual item in the list of surveyed spending items on benefits to workers. The list includes spending on benefits like social security contributions, wages, pensions, sick leave and paid leave, among others. Everything that does not fall into these categories, including training, is summarized under this ratio of spending on "other" benefits.

In addition, we use the share of permanent workers and the (natural logarithm of) average annual wage per worker as further measures of working conditions. The manager-to-staff ratio is calculated to account for management practices. The ratio of net exports to total sales and the share of costs spent on imported goods and imported raw materials are used as proxies for the degree of internationalization of the firm.

Technology adoption and the degree of diversification are multidimensional factors and thus best measured with a composite variable. Hence, we construct indexes for these factors using principal component analysis (PCA) with corresponding, non-overlapping bundles of variables.

We measure the relative value of patents over total sales to proxy firm innovation. Finally, we include a binary variable for the take-up of credit as an indicator of a firm's capacities to maintain liquidity.

► Table 8. Variables selected as potential predictors of firm resilience

Variable	Description (all variables are standardized)	Category
Age	Years since tax registration	Size and age
Number of workers	Total number of occupied personnel	Size and age
Ratio of other benefits	Ratio of spending in other benefits to total spending in workers benefits. This is a “rest” item in the list of surveyed spending on benefits to workers. The list includes spending on social security contributions, wages, pensions, sick leave, among others. If the firm spent on training workers, it would likely fall into this category. Thus, we use it as a proxy for spending on workers' training.	Working conditions
Share of permanent workers	Share of workers with a permanent contract relative to the total number of workers in the firm	Working conditions
Average wages per worker	Ratio of total spending in wages to the total number of workers in the firm	Working conditions
Manager ratio	Ratio of managers to workers	Management practices
Export ratio	Ratio of net exports to total sales	Internationalization
Imported goods	Ratio of cost spent on imported non-produced goods over total cost spent on non-produced goods	Internationalization
Imported raw material	Ratio of cost spent on imported raw material over total cost spent on raw material	Internationalization
Diversification index	PCA-index based on dummy indicators for the presence of the following sources of income: - Sale of self-produced goods - Sale of wholesale traded goods - Sale of retail traded goods - Exports of goods - Exports of services - Local service provision - Local construction services provision - Commission earnings - Operative leasing - Royalties - Dividends and interests - Subsidies - Insurance reimbursements - Other asset returns	Diversification
Technology index	PCA-index based on: - Share of investment in ITC goods - Share of investment in software - Share of investment in ITC consulting - Share of investment in other ITC - Connection to the internet - Broadband access - Share of personnel using the internet - Share of personnel using digital devices - Website - ITC specialist - Training for an ITC specialist - Training for a non-ITC specialist	Innovation and technology
Patents	Value of patents over total sales	Innovation and technology
Credit	Whether a firm takes up a credit or not	Adaptation

Note: Variables selected based on the literature review in ILO (2023) as potential predictors of resilience. The diversification and technology index are standardized cross-sectionally for each available year. PCA refers to principal component analysis.

Table 9 shows descriptive statistics for each indicator for every year between 2019 and 2021. The last column of the table reports the difference between the year-to-year comparisons and their statistical significance indicated by stars.

The ratio of “other” benefits to total benefits, our proxy for training spending, increased substantially between 2020 and 2021, from about 3 per cent to 3.5 per cent. Average annual wages declined between 2019 and 2020 by approximately US\$1,500, but increased again between 2020 and 2021 — but by about US\$1,300. Firms’ export ratio did not decline significantly during the peak pandemic period (2019–20), though it increased by about 1.8 percentage points during the recovery period (2020–21). Meanwhile, the share of firms that requested credit did not change significantly in the earlier period, but declined significantly, by 2.6 percentage points, during the recovery phase. In terms of economic structure, sectoral concentration remained relatively stable in the initial period of the crisis, except for the construction sector, whose share increased by approximately 1 percentage point. In contrast, in the recovery period, sectoral concentration in retail declined by 2.5 percentage points and increased in services by 2.7 percentage points.

Table 10 provides descriptive statistics for the predictors of firm resilience, grouped by the impact that the pandemic period had on firms’ sales. The left-hand side of the table shows a comparison of the firms that experienced a loss in sales between 2019 and 2020, with those that did not. On the right-hand side, the table shows the contrast between firms that managed a recovery in their sales levels by 2021 and those that did not.

On the loss side, firms that did not experience a loss in sales were on average younger and used to spend more on additional benefits to workers, like training. In addition, firms whose sales fell between 2019 and 2020 had a higher dependence on global supply chains. This is seen in the fact that their share of imported goods was approximately three times that of the firms that had no reduction in sales. Moreover, firms that experienced losses import about 2.5 times more of their raw materials. At the same time, they were 0.3 standard deviations more diversified than firms that did not experience a loss in sales. Firms with losses requested credit more often, which suggests that debt was a prevalent means to cope with the pandemic’s shock. In terms of sectoral composition, firms that were negatively impacted by the pandemic were most concentrated in manufacturing and retail. Firms whose sales did not decline were more present in the mining and services sector.

On the recovery side, firms that by 2021 managed to bring their sales back to 2019 levels were, on average, younger. In line with the pattern observed for losses in sales, firms that had more difficulties in recovering were on average more internationally oriented, more diversified and more likely to request credit in that period. Sectoral differences between firms that recovered and those that did not mirror sectoral differences in losses. There were more manufacturing and retail firms among those that did not manage to recover by 2021.

► Table 9. Yearly descriptives, all firms

	2019		2020		2021		t-test 2020-2019 Difference	t-test 2021-2020 Difference
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation		
Age	20.538	14.124	21.593	15.681	21.744	15.264	1.055***	0.151
Number of workers	188.039	495.624	176.779	482.044	181.760	501.143	-11.261	4.982
Ratio of other benefits (including training)	0.032	0.085	0.030	0.072	0.035	0.083	-0.002	0.005***
Share of permanent workers	0.986	0.082	0.985	0.083	0.985	0.080	-0.001	0.000
Log of average wages per worker	9.288	0.556	9.241	0.554	9.291	0.569	-0.046***	0.05***
Ratio of male-to-female wages	1.121	0.892	1.134	1.805	1.113	0.641	0.014	-0.022
Manager-to-staff ratio	0.073	0.164	0.078	0.182	0.083	0.190	0.005	0.005
Export ratio	0.157	0.342	0.155	0.341	0.173	0.357	-0.003	0.018*
Imported goods	0.347	0.419	0.334	0.419	0.337	0.418	-0.013	0.003
Imported raw material	0.316	0.366	0.314	0.363	0.324	0.366	-0.002	0.010
Diversification index (standardized by construction)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Technology index (standardized by construction)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Credit	0.627	0.484	0.613	0.487	0.587	0.493	-0.014	-0.026**
Share of manufacturing	0.191	0.393	0.187	0.390	0.184	0.387	-0.005	-0.003
Share of mining	0.029	0.167	0.028	0.164	0.029	0.169	-0.001	0.001
Share of retail	0.424	0.494	0.440	0.496	0.415	0.493	0.016	-0.025**
Share of construction	0.057	0.233	0.048	0.213	0.047	0.211	-0.01*	-0.001
Share of service	0.299	0.458	0.298	0.458	0.326	0.469	-0.001	0.027***
N	3779		3782		3965		7561	7747

Note: The table shows averages and standard deviations for firm-level determinants of resilience. The last two columns show the t-statistics for the year-to-year difference indicated at the top of the column. Stars indicate statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Source: ENESEM

► Table 10. Year-to-year loss and recovery, descriptive statistics

	Loss in sales in 2020						Recovery by 2021				
	Loss			No loss			T-test for loss Difference		Recovery		t-test for recovery Difference
	Mean	Standard deviation		Mean	Standard deviation				Mean	Standard deviation	
Age	24.067	15.906		19.585	15.207		-4.482***		20.9246	15.28228	3.402***
Number of workers	177.501	500.351		176.193	466.784		-1.308		177.5173	482.07193	17.617
Ratio of other benefits (including training)	0.027	0.060		0.032	0.079		0.005**		0.0356	0.08682	-0.006**
Share of permanent workers	0.986	0.080		0.984	0.086		-0.002		0.9866	0.07243	-0.004
Log of average wages per worker	9.255	0.530		9.229	0.574		-0.026		9.279	0.56637	0.05**
Ratio of male-to-female wages	1.106	1.539		1.158	2.002		0.052		1.1204	0.63725	-0.032
Manager-to-staff ratio	0.078	0.153		0.073	0.198		-0.002		0.0796	0.19065	-0.003
Export ratio	0.120	0.302		0.108	0.298		0.078***		0.1188	0.30666	-0.04***
Imported goods	0.271	0.400		0.099	0.274		-0.096***		0.1469	0.32233	0.022
Imported raw material	0.109	0.264		0.040	0.161		-0.16***		0.0636	0.20785	-0.017
Diversification index	0.163	1.101		-0.132	0.889		-0.295***		-0.051	0.97615	0.212***
Technology index	0.000	0.763		0.000	0.788		-0.0002		-0.0037	0.73961	0.028
Credit	0.666	0.472		0.569	0.495		-0.097***		0.5738	0.49461	0.053***
Share of manufacturing	0.251	0.434		0.135	0.341		-0.116***		0.1681	0.37402	0.064***
Share of mining	0.014	0.116		0.039	0.194		0.026***		0.0329	0.17838	-0.015***
Share of retail	0.612	0.487		0.299	0.458		-0.313***		0.3601	0.48012	0.227***
Share of construction	0.036	0.186		0.058	0.233		0.022***		0.0478	0.21346	-0.005
Share of services	0.087	0.282		0.469	0.499		0.382**		0.391	0.48806	-0.272***
N	1694			2088			3782			955	3965

Note: The table shows averages and standard deviations for firm-level determinants of resilience, comparing firms with losses in sales and firms that recovered to 2019 levels of sales by 2021. Columns 6 and 11 show the t-statistics for the respective group difference. Asterisks indicate statistical significance: *** p < 0.01, ** p < 0.05, * p < 0.1

Source: ENESEM

Workforce loss and recovery

One of the most important consequences of sales losses during a crisis is lay-offs. On the one hand, there is the immediate cost of job loss to individual households and its effect on exacerbating the crisis. On the other hand, the extent to which firms lay off workers has a direct short-term effect on its capacity to recover from the crisis. Moreover, lay-offs can have important long-term consequences for firms' productivity. Therefore, a firm's capacity to maintain its workforce levels during a crisis and/or recover them shortly after is an important indicator of resilience.

We approach this aspect of resilience by analysing the firm's degree of workforce retention and recovery throughout the crisis years of the COVID-19 pandemic in 2019, 2020 and 2021. While we can follow firms across time, not all of them remain in the sample every year due to the sampling design, where some firms might not meet the entry criteria any more or are simply not selected again within the random draw. Thus, we base the following dynamic analysis on the subsample of firms that appear continuously in the dataset between 2019 and 2021. Table 11 shows the rates for different attrition groups. The upper row displays the representative shares for the population of firms (using expansion factors), while the second row contains the share of the sample. Overall, 22 per cent of the firm population from 2019 remains in the dataset throughout the pandemic. This share is drawn from 72 per cent of the dataset observations.

► Table 11. Attrition in the ENESEM

	2019	2019 and 2021	2019, 2020 and 2021	2019 and 2020
Firm population	69.40	4.46	22.10	4.03
Sample observations	16.49	2.67	71.90	8.94

Note: The table shows the shares of different attrition groups. Each column indicates in which years the firms in that group are present in the data. The first row shows the representative shares for the population of firms in 2019, drawn using weighting factors. The second row displays the shares of the sample observations.

Source: ENESEM

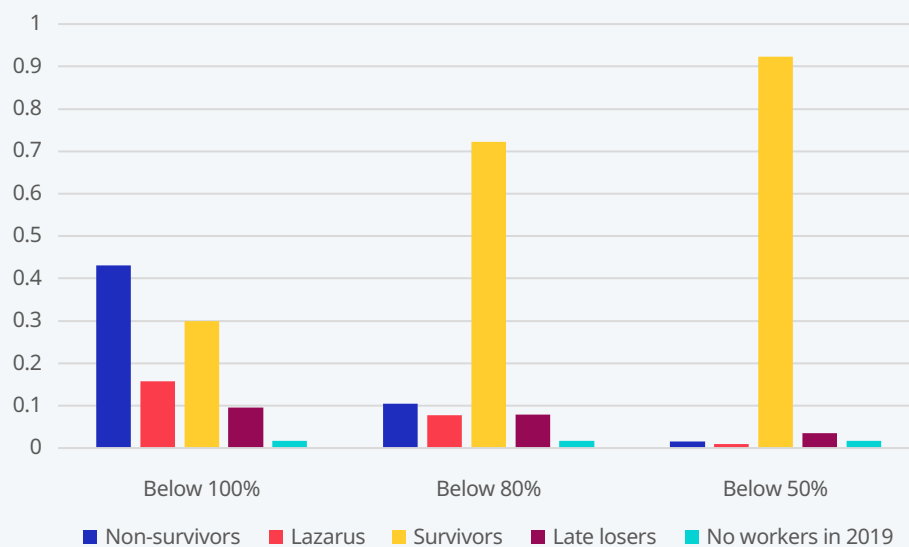
We measure firm resilience from the angle of workforce retention by establishing a profile of resilience relative to loss and recovery in a reference period, following the approach employed by Chacaltana et al. (2021) to study the resilience of the youth labour market. We identify whether a firm fell in 2020 below a given share of its 2019 workforce levels and whether it came back to at least that level in 2021. We do this for three different retention thresholds: 100 per cent, 80 per cent and 50 per cent of the 2019 workforce levels,²⁷ but we report only the results for the 100 per cent threshold. Results for the 80 per cent and 50 per cent thresholds are available upon request. Thereby, we identify five profiles that exhaustively categorize all firms present in the data in 2019, 2020, and 2021:

²⁷ We chose these benchmarks as identifiers for the profiles to be binary for ease of interpretation and because they capture, in a simple indicator, the idea of workforce retention and recovery. Note, however, that lowering the threshold has two opposite impacts on the strictness of the benchmark. On the one hand, a lower benchmark makes it harder to consider a firm a loser (in the sense that it loses part of its workforce), as only firms that lose a substantial portion of their workforce (for example 20 per cent or 50 per cent) are considered as such. On the other hand, a lower threshold makes it easier to consider a firm as recovered. This is because even if a firm does not fully recover to its pre-pandemic workforce levels, it will be tagged as a recovery case as long as it recovers some of its workforce beyond its loss in 2020. Hence, the higher the threshold the more sensitive is the indicator to workforce loss and the less sensitive it is to workforce recovery. Conversely, the lower the threshold, the less it captures workforce loss and the more it captures recovery.

- i. “Non-survivors” are firms that fall below the threshold in 2020 and do not recover by 2021.
- ii. “Lazarus” firms fall below the threshold in 2020 and recover to at least the threshold level or beyond by 2021. The name alludes to the figure of Lazarus in the Bible, which narrates that he came back to life after four days. Lazarus firms are called such because, metaphorically, they die and recover.
- iii. “Survivors” stayed above the given threshold throughout these three years.
- iv. “Late losers” stay above the threshold in 2020 but fall below it in 2021.
- v. A residual category includes firms that have no worker information in 2019.

Figure 11 shows the population shares of each profile for the different thresholds we compare. When we set the bar at 100 per cent, approximately 43 per cent of the firms present in the sample across the three years fell below their 2019 workforce levels and did not manage to recover by 2021. Moreover, nearly 16 per cent fell below their 2019 levels and recovered by 2021, while 30 per cent did not lose any workers in these three years. As we move the bar further down, the share of firms categorized as survivors increases while the shares of Lazarus and non-survivors decrease sharply. More than 70 per cent of the firms present in the data in 2019, 2020 and 2021 did not experience a workforce reduction of more than 20 per cent throughout these years. Moreover, 92 per cent of these firms retained at least half of their workforce throughout the pandemic years.

► Figure 11. Firm loss and recovery of workforce levels, relative to 2019



Note: The figure shows the shares of differently affected firms among the population of firms present in the dataset between 2019 and 2021. This is done for different thresholds. Non-survivors did not recover their 2019 workforce levels by 2021; Lazarus firms fell below the respective threshold in 2020 but recovered to 2019 workforce levels or above by 2021. Survivors stayed above the threshold for the three consecutive years. Late losers stayed above the threshold in 2020 but fell below it in 2021.

Source: ENESEM

Table 12 shows descriptive statistics for the set of resilience predictors by resilience profile. For the categories of Lazarus, survivors, late losers and firms with no workers in 2019, it shows the difference relative to the value of non-survivors and its statistical significance is indicated by asterisks.

Substantive and statistically significant differences can be observed in terms of age. Non-survivors are on average older than the rest of the profiles. The largest differences can be observed between non-survivors and survivor firms, which are on average approximately 4.5 years younger. This is in line with the patterns observed with a more comprehensive population of firms in table 9 and table 10, where firms that experienced sales losses between 2019 and 2020 and firms that did not recover to their 2019 sales levels by 2021 are on average older.

Size plays an important role as well, in terms of restorative and retentive capacity. Survivor and Lazarus firms are on average smaller than non-survivor firms. The largest contrast among firms with workers in 2019 is again with survivors, which have on average 30 per cent fewer workers than non-survivors.

In addition, survivor and Lazarus firms, on average, pay higher wages than non-survivors, although the difference is not statistically significant for survivors. This suggests that firms that could afford better compensation for their workforce were more likely to survive the impact of the pandemic or come back after the initial hit. This observation could be related to differential levels of productivity as a common variable. It is a fact that more productive firms tend to pay higher wages. If, in turn, productivity was a positive predictor of survival and recovery, then productivity could explain the correlation between average wages and the capacity to retain and restore workforce levels.

On average, non-survivor firms have a lower manager-to-staff ratio than survivor firms. Lazarus firms, in contrast, have a lower manager ratio than non-survivors, and therefore also a lower one than survivors. This suggests that smaller management units were a positive predictor of capacity for workforce retention — though not necessarily of recovery — during the pandemic.

Non-survivors have a higher share of imported goods out of their non-manufactured goods. This is in line with the observations from table 9 and table 10, whereby firms with higher exposure to global supply chains were more likely to reduce sales and were less likely to recover by 2021.

Survivor and Lazarus firms are consistently more concentrated in manufacturing across the different thresholds and were less so in the service and construction sectors. Lazarus firms were more represented in mining than non-survivor and survivor firms.

► Table 12. Drop in workforce below 100%, descriptive statistics

	Non-survivors			Lazarus firms			Survivors			Late losers			No workers in 2019		
	Mean	Standard Deviation		Mean	Standard Deviation	Diff. to non-survivors	Mean	Standard Deviation	diff. to non-survivors	Mean	Standard Deviation	Diff. to non-survivors	Mean	Standard Deviation	Diff. to non-survivors
Age	23.883	15.021		22.469	14.774	1.414*	19.405	13.885	4.478***	20.296	13.89	3.587***	17	13.304	6.883**
Number of workers	272.277	575.057		262.818	590.446	9.459	193.153	554.527	79.124***	198	598.401	74.277*	0	0	272.277***
Ratio of other benefits (including training)	0.028	0.058		0.033	0.073	-0.006	0.031	0.073	-0.004	0.024	0.063	0.004	0.055	0.232	-0.027
Share of permanent workers	0.982	0.09		0.979	0.093	0.003	0.992	0.049	-0.010***	0.982	0.108	0			
Log of average wages per worker	9.275	0.482		9.312	0.501	-0.037	9.356	0.554	-0.082***	9.368	0.665	-0.094**			
Ratio of male-to-female wages	1.086	1.07		1.106	0.585	-0.02	1.097	0.605	-0.01	1.125	0.678	-0.038			
Manager-to-staff ratio	0.052	0.071		0.046	0.051	0.005*	0.087	0.223	-0.036***	0.073	0.116	-0.021**			
Export ratio	0.144	0.327		0.162	0.341	-0.018	0.177	0.362	-0.033*	0.154	0.338	-0.01	0.167	0.389	-0.022
Imported goods	0.377	0.425		0.426	0.431	-0.048	0.327	0.41	0.050**	0.33	0.416	0.047	0.215	0.424	0.162
Imported raw material	0.364	0.375		0.299	0.35	0.065	0.386	0.376	-0.021	0.294	0.356	0.07	0		0.364
Diversification index	0.143	1.058		0.297	1.119	-0.154**	0.072	1.003	0.071	0.01	1.081	0.133*	-0.391	0.661	0.534***
Technology index	0.098	0.982		0.202	1.001	-0.103	-0.001	1.022	0.099*	-0.063	0.99	0.161*	-0.792		0.891
Credit	0.65	0.477		0.687	0.464	-0.037	0.66	0.474	-0.01	0.635	0.483	0.015	0.241	0.435	0.408***
Share of manufacturing	0.197	0.398		0.209	0.407	-0.012	0.238	0.426	-0.040**	0.22	0.415	-0.022	0.103	0.31	0.094
Share of mining	0.025	0.155		0.044	0.205	-0.019*	0.022	0.148	0.002	0.004	0.067	0.020***	0.069	0.258	-0.044
Share of retail	0.464	0.499		0.439	0.497	0.024	0.495	0.5	-0.032	0.516	0.501	-0.052	0.207	0.412	0.257***
Share of construction	0.032	0.177		0.041	0.199	-0.009	0.026	0.159	0.006	0.058	0.235	-0.026	0.069	0.258	-0.037
Services	0.282	0.45		0.267	0.443	0.016	0.219	0.414	0.063***	0.202	0.402	0.080***	0.552	0.506	-0.270***
N	1180			435		1615	850		2030	223		1403	29		1209

Analysis of resilience

Sales losses and recovery

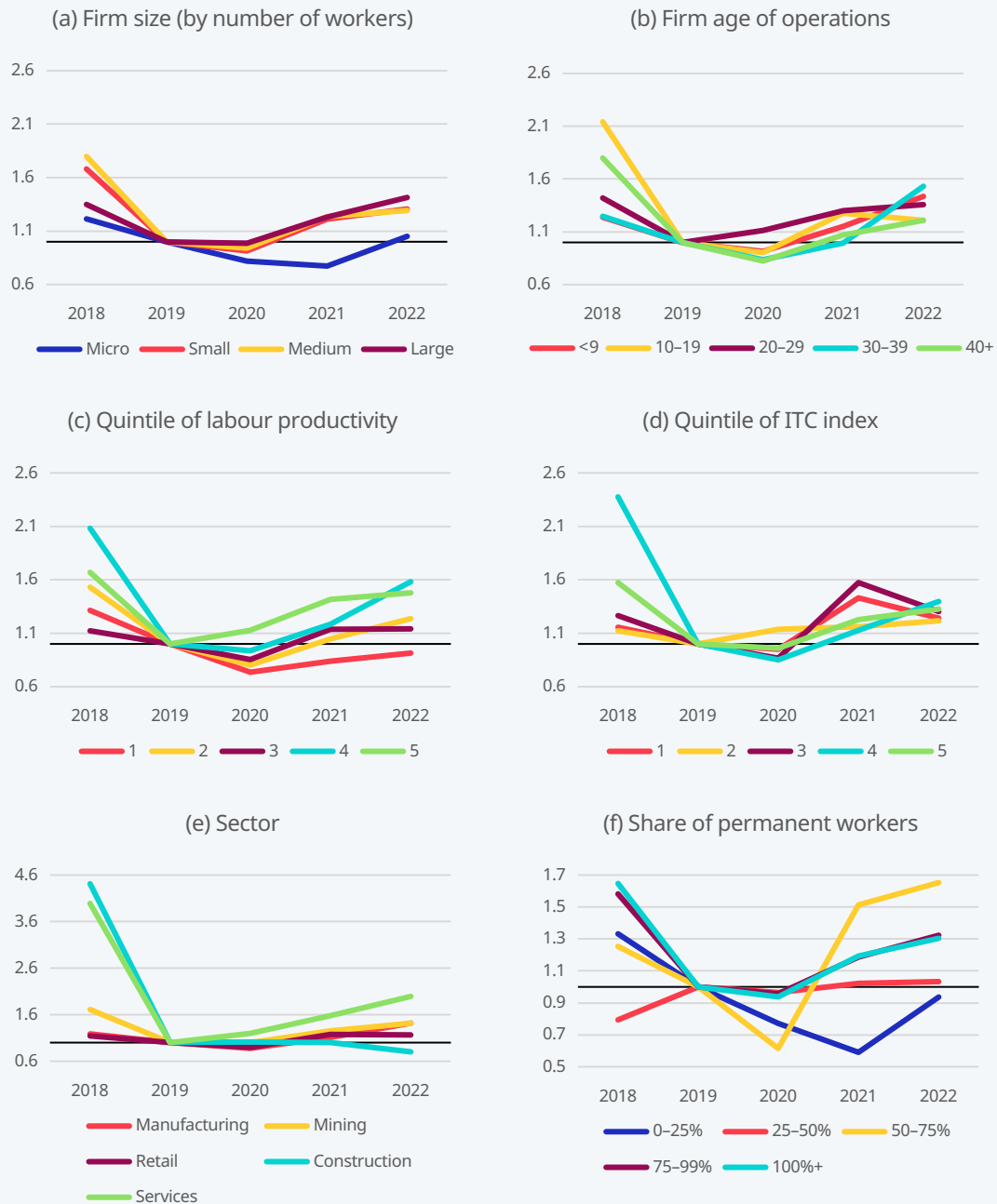
Measuring the dynamic effects of a crisis at the firm level and assessing the predictors of adaptive and restorative resilience best done with panel data, where we can compare a business's performance across time. The panel structure is one of the main advantages of the ENESEM. Figure 12 shows average sales levels for each year between 2018 and 2022, relative to the sales levels in 2019, for different subcategories of firms. Panel A displays this by firm size, and we observe that the largest losses were experienced by microenterprises whose sales had fallen by approximately 18 per cent between 2019 and 2020. Moreover, while the sales of small, medium-sized and large firms had on average recovered to beyond their 2019 levels, those of microenterprises fell further in 2021 to 23 per cent below their 2019 levels.

An assessment of these changes by firm age in panel B shows that the sales of the firms in most age groups declined by similar levels in 2020, and by 2021 were on the way to recovery. An exception to this pattern is the group of firms aged 20–29, which experienced, on average, an increase in sales relative to 2019 in the pandemic and post-pandemic years. In panel C, the rank of the quintiles of labour productivity, measured by the added value per worker, follows the rank of average reductions in sales around the pandemic. On average, all groups experienced reductions, except for the 20 per cent with the highest added value per worker, which experienced a continuous increase in sales throughout the pandemic, without losses in 2020. Overall, however, firms of all levels of added value per worker managed to recover above their 2019 sales levels by the end of 2022, except for the 20 per cent of firms with the lowest levels of labour productivity. Hence, productivity levels are associated both with the relative depth of the impact and the speed of recovery.

Panel D divides firms by their quintile in an index of technology adoption. The index is computed using different variables such as shares of investment in technology, internet access and usage as well as ICT training for employees, among others. The difference in average index levels between the lowest quintile and the highest is about 65 per cent of a standard deviation in the index. For reference, 1 standard deviation of the index in this data is roughly equivalent to the difference in the ITC index that corresponds to moving from (a) having a broadband internet connection, 10 per cent of the workforce using digital devices and internet and having a website (what we could consider “basic” technology adoption) to (b) having 50 per cent of the workforce using digital devices and internet, investing 4 per cent of investment budget in software and, in addition, having an IT specialist (arguably, a firm with a solid technological orientation).

Between 2019 and 2020, all quintiles of the ICT index experienced losses in net sales, except the second, where an average steady increase in net sales can be observed through 2022. The relative fall in 2020 was the deepest for firms in the third and fourth quintiles, and the smallest for the first and fifth quintiles. This suggests that firms with middle levels of technology adoption were more affected than firms at the extremes of the technology adoption spectrum.

► Figure 12. Average sales relative to 2019 levels, by enterprise features



Note: Each panel shows the yearly average in firm sales relative to the firm's sales level in 2019, shown by the black horizontal line at 1. Labour productivity is defined as value added per worker.

In terms of recovery, all firms grew beyond their 2019 net sales levels between 2020 and 2021, yet firms with a lower degree of technological adoption did so at a faster pace than those with higher levels of technological adoption. Specifically, firms in the first and third quintiles of technology adoption increased their sales by approximately 40 per cent and 60 per cent, respectively, relative to their net sales value in 2019. Meanwhile, firms in the first and second quintiles grew by about 13 per cent and 22 per cent between 2020 and 2021. However, less technological firms showed an average downward adjustment between 2021 and 2022, while more technologically capable firms continued to grow. Hence, by 2022, firms within the fourth and fifth quintiles of technology adoption had levels of net sales 39 per cent and 32 per cent higher than their pre-pandemic sales levels, respectively. Firms in the first, second and third quintiles reached not more than 30 per cent of their 2019 net sales.

Sectoral differences (panel E) are most relevant post-2020, when the sales of construction firms continued to decline relative to 2019. This diverges from the development of other sectors, particularly the service sector, which had the steepest post-pandemic rise in sales. Moreover, in terms of employment conditions, firms with a higher share of permanent workers generally experienced faster recovery. Two contrasts are particularly interesting in this regard. First, firms that have 0–25 per cent share of permanent workers experienced a similar drop in sales as those with 50–75 per cent. Both groups lost between 30 per cent and 40 per cent of their sales between 2019 and 2020. However, from 2020 to 2021, firms in the latter category achieved starkly stronger recovery in sales of up to 50 per cent more than 2019 levels, while sales continued declining for firms in the former category. Firms with 25–50 per cent permanent workers, those with 75–99 per cent and those with 100 per cent permanent employees experienced only a minor drop from 2019 to 2020. But from 2020 to 2021, sales grew by more than five times for firms in the two groups with higher shares of permanent employees.

An important observation is that for all categories, average sales in 2019 were lower than average sales in 2018. This could be related to Ecuador's political crisis in 2019, which triggered an overall economic contraction.

Loss in real sales in 2020

The regression results in table 13 highlight the key predictors of the probability of experiencing a loss in real sales between 2019 and 2020. Notably, in line with the descriptive observations from table 10, factors such as the age of the firm, the degree of internationalization, technology adoption and compliance were positively associated with a higher probability of declining sales in 2020. This suggests that older firms, those more globally integrated and those leveraging technology were more vulnerable to the economic disruptions caused by the pandemic. This is true as well for firms operating in retail. Meanwhile, firms in mining, construction and services had a lower probability of experiencing losses in sales. This is in line with the descriptive analysis in table 10, where services and mining experienced, on average, fewer losses in 2020 than other sectors. In contrast, firms with a higher ratio of other benefits to workers had a lower probability of sales losses during the pandemic. Importantly, both the linear probability and the logit model show qualitatively and quantitatively consistent results in terms of the relevant, statistically significant factors and their marginal contribution to the likelihood of experiencing losses in sales.

► Table 13. Loss in real sales in 2020

Dependent variable	Loss in real sales in 2019–20	
	OLS (1)	Logit - marginal effects (2)
Age	0.00250*** (0.00055)	0.00257*** (0.00056)
Number of workers	-0.00004** (0.00002)	-0.00004** (0.00002)
Ratio of other benefits (including training)	-0.35832*** (0.12695)	-0.38151*** (0.13518)
Share of permanent workers	-0.04496 (0.10040)	-0.03794 (0.09591)
Log of average wages per worker	-0.03810** (0.01728)	-0.03801** (0.01738)
Ratio of male-to-female wages	-0.00568 (0.00414)	-0.00489 (0.00442)
Manager-to-staff ratio	0.15389*** (0.05822)	0.16527** (0.06674)
Export ratio	0.09890*** (0.02805)	0.09829*** (0.02762)
Imported goods	0.09215*** (0.02609)	0.09035*** (0.02620)
Imported raw material	0.10639** (0.04494)	0.09732** (0.04434)
Diversification index	0.01358 (0.00903)	0.01395 (0.00911)
Technology index	0.02322** (0.01079)	0.02418** (0.01082)
Credit	-0.00079 (0.01730)	-0.00093 (0.01729)
ISIC sectors (omitted: manufacturing)		
- Mining	-0.28541*** (0.05623)	-0.27630*** (0.06246)
- Retail	0.10174*** (0.02782)	0.10296*** (0.02992)
- Construction	-0.08441* (0.04794)	-0.06852 (0.05325)
- Services	-0.41176*** (0.02938)	-0.41237*** (0.03128)
Observations	2,950	2,950
R-squared Pseudo R-squared	0.231	0.18

Note: Regression coefficients of a linear probability model estimated using ordinary least squares (OLS) (Regression coefficients of a linear probability model estimated using ordinary least squares (OLS) (column 1) and marginal effects from a logistic regression (column 2). The dependent variable is a binary indicator that takes the value of 1 if a firm experienced a decline in sales in 2020 relative to its sales volume in 2019. Standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Sectors are based on the International Standardization of Industrial Classification (ISIC) rev4.

Recovery by 2021

Table 14 shows the results of regressing a binary dependent variable, indicating whether a firm's sales volume in 2021 was at least the same as in 2019. The results reveal that factors such as the number of workers, the share of spending on additional benefits, the share of permanent workers and the degree of dependence on global supply chains for manufacturing positively affect the probability of recovery to 2019 sales levels by 2021. The latter factor is particularly surprising in the sense that it reveals a pattern that was not observable by a simple comparison of averages. As observed in table 9, the share of imported raw materials was more than two times higher among firms that experienced losses than among those that did not. However, the difference between the firms that managed to recover and firms that did not is not statistically significant. Yet table 14 indicates that, when controlling for other factors, a one percentage-point higher share of imported raw material increases the probability of recovery by 2021 by 14 to 15 percentage points. Similarly, as in the previous table, results are consistent between the linear probability model and the logit model, both in the direction and statistical significance of the coefficients as well as in the estimated magnitude of the effect.

► **Table 14. Recovery in real sales by 2021**

Dependent variable	Loss in real sales 2019–20	
	OLS (1)	Logit - marginal effects (2)
Age	-0.00092 (0.00061)	-0.00096 (0.00061)
Number of workers	0.00003* (0.00002)	0.00004* (0.00002)
Ratio of other benefits (including training)	0.19703* (0.11640)	0.21549* (0.12471)
Share of permanent workers	0.20237* (0.11201)	0.19122* (0.10721)
Log of average wages per worker	0.01267 (0.01992)	0.01154 (0.02015)
Ratio of male-to-female wages	0.01048 (0.01640)	0.01009 (0.01584)
Manager-to-staff ratio	-0.04306 (0.05357)	-0.03995 (0.05223)
Export ratio	-0.07821*** (0.02946)	-0.08277*** (0.02937)
Imported goods	-0.02912 (0.02906)	-0.02638 (0.02763)
Imported raw material	0.15747*** (0.04776)	0.14339*** (0.04625)
Diversification index	0.00016 (0.00963)	0.00002 (0.00957)
Technology index	-0.01271 (0.01187)	-0.01403 (0.01210)
Credit	0.02516 (0.01874)	0.02568 (0.01873)

► Table 14. Recovery in real sales by 2021 (cont.)

Dependent variable	Loss in real sales 2019–20	
	OLS (1)	Logit - marginal effects (2)
ISIC sectors (omitted: manufacturing)		
- Mining	0.21923*** (0.05980)	0.21465*** (0.05251)
- Retail	-0.00891 (0.03024)	-0.00882 (0.03284)
- Construction	0.00156 (0.05446)	0.00127 (0.05836)
- Services	0.27327*** (0.03156)	0.26722*** (0.02984)
Observations	2,725	2,725
R-squared Pseudo R-squared	0.074	0.06

Note: Regression coefficients of a linear probability model estimated using OLS (column 1) and marginal effects from a logistic regression (column 2). The dependent variable is a binary indicator that takes the value of 1 if a firm's sales volume in 2021 was at least the same as in 2019. Standard errors in parenthesis. Confidence levels: *** $p < 0.01$, ** $p < 0.05$. Sectors are based on the International Standardization of Industrial Classification (ISIC) rev4.

Workforce loss and recovery

Predictors of preservation and restoration

Lazarus recovery

A firm's age is a positive predictor of its capacity to restore its workforce after carrying out lay-offs, described as a Lazarus-style recovery. However, this association loses statistical significance at lower thresholds. Firms with higher wages per worker are less likely to experience a Lazarus-style recovery. Regarding sectoral distribution, firms in services have a higher probability of achieving a Lazarus recovery.

Survivors

Survivor firms are those that did not experience any losses below the respective threshold either during or after the pandemic. These results are the most mixed across thresholds since the category encompasses a lot of firms at lower workforce retention thresholds. Higher manager-to-staff ratios reduce the probability of being a survivor. A higher share of imported goods and a larger degree of diversification are positively associated with survival, while a higher share of imported raw materials influences survival negatively. In terms of sectors, mining firms have a higher probability of being survivors.

Late losers

At the highest threshold, older firms are less likely to be late losers — that is, to retain their workforce in 2019 and 2020 but lose some of it in 2021. The share of permanent workers is a consistent positive predictor of late loser outcomes, which suggests that permanent contracts could have shielded workers from immediate lay-offs during the pandemic, but they were not enough to protect them against structural adjustments after the peak years. Higher wages are a positive predictor of late loser outcomes. In addition, manager-to-staff ratios positively affect the probability of being a late loser.

The results for firms without workers in 2019 are displayed for completeness, but their coefficients cannot be meaningfully interpreted given the small size of their sample.

► **Table 15. Workforce drop by 100%**

Outcome	Workforce drop by 100%			
	Lazarus	Survivors	Late losers	Firms with no workers in 2019
Age	0.0042023*** (0.00071)	-0.0000325 (0.00053)	-0.0036658*** (0.00071)	-0.0005041 (0.00042)
Number of workers	0.0000166 (0.00002)	-0.0000080 (0.00001)	-0.0000073 (0.00002)	-0.0000012 (0.00001)
Ratio of other benefits (including training)	-0.1555307 (0.15223)	0.1278323 (0.10152)	0.1544111 (0.13174)	-0.1267127 (0.10385)
Share of permanent workers	-0.1876555 (0.13357)	-0.0812960 (0.08130)	0.3616990** (0.16112)	-0.0927474 (0.06004)
Log of average wages per worker	-0.0833732*** (0.02294)	-0.0107326 (0.01751)	0.0649991*** (0.02065)	0.0291067** (0.01180)
Ratio of male-to-female wages	-0.0010071 (0.01184)	0.0032916 (0.00724)	-0.0041037 (0.01204)	0.0018192 (0.00569)
Manager-to-staff ratio	-0.1183537 (0.12698)	-0.3154854** (0.12826)	0.3784157*** (0.09546)	0.0554234 (0.04272)
Export ratio	-0.0466340 (0.03324)	-0.0180427 (0.02483)	0.0608049** (0.02948)	0.0038719 (0.01821)
Imported goods	0.0609577** (0.03091)	0.0471850** (0.02291)	-0.0818329*** (0.02900)	-0.0263098 (0.01743)
Imported raw material	0.0239470 (0.05116)	-0.1035447** (0.04049)	0.1028840** (0.04532)	-0.0232863 (0.03002)
Diversification index	-0.0003919 (0.01057)	0.0194741*** (0.00749)	-0.0104149 (0.01012)	-0.0086672 (0.00638)
Technology index	-0.0015592 (0.01220)	0.0154819* (0.00892)	-0.0068771 (0.01147)	-0.0070456 (0.00703)
Credit	-0.0228082 (0.02067)	0.0201294 (0.01582)	0.0111835 (0.01929)	-0.0085047 (0.01131)

► Table 15. Workforce drop by 100% (Cont.)

Outcome	Workforce drop by 100%			
	Lazarus	Survivors	Late losers	Firms with no workers in 2019
ISIC sectors (omitted: manufacturing)				
- Mining	0.1112240 (0.06838)	0.1133446* (0.06073)	-0.1372565** (0.05456)	-0.0873121*** (0.02033)
- Retail	0.0641352** (0.03181)	-0.0233169 (0.02445)	-0.0316313 (0.03138)	-0.0091870 (0.02048)
- Construction	0.0627963 (0.06042)	0.0279456 (0.04788)	-0.1129543** (0.05378)	0.0222125 (0.03880)
- Services	0.1338117*** (0.03392)	-0.0008214 (0.02618)	-0.0931830*** (0.03231)	-0.0398073** (0.01995)
Observations	425	850	223	29

Note: The table shows the marginal effects of the coefficients of a multinomial logistic regression of a categorical resilience indicator on multiple predictors. The resilience indicator categorizes firms according to their workforce levels in 2020 and 2021 relative to their workforce levels in 2019. Here, we use a decline below 100% of the 2019 levels as a threshold for firm “death” with respect to their workforce decline. Based on this decline, the categories are non-survivors, Lazarus, survivors, late losers and firms that had no workers in 2019. The multinomial regression underlying the marginal effects presented here uses non-survivors as the base outcome. Standard errors in parenthesis. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Sectors are based on the International Standardization of Industrial Classification (ISIC) rev4.

Conclusions

This chapter explored how the COVID-19 pandemic functioned both as a rigorous stress test and as a significant driver of change in Ecuador’s business environment. It began by highlighting the severe economic consequences triggered by the pandemic, including substantial job losses and considerable disruptions in sales. These underscored the urgent need to identify the resilience factors that enable certain firms to endure, recover and even thrive during challenging times.

Through our presentation of Ecuador’s structural enterprise survey, we emphasized the critical value of having comprehensive, longitudinal data. Such data enabled us to capture not only pre-crisis business conditions but the evolving interactions between firm characteristics — such as size, age and degree of international exposure — and the unfolding dynamics of the crisis itself.

Our examination across different sectors and firm sizes revealed that resilience was notably uneven. While many small and medium-sized enterprises regained their pre-pandemic performance levels, microenterprises and specific sectors continued to experience significant, sustained hardships.

We further investigated key predictors of resilience, discovering that factors such as international integration, technology adoption and investments in workforce training played complex yet crucial roles. The ENESEM data reveal that resilience during the pandemic was driven by firm-level characteristics such as diversification, investment in worker benefits, number of permanent work contracts, technology adoption and lower dependence on global supply chains. Although firms heavily reliant on global supply chains initially faced sharper declines in sales, these same firms, under certain conditions, showed substantial recovery potential over the longer term.

Our findings align with regional literature that includes Ecuador. For example, a regional assessment by the Economic Commission for Latin America and the Caribbean (ECLAC) in 2020 includes the country in its analysis of structural enterprise performance during the COVID-19 crisis. This report highlights how Ecuadorian firms in services and manufacturing that had diversified income streams or technological

capabilities were more likely to recover, echoing the ENESEM findings. Apedo-Amah et al. (2020), though broader in scope, include Ecuador in their survey and show that Ecuadorian firms with access to credit and those that invested in internal capabilities (including training and ICT) were more likely to withstand and recover from the COVID-19 shock. The ENESEM's observation that younger firms experienced better outcomes contrasts slightly with the international consensus, which generally sees young firms as more vulnerable. However, although based on advanced economies, some literature (such as Fairlie (2020) that uses US data, and Juergensen et al. (2020) that analyses European SMEs) suggests that under certain conditions — especially when firms are digital natives or better trained — younger enterprises may adapt more quickly. Ecuador's case might be reflective of such dynamics, although more country-specific research is needed to confirm this interpretation. When comparing the results of our dynamic assessment to the literature, it is important to bear in mind that the subsample of firms that produce a balanced panel is likely to be different than the whole universe of firms. This form of self-selection might be a reason behind some of the divergences we have pointed to.

Our findings underscore that business resilience is inherently multifaceted and dynamic, combining elements of proactive preparation, adaptability and effective recovery strategies. Moreover, our analysis highlighted the critical importance of workforce management practices, illustrating that both the ability to maintain employment levels during the peak crisis period and the subsequent capacity to restore employment were central to resilience. Elements such as average wages, management quality and the stability provided by permanent contracts emerged as influential but variable, contingent on the severity of workforce disruption.

The insights we have gathered, crucial for policymakers and business leaders, emphasize the necessity of targeted support and strategic investments, particularly in technological infrastructure and human capital, to enhance firms' capacities to withstand future crises and recover from them. Most importantly for our broader discussion in this report, the use of structural surveys that track enterprises over time is an important tool for the analysis of different kinds of labour-related issues, including firms' ability to retain and restore their workforce during an economic shock.

References

- Apedo-Amah, Marie. Christine, Besart Avdiu, Xavier Cirera, M. Cruz, E. Davies, A. Grover, L. Iacovone, et al. 2020. "Unmasking the Impact of COVID-19 on Businesses. Firm Level Evidence from Across the World". World Bank Policy Research Working Paper No. 9434.
- Chacaltana, Juan, Grace Chang, Marta Favara, and Andrew. McKay. 2021. *Youth labour market resilience during the COVID-19 crisis in three middle-income countries*. ILO.
- ECLAC. 2020. "Preliminary Overview of the Economies of Latin America and the Caribbean".
- Fairlie, Robert W. 2020. "The Impact of COVID-19 on Small Business Owners: Evidence from the First Three months after Widespread Social-distancing Restrictions". *Journal of Economics & Management Strategy* 29(4): 727-740.
- INEC (Instituto Nacional de Estadísticas y Encuestas, Ecuador). 2024. *Boletín técnico N° 01-2024-REEM*.
_____. 2024. *Encuesta Estructural Empresarial (ENESEM) 2022 Metodología*.
- ILO. 2023. Determinants of Productivity Recovery and Business Resilience.
_____. 2020. ILO Monitor: COVID-19 and the World of Work.
- Juergensen, Jill, José Guimón, and Rajneesh Narula. 2020. "European SMEs amidst the COVID-19 Crisis: Assessing Impact and Policy Responses". *Journal of Industrial and Business Economics* 47(3), 499-510.

► Chapter 3.

Administrative employer-employee data: Brazil's *Relação Anual de Informações Sociais* (RAIS)

► Key takeaways:

- Administrative data from business and social registries allows the identification of links between firms and workers in order to analyse their characteristics and outcomes, even though it is limited to the formal sector.
- Due to institutional control mechanisms, administrative records offer high-resolution, high-reliability data.
- Unique firm identifiers and periodic collection of information by authorities create a longitudinal structure that is ideal for the analysis of shocks and resilience.
- Employing administrative data with employer-employee links from Brazil, we observe that the Brazilian formal sector showed high levels of restorative resilience to the COVID-19 shock, indicated by a strong increase in the prevalence of firm revival in 2021 after carrying out full lay-offs.
- While firm age was a positive determinant of revival, size, workers' tenure and wage levels are negatively associated with the restoration of workforces.

Introduction

Studying firm mortality with a survey of randomly selected firms has important limitations. When a firm is part of the sample in one year but not in another, this cannot be directly interpreted as a firm exit. Moreover, the accuracy of self-reported information in surveys depends largely on the mechanisms of quality control, when there are any. The use of administrative records, however, addresses the challenge posed by these limitations. While less representative of the informal sector, they are less prone to selection bias within the universe of formal firms. Moreover, the quality of their information is usually high due to institutionalized incentives and regular monitoring from authorities. They also provide links between data points that are unlikely to be available through labour force surveys alone, such as connections between enterprise information and individual outcomes.

For these reasons, administrative records are a very useful source of information to explore firms' resilience in times of crisis. In this case study, we employ data from the Brazilian Annual Social Information Report (*Relação Anual de Informações Sociais* – RAIS) to illustrate how firm data linked to workers data through administrative records can be used to assess restorative resilience in firms.

We emphasize the restoration of a firm's workforce as a fundamental capability, which becomes particularly vulnerable during crises and is essential for the resumption of normal-level operations. We operationalize this quality under the measure of Lazarus revival, which describes the "death" of firms after losing all of their workforce in a given year but recovering the following year by rehiring at least some of their pre-crisis employees.

The first part of this chapter describes the sampling and quality control procedure of RAIS. The second part discusses the variables we employ and our empirical approach. We then proceed to the analysis that provides an over-time description of mortality, revival and rehiring as well as a multivariate regression-based assessment of the main predictors of restorative resilience and employment growth. Section 5 concludes.

Sampling

RAIS is a rich source of linked employer-employee administrative data (RAIS 2022). A compulsory survey filled by all firms registered in Brazil forms the basis of its dataset. The survey is managed by the Brazilian Ministry of Labor and Employment (Ministerio do Trabalho e Emprego, MTE). This annual collection of data started in 1986, originally with a subset of regions, and by 1994, it had reached universal coverage of all formal establishments in Brazil.

Since RAIS is an administrative record, and registration with central tax authorities is a condition to be surveyed, its information is focused solely on workers and firms in the formal sector. This is an important limitation in the Brazilian context, where 37 per cent of workers are employed in the informal sector (ILOSTAT 2023). Nevertheless, RAIS provides three major advantages for labour market research: it has accurate data, information on employer-employee links and a panel structure that makes it possible to follow firms across time.

Firms have clear incentives to provide accurate information in the survey. They must pay a fine for providing late, incomplete or inaccurate information. Therefore, firms usually hire specialized accountants to complete the survey. The MTE inspects establishments regularly to monitor the accuracy of the reported information, paying special attention to earnings and compliance with minimum wage legislation.

RAIS provides an anonymized unique person identifier for each worker. Likewise, establishments and firms have unique identifiers through which it is possible to link employees to employers.

These identifiers are time-invariant and, thus allow for the tracking of employees and firms over time, either individually or jointly.

Despite these advantages that RAIS provides, an important contrast to the two previous cases (EMICRON and ENESEM) is the access to the data. While the latter two are freely accessible online through the respective National Statistical Institutes, RAIS is only available with authorization and can be accessed only at the physical premises that host the servers. However, this is a standard procedure and data usage agreements with diverse research organizations around the globe are widespread.

Data and empirical approach

Since we are interested in exploring the correlates of firms' resilience, our focus is on a measurement of workforce retention at the firm level. In other words, we explore the extent to which firms can preserve or restore their employment over the years.

We operationalize this concept as follows. We define a yearly binary indicator of firm mortality. Thereby, a firm is considered dead if it has no employees in a year, irrespective of whether the firm itself declares itself to be active or not. We choose this description to account for the possibility that a firm may decide not to formally declare itself inactive to reduce the bureaucratic costs of doing so, while being de facto inoperative by not having any employees. A firm with at least one employee is considered alive. Thus, we employ a workforce-centred conceptualization of firm survival and death.

Based on this characterization, we observe dynamic patterns of mortality. Primarily, we focus on patterns over three-year periods consisting of years $t-1$, t and $t+1$. A firm's death occurs in year t if it was alive in $t-1$ and dead in t . All firms that show this year-to-year outcome compose the stock of firms that die in year t .

Among firms that died in year t , we observe their status in $t+1$, that is, a year after their death, and categorize them accordingly. We consider firms that come back to life in year $t+1$ to be Lazarus firms. Firms that remain dead in $t+1$ are considered non-survivors. Conceptually, this classification allows us to assess the prevalence and predictors of firms' restorative resilience (ILO 2017; Chacaltana et al. 2021).

In Section 4.1 below, we provide an overview of mortality rates and prevalence of Lazarus behaviour over time in Brazil. In addition, we employ a binomial logistic regression model (logit) to assess the influence of a set of covariates on the probability of a firm's revival in year $t+1$ after dying in year t , that is, the probability of becoming a Lazarus firm over a three-year period.

In Section 4.2, we explore the correlation of Lazarus behaviour with a firm's age, its total number of employees in year $t-1$ and a binary indicator for whether the firm has more than one establishment. We also consider the main regions of Brazil — North, Northeast, Midwest, Southeast and South — where the firm operates. Moreover, we include an indicator for the sector of economic activity based on Brazil's own National Classification of Economic Activities (CNAE). Finally, we include a set of firm-level worker characteristics: the average age and tenure of its employees, the average monthly wages and the shares of workers who completed secondary and higher education, respectively.

In Section 4.3, we repeat this exercise to assess the probability of a firm expanding its workforce year by year. This complements our analysis of a firm's Lazarus revival by shedding light on the factors associated with its capacity to grow the number of its workers, a factor directly linked to its restorative resilience after a mass lay-off.

Analysis

Firm mortality and Lazarus firms

Firm mortality rates in Brazil's formal sector have changed over time, and more so during the COVID-19 pandemic. Between 2017 and 2019, these rates rose from 11 per cent to 11.4 per cent (table 16.) In contrast, they decreased between 2020 and 2021, easing to 9.4 per cent by 2021.

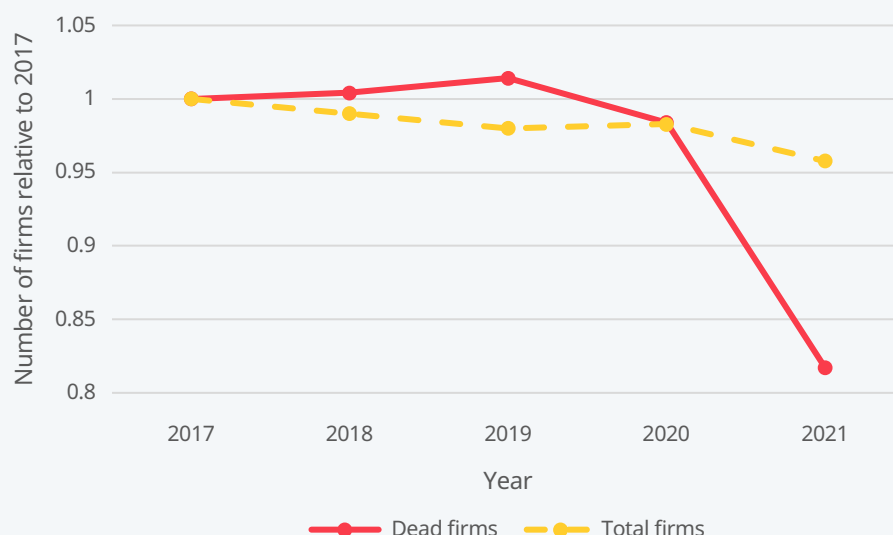
As seen in figure 11, the increase in mortality rates between 2017 and 2019 was caused by a simultaneous decrease in the size of the firms' population (the denominator) and an increase in the absolute number of dying firms (the numerator) — that is, the firms that remain registered but reduced their workforce to zero between two consecutive years. Meanwhile, from 2019 to 2021 the total number of firms (alive and dead) continued to decline, while the number of dying firms started to drop as well. But compared to the reduction in the population of firms, the decline in absolute mortality — by nearly 20 per cent in contrast to 2 per cent in the total firms' population — was more pronounced. Thus, the reduction in firm mortality rates around the COVID-19 pandemic was led primarily by a real decrease in the prevalence of dying firms. In other words, fewer firms were dying between 2019 and 2021 compared to between 2017 and 2019.

► Table 16. Mortality rate

Year	Dead firms	Total firms (alive and dead)	Mortality rate in year (in %)
2017	293 119	2 669 110	10.98
2018	294 350	2 642 457	11.14
2019	297 280	2 615 558	11.37
2020	288 389	2 623 253	10.99
2021	239 528	2 556 214	9.37

Note: The table displays the prevalence of firm mortality over time between 2017 and 2021. A firm is considered dead if it has no employees each year, irrespective of whether the firm itself declares itself to be active or not. The number of dead firms refers to the number of firms that were alive in year t-1 and died in year t. "Total firms" is the number of firms that were alive in year t-1. The mortality rate is the share of dead firms in year t among all firms that were alive in year t-1.

► Figure 13. Trends in firm mortality



Note: The table displays the values relative to 2017 of the number of dead firms and the total firms that were alive in year t-1 between t=2017 and t=2021. A firm is considered dead if it has no employees each year, irrespective of whether the firm itself declares itself to be active or not. The number of dead firms refers to the number of firms that were alive in year t-1 and died in year t. "Total firms" is the number of firms that were alive in year t-1. The mortality rate is the share of dead firms in year t among all firms that were alive in year t-1.

The decline in mortality rates around 2020 coincided with a rise in the firms' restorative resilience, measured by the rate of Lazarus revival. When firm mortality reached its tipping point in 2019, only 13.05 per cent of firms that died in 2019 recovered by 2020 (table 17). This was the lowest rate of Lazarus revival since 2018, as revival reached nearly 15 per cent in the 2017-19 period. However, revival rates increased again after 2020, so that 18 per cent of firms that died in 2020 recovered by 2021.

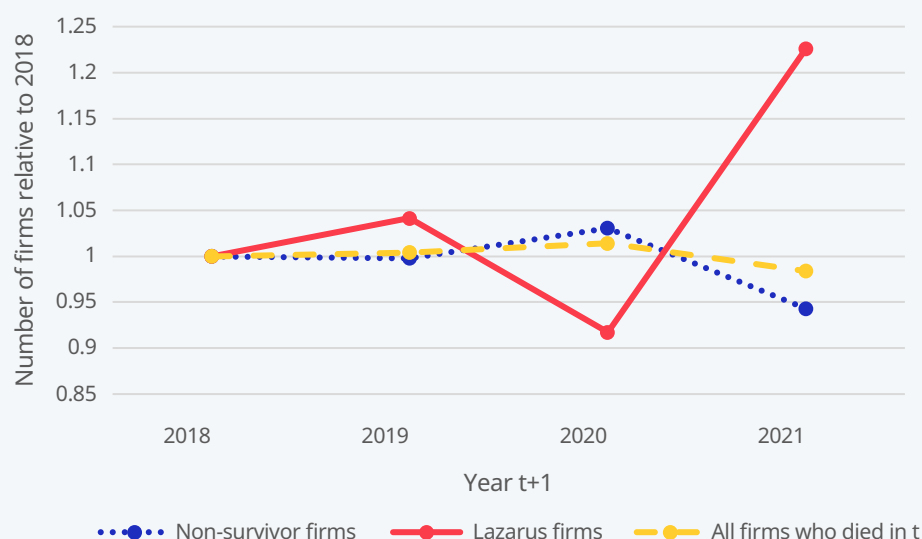
The increase in the share of Lazarus firms is in part explained by a decrease in its denominator, the number of dying firms, for which we observe a drop of about 2 per cent between 2019 and 2020 (see figure 14). However, the absolute number of Lazarus firms also increased during this period and did so comparatively faster than the number of dying firms. From 2020 to 2021, the number of Lazarus firms grew by about 34 per cent. Therefore, there was a 4 percentage-point increase in the share of Lazarus firms around the pandemic period of 2019–21 stems largely from a real increase in the prevalence of revival.

► Table 17. Share of Lazarus firms

Death to revival period	Non-survivor firms	Lazarus firms	All firms that died in t-1	Share of Lazarus firms (in %)
2016–18	250 821	42 298	293 119	14.43
2017–19	250 304	44 046	294 350	14.96
2018–20	258 481	38 799	297 280	13.05
2019–21	236 540	51 849	288 389	17.98

Note: The table displays the prevalence of Lazarus behaviour over three years between t–1 and t+1. A firm is considered dead if it has no employees each year, irrespective of whether the firm itself declares itself to be active or not. Non-survivor firms are firms that were alive in t–1, died in t and remained dead in t+1. Lazarus firms were alive in year t–1, died in t and recovered in t+1. The share of Lazarus is the share of firms that were revived in year t+1 among all firms that were alive in year t–1 and died in year t.

► Figure 14. Trends in the revival of Lazarus firms



Note: The figure displays the values relative to 2017 of the number of non-survivor firms, the number of Lazarus firms and the total firms that died in year t between t=2017 and t=2020. A firm is considered dead if it has no employees each year, irrespective of whether the firm itself declares itself to be active or not. Non-survivor firms are those did not restore their workforce by the third year of three years. Lazarus firms are firms that die in year t and were revived by year t+1. The number of dead firms refers to the number of firms that were alive in year t–1 and died in year t.

A closer look at firms' rehiring behaviour provides additional evidence for the real rise in Brazilian firms' restorative resilience in recent years. Table 18 compares rehiring rates around the 2015 economic crisis in Brazil, following the 2014 commodity price shock and political crisis, and the 2020 crisis caused by the COVID-19 pandemic. The number of laid-off workers was higher in the 2020 crisis than in 2015. Despite this, the share of workers rehired during recovery tripled around the COVID-19 pandemic compared to the 2015 crisis. This suggests that Brazilian firms were better at restoring their workforce after the pandemic crisis than they were after the 2015–16 crisis.

► **Table 18. Post-crisis rehiring**

Crisis period	Recovery period	Total number of employees during recovery	Total employees fired during crisis	Total employees rehired during recovery	Share of rehired employees (in %)
2015–16	2017–18	60 779 363	6 810 475	143 904	2.11
2020	2021	55 630 120	7 568 550	477 198	6.31

Note: The table displays rehiring outcomes for two crisis and recovery periods. The share of rehired is the quotient of total rehired employees over total workers fired during the crisis.

Determinants of Lazarus recovery

We now turn to assessing Lazarus-type restorative resilience with the help of multivariate regression analysis. Our binary outcome variable takes the value of 1 if, within three years, a firm is alive in year $t-1$, dies in year t and is revived again in year $t+1$. Such a firm is considered a Lazarus firm. The Lazarus indicator takes the value 0 for all firms that died in year t but did not reappear by year $t+1$. We assess the link between a set of firm-level predictors of resilience and the probability of reviving in $t+1$ with a logit regression model. Table 19 shows the odds ratios of this exercise for five different three-year periods spanning between 2016 and 2021 to cover the period of the COVID-19 pandemic.

We observe that older firms are more likely to recover than younger firms, and this effect is consistent over time. Meanwhile, the influence of firm size has changed over the years. Between 2016 and 2019, smaller firms were more likely to restore their workforce after dying, while the odds tilted towards larger firms in the period 2018–20.

A similar pattern can be observed in the influence of having more than one establishment. This influenced revival negatively around 2016 and 2018, but had a positive influence in 2018–20. During the COVID-19 pandemic, however, firms with multiple establishments showed less resilience, but this was not the case for firms with more workers. In fact, we observe no statistically significant association between the number of employees and restorative resilience in Brazil around the pandemic years. This indicates that, even after controlling for other characteristics, the increase in restorative capabilities that we observed around 2020 and 2021 cuts across firms of diverse sizes.

Differences in restorative resilience across sectors were not statistically significant between 2016 and 2019. During the period 2018–20, however, construction firms were more likely to recover than agricultural businesses. During the pandemic years, retail and industry firms were more likely than agricultural firms to be able to restore their workforce after dying. Thus, a concentration of restorative capacities within the retail and industrial sectors coincided with the overall increase in revival rates observed in Brazil's formal economy.

Brazil's regions also showed different patterns of resilience during the pandemic, compared to previous periods. During the pandemic, resilience was more prevalent in the Northeastern and Southeastern regions. In the period 2016–18, firms operating in Brazil's Northern region had a higher probability of recovery after death than those operating in all four other regions (Northeast, South, Southeast and Midwest). Between 2017 and 2020, operations in the North were not different in terms of resilience from those in the Northeast. Around the pandemic, however, firms in the Northeast and Southeast regions were more likely to recover than those in the North.

Consistently over time, and also during the pandemic, firms with older employees, those with longer average tenure and higher wages as well as those with a higher share of workers with secondary and higher education have, on average, a lower probability of restoring their workforce after laying off all their employees. Yet while these differences are statistically significantly different from 1, the magnitude of the coefficient is very close to 1 and, thus, the difference along these dimensions in the probability of recovery is relatively small.

► Table 19. Binomial logistic regression of Lazarus recovery on firm-level predictors (odd ratios)

	2016–18	2017–19	2018–20	2019–21
Firm age	1.0119 (0.00068)***	1.01138 (0.00064)***	1.01499 (0.00064)***	1.01076 (0.00059)***
Number of employees	0.99007 (0.00117)***	0.9921 (0.001)***	1.00408 (0.00031)***	0.99998 (0.00036)
Sector (omitted: agriculture)				
- Retail and trade	1.03984 (0.0611)	1.07147 (0.05743)	1.0307 (0.0558)	1.1436 (0.05964)**
- Construction	0.97294 (0.06398)	1.07847 (0.0604)	1.15675 (0.05904)**	1.06731 (0.06292)
- Industry	0.90408 (0.0633)	0.98266 (0.0596)	1.00793 (0.05816)	1.13451 (0.06144)**
- Services	1.03346 (0.06119)	1.07698 (0.05752)	1.05698 (0.05585)	1.05277 (0.05965)
Region of operations (omitted: north)				
- Northeast	0.90858 (0.03146)**	0.96659 (0.03016)	1.02888 (0.0301)	1.07401 (0.02868)**
- Southeast	0.87681 (0.02179)***	0.85186 (0.02102)***	0.90863 (0.02158)***	1.05265 (0.01986)**
- South	0.95369 (0.02056)**	0.95094 (0.0196)**	0.89504 (0.02058)***	0.97408 (0.01858)
- Midwest	0.89885 (0.01892)***	0.8997 (0.01795)***	0.85723 (0.0186)***	0.89565 (0.01699)***
Multi-establishment firms	0.83476 (0.02831)***	0.97919 (0.02609)	1.11307 (0.02518)***	0.89586 (0.0255)***
Average employee age	0.99202 (0.00062)***	0.99018 (0.00061)***	0.99325 (0.00064)***	0.99061 (0.00058)***
Average employee tenure	0.99462 (0.00023)***	0.9948 (0.00021)***	0.99729 (0.00018)***	0.99461 (0.00019)***
Average monthly wage	0.99993 (0.00001)***	0.99998 (0.00001)***	0.99998 (0.00001)**	0.99994 (0.00001)***

► **Table 19. Binomial logistic regression of Lazarus recovery on firm-level predictors (odd ratios) (Cont.)**

Outcome	Workforce drop by 100%			
	Lazarus	Survivors	Late losers	Firms with no workers in 2019
Employees with secondary education (share)	0.99953 (0.00014)**	0.9995 (0.00015)***	0.99999 (0.00016)	0.99936 (0.00015)***
Employees with higher education (share)	0.99896 (0.00029)***	0.99829 (0.00028)***	0.99985 (0.00028)	0.99839 (0.00026)***

Note: The table shows the odds ratios for the estimated coefficients of a logistic regression of a binary indicator of Lazarus behaviour on a set of firm-level covariates. Lazarus firms were alive in year $t-1$, died in t and revived in $t+1$. A firm is considered dead if it has no employees each year. Standard errors are in parentheses. Stars indicate significance levels of rejecting the null hypothesis of the odds ratio being different from 1. Significance levels: * 0.1, ** 0.05, *** 0.001.

Employment growth determinants

Table 20 shows the results of an exercise similar to that above but with a focus on the predictors of employment growth, which is a key element of restorative resilience. We define the outcome variable as taking the value of 1 if a firm experienced growth between t and $t+1$, for all year pairs between 2016 and 2021.

Older and larger firms are more likely to expand their workforce year by year and this positive effect is consistent across years. Firms with multiple establishments are also substantially more likely to expand. The probability that a firm experiences employment growth doubles for firms with multiple establishments relative to firms with only one.

In terms of sectoral differences, these are marked and consistently present over time. Relative to agricultural firms, firms in retail, construction and services have a lower probability of expanding their workforce, while firms in industry are more likely to do so. Consistent with the observations above for the pandemic period, the odds ratio for the industry dummy is the largest for the probability of growing between 2020 and 2021.

Firms operating in Brazil's Northeast, Southeast and South are less likely to experience workforce growth than those in the North. This is the case in the Midwest too except during the period 2016–18, when firms in this region had significantly more chances to grow.

The effect of firm-level employee traits is varied. Firms with older employees and longer tenure are, on average, less likely to hire more workers year by year, consistent with our observation about restorative resilience. In contrast to the Lazarus analysis, however, firms that pay higher wages and employ a larger share of educated workers have a higher chance of expanding in general. This divergence is likely to be related to differential retention capacities of firms. Recall that the Lazarus analysis above is performed among firms that become inactive, while the growth analysis is based on a broader sample. On the one hand, firms that did not experience losses could be driving the intuitive positive association between higher productivity (higher wages and higher education) and growth. On the other hand, firms that require more qualified workers (among those that laid off their entire workforce due to the pandemic) might have a harder time attracting them post-pandemic, compared to firms that demand more readily available less-qualified personnel.

Overall, the consistency of the impact of these factors stands out in the analysis of employment growth. This suggests that a firm's general ability to increase the size of its workforce while being alive is a behaviour that can be well described by this set of predictors in a consistent manner over time. In contrast, the influence of firm characteristics on restorative resilience varies widely over time, as discussed in the previous section.

► **Table 20. Binomial logistic regression of employment growth on firm-level predictors (odd ratios)**

	2016–17	2017–18	2018–19	2019–20	2020–21
Firm age	1.00739 (0.00016)***	1.00663 (0.00016)***	1.00775 (0.00016)***	1.00429 (0.00017)***	1.00772 (0.00015)***
Number of employees	1.00025 (0.00001)***	1.00021 (0.00001)***	1.00032 (0.00001)***	1.00009 (0.00001)***	1.00029 (0.00001)***
Sector (omitted: agriculture)					
- Retail and trade	0.91124 (0.02192)***	0.97338 (0.02189)	0.96226 (0.02192)*	0.75643 (0.02361)***	0.89723 (0.02166)***
- Construction	0.87053 (0.01594)***	0.90052 (0.01609)***	0.89987 (0.01609)***	0.78585 (0.01689)***	0.87402 (0.01575)***
- Industry	1.09538 (0.01622)***	1.18551 (0.01636)***	1.21442 (0.01635)***	1.10983 (0.01716)***	1.23027 (0.01601)***
- Services	0.9035 (0.01597)***	0.95237 (0.01611)***	0.94339 (0.01611)***	0.67818 (0.01693)***	0.8677 (0.01577)***
Region of operations (omitted: north)					
- Northeast	0.9559 (0.00803)***	0.93272 (0.00793)***	0.91452 (0.00792)***	0.83022 (0.00859)***	0.94269 (0.00779)***
- Southeast	0.96683 (0.0075)***	0.92647 (0.0074)***	0.90861 (0.00737)***	0.83159 (0.00796)***	0.86269 (0.00726)***
- South	0.96058 (0.00786)***	0.90433 (0.00776)***	0.89029 (0.00774)***	0.8439 (0.00835)***	0.85287 (0.00761)***
- Midwest	1.03701 (0.00869)***	0.98132 (0.00851)**	0.95579 (0.00848)***	0.89059 (0.00916)***	0.90312 (0.00833)***
Multi-establishment firms	1.79194 (0.00506)***	1.90167 (0.00499)***	2.0148 (0.00499)***	1.74604 (0.00533)***	1.86303 (0.00491)***
Average employee age	0.98704 (0.0002)***	0.98762 (0.0002)***	0.9871 (0.0002)***	0.98828 (0.00022)***	0.98665 (0.0002)***
Average employee tenure	0.99104 (0.00006)***	0.99059 (0.00006)***	0.99076 (0.00006)***	0.99109 (0.00006)***	0.99043 (0.00005)***
Average monthly wage	1.00005 (0)***	1.00006 (0)***	1.00009 (0)***	1.00009 (0)***	1.0001 (0)***
Employees with secondary education (share)	1.00023 (0.00005)***	1.00032 (0.00005)***	1.00006 (0.00005)	1.00011 (0.00005)**	1.00023 (0.00005)***
Employees with higher education (share)	1.00253 (0.00008)***	1.00259 (0.00008)***	1.00239 (0.00008)***	1.0018 (0.00009)***	1.0013 (0.00008)***

Note: The table shows the odds ratios for the estimated coefficients of a logistic regression of a binary indicator of firms' year-to-year employment growth on a set of firm-level covariates. Lazarus firms were alive in year $t-1$, died in t and revived in $t+1$. A firm is considered dead if it has no employees each year. Standard errors are in parentheses. Asterisks indicate significance levels of rejecting the null hypothesis of the odds ratio being different from 1. Significance levels: * 0.1, ** 0.05, *** 0.001.

Conclusions

RAIS, the Brazilian set of administrative data linking between employers and employees, is a rich source of information for studying the patterns of firm resilience. Using data from RAIS between 2016 and 2021, we studied the prevalence and predictors of firm restorative resilience, also known as Lazarus behaviour. The pandemic years saw a reduction in firm mortality and an increase in firms' Lazarus revival compared to previous years. These changes in rates were driven mainly by real changes in outcomes, and not only by changes in the size of the reference population. Absolute firm mortality dropped by nearly 20 per cent and the number of Lazarus firms increased by more than 30 per cent. This might reflect substantive differences in firms' capacity to rehire employees between the years around the COVID-19 pandemic and previous crisis periods. We note that the rehiring rate between 2020 and 2021 was about three times higher than that during the 2015–16 economic recession in Brazil.

We study Lazarus-type recovery in more detail, with the help of multivariate regression analysis. For some of the predictors we analyse, the direction of their association with firm resilience varies over time. For instance, firm size is not statistically significantly correlated with Lazarus revival during the pandemic years, but had significant predictive power in previous years. This could indicate that the increase in restorative capabilities observed for this period was prevalent across firms of different sizes.

The time variation in the influence of firm characteristics like size, sector and location on resilience contrasts with the consistency of the effect of these traits on employment growth in general. Our results align with findings from the OECD (2017), which shows that larger and older firms are more likely to experience employment growth over time. Additionally, firms with multiple establishments have a higher probability of expanding employment year by year, echoing the OECD's (2017) conclusion that geographic diversification supports employment growth. We also observe that industrial firms and those in regions with higher educational levels are more likely to grow, reflecting the OECD's (2017) finding that sector and geographic location significantly influence employment dynamics. Furthermore, firms that pay higher wages and employ more educated workers tend to experience growth, consistent with the OECD's (2017) conclusion about the importance of human capital. Conversely, firms with older and longer-tenured employees are less likely to experience both restorative resilience and growth, in line with the OECD's (2017) observation that younger workforces are more conducive to expansion.

The previous analysis indicates that firms' capacity to expand their workforce is a relatively stable trait that can be well described by firm-level traits. In contrast, the nature of restorative resilience is different for different periods. Not only was mortality lower and firm revival higher during the pandemic years, but the firm-level characteristics that predict this behaviour changed during the pandemic. There can be multiple possible causes for this variation, none of which can be excluded through this descriptive analysis. On the one hand, firms' actual resilience capabilities could have changed over time. On the other hand, differences in the nature of the COVID-19 crisis could have made different sources of resilience more effective than in the past. Overall, the discussion showcases the vast potential that linked employer-employee data provides in assessing firms' resilience over time.

Our analysis strongly aligns with findings from Brazilian studies. For instance, research by Nakatani, Ribeiro, and Alves (2021), using RAIS data, documents the capacity of formal firms in Brazil's industrial and service sectors to rehire workers and stabilize employment in 2021, and emphasizes the role of formal labour institutions. Their work confirms that older and geographically advantaged firms had better recovery outcomes, aligning with the findings of this study. Moreover, Bartik et al. (2020), although focused on the United States, support the more general insight that firms embedded in formal employment systems were more likely to access wage subsidies and workforce retention schemes. This is relevant in the Brazilian context, where policy responses included payroll support measures for registered firms. Additionally, the International Monetary Fund (2021), in its analysis of Latin American countries including Brazil, shows that formal firms had lower exit rates and better trends in employment recovery. This supports the RAIS-based findings. The observed sectoral variation in recovery patterns in Brazil also corresponds to 2020 findings by Brazil's Institute for Applied Economic Research (IPEA),

which show that firms in services and IT were more resilient than those in high-contact sectors like hospitality or retail.

References

- Chacaltana, Juan, Guillermo Chang, Marta Favara, and Andy McKay. 2021. *Youth Labour Market Resilience during the COVID-19 Crisis in Three Middle-income Countries*. ILO.
- ILO. 2023. "Statistics on the Informal Economy". ILOSTAT database. Accessed 11 November 2025.
- . 2017. Recommendation 205, Employment and Decent Work for Peace and Resilience.
- OECD. 2017. *Business Dynamics and Productivity: Employment Growth of Establishments in the Brazilian Economy – Results by Age and Size Groups*.
- RAIS (Relação Anual de Informações Sociais (RAIS). 2022. *Manual de Orientação RAIS: Ano-Base 2021*.

► Concluding remarks

Enterprise and establishment surveys serve as indispensable tools for understanding the complex interplay between businesses and labour markets. This document has illustrated how different types of surveys, each with unique strengths and limitations, can be leveraged to address critical research questions. By examining resilience to the COVID-19 pandemic, the case studies from Colombia, Ecuador, and Brazil provide a compelling demonstration of the potential of enterprise surveys to generate actionable insights.

In Colombia, the analysis of the EMICRON survey reveals that 77 per cent of microenterprises are informal, and are mostly one-person operations. The study indicates that increased formalization boosts resilience, as formal firms, particularly those adopting digital technologies, consistently exhibit higher productivity and stronger performance. However, the COVID-19 pandemic inflicted substantial sales losses in 2020, though informal firms and those in agriculture experienced less severe declines and demonstrated quicker recoveries. This differential outcome is attributed to the inherent resilience of agricultural businesses, where operations are less constrained by social distancing measures and where there was continued demand for essential food supplies. Thus, while increased formality and digital adoption are linked to heightened resilience, the nature of the sector and its demand patterns can sometimes offset the disadvantages of informality.

In Ecuador, the findings based on the ENESEM survey focus exclusively on formal, registered firms and underscore several factors that affect resilience during the crisis. Firms that maintained or recovered their sales during the pandemic tended to be younger, had higher levels of diversification, invested more in technology and worker training, and showed reduced dependency on global supply chains. In this context, diversification and technology adoption, as well as investments in worker benefits, consistently increase resilience, whereas heavy reliance on international trade channels appears to heighten vulnerability. Although the evidence that younger firms were more resilient seems to diverge somewhat from the broader literature – which often posits that older firms are better equipped to face shocks – this result might be explained by sector-specific dynamics or survivor bias in the sample of firms that continued operating during the crisis.

The results for Brazil, derived from the RAIS administrative data, offer a detailed view of the formal sector by tracking employer-employee relationships. This study emphasizes the phenomenon of "Lazarus firms", which were capable of significantly restoring their workforce following initial pandemic-induced lay-offs. Here, firm size and age are not statistically significantly correlated with Lazarus revival during the pandemic years, while in previous years they had a significant predictive power. When examining the determinants of employment growth, firms with better pay and a more skilled workforce were more likely to grow after the pandemic.

When comparing the three countries, the studies consistently show that resilience is influenced by several overlapping factors, though with nuanced implications. In general, increased formalization and the adoption of digital technologies lead to greater resilience and recovery, as these factors bolster productivity and efficiency. Diversification and investment in worker training further support recovery, while heavy exposure to international supply chains can make firms more vulnerable during crises. Firm size is an important determinant of resilience, with SMEs exhibiting greater vulnerability. Sector-specific characteristics also play an important role, as seen with the relative resilience of agricultural businesses in Colombia, while in Ecuador services experienced the steepest recovery and in Brazil the retail sector was most able to recover its workforce. Overall, while the data broadly supports mainstream views in the literature, certain differences highlight the importance of considering local economic structures and sector-specific factors in policy design.

Turning now to an examination of data sources, Colombia's EMICRON highlights the importance of capturing informality and microenterprise dynamics, offering valuable lessons for fostering resilience in vulnerable economic segments. Ecuador's ENESEM underscores the role of structural surveys in understanding formal sector compliance and adaptability, while Brazil's RAIS showcases the power of longitudinal administrative data to analyse workforce restoration and firm survival.

These diverse approaches underscore a central conclusion: the selection of survey type must align with the research objective, whether it is understanding structural economic changes, labour demand, or resilience factors. The integration of complementary data sources and the promotion of greater access to microdata can significantly enhance the utility of these surveys for labour market analysis.

As we look to the future, the insights drawn from these case studies can inform both policy and research, aiding in the design of targeted interventions that bolster enterprise resilience and support sustainable economic recovery. By continuing to refine and expand the use of enterprise surveys, researchers and policymakers can better anticipate and respond to the evolving challenges facing businesses and workers alike.

