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Sustainable enterprises and jobs: Formal enterprises and decent work

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Preface

This thematic edition of the *World Employment and Social Outlook* report examines the fundamental role that sustainable enterprises play as engines of job creation, and how firms' characteristics and strategies are related to labour market outcomes and firms' performance. The analysis takes into account different initiatives by the international community and the ILO.

The report builds on the concept of "sustainable enterprises" elaborated at the 96th Session of the International Labour Conference in 2007 in the Conclusions on *The promotion of sustainable enterprises* adopted by the Conference. The concept is implicitly linked to a general approach to sustainable development – an approach which postulates a holistic, balanced and integrated perspective on development – and emphasizes that firms can meet their needs of competitiveness and profitability at the same time as advancing long-term societal goals.

The growing recognition of the contribution of sustainable enterprises since the 2007 Conference was demonstrated when the United Nations 2030 Agenda for Sustainable Development referred to the central role that enterprises play in productive and equitable growth, explicitly referring to the promotion of job creation, entrepreneurship and the formalization of and growth of micro-, small and medium sized enterprises as being at the heart of achieving decent work and economic growth (Goal 8).

In 2013, the ILO launched the Enterprises Initiative as one of seven initiatives to mark the ILO's centenary in 2019. It aims to advance established ILO objectives by identifying areas where the ILO can work with enterprises to achieve the goals of the Organization. Accordingly, the Office has been carrying out research on trends and experiences, developing networks and engaging in partnerships, and providing advice and support to sustainable enterprises. But more work is needed to deepen our understanding of how to strengthen the contribution of enterprises to decent work and economic growth.

This edition of the *World Employment and Social Outlook* therefore provides evidence to inform the international debate about the contribution of enterprises to decent work and economic growth. It finds that in today's fast-paced global environment, firms may often make strategic decisions involving competitiveness through a short-term rather than a long-term perspective. And decisions regarding hiring practices, training and efforts to innovate and engage in trade can have profound – in some cases counterproductive – implications for firm performance and labour market outcomes.

Based on the latest available data, the report finds that firms that invest in the sustainability of their workforce – through on-the-job training, promoting equity in employment opportunities and securing workers' protection and rights – as well as investing in other important factors of production, such as innovation, and engaging in external markets, can be highly competitive without sacrificing the creation of decent employment.

But enterprises cannot do it alone. All social partners have a role to play. Governments have a major role in shaping institutions that foster sustainable enterprises and inclusive growth, while workers and their organizations are important for advocacy of appropriate policies and regulations as well as representation.

The ILO will continue to explore these issues through further research and dialogue. It is hoped that through such endeavours we will contribute to the state of knowledge relating to the challenges posed by the future of work and to the design and implementation of policies to advance sustainable enterprises and decent work in the next century of the Organization's existence.

Guy Ryder
ILO Director-General

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Table of contents

Boxes

Figures

Tables

Executive summary

In the global economy, the environment for firms and job dynamics are constantly evolving…

The global and regional environment for firms has been constantly evolving since 2008. The impacts of lower economic growth and trade on global supply chains and the resultant concerns regarding job quantity and job quality are high on the agendas of many countries. Other important trends, notably technological changes and innovation, are shaping the world of work in new and different ways and have complicated the post-crisis environment. Against this backdrop, this thematic edition of the *World Employment and Social Outlook 2017* report examines how firms – as the engine of job creation – have been affected by and responded to these developments. In particular, the report analyses the implications of these developments on firm performance and job dynamics and considers how policies to support enterprises and the environment in which they operate could help to create more and better jobs and, in turn, achieve inclusive and sustainable growth.

Over 201 million workers worldwide are currently unemployed, an increase of 3.4 million compared to 2016. The global unemployment rate stands at 5.8 per cent, and is not expected to drop any time soon. Despite some progress made over the past decades, nearly 780 million workers in emerging and developing countries (corresponding to almost every third worker) are still living in conditions of extreme or moderate poverty. More than 1.4 billion workers the world over are in vulnerable employment, many of them in emerging and developing countries. The number of workers in vulnerable employment increases by around 11 million each year. This situation poses significant challenges, as these workers are less likely to have secure jobs with regular incomes and access to social protection. Even today, the world hence faces significant decent work deficits.

Private sector formal enterprises play a crucial role in creating decent jobs. This notion is echoed in the goals laid out in the Agenda for Sustainable Development, which places the promotion of job creation, entrepreneurship and the formalization and growth of micro-, small and medium-sized enterprises at the heart of achieving the goal of "decent work and economic growth" (Goal 8).

In 2016, the private sector employed 2.8 billion individuals worldwide, representing 87 per cent of total employment. This figure covers both the informal and formal sectors, and while enterprises in the former employ substantial numbers of workers, especially in some emerging and developing economies, formal sector firms employ more than half of the world's wage and salaried workforce in the private sector.

Moreover, while large enterprises are the principal source of employment in the formal private sector relative to small and medium-sized enterprises (SMEs), the contribution of SMEs to total employment has grown over the past years. Novel estimates of employment by firm size suggest that the number of employees within SMEs in the formal sector almost doubled in the 132 countries for which estimates are available, with SMEs' share of total employment rising from 31 to 35 per cent. But, there is considerable heterogeneity across regions and income groups. For example, in developing economies, SMEs account for 52 per cent of total employment, compared with 34 per cent in emerging economies and 41 per cent in developed economies. SMEs and young firms are also often more dynamic with respect to employment growth.

…and since the onset of the crisis many firms, notably SMEs, have struggled and remain underdeveloped in emerging and developing economies…

Before the global and financial crisis of 2009, the average employment growth for SMEs – focusing on full-time permanent employment only – was substantially higher than that for large firms, at 4.7 and 3.3 percentage points, respectively. However, full-time permanent employment growth in SMEs has stagnated in recent years. Similarly, job dynamics among young firms in terms of full-time permanent employment have weakened since the crisis. During the pre-crisis period, the employment growth rate among young firms was on average 6.9 percentage points higher than for established firms, but the difference declined to 5.5 percentage points in the post-crisis period. This change reflects developments in the overall business environment, whereby employment creation in large firms has remained weak, while new and younger firms have been shedding jobs at a much faster pace than before.

Firm-level employment dynamics also differ according to level of development. In fact, the capacity of SMEs to generate job growth, relative to large firms, increases with income per capita. In developing economies, the rate of job creation among SMEs is similar to that for large firms, but in emerging and developed economies, employment growth is higher among SMEs than large firms (although the premium relative to large firms is considerably lower in emerging economies than that in developed economies). This may reflect the fact that many SMEs in developing economies, and to a lesser extent in emerging economies, are entrepreneurs out of necessity, whose primary focus is to survive and not necessarily to expand.

…but, in addition, underlying these recent changes in firm-level employment are a number of structural issues that are constraining enterprise growth.

The environment within which firms operate – beyond recent cyclical developments – has an important effect on firm growth. The report shows that a range of country-specific factors, such as labour market institutions, historical patterns of organization, access to trade and global supply chains, market size and financing availability, affect firm growth and, in some instances, explain the persistence of informality – which can have widespread, negative consequences for businesses, workers and society.

A large number of firms, and by default workers, remain in the informal economy, and so the analysis presented in the report considers the wide-ranging effects of informality. These include, for example, a firm's ability to grow and create wealth and jobs which, in turn, affects the ability of workers to access social protection.

At the same time, in today's ever-changing business environment, individual firms must make decisions on how to respond to fluctuations in demand. Decisions regarding hiring practices, training and efforts to innovate can have profound – in some cases counterproductive – implications for firm performance and labour market outcomes.

First, trade can help firms grow and create jobs, with significant distributional consequences for both firms and workers…

International trade stimulates employment growth by providing firms with opportunities to enhance their competitiveness, to export to foreign markets and to make use of the best available production inputs through importing. However, for economic, social and political reasons, global trade has entered a period of stagnation, with important implications for employment growth. In 2016, an estimated 37 per cent of workers (equivalent to 167 million workers) were employed by exporting firms in the 132 countries analysed, which is less than before the economic and financial crisis. As trade has stagnated, so too has trade-related employment.

However, the impacts of trade in terms of productivity and quantity and quality of jobs vary considerably between firms, indicating that the gains from trade are not necessarily shared in an inclusive manner. The report finds that exporting and importing firms are more productive than firms that do not engage in trade, and that they pay higher wages than their non-trading counterparts. However, the productivity premiums for exporting and importing outweigh the wage premium by 13 and 5 percentage points, respectively. Similarly, for firms there are significant disparities. For instance, exporting firms that

supply inputs into global supply chains (GSCs) have higher productivity levels than other exporters. However, here too the wage premium is smaller than the productivity premium. Interestingly, being both an exporting firm and participating in a GSC as a firm that assembles final goods is associated with having a larger share of temporary employment. These findings confirm the importance of addressing distributional dimensions in making trade and GSCs work for all.

Moreover, the expansion of GSCs into countries lacking the institutional capacity to regulate and effectively enforce labour standards poses challenges to workplace compliance. In response, many multinational enterprises, which are key players in the coordination of GSCs, have undertaken voluntary initiatives to improve the monitoring of compliance with labour standards in their supply chains. While this is an important positive step, the analysis in the report shows that commitment by firms to the implementation of freedom of association remains a challenge.

…second, the business environment, in particular access to finance and labour market regulations, affects firms' human resources and financial strategies…

While firms need labour flexibility for production efficiency and for responding to changing market demands, there are various ways of securing such flexibility, with different outcomes for firms and workers. The report finds that by opting for internal functional flexibility (e.g. worker training), firms can maintain their overall competitiveness without sacrificing job quality. Flexibility can also be achieved through external numeric flexibility (e.g. by relying heavily on temporary workers), but gain tends to be short term in nature and associated with overall long-term negative implications for firms and workers. Indeed, in some cases it may lead to long-term negative productivity growth, which may trap enterprises within a vicious cycle of low wages and low productivity. The analysis indicates that labour regulations, if properly designed and implemented, can play a role in encouraging enterprises to pursue internal flexibility. In particular, ensuring that fixed-term employees have equal treatment to permanent employees may induce enterprises to make less use of temporary employment and to provide more training for workers, particularly permanent employees, yielding better outcomes for both workers and firms.

Securing sufficient funds for working capital and investments through formal external financing has strong positive implications, not only for the wages of workers but also for competitiveness, in terms of higher labour productivity and lower unit labour costs. Yet, access to finance consistently emerges as one of the major constraints facing enterprises, especially in developing economies. Part of the challenge lies in the fact that many firms do not apply for bank loans because of the high costs involved. The report finds that SMEs and young firms make greater use of bank loans for working capital when there are fewer financial market imperfections. This suggests that improving the institutional environment, through greater accountability, transparency in information and respect for the rule of law, has an important role to play in allowing financially constrained firms to gain access to external formal funds for their working capital, which may in turn allow them to invest, expand and hire more workers.

Importantly, greater efforts are needed to encourage the formalization of firms, such as measures to strengthen institutions and the rule of law. The ILO's Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204), provides guidance on facilitating the transition of workers and enterprises from the informal economy to the formal economy.

…and third, innovation is a major driver of enterprise transformation.

Innovation is another important source of competitiveness for enterprises, as well as a key driver of sustained growth and development. Yet there have been mixed views about whether innovation creates or destroys jobs and how workers are impacted in terms of job quality – a debate which has only intensified lately as new technologies risk to disrupt means of production. In fact, in recent years, considerable job contraction in non-innovative low-technology firms has also been observed, highlighting the high risk of job loss among low-skilled workers in the manufacturing sector. Moreover, the pace and spread of recent technological changes that could affect high- and low-skilled sectors have amplified these concerns.

Regarding sources of innovation, the report underlines that while R&D engagement is a significant determinant of successful innovation, other sources also play important roles, including public funding, external acquisition of technologies and on-the-job training. Overall, innovation leads to better labour

market outcomes: innovative firms tend to be more productive, create more jobs, employ more skilled workers – meaning that they employ more educated workers and offer more training – and hire more female workers. Yet, in some cases innovation has led to more intense use of temporary workers, and different types of innovation (product, process, marketing and organizational) can lead to differential effects. For example, firms that implement product and process innovations are more likely to hire workers on temporary contracts, while firms that adopt marketing and organizational innovations tend to employ more female workers.

Thus, adequate education, training and social protection policies are necessary both to foster innovation and to prepare workers (and firms) effectively for the changing job environment. This means that social partners and other stakeholders will be required to participate in reflections on the types of jobs and skills that will be relevant in the future. Additionally, these findings reinforce the importance of ensuring equal treatment for all workers in terms of social protection. Moreover, the importance of public funding and publicly funded research to innovation in firms highlights the role that public institutions can play in promoting innovation.

Looking forward, sustainable enterprises are at the centre of inclusive growth.

A comprehensive approach that addresses the systemic barriers characteristic of the prevailing business environment can assist firms to organize themselves in a win–win manner, i.e. one conducive to improving conditions for both firms and workers. Such an approach would lead to the growth of sustainable enterprises, and hence inclusive growth and decent work outcomes.

Introduction

Globally, the economic outlook is improving, but in many regions, growth rates remain below the level needed for rapid progress towards achieving the Sustainable Development Goals. At the same time, unemployment levels remain elevated and there are widespread concerns regarding the quality of jobs. In this context, it is important to recognize that firms are the engine of economic growth and employment creation. This notion is echoed in the goals laid out in the Agenda for Sustainable Development, which places the promotion of job creation, entrepreneurship and the formalization and growth of micro-, small and medium-sized enterprises at the heart of achieving the goal of "decent work and economic growth" (Goal 8). However, there are considerable knowledge gaps in this area. For this reason, enterprises are an integral part of the ILO's Future of Work Centenary Initiative in an effort, among other aims, to improve understanding of the link between enterprise growth and decent work outcomes.

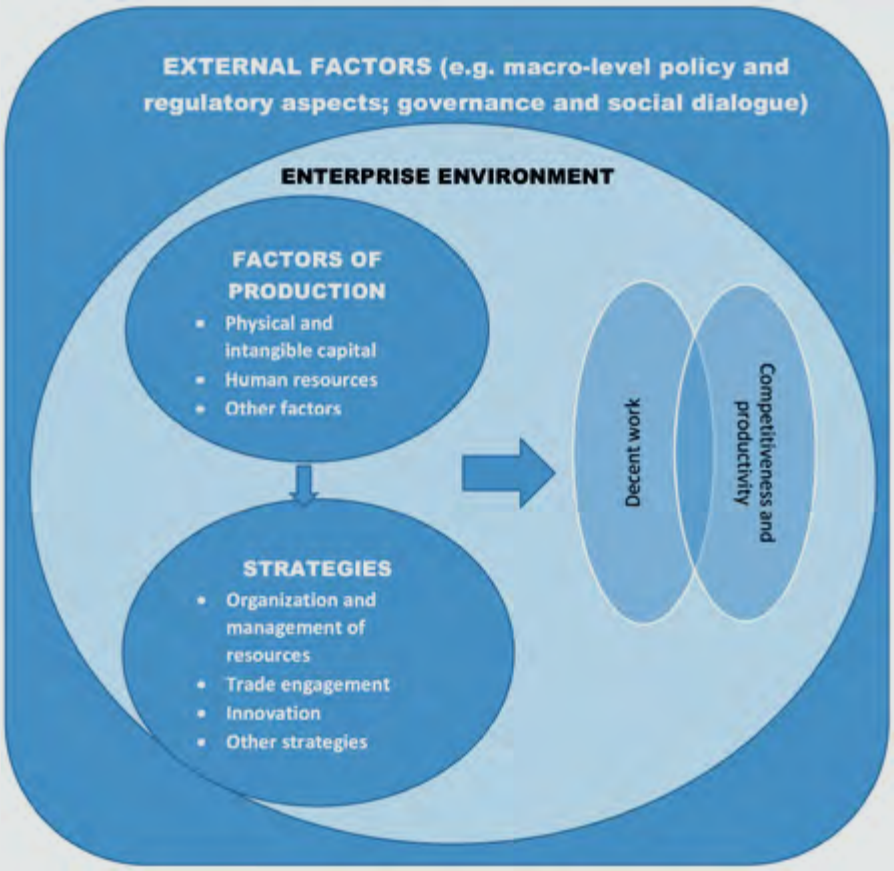
As part of that endeavour, this *World Employment and Social Outlook* examines the characteristics of firms (e.g. size, age and sector) and their strategies (internal and external), and how they relate to enterprise performance and labour market outcomes. As the title conveys, the focus is primarily on formal private sector enterprises and how they respond to changing global and national contexts. In particular, the report assesses how various internal strategies to manage and organize human and financial resources – including capital structure, innovation, trade and global supply chains – are linked with competitiveness and labour market outcomes at the enterprise level.

Like previous studies of a similar nature, this report emphasizes that enterprises alone cannot generate economic growth, full and productive employment and decent work for all. Such achievements require governments and social partners to take their share of responsibility. Governments play an important role, notably through effective social dialogue, in shaping institutions that foster sustainable enterprises and inclusive growth. Yet the report highlights that decent and productive employment is fundamentally based on firms fostering equity in employment opportunities, workers' protection and rights, and investing in workers as well as other important factors of production.

The definition of an enterprise used in this report is taken from the report *Decent work and the informal economy* to the 90th Session of the International Labour Conference in 2002, in which an enterprise is defined as "a unit engaged in the production of goods or services for sale or barter. In terms of legal organization, enterprises may be corporations (including quasi-corporate enterprises), non-profit institutions, unincorporated enterprises owned by government units, or private unincorporated enterprises". The conceptual framework for this report is adapted from the integrated approach to sustainable enterprise development and the 17 pillars for an enabling environment that emerged, respectively, from the report *The promotion of sustainable enterprises* to the 96th Session of the International Labour Conference in 2007 and the Conclusions adopted by the Conference. This approach takes a holistic view of the different interconnected spheres at the micro, macro and meta levels. The first of these, the micro level, covers individual enterprises, including how an enterprise is organized, its "immediate environment" (e.g. financial and human resources administration, and use of energy, transport and communications) and its relationships with other actors, such as suppliers and customers. Workplace organization, stakeholder support networks and some aspects of social dialogue are also included at the micro level. The macro level refers to the policy (including fiscal, sectoral, industrial, and trade and investment promotion policies) and regulatory aspects (e.g. business licensing and registration, bankruptcy law and corruption, investor and worker protection), which together shape the competitive and enabling environment for enterprises. Finally, the meta level encompasses the broad political, social, environmental and social dialogue conditions that influence the quality and functioning of institutions, including government (e.g. a stable political environment, the rule of law, democracy and levels of inequality).

Figure 1

Shaping enterprise behaviour: A framework of internal and external factors



Source: Adapted from ILO, 2007a.

The conceptual framework for this report, as based on this approach, is presented in figure 1. It integrates the different elements that play a role in shaping the behaviour of enterprises in the formal sector, taking into account that these enterprises are fundamental to the achievement of inclusive development and decent work outcomes. It also considers the fact that enterprises do not operate in a vacuum. At the micro level, it is the formal enterprise (which is the focus of the report) that is the main engine of decent job creation – and maintenance – as well as the basic unit for productivity and competitiveness. But enterprise strategies are influenced by the factors of production that are available, including capital and human resources. These factors, in combination with the external factors, influence enterprise strategies, for instance when deciding on the organization of production and market access options. At these levels, the report focuses on the macroeconomic environment (for instance, by conducting pre- and post-crisis analyses), the relationships between certain institutional and regulatory settings (such as labour legislation, adequate social protection schemes, and the role of governments in facilitating trade and economic integration) and access to and use of technology and innovation. At the meta level, it considers particular elements of governance, including social dialogue, rule of law and corruption, quality of institutions and government efficiency.

The various micro-, macro- and meta-level factors are treated – albeit to varying degrees – in an integrated manner throughout the various chapters of this report. Chapter 1 presents an overview of formal enterprises, mapping them by characteristics such as size, age and sector. More specifically, based on an analysis of private formal sector enterprises in 132 developing, emerging and developed economies, it investigates how these characteristics influence firm dynamics and employment outcomes by

identifying the types of firms (by size and age) that created and destroyed specific types of jobs during the pre- and post-crisis periods. A critical examination of the drivers of employment and growth is included in subsequent chapters, as well as a review of factors shaping firms' behaviours. This includes organization and management of resources, trade and innovation, and how these factors relate to job quality, competitiveness and labour market outcomes.

Chapter 2 sheds light on efficient and equitable management of human and financial resources as the key to promoting sustainable enterprises. Using firm-level data, it examines the differences in enterprise management practices in relation to firm performance, competitiveness and job quality. Given that enterprises' managerial decisions are influenced by the wider business environment, it also analyses the relationships between external factors, such as regulations and institutions, as well as enterprises' managerial practices. The recent stagnation in international trade and its implications for the distribution of jobs across trading and non-trading firms are documented in Chapter 3. The share of workers employed by exporting firms dropped significantly during the financial and economic crisis, and stands now at 37 per cent (corresponding to 167 million workers) in the 132 countries for which data are available. Against this backdrop, the chapter then examines how trade and global supply chains are related to the efficiency and labour market outcomes of firms. Finally, Chapter 4 aims to contribute to the debate on the links between innovation, productivity and employment (in its various aspects) based on firm-level data. To achieve this, it examines the differences between innovative and non-innovative firms in terms of labour productivity, job creation and selected labour market outcomes, such as type of employment contract (temporary/permanent), skills (education and on-the-job training) and female employment. Moreover, going beyond R&D engagement, the chapter explores various factors (both internal and external) that make firms more likely to innovate.

1 Enterprise dynamics and employment growth

Introduction

Private sector enterprises[1] account for the bulk of global employment: in 2016, 2.8 billion individuals were employed by the private sector, which represents 87 per cent of total employment, with the remaining 13 per cent in non-market services.[2] Although private enterprises' share of employment differs across countries, a strong private sector is the foundation for growth, job creation and poverty reduction. This is universally recognized in the United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs), which explicitly refer to the role of entrepreneurship and the formalization and growth of micro-, small and medium-sized enterprises (MSMEs) in achieving the goal of decent work and economic growth.

In this context, a range of factors, including firm-level characteristics, influence and determine the contribution of private sector enterprises to the achievement of decent work goals. Some of these characteristics are known to be particularly important in determining both the quantity and quality of employment. Informality, particularly informal enterprises, is one characteristic that has already been much analysed and debated, including in previous editions of this report (ILO, 2014, 2015a, 2016a).

Another related characteristic of major importance is firm size. Employment performance, as measured by the quantity and quality of jobs, tends to vary between large, medium and small enterprises. For instance, previous studies have demonstrated the critical contribution of entrepreneurship and small and medium-sized enterprises (SMEs) to employment and economic growth (Beck, Demirgüç-Kunt and Levine, 2007; ILO, 2007a, 2015b; de Kok, Deijl and Veldhuis-Van Essen, 2013). The age of firms is also often seen to be a factor influencing their employment performance.

One critical question in this regard is whether the relationship between firms' characteristics and employment has been changing over time, particularly in the context of the global and financial crisis of 2009.[3] As economic crises often involve large-scale job destruction, which may lead to changes in firm-level employment dynamics, it is important to examine time-related changes and, more interestingly, whether there have been any post-crisis effects.

With this in mind, this chapter investigates how employment outcomes vary with respect to firm size, age and sector and over time. It provides an in-depth analysis of formal private sector enterprises in developing, emerging and developed economies.[4] Covering over 150 economies, it is the most comprehensive firm-level analysis to date on employment and employment quality based on the selected firm characteristics.

1. A private enterprise is defined as a unit engaged in the production of goods or services for sale or barter. In terms of legal organization, a private enterprise may be a corporation (including quasi-corporate enterprises) or an unincorporated or non-profit institution.
2. Calculations based on ILO Trends Econometric Models. "Non-market services" refers to the common public sector (education, health and social services, public administration and defence).
3. Hereinafter referred to simply as "the crisis", unless otherwise stated.
4. For details regarding the list of regional, country and income groupings used in this report, see Appendix A.

The chapter finds that both firm size and age are related to employment growth and types of employment. In particular, relative to SMEs, large enterprises are the principal source of employment in the formal private sector. But SMEs and young firms are more dynamic than large firms, both with respect to employment growth and as an important source of employment and firm ownership for certain groups, particularly women. Since the crisis, for certain types of employment the contribution of young firms and SMEs has declined, owing in part to the faster rate of job destruction seen in SMEs relative to large enterprises. Finally, region-specific (and by extension country-specific) characteristics play a stronger role in influencing firm size than the specific sectoral composition.

These findings shed light on the importance of an enabling environment for enterprise survival and growth. Indeed, there is a need for policies to better promote SMEs' and young firms' access to resources, particularly in the post-crisis era. The findings also highlight the need to strengthen the business environment for all firms.

The chapter is structured as follows. Section A provides a snapshot of enterprises by size and age across regions, and seeks to determine the extent to which differences in firm size across regions are driven by country-specific and industry-specific factors. Section B analyses the firm-level employment dynamics, including an analysis of net job growth (where jobs are created and destroyed) along with the main characteristics of enterprises. In order to gain insights into changes over time, the section compares the pre- and post-crisis periods. Section C summarizes the main findings. A more detailed analysis of the drivers of employment and growth – as well as an analysis of factors influencing firms' behaviour – is presented in subsequent chapters. This includes organization and management of resources, trade and innovation, and how they relate to job quality, competitiveness and labour market outcomes (Chapters 2, 3 and 4).

A. Global overview of employment and trends, by enterprise structure

The term enterprise covers a diverse range of entities. It encompasses a broad spectrum of firms and different types of workers, in both the formal and informal sectors. The starting point of this chapter, however, is an analysis of the distribution of employment in the formal sector, notably SMEs and large enterprises (box 1.1). Section A thus lays the groundwork for the report by mapping these firms by size, age and sector, and by their contribution to employment. The pre- and post-crisis trends are covered in section B. To the extent possible, informal enterprises and micro-enterprises are also examined, but due to data restrictions this analysis is limited in scope.

This report defines the following categories of firm size: micro-enterprises, which have fewer than five employees; small enterprises, between five and 19 employees; medium-sized enterprises, between 20 and 99 employees; and large enterprises, 100 or more employees. These definitions are consistent with the World Bank's definitions of firm size (box 1.1). The firm age categories are well established in the literature and are defined as follows: young (0–5 years), mature (6–10 years) and old (more than 10 years).

Half the world's workforce is in the informal economy

While it is true that private sector enterprises are a major source of employment – 87 per cent of total employment, as stated previously – this includes employment generated by informal enterprises, which can be substantial, especially for some developing and emerging economies. According to ILO estimates, about half the world's workforce is employed in the informal economy, the bulk of which is in the emerging and developing world.[5]

The informal economy is a broad concept, referring to "all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements" (ILO, 2014, p. 4). As such, it includes *firms* operating in the informal sector and *informal jobs* in the informal

5. Calculations based on ILO STAT.

Box 1.1

Data coverage and definitions

Types of firms covered in the report: Figure 1.1 shows the types and range of enterprises covered by this report. The report focuses primarily on the formal private sector, notably SMEs and large enterprises (dark green area). It excludes public and agricultural enterprises from the analysis (white areas). To the extent possible, the report also includes informal and micro-enterprises (light green areas).

Definition of firm size: Definitions of firm size vary by country and international organization, based on a range of criteria, such as number of employees or value of sales and/or assets. The most commonly used size thresholds define small enterprises as firms with fewer than ten or 50 employees and medium-sized enterprises as having fewer than 100 or 250 employees. Some studies, however, argue that for medium-sized enterprises in developing economies, the threshold of 250 employees is "very high". In general, at the country level, lower size thresholds for large enterprises tend to be used for developing and emerging economies than for developed economies.[1] In one study of 132 economies, two-thirds of the countries defined MSMEs differently than the 250 employee threshold (Kushnir, Mirmulstein and Ramalho, 2010).

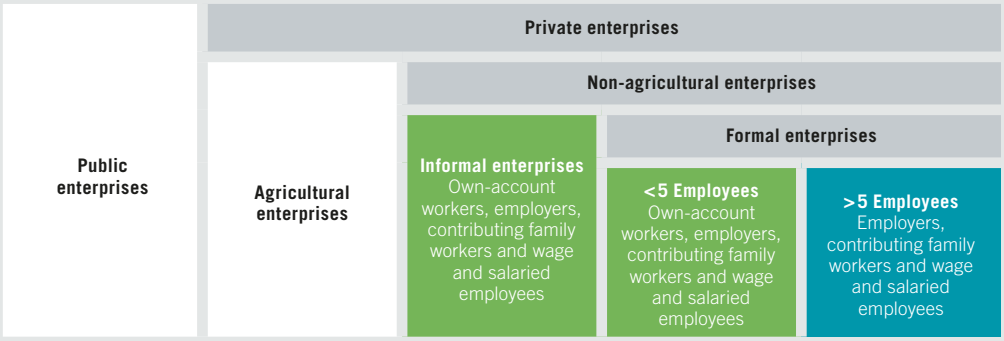
This report defines, unless otherwise stated, micro-enterprises as firms with fewer than five employees, small enterprises as firms with between five and 19 employees, medium-sized enterprises as firms with between 20 and 99 employees, and large enterprises as firms with 100 or more employees. This is in line with the definition introduced by the World Bank in its World Bank Enterprise Surveys (WBES).

All data are at the establishment level. An establishment can be a part of a larger enterprise group with a parent firm, therefore the size of the establishment and that of the parent firm can be different. This report refers to the size of the establishment, not that of the parent firm. This can result in the misrepresentation of the size of some firms, especially in the retail and wholesale sector, where firms tend to expand by creating a number of relatively small establishments (Haltiwanger, Jarmin and Miranda, 2013). However, particularly in the WBES, the vast majority of establishments are independent firms. Thus, the mismatch between establishment and firm size is small and does not severely affect the analyses.[2]

Definition of firm age: The definition of firm age is more standardized across studies (e.g. Aga et al., 2015; Ayyagari, Demirgüç-Kunt and Maksimovic, 2014; Criscuolo, Gal and Menon, 2014; Haltiwanger, Jarmin and Miranda, 2013; Rijkers et al., 2014). Therefore, firms are defined as: young (0–5 years), mature (6–10 years) or old (11+ years).

Figure 1.1

Types of enterprise and coverage in the report



Note: White areas indicate types of enterprise not covered by the report. Light green shading indicates types of enterprise that are covered by the report but, due to data restrictions, are not a main focus. The dark green shading indicates the types of enterprise that are the main focus of the report.

[1] *See http://www.enterprisesurveys.org/; EU recommendation 2003/361, available at: http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en.* [2] *For instance, in the data set for the retail and wholesale sector, firms that are part of a larger enterprise group and have a parent firm constitute 4.8 per cent of the total number of firms.*

and formal sectors. In practice, it is difficult to measure the number of informal enterprises. There are variations in the definition of informality across countries, based on such characteristics as registration status, social security coverage and type of employment contract (ILO, 2014, 2015b). Additionally, given its nature, extensive (and reliable) data for the informal economy are, by definition, hard to collect on a broad scale.

Based on available information, when one considers all enterprises together then a large share of them, particularly in developing economies, would be classed as informal. In fact, one estimate suggests that 78 per cent of all MSMEs globally are informal enterprises, while the other 22 per cent are in the formal sector (of which 9 per cent are SMEs in the formal sector) (IFC, 2010).

Micro-enterprises make an important contribution to employment creation

The contribution of formal micro-enterprises to growth and employment is also an important consideration. An analysis of 14 economies across Africa and Asia shows that, in some instances, formal micro-enterprises contribute a significant share of employment (figure 1.2, panel A). In six of the 14 economies, micro-enterprises account for between 13.8 and 48.7 per cent of permanent employment. For instance, in the Democratic Republic of the Congo, the share of employment in formal micro-enterprises is relatively high (48.7 per cent), possibly owing to the small-scale development approach that has characterized the country's transition from conflict to peace (Fox and Sohnesen, 2016; Santos, 2003). There has also been a shift towards small-scale artisanal mining as a principal means of livelihood in both the Democratic Republic of the Congo and Burkina Faso (38.5 per cent). This form of employment brings in higher earnings than working in medium-sized or large enterprises and has become a permanent feature of Africa's rural economy (Hilson, 2009). In the other eight economies, formal micro-enterprises account for less than 10 per cent of formal employment.[6]

Among a selected group of developed economies for which information is available, micro-enterprises (defined in this instance as having fewer than ten employees) are an important contributor to employment levels, albeit with significant heterogeneity across countries (figure 1.2, panel B). In this sample, micro-enterprises account for more than one-fifth of total employment in most of the economies, rising to 46 per cent and 59 per cent in Italy and Greece, respectively. Of course, it should also be noted that because the definitions of employment (permanent full time vs total) and firm size (fewer than five vs fewer than ten) are different between panels A and B, the figures are not directly comparable.

Other business models, such as cooperatives, provide important employment opportunities, particularly for vulnerable groups of workers

Another type of ownership structure that is important in the context of employment but difficult to capture given the nature of the enterprise survey data used for this report, is the cooperative model. Cooperatives adopt a business model that, besides generating profits, like most enterprises, sees firms operating within a framework of guiding principles (such as voluntary and open membership, democratic member control, member economic participation, autonomy and independence, among others) and values (such as honesty, social responsibility and caring for others).[7] These cooperatives are particularly relevant for micro-enterprises in agriculture and for groups of workers who can experience challenges in the labour market (such as women, indigenous peoples, migrants, self-employed workers, freelancers and independent contractors, as well as workers in the gig economy). They provide these groups with much-needed market access, and also with certain levels of protection and organization, allowing them to satisfy their customers' needs for goods and services in a long-term, sustainable manner (Birchall and Ketilson, 2009; Simmons and Birchall, 2008; Salvatori, 2017; Smith, 2014).

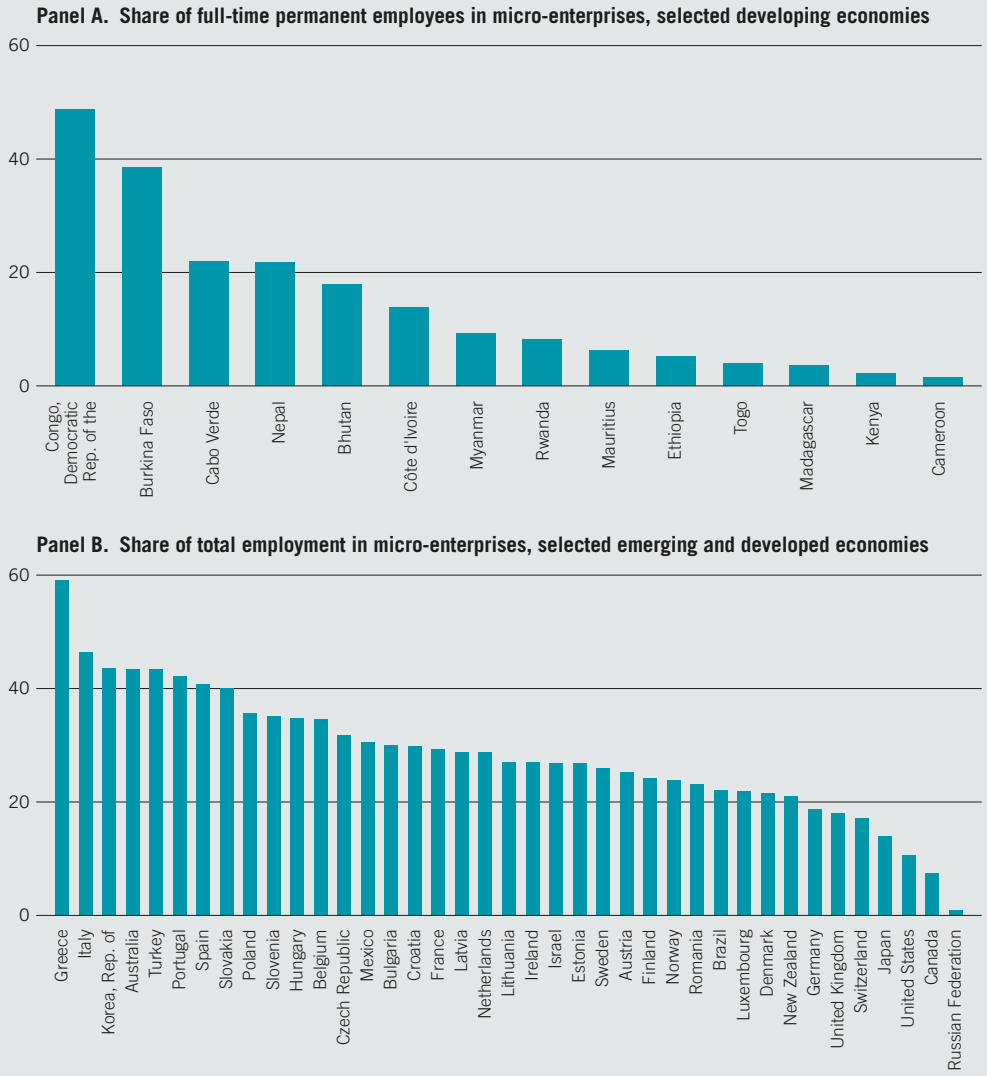
A global census of cooperatives conducted from 2013 to 2014 collected data from about 2.6 million cooperatives in 145 countries, which together had over 1 billion members and clients (UNDESA, 2014).

6. In Kenya, one of the economies with less than 10 per cent of formal employment in micro-enterprises, part of the reason could be the presence of a large informal economy. Indeed, most micro-enterprises operate informally (82.7 per cent) owing to high operating costs, declining income and difficulty in obtaining licences (World Bank, 2016).

7. The other cooperative principles are: education, training and information; cooperation among cooperatives; and concern for community (Birchall and Ketilson, 2009). It should also be noted that cooperatives, along with other types of collaborative organizations and enterprises (e.g. social enterprises), are part of the social and solidarity economy (ILO, 2016b).

Figure 1.2

Contribution of micro-enterprises to employment, latest year (percentages)



Note: For panel A, micro-enterprises are defined as firms with fewer than five employees; data are only available for full-time permanent employment. In panel B, micro-enterprises are defined as firms with fewer than ten employees; data are for total employment.

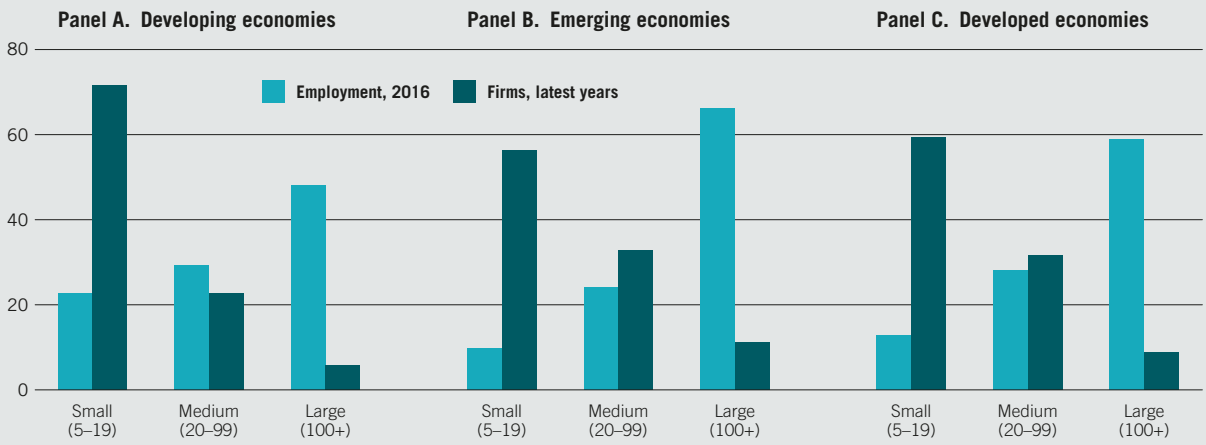
Source: ILO calculations based on World Bank Micro Enterprise Survey, August 2016 (panel A) and OECD, 2016 (panel B).

It found that about 12.6 million employees worked in 770,000 cooperatives (not including data from the nearly 1 million Chinese agricultural cooperatives).[8] Another report (Roelants, Hyungsik and Terrasi, 2014), which takes into account a broader range of workers, including both full-time and part-time, using official data from 74 countries (covering 75 per cent of the world's population), estimates that 26.4 million people are employed in cooperatives as employees or worker-members. It also estimates that 223.6 million producers are linked to cooperatives through their system of production.

8. Recent studies include the 2016 World Co-operative Monitor report, which used information from 2,370 cooperatives in 63 developed and developing countries (International Cooperative Alliance and Euricse, 2016). It found that more than half of those cooperatives had registered a turnover above US$100 million, and that they operate in the following sectors: agriculture and food industries (26 per cent), insurance (22 per cent), banking and financial services (16 per cent), wholesale and retail trade (14 per cent), health and social care (7 per cent), industry (6 per cent), and other services (9 per cent) and activities (1 per cent).

Figure 1.3

Distribution of total employment and number of firms between SMEs and large firms, 2016 and latest year (percentages)



Note: The data on employment shown in the figures are estimates for 2016, based on the ILO's estimation model for employment by firm characteristics covering 132 economies. See Appendix C for detailed descriptions of the methodology. The data on firms are weighted averages based on the population estimates of the number of firms for the latest available years from the WBES. See Appendix A for regional groupings and Appendix B for a detailed list of countries. See the WBES methodology page for more details on sampling and weights, available at: http://www.enterprisesurveys.org/methodology.

Source: ILO estimates and calculations based on World Bank Enterprise Survey, August 2016.

Efforts by multiple organizations – including the ILO[9] – to gather large-scale and comparable statistics are under way. Country-specific databases are contributing to this endeavour, such as one compiled in Italy (ongoing since 2010) that includes financial and employment data from over 80,000 cooperatives (Euricse and Carpita, 2011; Euricse, 2015).

While cooperatives, informal enterprises and micro-enterprises are important considerations in terms of firm-level dynamics and employment creation, owing to data limitations the remainder of this chapter focuses on the contribution of SMEs and larger firms in the formal sector.

Employment in the formal sector in small, medium-sized and large enterprises is heterogeneous across regions

The latest estimates for SMEs and large enterprises in the formal sector suggest that there is considerable heterogeneity across regions and income groups. For example, in developing economies, SMEs account for 52 per cent of total employment, compared with 34 per cent in emerging economies and 41 per cent in developed economies (figure 1.3).[10] Thus, on average, there seems to be a U-shaped employment distribution for SMEs across regions, based on the level of income. This distribution could be related to the process of structural transformation, where in the initial stages of development there is a high number of, and considerable share of employment in, smaller firms; but as economies become more sophisticated at organizing production, manufacturing firms grow in size (Biggs and Oppenheim, 1986; Kuznets, 1973; Lewis, 1954).[11] However, in later stages of development, as demand and production shift towards more modern service industries, which tend to be smaller in size, greater diversity in firm size can occur (Loveman and Sengenberger, 1991).[12] Yet, a firm-level analysis at the

9. See ILO, 2016c.

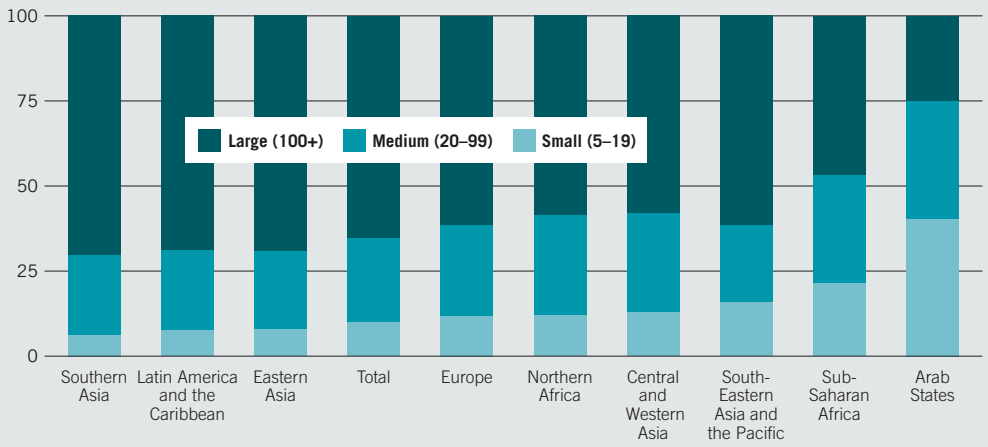
10. As discussed in box 1.1, there are different definitions of what constitutes an SME. Therefore, to validate the analysis, employment shares are also calculated based on an alternative size definition for SMEs (that is, 20–249 employees). The results based on this definition follow a similar pattern.

11. This was the case in the East Asian economies of Indonesia, Japan, Republic of Korea and Thailand, where the average firm size increased as they developed their manufacturing sectors (Poschke, 2014).

12. Ayyagari, Demirgüç-Kunt and Maksimovic (2014) also find that there is a cross-country variation of the SME size class, which initially decreases as average income levels rise, but then increases at higher income levels.

Figure 1.4

Distribution of total employment by region and firm size, 2016 (percentages)



Note: The data shown in the figure are estimates for 2016, based on the ILO's estimation model for employment by firm characteristics covering 132 economies. See Appendix C for detailed descriptions of the methodology. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

country level finds only a weak relationship between size and income per capita. This suggests that other factors besides economic development are at play in determining firm size – an issue analysed later in this section.

In all regions, the share of firms in the overall firm population declines as firm size increases, and SMEs account for at least 90 per cent of all firms in the formal sector.

There are also regional variations in terms of share of formal employment by firm size. Across all regions, the average employment share for SMEs is 34.8 per cent, but the shares are much higher in Arab States (75.2 per cent), sub-Saharan Africa (53.3 per cent) and South-Eastern Asia and the Pacific (38.5) (figure 1.4).[13] In the Arab States, this is partly driven by small-scale employment in conflict areas such as Iraq, as well as the exclusion of large resource-based economies from the database. In Southern Asia, Eastern Asia and Latin America and the Caribbean, there are relatively lower shares for SMEs.

The share of total employment in SMEs is growing

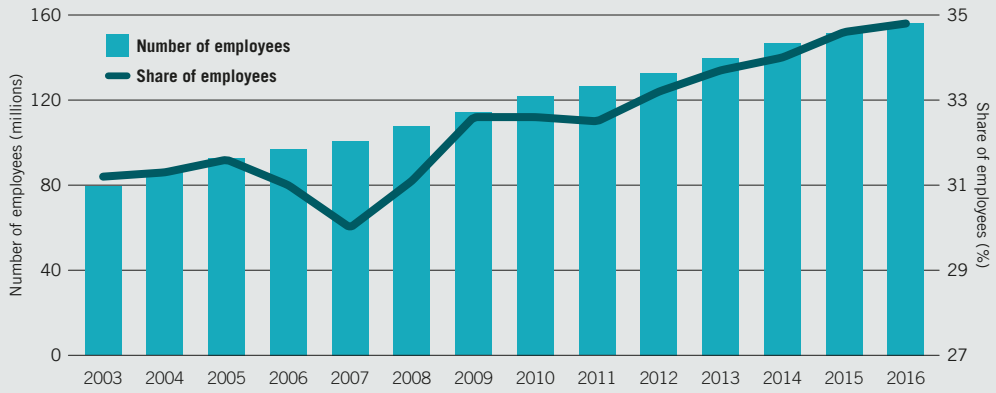
When it comes to employment dynamics in the formal sector, the focus of this report, numerous studies have documented the importance of SMEs in economic growth and employment creation. Birch's seminal study found that SMEs were the major job creator in the United States (Birch, 1979), and subsequent studies have highlighted the important contribution of SMEs to employment levels and growth in developing, emerging and developed economies (Ayyagari, Demirgüç-Kunt and Maksimovic, 2011; Aga et al., 2015; Criscuolo, Gal and Menon, 2014). Estimates for this report based on 132 economies show that SMEs' share of total full-time employees in the formal sector increased by 3.6 percentage points between 2003 and 2016, from 31.2 per cent to 34.8 per cent (figure 1.5).[14] The number of total full-time employees in SMEs has also continued to rise: in fact, over the period 2003 to 2016 the number nearly doubled, from 79 million to 156 million.

13. The 34.8 per cent average share is based on a cut-off (between SMEs and large firms) of 100 employees. If the cut-off is raised to 250 employees, the SME average across all regions rises to 46 per cent, and the shares for Northern Africa (53 per cent), sub-Saharan Africa (56 per cent) and Europe (60 per cent) also increase.

14. Due to data availability constraints, the analysis does not include firms with fewer than five employees.

Figure 1.5

Number and share of total full-time employees in SMEs, 2003–16



Note: The data shown in the figure are based on the ILO's estimation model for employment by firm characteristics covering 132 economies. See Appendix C for detailed descriptions of the methodology. See Appendix B for a detailed list of countries in WBES and Appendix C for methodology. See the WBES methodology webpage for more details on sampling and weights, available at: http://www.enterprisesurveys.org/methodology.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

SMEs are also an important source of female employment and firm ownership

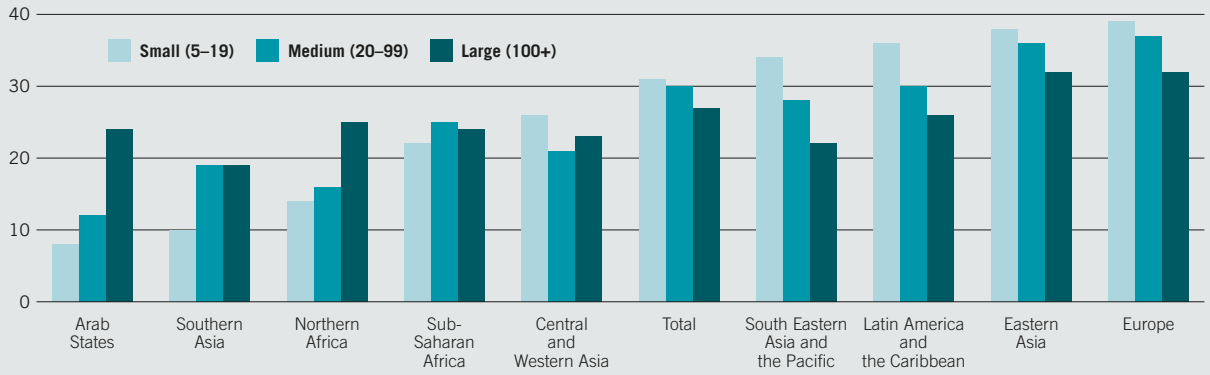
The available evidence shows that full-time female permanent employees in the formal sector are more likely to be found in SMEs than in large firms. On average, across all regions, around 31 per cent of full-time permanent employees in SMEs are women, compared with 27 per cent in large enterprises (figure 1.6). Above-average shares of women in SME employment are found in Europe (around 38 per cent), Eastern Asia (37 per cent), South-Eastern Asia and the Pacific (31 per cent) and Latin America and the Caribbean (33 per cent).

In Southern Asia, as well as both African regions and the Arab States, the share of women in full-time permanent employment in SMEs is considerably lower, at less than one in four. In some regions, this is offset by a higher share of women's employment in large enterprises (such as Arab States and North Africa), but in the latter case, both shares remain below the average for all regions.

Of course, the differences in women's full-time permanent employment across regions are linked to variations in sectoral and occupational segregation. A related factor is the extent to which women work in part-time employment or in enterprises in the informal sector (many of which are MSMEs – see above – also not captured here).

Figure 1.6

Share of women in full-time permanent employment, by region (percentages)

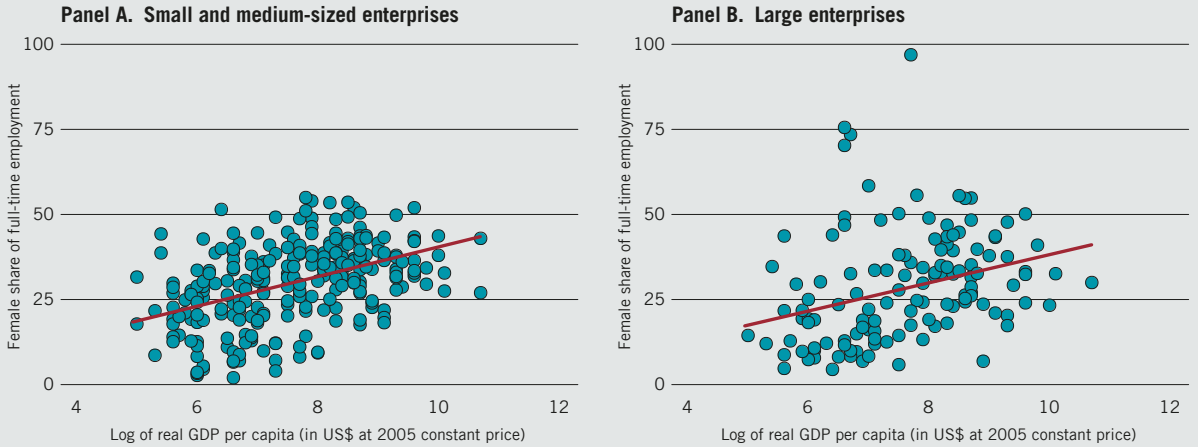


Note: Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO calculations based on World Bank Enterprise Survey, August 2016.

Figure 1.7

Female share of full-time permanent employment versus income per capita, by firm size, latest year (percentages)



Note: Data available only for full-time permanent employees. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

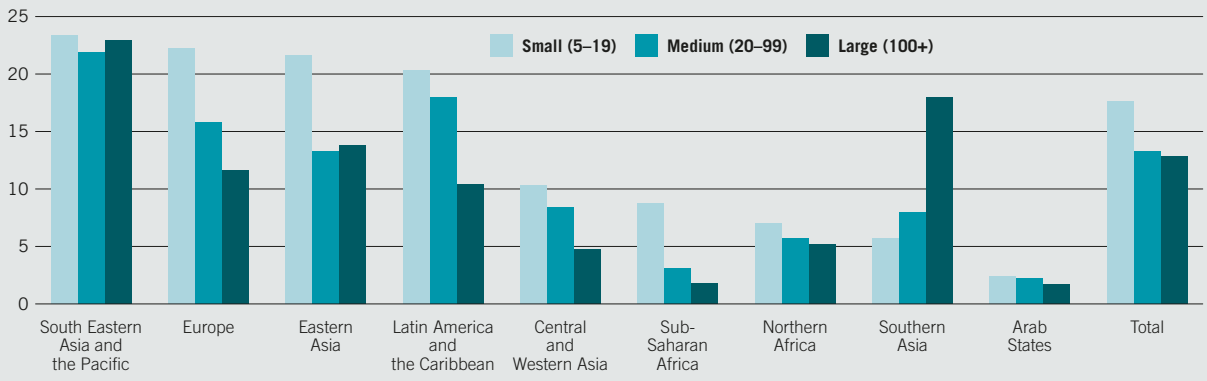
Source: ILO calculations based on World Bank Enterprise Survey, August 2016; and World Bank World Development Indicators.

It should also be noted that the share of women's employment, particularly in SMEs, is strongly (positively) correlated with income per capita of the country (figure 1.7). In this respect, women's engagement with enterprises can have important growth and development implications, because micro-enterprises and SMEs are often an entry point for women into the formal labour market (see also box 1.2). A recent ILO report (ILO, 2017) suggests that if the gap between women's and men's participation in the labour market were reduced by one-quarter by 2025, it would have the potential to add US$5.8 trillion to the global economy, or 3.9 per cent of global GDP. The largest beneficiaries would be Northern Africa, Southern Asia and the Arab States, where the contributions would be 9.5, 9.2 and 7.1 per cent, respectively.

Moreover, with the exception of Southern Asia, MSMEs are more likely than large enterprises to have a female as their top manager (figure 1.8). The distinction is especially large between small and large enterprises in Europe, Latin America and the Caribbean and sub-Saharan Africa. With micro-enterprises in particular, the high share of women as top managers is due to the high share of women owning such enterprises. In developing economies, owning or working for a micro-enterprise has often been the only option for women wishing to enter the labour market (Kabeer et al., 2010). In this respect, employment through MSMEs has the capacity to contribute to the larger goal of women's economic empowerment and gender equality (box 1.2).

Figure 1.8

Share of firms with female top manager, by firm size, latest year (percentages)



Note: Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO calculations based on World Bank Enterprise Survey, August 2016.

Box 1.2

Women's employment in micro-enterprises: Evidence from 11 low-income countries

In eight out of 11 countries for which data are available, women have a higher proportion of employment in micro-enterprises than in firms of other sizes (figure 1.9). In Bhutan and Cabo Verde, the share is at least 60 per cent, compared with around 15 and 35 per cent, respectively, in large enterprises.

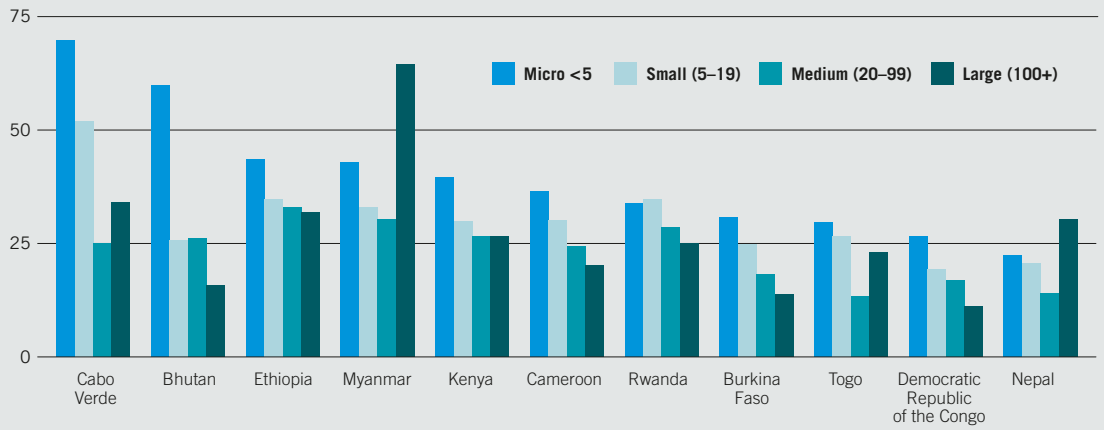
The high share of women in micro-enterprises can be attributed to a number of factors, mostly related to female entrepreneurship.

- **Needs-based employment:** Female-owned micro-enterprises are often necessity-based, rather than opportunity-based, i.e. the aim is to fulfil family needs or supplement family income. This is corroborated by literature on the "added worker effect" (Lundberg, 1985), which refers to a temporary increase in female labour force participation when men are unemployed or do not earn enough money to support the family. With need being the sole driver, there is no motivation to grow these enterprises or to formalize them (ILO, 2014).
- **Access to resources:** Women are often the main target of microfinance institutions, which enables them to start businesses. However, the amount of capital they start with is often lower than that of their male counterparts. Having less capital, women tend to start smaller firms. One study on Ethiopia found that female-headed firms started with an average capital of US$2,115, while male-headed businesses started with an average capital of US$3,161 (Bekele and Jacobs, 2008). In addition, further access to credit is limited, making it difficult for women in micro-enterprises to grow their businesses if that was their preference.
- **Time factors:** Women's share of unpaid care work is substantially higher than that of men, leaving them in a state of "time poverty". In Kenya, most female owners of enterprises care for more than six dependants, often with little or no assistance from their spouses (ILO, 2008). With less time to invest in their enterprise, women operate smaller businesses.

In developed economies there is also a high rate of female entrepreneurship: the number of female sole proprietors of micro-enterprises ranges from 20 per cent to 40 per cent, averaging 25 per cent (ILO, 2015b). Additionally, the survival rates and contribution to employment creation are similar in male- and female-owned enterprises in the first three years after start-up; however, the average sales turnover of women entrepreneurs is a fraction of that of their male counterparts (ibid).

Figure 1.9

Share of female full-time permanent employees by firm size, latest year (percentages)



Note: Data for Burkina Faso, Cabo Verde, Nepal and Togo are from 2008; for Ethiopia and Rwanda from 2010; for Democratic Republic of the Congo and Kenya from 2012; for Myanmar from 2013; for Bhutan from 2014.

Source: ILO calculations based on World Bank Enterprise Surveys, August 2016.

The sector to which a firm belongs is an important determinant of firm size, but country-specific characteristics are more important

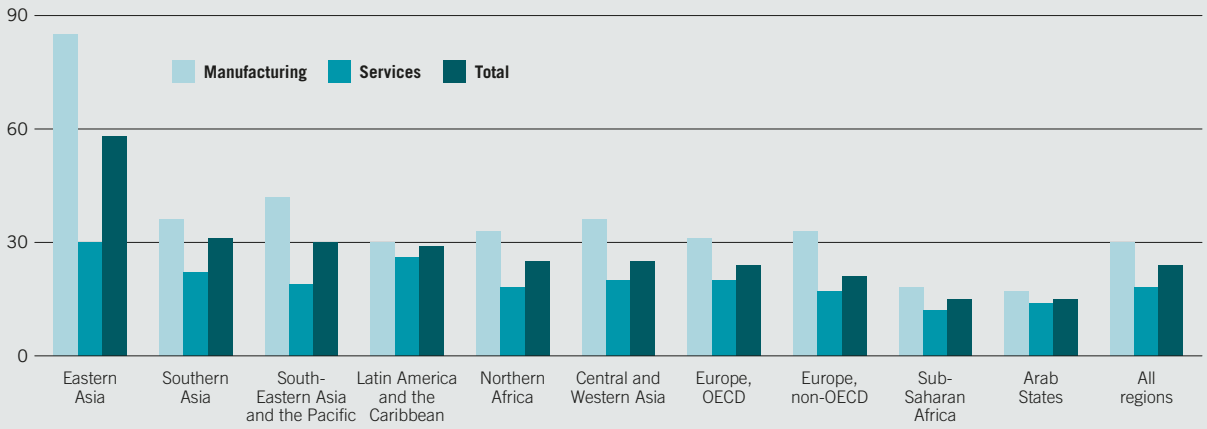
Variation in firm size has been attributed to a number of sector- and country-specific factors. These include industrial composition (which can have an impact on the entry costs, e.g. fixed costs such as capital investment), market size and market access – including openness to trade, ownership status and institutions (Bartelsman, Haltiwanger and Scarpetta, 2004; Criscuolo, Gal and Menon, 2014; Poschke, 2014), as well as income level and stage of development (Biggs and Oppenheim, 1986).[15] In particular, the process of structural transformation has been responsible for shaping the firm size distribution, especially in the manufacturing sector (see, for example, Poschke, 2014; Loveman and Sengenberger, 1991). The latter two issues, stage of development and structural transformation, have been discussed earlier in this section.

In general, the majority of firms (55.6 per cent) in the analysis for this chapter are in the services sector, compared with 44.4 per cent in the manufacturing sector. However, the services sector contributes a smaller share (35.4 per cent) to total formal-sector employment in SMEs and large firms. Part of the reason for the disproportionate contributions may be the average sizes of firms, which differ considerably between the manufacturing and services sectors. In general, manufacturing firms tend to be larger at start-up than their services counterparts (Criscuolo, Gal and Menon, 2014), and this size difference continues throughout the lives of firms. This is confirmed by an analysis of data for full-time employees: on average, the median firm size is smaller in the services sector (18 employees) than in the manufacturing sector (30 employees) (figure 1.10). Additionally, a large share of informal (typically smaller) and micro-enterprises (which are excluded from this analysis) can be found in the services sector.

This sectoral disparity in firm size is evident across all regions. It is particularly stark in most of the Asian economies, where the median size of firms in the manufacturing sector is well above the global average, ranging from 38 to 85 full-time employees across Southern Asia, South-Eastern Asia and the Pacific and East Asia, compared with 19 to 30 full-time employees for the services sector. These findings are characteristic of Asia as a global and regional manufacturing hub, encompassing major economies in South-Eastern and Southern Asia (*The Economist*, 2015; Wooldridge, 2016; Yang, 2016).

Figure 1.10

Median number of full-time employees per enterprise, by broad sector, latest year



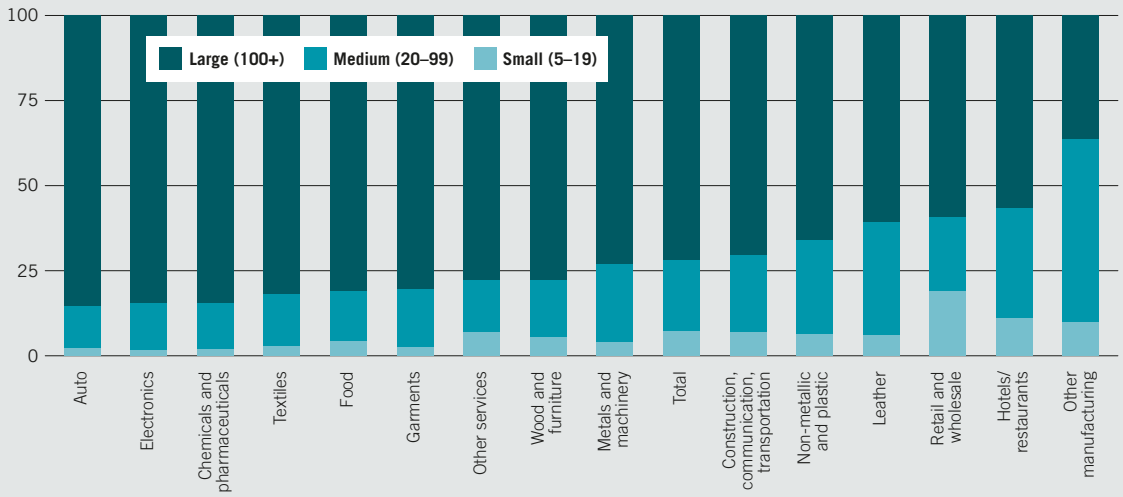
Note: Total employment, based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO calculations based on World Bank Enterprise Survey, August 2016.

15. There is also evidence that the increase in employment in large firms, at least in developed economies, is not due to an increase in the number of large firms, but to increases in employment at the top of the firm size distribution (see, for example, Elsby and Michaels, 2013).

Figure 1.11

Distribution of total employment by firm size, manufacturing and service industries, in selected developing, emerging and developed economies, latest year (percentages)



Note: Industry classification: ISIC Rev 3 2-digits. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO calculations based on World Bank Enterprise Survey, August 2016.

In the Latin America and the Caribbean region, the size disparity between manufacturing and services firms is smaller owing to the larger number of services firms in the region and their relatively larger size. According to a recent report by the Inter-American Development Bank (Rubalcaba, 2013), this trend is partly a reflection of developments in the Caribbean economies, where the services sector contributes a large share of employment and value added (74 per cent of value added).

The importance of large manufacturing firms to formal full-time employment in specific industries becomes more evident when the data are further disaggregated. However, it should be noted that disaggregation at this level may not be fully representative owing to the stratification of firms in the WBES and therefore care should be taken in interpreting the results. In the electronics, automobiles, textiles, chemicals and pharmaceuticals, food and garments industries, more than 80 per cent of workers are employed in large firms (figure 1.11). In contrast, manufacturing firms in industries such as leather and other manufacturing industries have a relatively higher share of employment in SMEs (about 40–60 per cent).

The figure also shows that service industries have a higher share of employment in SMEs than manufacturing industries. For example, more than 40 per cent of employment in the hotel and restaurant industry is in SMEs, while the retail and wholesale sector has the largest employment contribution from small firms (20 per cent).

To better understand how the industry composition affects the average firm size across regions, a modified shift–share decomposition based on Bartelsman, Haltiwanger and Scarpetta (2004) has been undertaken. The purpose of the exercise is to explain cross-regional differences in firm size based on two factors: industry composition and within-industry differences. The analysis focuses on the manufacturing sector because of the availability of data. The first factor, the composition of manufacturing industries across regions, accounts for *industry-specific* elements that have an impact on firm size, such as capital intensity, technology and other specific characteristics. For example, if a region has a greater share of firms in those industries that tend to have larger firm size, such as automobile manufacturing, then this could lead to a larger than average firm size for the region. The second factor, differences between manufacturing industries across regions, accounts for differences in firm size that may be due to *region-specific* elements, such as institutional factors, historical patterns of

Table 1.1

Shift–share analysis of firm size, total employment, by region, latest year

Subregion	Industry composition (industry-specific) (1)	Average size of firm in the region (region-specific) (2)	Interaction between industry composition and firm size (3)	Total (4)
Northern Africa	–0.08	0.12	–0.01	0.03
Sub-Saharan Africa	–0.15	–0.31	0.00	–0.46
Latin America and the Caribbean	–0.07	–0.07	0.01	–0.13
Arab States	–0.15	–0.37	0.01	–0.51
Eastern Asia	–0.06	0.77	0.12	0.83
South-Eastern Asia	–0.05	0.37	–0.04	0.28
Southern Asia	–0.03	0.17	–0.06	0.09
Europe, OECD	–0.16	–0.21	0.04	–0.33
Europe, non-OECD	–0.15	0.01	0.04	–0.10
Central and Western Asia	–0.06	–0.05	0.01	–0.10

Note: Columns 1–3 represent subcomponents of the total (column 4). The total is the deviation (in percentage) of the regional average from the total average (all regions). For example, the average firm size in Northern Africa is 3 per cent bigger than the total average, which is mainly attributed to manufacturing firms in Northern Africa being, on average, 12 per cent larger than other manufacturing firms in the same sectors in the region. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO calculations based on World Bank Enterprise Survey, August 2016.

organization and market size. The idea behind the analysis is to understand the contribution of each of these components to deviations in regional average firm sizes from the average across all regions (i.e. the total average).[16]

In three of the four Asian regions, the average size of manufacturing firms is larger than the total average for all regions (table 1.1, column 4). In Eastern Asia, the average firm in the manufacturing sector is 83 per cent larger than the total average; while in South-Eastern Asia and Southern Asia they are 28 per cent and 9 per cent larger, respectively. In each of these regions *region-specific* differences (column 2), rather than the *industry-specific* composition (column 1), play a stronger role in firm size.

In sub-Saharan Africa, the Arab States and Europe (OECD economies), the average firm size is relatively smaller than the total average, by 46, 51, and 33 per cent respectively. In each of these regions, the within-sector difference dominates again, but the industry composition also plays an important role. For example, in these three regional groupings the industry composition is relatively smaller than the regional average by around 15 per cent, compared to the Asian regions where it is between 3 and 6 per cent. This suggests some correlation between region-specific factors and industry composition in the case of small firms, which does not exist in larger firms.

In general, the findings suggest scope for further analysis on country specific factors that play a role in determining firm size, and consequently the distribution of total employment.

16. Given the large number of economies in the data set, this methodology is presented at the regional instead of the country level.

B. Enterprise and employment growth: Who creates and destroys jobs?

The previous section focused on employment levels, to provide a better understanding of where jobs are located in the economy based on a number of firm characteristics. This section provides an analysis of employment from a more dynamic perspective, by identifying the types of firms (by size and age) that created and destroyed jobs during the pre- and post-crisis periods. Such an analysis is important to facilitating a better understanding of which firm characteristics may be related to employment growth.

Although theory suggests that there is no relationship between firm growth and firm size,[17] empirical findings are rather mixed. Some suggest that once a firm's age is taken into consideration, there is indeed no relationship between firm size and employment growth (Haltiwanger, Jarmin and Miranda, 2013); but other studies show that smaller firms grow faster than larger firms, even after controlling for firm age (Aga et al., 2015; Ayyagari, Demirgüç-Kunt and Maksimovic, 2014).

The empirical findings on the relationship between firm age and employment growth are relatively more established, with a number of studies showing that young firms grow faster in terms of employment (Haltiwanger et al., 2016; Li and Rama, 2015). These young high-growth enterprises are often referred to as "gazelles", and as such they are targeted as the engine of job growth by policies aiming to promote employment growth through enterprise development.

These employment dynamics can be further complicated when significant economic shocks such as recessions occur. These shocks can have cyclical (and hence temporary) impacts on firm-level employment patterns, but, if large and prolonged, they may have structural (and hence long-term) impacts that change the size- and age-related employment patterns in a fundamental way.

In light of these considerations, this section examines changes in the relationship between firm characteristics and employment growth at the firm level for the period 2003–08 (pre-crisis) and 2009–14 (post-crisis). A distinction is also made between firms "in expansion" and firms "in contraction" in order to determine whether impacts vary according to firms' characteristics.

It should be noted that this analysis on employment growth is confined to full-time permanent employees due to the limited data availability. Additionally, the data set contains information on surviving firms only, not on firms that have exited the market. Thus, job destruction caused by the exit of firms cannot be considered.[18] Although these limitations can hamper our understanding of the process of creative destruction in a market economy, where obsolete firms are replaced by more productive ones, the analysis on the intensive margin of business dynamics (i.e. upscaling and downsizing of the incumbents) is certainly informative, as several studies have been conducted on this topic (Aga et al., 2015; Ayyagari, Demirgüç-Kunt and Maksimovic, 2014; Criscuolo, Gal and Menon, 2014).[19]

SMEs and younger enterprises have more rapid job growth – in terms of full-time permanent employees – than large and older enterprises, especially in higher income countries

In terms of employment growth, the evidence shows that over the entire period of interest, SMEs in the formal sector grew faster than large enterprises (consistent with evidence presented in figure 1.5). More precisely, small firms grew 2.0 percentage points faster than large firms during the 11-year period from 2003 to 2014, while medium-sized enterprises grew 1.1 percentage points faster than large firms (figure 1.12).

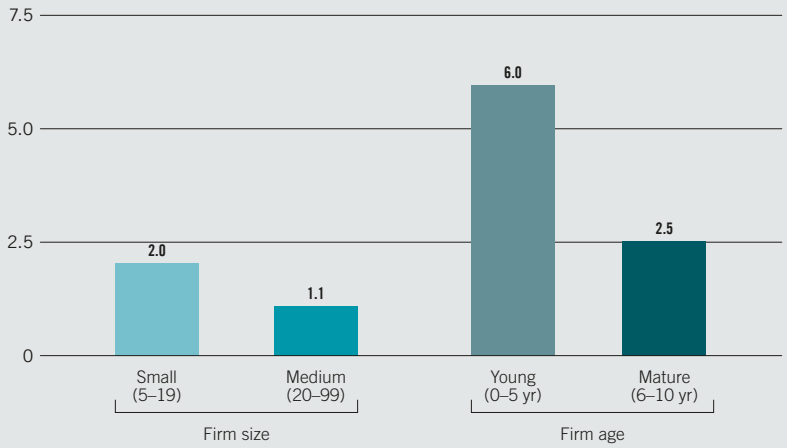
17. As stated by Gibrat's law (Gibrat, 1931).

18. Job destruction caused by exit of firms is particularly relevant for young firms, given their low survival rate (Criscuolo, Gal and Menon, 2014; Haltiwanger, Jarmin and Miranda, 2013). Calvino, Criscuolo and Menon (2016) show that the average survival rate for young firms in 19 OECD countries is just above 60 per cent in the first three years from entry, 50 per cent after five years and just over 40 per cent after seven years.

19. Criscuolo, Gal and Menon (2014) analyse both intensive and extensive margins of gross job flows.

Figure 1.12

Employment growth premium: SMEs relative to large firms, and young and mature firms relative to old firms, by size and age, 2003–14 (percentage point difference, full-time permanent employees)



Note: The bars show point estimates of the relation of firm size and firm age to the average annual growth rates for full-time permanent employment over two years, between three years prior to the survey and one year prior to the survey. The size and age categories are measured relative to large firms (100+ employees) and old firms (11+ years), respectively. The size category is based on the average number of full-time permanent employees between three years prior to the survey and one year prior to the survery in order to avoid the regression to the mean effect. The age category is based on the age of firms three years prior to the survey. The point estimates are all statistically significant at the 90 per cent confidence level. Based on 132 economies, see Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

However, a more disaggregated analysis by income group reveals that SMEs in developing economies do not appear to have grown any faster than large firms.[20] This finding is consistent with other studies, which show that the vast majority of small enterprises in developing economies are "entrepreneurs out of necessity" and often do not grow beyond a few employees (Nichter and Goldmark, 2009; Poschke, 2013; Schoar, 2010). Additionally, SMEs in both emerging and developed economies grew faster than large firms, with the premium being higher in developed economies.[21] Thus, the evidence seems to suggest that the employment growth premium for smaller firm size is to some degree correlated with level of development. This could be because the economic environment in developed economies is more favourable to SME growth than that in lower income countries (ILO, 2007b). Such factors may include better macroeconomic conditions, infrastructure and access to resources, including skilled labour,[22] and better access to finance, capital and technology. In addition, the growth of temporary employment, which is not included in this analysis and is more prevalent in developing and emerging economies, may have some impact on these findings (see Chapter 2).

20. Ayyagari, Demirgüç-Kunt and Maksimovic (2014) found that SMEs grew faster than large firms across all income groups, including low-income economies. However, the size classification they used is based on the base year. As documented in Davis, Haltiwanger and Schuh (1998) and Haltiwanger, Jarmin and Miranda (2013), this firm size classification method is prone to suffer from the "regression to the mean" effect. In particular, the latter document that the use of base year category yields upward biased attribution of employment growth to the small category. The analysis conducted for this report uses the size category based on the average number of employees between the latest fiscal year and three years prior in order to circumvent the regression to the mean effect.

21. For example, the employment growth premium for small firms relative to large firms is 5.9 percentage points in developed economies and 1.5 percentage points in emerging economies. Similarly, the employment growth premium for medium-sized firms relative to large firms is 4.2 percentage points in developed economies and 0.8 percentage points in emerging economies (see Annex D for the regression results).

22. For instance, Lucas (1978) finds that entrepreneurs with higher managerial abilities choose a larger size of operation.

Figure 1.12 also shows that young and mature enterprises grew faster than old enterprises. On average, the employment growth premium for young and mature enterprises is 6.0 and 2.5 percentage points, respectively. The premium for younger firms is also larger in developed economies than in developing and emerging economies. The mechanisms through which firm age is related to firm growth are largely unknown (Haltiwanger et al., 2016). Some existing theories suggest that young firms face greater difficulties in growing due to their lack of business experience (Stinchcombe, 1965), while others contend that older firms suffer from "obsolescence" and "senescence" (Barron, West and Hannan, 1994). Older firms can indeed be less flexible in their organizational strategies and face greater difficulties in adjusting to changing business environments. Thus, given the conflicting views on how and why firm age can be related to firm growth patterns, further research is needed to better inform policy-making.

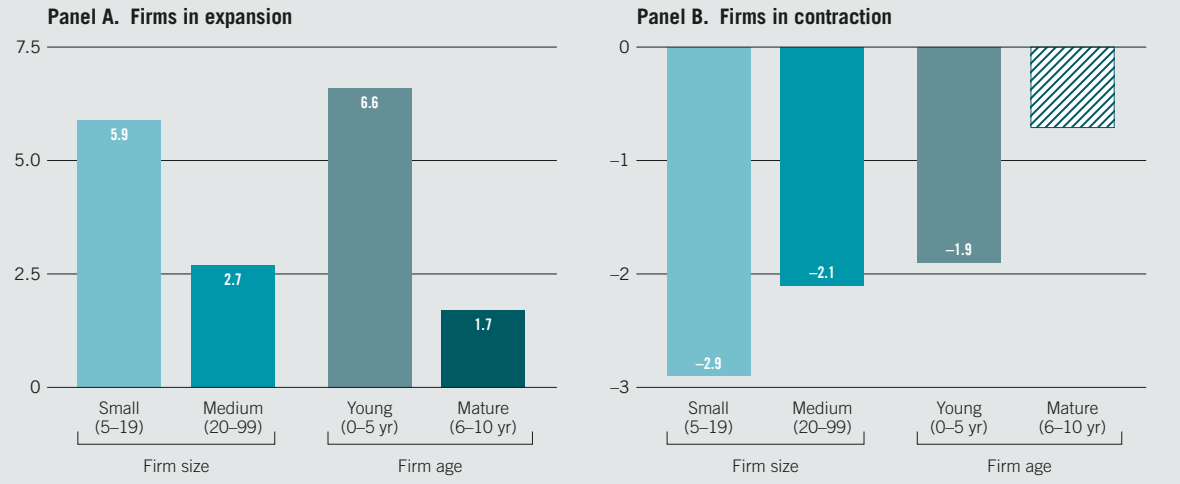
The employment premium for SMEs is largely attributable to the rapid growth of firms "in expansion"

An emerging body of evidence shows that smaller and younger businesses experience greater variance in employment growth, swinging into both positive and negative territories, alongside changes in aggregate demand (Haltiwanger, Jarmin and Miranda, 2013; Decker et al., 2016). A separate analysis of firms with positive *net* employment growth ("in expansion") and firms with negative *net* employment growth ("in contraction") reveals different firm-level employment patterns.

The analysis shows that smaller firm size is associated with higher positive employment (full-time permanent) growth for firms in expansion, but greater negative growth for those in contraction (figure 1.13). The employment growth rates for small firms and medium firms in expansion were higher than that for large firms in expansion, by 5.9 and 2.7 percentage points, respectively (figure 1.13, panel A). Among firms in contraction, small and medium firms had a greater decline in employment growth than their large counterparts, by 2.9 and 2.1 percentage points, respectively (figure 1.13, panel B).

Figure 1.13

Employment growth premium for firms in expansion or contraction: SMEs relative to large firms, and young and mature firms relative to old firms, by firm size and age, 2003–14 (percentage point difference, full-time permanent employees)



Note: The bars show point estimates of the relation of firm size and firm age to the average annual growth rates for full-time permanent employment over two years, between three years prior to the survey and one year prior to the survey. The size and age categories are measured relative to large firms (100+ employees) and old firms (11+ years), respectively. The size category is based on the average number of full-time permanent employees between three years prior to the survey and one year prior to the survery in order to avoid the regression to the mean effect. The age category is based on the age of firms three years prior to the survey. The point estimates shown in full colour and labelled with numbers are statistically significant at the 90 per cent confidence level. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

Similarly, younger firms are associated with higher employment growth for the firms in expansion, but greater negative employment growth for those in contraction. The employment growth rate of young and mature firms is higher than that of old firms by 6.6 and 1.7 percentage points, respectively (figure 1.13, panel A); while younger firms in contraction had a greater decline in employment growth than their older counterparts by 1.9 percentage points (figure 1.13, panel B).

In this respect, firm size and age can have different implications for employment growth, depending on the firms' growth cycle. At the same time, this also means that the net employment premium of smaller and younger firms is driven by the strong growth of firms in expansion (Decker et al., 2016).

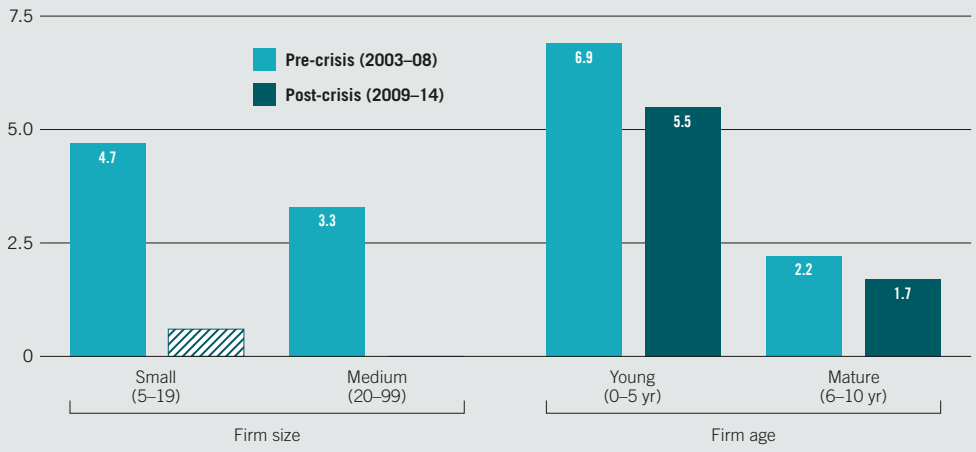
The employment growth premium for young firms, in terms of full-time permanent employment, has weakened substantially since the crisis

The crisis weakened the overall employment capacity across all firms, but the damaging effects were particularly large for small and young firms. This disproportionate impact of the recession has important implications for employment growth. The results from an analysis of the pre- and post-crisis periods show that the employment growth premium for firms of smaller size and younger age has weakened or even disappeared in recent years, at least in terms of full-time permanent employment.

From 2003 to 2008, the full-time permanent employment growth rates for small and medium-sized firms were higher than for large firms, by 4.7 and 3.3 percentage points, respectively. However, the premium was absent from 2009 to 2014, when employment growth for SMEs was not faster than that for large firms (figure 1.14).

Figure 1.14

Employment growth premium: SMEs relative to large firms, and young and mature firms relative to old firms, by firm size and age, 2003–08 and 2009–14 (percentage point difference, full-time permanent employees)

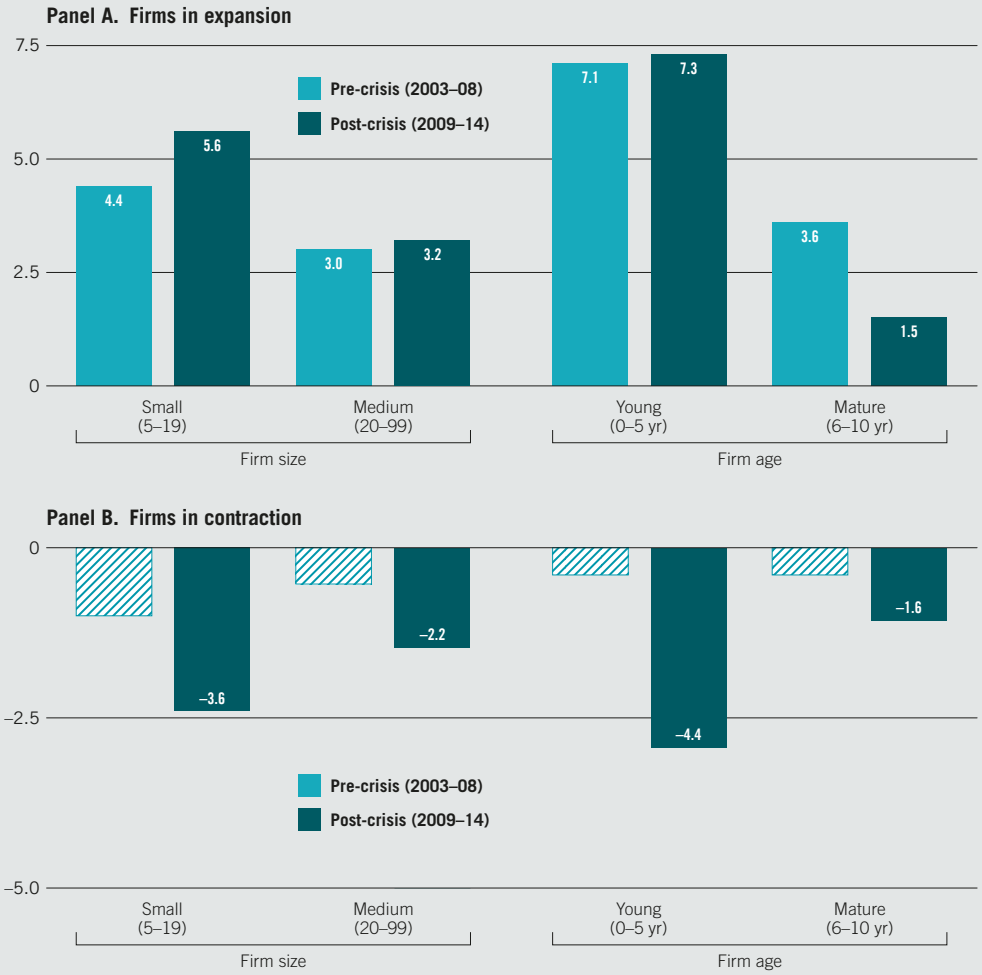


Note: The bars show point estimates of the relation of firm size and firm age to the average annual growth rates for full-time permanent employment over two years, between three years prior to the survey and one year prior to the survey. The size and age categories are measured relative to large firms (100+ employees) and old firms (11+ years), respectively. The size category is based on the average number of full-time permanent employees between three years prior to the survey and one year prior to the survery in order to avoid the regression to the mean effect. The age category is based on the age of firms three years prior to the survey. The point estimates shown in full colour and labelled with numbers are statistically significant at the 90 per cent confidence level. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

Figure 1.15

Employment growth premium for firms in expansion or contraction: SMEs relative to large firms, and young and mature firms relative to old firms, by firm size and age, 2003–14 (percentage point difference, full-time permanent employees)



Note: The bars show point estimates of the relation of firm size and firm age to the average annual growth rates for full-time permanent employment over two years, between three years prior to the survey and one year prior to the survey. The size and age categories are measured relative to large firms (100+ employees) and old firms (11+ years), respectively. The size category is based on the average number of full-time permanent employees between three years prior to the survey and one year prior to the survery in order to avoid the regression to the mean effect. The age category is based on the age of firms three years prior to the survey. The point estimates shown in full colour and labelled with numbers are statistically significant at the 90 per cent confidence level. Based on 132 economies. See Appendix A for regional groupings and Appendix B for a detailed list of countries in WBES.

Source: ILO estimates based on World Bank Enterprise Survey, August 2016.

A similar downward shift in the employment growth premium is also observed for firm age. From 2003 to 2008, the employment growth rates for young and mature firms were higher than those for old firms, by 6.9 and 2.2 percentage points, respectively; while from 2009 to 2014, the premium decreased to 5.5 and 1.7 percentage points, respectively. Considering that firms become older as time goes by, it naturally follows that the employment structure shifts towards old firms, unless the new generation of young firms maintains the pace of employment growth achieved by the past generation of young firms. However, the analysis suggests that the new generation of young firms is creating jobs (full-time permanent ones) at a much slower pace than the previous generation.

There has been acceleration of job destruction in small and young firms that are contracting, rather than deceleration in employment creation in firms that are growing

Separating firms between those in expansion and those in contraction reveals the sensitivity of employment growth to the effects of the business cycle. The observed downward trend in the employment growth premium has been driven by the acceleration of job destruction by SMEs and young and mature enterprises. Among the firms in expansion, the relationship between firm size and employment growth appears to be stable across both pre- and post-crisis periods (figure 1.15, panel A). Thus, for the firms in expansion, being smaller and younger is robustly associated with higher net employment growth than achieved by larger and older enterprises, throughout both the pre-crisis and post-crisis periods.

However, when shifting the focus to firms in contraction, it becomes clear that being smaller and younger is associated with higher negative employment growth than seen in their large and old counterparts in recent years. From 2003 to 2008, small and medium-sized enterprises experienced negative employment growth, at rates that were not statistically different from those achieved by large firms. However, from 2009 to 2014, SMEs experienced much greater negative employment growth rates than large firms, the differences being 3.6 and 2.2 percentage points, respectively. The acceleration in negative employment growth between 2009 and 2014 is also observed for young and mature firms, which contracted at a faster pace than old firms, by 4.4 and 1.6 percentage points, respectively (figure 1.15, panel B).

The fact that young and mature enterprises retained their faster rates of employment growth despite the accelerated job destruction in recent years means that those firms are important engines of job creation even during times of economic downturn.

C. Concluding remarks

The promotion of employment in the formal sector is an essential strategy in reducing decent work deficits. This chapter helps to lay the groundwork for an analysis of enterprises by providing an overview and assessment of where jobs are being created in enterprises in the formal sector, and of their dynamics based on size, age and sector. These are important characteristics for determining not only the quantity of jobs, but also their quality (as will be seen in subsequent chapters) and for formulating specific policies linked to the promotion of entrepreneurship, SMEs, start-ups and the link with large firms.

Taking advantage of comprehensive firm-level data in developing, emerging and developed economies, this chapter has investigated the extent and nature of firm dynamics and labour market outcomes pre- and post-crisis. It finds that both firm size and firm age are related to employment growth and employment characteristics. In the formal sector, large enterprises play a more important role than SMEs as the principal source of employment, but there are heterogeneities across regions, with firm size being shaped more by region-specific (and, by extension, country-specific) than industry-specific characteristics. This finding is important when considering the role that institutions, tax policies, macro environment and regulatory frameworks play in industrial growth.

Additionally, based on trends since 2003, SMEs and young firms are more dynamic than large firms with respect to full-time permanent employment growth and are also an important source of employment for women and firm ownership. However, recent trends show a decline in the contribution that younger firms and SMEs make to full-time permanent employment, owing in part to their faster rate of job destruction relative to large and old enterprises. This suggests a stronger role for policies that not only support younger firms and SMEs acutely impacted by the crisis but also improve their sustainability in the longer term.

The ILO has long recognized the importance of SMEs to achieving decent and productive work outcomes and continues to provide guidance in this area.[23] There are varying constraints placed on enterprises by country-specific situations, but in general an enabling environment is crucial for SMEs' development and growth, sustainability and contribution to decent work outcomes. Specific measures to improve the enabling environment include, but are not limited to, the design of rules and regulations to promote as well as protect SMEs and to improve their access to finance – these are discussed further in Chapter 2.

Indeed, the social and solidarity economy has been considered as one approach to confronting some of the challenges linked to the scale and scope of SMEs. Collaborative enterprises, such as cooperatives, have been shown to be instrumental to improving job quality and to providing voice and representation. This is particularly relevant with respect to new forms of work related to the "gig" economy and technological changes, but also within supply chains. Evidence has also shown that cooperatives are resilient during economic downturns (Birchall and Ketilson, 2009) and have responded to financial shocks by maintaining – and sometimes increasing – production and employment levels (Birchall, 2013). In this regard, the Promotion of Cooperatives Recommendation, 2002 (No. 193), suggests that developing a framework to regulate cooperatives is important and should be guided by the cooperative values and principles. If cooperatives are unregulated, they could lack legal personality and therefore find it difficult, if not impossible, to possess or own assets or be considered for financing purposes (Delgado, Dorion and Laliberté, 2014). Hence, regulating cooperatives fosters a transition from informality to formality (Henry, 2012).

On the issue of informality, there are limited data on informal enterprises, but the persistence of a large informal economy is incompatible with an environment conducive to growth for firms in the formal sector (ILO, 2007b, 2014). The large majority of informal and micro-enterprises in developing countries tend to be low productivity MSMEs that are born out of necessity and survival, and with no intentions for growth (ILO, 2015b; Porta and Shleifer, 2008). In addition, workers in informal enterprises tend to be vulnerable to exploitation and lack adequate social protection and basic worker rights; and because enterprises are operating in the shadow economy they escape tax liabilities and avoid making payments for workers' entitlements (ILO, 2014). These factors place an additional burden on governments by raising the cost of care for their citizens, and by weakening their revenue streams for funding much-needed programmes to stimulate growth and development (ibid.). Such factors also contribute to making an inefficient environment within which formal enterprises must operate, thrive and create decent jobs. A recent ILO international labour standard, the Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204), provides guidance on additional areas important to reducing decent work deficits in the informal economy. The Recommendation covers the facilitation of transition of workers and enterprises from the informal to the formal economy, the prevention of informalization of formal economy jobs and the promotion of decent work in the formal sector.

23. See, for example, the Job Creation in Small and Medium-Sized Enterprises Recommendation, 1998 (No. 189); the Conclusions concerning the promotion of sustainable enterprises adopted by the 96th Session (2007) of the International Labour Conference; the ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up (1998); the Global Employment Agenda (2003); and the ILO Declaration on Social Justice for a Fair Globalization (2008).

Appendix A. Regional and income country groupings

Africa

Northern Africa
Algeria
Egypt
Libya
Morocco
Sudan
Tunisia
Western Sahara

Sub-Saharan Africa
Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Cabo Verde
Central African Republic
Chad
Comoros
Congo
Congo, Democratic Republic of the
Côte d'Ivoire
Djibouti
Equatorial Guinea
Eritrea
Ethiopia
Gabon
The Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Mozambique
Namibia
Niger
Nigeria
Réunion
Rwanda
Sao Tome and Principe
Senegal
Seychelles
Sierra Leone
Somalia
South Africa
South Sudan
Swaziland
Tanzania, United Republic of
Togo
Uganda
Zambia
Zimbabwe

Americas

Latin America and the Caribbean
Antigua and Barbuda
Argentina
Bahamas
Barbados
Belize
Bolivia, Plurinational State of
Brazil
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
French Guiana
Grenada
Guadeloupe
Guatemala
Guyana
Haiti
Honduras
Jamaica
Martinique
Mexico
Netherlands Antilles
Nicaragua
Panama
Paraguay
Peru
Puerto Rico
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
United States Virgin Islands
Uruguay
Venezuela, Bolivarian Republic of

Northern America
Canada
Greenland
United States

Arab States
Bahrain
Iraq
Jordan
Kuwait
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
West Bank and Gaza Strip
Yemen

Asia and the Pacific

Eastern Asia
China
Hong Kong, China
Japan
Korea, Democratic People's Republic of
Korea, Republic of
Macau, China
Mongolia
Taiwan, China

South-Eastern Asia and the Pacific
Australia
Brunei Darussalam
Cambodia
Cook Islands
Fiji
French Polynesia
Guam
Indonesia
Kiribati
Lao People's Democratic Republic
Malaysia
Marshall Islands
Micronesia, Federated States of
Myanmar
Nauru
New Caledonia
New Zealand
Palau
Papua New Guinea
Philippines
Samoa
Singapore
Solomon Islands
Thailand
Timor-Leste
Tonga
Tuvalu
Vanuatu
Viet Nam

Southern Asia
Afghanistan
Bangladesh
Bhutan
India
Iran, Islamic Republic of
Maldives
Nepal
Pakistan
Sri Lanka

Europe and Central Asia

Northern, Southern and Western Europe
Albania
Andorra
Austria
Belgium
Bosnia and Herzegovina
Channel Islands
Croatia
Denmark
Estonia
Finland
France
Germany
Greece
Iceland
Ireland
Italy
Latvia
Liechtenstein
Lithuania
Luxembourg
Macedonia, the former Yugoslav Republic of
Malta
Monaco
Montenegro
Netherlands
Norway
Portugal
San Marino
Serbia
Slovenia
Spain
Sweden
Switzerland
United Kingdom

Eastern Europe
Belarus
Bulgaria
Czech Republic
Hungary
Moldova, Republic of
Poland
Romania
Russian Federation
Slovakia
Ukraine

Central and Western Asia
Armenia
Azerbaijan
Cyprus
Georgia
Israel
Kazakhstan
Kyrgyzstan
Tajikistan
Turkey
Turkmenistan
Uzbekistan

Developed countries

High income

Andorra
Antigua and Barbuda
Argentina
Australia
Austria
Bahamas
Bahrain
Barbados
Belgium
Brunei Darussalam
Canada
Channel Islands
Chile
Croatia
Cyprus
Czech Republic
Denmark
Equatorial Guinea
Estonia
Finland
France
French Guiana
French Polynesia
Germany
Greece
Greenland
Guam
Hong Kong, China
Hungary
Iceland
Ireland
Israel
Italy
Japan
Korea, Republic of
Kuwait
Latvia
Liechtenstein
Lithuania
Luxembourg
Macau, China
Malta
Martinique
Monaco
Netherlands
Netherlands Antilles
New Caledonia
New Zealand
Norway
Oman
Poland
Portugal
Puerto Rico
Qatar
Russian Federation
Réunion
Saint Kitts and Nevis
San Marino
Saudi Arabia
Seychelles
Singapore
Slovenia
Spain
Sweden
Switzerland
Taiwan, China
Trinidad and Tobago
United Arab Emirates
United Kingdom
United States
United States Virgin Islands
Uruguay
Venezuela, Bolivarian Republic of

Emerging countries

Upper-middle income

Albania
Algeria
Angola
Azerbaijan
Belarus
Belize
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
China
Colombia
Cook Islands
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
Fiji
Gabon
Grenada
Guadeloupe
Iran, Islamic Republic of
Iraq
Jamaica
Jordan
Kazakhstan
Lebanon
Libya
Macedonia, the former Yugoslav Republic of
Malaysia
Maldives
Marshall Islands
Mauritius
Mexico
Mongolia
Montenegro
Namibia
Palau
Panama
Paraguay
Peru
Romania
Saint Lucia
Saint Vincent and the Grenadines
Serbia
South Africa
Suriname
Thailand
Tonga
Turkey
Turkmenistan
Tuvalu

Lower-middle income

Armenia
Bangladesh
Bhutan
Bolivia, Plurinational State of
Cameroon
Cabo Verde
Congo
Côte d'Ivoire
Djibouti
Egypt
El Salvador
Georgia
Ghana
Guatemala
Guyana
Honduras
India
Indonesia
Kenya
Kiribati
Kyrgyzstan
Lao People's Democratic Republic
Lesotho
Mauritania
Micronesia, Federated States of
Moldova, Republic of
Morocco
Myanmar
Nauru
Nicaragua
Nigeria
Pakistan
Papua New Guinea
Philippines
Samoa
Sao Tome and Principe
Senegal
Solomon Islands
Sri Lanka
Sudan
Swaziland
Syrian Arab Republic
Tajikistan
Timor-Leste
Ukraine
Uzbekistan
Vanuatu
Viet Nam
West Bank and Gaza Strip
Western Sahara
Yemen
Zambia

Developing countries

Low income

Afghanistan
Benin
Burkina Faso
Burundi
Cambodia
Central African Republic
Chad
Comoros
Congo, Democratic Republic of the
Eritrea
Ethiopia
Gambia
Guinea
Guinea-Bissau
Haiti
Korea, Democratic People's Republic of
Liberia
Madagascar
Malawi
Mali
Mozambique
Nepal
Niger
Rwanda
Sierra Leone
Somalia
South Sudan
Tanzania, United Republic of
Togo
Uganda
Zimbabwe

Appendix B. Data set on employment, by firm characteristics

The WBES data set covers 132 economies from all income groups and geographical regions, between 2006 and 2016.

Regional group	Number of countries and territories	Countries and territories	Survey years
Northern Africa	4	Egypt; Morocco; Sudan; Tunisia	2013 and 2014
Sub-Saharan Africa	42	Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Congo, Democratic Republic of the Congo; Côte d'Ivoire; Djibouti; Eritrea; Ethiopia; Gabon; The Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mozambique; Namibia; Niger; Nigeria; Rwanda; Senegal; Sierra Leone; South Africa; Swaziland; United Republic of Tanzania; Togo; Uganda; Zambia; Zimbabwe	2006, 2007, 2009–2011 and 2013–2015
Latin America and the Caribbean	27	Argentina; Bahamas; Barbados; Belize; Bolivia; Brazil; Chile; Colombia; Costa Rica; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; Guatemala; Guyana; Honduras; Jamaica; Mexico; Nicaragua; Panama; Paraguay; Peru; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Uruguay; Bolivarian Republic of Venezuela	2006, 2009 and 2010
Arab States	5	Iraq; Jordan; Lebanon; West Bank and Gaza Strip; Yemen	2010, 2011 and 2013
Eastern Asia	2	China; Mongolia	2009, 2012 and 2013
South-Eastern Asia and the Pacific	15	Cambodia; Fiji; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar; Papua New Guinea; Philippines; Samoa; Solomon Islands; Thailand; Tonga; Vanuatu; Viet Nam	2009, 2012–2016
Southern Asia	7	Afghanistan; Bangladesh; Bhutan; India; Nepal; Pakistan; Sri Lanka	2007, 2009, 2011 and 2013–2015
Europe	21	Albania; Belarus; Bulgaria; Bosnia and Herzegovina; Czech Republic; Croatia; Estonia; Hungary; Latvia; Lithuania; FYR of Macedonia; Republic of Moldova; Montenegro; Poland; Romania; Russian Federation; Serbia; Slovakia; Slovenia; Sweden; Ukraine	2007–2009, 2012–2014
Central and Western Asia	9	Armenia; Azerbaijan; Georgia; Israel; Kazakhstan; Kyrgyzstan; Tajikistan; Turkey; Uzbekistan	2008, 2009 and 2013
Total	**132**		

Appendix C. Numbers and shares of workers by firm size

Chapter 1 has presented estimates of the number and shares of workers in small, medium-sized and large enterprises. These figures are based on the ILO's Estimation Model for Employment by Firm Characteristics, which is briefly described in this appendix. More methodological details can be found in Viegelahn et al. (forthcoming).

The model uses World Bank Enterprise Surveys (WBES) data, which provide firm-level information on employment and hence on firm size from 208 surveys conducted in 132 countries (see Appendix B for a list of these countries). These countries account for 82 per cent of the global labour force and 73 per cent of global wage and salaried employment. Each survey generates two annual data points on the share of employment by firm size, considering both full-time permanent and temporary employment. These data points are created by using data on employment from the last fiscal year and three years ago, reported in the survey, and combining it with information on firm size, following the categorization introduced in this chapter. Small, medium and large firms are hence respectively defined as firms with 5–19 employees, 20–99 employees and 100+ employees.

The firm-level surveys that the analysis is based on were conducted between 2006 and 2016. With information on the last fiscal year and three years ago, data points are available for the period 2003–15, assuming for tractability that fiscal years correspond to calendar years in all countries.[1] The 208 surveys produce 415 data points,[2] which corresponds to 22.5 per cent of all possible data points for the sample of 132 countries between 2003 and 2016, which is the period for which estimates are produced.

Estimating the shares of workers by firm size

In a first step, the model estimates the shares of workers in small, medium-sized and large enterprises for those countries and years for which data are missing. To estimate missing data points, a set of 12 regression specifications, estimated with ordinary least squares (OLS), is set up to explain the corresponding employment share as the dependent variable. The dependent variable is log-ratio transformed to ensure that the estimated employment shares for firm size lie within the range 0 to 1 and add up to 1. The 12 regression specifications result in 24 different models, as each regression is run both on the full sample and by country income group.

The regression models combine in different forms the following variables as explanatory variables in the regression: GDP growth, inward/outward foreign direct investment (FDI) as percentage of GDP, the export/import share in GDP, the manufacturing share in total value added, and country fixed effects. GDP growth is taken from the IMF World Economic Outlook database, while all other variables are taken from the World Bank's World Development Indicators database. With very few exceptions, these input data are balanced, with only a small number of missing data points. Where data for explanatory variables are missing, these data are imputed on the basis of simple linear imputation techniques or averages across the corresponding country income group.

Based on a cross-validation procedure with 100 repetitions, where in each repetition 20 per cent of the data points are randomly dropped and then predicted with the different models that are run on the full sample and by country income group, an average root mean squared error (RMSE) can be calculated for each of the 24 models. The procedure respectively selects the model with the lowest average RMSE as the model used to predict employment by firm size. This is the model that, based on the cross-validation procedure, performs best in terms of being able to predict missing data points accurately.

The final data series on employment shares consists of the actual data points from the surveys, where they are available, and the estimated data points from the model, where the actual data points are missing. Finally, a smoothing mechanism is applied which preserves actual data points from the surveys, but adjusts estimated data points in order to avoid any breaks in the data series. The model hence extends the original 415 data points to 1,848 data points for each share, which corresponds to a balanced panel for 132 countries between 2003 and 2016.

1. A survey conducted in 2008 will, for example, give data points for 2005 and 2007.

2. For Bulgaria, the three surveys that have been conducted produce only five instead of six data points due to some overlap in years.

Estimating wage and salaried employment in small, medium-sized and large formal enterprises of the manufacturing and market services sector

The employment that is covered by the WBES corresponds to wage and salaried employment in formal enterprises with at least five employees, operating in the manufacturing and market services sector (employment base). The employment shares by firm size that are estimated in the first step are defined as relative to this employment base. In order to obtain the number of workers by firm size, the model hence needs to produce an estimate for the employment base.

The second step of the model estimates wage and salaried employment in formal enterprises operating in the manufacturing and market services sector, as a share of total wage and salaried employment.[3] This share enters the regressions as a dependent variable and is calculated from original labour force surveys, made available by the ILO Statistics Department. On the whole, 123 data points are available. The dependent variable is log-ratio transformed to ensure that the estimated shares lie within the range 0 to 1.

A first OLS regression model is set up, which includes GDP growth, GDP per capita (in logs), the urbanization rate, the share of manufacturing and market services employment in total employment (log-ratio transformed) and the share of wage and salaried employment in formal enterprises of the non-agricultural sector (log-ratio transformed) as explanatory variables.

Data on GDP growth are taken from the IMF World Economic Outlook database. Data on GDP per capita come from the World Bank's World Development Indicators database, and the urbanization rate is taken from the United Nations Statistics Division. Data are available for all countries and all years. GDP growth accounts for business cycle effects, while GDP per capita and the urbanization rate are related to the prevalence of the formal sector in an economy. Data on the share of manufacturing and market services employment in total employment, not restricted to wage and salaried employment, are taken from the ILO's Trends Econometric Models and are equally balanced.

Data on the share of wage and salaried employment in formal enterprises of the non-agricultural sector, where non-agriculture comprises more than just manufacturing and market services, are calculated from original labour force surveys, made available by the ILO Statistics Department, complemented with data from the ILO's Social Protection Department. These data are available for 205 data points.

The first model extends the 123 data points to 205 data points for wage and salaried employment in formal enterprises of the manufacturing and market services sector with at least five employees, as a share of total wage and salaried employment. These 205 data points enter a second OLS regression model as a dependent variable.

This second model is similar to the first one, but only includes GDP growth, GDP per capita (in logs), the urbanization rate and the share of manufacturing and market services employment in total employment (log-ratio transformed) as explanatory variables. As data for all these explanatory variables are balanced, the second model can be used to extend the 205 data points to the 1,848 data points needed.

Multiplying the estimated shares with data on total wage and salaried employment, available from the ILO's Trends Econometric Models, results in an estimate for the employment base in terms of the number of workers, corresponding to wage and salaried employment in formal enterprises operating in the manufacturing and market services sector. The resulting number indicates that in 2016 an estimated 449 million people worked in formal enterprises of the manufacturing and market services sector, in the 132 countries analysed. This corresponds to 17 per cent of total employment and almost 35 per cent of total wage and salaried employment in these countries.

With data on wage and salaried employment in formal enterprises of the manufacturing and market services sector, and data on employment shares by firm size and firm age, it is possible to calculate employment by firm size in terms of numbers. These numbers can then be aggregated over all 132 countries or by country income group.

3. The employment base covered includes employment in formal micro-enterprises and is hence an upper-bound estimate of the employment base covered by the WBES. While data on employment in formal micro-enterprises are not available for a large number of countries, evidence from some countries suggests that the corresponding figure is relatively low, as most micro-enterprises are informal.

Appendix D. The relationship between firm characteristics and employment growth at the firm level

Section B of this chapter has presented empirical analysis of the relationship between firm size, firm age and employment growth at the firm level, based on the World Bank Enterprise survey, which covers more than 100,000 firms from 132 countries for years between 2006 and 2016. Depending on specifications, the number of firms considered in the analysis ranges from 2,000 to 30,000.

The regression analysis employs an OLS model, which takes the form:

$$EMPG_{it} = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_{it-2} + \beta_3 FIRMCHARA_{it} + \beta_4 FIRMBEHAV_{it} + \mu_s + \lambda_{ct} + v_{it}$$

where $EMPG_{it}$ denotes full-time permanent employment growth rate of a firm i over the period from $t–2$ to t.

On the right-hand side of the equation, four explanatory variables are included. $SIZE_i$ denotes the size (small, medium-sized or large) of a firm i. Among the three size categories, the large category is set as the reference category, thus coefficients for the other two categories capture the association of small and medium size with employment growth relative to the large category. Following Davis, Haltiwanger and Schuh (1998) and Haltiwanger, Jarmin and Miranda (2013), the firm size categorization is based on the average number of full-time permanent employees between two time periods. Therefore, this variable does not carry the subscript t. AGE_{it-2} denotes the age (young, mature or old) of a firm i as of the year $t–2$. Among the three age categories, the old category is set as the reference category, thus coefficients for the other two categories capture the association of young and mature age with employment growth relative to the old category. $FIRMCHARA_{it}$ denotes variables for firm characteristics other than firm size and age that can be related to employment growth. Such variables include the log of labour productivity, the log of real wage, and dummy variables for the types of ownership, with domestic ownership as the reference group. The log of labour productivity controls for a possibility that firms with higher productivity experience faster employment growth. The log of wage takes into account labour arbitrage effect where firms' employment creation is stronger when the level of wages is lower. The dummy variable for ownership takes into account the possibility that foreign ownership is associated with lower employment growth (Dachs and Peters, 2014). $FIRMBEHAV_{it}$ denotes variables for firm behaviour, such as exporting, importing, the use of foreign-licensed technology, gaining external credits and the share of temporary employees in the total number of employees. Finally, μ_s is a sector fixed effect, λ_{ct} is a survey fixed effect and v_{it} denotes the error term. Variables carry subscript i to indicate a firm, t to indicate a year, s to indicate a sector and c to indicate a country.

In addition to the abovementioned specification, two dummy variables are included for indicating whether firms experience positive or negative net employment growth. These two variables are interacted with the variables for firm size and age to capture the relationship between firm size, age and employment growth specific to firms with positive or negative net employment growth. For this specification, the equation takes the form:

$$\begin{aligned} EMPG_{it} = {} & \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_{it-2} + \beta_3 FIRMCHARA_{it} + \beta_4 FIRMBEHAV_{it} + \beta_5 EXPAND_{it} + \\ & \beta_6 CONTRACT_{it} + \beta_7 SIZE_{it} \times EXPAND_{it} + \beta_7 AGE_{it-2} \times EXPAND_{it} + \\ & \beta_8 SIZE_{it} \times CONTRACT_{it} + \beta_8 AGE_{it-2} \times CONTRACT_{it} + \mu_s + \lambda_{ct} + v_{it} \end{aligned}$$

where $EXPAND_{it}$ is a binary dummy variable with the value of 1 indicating firms with positive employment growth and 0 indicating firms with zero or negative employment growth. $CONTRACT_{it}$ is a binary dummy variable with the value of 1 indicating firms with negative employment growth and 0 indicating firms with zero or positive employment growth.

The abovementioned two models are estimated for all years, early years (pre-crisis: 2003–08) and more recent years (post-crisis: 2009–14) so that changes in the coefficient across different time periods can be seen. When fitting the model to early years and more recent years, the sample is restricted to the surveys that have employment growth data for both time periods.

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2 Labour flexibility, capital structure and enterprise performance

Introduction

Chapter 1 provided an overview of how employment dynamics vary according to the characteristics of firms, such as size and age. These dynamics reflect the strategic decisions that firms make in managing their major resources, including human and financial, given specific constraints. Such decisions allow them to respond to an ever-changing business environment by building an adequate degree of flexibility into the workforce, as well as establishing an optimal capital structure for day-to-day operations and new investments. These decisions are often influenced by a range of factors at the macro level that are beyond the control of individual firms, such as macroeconomic conditions, regulatory frameworks, rule of law and institutions, among other aspects.

The ILO recognizes that promoting sustainable enterprises involves a great deal more than simply backing micro-level interventions which aim to help diverse enterprises to manage their human, financial and natural resources more efficiently and equitably in order to stimulate innovation, enhance productivity and meet a range of other needs (ILO, 2007). It is also about strengthening the rule of law and institutional and governance systems to encourage an enabling environment within which enterprises can develop and prosper.[1] Additionally, an integral element of the process of nurturing sustainability involves sharing the consequent benefits between enterprises and the wider society.

In achieving this goal, the interplay between internal decisions, particularly those relating to the primary production resources of labour (in terms of flexibility) and capital, and the external business environment is of paramount importance. This relationship is vital not only because of the immediate consequences for the enterprises and workers directly involved, but also due to the broader implications for economic growth and social development (Reinecke and White, 2004; ILO, 2007, 2015a; Dyring-Christensen, Hegazy and van Zyl, 2016).

However, empirical evidence on how enterprises make decisions on labour flexibility and capital structure, and how such decisions relate to their performance, remains either fragmented or inconsistent, particularly in developing countries (Roca-Puig et al., 2008; Ayyagari, Demirgüç-Kunt and Maksimovic, 2010; Levine and Warusawitharana, 2014). If certain types of labour flexibility strategies and financing decisions are associated with better performance in terms of productivity and labour market outcomes, it is then important to revisit the ongoing debates on whether particular policy environments, including regulatory frameworks, are conducive to supporting these decisions. This chapter examines enterprises' strategies on labour flexibility and financing decisions in relation to their performance using a set of harmonized multi-country databases.[2]

1. As detailed in the Introduction to this report, this enabling environment is composed of 17 pillars, which are interdependent and mutually reinforcing.

2. The analysis utilizes a unique data set, constructed by linking the World Bank Enterprise Survey on firm behaviours and performance, the Centre for Business Research Leximetric Database on labour and financial regulations and the Worldwide Governance Indicators on governance. The data set covers more than 100,000 firms in 132 economies across all income groups for the years between 2003 and 2016.

The range of topics that are pertinent to enterprise labour flexibility and financing decisions is vast. In order to keep the discussion in this chapter both manageable and meaningful, only a few types of management strategies, which are relevant to both enterprise competitiveness and job quality, have been chosen as the analytical focus. Although these are far from exhaustive, they have been selected so as to touch upon major broad categories of labour flexibility and financing decisions discussed in the literature.

Section A examines labour flexibility strategies, focusing specifically on two types of practice: (1) numerical flexibility, by which the volume of labour is adjusted through various practices, such as the use of fixed-term work, temporary work, agency work and flexible working hour arrangements; and (2) functional flexibility, which focuses on enhancing the ability of the labour force to carry out various tasks, through training, multi-skilling, team-working and reorganization of work and production networks. Turning the analytical focus on financing decisions, section B examines the uses of internal and external funding. Among the various types of external funding, this chapter focuses on bank loans and supplier credit, sources which correspond to formal and informal financing, respectively. Section C presents the conclusions drawn from this analysis.

The chapter finds that "investing in people", whether through a strategy of functional flexibility or financing decisions for securing working capital, is the key feature of enterprises that are associated with higher competitiveness and better job quality. More specifically, through the provision of formal training for permanent employees, functional labour flexibility is associated with higher wages and productivity and lower unit labour costs, while numerical labour flexibility, enhanced through the use of temporary employment, is associated with lower wages and productivity, but not associated with unit labour costs at all. Additionally, securing external formal funding to provide working capital is important. Those enterprises that use bank loans for working capital (i.e. funds for day-to-day operations) more intensively enjoy higher productivity and pay higher wages, while those that rely more heavily on internal funds are less productive and pay lower wages. In addition, the positive relationship between the use of bank loans and wages is not observed when bank loans are used for new investments, suggesting that securing formal external funding for new investments is not automatically linked to better job quality.

A. Labour flexibility, productivity and employment outcomes

Globalization and technological change have both contributed to the demand for greater labour flexibility (Roca-Puig et al., 2008). In order to be productive and competitive, enterprises need a certain degree of flexibility to allow them to organize their production and respond to changing market demands. However, basic protection is necessary for workers' security and to uphold effective levels of established rights (ILO, 2009).[3] Maintaining the balance between the need for labour flexibility and workers' rights protection is a challenging issue, especially during the recent period of macroeconomic uncertainty (see box 2.1).

Broadly speaking, the strategies of enterprises which aim to enhance the flexibility of their workforce can be categorized into two types: numerical and functional flexibility (Atkinson, 1984; Smith, 1997).[4] Numerical flexibility refers to a process through which firms adjust the volume of labour in terms of the number of workers or hours worked (Atkinson, 1984; Volberda, 1998; EC, 2005). This type of flexibility is particularly relevant for firms with an urgent requirement to reduce labour costs (arising from a need to engage in price competition) or other short-term oriented strategies driven by external factors. Numerical flexibility is therefore an important business strategy for firms in some sectors and during certain economic cycles, where factors such as inflationary pressure on pricing (e.g. the retail sector) or large seasonal fluctuations in demand (e.g. the agriculture, construction and tourism sectors) are particularly crucial. Numerical flexibility can be enhanced through various practices, such as the use of fixed-term workers, temporary workers or agency workers. Since these practices require firms to interact with external labour markets, they are often referred to as "external numerical flexibility" (Kalleberg, 2001; Preenen et al., 2017). However, firms can also adjust the volume of labour through flexible working hour arrangements for existing workers, such as voluntary part-time work, overtime and weekend and shift work. These practices are conducted internally within the firm, therefore they are referred to as "internal numerical flexibility" (Looise, van Riemsdijk and de Lange, 1998).

The second broad category, functional flexibility, refers to a process through which firms adjust the level of their workers' know-how, skills and adaptability to various segments of the productive process (Atkinson, 1984; Boyer, 1987; Kalleberg, 2001; EC, 2005). This type of flexibility is particularly relevant for firms with a great need for innovation and productivity enhancement (often driven by the requirement to engage in quality competition) and associated long-term oriented strategies, such as enhancement of their workforce's skills, investment in R&D and organization of work and production processes (EC, 2005). In order to enhance functional flexibility, firms often engage in such practices as continuous training, multi-tasking, team working, involvement of workers in job design and adaptation of new technology. Since these practices are primarily carried out within a firm, functional flexibility tends to overlap to a large extent with internal flexibility (Kalleberg, 2001; Roca-Puig et al., 2008; Preenen et al., 2017). However, firms can also deploy labour to different tasks by subcontracting to specialized suppliers (EC, 2005) or issuing service contracts to independent contractors (see box 2.3 for a discussion on the use of dependent self-employment). Some researchers therefore further categorize functional flexibility into "external functional flexibility" and "internal functional flexibility" (Looise, van Riemsdijk and de Lange, 1998).

Depending on sectors, economic cycles and other conditions, such as the skills endowment of the labour force, firms seek to strike a balance between numerical and functional flexibility, taking into account consideration of their short-term and long-term competitiveness (ILO, 2016b). As in most managerial decisions, both of these strategies involve costs and benefits (see box 2.2). Enterprises may value workers' know-how, skills and their adaptability, which enables them to perform a wide range of tasks within a production process but, to make it happen, need to invest in training and/or implement reorganization of workplace and supplier networks. Similarly, numerical flexibility may be required to respond to fluctuations in product demand, and could provide opportunities for better work–life balance for some workers. However, over-reliance on labour adjustments through the external labour market (e.g. hiring more temporary workers) may demotivate workers and/or discourage investment in training, eventually leading to lower firm productivity (ibid.). Furthermore, excessive recourse to numerical flexibility may in some instances deprive workers of basic protection and job stability, and limit their opportunities for career advancement.

3. In other words, "ideally, labour as a factor of production should not represent an obstacle for firms, which more than ever require flexibility, versatility, and adaptability" (Méda, 2016, p. 1). The author notes at the same time that "individuals' expectations related to work have never been so intense", such as the desire for work to be fulfilling. In this chapter, we do not discuss the value of work. For a full discussion, see Méda (2016).

4. There are extended elaborations on this generic typology – see EC (2005) for a comprehensive overview.

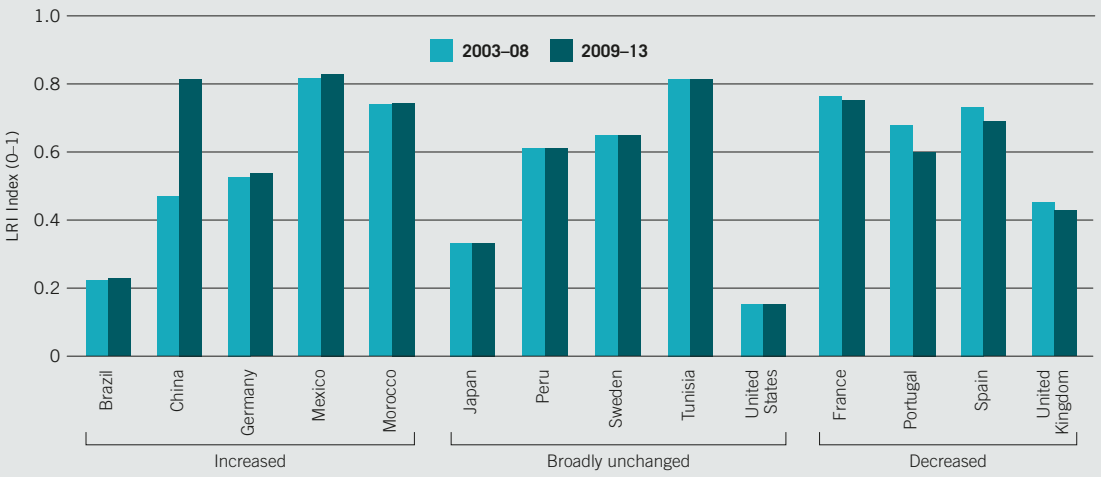
Box 2.1

Reforms of labour regulations[1] over time and linkages with the broader macroeconomic environment

In recent periods of macroeconomic instability and crisis, labour market deregulation was encouraged, among other austerity and adjustment measures, to improve firms' competitive positions and stimulate economic growth. Analysing the austerity policies of 187 countries, Ortiz et al. (2015) found that at least 89 countries (49 of them developing) considered labour reforms. Governments promoted labour market flexibility mainly through the reduction of job security, the promotion of non-standard forms of employment and the decentralization and weakening of collective bargaining and trade unions (Hermann, 2014; UNHRC, 2016).[2] Different studies point out that a number of labour law reforms were undertaken during the time of the Eurozone economic crisis. ILO and IILS (2012) found that at least 13 out of 17 Eurozone countries in the study reformed labour regulations specifically relating to the decentralization of collective bargaining and dismissal (collective or individual) protection (e.g. shortening notice periods for dismissal, changing definitions of fair and unfair dismissal, reducing severance payments, weakening or eliminating the right to be reinstated after unfair dismissals, among other measures). Figure 2.1, based on the Centre for Business Research Labour Regulations Index (CBR-LRI), presents the average levels (in terms of the score assigned according to the CBR-LRI) of regulations dealing with dismissal in selected countries for pre- and post-crisis periods (2003–08 and 2009–13). The figure shows a decline in the score of some EU economies, particularly those affected by the crisis. However, in other economies, the score either remains unchanged or reflects a modest change. Hence, this policy has not been applied universally. Changes in labour regulations are heterogeneous and vary widely across systems (whether civil or common law) and over time (Adams et al., 2017).[3]

Figure 2.1

Pre- and post-crisis levels of the regulation of dismissals, selected countries



Note: The scores are the result of averaging different indicators in the category of dismissal protection as per the CBR-LRI database. The indicators taken into account are as follows: (a) legally mandated notice period (all dismissals); (b) legally mandated redundancy compensation; (c) minimum qualifying period of service for normal case of unjust dismissal; (d) law imposes procedural constraints on dismissal; (e) law imposes substantive constraints on dismissal; (f) reinstatement normal remedy for unfair dismissal; (g) notification of dismissal; (h) redundancy selection; and (i) priority in re-employment.

Source: ILO calculations based on the CBR-LRI.

Box 2.1

(cont'd)

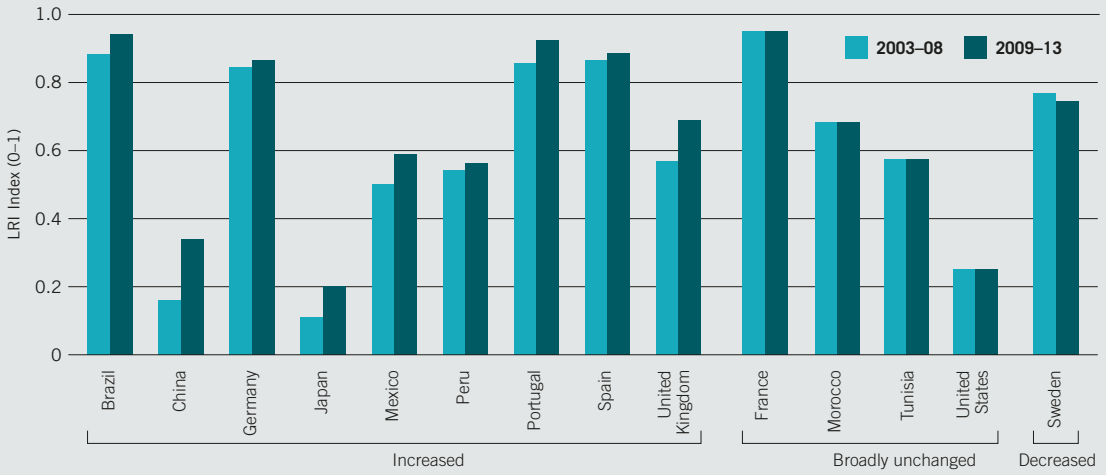
A recent ILO study notes an increasing trend towards the use of non-standard forms of employment (ILO, 2016a). In this respect, a question that arises is how labour regulation has adapted to this reality. Indeed, increasing levels of protection for workers involved in part-time, fixed-term and agency work have been observed not only in various European and other developed economies, but also in emerging and developing economies, albeit to a more modest extent (ILO, 2015b; Adams et al., 2017). The reforms have, among other changes, required that workers in non-standard forms of work be treated in a proportionate or in the same manner as employees in permanent contracts, or limited the use of agency work. For instance, in Mexico, a country where labour reforms have been relatively rare since the 1970s, a substantive reform was adopted in 2012 restricting and imposing conditions on, among other aspects, the use of outsourcing (Campuzano, 2017).[4]

Figure 2.2 shows the changes in the levels of protection of different forms of employment in the pre- and post-crisis periods.

Currently, the impact of labour market regulation on employment, productivity or economic growth is still a matter for debate (Betcherman, 2014; Aleksynska and Eberlein, 2016). However, the discourse favouring excessive labour market deregulation has gradually shifted. For instance, the World Bank has indicated that not only is employment regulation important in protecting workers from "arbitrary or unfair" treatment, but it also may enhance productivity through promoting cooperation between workers and employers (World Bank, 2014). In this regard, international organizations are increasingly acknowledging the beneficial role of labour regulations when adapted to the particular context of the labour market (ILO, 2016a).

Figure 2.2

Pre- and post-crisis levels of the regulation of different forms of employment, selected countries



Note: The scores are the result of averaging different indicators in the category of dismissal protection as per the CBR-LRI database. The indicators taken into account are as follows: (a) the law, as opposed to the contracting parties, determines the legal status of the worker; (b) part-time workers have the right to equal treatment with full-time workers; (c) part-time workers have equal or proportionate dismissal rights to full-time workers; (d) fixed-term contracts are allowed only for work of limited duration; (e) fixed-term workers have the right to equal treatment with permanent workers; (f) maximum duration of fixed-term contracts; (g) agency work is prohibited or strictly controlled; and (h) agency workers have the right to equal treatment with permanent workers of the user undertaking.

Source: ILO calculations based on the CBR-LRI.

[1] In general, labour market regulation includes different aspects relating to employment protection law, industrial relations, employee representation law, minimum wages, working hours and regulation of forms of employment, among others. While labour regulation constitutes a means to achieve decent work, many firms perceive labour regulations as an obstacle to their operation to varying degrees corresponding to the level of development of the economy and the size of the firm. [2] Anner and Caraway (2010) highlighted the fact that, in order to obtain financial assistance from these institutions, in their letters of intent to the International Monetary Fund (IMF) (1998–2005) at least one-third of governments made commitments to make labour market regulation more flexible. [3] For a closer look at the trends, see ILO (2015b), Chapter 4. [4] The reform established that this type of work can only be used for specialized activities, that it cannot be used for activities equal or similar to those of the firm's workers and that it cannot include all the activities performed at the firm.

Box 2.2

Enterprises and labour flexibility

Many researchers would agree that a certain degree of labour flexibility is necessary for enterprise competitiveness and job creation. This argument has become even stronger in the era of globalization, which is characterized by more flexible and networked production structures across a broader range of competitive markets. As firms adapt to this rapidly changing environment, some would argue that labour markets also need to adapt. In this respect, non-standard forms of employment, such as temporary, part-time and on-call work, multi-party employment and ambiguous employment relationships, are becoming increasingly prevalent (ILO, 2016b). This has called into question the "standard" employment relationship as the definitive contractual arrangement between enterprises and workers (ILO, 2015b).

The main argument advanced for labour market flexibility relates to addressing market inefficiencies. The premise is that firms' inability to fire workers during cyclical downturns (or their reluctance to do so due to fixed costs) impacts on hiring decisions, which slows job creation during cyclical upswing periods. This rigidity is also perceived to have implications for firms' productivity and their performance. Empirical studies supporting this argument are, however, wide-ranging and show mixed results.* For example, Bernal-Verdugo, Furcerci and Guillaume (2012) show that increases in labour market flexibility (particularly relaxation of the hiring and firing regulations) had a significant negative impact on unemployment rates in 97 countries from 1985 to 2008. Other studies credit labour market flexibility with the post-crisis improvements in employment rates in some EU economies, such as Spain and the United Kingdom (OECD, 2014a, 2015). However, other studies find either adverse impacts or no impact at all (Glyn et al., 2003; Heckman and Pagés, 2004). Some have even suggested that a strategy of labour market flexibility is incompatible with the promotion of "routinized innovation" and higher productivity activities (Vergeer et al., 2015; Rubery, Keizer and Grimshaw, 2016). Both sets of authors note the importance of income security and training, as well as worker commitment (loyalty) and motivation to productivity outcomes (ibid.).

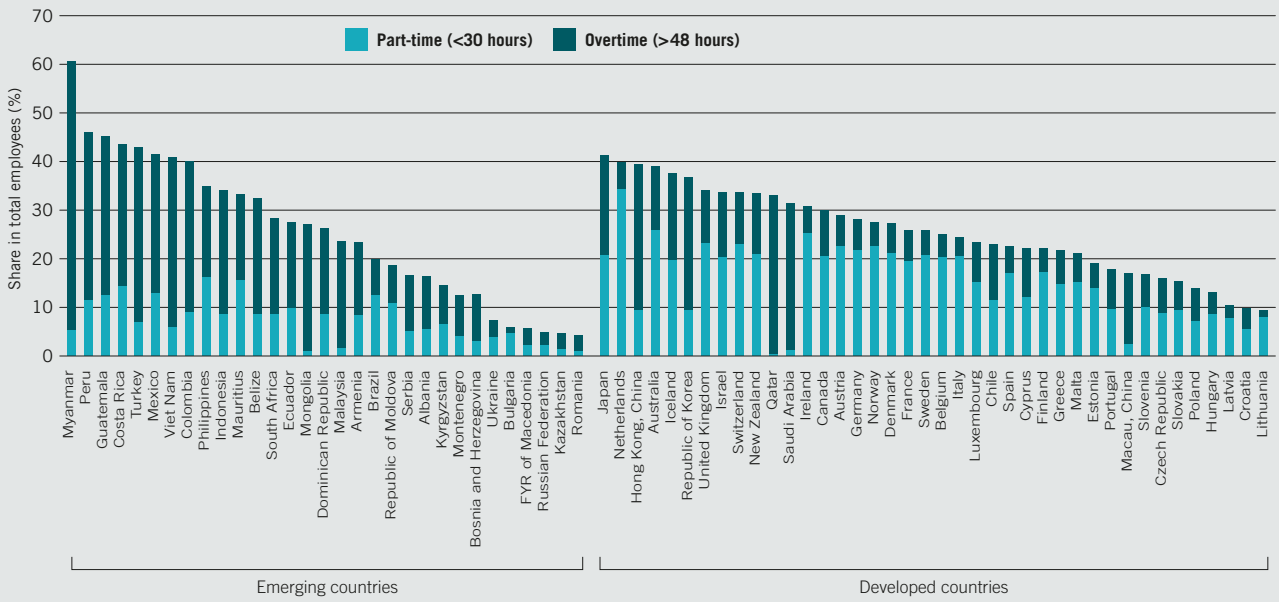
On the supply side, there is also the argument that some workers, depending on their specific circumstances, prefer more flexible working arrangements. Flexible work arrangements can provide better opportunities for work–life balance, particularly for those with family obligations, young people and older workers (Chassin, 2013). Additionally, such flexibility can help to integrate disadvantaged workers into the labour market and serve as a stepping stone to permanent employment (ibid.), thereby changing the distribution of employment and closing gaps in participation and employment among such groups. However, some evidence has shown that, rather than providing a stepping stone, some flexible forms of employment can be a stumbling block, partly owing to underinvestment in skills and training that can reduce the possibility of upgrading to better forms of employment (Rubery, Keizer and Grimshaw, 2016). Particularly in the case of women, but also among youth, flexibility can come at the cost of lower wages and limited opportunities for career advancement (Gregg and Gardiner, 2015; Grimshaw and Rubery, 2015; Rubery, Keizer and Grimshaw, 2016).

Since firms use a number of strategies to adjust to economic shocks, including other forms of numerical and also functional flexibility, such as management and training programmes, job security regulations may not necessarily be a barrier to labour flexibility (Marshall and Van Adams, 1994). This points to the importance of creating an enabling environment using comprehensive measures to motivate companies to compete on the basis of other measures besides cost competitiveness, including innovation and quality.

** For an overview, see Valverde, Tregaskis and Brewster (2000), Ingason (2013) and Betcherman (2014).*

Figure 2.3

Numerical flexibility through the use of part-time work and overtime, selected countries, 2015 (percentage of total employees)



Note: The data on distribution of employees by working hours are not available for many developing economies, hence the omissions from the figure.

Source: ILO calculations based on ILO STAT.

The use of part-time arrangements is particularly common among firms in developed economies

As mentioned above, one of the ways in which firms enhance their numerical labour flexibility is to adjust the working hours of employees through practices such as part-time work or overtime. Reflecting the need for numerical flexibility, these arrangements are observed in many parts of the world. The degree of recourse to part-time work and overtime varies across countries but some general patterns are discernible. First, firms in developed economies are more likely to use part-time arrangements than those in emerging economies. The mean share of employees working less than 30 hours per week is 21 per cent in developed economies, compared to 7.8 per cent in emerging economies. Second, firms in emerging economies are more likely to use overtime arrangements than firms in developed economies. The mean share of employees working more than 48 hours per week is 18.3 per cent in emerging economies, compared to 12.4 per cent in developed economies (see figure 2.3).

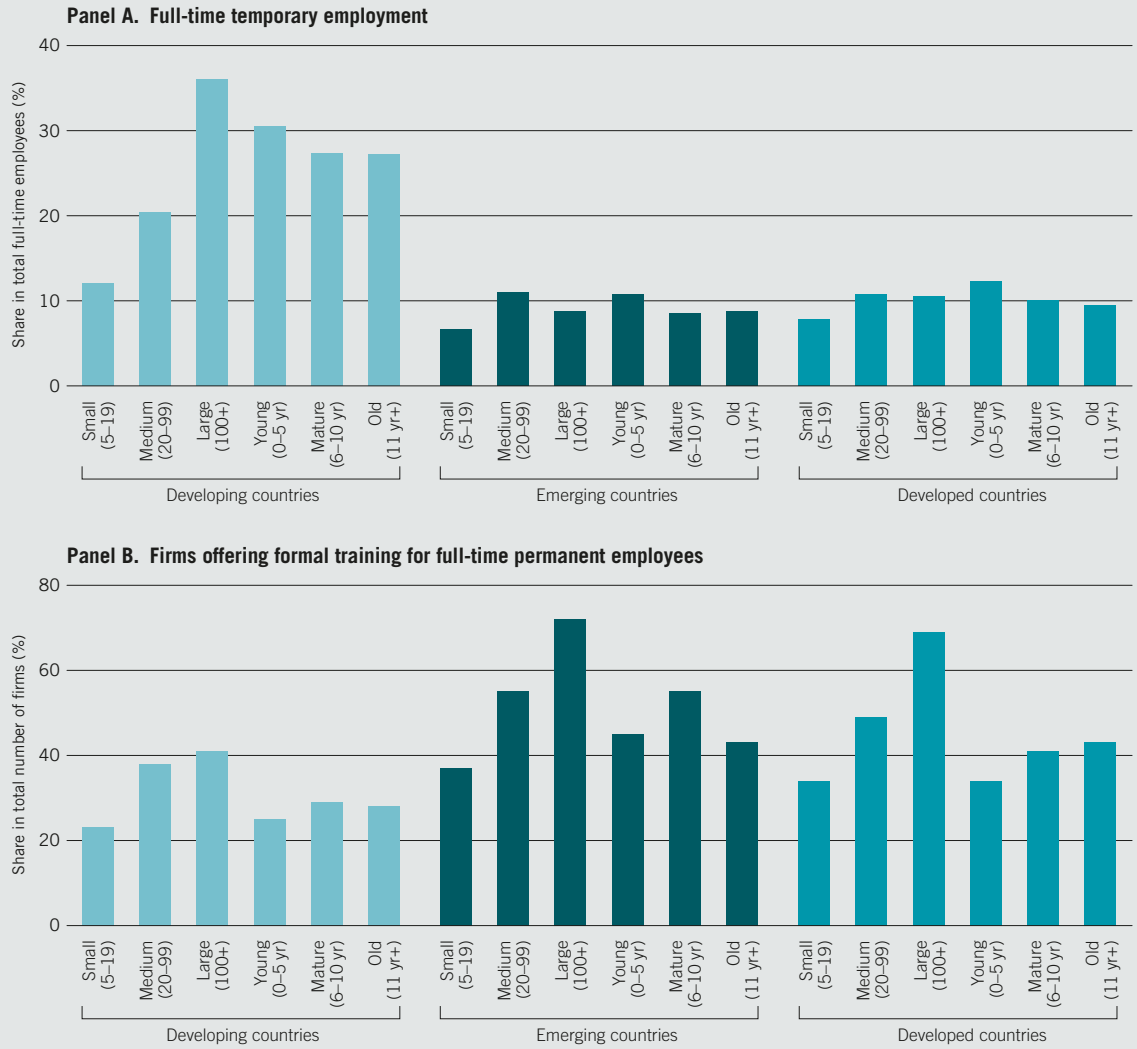
Recourse to numerical flexibility through the use of temporary employment is particularly prevalent among enterprises in developing economies

In addition to working hours, the number of workers employed by a firm is a key area in terms of numerical adjustment. The use of temporary employment is observed in many parts of the world, with great variations across countries. However, there are broad patterns relating to level of economic development and firm characteristics. First, the income level of countries is negatively correlated with the share of full-time temporary employment[5] in total full-time employment. In developing economies, more than one in five full-time employees (28.6 per cent) are on full-time temporary contracts, while in emerging and developed economies the share is much smaller, at 8.9 and 10.2 per cent, respectively. Second,

5. Full-time temporary workers are employees who are paid on a short-term basis (i.e. for less than a fiscal year) with no guarantee of renewal of contract employment, and who work eight or more hours per day. Temporary employment as surveyed by the World Bank Enterprise Survey does not include part-time temporary workers. For more information, see http://www.enterprisesurveys.org.

Figure 2.4

Numerical and functional flexibility, by firm size, firm age and country group, latest available year (percentages)



Souce: ILO calculations based on World Bank Enterprise Survey, August 2016.

a closer look at firm characteristics reveals that it is the large firms in developing economies where full-time temporary employment is most prevalent (see figure 2.4).[6] More than one in three full-time employees (36.0 per cent) in large firms in developing economies are on full-time temporary contracts, a much higher share than the sample average for large firms at 9.1 per cent. Other categories of workers are also used to achieve numerical flexibility, including "zero hour" and dependent self-employed workers. Interestingly, although the dependent self-employed have no employment contract, they do share some characteristics with employees.

6. A regression analysis also finds a negative and statistically significant correlation between the income level of a country and the intensity of firms' use of temporary employment.

The provision of formal training for full-time permanent employees is substantially less common in developing economies

Turning to functional flexibility, there are again large variations across economies and between firms. Data show that enterprises in developing economies are much less likely to provide formal training to their full-time permanent employees, compared to those in emerging and developed economies. The mean share of firms with formal training programmes in developing economies is 27 per cent, compared to 47 per cent in emerging economies and 42 per cent in developed economies. This relatively low level of training provision in developing economies needs to be understood in conjunction with their more intensive use of temporary employment. Some studies have found that firms with higher levels of temporary employees have less incentive to train their workers (Ruiz-Santos, Ruiz-Mercader and McDonald, 2003). However, it is worth noting that, in developing economies, larger enterprises tend to use full-time temporary employment intensively and are also more likely to provide formal training to full-time permanent employees. This suggests that enterprises may tend to mix different approaches to labour flexibility (functional and numerical), and as a result those enterprises that use full-time temporary employment intensively can also be those that invest in training of their full-time permanent employees (Osterman, 2000; Bacon and Blyton, 2001).

Numerical and functional flexibilities have contrasting implications for enterprise performance

The implications of numerical and functional labour flexibilities for enterprise performance, in terms of both competitiveness and job quality, remain open-ended empirical questions. In fact, only a few empirical studies exist on how these two types of flexibility are associated with enterprise performance in developing and emerging economies. This section therefore aims to fill this knowledge gap by examining the relationships between enterprise performance and selected practices related to numerical and functional labour flexibility. More specifically, it examines how the use of full-time temporary employment (i.e. numerical flexibility) and the provision of training to full-time permanent employees[7] (i.e. functional flexibility) are associated with firm performance. In order to assess these implications in terms of both productivity and job quality, the analysis provides a comprehensive picture of how the two different types of labour flexibility strategies are related to (1) job quality, as measured by real wages; (2) productivity, as measured by labour productivity; and (3) overall competitiveness, as measured by nominal unit labour costs, which are driven by both wages and productivity.

As reviewed at the beginning of this section, these practices are only two examples of many other firm behaviours pertaining to labour flexibility. However, given the lack of harmonized firm-level data sets covering other dimensions of flexibility, or a comprehensive composite indicator, empirical research on this topic is compelled to select relevant variables from the available data sets. In this regard, the two variables of choice for the current analysis, the use of full-time temporary employment and the provision of training to full-time permanent employees, are certainly valid candidates, as they directly correspond to the two broad categories of numerical and functional flexibility. As the data availability improves, more research should certainly be conducted on this topic. The analysis conducted in this section is one attempt made with the current state of data availability.

The findings are twofold. First, more intensive recourse to numerical flexibility through the use of full-time temporary employment is, on average, associated with lower wages and lower productivity and is not associated with the overall competitiveness of an enterprise, measured in terms of unit labour costs. Second, recourse to functional flexibility through the provision of formal training for full-time permanent employees is, on average, associated with higher wages, higher productivity and lower unit labour costs (ULCs).

7. Full-time permanent workers are paid employees who are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and who work eight or more hours per day. They include employees and managers. Permanent employment as surveyed by the World Bank Enterprise Survey does not include part-time permanent employees. For more information, see http://www.enterprisesurveys.org.

Box 2.3

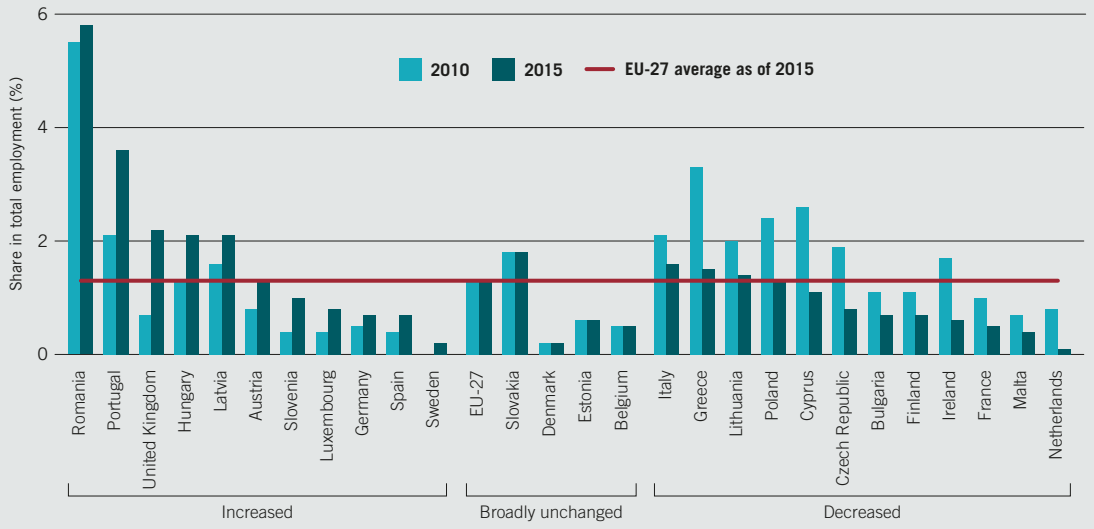
A new form of labour flexibility? Dependent self-employed in the EU-27[1]

Among the many forms of human resource management strategies for enhancing numerical flexibility, there is a heightened interest in firms' use of so-called "dependent self-employed workers", who have no employment contract and are therefore registered as "self-employed", but who share some characteristics with employees. Instead of running their own businesses, these "economically dependent workers" or "dependent contractors" work under a commercial contract (or service contract) with a client firm (Oostveen et al., 2013). As such, they are dependent on only one or a few client firms for their income and work under close supervision (ILO, 2016b). The working conditions of the dependent self-employed can be at greater risk than those of employees, in terms of their ability to exercise their fundamental rights at work, such as freedom of association and the right to collective bargaining, because, in certain jurisdictions, labour laws, including minimum wage legislation, apply only to wage and salaried workers (ibid.). This "grey zone" in the labour law is attracting a considerable amount of attention from the social partners and governments.

Perhaps contrary to commonly held perceptions, the share of dependent self-employed in total employment is very small (around at 1.3 per cent) and remained broadly unchanged between 2010 and 2015 in the EU-27 countries. However, beneath this aggregate trend is a dichotomy between countries which have seen upward trends and those which have experienced downward trends (figure 2.5). On the one hand, countries such as Hungary, Latvia, Portugal and the United Kingdom have seen a relatively sizeable increase in the share of dependent self-employment in total employment since 2010, pushing the shares in those countries well above the EU-27 average as of 2015. On the other hand, countries such as Cyprus, Czech Republic, Greece, Ireland, Italy, Lithuania and Poland have seen relatively sizeable decreases, pushing their shares down to just above or below the EU-27 average. Given this disparity, the question of whether or not dependent self-employment will become a more dominant form of employment relationship in future will need to take into account country-specific considerations. The OECD (2014b) finds that countries with a high prevalence of dependent self-employment tend to have a low incidence of standard fixed-term employment, suggesting a possible substitutability between these two types of workforce. Further research on the drivers of the cross-country differences in the prevalence of dependent self-employed is needed.

Figure 2.5

Shares of dependent self-employment in total employment, 2010 and 2015 (percentages)



Source: ILO calculations based on the European Working Conditions Survey, 2010 and 2015.

Box 2.3

(cont'd)

Consistent with the widely held concerns, there is some evidence that the working conditions of the dependent self-employed are in jeopardy, in comparison to those of employees. For instance, the monthly earnings of dependent self-employed workers have consistently been considerably lower than the monthly wage of employees. The European Working Conditions Survey shows that, in 2010 and 2015, the dependent self-employed earned 67.1 per cent and 67.9 per cent of the monthly wage of employees, respectively. This is partly a reflection of the fact that dependent self-employed workers tend to work shorter hours.[2] However, the survey shows that, in 2015, they worked 92.1 per cent of the average working hours of employees, suggesting that factors other than working hours are responsible for the income gap. This gap is likely to persist in the near future, given the weaker prospects of income increases among the dependent self-employed. According to the survey, in 2015, one-fifth (20.4 per cent) of the dependent self-employed saw their earnings rise, while among employees the proportion amounted to about one-third (34.4 per cent).

Despite the lower pay and weaker financial prospects of dependent self-employed workers, one of the reasons why a worker would choose this form of employment over working as an employee is to gain greater autonomy. However, the survey shows that the autonomy of being "self-employed" is becoming less relevant for dependent self-employed workers. In 2010, 13.7 per cent of such workers said that their working time arrangements are set by the company or organization, with no possibility of making changes. As of 2015, this share has risen to 19.5 per cent, indicating a shift in power dynamics, skewed towards the client firms. However, on the positive side, it is worth noting that this greater degree of control over working arrangements on the part of client firms appears to have come with increased levels of responsibility. For instance, the survey shows that the share of dependent self-employed workers who received on-the-job training has risen in recent years, from 8 per cent in 2010 to 20.9 per cent in 2015.

In summary, the findings show that a rise in the number of dependent self-employed workers is apparent in some countries but not in others, with the result that the overall trend is broadly unchanged. However, the widely held concerns about the working conditions of those workers are validated, given their lower levels of pay and weaker financial prospects, and the greater degree of control over working hour arrangements exercised by the client firms.

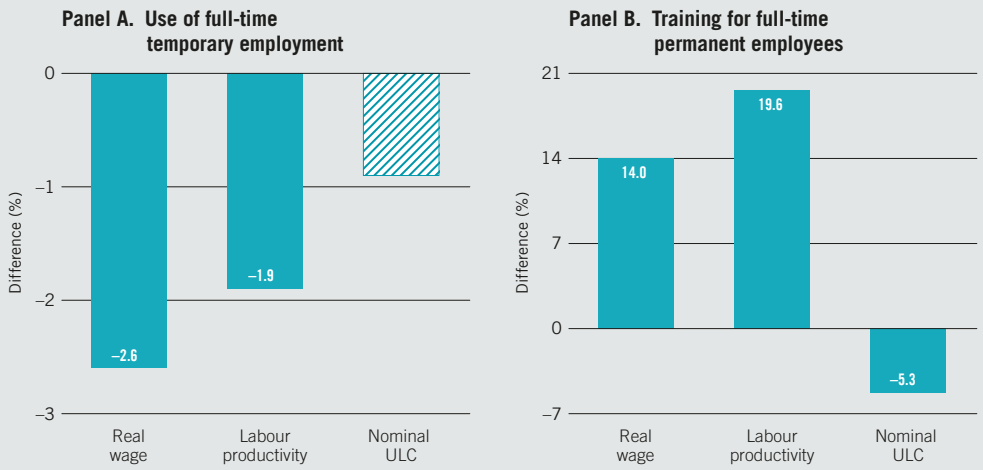
[1] Croatia is excluded from these analyses as it only acceded to the EU in 2013. [2] In 2015, the average weekly number of working hours among dependent self-employed workers was 33.2 hours, while among employees it was 36.1 hours.

Figure 2.6, panel A shows that more intensive use of full-time temporary employment is negatively associated with real wages. Enterprises with a 10 percentage point larger share of full-time temporary employment in total full-time employment have lower real wages, by 2.6 per cent. In addition, the use of full-time temporary employment tends to create its own costs for firms in terms of productivity. Our estimates show that a 10 percentage point larger share of full-time temporary employment is associated with a 1.9 per cent lower level of labour productivity. As a result of these negative associations with wages and labour productivity, the use of full-time temporary employment is not found to be associated with the overall competitiveness of enterprises, measured in terms of ULCs, in any statistically significant way. Thus, although the use of temporary employment may be a viable strategy for ensuring enterprise competitiveness in the short term, these results imply that recourse to numerical flexibility through the intensive use of temporary employment may trap enterprises in the vicious cycle of low wages and low productivity.

Unlike the case of numerical flexibility, figure 2.6, panel B shows that recourse to functional flexibility through the provision of formal training to full-time permanent employees has a positive relationship with enterprise competitiveness and job quality. Enterprises that provide formal training to their full-time permanent employees pay wages that are 14 per cent higher than those which do not offer training. In addition, enterprises with formal training programmes are almost 20 per cent more productive than those without such programmes. Moreover, since the productivity premium surpasses the wage premium, enterprises with training programmes are also more competitive, with unit labour costs that are 5.3 per cent lower than those that do not offer training. Thus, although the provision of training and the related wage premium incur additional labour costs for enterprises, the productivity gains associated with the functional flexibility outweighs such additional costs, hence overall lower unit labour costs and higher competitiveness.

Figure 2.6

Relationship between labour flexibility and enterprise performance (percentage difference)

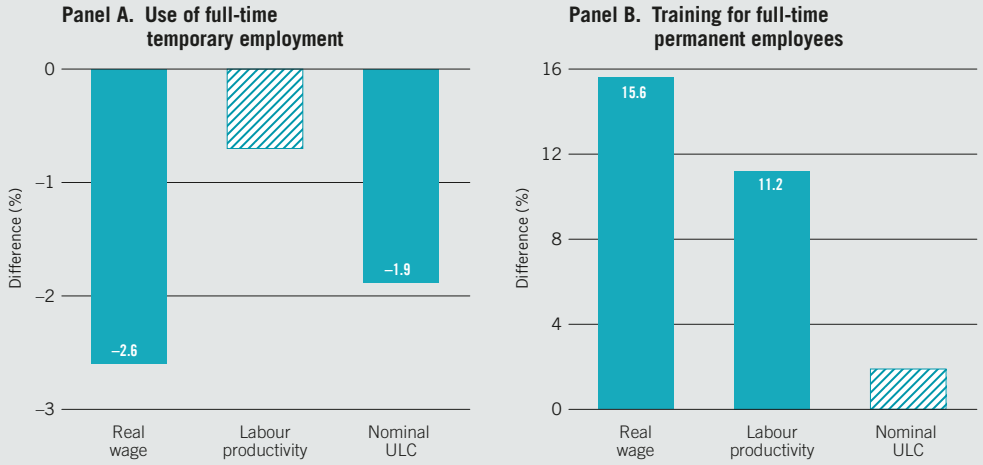


Note: The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the World Bank Enterprise Survey, August 2016.

Figure 2.7

Relationship between labour flexibility and enterprise performance, textile and garment sectors (percentage difference)



Note: The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the World Bank Enterprise Survey, August 2016.

However, it is worth noting that the abovementioned implications of numerical and functional flexibility for enterprise performance may differ for sectors characterized by low profit margins, such as the textile and garment sectors. For instance, the same analysis as that conducted for figure 2.6, but restricting the sample to enterprises in the textile and garment sectors, shows that in those sectors enterprises which resort to more intensive use of full-time temporary employment are indeed more competitive, with unit labour costs that are 1.9 per cent lower. This result, however, is driven by lower wages, not by higher productivity (see figure 2.7, panel A). In other words, the higher competitiveness of enterprises associated with more intensive use of full-time temporary employment is based on the sacrifice of job quality rather than on increased efficiency. This is another indication that the use of temporary employment based on a strategy of labour cost reduction may trap enterprises in the vicious cycle of lower wages without generating any improvement in productivity.

On the other hand, those enterprises in the textile and garment sectors that provide formal training for full-time permanent employees pay wages that are 15.6 per cent higher, and are 11.2 per cent more productive, than those that do not (see figure 2.7, panel B). There is no statistically significant association between the provision of training and ULCs, positive or negative. This shows that, although enterprises with formal training programmes in place do incur higher labour costs, they are also more productive; therefore, the higher labour costs associated with the provision of training do not hinder overall competitiveness. Thus, given the absence of negative implications for overall competitiveness and the positive implications for wages and productivity, the benefit of adopting a functional flexibility strategy holds even for enterprises in sectors with low profit margins.

The protection of fixed-term employees is negatively associated with enterprises' use of temporary employment

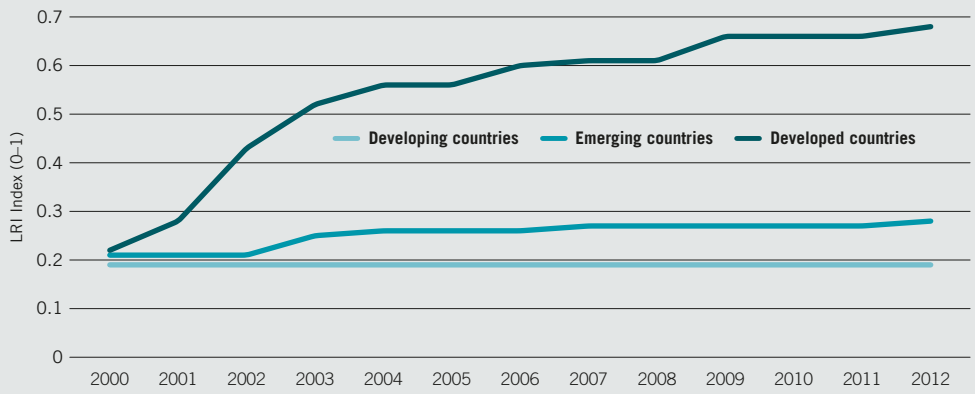
In light of the positive implications for enterprise performance in the three dimensions examined (i.e. real wages, labour productivity and unit labour costs), the results presented in figures 2.6 and 2.7 point to the desirability of placing stronger emphasis on the provision of training for permanent employees rather than intensifying the use of temporary employment when seeking the right balance between numerical and functional flexibility. The question is therefore how to encourage companies to adopt this approach, which is mutually beneficial for the enterprise and its workers. This is essentially a question of implementing public policies that create appropriately favourable environments and incentives for enterprises.

The issue of particular relevance in this regard is the role of labour regulations. As discussed in the introduction to this chapter, enterprises operate under regulatory constraints. Some jurisdictions have stronger protection of employees in place than others, and such differences in the strength of employment protection may influence enterprise decisions, including those concerning the use of temporary employment.

These regulations differ considerably across countries, as documented in a number of studies (see, for example, ILO, 2016b). Data from 116 countries show that employment protection regulations pertaining to fixed-term employees tend to offer less protection to workers in developing economies, and this explains, at least partially, the substantially larger share of temporary employment in these economies. For instance, labour regulations in developing economies offer substantially lower levels of protection to fixed-term workers in terms of their right to equal treatment with permanent employees. Figure 2.8 shows that, between 2000 and 2012, developing economies made no progress in ensuring equal rights between fixed-term and permanent workers, while all the other country groups made some progress towards promoting fixed-term workers' rights to equal treatment. The persistently weak protection of

Figure 2.8

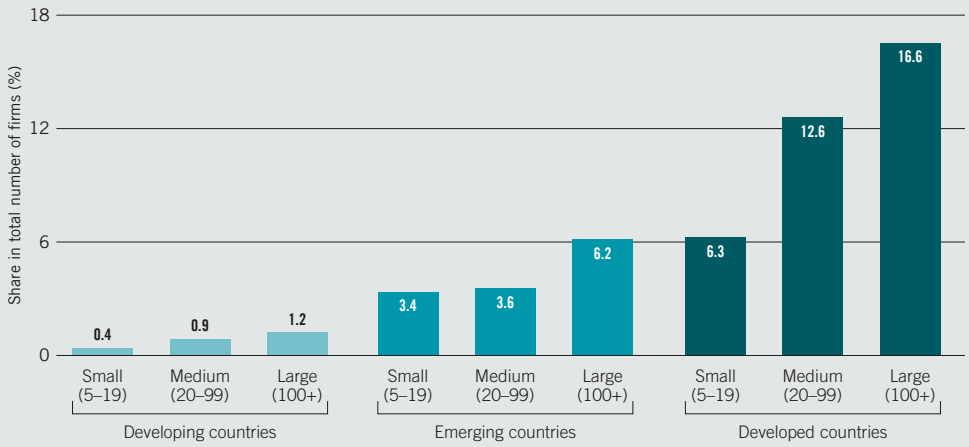
Labour regulations pertaining to fixed-term workers' rights to equal treatment with permanent workers, 116 countries, by country group, 2000–12



Source: ILO calculations based on the CBR-LRI.

Figure 2.9

The proportion of enterprises that perceive labour regulations as a major constraint, latest available year (percentages)



Source: ILO calculations based on the World Bank Enterprise Survey, August 2016.

fixed-term workers' rights in developing economies is in line with the patterns presented in figure 2.4, where enterprises in developing economies are more likely to have recourse to numerical flexibility strategies involving the use of temporary employment, compared to enterprises in other economies. If such recourse is based on unequal treatment between fixed-term and permanent workers, the pattern certainly raises concerns, not only in the light of its implications for enterprise performance but also from the perspective of the protection of workers' rights (Aleksynska and Muller, 2015).

The weak protection of fixed-term workers in lower income countries is strongly reflected in the way that enterprises perceive labour regulations as a major constraint. The data show that, in developing economies, only a very small proportion (0.4 to 1.2 per cent) of enterprises perceive labour regulations as a major constraint. Reflecting the stronger protection of fixed-term workers in higher income countries, the proportion becomes larger in emerging (3.4 to 6.2 per cent) and developed (6.3 to 16.6 per cent) economies (see figure 2.9). Furthermore, enterprises in developed economies, particularly large and medium-sized firms, identify these types of regulations as one of their main challenges (16.6 per cent for large and 12.6 per cent for medium-sized firms). Possible explanations for these differences in perceptions – by size and country level of development – include the large number of informal workers in developing and some emerging economies, the scope of application of labour and employment regulation (e.g. small enterprises could be exempt from the application of labour regulations),[8] gaps between law and practice, influenced by low levels of compliance and limited capacity of labour institutions to enforce regulations, and underlying political settings (e.g. democracy, accountability, corruption, among other factors).[9]

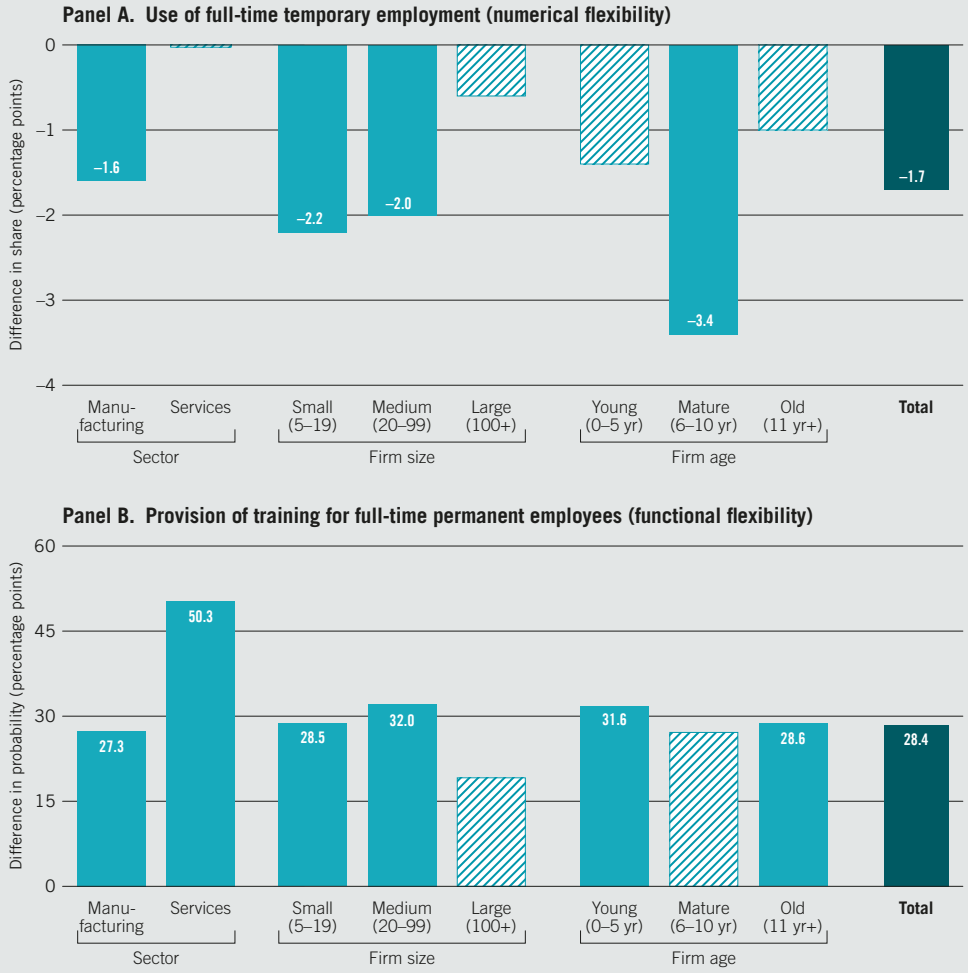
Our empirical analysis finds that the regulatory environment is indeed closely related to enterprises' labour flexibility practices, showing that the use of full-time temporary employment is negatively associated with the strength of legal protection of fixed-term employees in terms of their equal rights with permanent employees. In countries where such labour protection is stronger, firms are less likely to use full-time temporary employment. The share of full-time temporary employment in total full-time employment is smaller, by 1.7 percentage points, in countries with stronger legal protection of fixed-term employees' rights (see figure 2.10). This pattern is observed across the range of firm characteristics, such as size, age and sector, albeit some exceptions. These results imply that ensuring equal rights between fixed-term and permanent employees can potentially reduce the relevance of numerical

8. See, for example, Fenwick et al. (2007) and Fenwick and Van Goethem (forthcoming).

9. Whereas, in developed economies, where levels of informality are lower, there is a greater capacity for enforcement, complemented by stronger and more effective labour institutions, as well as more favourable political contexts, which may lead to higher levels of compliance in comparison to developing economies (ILO, 2007).

Figure 2.10

Relationship between the protection of fixed-term employees' rights to equal treatment with permanent employees and human resource management strategies (percentage point change)



Note: The bars show point estimates of the relationhip between the strength of labour regulations and the share of temporary employees in total number of employees. The point estimates should be understood as the expected difference in the share of temporary employment between countries with the weakest protection of fixed-term workers' rights and those with the strongest protection. The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the CBR-LRI and World Bank Enterprise Survey, August 2016.

flexibility, and may induce enterprises to favour functional flexibility strategies. Figure 2.10, panel B seems to confirm such a hypothesis. The probability that enterprises provide formal training to full-time permanent employee is higher, by 28.5 percentage points, in countries with stronger protection of fixed-term employees' rights to equal treatment with permanent employees. This pattern is observed across firm size, firm age and sectors, despite some exceptions.

In summary, this section finds that enterprises' recourse to numerical flexibility through more intensive use of full-time temporary employment is associated with lower wages and lower labour productivity, and not associated with unit labour costs. On the other hand, recourse to functional flexibility through the provision of formal training for full-time permanent employees is associated with higher wages, higher labour productivity and lower unit labour costs. These findings suggest that a "high-road" approach to human resource management has positive implications for overall enterprise competitiveness, without sacrificing job quality. While competitiveness based on labour cost minimization can

be secured in the short term, these benefits come with rather negative implications in the long run, such as negative productivity growth, which in turn traps enterprises in the vicious cycle of low wages and low productivity. In this respect, our analysis indicates that labour regulation can play a role in encouraging enterprises to place a greater emphasis on functional flexibility rather than intensifying their recourse to numerical flexibility of labour. In particular, ensuring fixed-term workers' rights to equal treatment with permanent workers may potentially make numerical flexibility less relevant for enterprises, so that they may make less intensive use of temporary employment and provide more training to permanent employees.

Labour regulations, like other types of regulation, can be considered costly and troublesome, which may limit compliance. But these perceptions are often influenced by the limited access of firms to information concerning employment standards. In fact, studies showed that small and medium-sized enterprises (SMEs) tend to face challenges in obtaining information on labour regulations, understanding complex and sometimes conflicting requirements and covering the financial costs that compliance may entail (Pires, 2008).

However, even if some enterprises perceive labour regulations as "constraining", they may regard them as necessary and be motivated to comply for a number of reasons. For instance, managers could be naturally inclined towards "doing the right thing", in which case they take into account moral and ethical considerations in their decision-making. Reputational issues may also be considered. This is common, for example, in the case of large brands or multinational enterprises, which respond to consumer demands. Finally, compliance could be strengthened in an environment with effective and/or innovative labour institutions (such as labour inspectorates and administration, and occasionally in collaboration with other organizations). In these cases, non-compliance is more likely to be detected and punished or incentives may be offered to balance compliance with productivity (see section B for further information).[10]

In fact, the importance of labour market regulation as a tool for policy-makers to promote inclusive development and equality has been highlighted in various empirical studies (ILO, 2015b). Emerging literature on the impacts of labour regulations based on new indicators and data sets from studies using different time-series data, such as the ILO's Employment Protection Legislation database (EPLex) and the Centre for Business Research Labour Regulations Index (CBR-LRI, used for the analysis in this chapter), can offer new evidence in this respect (Deakin, 2016; ILO, 2015b; Ludlow and Blackham, 2015). For example, studies based on these data show that, when adequately implemented, laws with a particular focus on collective bargaining and directed to enhance workers' voice at the firm and industrial level have the potential to reduce inequality without adversely impacting on employment (Deakin, Fenwick and Sarkar, 2013; Deakin, Malmberg and Sarkar, 2014; Deakin, 2016).[11]

Hence, labour regulations and compliance can be seen as necessary and beneficial and can contribute to the realization of the pillars of decent work, such as fundamental principles and rights at work, social and employment protection and the strengthening of social dialogue (Dyring-Christensen, Hegazy and van Zyl, 2016).[12] These have been associated with enhanced well-being and capabilities for workers, and with poverty reduction in the longer term (Kantor, Rani and Unni, 2006). The ILO suggests that rights such as freedom of association and the effective recognition of collective bargaining are enabled through an "effective legal and institutional framework for labour relations, strong employers' and workers' organizations and an efficient labour administration" (ILO, 2017, p. 5). To this end, labour market regulations can promote inclusive development and equality, for example by supporting democratization and social dialogue (Kolben, 2016).[13]

10. For a comprehensive review of the literature see, for example, Fenwick et al. (2007), Parker and Nielsen (2011) and Howe, Hardy and Adams (2015).

11. The research focuses both on developed and on developing and emerging economies, including Brazil, China, France, Germany, India, Japan, Russian Federation, South Africa, Sweden, the United Kingdom and the United States.

12. In general, Deakin (2016) proposes five functions of labour market regulation: economic coordination; risk distribution; demand management; democratization; and empowerment. But Marshall (2016) adds that labour market regulation could also help to redress vulnerabilities and unfreedoms of the region or country (this based on Amartya Sen's work).

13. This is particularly the case with employment protection legislation and minimum wage laws.

B. Capital structure, productivity and employment outcomes

Financial resource management is the lifeblood of day-to-day business operations and new investments; at the same time, it is also an area in which many enterprises struggle. Access to finance consistently emerges as one of the major constraints perceived by enterprises, especially in developing economies. The data show that almost one-quarter of enterprises in developing economies find access to finance to be a major constraint. The proportion of such enterprises is also sizeable in emerging economies, at 15 per cent, and in developed economies, at 11 per cent. These perceptions on the part of enterprises illuminate the current business environment, in which many enterprises want to use external funds but are not enabled to do so. This section discusses the possible roles played by institutional and regulatory environments in influencing enterprises' financing decisions.

Firms may choose to finance their day-to-day activities and long-term investment through various sources, both internal and external. Internal sources mainly include retained earnings and sometimes owners' contributions, while external sources consist primarily of debt (trade credit and bank loans) and outside equity (box 2.4). Figure 2.11 looks at how these different sources of funding make up a firm's capital structure across size, age and country group. These different capital structures reflect both the access issues from the supply side and the preferences from the demand side.

With regard to the choices of finance made by firms, the pecking order theory suggests the existence of a hierarchy in financing decisions (e.g. Myers and Majluf, 1984; Petersen and Rajan, 1994; Vanacker and Manigart, 2010). According to this theory, market imperfections resulting from information asymmetry make the use of external funds much more costly than the use of internal funds. Firms will therefore prefer the use of low-cost retained earnings to more expensive outside funds.[14] This is supported by the patterns observed in figure 2.11, which shows that internal funds/retained earnings account for the largest shares in financing both working capital and new assets, at above 65 per cent. The reliance on internal funds is particularly prominent in small firms, young firms and firms in developing economies.

Box 2.4

Sources of finance

A range of financing options are available for firms, which can be internal or external, informal or formal. This box introduces some of the most commonly used sources, while other sources can include non-bank financial institutions, such as micro-finance organizations and leasing companies, and some informal sources, such as money-lenders or friends and relatives.

Retained earnings are the part of income retained by a firm to be reinvested in its business or to pay debt. This is the cheapest way of financing capital.

Trade credit is credit offered to a firm by its suppliers, who allow the firm to buy now but pay later. Payment typically has to be made within a short time period, say 30–60 days, depending on the common practices in different sectors. Discounts are usually available if the firm manages to pay within an even shorter period. Trade credit can take the form of advance payment by customers.

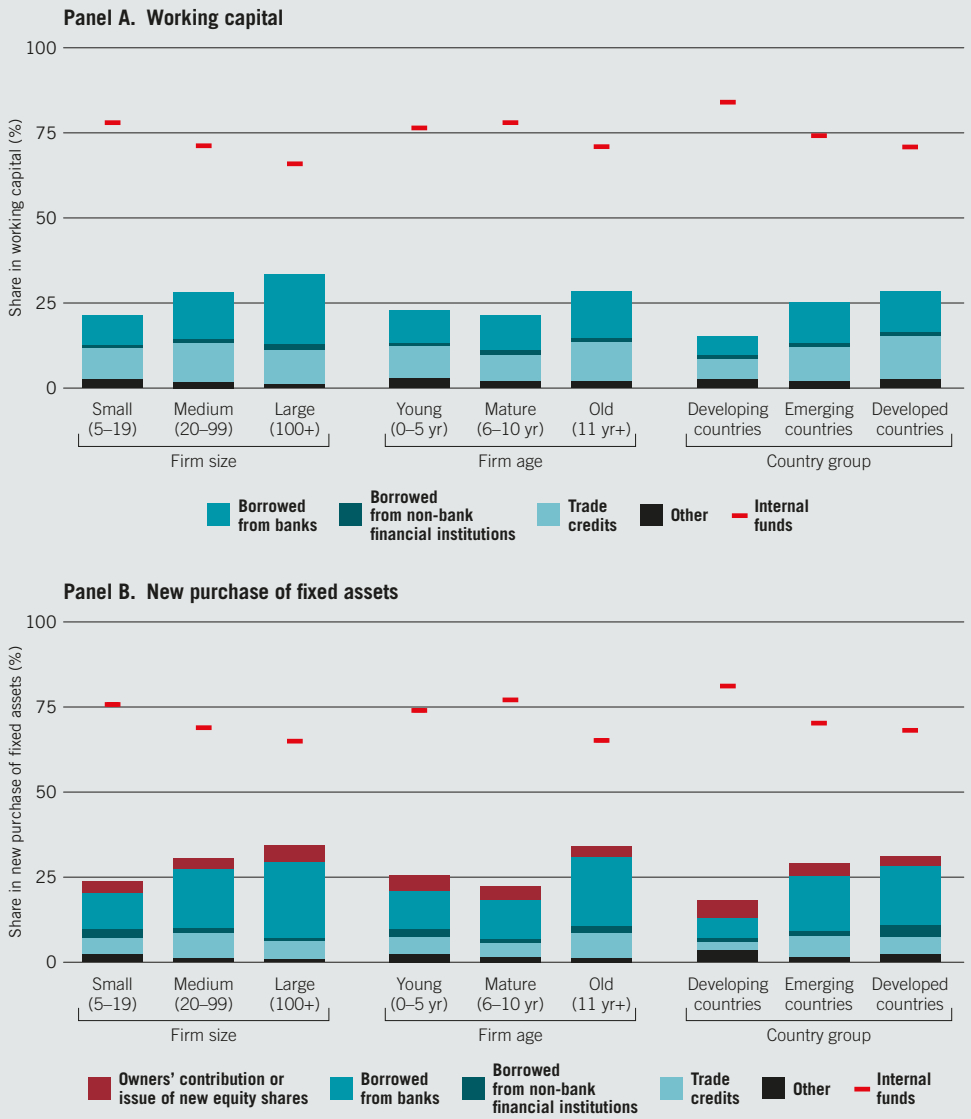
Bank loans are a form of medium- to long-term finance covering a fixed time period. They have a pre-set interest rate, and the timing and amount of repayment are predetermined. A bank loan requires a firm to provide some collateral as security. This normally comes from the firm's assets but, in the case of start-ups, owners' personal assets can also be accepted.

Equity financing raises capital by selling shares in the enterprise, or full ownership, to investors. There are many kinds of equity financing, varying in scale and scope. For example, large firms can raise significant capital by initial public offerings (IPOs), whereas venture capital and angel investment are commonly used by start-ups.

14. For small firms, internal funding is also preferred in order to retain the firm's independence and ownership status (Hamilton and Fox, 1998).

Figure 2.11

Capital structure, by firm size, firm age and country group (percentages)



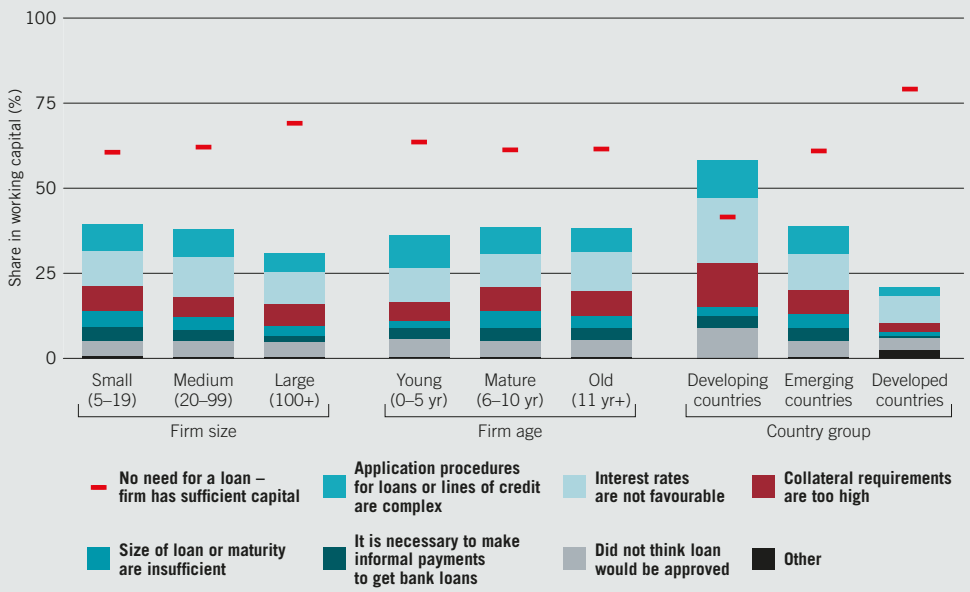
Source: ILO calculations based on the World Bank Enterprise Survey, August 2016.

When sources of internal funding become insufficient to finance operations and growth, firms have to resort to external financing. The choices are normally between trade credits, bank loans and external equity. Figure 2.11 shows that working capital is mainly financed by trade credits and bank loans. As firms become larger and older, bank loans also become more important in financing day-to-day activities and usually prove to be the primary source when firms need to purchase new assets with outside funding. This is because bank loans are best suited for medium- to long-term financing needs, while trade credits have a much shorter maturity period. Similar to the patterns observed for working capital, larger firms, older firms and firms in more developed countries are able to access bank loans more readily to finance new assets, such as equipment.

For many firms, especially small businesses and young start-ups, the lack of audited financial statements, repayment history and business assets to use as collateral imposes considerable constraints on their ability to obtain favourable terms for formal bank loans, if indeed they can access a loan at all. Banking institutions find lending to SMEs a risky and costly business. In SMEs it is not uncommon to find informal practices relating to management, as well as a lack of capacity to provide formal documentation, and to keep records that provide adequate financial statements. Hence, there is insufficient quality and transparency of information to offer potential creditors. Consequently, when banks do grant

Figure 2.12

Main reason for not applying for a bank loan during last fiscal year, by firm size, firm age and country group (percentages)



Source: ILO calculations based on the World Bank Enterprise Survey, August 2016.

credit to SMEs, they normally do so at high interest rates and the decisions are based on collateral and credit history, which has a negative impact on young and small firms (Harvie, 2015).

Figure 2.12 looks at the choice and access issues relating to bank loans from a firm's perspective over a fiscal year. On average, over 60 per cent of firms did not apply for a bank loan because they had sufficient capital to support their business. The remaining firms chose not to apply in spite of the clear need for a loan. The share of firms that unwillingly opt out of bank loans is highest among small firms (almost 40 per cent) and those in developing countries (almost 60 per cent). The main reasons for this decision are identified as unfavourable interest rates, complex application procedures and high collateral requirements.

Trade credit offers a viable alternative to bank loans. Suppliers have a close relationship with firms and have better information than commercial banks on the firms' ability to repay. When timely payments are made, trade credit offers many benefits compared to bank loans, such as the ability to exercise quality control before payment (Smith, 1987) and greater financial flexibility. If firms are not able to make payments within the discount period, however, trade credit can be an expensive substitute for bank loans, due to the foregone discount.

According to the traditional pecking order theory, new external equity will be the last resort when making financing decisions, due to its higher information asymmetry cost in comparison to debt. The cost of raising external equity is particularly high for small and unlisted firms. For example, the average annual return required by venture capitalists can be as high as 20–50 per cent (Sapienza, Manigart and Vermeir, 1996). Evidence has shown, however, that despite its high cost, external equity has been extensively used by high-growth companies (Frank and Goyal, 2003). This is also supported by figure 2.11, panel B, which shows that young firms (which normally have higher growth rates) use more new equity than their more mature counterparts. This is because high-growth firms have more restrictive debt capacity constraints (Lemmon and Zender, 2010), which are determined by a firm's leverage level as well as its ability to repay debt (Vanacker and Manigart, 2010). It is also likely to be due to the fact that young firms do not yet have the retained earnings of older firms with which they can reinvest. Firms in developing countries issue significantly more new equity to finance new assets, to both owners and outsiders, than those in emerging and developed economies. This is probably due to the less developed banking system in developing economies, which imposes greater debt-issuing constraints on firms.

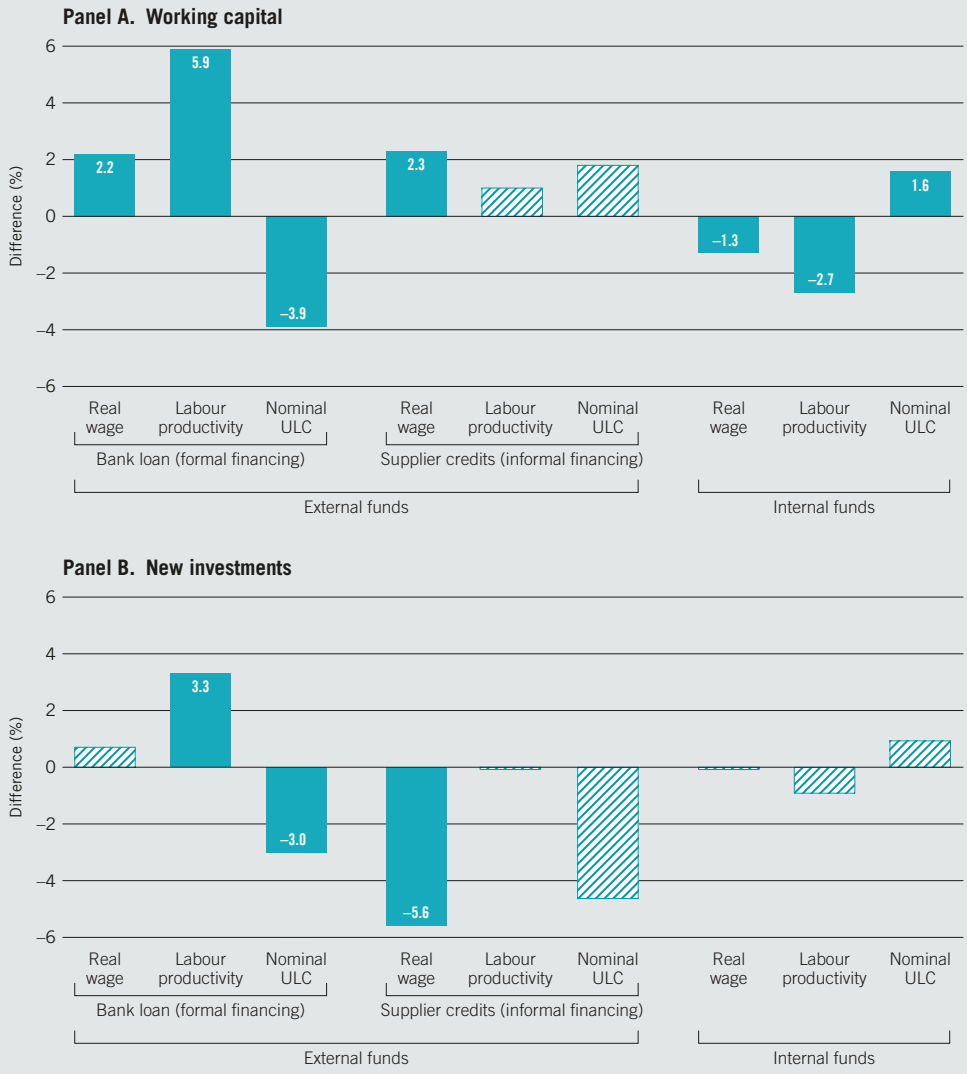
Financing decisions have differing implications for enterprise performance and employment

The analysis so far has shown that many enterprises' preference for using an internal source of funds is due to the high costs associated with obtaining external funding, rather than having "no need for one". This pattern is particularly prominent among firms in developing economies, SMEs and young firms, which can have negative implications for their performance.

Empirical evidence on how enterprises' financing decisions are related to their performance is scarce, with only a few exceptions (Ayyagari, Demirgüç-Kunt and Maksimovic, 2010; Levine and Warusawitharana, 2014). This part of section B, therefore, aims to analyse how these different financing decisions relate to various indicators of performance, following a similar structure to that presented

Figure 2.13

Relationship between financing decisions and enterprise performance (percentage difference)



Note: The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the World Bank Enterprise Survey, August 2016.

in section A. In particular, the proportions of (1) internal funds, (2) bank loans and (3) supplier credit in both working capital and new investments are analysed in terms of their associations with (1) real wages, (2) labour productivity and (3) nominal ULC.

The findings are threefold. First, utilizing a larger proportion of internal funds in working capital is associated with lower wages, lower productivity and higher unit labour costs. Second, a larger proportion of bank loans in working capital is associated with higher wages, higher productivity and lower unit labour costs. Third, the positive association observed between bank loans and wages is absent in the case of new investment.

Figure 2.13 shows that the greater use of bank loans for working capital is a better financing option, overall, than the more intensive use of internal funds, in terms of enterprise performance. A 10 percentage point larger proportion of internal funds in working capital is associated with wages that are 1.3 per cent lower and labour productivity that is 2.7 per cent lower. In contrast, a 10 percentage point larger proportion of bank loans in working capital is associated with 2.2 per cent higher wages, 5.9 per cent higher labour productivity and 3.9 per cent lower unit labour costs. A larger proportion of bank loans in new investment is also positively associated with labour productivity, but not with wages. This shows that securing funds for new investments certainly has positive implications for labour productivity, although not for wages. Thus, given the positive association between bank loans and wages in the case of working capital, strategies to help enterprise to secure such loans for working capital warrants more attention on the part of policy-makers.

The relationship between the regulatory/institutional environment and access to bank loans

Among various policy considerations, the regulatory environment in the area of creditor rights protection may have the potential to facilitate the use of bank loans by enterprises (Maresch, Ferrando and Moro, 2015). This is because stronger protection of creditor rights is expected to improve lending relationships by increasing the willingness of banks to provide credit (La Porta et al., 1997; Qian and Strahan, 2007). However, some argue that it is not only the overall strength of protection, but also the types of protection that matter in promoting access to bank loans by enterprises. Indeed, the effect of creditor rights protection on financial market development can go in both positive and negative directions (Deakin, Mollica and Sarkar, 2017). Empirical evidence from the current analysis finds that the strength of the protection afforded to creditors in the area of bankruptcy proceedings (i.e. protecting the creditors in the case of default by debtors) is associated with better access to bank credit by enterprises, with different orders of magnitude, dependent on sector, firm size and firm age.

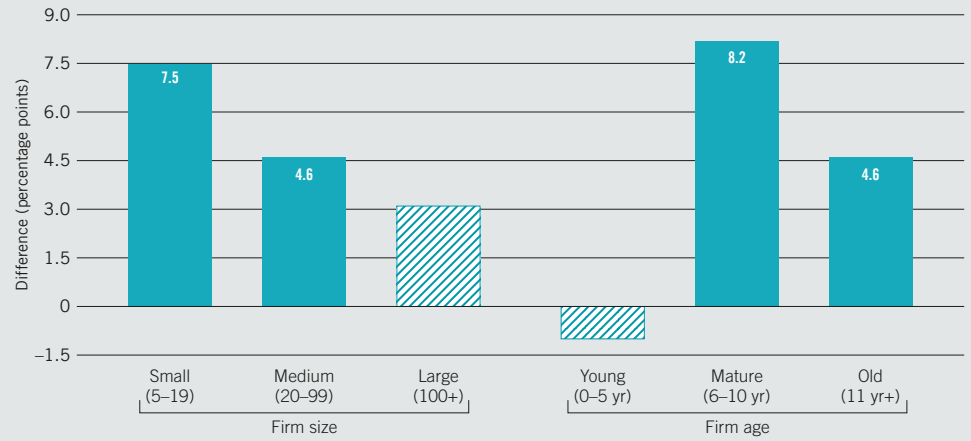
Firms in countries with strong protection of creditor rights in the case of debtor default tend to have a larger share of bank loans as a percentage of working capital, by 4.8 percentage points, than those in countries with weak protection. A closer look reveals that the magnitude of this positive association tends to be larger for smaller firms, but not significant for young firms (figure 2.14). This suggests that measures to protect creditor rights might not improve the access to bank loans by young firms. Policy measures aiming to create a more inclusive business environment may benefit from taking these disparities into consideration.

In addition to the strength of creditor rights protection, the reliability and accessibility of credit information are important institutional factors that can affect financial market development (see, for example, Safavian and Sharma, 2007). Better information transparency would increase creditor confidence in firms and, in turn, improve lending relationships. Empirical evidence from the current analysis finds that voice and accountability,[15] used as proxies for a country's overall transparency in information, are positively associated with access to bank credit (figure 2.15). This positive association is significant only for SMEs and younger firms, and its magnitude is particularly large for small and young enterprises. Thus, the depth of credit information required to secure bank lending should be taken into consideration in policy-makers' efforts to help SMEs and young firms grow.

15. The underlying data source for constructing this index includes the data from the Institutional Profiles Database (IPD), which contains data on freedom of access to information and reliability of basic economic and financial statistics, among much other information.

Figure 2.14

Relationship between creditor rights protection and the share of bank loans as a percentage of working capital (percentage point change)

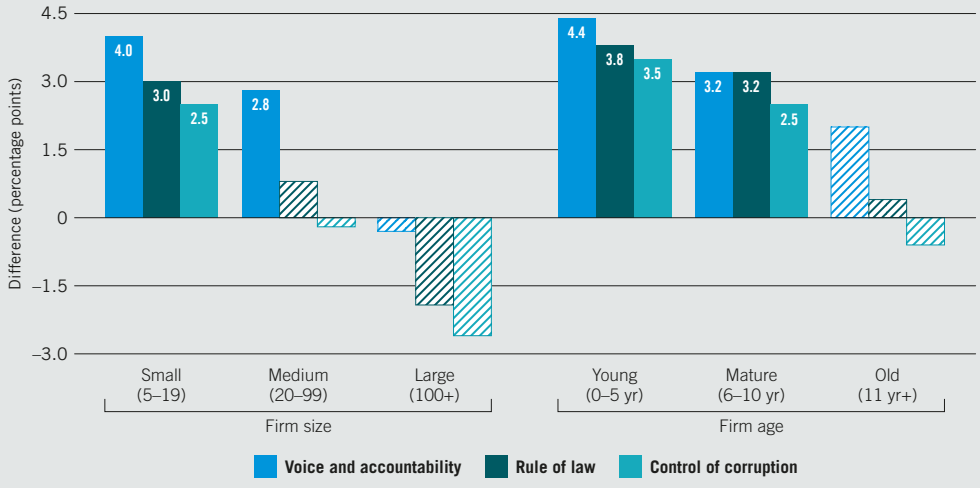


Note: The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the CBR-LRI and World Bank Enterprise Survey, August 2016.

Figure 2.15

Relationship between institutions and the share of bank loans as a percentage of working capital (percentage point difference)



Note: The point estimates shown in solid colour and labelled with numbers are statistically significant at the 90 per cent confidence level, otherwise they are not statistically significant.

Source: ILO estimates based on the World Bank Enterprise Survey, August 2016 and the Worldwide Governance Indicators.

Other areas of governance can also play a role in reducing transaction costs, and thereby lessen the degree of financial market imperfection. Similar to the results on voice and accountability, higher scores in other areas of governance are all related to better access to bank loans by SMEs and young firms. This empirical evidence strongly suggests that improvement in governance should be the priority for policy measures aiming to achieve more equitable and inclusive financial markets. Given that bank loans are the most common source of finance for enterprises of all sizes, the disproportionate difficulties experienced by SMEs and young firms in accessing bank finance indicate that making the financial markets more inclusive through better governance should figure highly in policy priorities.

In summary, with respect to enterprises' financing decisions, this section finds that the use of external funds through formal financing (i.e. bank loans) is associated with higher enterprise performance, compared with the use of internal funds. More intensive use of internal funds for working capital is associated with lower wages, lower productivity and higher unit labour costs. In contrast, a greater use of bank loans for working capital is associated with higher wages, higher productivity and lower unit labour costs. However, the positive association between the use of bank loans and wages is not observed when bank loans are used for new investment. This suggests that securing adequate funds for working capital has more direct implications for wages than securing funds for new investments.

Policy considerations may therefore benefit from taking into consideration these direct implications of working capital for job quality and productivity at the enterprise level. In particular, this chapter has shown that firms are more likely to make greater use of bank loans for working capital in countries which have stronger creditor rights protection. In addition, SMEs and young firms make greater use of bank loans for working capital in countries with fewer financial market imperfections; improvements to the financial environment include greater accountability and information transparency, increased respect for the rule of law and less corruption. This suggests that better institutions have an important role to play in encouraging SMEs and young firms to gain external formal funding and thus secure sufficient financing for their working capital, which may in turn allow these enterprises to invest in their workers.

Some innovative practices have proven beneficial in allowing firms to access additional capital for growth, such as equity capital, which is necessary to facilitate enterprise growth, investment in fixed assets and support growing needs for debt financing. This type of financial instrument can be tailored towards vulnerable groups that are generally excluded from financial services due to their lack of credit history or scant equity, while supporting broader social and ecological issues (box 2.5).

Box 2.5

Facilitation of access to equity capital for SMEs and start-ups in Germany and the Republic of Korea

Germany and the Republic of Korea have adopted policies to facilitate SMEs' access to equity.

- Germany, for example, launched a Micro-mezzanine fund in 2013 (it started with 35 million euros) with the aim of promoting social inclusion by increasing financing opportunities for small business and start-ups. The financial instrument gives priority to "disadvantaged groups", such as women, migrants and the unemployed, which are generally excluded from financial services due to their lack of credit history or scant equity. It also fosters support for social or ecological enterprises with viability on their business models. The fund was expanded in 2015 to 83.3 million euros (50 million from the European Social Fund and 33.3 million from the national European Recovery Programme Special Fund). It fosters so-called "silent partnership" investments, which allow enterprises to increase their capital base (and therefore their credit rating) without having to provide collateral, or surrender voting or management rights. Based on an impact assessment, the financial instrument will continue until 2020. As of December 2015, 15 regional investment companies with appropriate local knowledge and networks have been involved with the fund, supporting 1,781 enterprises (2 per cent of which are social enterprises) that have generated employment for 7,775 people.[1]
- The Republic of Korea implemented policies to promote the channelling of venture capital to SMEs[2] as a measure to help small firms and potential entrepreneurs to access finance. The venture capital market in the country began to develop in 1998 in response to a strategy to prompt business restructuring in support of start-ups in knowledge-based industries. The venture capital market contracted between 2002 and 2006, but has rebounded steadily since 2006, in spite of the global economic and financial crisis (Jones, 2015). This strategy has, since 2013, been part of the Government's "creative economy" plan,[3] and its success can be credited to the role of fast-growing young and small firms. The policy design is directly linked to the fact that the Republic of Korea is strong in areas such as R&D (where spending reached 4.4 per cent of GDP in 2012, which is the highest in the OECD countries) and patents (in 2011 its filings reached 5.7 per cent of the total world patent filings, up from 2.3 per cent in 2003). While the effectiveness of the policy has not yet been analysed, it includes a combination of elements designed to facilitate the accomplishment of specific goals. The policy employs different types of measures according to the age of firms: for example, for start-ups (classified as 0–3 years old), the measures include the promotion of so-called "angel investments" (by offering tax reductions as incentives) and crowd funding (via online platforms, to facilitate the participation of a larger number of small investors). For enterprises in a "development stage" (4–9 years old), mergers and acquisitions are promoted; for example, through the reduction of corporate taxes on buyers and a simplification of the mergers and acquisitions process for venture companies. In the case of mature firms (10–15 years old), some of the measures focus on promoting reinvestment (through various levels of capital gains tax on reinvestment resources).[4]

[1] European Commission and European Investment Bank (2016). [2] General Survey Concerning Employment Instruments (2010). [3] The plan comprises three main goals: creating new jobs and markets through creativity and innovation; strengthening the leadership of the country through developing a creative economy; and creating a society where creativity is respected and manifested. [4] The aim of these measures is to shift from loans to investment-oriented financing of start-ups, with a focus on the importance of sharing risks between entrepreneurs and their sources of financing during the first three years of a firm's existence.

C. Concluding remarks

This chapter sheds light on human and financial resources management as two of the most important drivers of competitiveness and decent work provision at enterprises. It has also analysed regulatory and institutional environments in which certain management practices are more common. After comparing various management practices in the areas of labour flexibility and financing decisions with enterprise performance – in terms of both productivity and wages – the chapter finds "investing in people" to be a key feature of enterprises with higher productivity, higher wages and higher overall competitiveness, measured in terms of unit labour costs.

The findings of the chapter have several important implications for policy considerations. First, it has provided empirical evidence that, when striking a balance between numerical and functional flexibility, a stronger emphasis on internal functional flexibility and investment in workers in the form of training is preferable to a stronger emphasis on external numerical flexibility, in the light of enterprise performance in terms of wages, productivity and unit labour costs. Policies and institutions should therefore be designed to motivate enterprises to choose a "high-road" approach to human resource management over a "low-road" approach. There is growing recognition that, in many cases, recourse to external numerical flexibility is a choice that enterprises make, rather than one dictated by necessity (Ton, 2014). Policy-makers are therefore encouraged to reflect on the way in which policies and regulations can create an external environment where the relevance of internal functional flexibility can be heightened. One such way, as suggested in section A, is to ensure the protection of fixed-term employees' rights to equal treatment with permanent employees. More research is needed to identify other regulatory and institutional areas that are closely related to enterprise choice in terms of numerical and functional flexibility.

With regard to enterprises' financing decisions, the chapter has highlighted that the use of external formal financing for working capital warrants closer attention from policy-makers. Securing sufficient funds for working capital through formal financing can have strong positive implications, not only for the wages of workers, but also for higher labour productivity and lower unit labour costs. Considering the costs associated with obtaining bank loans, and the survey results which show that many firms do not apply for bank loans because of these costs, the reduction of financial market imperfections should certainly be among the policy priorities for promoting enterprise competitiveness and job quality. In addition to creditor rights protection, various institutional areas, such as voice and accountability, the rule of law and control of corruption are all found to be positively associated with the proportion of bank loans in working capital at SMEs, young firms and firms in developing economies.

Appendix A. The relationship between human and financial management practices and enterprise performance at the firm level

Chapter 2 conducts empirical analysis of the relationship between firms' human and financial management practices and enterprise performance at the firm level, based on the World Bank Enterprise Survey, which covers more than 100,000 firms from 132 countries for the years between 2006 and 2016. Depending on specifications, the number of firms considered in the analysis ranges from 2,200 to 33,000.

The regression analysis employs the ordinary least squares (OLS) model, which takes the form:

$$PERFORM_{it} = \beta_0 + \beta_1 SHTEMP_{it} + \beta_2 TRAINING_{it} + \beta_3 FNCE_{it} + \beta_4 FIRMCHARA_{it} + \beta_5 FIRMBEHAV_{it} + \mu_s + \lambda_{ct} + v_{it}$$

where $PERFORM_{it}$ denotes a set of indicators on firm performance, namely logarithms of real wage, labour productivity and nominal unit labour costs at a firm i in year t.

On the right-hand side of the equation, five types of explanatory variables are included. $SHTEMP_{it}$ denotes the percentage of full-time temporary employment in full-time total employment. $TRAINING_{it}$ is a binary variable with the value of 1 indicating the provisions of formal training programmes for permanent employees, and 0 indicating otherwise. $FNCE_{it}$ is a set of variables indicating the proportion of internal funds, bank loans, supplier credits and non-bank credits as a percentage of working capital and the purchase of new fixed assets (i.e. new investments). Internal funds and other three types of external funds are included in separate regressions in order to avoid multicolinearity. $FIRMCHARA_{it}$ indicates a set of variables on firm characteristics, namely logarithm of the number of total full-time employees, logarithm of firm age and a categorical variable indicating the firm's ownership type with the value of 1 for domestic, 2 for foreign, 3 for state and 4 for other. $FIRMBEHAV_{it}$ is a set of variables on various firm behaviours, such as a categorical variable indicating export intensity with the value of 1 for non-exporter (0 per cent foreign sales), 2 for light exporter (less than 20 per cent foreign sales), 3 for medium exporter (20–60 per cent foreign sales) and 4 for heavy exporter (more than 60 per cent foreign sales), a categorical variable indicating import intensity with the value of 1 for non-importer (0 per cent of foreign inputs), 2 for light importer (less than 20 per cent of foreign inputs), 3 for medium importer (20–60 per cent of foreign inputs) and 4 for heavy importer (more than 60 per cent of foreign inputs) and a binary variable indicating the use of foreign-licensed technology, with the value of 1 indicating such use and the value of 0 otherwise. Finally, μ_s is a sector fixed effect, λ_{ct} is a survey fixed effect, while v_{it} denotes the error term. Variables carry subscript i to indicate a firm, t to indicate a year, s to indicate a sector and c to indicate a country.

Appendix B. The relation of regulations and institutions to human and financial resource management practices in enterprises

Chapter 2 performs a series of empirical analyses on macro–micro linkage between regulations/institutions and human and financial management practices in enterprises. The analysis makes use of a unique data set that combines the World Bank Enterprises Survey (WBES), the Centre for Business Research Labour Regulations Index (CBR-LRI) and Creditor Protection Index (CBR-CPI) and Worldwide Governance Indicators (WGI). The data set which combines the WBES and the CBR-LRI covers more than 82,000 firms from 78 countries for the years between 2006 and 2014. The data set which combines the WBES and CBR-CPI covers more than 23,000 firms from 14 countries for the years between 2006 and 2013. The data set which combines the WBES and WGI covers more than 112,000 firms from 127 countries for the years between 2006 and 2014.

The regression analysis on the relationship between labour regulations and the use of full-time temporary employment uses the OLS model, which takes the form of:

$$SHTEMP_{it} = \beta_0 + \beta_1 LRI_{ct} + \beta_2 WGI_{ct} + \beta_3 FIRMCHARA_{it} + \beta_4 FIRMBEHAV_{it} + \beta_5 MACRO_{ct} + \mu_s + \lambda_t + v_{it}$$

where $SHTEMP_{it}$ denotes the percentage of full-time temporary employment in full-time total employment at a firm i in year t.

The regression analysis on the relationship between labour regulations and the provisions of formal training for full-time permanent employees (available as a binary variable) uses the probit model, which takes the form of:

$$Pr(P_{it} = 1) = \Phi(\beta_0 + \beta_1 LRI_{ct} + \beta_2 WGI_{ct} + \beta_3 FIRMCHARA_{it} + \beta_4 FIRMBEHAV_{it} + \beta_5 MACRO_{ct} + \mu_s + \lambda_t + v_{it})$$

where $Pr(P_{it} = 1)$ is the probability of firm i providing formal training for its permanent employees, in year t.

On the right-hand side of the equations, five types of explanatory variables are included. LRI_{ct} denotes a set of three indicators[1] on the strength of protection of fixed-term employees and nine indicators[2] on the strength of labour regulations pertaining to dismissals, with the value of 1 indicating the strongest protection and the value of 0 indicating the weakest protection. These indicators are from the CBR-LRI database. WGI_{ct} denotes the average of six indicators from the Worldwide Governance Indicators, covering the areas of "voice and accountability", "political stability and absence of violence/terrorism", "government effectiveness", "regulatory quality", "rule of law" and "control of corruption". $FIRMCHARA_{it}$ indicates a set of variables on firm characteristics, namely logarithm of the number of total full-time employees, logarithm of firm age and a categorical variable indicating the firm's ownership type with the value of 1 for domestic, 2 for foreign, 3 for state and 4 for other. $FIRMBEHAV_{it}$ denotes a set of variables for firm behaviours, namely two categorical variables indicating export intensity and import intensity, a binary variable indicating the use of foreign-licensed technology, a categorical variable indicating firm's access to finance and a categorical variable indicating firm's ownership. $MACRO_{ct}$ is a set of macroeconomic variables, namely logarithm of real GDP per capita, share of youth in total labour force, share of female persons in total labour force, inflation rate and the share of urban population in total population. Finally, μ_s is a sector fixed effect, λ_t is a year fixed effect, while v_{it} denotes the error term. Variables carry subscript i to indicate a firm, t to indicate a year, s to indicate a sector and c to indicate a country.

1. The three variables from the CBR-LRI are: "LRI-4: Fixed-term contracts are allowed only for work of limited duration", "LRI-5: Fixed-term workers have the right to equal treatment with permanent workers" and "LRI-6: Maximum duration of fixed-term contracts". See Adams et al. (2017) for detailed descriptions of each variable and the methodology used for deriving the variables.

2. The nine variables from the CBR-LRI are : "LRI-16: Legally mandated notice period", "LRI-17: Legally mandated redundancy compensation", "LRI-18: Minimum qualifying period of service for normal case of unjust dismissal", "LRI-19: Law imposes procedural constraints on dismissal", "LRI-20: Law imposes substantive constraints on dismissal", "LRI-21: Reinstatement normal remedy for unfair dismissal", "LRI-22: Notification of dismissal", "LRI-23: Redundancy selection" and "LRI-24: Priority in re-employment". See Adams et al. (2017) for detailed descriptions of each variable and the methodology used for deriving the variables.

The regression analysis on the relationship between creditor rights protection and the financing decisions of enterprises employs the OLS model, which takes the form of:

$$FNCE_{it} = \beta_0 + \beta_1 CPI_{ct} + \beta_2 FIRMCHARA_{it} + \beta_3 FIRMBEHAV_{it} + \beta_4 MACRO_{ct} + \mu_s + \lambda_t + v_{it}$$

The regression analysis on the relationship between governance and the financing decisions of enterprises employs the OLS model, which takes the form of:

$$FNCE_{it} = \beta_0 + \beta_1 WGI_{ct} + \beta_2 FIRMCHARA_{it} + \beta_3 FIRMBEHAV_{it} + \beta_4 MACRO_{ct} + \mu_s + \lambda_t + v_{it}$$

$FNCE_{it}$ denotes the proportion of internal funds, bank loans, supplier credits and non-bank loans as a percentage of working capital or new purchase of new fixed assets at a firm i in year t.

On the right-hand side of the equation, CPI_{ct} denotes a binary variable on creditor rights in terms of entry to corporate bankruptcy proceedings with the value of 1 indicating a country with the strongest protection, and the value of 0 indicating the other countries.[3] This variable is from the CBR-CPI database. WGI_{ct} denotes six indicators from the Worldwide Governance Indicators, covering the areas of "voice and accountability", "political stability and absence of violence/terrorism", "government effectiveness", "regulatory quality", "rule of law" and "control of corruption". $FIRMCHARA_{it}$ is a set of variables for various firm characteristics, namely logarithms of the total number of full-time employees, firm age, real wage and labour productivity and a categorical variable indicating firm's ownership. $FIRMBEHAV_{it}$ denotes a set of variables for firm behaviours, namely two categorical variables indicating export intensity and import intensity and a binary variable indicating the use of foreign-licensed technology, share of full-time temporary employment as a percentage of total full-time employment, a binary variable indicating the provision of formal training for permanent employees and a categorical variable indicating firm's access to finance. $MACRO_{ct}$ is a set of macroeconomic variables, namely GDP growth rate, inflation rate and the share of domestic credit to private sector as a percentage of GDP. Finally, μ_s is a sector fixed effect, λ_t is a year fixed effect, while v_{it} denotes the error term. Variables carry subscript i to indicate a firm, t to indicate a year, s to indicate a sector and c to indicate a country.

3. This binary variable was constructed based on "LRI-7: Entry to corporate bankruptcy proceedings". See Armour (2016) for detailed description of LRI-7.

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3 Trade and the organization of production: Efficiency and labour market outcomes

Introduction

Enterprises evolve over time and operate in a changing economic environment, often in conditions of high uncertainty. In these conditions, they attempt to find the optimal way to produce and sell their products, in order to enhance their competitiveness and ensure profitability. These decisions, as demonstrated in previous chapters, have impacts on workers. This chapter focuses on trade and the organization of production as key decision variables for enterprises and discusses the implications of enterprise responses on efficiency and labour market outcomes.

Enterprises are economic actors that take the decision to export, import and organize production through domestic and international supply chain linkages. The various tasks that make up a production process are often undertaken in more than one country, thereby forming a global supply chain (GSC) and distribution network that weaves across both domestic and international markets, generating trade flows. Some of this work is performed in-house at different production sites located in different countries, requiring an enterprise to engage in foreign direct investment, while other tasks are carried out by external supplier firms, with both formal and informal enterprises being part of the production process at different nodes of the chain. Production for GSCs takes place not only in large-scale factories, but also in small-scale units such as households.

Enterprises' decisions regarding their participation in trade and GSCs have direct consequences for the world of work, as they determine how many and what type of jobs are created in different locations around the world. Information and communication technologies provide enterprises with new options for selling their products or purchasing their inputs, allowing for an easier and more direct relationship between buyers and suppliers in different locations. They also facilitate innovative methods of organizing production and distribution, such as crowdsourcing or e-commerce. The way firms organize production shapes the future of work, as modern ways of organizing production often introduce new types of jobs which depart from the traditional model of lifelong attachment to a single enterprise employer (ILO, 2015a).

The issues of trade and the organization of production through GSCs have recently gained greater attention in global policy debates. This has been triggered by the observation that their effects on workers often vary between different industries, firms and workers themselves, with losses for some and gains for others. At the same time, it is widely recognized that exporting and importing firms provide jobs for millions of workers and that many of these jobs depend on whether the firms experience an enabling environment for their business. International trade and GSCs are widely regarded as contributors to the economic development of countries and engines of job creation, having the potential to lift millions of workers out of poverty, provided that supportive policies and institutions are in place (Le Goff and Singh, 2014; Winters, 2000; Winters, McCulloch and McKay, 2004). But at the same time there are concerns that at least some of the jobs generated do not offer decent working conditions (ILO, 2016a).

This chapter aims to contribute to the ongoing debates. Section A provides the context by showing aggregate trends and patterns in trade and the organization of production, and presents novel estimates on the numbers and shares of workers in exporting and importing firms. The share of workers employed by exporting firms dropped significantly during the trade collapse caused by the global economic crisis and has stagnated ever since, standing currently at 37 per cent. This corresponds to 167 million workers, within the 132 countries for which data are available.

Section B provides evidence on how efficiency and labour market outcomes relate to the exporting and importing behaviour of firms. The indicators used to measure efficiency and labour market outcomes at the enterprise level are: total factor productivity (TFP), labour productivity, wages, employment, the temporary employment share and the female employment share. The exporting and importing behaviour of firms is taken into account through their export and import status, their export and import intensity (which are respectively measured through the percentage of exports in a firm's total sales value and the percentage of imports in a firm's total value of raw materials used in production), and the number of years that a firm has been exporting. The consideration of a multitude of dimensions produces a nuanced picture of the relationship between firms' trading behaviour, on the one hand, and efficiency and labour market outcomes, on the other.

Section C introduces a novel approach to identifying GSC supplier firms on the basis of standard firm-level data, and distinguishes between GSC input suppliers (which contribute to GSCs by supplying intermediate inputs that are further processed in the production process) and GSC final goods suppliers (which contribute to GSCs by undertaking the assembly of intermediate inputs into the final goods). The section compares efficiency and labour market outcomes within these firms with the outcomes for other exporters.

Sections B and C find that a firm's engagement in trade is positively related to firm productivity, while the relationship with labour market outcomes depends on the particular dimension being considered. While exporters and importers are more productive and pay higher wages than their non-trading counterparts, there is a gap between the productivity and the wage premium of exporting and importing firms, indicating that gains from trade are only partially translated into gains for workers. Within exporting firms, heavy exporters tend to have lower labour productivity and pay lower wages than other exporters, while firms that supply inputs into GSCs have higher productivity and pay higher wages than other exporters. Exporters, especially those that form part of GSCs by assembling final goods, employ more women than non-exporters, but at the same time tend to have higher shares of temporary employment. Importers are found to employ fewer temporary workers.

Section D summarizes the key findings of this chapter.

A. Trends and patterns in trade, the organization of production and employment

Firms are operating in a rapidly changing economic environment

The economic environment in which firms operate is constantly changing. This change is driven by the policies, regulations and institutions that are encountered in different parts of the world, as well as by the behaviour of different economic actors, including consumers and other firms. This environment is largely external to firms and can have an influence on whether and how much firms export and import, whether they participate as suppliers in GSCs, and how they organize their production. Some recent trends have had an important impact on this environment.

A first trend has been the weakening of aggregate demand observed over recent years, especially in developed economies, but also in some emerging economies (Bems, Johnson and Yi, 2010; World Bank, 2015). Moreover, demand for traded goods has become weaker, including demand for traded consumer goods and for goods whose production relies on traded inputs.

A second, related trend is the rise in trade protectionism over the past few years, which is likely to have contributed to the almost threefold increase in the number of non-tariff barriers imposed globally since 2000 (ILO, 2016b). Trade protection is imposed on all types of goods, including inputs into production, and raises the costs of trade, counteracting the decline in trade costs due to technological advancements and in costs of transportation (Hummels, 2007). Trade protection can have an impact on how and where firms set up their GSCs and how much they engage in trade.

Third, the global economy has seen a strong rise in uncertainty. This has been affecting firms by delaying or impeding their investments, including investments in productive capacity abroad (and hence GSCs). The forms of uncertainty that are most relevant to firms include not only trade policy uncertainty (Crowley, Song and Meng, 2016; Handley, 2014; Handley and Limão, 2015), but also uncertainty surrounding economic policies in general, as indicated by the Economic Policy Uncertainty Index (Baker, Bloom and Davis, 2016), which rose to unprecedented global levels in recent years.[1]

A fourth trend that has had an impact on firms' decision-making on trade and the organization of production has been the decline in investment, which as a share of GDP has gone down in almost all regions of the world during the past eight years, with developing Asia and Latin America being the only exceptions.[2] This slump in investment has created a relative shift in demand, away from investment goods such as machinery and equipment (Hoekman, 2015; Constantinescu, Mattoo and Ruta, 2015). Those, however, are goods whose production is typically characterized by a high degree of international fragmentation.

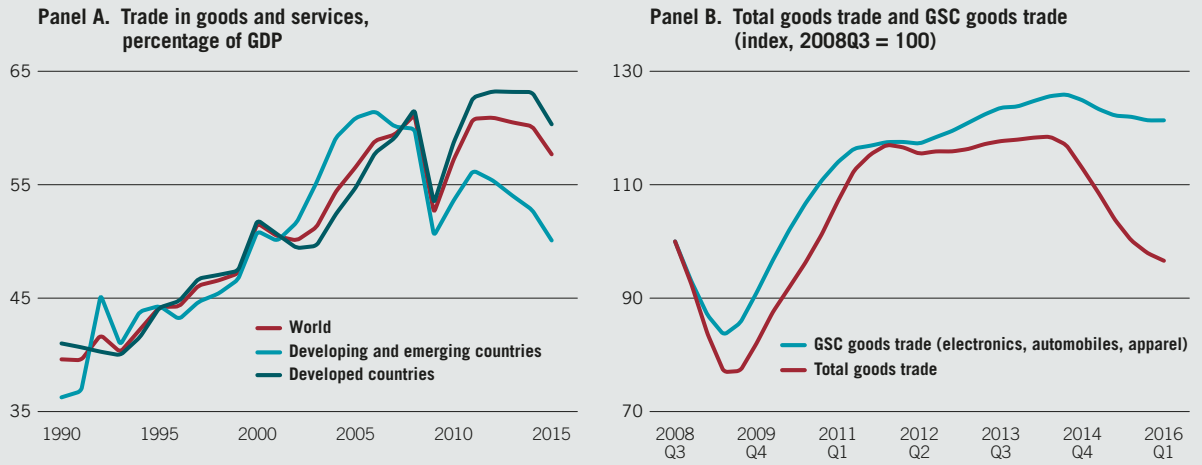
A fifth trend has been the decline in firms' access to finance, including trade finance, driven largely by a reduction in the risk appetite of financial institutions. In the absence of trade credit, exporting firms can no longer insure themselves against the possibility of trade credit defaults. As this makes exporting a riskier activity, firms have less incentive to export (Ahn, Amiti and Weinstein, 2011). The lack of access to trade finance constitutes a problem particularly for small and medium-sized enterprises (SMEs), which saw more than one in two trade finance requests rejected in 2014 (DiCaprio, Beck and Daquis, 2015; WTO, 2016a).

1. The Economic Policy Uncertainty Index is a measure of the news coverage of policy-related economic uncertainty. The global index stood at 70.0 in 2007, but rose to an unprecedented 198.3 in 2016 (simple annual averages based on monthly data).

2. According to data from the IMF World Economic Outlook Database October 2016, investment as a percentage of GDP fell by 2.4 percentage points in advanced economies over the period 2007 to 2015. Developing country regions also saw declines in investment as a share of GDP during the same period. Only in developing Asia did investment as a percentage of GDP substantially increase, by 3.4 percentage points over the same period. In Latin America, it increased only slightly, by 0.1 percentage points.

Figure 3.1

Trends in global trade, 1990–2016



Note: The data for GSC goods trade and total goods trade are based on quarterly data on the import value and show moving averages over the last two quarters, the current quarter and the coming quarter. GSC goods trade refers to trade in three product groups whose production is typically characterized by GSCs, including apparel and footwear, electronics, and motor vehicles and parts. The goods included in the respective GSCs are defined by Sturgeon and Memedović (2011) and Ferrantino and Taglioni (2014).

Source: ILO calculations based on World Bank (World Development Indicators) and International Trade Centre (Market Analysis Tools).

Trade has been stagnating after many years of rapid growth

In light of these changes in the economic environment, it is not surprising to see that firms have traded considerably less in the past few years than previously. This becomes apparent from aggregate trade figures, which are the accumulated result of individual enterprise behaviour. While global trade increased almost continuously from 1990 to 2008, from below 40 per cent of GDP to above 60 per cent, the trade collapse in 2009 brought it down to 53 per cent of GDP in 2009. After a strong recovery in 2010, global trade entered a period of stagnation, hovering at values just above 60 per cent of GDP, comparable with the 2008 level. In 2015, global trade declined to 58 per cent of GDP (figure 3.1, panel A).

This stagnation has not been driven by enterprises in any particular group of countries, but is a truly global phenomenon that is being observed in countries from all income groups, especially in the developing world. In an uncertain environment, in which new forms of trade, such as cross-border e-commerce, are emerging (box 3.1), it remains to be seen whether the trade stagnation that has been observed during the past few years is a temporary or a permanent phenomenon.

A question that arises is whether the overall stagnation in trade also encompasses trade within GSC networks. Electronics, automobiles and apparel are sectors whose production is most heavily organized along GSCs. The sum of trade in these sectors' outputs (such as, respectively, mobile phones, automobiles and t-shirts) and trade in inputs used in the production of these outputs (such as, respectively, circuit boards, wheels and cotton) gives an indication of goods trade within such GSC networks (Sturgeon and Memedović, 2011). The trade stagnation has indeed also affected GSC goods trade, even though the slowdown in input and output trade related to the GSCs for these three product groups has been less pronounced, especially from the second half of 2014 onwards (figure 3.1, panel B). However, the trade value is still on a declining trend, driven mostly by electronics and garments, and to a lesser extent by automobiles, for which there is a continuously strong demand.

Box 3.1

Can cross-border e-commerce help to revive trade?

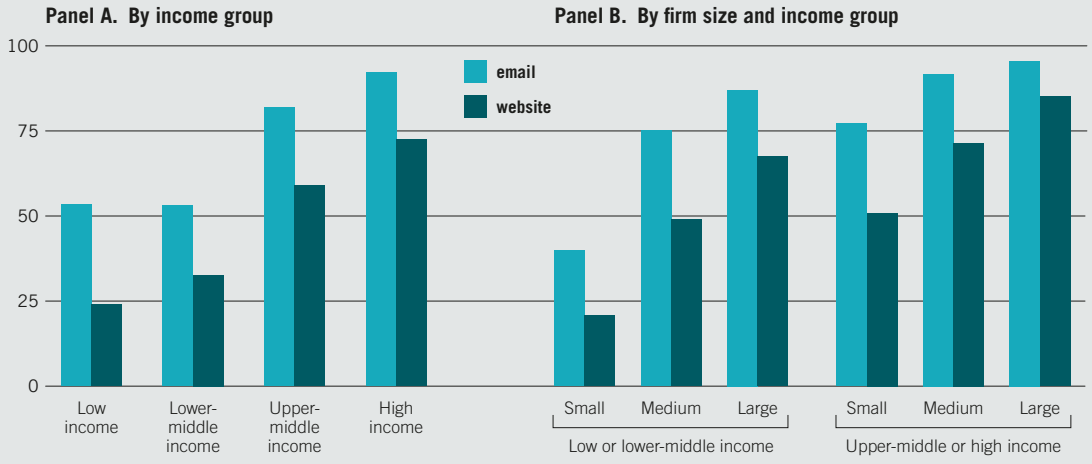
With the estimated number of online buyers currently at above 1 billion (UNCTAD, 2015), e-commerce has become increasingly important for many firms' success. Cross-border e-commerce accounts for a significant share of online sales, and the market is growing fast. For example, the share of cross-border e-commerce in all business-to-business (B2B) and business-to-consumer (B2C) transactions exceeds 50 per cent in both India and Singapore (Payvision, 2014). However, the economic opportunities of cross-border e-commerce are not equally distributed globally and across different types of firms, and the potential of e-commerce is not being fully realized.

In low-income and lower-middle-income countries, only around half of firms use email and only around 30 per cent use their own website to communicate with clients or suppliers. This compares to more than 80 per cent using email and 60 per cent using their own website in upper-middle-income and high-income countries (figure 3.2, panel A). Smaller enterprises use the Internet for their business considerably less than larger enterprises. The gap between small and larger enterprises is particularly pronounced in less developed countries (figure 3.2, panel B). Many of these enterprises might still be unaware of the opportunities presented by e-commerce (Stockdale and Standing, 2006; Thulani, Tofara and Langton, 2010). Moreover, managers and workers in these enterprises often lack the skills required to identify e-commerce needs and realize its possible benefits (UNCTAD, 2015).

Enterprises can benefit from e-commerce in various ways, such as through enhanced participation in global value chains, access to a larger number of markets, improved efficiency and lower transaction costs (UNCTAD, 2015). In terms of cross-border e-commerce, Internet-powered e-commerce can greatly reduce the cost of collecting information and matching consumers and suppliers, thus lowering a potentially substantial barrier to trade and increasing the volume of trade (Terzi, 2011). In addition, e-commerce can have a significant impact on services trade as it makes some previously non-tradable services, such as R&D or inventory management, tradable and lowers the cost of such services.

Figure 3.2

Share of firms using email and own website to communicate with clients or suppliers (percentages)



Source: ILO calculations based on World Bank Enterprise Surveys, World Bank World Development Indicators Database.

(continued overleaf)

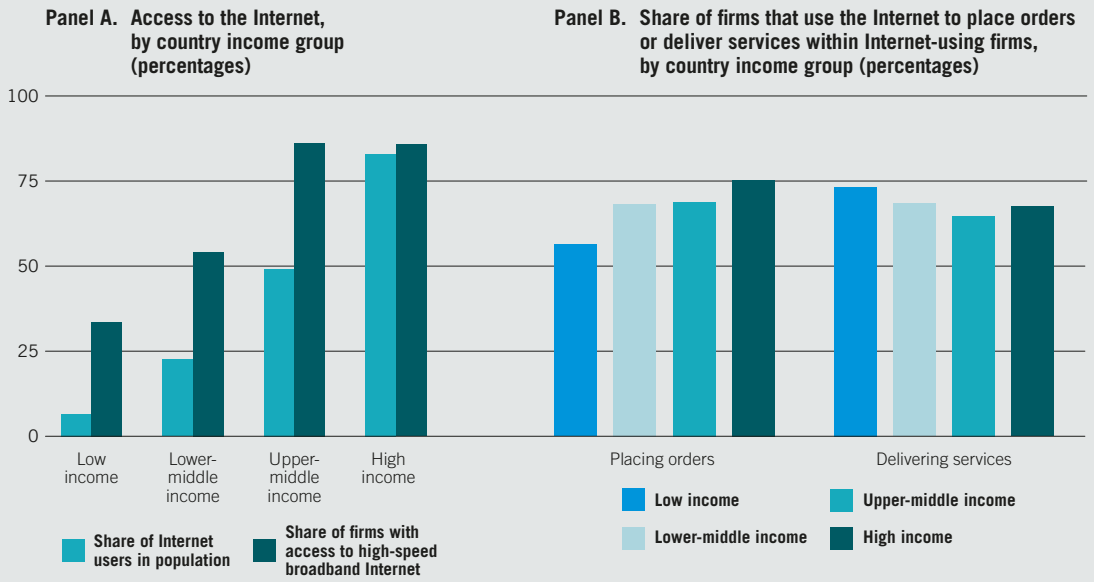
Box 3.1

(cont'd)

However, enterprises in developing countries, especially low-income countries, have not been able to benefit fully from e-commerce, often because of poor information and communication technology (ICT) infrastructure. Only a relatively small share of the population in these countries uses the Internet, even today. Moreover, fewer than half of all firms in low-income countries have access to high-speed broadband Internet (figure 3.3, panel A). However, when they have access to the Internet, they use it very similarly to firms in higher income countries. They use Internet to place orders and deliver services to clients as much as, if not more often than, firms in higher income groups (figure 3.3, panel B). Making improvements to the ICT infrastructure in developing countries, especially in low-income countries, might therefore be an effective way to increase trade volumes and revive trade in these countries.

Figure 3.3

Internet use and access



Source: ILO calculations based on World Bank Enterprise Surveys, World Bank World Development Indicators Database.

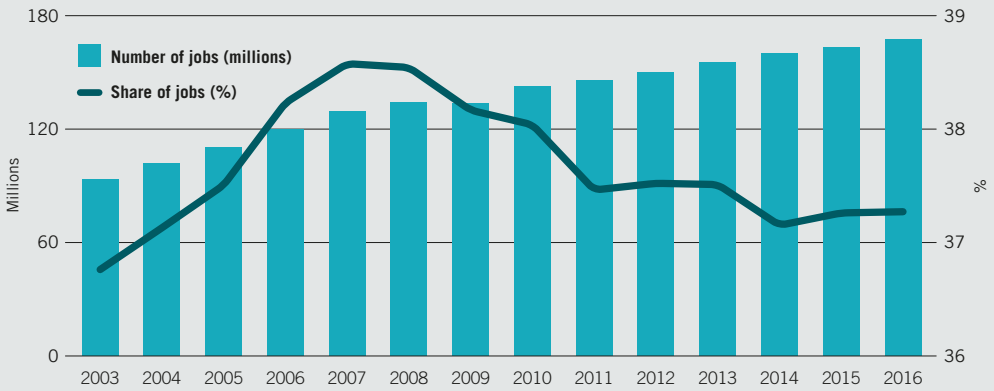
The share of workers employed by exporting firms declined during the crisis

In order to assess the employment impact of the trade collapse and the subsequent trade stagnation, this chapter estimates the numbers and shares of workers in light, medium and heavy exporters and importers for 132 countries. In terms of country coverage, these 132 countries cover 82 per cent of the global labour force (see Appendix A). In terms of employment coverage, the estimates consider workers in formal manufacturing and services firms with at least five employees (small, medium-sized and large enterprises), which may include both formal and informal workers, covering more than half of total wage and salaried employment.

Figure 3.4 shows that 167 million workers were employed by exporting firms in 2016 in the 132 countries analysed, an increase of almost 80 per cent since 2003, when only 94 million workers worked for exporters. The share of workers employed by exporting firms was on a rising trend before the crisis but declined after the trade collapse, from 38.5 per cent in 2008 to 37.2 per cent in 2014. During this period, most jobs were created in non-exporting firms. In the past two years, the share of workers employed by exporting firms has been stagnant at 37.3 per cent.

Figure 3.4

Number and share of jobs in formal exporting firms with at least five employees, 2003–16



Note: See Appendix A for methodological details. The figure considers employment in formal sector enterprises of the manufacturing and services sector with at least five employees.

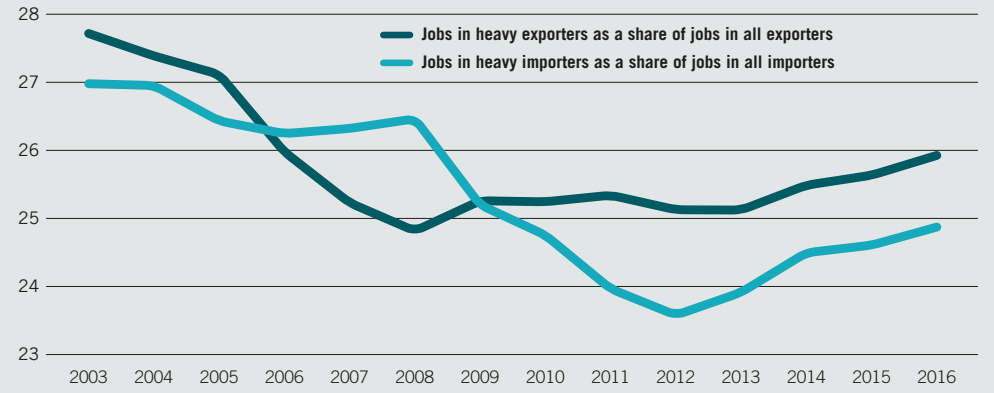
Source: ILO estimates based on World Bank Enterprise Surveys.

The crisis affected employment in all types of exporters similarly, regardless of export intensity

While the global trade collapse has had overall negative impacts on the share of employment in trade-related firms, it is also important to note that the impacts may vary considerably among these firms, particularly in the degree of their relative participation in trade (trade intensity). To analyse this distributional dimension, firms are grouped into four categories, namely non-traders, light traders, medium traders and heavy traders, for both exporters and importers (box 3.2). Figure 3.5 shows that, within the group of exporters, the share of workers employed by heavy exporters was on a downward trend before the crisis, indicating that it was especially light and medium exporters that employed an increasing number of workers during these years. This share remained relatively steady in 2008–13, at around 25 per cent, suggesting that the crisis affected employment in all types of exporters to a

Figure 3.5

Shares of jobs in heavy exporters and heavy importers, 2003–16 (percentages)



Note: See Appendix A for methodological details. The figure considers employment in formal sector enterprises of the manufacturing and services sector (in the case of exporters) and of the manufacturing sector (in the case of importers) with at least five employees.

Source: ILO estimates based on World Bank Enterprise Surveys.

Box 3.2

Light, medium and heavy exporters and importers: Who are these firms?

Firms are assigned to groups of similar size, according to their export and import intensity. Non-exporters and light, medium and heavy exporters are defined as those exporting 0 per cent, more than 0 and up to 20 per cent, more than 20 and up to 60 per cent and more than 60 per cent of their sales, respectively. Non-importers and light, medium and heavy importers are firms that respectively import 0 per cent, more than 0 and up to 20 per cent, more than 20 and up to 60 per cent and more than 60 per cent of their raw materials in terms of value. Both direct trade and indirect trade (through an intermediary) are taken into consideration.

Firms with different trade intensities have different characteristics (table 3.1). Exporters have more sales, hire more workers and are on average older than non-exporters. The same holds when comparing importers with non-importers. Within exporters, light exporters are the largest firms in terms of sales and are the oldest firms, compared with medium and heavy exporters. Similarly, light importers have the highest sales and are older than light and medium importers. The average number of employees increases with higher export intensity and decreases with higher import intensity.

Table 3.1

Characteristics of the enterprise population in 132 countries, latest year, by trading status

			Exporters *Manufacturing and services firms*					Importers *Manufacturing firms*				
	All manufacturing and services firms	All manufacturing firms	Non-exporters	All exporters	Light exporters	Medium exporters	Heavy exporters	Non-importers	All importers	Light importers	Medium importers	Heavy importers
Sales (US$ million)	3.0	3.9	2.3	5.6	7.0	4.6	5.4	2.3	6.5	10.7	5.0	5.8
Firm age (years)	14.7	16.5	14.2	17.3	21.1	16.3	14.7	14.8	19.1	20.6	19.0	18.3
Number of full-time permanent employees	68.4	102.5	53.1	135.6	129.6	133.0	145.1	75.6	160.6	184.3	162.2	146.1

Note: Only firms with at least five employees are considered. Exporting data are available for manufacturing and services firms and comprise both direct and indirect exports, where indirect exports are exports through an intermediary firm. Importing data are available for manufacturing firms only and comprise both direct and indirect imports, where information on importing status is based on information about whether firms use foreign raw materials in their production. US$ refers to 2005 constant US dollars. Reported figures correspond to population estimates, as survey weights have been applied.

Source: ILO estimates based on World Bank Enterprise Surveys.

The distribution of firms by export intensity shows significant variation across sectors (figure 3.6, green bars): 27 per cent of manufacturing firms and 12 per cent of services firms are exporters. Within manufacturing, exporters are most frequently found in the machinery sector, where 42 per cent of all exporters are light exporters, 43 per cent are medium exporters and 15 per cent are heavy exporters. The garment and leather sector has the largest share of heavy exporters in total exporters, corresponding to 52 per cent, compared with an overall average for manufacturing of less than 27 per cent.

similar extent, and rose slightly to almost 26 per cent over the past two years. The share of workers employed by heavy importers in total employment within importing firms declined during the crisis from 26.5 per cent in 2008 to 23.6 per cent in 2012, indicating that the crisis had a disproportionate effect on employment in heavy importers. In 2016, this share stood at 24.9 per cent, still below pre-crisis levels. Given the current trade stagnation, it remains to be seen how the share of employment in heavy exporters and importers will evolve in the near future.

Box 3.2

(cont'd)

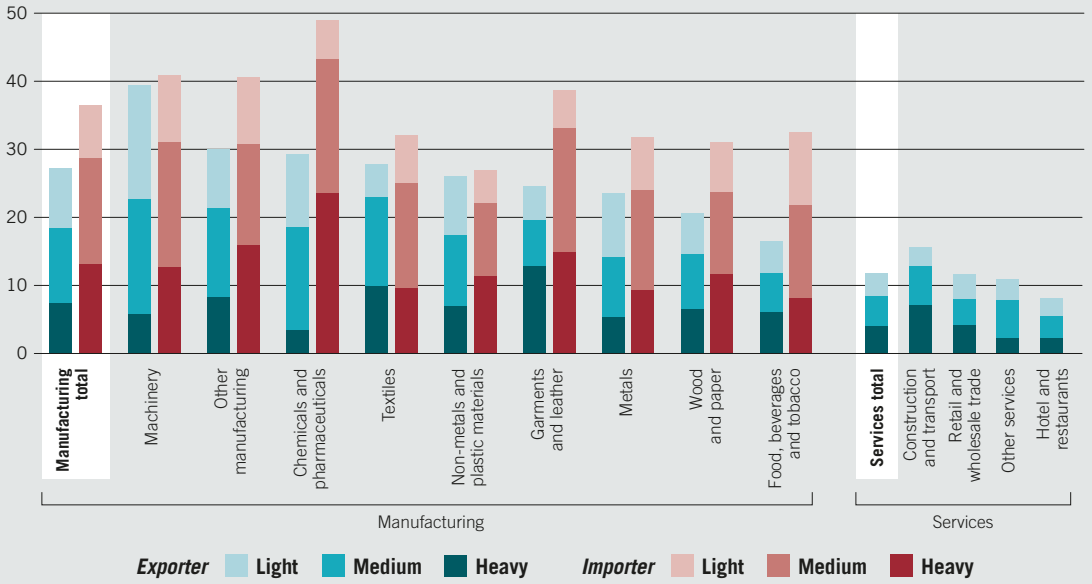
The distribution of firms by import intensity also varies across sectors (figure 3.6, red bars): Almost 37 per cent of manufacturing firms import raw materials from abroad. The chemicals and pharmaceuticals sector has the largest share of importing firms, corresponding to 49 per cent of all firms, with 88 per cent of firms being either medium or heavy importers.

There is a strong correlation between the shares of exporters and importers across different sectors, indicating that sectors that have a larger share of exporters also tend to have a larger share of importers.

An additional observation is that the shares of exporters and importers increase with firm size (WTO, 2016b). Among all manufacturing and services firms, 11 per cent of small firms, 24 per cent of medium-sized firms and 38 per cent of large firms export, while 24 per cent of small firms, 40 per cent of medium-sized firms and 58 per cent of large firms are importers.

Figure 3.6

Share of exporters/importers in total number of firms, latest year, by export/import intensity and economic sector (percentages)



Note: Only firms with at least five employees are considered. Exporting data are available for manufacturing and services firms and comprises both direct and indirect exports, where indirect exports are exports through an intermediary firm. Importing data are available for manufacturing firms only and comprise both direct and indirect imports, where information on importing status is based on information about whether firms use foreign raw materials in their production. Reported figures correspond to population estimates, as survey weights have been applied.

Source: ILO estimates based on World Bank Enterprise Surveys.

B. Exporters and importers: Efficiency and labour market outcomes at the enterprise level

Section A has shown aggregate trends in the numbers of workers employed by exporting firms, and in the shares of workers employed by firms with different export and import intensities. Given these aggregate trends, one can ask: What is the relationship between trade, efficiency and labour market outcomes at the enterprise level? This section presents results on how a firm's exporting and importing status and intensity, and the number of years that it has been exporting, are related to its productivity and the quantity and quality of jobs it provides, taking the analysis from the aggregate level to the enterprise level. The purpose of the analysis is to study efficiency and labour market outcomes in exporting and importing firms, in order to identify outcomes where these firms perform well and those where they do not.

Measuring efficiency and labour market outcomes

The analysis draws on cross-sectional data for over 68,000 formal, privately owned manufacturing firms with at least five employees from 207 surveys conducted in 132 countries from all country income groups, taken from the World Bank Enterprise Surveys. The country income groups referred to in the section are based on the World Bank's Country Income Classification, described in Appendix A to Chapter 1.

To measure firm-level efficiency, alternative indicators are available. The indicators used in this section are:

- total factor productivity (TFP); and
- labour productivity.

TFP measures how efficiently a firm uses all its inputs together (including labour, capital, raw materials and electricity).[3] Labour productivity focuses on labour only, measuring how much value added (calculated as the difference between sales and raw material expenses) a worker within a firm generates on average. If, for example, firm A uses a higher capital stock than firm B, but is identical to it with respect to output and all other inputs (labour, raw materials and electricity), firm A will have the same labour productivity, but a lower TFP, than firm B, as it needs more capital to produce the same amount of output.

TFP and labour productivity are not directly comparable measures, as TFP is a multiplicative factor in the production function, while labour productivity is measured in monetary currency units. TFP and labour productivity are hence very different measures of efficiency.

To measure firm-level labour market outcomes, the analysis would ideally like to consider all different dimensions of job quantity and quality (ILO, 2013). The available data allow us to use the following indicators:

- average wage;
- total employment;
- share of female employment; and
- share of temporary employment.

Total firm-level employment is an indicator of the availability of employment opportunities within a firm. The firm-level share of female employment is an indicator of equal opportunity and treatment in employment between the sexes. The average firm-level wage gives an indication of the adequacy of earnings. The firm-level share of temporary workers in total employment is a proxy measure for the average level of employment security. It is also an indicator of job quality, given that it has been shown to be associated with an increased prevalence of physical and mental health issues (Benavides et al., 2000; Virtanen et al., 2005; Waenerlund, Virtanen and Hammarström, 2011).

3. To estimate firm-level TFP, this chapter follows closely Saliola and Seker (2011). The estimated TFP measure can be interpreted as follows. Take two firms which have the same labour, raw materials and electricity expenses and the same capital stock values. If one of the firms sells twice as much in terms of value than the other, then that firm's TFP will be twice as high as that of the other firm.

Relating efficiency and labour market outcomes to trade

This section relates each of the above indicators of firm-level efficiency and labour market outcomes to firm-level trade indicators through regression analysis. For the trading behaviour of firms, three different indicators are considered. First, the section looks at export and import status and compares efficiency and labour market outcomes between exporting and non-exporting firms, and between importing and non-importing firms (see Appendix B for more details). Second, it uses firm-level export and import intensity, which indicates how much firms engage in exporting and importing, comparing efficiency and labour market outcomes among firms with different export and import intensities (see Appendix B). Third, it considers the number of years firms have been exporting, analysing how exporting experience is related to efficiency and labour market outcomes within exporting firms (see Appendix C).

The analysis implicitly compares firms with identical ownership status (domestic or foreign-owned) and age, with a similar type of economic activity (as measured through capital intensity, electricity intensity and sector dummies) and within the same country and year (as measured through survey dummies) with each other. These variables enter the regressions as control variables. It is important to note that variables such as sales (accounting for firm size) or workers' average education level are purposely not controlled for in the regressions, as trade may relate to efficiency and labour market outcomes through precisely these channels (economies of scale, change in the composition of the workforce).

The results should be interpreted as average outcomes, which does not preclude outliers with regard to efficiency and labour market outcomes in either direction. The results of the analyses are presented in the remainder of this section.

Exporters are significantly more productive than non-exporters

Figure 3.7 provides empirical evidence on the difference in efficiency outcomes between exporting and non-exporting firms, and between importing and non-importing firms, using firm-level measures of TFP and labour productivity. Exporters are more productive than non-exporters. Indeed, relative to a non-exporting firm, an exporting firm's TFP is, on average, more than 7 per cent higher (panel A), and its labour productivity more than 30 per cent higher (panel C). The positive productivity premium for exporters is observed throughout all country income groups. The positive labour productivity premium is observed across all sectors, and a positive TFP premium is observed across all sectors except non-metals and plastics, and machinery. The machinery sector has a relatively large share of exporters (see box 3.2), which is likely to result in a high degree of competition in export markets and hence decreased sales relative to input use.

Importers tend to be significantly more productive than non-importers (panels B and D), but with a smaller premium for importers than for exporters. When using labour productivity as an efficiency indicator, the positive importer premium is estimated to be 19 per cent. A significantly positive labour productivity premium for importers is observed for all country income groups. The importer premium on labour productivity is positive and statistically significant for all sectors except textiles, garments and leather. For TFP, an importer premium is found only for firms in lower-middle-income countries, for which importing might be a particularly crucial activity for competition in international markets. Importers are just as productive as non-importers in most sectors, except in the wood and paper sector, where they are less productive, and in the non-metals and plastics sector and the metals sector, where they are more productive than non-importers.

The finding that trading firms are more productive than non-trading firms is in line with both the theoretical literature (Kasahara and Lapham, 2013; Melitz, 2003) and the empirical literature (Bernard et al., 2007, 2012; Mayer and Ottaviano, 2008; Wagner, 2007). The source of the productivity premium for trading firms, however, has been the subject of intense academic debate.

On the one hand, the productivity differences between trading and non-trading firms may arise as a result of self-selection. One reason that more productive firms are self-selected into the exporting market is because firms have to pay a fixed cost in order to start exporting and importing and these fixed costs are economically significant (Bernard and Jensen, 2004; Das, Roberts and Tybout, 2007). Before entering export markets, firms need to undertake market research, adapt their products to foreign consumers' needs and set up distribution channels. Before starting to import, firms need to undertake supplier research, adapt their production process to the new foreign input variety and set up sourcing channels. Only the most productive firms can afford these costs.

Figure 3.7

Percentage differences in firm-level productivity between trading and non-trading firms, by income group

Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with the logarithm of productivity (TFP) and labour productivity, respectively, as the dependent variable, and exporter status dummy, import status dummy, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

On the other hand, the productivity differences between trading and non-trading firms may also be a result of "learning by exporting", through at least three channels. First, exporting firms can benefit from economies of scale, where the scaling-up of production in order to serve export markets is accompanied by a lowering of unit costs. Indeed, one of the main motivations for firms to export is to grow their business by benefiting from the potential of less saturated export markets (Kubíčková, Votoupalová and Toulová, 2014; Moen, 1999). Second, firms may learn from serving potentially more sophisticated foreign consumers, who demand a higher quality of products. Finally, firms are exposed to competition in foreign markets that may force them to become more productive if they are to survive and be successful.

On the importing side, there can be "learning from importing". When firms are able to access foreign inputs, they have a wider variety of inputs to choose from, including inputs that are potentially of higher quality, which may be accompanied by technology and knowledge transfers (Ethier, 1982; Grossman and Helpman, 1991). The empirical literature largely confirms the positive impact that increased access to foreign inputs has on firm productivity (Amiti and Konings, 2007; Halpern, Koren and Szeidl, 2015; Stone and Shepherd, 2011; Vandenbussche and Viegelahn, 2016).

The empirical literature suggests that both directions of causality matter, even though the relationship can be different for different countries (De Loecker, 2007, 2013; Fatou and Choi, 2015; Keller and Yeaple, 2009; Van Biesebroeck, 2005).

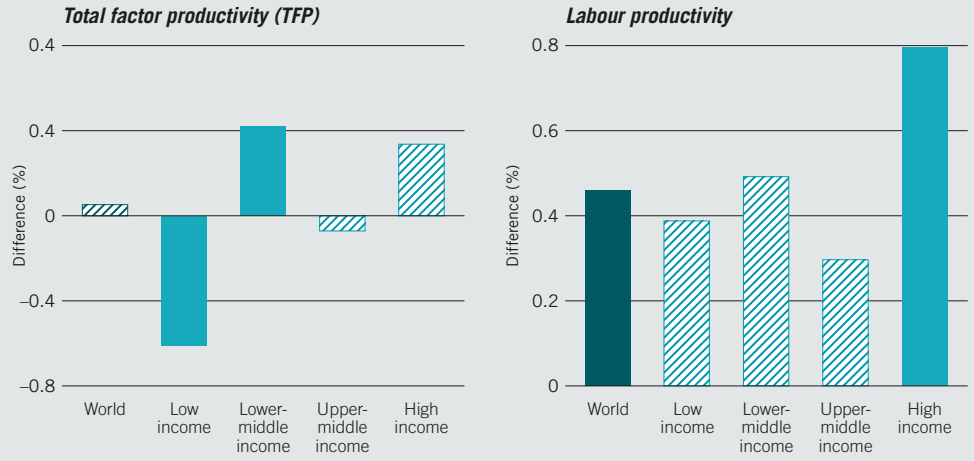
Exporters' labour productivity tends to grow with exporting experience

In low-income economies, when looking at exporting firms of identical age and with other identical firm characteristics, productivity levels (based on the TFP indicator) become significantly lower with more exporting experience. A possible reason for this is that a lack of trade infrastructure – a frequent consideration in these countries – makes it particularly difficult for exporting firms to grow, expand into new export markets and export new products. In lower-middle-income countries, in contrast, productivity levels in exporting firms become significantly higher the longer that firms have been exporting.

A positive relationship is also found between exporting experience and labour productivity, with 10 per cent more exporting years being associated with an almost 0.5 per cent higher labour productivity, mainly driven by high-income countries (figure 3.8). These findings are in line with the idea that there are learning effects from exporting, materializing in productivity gains after the firm has started to export. The presence of learning effects would indeed imply that longtime exporters have a higher productivity than firms that just have started exporting and that have not had many opportunities to learn.

Figure 3.8

Estimated productivity effect of a 10 per cent increase in the number of years a firm has been exporting



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with the logarithm of productivity (TFP) and labour productivity as respective dependent variables, and the logarithm of the number of exporting years, export intensity, import intensity, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix C for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

The productivity premium for exporters holds for all export intensities, but is related to export intensity in a non-linear way

As noted earlier, trade intensity also matters. Exporting firms are heterogeneous, ranging from those that export only occasionally, after receiving unsolicited orders from abroad, to firms that proactively exploit the potential of foreign markets or have been created for the sole purpose of exporting. Importing firms are also heterogeneous, ranging from firms that source only one of their inputs from abroad to those that purchase all their inputs from foreign suppliers. The impact of import intensity on productivity has been largely neglected by the literature that relates trade to productivity, and only a few studies take into account export intensity as opposed to export status. These studies tend to find evidence for a positive relationship between export intensity and productivity, implying that productivity increases the more a firm exports (Castellani, 2002; Liu, Tsou and Hammitt, 1999). In addition, exporting has been found to increase the productivity growth of firms with lower export intensity, but not that of firms with higher export intensity (Fryges and Wagner, 2008).

The findings in this chapter indicate that a productivity premium is present across all trade intensities, but with different magnitudes, regardless of whether TFP or labour productivity is used as an indicator. The productivity of exporters is estimated to be higher, compared with non-exporters, regardless of the export intensity (figure 3.9, panels A and C). For labour productivity, however, a non-linear relationship is observed, with productivity at its peak for export intensities of around 20–40 per cent, and relatively lower productivity for heavy exporters. For importers with different import intensities, barely any difference in productivity is measured in TFP (panel B), while labour productivity is estimated to increase with higher import intensity, at least up to import intensities of around 70–80 per cent (panel D).

Exporters and importers pay significantly higher wages than firms not engaged in trade, but the wage premium is smaller than the labour productivity premium

Figure 3.10 provides evidence on the relationships between exporting, importing and wages. Exporters and importers pay on average higher wages than firms that have similar characteristics but are not engaged in trade. Exporters are estimated to pay on average almost 18 per cent higher wages than non-exporters (panel A1), while the wage premium for importing is estimated to be over 14 per cent (panel A2). The sizes of these premiums are within the range of wage premiums estimated in previous studies (Schank, Schnabel and Wagner, 2007). Exporters and importers also pay higher wages in all country groups, with the estimated premium varying across different country income groups. Exporters and importers across nearly all sectors pay statistically significantly higher wages than non-exporters and non-importers, respectively. One notable exception is the textiles sector, where no statistically significant difference in wages between importers and non-importers can be detected.

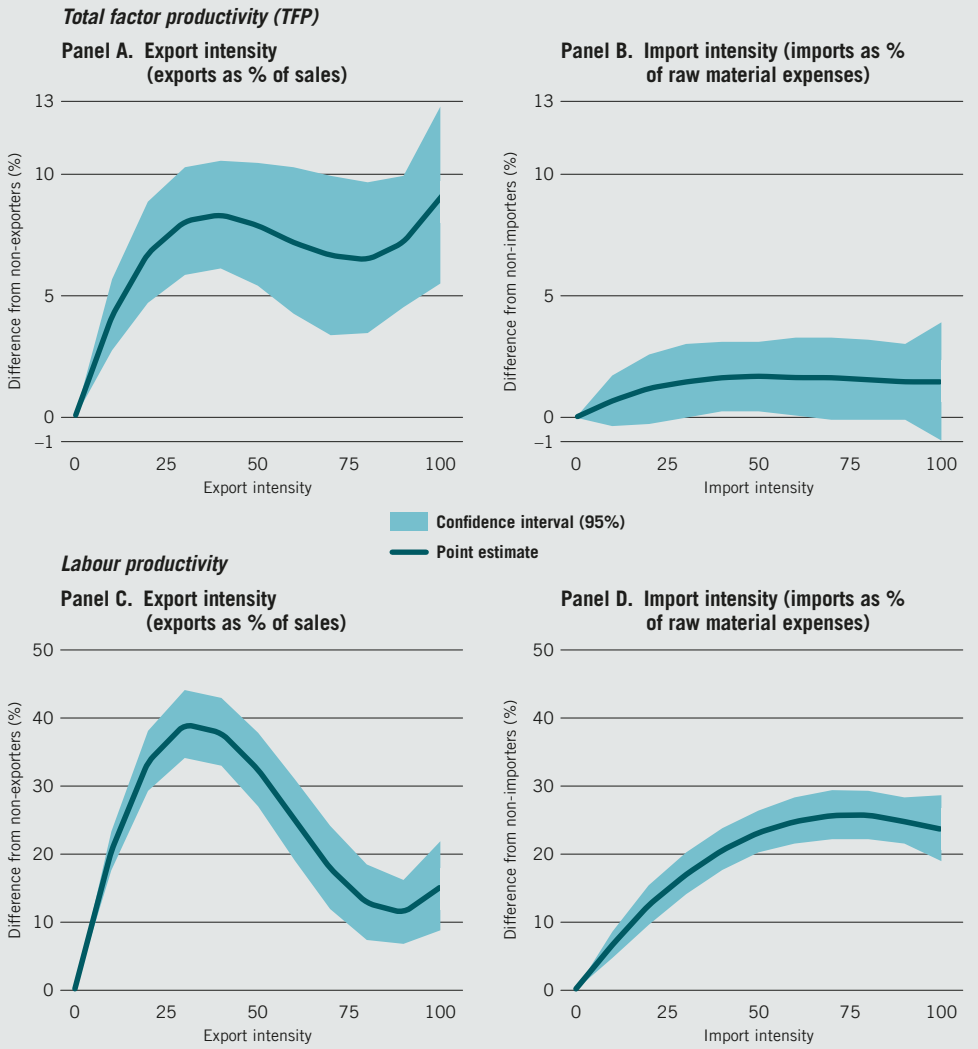
The literature has indeed documented that both importers and exporters pay higher wages on average (Bernard et al., 2007; Duda-Nyczak and Viegelahn, forthcoming; Egger, Egger and Kreickemeier, 2013). But firm heterogeneity also plays a role: exporting has particularly been shown to yield wage gains in firms in which wages are determined through collective bargaining (Carluccio, Fougère and Gautier, 2015). Increased access to foreign inputs through lower input tariffs has been found to lead to higher wages, while the impact of a decline in output tariffs is less pronounced, at least in the case of Indonesia (Amiti and Davis, 2012). Other reasons for a wage premium for trading firms are differences in the skills composition of trading firms' workforces relative to non-trading firms, implying higher wages in the case of a more highly skilled workforce (Bustos, 2011; Verhoogen, 2008; Yeaple, 2005).

Given the significant productivity premiums for exporters and importers shown in figure 3.7, the question is to what extent these efficiency gains have been translated into wage gains. And while the magnitude of such "rent-sharing" depends on a range of factors, the extent of workers' bargaining power is likely to play a critical role.

Wage premiums are considerably and statistically significantly smaller than the labour productivity premiums documented in figure 3.7, panels C and D (whose magnitude can be directly compared, given that regressions include the same set of control variables). The estimated wage premium for

Figure 3.9

Variation of productivity for firms with average characteristics, by trade intensity



Note: Estimates are based on OLS regressions with the logarithm of productivity (TFP) and labour productivity as respective dependent variables, and export intensity (linear, quadratic and cubic term), import intensity (linear, quadratic and cubic term), foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B and Soete and Viegelahn (forthcoming) for methodological details.

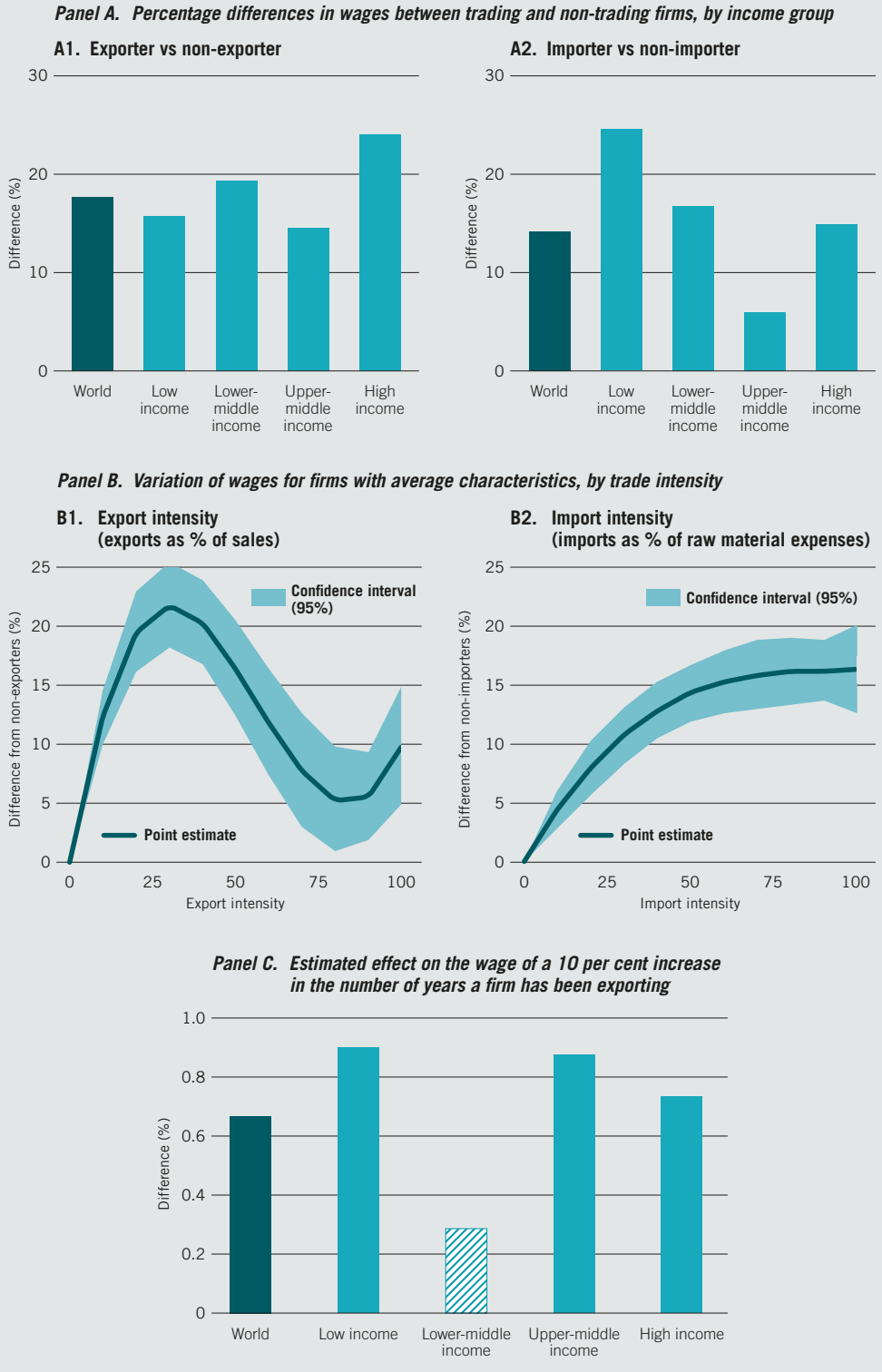
Source: ILO estimates based on World Bank Enterprise Surveys.

exporting is smaller than the estimated labour productivity premium, and consistently so across country income groups. For importing, there is a gap between the estimated wage premiums and the estimated productivity premiums, but only for low-income and lower-middle-income countries; while the estimated wage and productivity premiums for upper-middle-income and high-income countries are quantitatively in a similar range.

The results indicate that exporting and importing are positively related to the wage that firms pay on average to their workers. However, the efficiency gains related to exporting and importing do not always translate into wage gains of a similar magnitude. These results are also in line with earlier evidence documenting a negative association between the participation in GSCs and the labour share of income (ILO, 2015b; IMF, 2017).

Figure 3.10

Exporting, importing and wages



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with the logarithm of average wage as the dependent variable. The main variables of interest included into the regression are, respectively, exporter status dummy and import status dummy (for panel A), export intensity and import intensity (linear, quadratic and cubic term – for panel B) and the number of years a firm has been exporting (for panel C). The control variables included in each regression are a foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies. See Appendices B and C and Soete and Viegelahn (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

The few existing studies on the impact of trade intensity on wages tend to find that export intensity has a positive impact on wages (Munch and Skaksen, 2008; Schank, Schnabel and Wagner, 2007). Our analysis confirms the presence of positive wage premiums across all levels of export and import intensity, but the relationship is not linear. Firms with low export intensities pay higher wages than firms with higher export intensities, the difference being statistically significant (figure 3.10, panel B1). On the importing side, it broadly holds that firms' wages are higher the greater their share of imports in total raw material expenses (figure 3.10, panel B2). These patterns are observed for a large number of sectors and for different country income groups.

The way in which wages paid by the average firm vary by export and import intensity is very similar to how labour productivity in the average firm varies (figure 3.9, panels C and D), suggesting that workers are able to obtain a share of the value added that they create, which is relatively independent of the export or import intensity of firms. However, for all intensities, wage premiums are smaller than labour productivity premiums.

Finally, wages tend to be higher the longer a firm has been exporting: a 10 per cent increase in exporting years relates to a 0.7 per cent rise in wages (figure 3.10, panel C). The average wage premium for one more exporting year is relatively similar to the average labour productivity premium, indicating that the productivity–wage gap does not systematically change with the number of years a firm has been exporting.

Exporters and importers have larger workforces than non-trading firms

Figure 3.11 provides evidence on the relationships between exporting, importing and the size of a firm's workforce. On average, an exporter employs a workforce that is more than twice the size of that employed by a non-exporter, with an average difference of 158 per cent (panel A1). Exporters have larger workforces than non-exporters in all sectors. Moreover, workforces are estimated to be larger in all exporting firms, regardless of their trade intensity (panel B1), and firms with a high export intensity tend to have the largest workforces. For example, a firm that exports all its sales is estimated to employ around four times as many full-time permanent employees as a non-exporting firm. Exporting firms continue to grow in terms of their number of full-time permanent employees the longer they are in the export market; 10 per cent more exporting experience corresponds to almost 2.5 per cent more full-time permanent employees (for firms with similar characteristics) (panel C).

Similarly, importers tend to be larger than non-importers, even though the difference between importers and non-importers is only 56 per cent (panel A2). Importers have more permanent full-time employees than non-importers in firms across all economic sectors. Among all importers, the largest workforces are found in firms with intermediate import intensities.

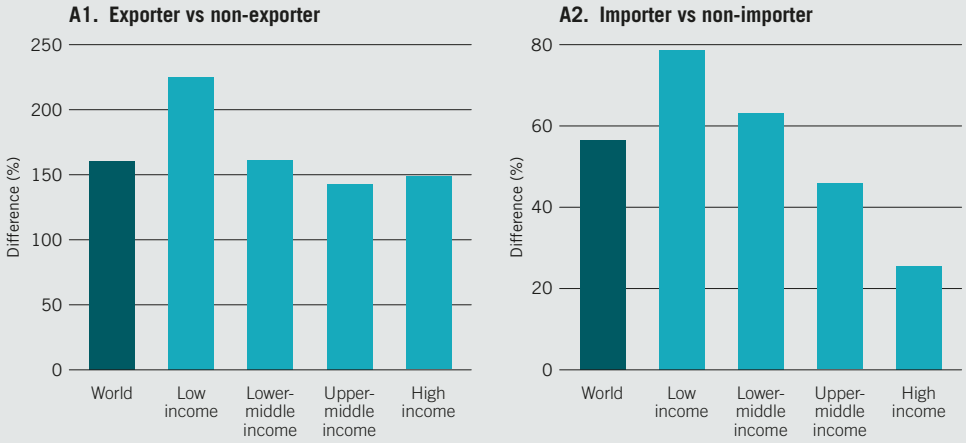
The literature has already widely documented that firms engaged in international trade are typically larger and hence have larger workforces (Bernard et al., 2007), and that this difference is partially due to international economies of scale. The analysis in this chapter adds to this by showing that the differences between trading and non-trading firms are largest for low-income countries, but that they appear to decline when countries climb up the development ladder and become richer. One possible explanation for this pattern is that the barriers to trade for low-income countries are likely to be higher than for high-income countries, as low-income countries often lack infrastructure of sufficient quality to enable trade.

The prevalence of exporting firms has indeed been found to grow with the level of a country's development (Fernandes, Freund and Pierola, 2015). Firms engaged in trade need then to pay a particularly large fixed cost to trade in less developed countries, which they can only afford when they are particularly productive. But it is especially firms with particularly large workforces that are most productive. Hence the difference between trading and non-trading firms is expected to be more pronounced in countries where the fixed costs of entering export and import markets are higher.

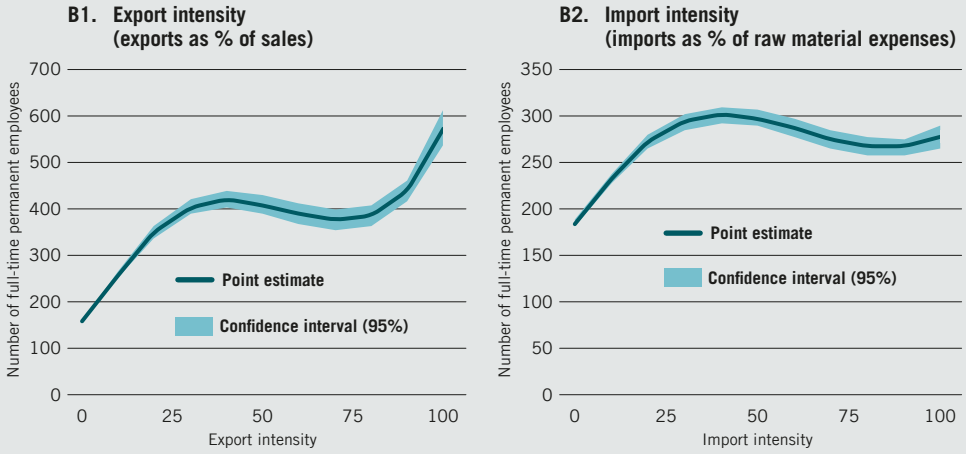
Figure 3.11

Exporting, importing and full-time permanent employment

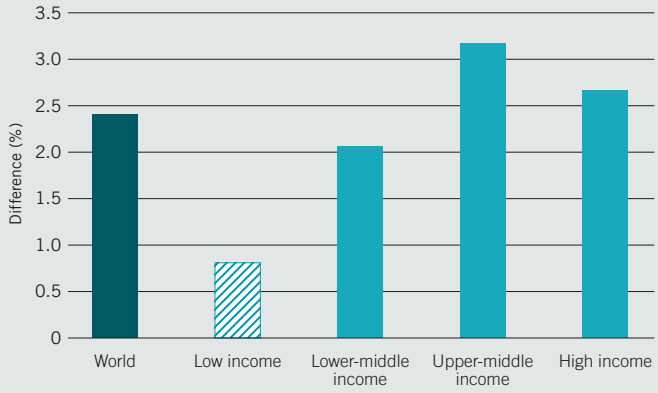
Panel A. Percentage differences in employment between trading and non-trading firms, by income group



Panel B. Variation in employment for firms with average characteristics, by trade intensity



Panel C. Estimated effect on employment of a 10 per cent increase in the number of years a firm has been exporting



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with the logarithm of full-time permanent employment as the dependent variable. The main variables of interest included into the regression are, respectively, exporter status dummy and import status dummy (for panel A), export intensity and import intensity (linear, quadratic and cubic term – for panel B) and the number of years a firm has been exporting (for panel C). The control variables included into each regression are a foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies. See Appendices B and C and Soete and Viegelahn (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

Heavy exporters and importers have higher shares of women in their workforces

Figure 3.12 examines the relationships between exporting, importing and the share of women in a firm's workforce. Across all country income groups except for high-income countries, exporters employ relatively more women than non-exporters (panel A1). The difference between exporters and non-exporters is on average around 3 percentage points, but reaches almost 9 percentage points in low-income countries. Exporters in all sectors employ more permanent full-time female workers than non-exporters, the difference being statistically significant in most cases. Heavy exporters have particularly large shares of women in their workforces (panel B1). According to these estimates, in an average non-exporting firm the share of female workers in the workforce is about 29 per cent, while in firms that export all their sales the share reaches 40 per cent.

There is no statistically significant relationship between the number of years a firm has been exporting and the female employment share, indicating that there is no gender bias in hiring after a firm has started exporting (panel C).

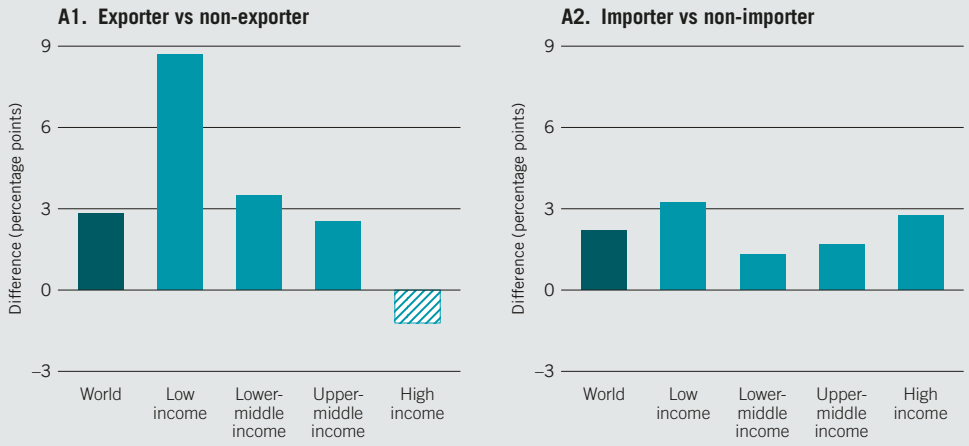
Importing is also positively related to the share of women in full-time permanent employment, with an estimated average difference between importers and non-importers of above 2 percentage points (panel A2). The difference is estimated to be highest in low-income countries. Importers employ significantly more female workers in some sectors (e.g. wood and paper, and garments and leather), but in other sectors there is little or no difference. For importers, the share of women in a firm's full-time permanent workforce continuously rises with import intensity, from 28 per cent for non-importers to 32 per cent for firms that import all of their raw material inputs (panel B2).

Export orientation has been shown to be related to increased female employment in some countries and sectors. For example, a study of export-oriented Mexican cities found that female employment is concentrated in export-oriented sectors (Tamborini, 2007). A positive correlation between export orientation and the "feminization of labour" has also been found for Bangladesh (Kabeer and Mahmud, 2004), India (Ghosh, 2004), Kenya (Were, 2012) and Turkey (Başlevent and Onaran, 2004; Ozler, 2000). Recent evidence from Africa suggests that exporter and importer premiums can increase if a country implements gender-related policies (Duda-Nyczak and Viegelahn, 2017). While a high share of women in a firm's workforce is an indicator for the inclusiveness of jobs, it does not necessarily provide an indication of the quality of jobs held by women (or men) (an examination of this issue extends beyond the scope of this report).

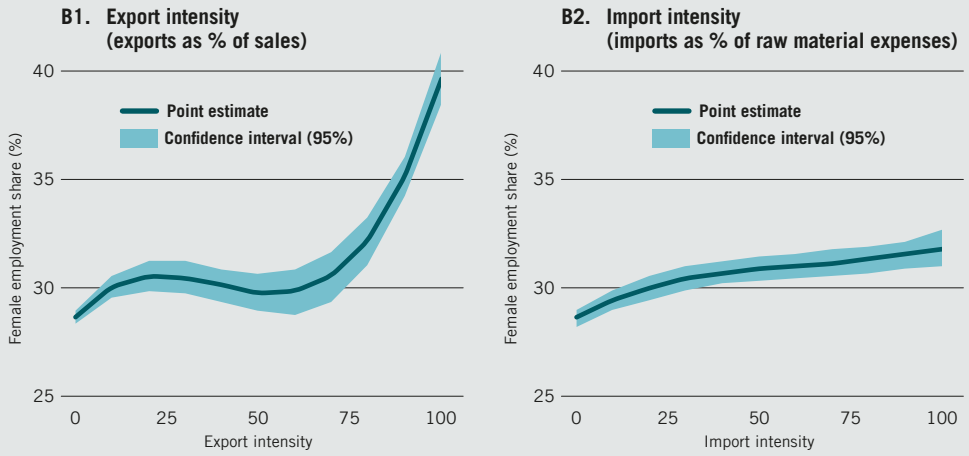
Figure 3.12

Exporting, importing and the female employment share

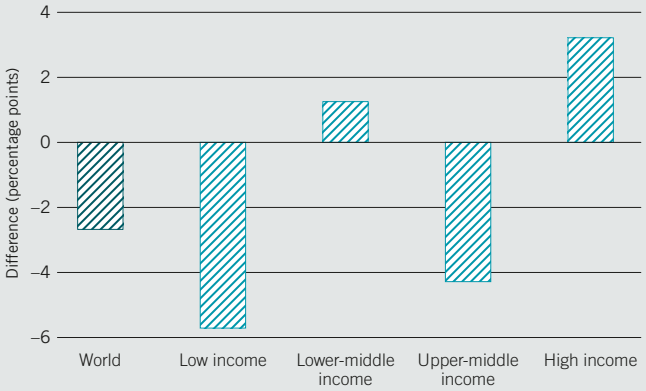
Panel A. Percentage point differences in the female employment share between trading and non-trading firms, by income group



Panel B. Variation in female employment share for firms with average characteristics, by trade intensity



Panel C. Estimated effect on female employment of a 10 per cent increase in the number of years a firm has been exporting



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with share of female employment in full-time permanent employment as the dependent variable. The main variables of interest included into the regression are, respectively, exporter status dummy and import status dummy (for panel A), export intensity and import intensity (linear, quadratic and cubic term – for panel B) and the number of years a firm has been exporting (for panel C). The control variables included into each regression are a foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies. See Appendices B and C and Soete and Viegelahn (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

Exporters have higher shares of temporary workers in their workforces, while importers tend to employ fewer temporary workers, but results differ by sector

Figure 3.13 provides evidence on the relationships between exporting, importing and the share of temporary employment. The share of workers in temporary employment is an indicator of job stability and security. When comparing firms with the same ownership status, age and economic activity, the overall average share of temporary employment in total employment is 1.5 percentage points higher for exporters than for non-exporters in countries from all income groups (panel A1). The higher the export intensity, the higher the share of temporary workers in those firms (panel B1). The number of years that a firm has been exporting is negatively associated with the temporary employment share: 10 per cent more exporting years relates to a 6 percentage point reduction in the temporary employment share (panel C).

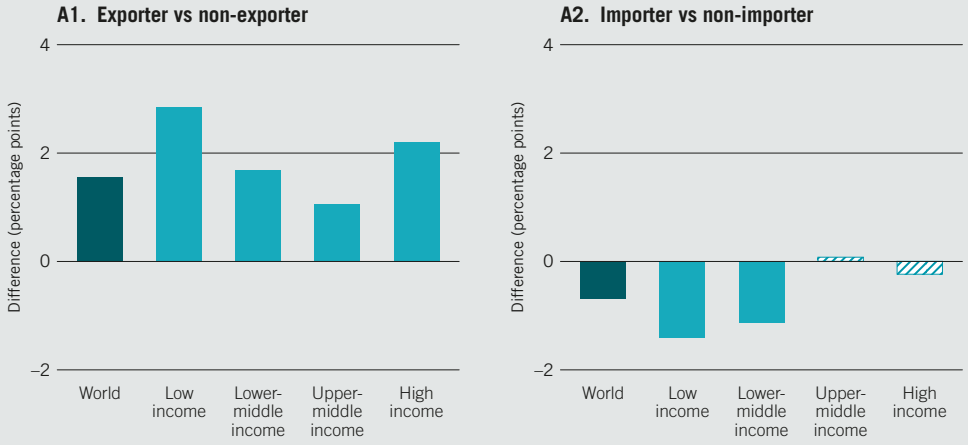
The literature appears to confirm a link between exporting and sales volatility (Nguyen and Schaur, 2012), which may help to explain why exporters have a higher demand for temporary workers. In Japan, it has recently been shown that firms engaged in trade use temporary employment more extensively, supporting the idea that temporary contracts act as an employment buffer for trading firms (Machikita and Sato, 2016). Flexibility appears to be one of the main motives behind the use of temporary contracts, although findings vary across sectors (Aleksynska and Berg, 2016; see also Chapter 2 for further analysis). Exporters in the food, beverages and tobacco sector, for example, have a 7.4 percentage point higher temporary employment share than non-exporters in the same sector, while exporters in the metals sector have a 1.8 percentage point lower temporary employment share.

Importers use temporary employment less heavily than non-importers, at least in low-income and lower-middle-income countries, having a temporary employment share that overall is almost 0.7 percentage points lower than that of non-importers (panel A2). However, the results for importers versus non-importers vary by sector. For example, importers in the food, beverages and tobacco sector and the non-metals and plastic materials sector have a 1.3 and 3.1 percentage point lower temporary employment share, respectively, than non-importers, while importers in the garment and leather sector and the metal sector have a 1 percentage point higher temporary employment share. One possible explanation for the differences is the variation in skills and training requirements across sectors. If a sector requires only minimum skills and training, it is easier for firms to employ temporary workers as a response to foreign market fluctuations. If a sector requires highly skilled workers, this option becomes more challenging. Temporary employment use also falls with increasing import intensity (panel B2).

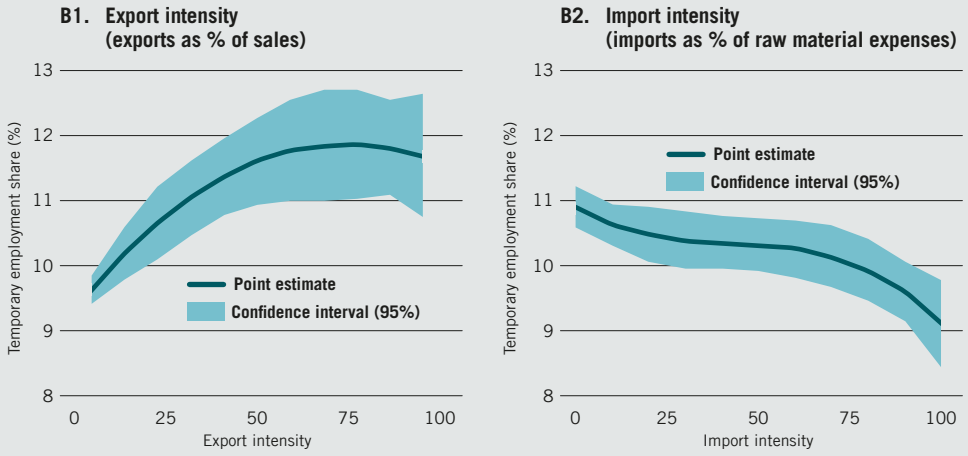
Figure 3.13

Exporting, importing and the share of temporary workers

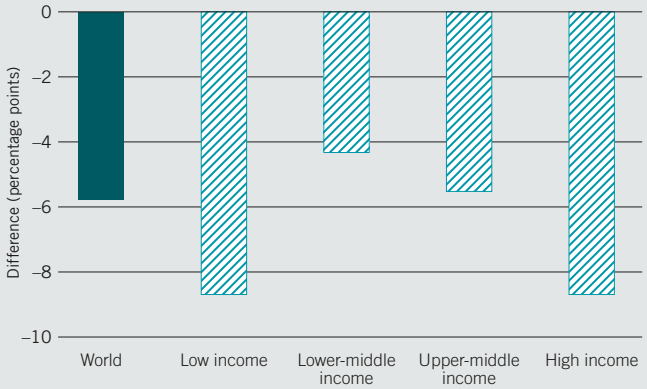
Panel A. Percentage point differences in the temporary employment share between trading and non-trading firms, by income group



Panel B. Variation of the temporary employment share for firms with average characteristics, by trade intensity



Panel C. Estimated effect on temporary employment of a 10 per cent increase in the number of years a firm has been exporting



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions with the share of temporary employment as the dependent variable. The main variables of interest included into the regression are, respectively, exporter status dummy and import status dummy (for panel A), export intensity and import intensity (linear, quadratic and cubic term – for panel B) and the number of years a firm has been exporting (for panel C). The control variables included in each regression are a foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies. See Appendices B and C and Soete and Viegelahn (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

C. Suppliers in global supply chains: Efficiency and labour market outcomes at the enterprise level

The previous section has documented that efficiency and labour market outcomes vary not only between trading firms and non-trading firms, but also among trading firms, depending on their trade intensity. This section continues to look at variations among trading firms, focusing on exporters within GSCs.

Identifying supplier firms in GSCs and estimating their efficiency and labour market outcomes

A GSC represents the cross-border organization of tasks required for production, including product development, the supply of intermediate inputs in different stages of processing, final assembly and product delivery. The resulting fragmentation of production across borders gives rise to demand–supply relationships that form a GSC, where different tasks of the production process are performed in two or more countries (ILO, 2015b, 2016c). *Lead firms* are firms that organize their production processes as GSCs, while *supplier firms* are firms that undertake tasks that form part of a production process.[4]

This section attempts to identify, among all exporting firms, those firms that contribute to a GSC through their exports (as supplier firms), and to analyse efficiency and job outcomes within these firms, relative to other exporters. The analysis distinguishes between firms that supply inputs into GSCs, termed *GSC input suppliers*, and firms that undertake the assembly of final goods, termed *GSC final goods suppliers*. GSC input suppliers produce intermediate inputs that enter foreign production. GSC final goods suppliers undertake the assembly of intermediate inputs to the final product by order of a foreign lead firm. GSC input suppliers are distinguished from GSC final goods suppliers in that final goods assembly more frequently involves manual labour than the production of intermediate inputs (Fasth, Stahre and Dencker, 2010), making it a different type of activity, which may result in different efficiency and labour market outcomes. Box 3.3 describes in more detail how this section uses the available firm-level data to identify supplier firms in GSCs.

GSC input and final goods suppliers are distinguished from other exporters by the requirement that the demand for their products originates from foreign lead firms, rather than foreign consumers. This creates some particularities with regard to the buyer–supplier relationships that GSC supplier firms are subjected to, when compared with other exporters (Gereffi, Humphrey and Sturgeon, 2005).

One particularity of GSCs is that they may lead to power asymmetries between firms. For example, a small number of lead firms could enjoy a high degree of market power, as a large number of small suppliers compete fiercely with each other. Similarly, a large number of lead firms may have to compete for a small number of suppliers. The dominant companies in GSCs – which are often large multinational enterprises (MNEs) based either in developed countries or, increasingly, in developing countries (see box 3.4) – frequently retain control of the most profitable segments of these chains, namely distribution and marketing.

Another particularity arises where the design of a GSC supplier firm's production process requires some coordination with the foreign lead firm. Such a situation may create dependencies between the foreign lead firm and the GSC supplier firm.

4. The term *lead firm* is frequently encountered in the GSC literature. It does not imply that a *lead firm* has control over the working conditions in *supplier firms*. It is also important to note that a firm can be a lead firm and a supplier firm at the same time, if it organizes at least one of its own production processes in a GSC and, at the same time, contributes through at least one of its outputs to a production process of another GSC (see also box 3.3).

Box 3.3

How to identify supplier firms in GSCs

GSCs arise when one production process takes place in two or more countries. Based on this concept, two definitions of *supplier firm* can be developed. These definitions consider: (i) the production of intermediate inputs that are further processed elsewhere in the production process, and (ii) the assembly of different intermediate inputs to the final product. The analysis uses data from the World Bank Enterprise Surveys (see Viegelahn and Wang, forthcoming, for more details).

GSC input suppliers are defined as firms whose main product can be classified as an intermediate input into a production process and whose main market for their main product is the export market. An intermediate input corresponds to a product that needs to be processed further before it can be consumed. For example, intermediate inputs in car production are car doors, airbags or bearings. The exporting of inputs that are processed further abroad by definition establishes a supply chain that stretches across at least one border. *GSC input suppliers* are hence firms that directly participate in a GSC as an exporter of inputs. For example, a firm that mainly produces car doors that are used in final car assembly taking place abroad will be counted as a *GSC input supplier*.

There are also firms that form part of a GSC but do not produce intermediate inputs. Rather, their main task is to undertake the final assembly of a product. Given that these firms produce final goods as opposed to intermediate inputs, they are not included within the first definition. For this reason, a second definition is used.

GSC final goods suppliers are firms whose main product can be classified as a final product, whose main market for the main product is the export market, and which do not export indirectly through an intermediary. A final product, such as a mobile phone or a t-shirt, is one that can be directly used by the consumer without the need for further processing. The main market for it must be the export market, to reflect the idea that *GSC final goods suppliers* assemble these products in one country before shipping them into other countries (in which the lead firm has a commercial presence). To identify firms that undertake the final assembly under contract from a foreign lead firm, the final goods must be exported directly by the supplier firm. If the *GSC final goods supplier* undertakes the final assembly by order of a lead firm, it will most likely export the final goods directly to the storage facilities of the lead firm (located in other countries) and will not use an intermediary wholesaler.

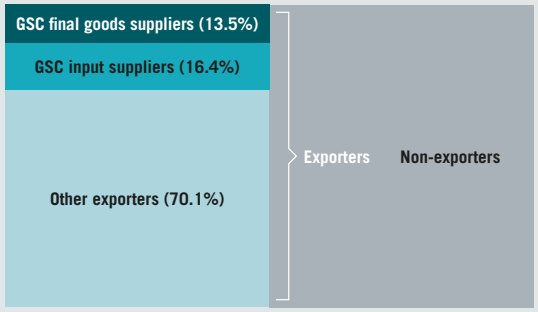
This definition may be too broad in scope, as it counts not only firms that produce for lead firms, but also other exporters that export final goods directly. However, it does include those firms that are indeed *GSC final goods suppliers*. For example, a firm that is located in Bangladesh and produces garments for the global market by order of a lead firm located elsewhere exports its ready-made garments directly. This firm will therefore be counted as a *GSC final goods supplier*, according to the above definition.

Additionally, due to limitations in the availability of data, only formal firms that are small, medium-sized or large are considered.[1] It is important to note that informal enterprises and micro-enterprises may also be suppliers for GSCs.[2] This is especially true in buyer-driven GSCs, where large formal firms can cut costs by having some stages of their production carried out by informal sector enterprises which act as supplier firms. In the absence of formal registration by such enterprises, and given the high fixed costs of exporting, these firms tend not to supply goods across borders, but rather supply domestically.[3] However, their products can eventually end up in GSCs, hence they participate indirectly in GSCs rather than directly through exporting.

Based on the above two definitions, 2,860 *GSC input suppliers* and 2,345 *GSC final goods suppliers* can be identified, out of a total of almost 18,000 exporting firms. This corresponds to 16.4 and 13.5 per cent, respectively, of the total sample of exporters (see figure 3.14). Large proportions of *GSC input suppliers* are found in the non-metals and plastics sector (20.8 per cent) and the textiles sector (20.2 per cent), while most *GSC final goods suppliers* are found in the garments and leather sector (50.7 per cent) and the food, beverages and tobacco sector (31.2 per cent).

Figure 3.14

Illustration of the GSC supplier firm definition



With regard to firm-level characteristics, GSC supplier firms identified in our sample of exporters have, on average, similar sales figures as other exporters. For GSC input and final goods suppliers, average annual sales (2005 constant US$) are US$8.8 million and US$7.0 million, respectively, compared with US$7.7 million for other exporters. On average, GSC supplier firms tend to be younger than other exporters and have larger workforces. Given that the main market for a GSC supplier firm's product must be the export market, GSC supplier firms unsurprisingly tend to have a higher export intensity than other exporters (76.7 and 84.3 per cent for GSC input and final goods suppliers, respectively, compared with 34.5 per cent for other exporters).

[1] While the analysis has not considered employment in informal firms, it has considered both formal and informal employment in formal firms. [2] Several examples show the crucial role that the informal sector can play in GSCs; see, for example, Carr and Chen (2002), Carr, Chen and Tate (2000), Lusby and Derks (2006), and Kaplinsky and Morris (2001). [3] Based on data for 14 countries from the World Bank Micro-Enterprise Surveys, only 2 per cent of micro-enterprises – defined as enterprises with fewer than five employees – are exporters.

Box 3.4

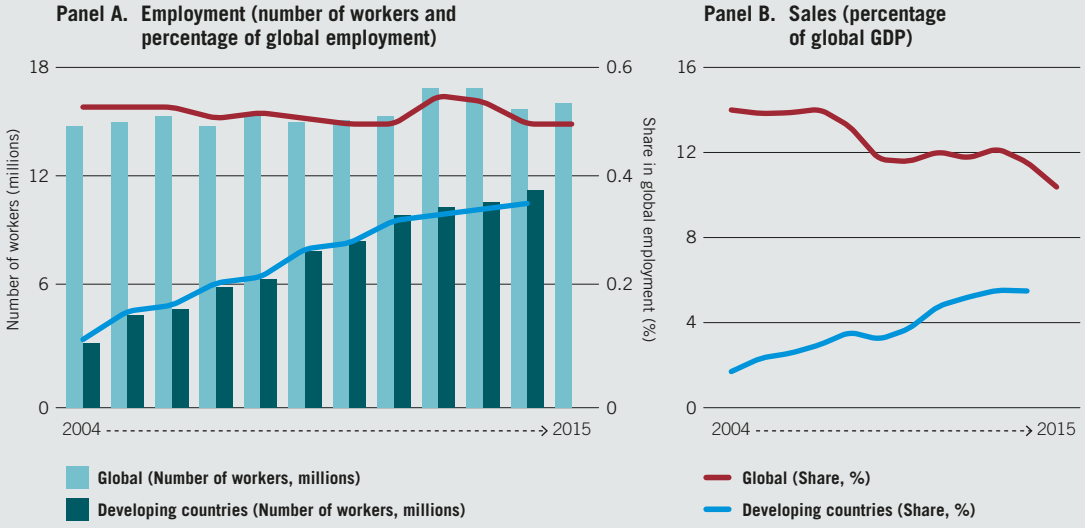
Are MNEs from developing countries becoming more important as coordinators of GSCs? Evidence from the top 100

Multinational enterprises (MNEs) are enterprises that comprise entities in more than one country, which share a common strategy, knowledge, resources and responsibilities. As such, MNEs play a leading role in coordinating GSCs, with cross-border trade of inputs and outputs taking place within their networks of affiliates (intra-firm trade), contractual partners (which includes contract manufacturing, licensing and franchising) and arm's-length suppliers. It is estimated that MNE-coordinated GSCs accounted for some 80 per cent of global trade in 2010 (UNCTAD, 2013).

This box provides evidence showing that MNEs headquartered in developing countries are playing an increasingly important role. It uses data on the 100 largest non-financial MNEs (identified for each year on the basis of their foreign assets) in the world and the top 100 in developing countries. According to these data, the 100 largest non-financial MNEs in the developing world employed 11.5 million workers in 2014, increasing their share of global employment from 0.12 to 0.36 per cent between 2004 and 2014. They also tripled their sales in terms of share of global GDP, to almost 6 per cent in 2014. The 100 largest MNEs in the world, in contrast, accounted for a relatively stable share of global employment and saw a decrease in their sales as a share of global GDP. In 2015, around 16.1 million workers were employed by the 100 largest MNEs in the world, corresponding to around 0.5 per cent of global employment and an average of around 161,000 workers per firm (figure 3.15).

Figure 3.15

Employment and sales of the 100 largest non-financial MNEs, world and developing countries, 2004–15



Note: Developing countries comprise the group of "transitioning and developing countries" as defined by UNCTAD.

Source: ILO calculations based on data from UNCTAD (World Investment Report, various editions), ILO and World Bank.

Also, an increasing number of MNEs based in developing countries have joined the world's 100 largest non-financial MNEs. While most of the top 100 MNEs in the world still have their headquarters in developed countries, MNEs in developing countries are beginning to catch up. Until 1994, all of the top 100 MNEs in the world originated from developed countries, but by 2014, eight MNEs from developing countries had joined the list. Developing-country MNEs have also greatly improved their labour productivity, measured as sales over employment, resulting in a narrowing of the productivity gap with developed-country MNEs. This is especially evident in industries such as computers, electronics, electrical equipment, textiles and apparel, construction and trade (UNCTAD, 2016).

Box 3.5

What has been the focus of CSR initiatives?

MNEs have undertaken voluntary initiatives to improve the monitoring of compliance with international labour standards within their supply chains. Commonly known as private compliance initiatives (PCIs) or corporate social responsibility (CSR) initiatives, these have adopted many forms of "self-regulation", such as codes of conduct, certification and other self-reporting mechanisms (ILO, 2017). Several international normative instruments serve as a reference point for PCIs, including the *Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy* and the *United Nations Guiding Principles on Business and Human Rights*. Interestingly, while these initiatives cover a broad range of employment and labour issues, the importance given to each of them varies considerably across the initiatives adopted.

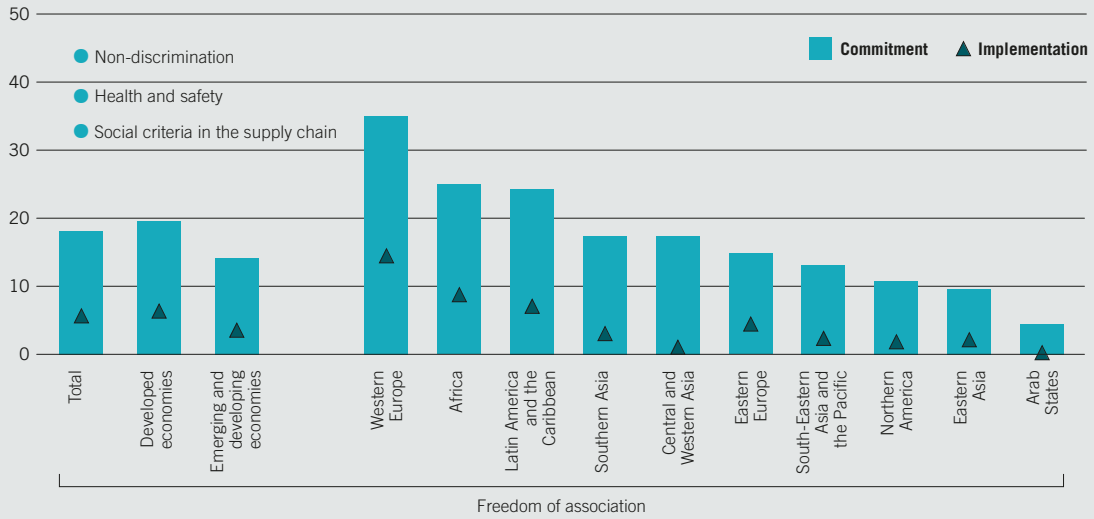
The multiple and complex dimensions of CSRs are captured in the database compiled by VigeoEiris, a European CSR rating agency, which covers more than 3,000 MNEs and measures the levels of voluntary commitment and means of implementation across the selected major dimensions, including non-discrimination, health and safety, freedom of association and social criteria in the supply chain. Social criteria in the supply chain refers to the extent to which the social performance of a supplier is controlled by the outsourcing company, where social performance relates to fundamental labour rights and working conditions.

Figure 3.16 shows how well companies behave in terms of CSR on a scale of 0 to 100, where 100 corresponds to an ideal situation.[1] Overall, none of the scores for labour and employment CSR issues per region reaches 50/100. More importantly, there are significant variations in the way in which each dimension is treated in terms of both commitment and implementation. Compared with the importance given to non-discrimination in the workplace (44.6/100), the improvement of health and safety (38.8/100) and the integration of social factors in the monitoring of the supply chain (33.6/100), the score for private commitment (and implementation) regarding freedom of association is globally very low (18.1/100), meaning that very few companies worldwide see this issue as a priority of self-regulation. Note that, while not being free from possible subjectivity, the VigeoEiris indicator for freedom of association is based on a comprehensive list of international standards, including the Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87), and the Right to Organise and Collective Bargaining Convention, 1949 (No. 98).

Regional and sectoral variations are also significant, although no regions or sectors manage to reach 50/100. The levels of commitment are relatively high in Western Europe compared with East Asia and Arab States. In terms of sectors, it is worth noting that financial and IT services companies are rather reluctant to commit to freedom of association, while companies in the luxury goods and cosmetics, electric components and equipment and beverage sectors are more committed, possibly because of the critical importance of brand reputation for these types of products. Our analysis also shows that the level of commitment regarding

Figure 3.16

Level of commitment and implementation regarding CSR initiatives, average scores



Source: ILO calculations based on VigeoEiris database.

Box 3.5

(cont'd)

freedom of association is positively associated with the degree of internationalization (as measured by the percentage of foreign sales and the percentage of foreign assets), the size of firms (as measured by the number of employees and the revenues) and the age of the enterprises (Delautre, forthcoming).

As an "enabling" right, the promotion of freedom of association can also have a positive influence on all the other dimensions of CSR. Social dialogue allows the creation of a framework that enables a firm to better take into account its economic, social and environmental responsibilities. Top scorers in terms of freedom of association also have better commitment scores than average in other dimensions (figure 3.17), not only in other labour-related dimensions (related to internal workers and third parties), but also in other CSR dimensions, such as human rights, environment and corporate governance. This occurs particularly when a high level of commitment is combined with the implementation of concrete measures, such as training for workers and managers, internal communication, reporting and monitoring measures (possibly including external verification or risk mapping) or audits of suppliers. CSR commitments are strongest when they are backed by a real willingness to ensure there is social dialogue within an enterprise.

Figure 3.17

Average scores of top performers in terms of freedom of association across the different dimensions

Source: ILO calculations based on VigeoEiris database.

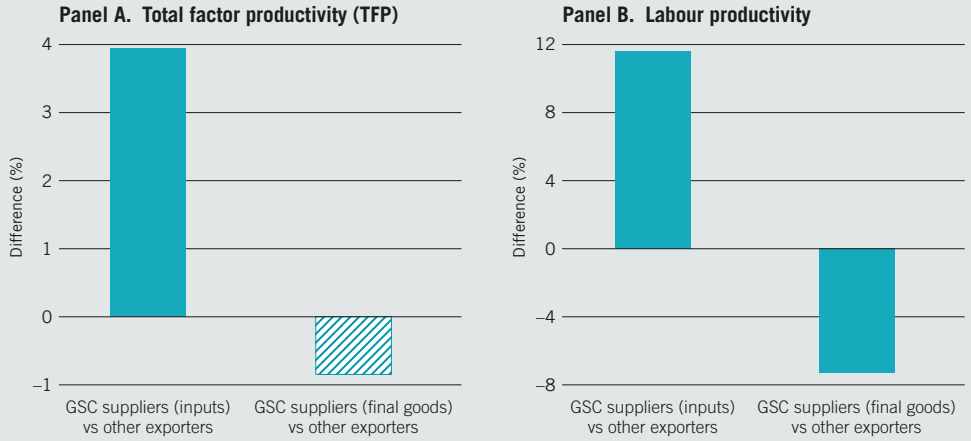
[1] *For example, a company with a score of 100 for freedom of association (FoA): will have signed an international framework agreement (IFA) with a global union (plus possibly the Global Compact) and have a code of conduct; may have completed the IFA with local specific agreements; will have made explicit its commitment towards protection of FoA, the right to organize and the right to collective bargaining, the prevention of employee representative discrimination, etc.; and will have explicitly allocated this responsibility to senior management and have periodic consultations with unions on this issue.*

Finally, as foreign lead firms and GSC supplier firms operate in different countries, they also operate in different socio-economic and legal environments, which raises issues related to the implementation of labour standards in trans-national activities. This has prompted discussions about governance deficits (ILO, 2016c; Mayer and Gereffi, 2010), with some firms undertaking voluntary initiatives aimed at improving the monitoring of compliance with international labour standards in their supply chains (see box 3.5 on the corporate social responsibility behaviour of MNEs).

All the particularities related to GSCs are, in one way or another, likely to have an impact on efficiency and labour market outcomes in GSC supplier firms, which directs the focus of this section.

Figure 3.18

Percentage difference in firm-level productivity between GSC supplier firms and other exporters



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions on the sample of exporters only with the logarithm of productivity (TFP) and labour productivity, respectively, as the dependent variable, and GSC status dummies, import status dummy, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B and Viegelahn and Wang (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

To date, working conditions within GSC supplier firms have been analysed mainly through case studies that focus on one particular sector in one particular country (see, for example: Evers, Amoding and Kirishnan (2014) on the floriculture sector in Uganda; Funke et al. (2014) on the hortifruiticulture sector in Brazil; Rossi (2013) on the garment sector in Morocco). Such studies typically rely on a small number of empirical observations, and provide a qualitative analysis of supplier–buyer relations and their relationship with efficiency and labour market outcomes. While case studies analyse selected firms in selected supply chains in more depth, this section aims to provide an overall picture of efficiency and labour market outcomes, providing quantitative evidence.

The efficiency and labour market outcomes that are considered here are analogous to those considered in section B. Also, the estimation strategy is similar to that used for section B, based on regression analyses using GSC supplier status as the main variable of interest and firm ownership status (foreign-owned or domestic), firm age, capital intensity, electricity intensity, sector dummies and country-year dummies as control variables.[5]

The empirical analysis in this section examines efficiency and labour market outcomes in GSC input suppliers, relative to other exporters, and in GSC final goods suppliers, relative to other exporters. Other exporters are those exporting firms that have been identified as neither GSC input suppliers nor GSC final goods suppliers. These firms either do not predominantly produce for the export market and are hence not primarily GSC suppliers, or they export final goods through an intermediary, which makes them unlikely to produce by order of a foreign lead firm.

GSC input suppliers are more productive than other exporters

The group of exporting firms is heterogeneous. When comparing exporting firms that differ only according to whether they are GSC input supplier firms or not, it is found that GSC input suppliers are, on average, significantly more productive than other exporters (figure 3.18). The difference in TFP is nearly 4 per cent, while the difference in labour productivity is above 11 per cent. For GSC final goods suppliers, no statistically significant TFP premium can be identified, while their labour productivity is about 8 per cent lower than that of other exporters.

5. Following the methodology used for section B, variables such as sales (accounting for firm size) or workers' average educational level are purposely not controlled for in the regressions, as GSC participation may relate to efficiency and labour market outcomes through exactly these channels (economies of scale, change in the composition of the workforce). As in section B, results should be interpreted as average outcomes, which does not preclude outliers with regard to working conditions in either direction.

Box 3.6

GSCs and financialization: Where are the profits going?

A growing empirical literature provides evidence that non-financial firms, especially those that are based in developed economies, have increasingly invested their funds in financial assets and obtained their income from returns on those assets. According to this literature, an essential element of these firms' business strategy has been to raise shareholder returns through dividend payments, share buybacks, or mergers and acquisitions, which in turn has been feeding into a massive growth of the financial sector. This so-called "financialization" of the economy has emerged since the 1980s, when the assertion of shareholder rights shifted power in corporate governance from managers to shareholders. While the return on real manufacturing investments declined at the time due to increased competition and overproduction, the return on financial investments increased due to tight monetary policy and deregulation of financial markets. As a result, non-financial firms reduced their investments in the real economy and increased their financial investments (Milberg, 2008; Lin and Tomaskovic-Devey, 2013).

Since the 1970s and 1980s, many developed economies have seen an increasing financialization of their non-financial firms, while at the same time those firms have increasingly organized their production through GSCs. It is impossible to claim that one of these trends caused the other, but, according to the literature, they are certainly likely to be inter-related. On the one hand, globally fragmented production allows firms to generate additional profits, which may free up capital that can be paid out to shareholders and thus sustain the process of financialization (Milberg, 2008; Milberg and Winkler, 2011). On the other hand, financialization may (at least in some sectors) put firms under pressure to set up GSCs and organize them in a way that maximizes profits in the short term (Gibbon, 2002).

There are several indicators that can suggest the degree of financialization of an economy. The average share of profits captured by the financial sector has been growing in virtually all EU-15 countries for which data are available, with the simple average across countries rising from 21 per cent in 1970 to 36 per cent in 2005 (Watt and Galgóczi, 2009). Similarly, in the United States, the ratio between financial sector and non-financial sector corporate profits increased from 26 per cent in 1973 to 43 per cent in 2005 (Palley, 2007). The importance of finance within the non-financial sector has also been growing over time. As data from the Board of Governors of the Federal Reserve System indicate, the share of financial assets in total assets for non-financial corporations has been on a strongly upward trend in the United States, rising from 24 per cent in 1970 to 46 per cent in 2014.

A successful enterprise can generate static gains through higher immediate profits. Furthermore, the reinvestment of these profits into the enterprise can also create dynamic gains at the time these investments pay off. However, by focusing on short-term shareholder interests, firms create leakage from these investment flows, as resources are being used for the purchase of financial assets and not for investment in the physical production capacity of the enterprise, which in many cases would benefit the enterprise in the long term (Milberg, 2008).

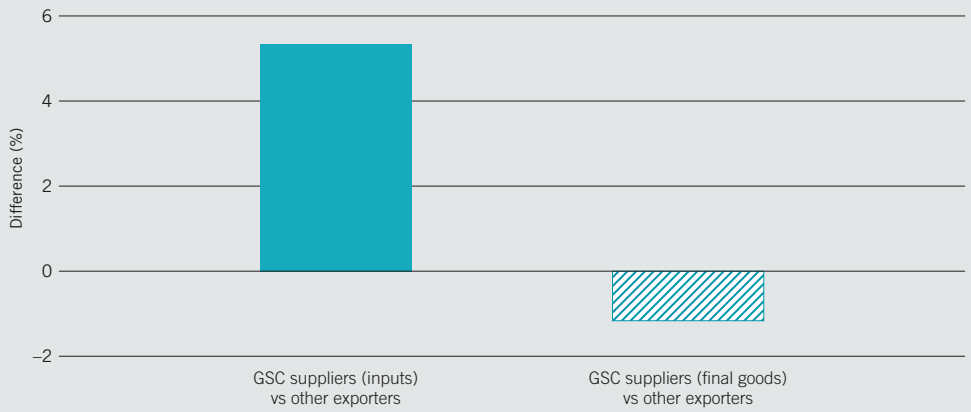
The literature has documented an empirical link between financialization and inequality. Increased financialization, measured through the ratio of financial returns to non-financial profits, can be associated with decreased labour shares of income, increased top executives' shares of compensation and increased earnings dispersion among workers in an industry, based on data from the United States (Lin and Tomaskovic-Devey, 2013). In addition, increased interest and dividend payments impact the labour share of income negatively, as shown for 13 OECD countries (Dünhaupt, 2013), and increased financial openness has been found to depress the labour share of income for different samples of countries (Stockhammer, 2009, 2013).

One possible explanation for the higher productivity of GSC input supplier firms is the importance of scale. Tasks that are outsourced or offshored are often relatively simple and can be executed on a large scale, making productivity gains due to economies of scale likely. GSC final goods suppliers are firms that undertake the final assembly of inputs to the product. This frequently involves manual labour (Fasth, Stahre and Dencker, 2010), which may be associated with lower productivity and could explain the negative difference relative to other exporters.

Both GSC input and final goods suppliers' productivity, as measured in this chapter, also depends on the sales value, and hence on the price they receive. This price depends on a range of factors, including the ability of suppliers to negotiate with lead firms, buyer–supplier relationships, market structure and financial market pressures on lead firms to prioritize short-term profits (see box 3.6 for a discussion on GSCs and financialization). All these factors may result in a lower sales price and hence the lower productivity of GSC suppliers.

Figure 3.19

Percentage difference in firm-level wages between GSC supplier firms and other exporters



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions on the sample of exporters only with the logarithm of the average firm-level wage as the dependent variable, and GSC status dummies, import status dummy, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B and Viegelahn and Wang (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

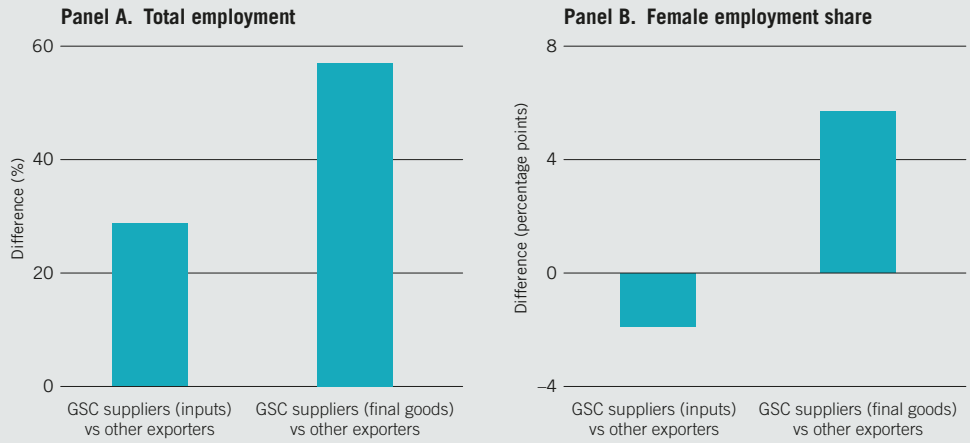
Productivity differences between GSC supplier firms and other exporters are not fully translated into wage differences

GSC input suppliers on average pay 5 per cent higher wages than other exporters (figure 3.19). This wage premium is smaller than the labour productivity premium for GSC input suppliers, which was estimated to be above 11 per cent. This result is in line with existing evidence on the effect of a sector's (or country's) participation as a supplier in a GSC on the sector-level (or country-level) labour income share, where a higher level of participation has been found to be associated with a lower labour income share (ILO, 2015b; IMF, 2017).

GSC final goods suppliers are not found to pay significantly higher wages than other exporters. Nor are they found to pay significantly lower wages, despite having markedly lower labour productivity than other exporters.

Figure 3.20

Percentage difference in firm-level employment and percentage point difference in the female employment share between GSC supplier firms and other exporters



Note: All estimates are statistically significant at the 10 per cent level. Estimates are based on OLS regressions on the sample of exporters only with the logarithm of full-time permanent employment and the female employment share, respectively, as the dependent variable, and GSC status dummies, import status dummy, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B and Viegelahn and Wang (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

GSC supplier firms have larger workforces than other exporters and provide important employment opportunities for women

GSC supplier firms have larger workforces than other exporters (figure 3.20, panel A). The employment premium corresponds to 29 per cent for GSC input suppliers, but rises to 57 per cent for GSC final goods suppliers. This confirms the importance of scale for supplier firms that produce inputs or engage in final assembly.

GSC supplier firms also provide women with opportunities to participate in the formal economy, in both full-time permanent and full-time temporary employment. However, gender imbalances remain entrenched in specific sectors (box 3.7). The share of women in the workforce is found to be significantly higher for GSC final goods suppliers than for other exporting firms, while GSC input suppliers employ relatively fewer women than other exporters (figure 3.20, panel B). The final assembly of products is therefore a particularly important source of employment women. Indeed, many women work in the production of garments or the final assembly of electronic products. These types of tasks often require manual labour where care and diligence are particularly important. As employers often consider women to be more careful, diligent and compliant than men (Cavalcanti et al., 2011; Oxfam, 2004), a relatively large share of women may be hired for this type of work.

There are other possible reasons why women tend to be over-represented in manual final assembly work. In some countries, women might have less access than men to education, restricting women to manual final assembly work (which often does not require any formal education). There is also evidence that female labour supply is less sensitive to wages than male labour supply (Hirsch, 2016). Therefore, as international competition exerts downward pressure on wages, especially in manual final assembly work, women's demand for jobs is likely to decrease less than that of men. This may then lead to a relatively large share of women being employed in manual final assembly jobs.

Box 3.7

Women in GSCs

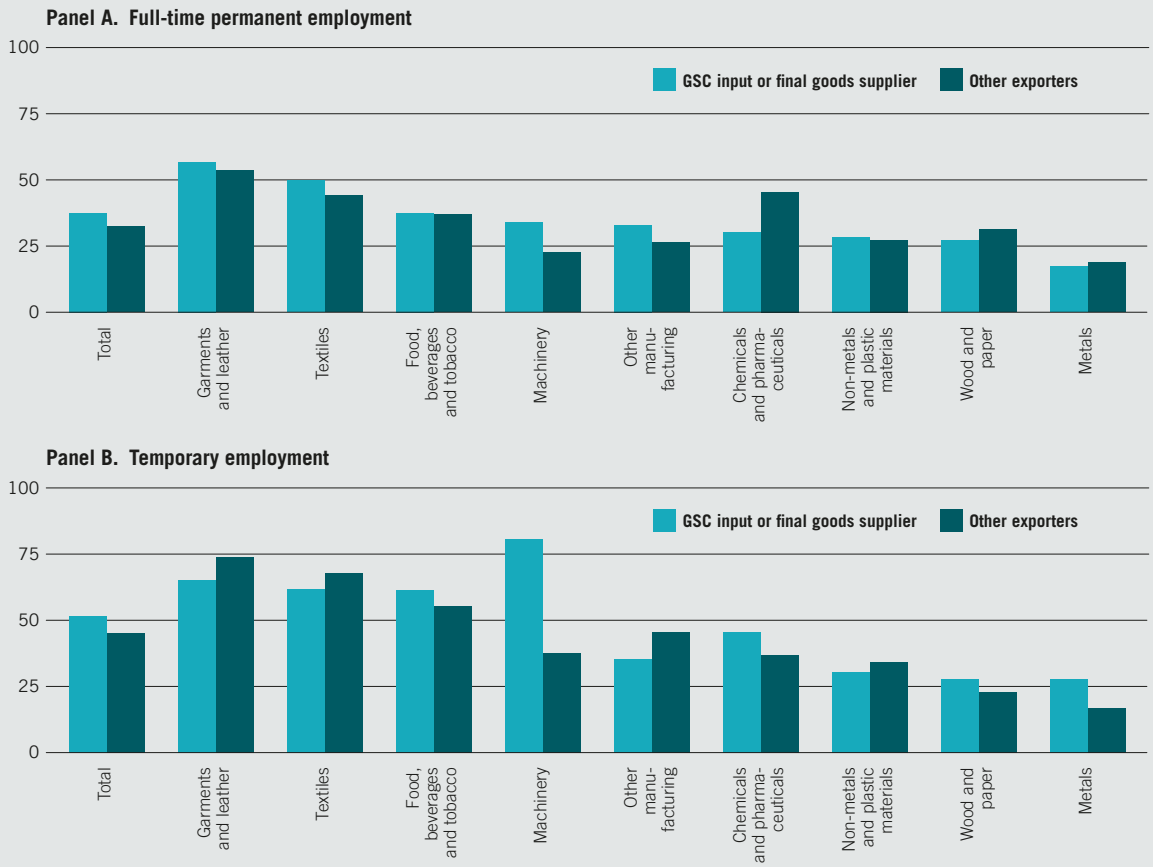
GSCs provide increased opportunities for women to participate in the formal economy. Based on data for formal firms from the World Bank Enterprise Surveys from 70 developing countries, figure 3.21 looks at women's workforce participation in exporting manufacturing firms, distinguishing between firms that have been identified as GSC supplier firms and those that are other exporters. Panel A shows the share of women in permanent employment, while panel B shows the share of women in temporary employment.

Gender imbalances in terms of the share of women in permanent employment persist in both GSC supplier firms and other exporters in almost all sectors, with the share of female employment exceeding 30 per cent. Firms in the garments and leather sector and the textiles sector hire most female permanent workers, the share being above 50 per cent in both GSC supplier firms and other exporters. The metals sector hires the smallest share of women, corresponding to only about 18 per cent. Comparing the differences between GSC supplier firms and all other exporters in the sample, the share of female permanent employees is about 5.2 percentage points higher in GSC supplier firms. This difference, however, varies greatly across different sectors. For example, in the chemicals and pharmaceuticals sector, the share of permanent female workers in GSC suppliers is 15.3 percentage points lower than the share in other exporters.

The share of women in temporary employment is generally higher than the share of women in permanent employment. This is true for all sectors, with the share of women in temporary employment ranging from around 20 to 70 per cent. GSC supplier firms in the garments and leather sector, the food, beverages and tobacco sector and the machinery sector have some of the highest shares of women in temporary employment, standing at above 60 per cent. In five out of nine sectors, GSC supplier firms have higher shares of female temporary employment than other exporters.

Figure 3.21

Share of women in permanent and temporary employment by sector and GSC supplier status (percentages)

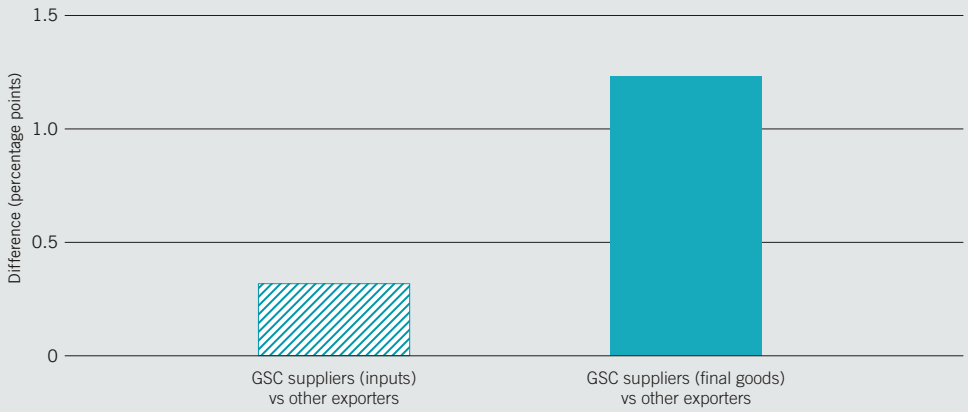


Note: Data based on 70 countries, latest available year. Manufacturing firms only.

Source: ILO Research Department calculations based on World Bank Enterprise Surveys.

Figure 3.22

Percentage point difference in the share of temporary employment between GSC supplier firms and other exporters



Note: Striped bars indicate that the estimate is statistically not significantly different from zero. Solid colour bars indicate that the estimate is statistically significant at the 10 per cent level. Estimates are based on OLS regressions on the sample of exporters only with the temporary employment share as the dependent variable, and GSC status dummies, import status dummy, foreign ownership dummy, firm age, electricity costs over sales, capital stock repurchase value over sales, sector dummies and survey dummies as explanatory variables. See Appendix B and Viegelahn and Wang (forthcoming) for methodological details.

Source: ILO estimates based on World Bank Enterprise Surveys.

GSC final goods suppliers have a higher temporary employment share than other exporters

Firms that are GSC final goods suppliers employ relatively more temporary workers than other exporters (figure 3.22). The difference amounts to around 1.2 percentage points. This is in line with the high volatility of orders and production observed in some GSC sectors, such as electronics. For example, Mexico and Thailand have been identified as countries in which a large number of temporary workers are employed in firms of the electronics sector (Holdcroft, 2012). The larger share of temporary workers in GSC final goods suppliers suggests that these firms have a relatively high worker turnover, with workers enjoying on average less job security and stability than workers employed by other exporters. In contrast, there is no evidence for a difference in the share of temporary employment between GSC input suppliers and other exporters.

D. Summary and implications

This chapter has examined how trade and GSCs are related to enterprise efficiency and labour market outcomes. First, we documented the stagnation in international trade that has affected goods and services trade, as well as trade within GSC networks. The economic crisis also led to a decrease in the share of workers employed by exporting firms, with employment affected similarly in firms with different export intensities.

Second, we analysed the relationship between firm-level efficiency and labour market outcomes, and firm-level trade. Exporters and importers have been shown to be more productive than their non-trading counterparts, the difference being particularly pronounced between exporters and non-exporters. There is also some indication that firms become more productive the longer they are active in the export market. Exporters and importers also employ a large workforce, which grows with exporting experience. Trading firms, especially heavy exporters, employ a large share of women. Exporting and importing firms also pay higher wages, which increase on average with the number of years a firm has been active in the export market. However, the wage premiums were found to be smaller than the corresponding productivity premiums, indicating that productivity gains from trade are not fully translated into wage gains for workers. Productivity sharing of gains from trade thus appears on average to be in favour of firms. Finally, firms use a higher share of temporary workers the more they export, indicating relatively less employment security for workers. This finding is particularly driven by firms that have recently started export activities. Even though results vary across sectors, importers have been shown to hire fewer temporary workers, providing on average higher employment security to their workforce.

Third, we investigated efficiency and labour market outcomes in exporting firms that are suppliers in GSCs, relative to outcomes in other exporters. Within the group of exporting firms, it is firms that supply inputs into GSCs that are particularly productive exporters. The productivity premium for exporting is hence particularly driven by GSC input supplier firms. GSC input supplier firms also pay higher wages than other exporters, but the wage difference is smaller than the productivity difference. Firms that contribute to GSCs by assembling final goods have lower productivity than other exporters, but are not found to pay significantly lower wages. GSC supplier firms were also found to have a larger workforce on average than other exporters. GSC final goods suppliers employ relatively more women than other exporters. GSC final goods suppliers also have larger shares of temporary employment than other exporters.

Overall, our analysis shows that a firm's engagement in trade is positively related to its productivity, while the relationship with labour market outcomes depends on the particular dimension that is considered. In addition, the relationships identified vary between firms and thus between workers. This points to the importance of considering the distributional dimensions of trade and GSCs in policy debates and development, in terms of both monetary and non-monetary payoffs of jobs. It also echoes growing concerns about the social and political consequences of the failure to address the distributional impacts of trade and GSCs. Policy efforts to restore global trade therefore need to be accompanied by strong measures to make trade more equitable for firms and for workers.

Appendix A. Numbers and shares of workers in light, medium and heavy exporters and importers

This chapter presents estimates of the numbers and shares of workers in non-exporters, light exporters, medium exporters and heavy exporters, and in non-importers, light importers, medium importers and heavy importers. These figures are based on the ILO's Estimation Model for Employment by Firm Characteristics. Appendix C to Chapter 1 describes how this model is applied to the estimation of employment by firm size. This appendix describes the application of the model to the estimation of employment by export and import status. More methodological details can be found in Viegelahn et al. (forthcoming).

The model uses World Bank Enterprise Survey (WBES) data from 208 surveys conducted in 132 countries (see Appendix B in Chapter 1 for a list of these countries). These countries account for 82 per cent of the global labour force and 73 per cent of global wage and salaried employment. Each survey generates two annual data points on the share of employment by export and import status, using the same set of surveys and the methodology that is described in Appendix C to Chapter 1.

Non-exporting firms are defined as firms that do not export, and non-importing firms are defined as firms that do not import. Light exporters are exporters that export either directly or indirectly (through an intermediary) more than 0 and up to 20 per cent of their sales. Medium exporters are firms that export more than 20 and up to 60 per cent of their sales. Heavy exporters export more than 60 per cent of their sales. The same thresholds are used to define light, medium and heavy importers, where importing refers to the share of foreign raw materials in a firm's total raw material expenditure. Importing hence includes both direct and indirect importing (through an intermediary), in analogy to exporting.

Estimating the shares of workers by export and import status

The first step of the model closely follows the procedure described in Appendix C to Chapter 1, but uses employment shares by exporting or importing status as the dependent variable. The same set of 12 regression specifications, estimated with Ordinary Least Squares (OLS), is run on the full sample and by country income group, resulting in 24 models. The best performing model is chosen to generate the estimates. Based on the estimation procedure, the initially 413 data points for employment by exporting status and the 411 data points for employment by importing status are complemented with estimates and thereby extended to 1,848 data points for 132 countries between 2003 and 2016.[1]

Estimating wage and salaried employment in small, medium and large formal enterprises of the manufacturing sector only and the manufacturing and the market services sector

In order to obtain the numbers of workers in different types of firms, the employment shares by exporting status need to be multiplied with an employment base. The employment base that is used corresponds to wage and salaried employment in formal enterprises of the manufacturing and market services sector. This employment figure is estimated using the procedure described in Appendix C to Chapter 1. In the WBES, data on importing is, however, only available for manufacturing firms. The employment shares by firms' importing status hence needs to be multiplied with a different employment base. This base corresponds wage and salaried employment in formal enterprises of the manufacturing sector only. This employment figure is estimated in analogy to Appendix C to Chapter 1, but using data on manufacturing only, instead of data on manufacturing and market services.

Using, on the one hand, data on wage and salaried employment in formal enterprises with at least five employees for the manufacturing and market services sector and for the manufacturing sector only, and, on the other, data on employment shares by exporting and importing status, it is possible to calculate employment by exporting and importing status in terms of numbers. These numbers can then be aggregated over all 132 countries or by country income group.

1. For Bulgaria, the three surveys that have been conducted produce only five instead of six data points due to some overlap in years. Due to data issues, two data points for the Russian Federation on employment by export and import and two data points for Sierra Leone on employment by import status are dropped.

Appendix B. Trade status, trade intensity and suppliers in global supply chains: How they relate to efficiency and labour market outcomes

For the analysis of the relationships between trade or GSCs and enterprise efficiency or labour market outcomes, this chapter uses data on more than 68,000 formal manufacturing firms with at least five employees, from the World Bank Enterprise Surveys. The cross-sectional firm-level data have been collected in 207 surveys from 132 countries from 2006 to 2016.

The analysis relies on ordinary least squares (OLS) estimation with robust standard errors. In the absence of panel data, where individual firms can be observed in more than one year, the estimated coefficients need to be interpreted with caution, as they do not necessarily indicate a causal relationship. The estimated coefficients, however, indicate whether firms with similar characteristics have better or worse efficiency and labour market outcomes, depending on their participation in trade or GSCs.

The following equation is estimated on the full sample of firms to study the relationship between export and import status and efficiency and labour market outcomes:

$$LMI = \alpha + \beta EX + \gamma IM + \delta X + \varepsilon_s + \varepsilon_{ct} + \varepsilon_{it}$$

The following non-linear equation relates export and import intensity to efficiency and labour market outcomes and is equally estimated on the full sample of firms:

$$LMI = \alpha + \beta_1 EXI + \beta_2 EXI^2 + \beta_3 EXI^3 + \gamma_1 IMI + \gamma_2 IMI^2 + \gamma_3 IMI^3 + \delta X + \varepsilon_s + \varepsilon_{ct} + \varepsilon_{it}$$

The following equation relates the GSC supplier status of a firm to efficiency and labour market outcomes and is estimated on the sample of exporting firms:

$$LMI = \alpha + \beta_1 GSCI + \beta_2 GSCF + \gamma IM + \delta X + \varepsilon_s + \varepsilon_{ct} + \varepsilon_{it}$$

The variables carry subscript i to indicate a particular firm, subscript s to indicate the sector that this firm is operating in, subscript c to indicate the country in which the survey was conducted and subscript t to indicate the year in which the survey was conducted. The regression includes a sector fixed effect ε_s and a survey fixed effect ε_{ct}, and ε_{it} is the error term. The dependent variable LMI corresponds to one of the following variables: the logarithm of TFP, the logarithm of labour productivity, the logarithm of the average wage, the logarithm of the number of full-time permanent employees, the share of temporary employment or the share of female employment.

With regard to the main variables of interest, EX indicates the export status of firms and has a value of 1 if a firm is a direct or indirect exporter, and 0 otherwise. IM indicates the import status of firms and has a value of 1 if a firm is a direct or indirect importer, and 0 otherwise. EXI measures the export intensity and corresponds to the share of exports in total sales. IMI is the import intensity and stands for the share of imported raw materials in the total raw material expenses. $GSCI$ and $GSCF$ are indicators of the GSC supplier status (see box 3.3) and have a value of 1 if a firm is identified as a GSC input and final goods supplier, respectively, and 0 otherwise.

The vector of control variables X includes several firm-level characteristics that are likely to be relevant for the explanation of efficiency and labour market outcomes. To control for the type of economic activity that a firm is undertaking, capital intensity as the ratio between the replacement value of the capital stock and sales, as well as electricity intensity as the ratio between electricity expenses and sales, are included in the regressions. While sector fixed effects already control for differences across sectors, these two additional control variables take into account the heterogeneity of activities across sectors (e.g. manual work will need less electricity input than automated work). Moreover, a dummy variable that indicates whether a firm is foreign-owned is included. Finally, regressions control for the age of the firm, which corresponds to the differences between the year in which the survey was conducted and the year of incorporation. Other variables, such as measures of firm size or the skills structure of the workforce, are purposely not included as control variables, as exporting and importing may have an effect through precisely these variables.

Two robustness checks for regressions that relate export and import intensities to efficiency and labour market outcomes are conducted. First, spline regressions were used, largely confirming the results reported in this chapter that are based on regressions that allow for linear, quadratic and cubic terms of export and import intensity in the regressions. Second, a Wald test was performed to test for the exact functional form of the polynomial. In a few cases, test results indicated that the inclusion of a linear and quadratic term of export and import intensities would be sufficient. In these cases, however, the results were still very similar to those reported in this chapter, which also consider a cubic term.

More methodological details and full regression tables can be found in Soete and Viegelahn (forthcoming). For the regressions that relate GSC supplier firm status to efficiency and labour market outcomes, more methodological details and full regression tables can be found in Viegelahn and Wang (forthcoming).

Appendix C. Exporting years: How they relate to efficiency and labour market outcomes

For the analysis that relates the number of years a firm has been exporting to efficiency and labour market outcomes, data for more than 9,000 formal exporting firms with at least five employees in the manufacturing sector from the World Bank Enterprise Surveys are used. For these firms, data on the number of years a firm has been exporting are available. The cross-sectional firm-level data have been collected in 133 surveys from 92 countries from 2006 to 2016.

The analysis was first carried out using the whole sample of exporters and then within each income group to examine potentially different patterns in different income groups. It used ordinary least squares (OLS) regressions with robust standard errors. The following estimation equation was used to determine the relationship between the exporting years of a firm and efficiency and labour market outcomes:

$$LMI = \alpha + \beta EXYR + \delta X + \varepsilon_s + \varepsilon_{ct} + \varepsilon_{it}$$

The dependent variable LMI corresponds to one of the following variables: the logarithm of TFP, the logarithm of labour productivity, the logarithm of the average wage, the logarithm of the number of full-time permanent employees, the share of temporary employment or the share of female employment. $EXYR$ is the logarithm of exporting years. X is a vector of control variables including exporting intensity, importing intensity, firm age, foreign ownership, electricity costs over sales and capital stock repurchase value over sales. The reasons for including these control variables are given in Appendix B. Finally, ε_s is the sector fixed effect, ε_{ct} is the survey fixed effect and ε_{it} is the error term.

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4 Innovation in firms and labour market outcomes

Introduction

Chapter 3 discussed how the engagement of firms in international trade affects the organization of work, with important consequences for competitiveness, job creation and job quality. This chapter turns to another important driver of the transformation of enterprises, *innovation*, and its impact on the world of work. Innovation is an important source of competitiveness for enterprises as well as a key driver of sustained growth and development (Cornell University, INSEAD and WIPO, 2016; Oberdabernig, 2016; OECD, 2009, 2015a). Accordingly, innovation and new technologies are embedded in firm-level strategies, country-level economic policies and broader international agendas (for example, Sustainable Development Goals 4, 5, 9 and 17 and the ILO's Future of Work Centenary Initiative).

In particular, in the context of the future of work, the ILO has placed emphasis on employment-related aspects of innovation. Indeed, the impact of innovation on employment – from the perspectives of both quantity and quality – has long been a source of debate. Theoretical and empirical studies have attempted to answer questions such as: Does innovation create or destroy jobs? How are workers impacted in terms of job quality? Are some workers more affected than others? There are no simple answers to these questions and the literature is varied in its responses (Brynjolfsson and McAfee, 2014; Frey and Osborne, 2013). What we do know, however, is that over the long term, technological innovation has created more employment than it has destroyed and living standards have improved (ILO, 2015). However, the labour market and social benefits of innovation are not evenly distributed: workers with low skills tend to be more adversely affected, and less secure types of working relationship are gaining ground, with possible effects on income inequality. Moreover, the recent wave of technological changes, sometimes referred to as Industry 4.0[1] (Schwab, 2016), has intensified the concerns regarding the prospect of a "jobless future". Therefore, a better understanding of how innovation affects jobs, workers and firms is needed if better policy solutions are to be devised going forward.

Against this background, this chapter aims to bring insight to the future of work discussion by analysing recent available data and trends on the links between innovation, competitiveness and labour market outcomes. Section A begins by defining innovation and discussing the evidence to date at the aggregate (i.e. country) level – for as broad a set of economies as possible – with respect to the relationships between innovation and a range of labour market outcomes. Following this, sections B and C analyse innovation at the firm level based on a group of economies for which data from the Business Environment and Enterprise Performance Surveys (BEEPS) and MENA Enterprise Surveys (MENA ES) – surveys of transition and Middle East and North Africa (MENA) economies, respectively – are available. These surveys contain a richer set of data on employment than other commonly used innovation surveys, and hence allow for the type of analysis needed to address existing knowledge gaps with respect to employment-related outcomes at the firm level. In particular, section B analyses the determinants of firm-level innovation by type (for instance, product, process, organization and marketing) and section C examines how each of these is associated with economic/firm performance and employment outcomes.[2]

1. Referring to advances in artificial intelligence, the increasing use of the Internet and smartphones, among others.

2. It should be noted that while innovation is a popular term, it is inherently complex and broad and thus not easy to define. Indeed, a variety of definitions have been proposed for research and policies. Given this, it is not our objective to define innovation, but rather to identify different indicators for innovation and examine how each of these is associated with economic/firm performance and employment outcomes.

The chapter finds that there are considerable differences between innovative and non-innovative firms in terms of labour market outcomes. Innovative firms tend to be more productive, create more jobs, employ more skilled workers (meaning that they employ more educated workers and offer more on-the-job training) and hire more female workers. In some cases, innovation has also led to more intense use of temporary workers, and different types of innovation (product, process, marketing and organizational) can lead to differential effects. Additionally, sectoral differences play an important role – considerable job contraction is observed in non-innovative low-technology firms, suggesting an adverse impact on low-skilled workers. The chapter also finds that while R&D engagement is an important determinant of successful innovation, other drivers, including public funding, external acquisition of technologies and on-the-job training, are relevant. These findings suggest that policies that support firms to innovate, but which also address the adverse effects for specific groups of workers, are crucial.

A. Innovation and labour market outcomes: Aggregate-level evidence

Innovation is a broad concept which can be tackled from various angles (institutional, social or technological) (see UNRISD, 2016) and at different levels (for example, firm level or country level). Accordingly, there is no single definition of innovation and there is some ambiguity about what the term actually captures.[3] Importantly, even when a single definition is adopted, several different metrics can be used (ranging from innovation expenditure to numbers of patent applications, with sometimes important consequences for the results). This section presents a definition of innovation at the aggregate (i.e. country) level and explores the links between innovation, employment and productivity (sections B and C consider firm-level innovation).

Aggregate-level innovation: Measurements and considerations

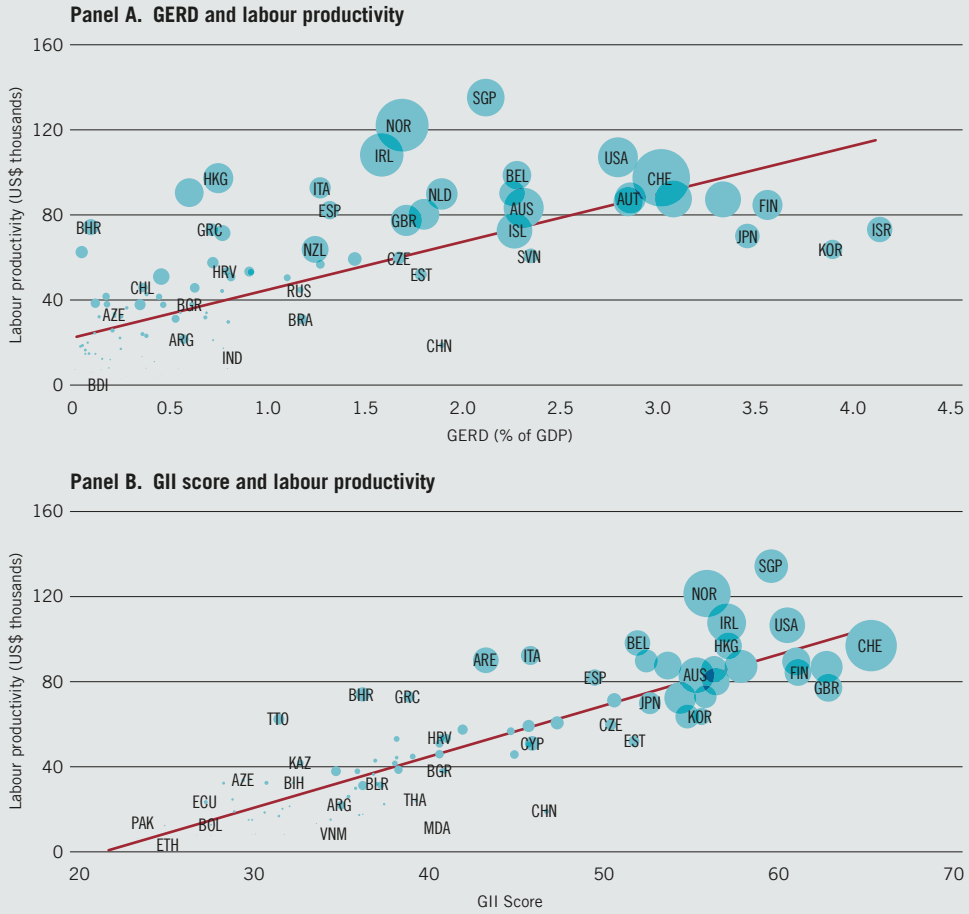
At the aggregate level it is difficult to find a proper proxy for innovation (Vivarelli, 2014). Studies have used a range of indicators, based either on inputs to innovation or outputs from innovation, most notably gross domestic expenditure on R&D (GERD), business enterprise R&D (BERD) and the number of patent applications (Feldmann, 2013; Pece, Simona and Salisteanu, 2015). GERD is an indicator of innovation input that comprises investment by the government, the higher education sector, the private non-profit sector and business enterprises (i.e. it includes BERD). While BERD is the main component of total R&D investment in developed economies, i.e. around 70 per cent of GERD (see OECD, 2017), public sector investment is relevant for a couple of reasons. First, groundbreaking innovations such as the Internet or the global positioning system (GPS) would likely not have been possible without public research and support (Mazzucato, 2015; OECD, 2015b). Second, private enterprises contribute very little to R&D in the developing world and depend mostly on public investment. The number of patents filed by a country per year[4] is also used as it can be a good indicator of a firm's technological dynamism, but its scope may be limited as many innovations are not patented (OECD and Eurostat, 2005).

Increasingly, composite indicators aiming to reflect the multidimensionality of innovation are also being used. One such indicator is the Global Innovation Index (GII), which adopts a broad concept of innovation and includes both innovation inputs and outputs, ranging from infrastructure to institutions.[5] However, composite indicators are often very sensitive to the dimensions selected and weights attributed to them, so they should be interpreted with caution, especially when analysing rankings. Although they have some drawbacks, these indicators provide some useful information for tracking countries' performance with respect to innovation.

3. See, for example, Skillicorn (2016), who asked 15 innovation experts what innovation is and received very different answers.
4. Defined as "a legal property right to an invention, which is granted by national patent offices" (OECD and Eurostat, 2005, p. 22).
5. GII combines several indicators: first, those which aim at capturing elements of the national economic framework: institutions, human capital and research, infrastructure, market sophistication and business sophistication; second, those which capture innovation outputs: knowledge and technology outputs and creative outputs (Cornell University, INSEAD and WIPO, 2016).

Figure 4.1

Innovation and productivity by country, averages 2009–14



Note: Data represent country averages for the period 2009–14 across 105 developed, emerging and developing economies. Labour productivity is calculated as GDP per person employed; GERD is measured as a percentage of GDP; and the GII represents weighted averages of 79 individual indicators. The bubble size indicates the GDP per capita (2015) based on PPP (constant 2011 international dollars). The country codes correspond to the International Organization for Standardization (ISO) 3-digit alphabetic codes (see the International Standard for country codes on the International Organization for Standardization (ISO) Online Browsing Platform (OBP) for more information (https://www.iso.org/obp/ui/#search)). The correlation coefficient between labour productivity and GERD corresponds to 0.70; and between labour productivity and GII score to 0.87.

Source: ILO calculations based on GII (2014); UNESCO Institute for Statistics; World Bank International Comparison Program database; and ILOSTAT database.

A positive link is found between innovation indicators and labour productivity

Figure 4.1 shows the positive relationship between two of the innovation indicators mentioned above (GERD and GII) and labour productivity (calculated as GDP per person employed). This is consistent with the findings of other studies that explore the link between innovation and productivity (Freeman and Soete, 1997; Hall, 2011; Roth and Thum, 2013).[6] The figure also shows that there are significant disparities between countries, which gives support to the idea that country-specific conditions play an important role, both in terms of innovation efforts and how these are transformed into productivity gains. Indeed, figure 4.1 clearly indicates that economies with higher GDP per capita (indicated by bubble size) tend to have higher labour productivity and to score better in innovation indicators. Other studies have also argued that differences in socio-economic conditions (such as wealth, presence of skills or labour market conditions) between countries have been decisive in how R&D investment was transformed into innovation, and innovation into economic growth and higher productivity (Bilbao-Osorio and Rodríguez-Pose, 2004).

6. It should be noted that some of these studies use different indicators of productivity (for example, total factor productivity instead of labour productivity).

There appears to be no link between aggregate innovation and employment level

The literature shows that innovation can have contrasting effects on employment, leading to both job creation (compensation effects) and destruction (displacement effects). The interplay between such forces has been widely referred to as "creative destruction", a term popularized by Schumpeter (1942). Several mechanisms have been put forward by theoretical studies to explain the linkages (see Vivarelli, 2014, for a more detailed overview). For instance, on the one hand, increased productivity related to innovation (see above) reduces the demand for workers (displacement effect). On the other hand, increases in productivity lead to a decline in unit costs and so can result in lower prices, which can in turn translate into additional demand, more production and finally into additional jobs (compensation effect).

However, these effects depend on several factors, ranging from the dynamics of demand to market structure. For example, if the gains due to improved productivity and the introduction of new products are not passed on to workers through higher wages, consumer demand does not necessarily increase. Accordingly, innovation might not translate into more production or more jobs. Such a trend has been observed in the United States in recent decades and is considered to be linked to innovation (Council of Economic Advisers, 2016). Brynjolfsson and McAfee (2014) highlight that while productivity has increased in the United States in recent decades, job creation has been sluggish. One of the reasons they identify as contributing to this outcome is the decline in competition, attributable to the so-called "winner-take-all markets" phenomenon, which becomes more compelling with innovation.[7] The type of innovation (such as product and process) might also play an important role, by opening up markets or improving the production process, as will be examined in section C.

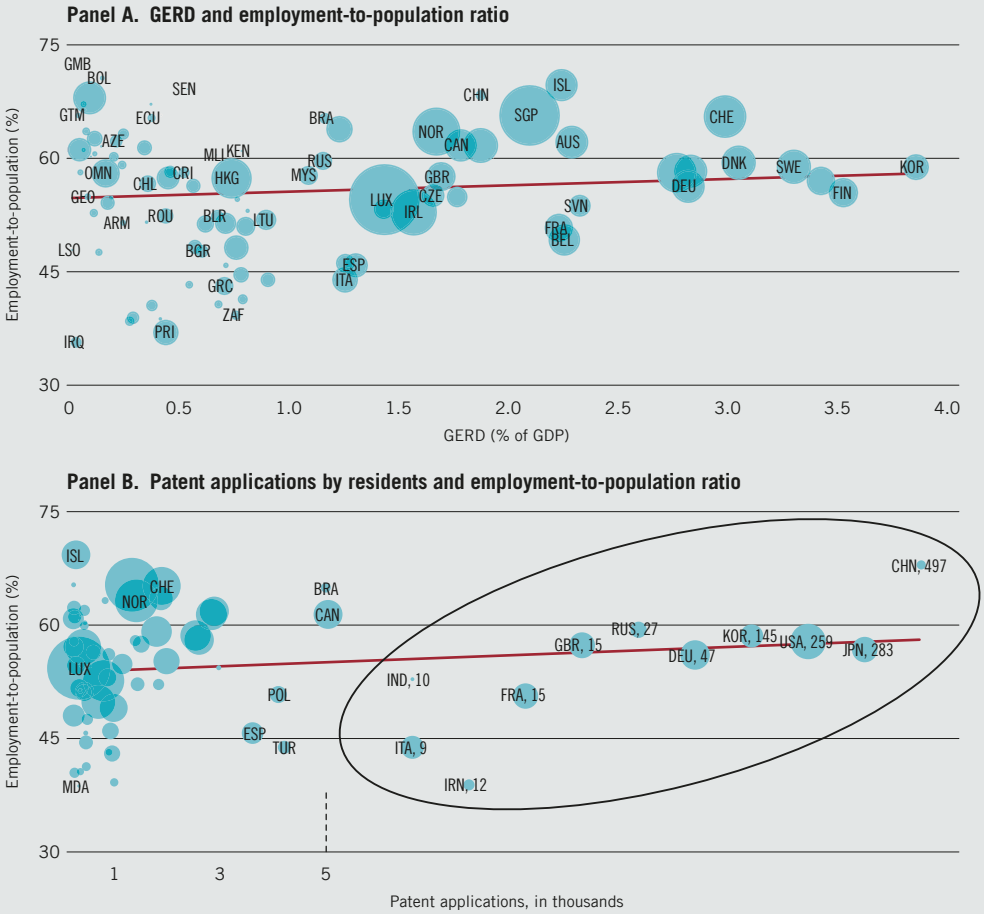
Echoing the mixed findings of the literature mentioned above, data on GERD as a percentage of GDP and the employment-to-population ratio over the last two decades at the country level indicate there is no clear link between innovation and employment (figure 4.2, panel A). Although slightly positive, the correlation between the two indicators is very weak (around 1 per cent). Using number of patent applications as an indicator of productivity gives a similar picture, as no immediate relation between this indicator and employment is seen (figure 4.2, panel B). There is also a high degree of heterogeneity between countries with respect to innovative behaviour. While the majority of countries for which data are available (70 per cent) invest less than 1 per cent of their GDP on GERD, the others (30 per cent, mostly developed countries) invest between 1 and 4.5 per cent. In addition, only a few economies (such as China, Japan and the United States) file a large number of patent applications (almost half a million for China), while the majority file fewer than 2,000 patents per year. Such differences do not seem to be associated with the different employment levels observed.

In general, the mixed evidence suggests there are other factors that affect the link between employment creation and innovation, such as country-specific conditions. Importantly, the aggregate-level picture shown here does not capture the mechanisms that might be at play at the firm level, such as the effects of different types of innovation. Productivity and employment might be affected in diverse ways by different types of innovation, some resulting in considerable increases or declines and some having no significant effect. As one study notes, "employment outcomes are shaped by the relative outcomes of firms that introduce one type or another of innovation and firms that do not" (Harrison et al., 2014, p. 30). Therefore, to improve our understanding of this dynamic, firm-level data need to be used to find direct links between various types of innovation activities and firms' employment trends and performance. In the remainder of this chapter, firm-level data are used to explore these links.

7. This means that innovation makes it possible for some actors to dominate the market far beyond what was previously imaginable. For example, a software programmer who writes a slightly better application or a blogger who posts videos on the Internet can become superstars (Brynjolfsson and McAfee, 2014). In addition to irrelevance of goods capacity in the digital world (which limited the success of traditional superstars), network effects amplify this phenomenon.

Figure 4.2

Innovation and employment, by country, averages 2009–14



Note: Data represent country averages for the period 2009–14 across 97 countries for panel A, and, respectively, across 73 countries for panel B. In panel B, the top 11 countries (China, Japan, United States, Republic of Korea, Germany, Russian Federation, United Kingdom, France, Iran, India, Italy) that file the highest number of patents are labelled with the accurate values, but are modified to fit the figure. The values for the rest of the countries are not modified. GERD is measured as percentage of GDP, and patent applications by residents are those filed via a national patent office or the Patent Cooperation Treaty procedure, which can be both private and public applications. The bubble size indicates the GDP per capita (2015) based on PPP (constant 2011 international dollars). The country codes correspond to the International Organization for Standardization (ISO) 3-digit alphabetic codes. The correlation coefficients between employment-to-population ratio and GERD and between employment-to-population ratio and patent applications correspond to 0.09 and 0.14, respectively.

Source: ILO calculations based on UNESCO; World Bank and ILOSTAT database.

B. Which types of firms innovate and what are the determinants of innovation?

This section aims to clarify the concept of innovation and its determinants at the firm level. It begins by defining the indicators used to capture different types of innovation (product, process, marketing and organizational) at the firm level. Then, it focuses on various factors (R&D engagement, exporting status, training and public funding) that tend to increase the probability of introducing innovation outputs.

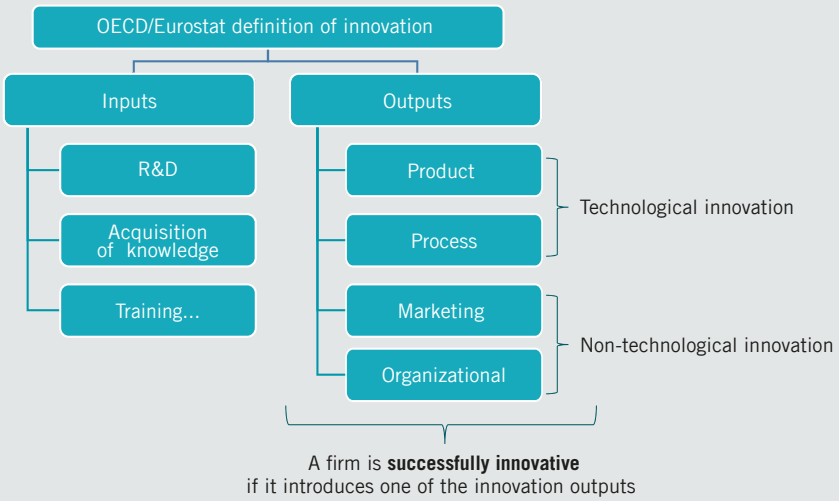
Firm-level innovation: Definitions and methodological approach

This and the following section focus on innovation from the perspective of individual firms, adopting the OECD/Eurostat methodological framework (figure 4.3).[8] This definition is used as it is currently the most systematic and comprehensive approach, and is widely adopted across developed, emerging and developing economies. In this framework, innovation is defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method" (OECD and Eurostat, 2005, p. 46).

On the basis of this definition, four types of innovation output are identified: product (a good or service that is new or significantly improved); process (a new or significantly improved production or delivery method); marketing (a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing); and organizational (a new organizational method in a firm's business practices, workplace organization or external relations). While product and process innovations are considered technological, organizational and marketing innovations are classified as non-technological. It should be noted that these categories are not exclusive and a firm can introduce several types of innovation output simultaneously. In this chapter, an "innovator" is defined as a firm that has been successful in introducing any one of these innovation outputs.

Figure 4.3

Definition of innovation, based on the OECD/Eurostat methodological framework



Source: ILO, based on the OECD/Eurostat methodological innovation framework.

8. In order to have a systematic approach at the firm level, the OECD in collaboration with Eurostat launched the *Oslo Manual* in 1997 (third updated edition in 2005). The objective of the manual is to "provide … guidelines for collecting and interpreting innovation data in an internationally comparable manner" (OECD and Eurostat, 2005, p. 4).

Box 4.1

Data and methodology

Sections B and C use mainly data from the Business Environment and Enterprise Performance Surveys (BEEPS) and Middle East and North Africa Enterprise Surveys (MENA ES) to provide descriptive statistics and econometric analysis. The analysis is complemented by data from OECD Innovation Indicators, which provides information at the country level based on various surveys, as well as data from Ibero-American and Inter-American Network on Science and Technology Indicators (RICYT) for Latin America and the Caribbean countries. Finally, reference is made to secondary sources that use innovation surveys for African countries (see Egbetokun et al., 2016; NEPAD Planning and Coordinating Agency, 2014). One caveat is that while all surveys follow the guidelines of the *Oslo Manual*, they use slightly different indicators to account for different innovation outputs and innovators; comparisons between regions should therefore be interpreted cautiously.

The BEEPS and MENA ES data set is derived from firm-level surveys by the European Bank for Reconstruction and Development (EBRD) and the World Bank and is based on more than 22,000 interviews with firms in Eastern Europe, Central Asia and the Middle East and North Africa (MENA) economies. The database includes a module on innovation following the third edition of the *Oslo Manual* (OECD and Eurostat, 2005), which comprises detailed information on product, process, organizational and marketing innovation, as well as R&D spending, protection of innovation and obstacles, among others. This database is particularly interesting as it also contains extensive information about employment-related issues and provides good representation of various sectors.

One limitation is that only registered companies are eligible to take part in the surveys, therefore there is no information on informal firms. Also, the BEEPS and MENA ES database includes only surviving firms in the sample, and thus does not capture the exit of firms from the market. Moreover, innovation activity in the survey is self-reported. There might be concerns about the use of self-reported firm-level surveys on innovation, as the firms might not accurately report the information or might lack the capacity to identify whether they are innovating or in which type of innovation they are engaging. This criticism also holds for self-reported surveys at the individual level. However, considering the large number of data points and the use of various surveys, the analysis is likely to provide a fair indication of the characteristics of innovative firms. Also, the statistical and empirical findings are complemented with those from the literature to check whether the two align.

The econometric analysis for this report is based on the CDM model developed by Crépon, Duguet and Mairesse (1998). This model explores the links between innovation inputs, innovation outputs and productivity. It first examines the relationship between innovation inputs and outputs, based on the idea that not all inputs translate into innovation outputs and taking into account the impacts of other factors. It then explores how different types of innovation output impact on the productivity of firms (see Appendix A for more details on the model). The CDM model is currently one of the most commonly used econometric frameworks for analysing the impact of innovation on productivity, as it allows selectivity and endogeneity issues to be corrected to some extent. Such an approach also allows the impact of firm characteristics on the decision to engage in innovation to be explored, which makes it possible to account for the circular relationship between innovation and employment.

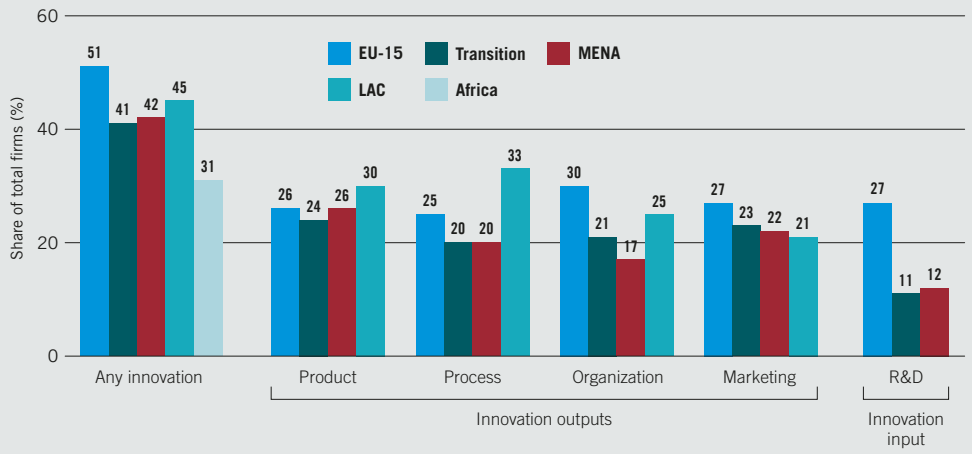
The OECD definition has the advantage of acknowledging that innovation can take various forms (i.e. product, process, organizational or marketing). Moreover, it introduces a distinction between innovation inputs (which refer to the efforts of the firm) and outputs (which refer to successful innovations) (Mohnen and Hall, 2013). This distinction between inputs and outputs means, on the one hand, that other factors, above and beyond R&D, are considered sources of innovation (such as on-the-job training or external acquisition of knowledge) (OECD, 2009, p. 11). On the other hand, it allows consideration of the possibility that investment in R&D does not always turn into successful innovation.

There are, however, some limitations to this methodological framework. First, the borders between the innovation types are not always clear, and distinguishing one from another might be a difficult task even for firms themselves. Second, innovation output variables are dichotomous, and thus do not allow for various levels of innovation or degrees of success for a particular innovation project. Finally, while the framework is recognized across a range of countries and income levels, it may not be fully applicable to some emerging and developing countries (NEPAD Planning and Coordinating Agency, 2014); for example, it does not provide guidance on how to consider innovation in informal enterprises, which are widespread in some emerging and developing economies.

Based on this framework and noting its limitations, an overview of the incidence of innovation at the firm level in various regions by innovation type is presented using a range of data sources. This is followed by an assessment of the determinants of innovation using more restricted firm-level data, notably from BEEPS and MENA ES (see box 4.1 for data and methodology).

Figure 4.4

Incidence of innovation in selected country groupings, latest year (percentages)



Note: Based on firm-reported data. The figure represents unweighted cross-country averages and indicates the percentages of firms engaged in innovation in the three years preceding the survey. The definition of innovation is based on the one provided by the Oslo Manual (OECD and Eurostat, 2005) and excludes ongoing and abandoned innovations. Data sets are not harmonized and refer to different periods. The EU-15 includes data for Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom. Latin America and the Caribbean (LAC) includes data for Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay. MENA includes data for Djibouti, Egypt, Israel, Jordan, Lebanon, Morocco, Occupied Palestinian Territory, Tunisia and Yemen. Data for transition economies include Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, the Former Yugoslav Republic of Macedonia, Montenegro, Mongolia, Poland, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan. Data for Africa include Ghana, Kenya, Lesotho, Senegal, South Africa, United Republic of Tanzania, Uganda and Zambia.

Source: ILO calculations based on BEEPS V (2014), MENA ES (2013/14), OECD Innovation Indicators (2012/13), RICYT (2012) for Latin America and the Caribbean innovation indicators and African Innovation Outlook II (2014) databases (NEPAD Planning and Coordinating Agency, 2014).

More than a third of firms across various regions engage in innovation activities

Among countries for which information is available, the incidence of innovative firms varies considerably across country groupings[9] and type of innovation (i.e. input vs output) (figure 4.4). In particular, the share of enterprises engaging in at least one type of innovation output is highest in EU-15 countries (51 per cent), followed by Latin America and the Caribbean, MENA and transition country groupings, at just over 40 per cent. The share of innovators is relatively lower in Africa, but is still over 30 per cent, which suggests that at the micro level, firms might be innovative even though the income level of the country is low (Egbetokun et al., 2016). This puts the findings at the aggregate level, which suggested a stronger link between innovation indicators and GDP per capita, in a different perspective. In the case of the EU-15, the high incidence of innovative firms is mostly driven by the higher share of firms engaging in organizational and marketing innovations (non-technological).

Particularly striking is the difference between the shares of firms engaging in R&D (i.e. innovation input) in the different regions.[10] Figure 4.4 shows that fewer than 15 per cent of firms in transition and MENA economies report R&D engagement, compared with 27 per cent among EU-15 countries. At first glance, this stands in stark contrast to the fact that similar shares of firms in EU-15, transition and MENA economies (approximately one-quarter) have introduced a new product (an innovation output).

9. These groups are constructed on the basis of data availability. See the notes under figure 4.4 for the exact composition of these groups of countries. Moreover, as mentioned in box 4.1, comparisons between regions should be interpreted cautiously.

10. R&D is often considered a proxy for innovation input, and it is found to increase significantly the probability of introducing an innovation output.

Also, in Latin America and the Caribbean, where R&D investment is known to be low,[11] the share of firms introducing product and process innovations is over 30 per cent. However, these findings are not surprising as firms in less developed regions often innovate by adopting and imitating existing practices and technologies, which were developed elsewhere, rather than engaging in R&D themselves (Crespi and Zuniga, 2012; EBRD, 2014). This phenomenon is often referred to as reverse engineering, i.e. firms try to replicate products and processes already available or combine existing knowledge in different ways (Arundel, Bordoy and Kanerva, 2008).

Public subsidies and knowledge exchange increase innovation

Indeed, while R&D is an important driver of innovation, clearly there are a range of factors that act as sources of innovation. The empirical analysis to investigate the determinants of innovation among transition and MENA economies (due to data restrictions) reveals a number of important considerations.

First, firms that benefit from public subsidies, regardless of the amount, will be more likely to engage in R&D (30 percentage points more likely) and to introduce more product, process and organizational innovations (37, 29 and 40 percentage points more likely, respectively) than those that do not (table 4.1). Importantly, this finding relates to any form of public subsidy. In the literature, the focus is often on R&D support by governments, which is found to increase the incentive to engage in innovation by reducing the costs and sharing the risks (see Bronzini and Piselli, 2016, for an overview of studies). However, the findings presented in table 4.1 suggest that, even though the public subsidy is not only for R&D, it has a significant positive effect on both innovation inputs and outputs.

Table 4.1

Determinants of firm-level innovation and their effects (percentage point change)

Inputs	← Innovation → ↓	Outputs			
R&D engagement	Determinants	Product	Process	Marketing	Organizational
—	R&D intensity (R&D expenditure per employee)	↑ 21	↑ 20		
↑ 48	Acquisition of external knowledge and technology	↑ 25	↑ 43	↑ 36	↑ 31
↑ 35	Training	↑ 34	↑ 32	↑ 33	↑ 39
↑ 30	Public funding	↑ 37	↑ 29		↑ 40
↑ 38	Export status				
↑ 1.4	Size	↓ 2 (non-linear)		↓ 1 (non-linear)	

Note: This table presents the results of the econometric analysis based on the CDM model conducted for this study. The zones labelled with percentages are statistically significant at the 95 per cent confidence level and should be interpreted as "one unit change in innovation determinants is associated with an increase/decrease in the probability of engaging in R&D or of introducing an innovation output of X percentage points on average". Blue zones indicate statistically non-significant results. The country and sector fixed effects are included, as well as firm age, education and international trade indicators. However, the latter variables were not included in the table because of their insignificant impact. See Appendix A for methodology.

Source: ILO estimations based on the BEEPS V and MENA ES databases, using the CDM model.

Second, acquisition of external knowledge is identified as a significant predictor of likelihood of introducing innovation for all types of outputs. For example, firms that report acquisition of external knowledge are 43 percentage points more likely to introduce process innovation. Firms may decide to acquire the knowledge externally if they do not have the capacity to create it, in an effort to "catch up" or "leapfrog" changing technologies (Loree,Bapuji and Crossan, 2011). In this respect, capital goods acquisition and buying patents (which embody technological change) are among the major ways

11. For example, a World Bank report finds that 8 per cent of firms in 31 countries in Latin America and the Caribbean have invested in R&D (Islam, 2014). Moreover, other studies (Crespi, Navarro and Zuñiga, 2010; Lasagabaster and Reddy, 2010) find that in Latin America and the Caribbean R&D intensity is about 0.5 per cent of annual sales.

through which small firms and firms in developing countries innovate (Vivarelli, 2014). Moreover, partnerships with other enterprises can be important sources of external knowledge. These partnerships can take various forms, such as interactive and non-interactive, and affect the innovation outcomes. For example, interactive partnerships (which involve the sharing of knowledge and mutual learning) are associated with new products and services, while non-interactive partnerships (such as imitation or copying) are associated with improved products and services (Roper et al., 2014).

Training is also essential for innovation, notably for outputs

Third, on-the-job training also emerges as an important determinant of firm-level innovation, increasing the probability of both engaging in R&D (by 35 percentage points) and introducing innovation outputs (by more than 30 percentage points for all types) (table 4.1). Interestingly, the impact of formal education is either insignificant or has a very small magnitude, over and above other factors. This finding suggests that tailored skills obtained through training within the firm are more important for being a successful innovator. Training can allow workers to acquire, create and transfer knowledge and "provide a foundation for innovation to occur" (Jones and Grimshaw, 2012, p. 6). This is consistent with a number of empirical studies, albeit limited, that find that training has a significant positive impact on both innovation inputs and outputs (see, for example, González, Miles and Pazó, 2015; Dostie, 2014; Bauernschuster, Falck and Heblich, 2008, 2009).

The low or non-existent impact of formal education on innovation can be potentially explained by other factors. The analysis in this section controls for sectors that are characterized by important differences in terms of education level. Therefore, sector-specific characteristics might be capturing some of the impact of education. The results might also point to the presence of skill mismatches, reflecting shortcomings in the education system (i.e. new workers might not have the skills that would enable firms to innovate).[12] However, reported skill mismatches might stem from the fact that employers are searching for very specific skills and training. Of course, the objective of formal education should not necessarily be to provide job-specific skills (Cappelli, 2012), yet the above discussion suggests that there is room for more effective education and training policies to improve innovation, including at the firm level.

Firm size has only a limited impact on innovation

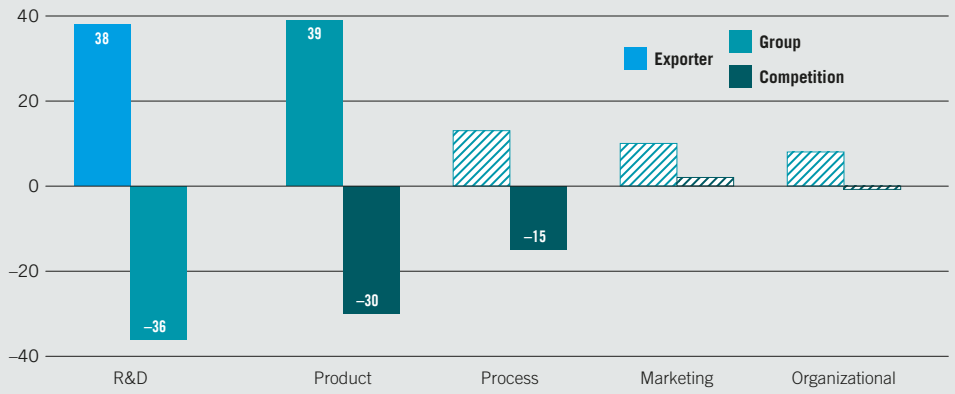
Fourth, firm size is found to have only a slightly positive impact on engagement in R&D (1.4 percentage points increase in likelihood) and to decrease only marginally the likelihood of introducing product and marketing innovations, by 2 and 1 percentage points, respectively (non-linear relationship). It should be noted that the impact of firm size may be captured by other variables. For example, it has been well documented that large firms benefit more from public funding (Acemoglu et al., 2013), which has been identified as an important driver of innovation (table 4.1). Similarly, acquisition of external knowledge can capture the impact on innovation in small firms, which often resort to this option, mainly through the acquisition of machinery that embodies the technological change (Vivarelli, 2014). Therefore, differences in firm size do not seem to explain many of the remaining differences regarding the successful introduction of innovation.

This is consistent with the prevailing literature, which presents mixed evidence with respect to firm size and innovation. On the one hand, some argue that large firms are more likely to innovate because they benefit from economies of scale and internal resources (including scientific personnel), as well as easier access to external finance, all of which allow them to more easily afford the related fixed costs (Bobenič Hintošová, Bruothová and Hliboká, 2014; Fransen, 2013; Chandy and Tellis, 2000; Damanpour, 1992). On the other hand, smaller firms – free from the burden of bureaucracy and being less risk-averse – might innovate more and take advantage of spillovers from local innovation systems and global supply chains (GSCs) through knowledge absorption (see Bobenič Hintošová, Bruothová and Hliboká, 2014 for references; Dean, Brown and Bamford, 1998).

12. At least 40 per cent of firms in the majority of transition and MENA economies report skills mismatches as an obstacle to innovation. In addition, a study conducted on 2,300 undergraduates in the United States found that 45 per cent of them demonstrated no significant improvement in a range of skills (Arum and Roska, 2011).

Figure 4.5

Marginal effects of international trade-related indicators on firm-level innovation (percentage point change)



Note: The figure shows the marginal effects of some determinants linked to engagement in international trade, such as exporter status, being part of a group and being exposed to too much competition, on the probability of engaging in innovation input (R&D) and introducing innovation outputs. The bars shown in full colour and labelled with numbers are statistically significant at the 95 per cent confidence level. Striped bars indicate that the estimate is statistically not significantly different from zero.

Source: ILO estimations based on BEEPS V and MENA ES databases, using the CDM model.

Exporters engage more in R&D, but too much competition may reduce successful innovation

Finally, the analysis here gives some support to the positive relationship between export participation and R&D engagement, and shows that exporting firms are around 38 percentage points more likely to engage in R&D than non-exporters (table 4.1). Chapter 3 has also shown that introducing new technologies is a driver of change in international trade and the organization of production along GSCs. One possible explanation is that as exporting firms are exposed to international competition they need to improve their technology more frequently in order to survive in a highly competitive environment (Almeida and Fernandes, 2008). Also, foreign markets can provide learning opportunities through technological spillover effects. Participation in GSCs, for example, provides knowledge transfer opportunities "within the supply chain through horizontal, backward, forward and vertical linkages" (Gyeke-Dako et al., 2016, p. 14). However, being an exporter has not been found to have any statistically significant impact on introduction of innovation outputs (table 4.1).

Therefore, the effects of some other variables linked to international trade and globalization have also been examined in the empirical analysis (see figure 4.5). Being part of a larger group of firms – whether an international group (e.g. multinational enterprise) or a domestic group[13] – increases the likelihood of introducing product innovation by 39 percentage points. This finding might be due to the fact that firms can benefit from pre-existing knowledge provided by other firms of the group. In addition, being subject to too much competition (foreign or domestic) plays an important role, especially for product and process innovations, on which it has a large negative impact (by 30 and 15 percentage points, respectively). This shows that being engaged in international trade does not automatically translate into better innovation outcomes. In this regard, it is well documented that if firms do not have sufficient absorptive capacity to identify and assimilate the knowledge from others, the spillover effects of international trade might not occur. This suggests that targeted policies are needed to promote innovation for firms with different characteristics; for example, for individual firms which are not part of a group (Criscuolo, Squicciarini and Lehtoranta, 2010) or that have weak absorptive capacity, especially in developing countries.[14]

13. As a limitation of the study, it should be specified that this variable comprises both domestic and foreign firm groups and that no distinction between the two is possible.

14. Another issue linked to globalization is the contribution of migrant workers to innovation in their adoptive countries. While it was not possible to explore this aspect in the chapter due to lack of data, an emerging literature has found some positive effects, especially in the case of migration of skilled workers, where workers bring new knowledge and experience and allow access to broader networks. (See Jensen, 2014, for a literature review.)

The above section has highlighted that there are important determinants of innovation other than R&D, such as public funding, external acquisition of technologies and on-the-job training. The importance of on-the-job training offered by firms is particularly relevant to the discussion on employment and productivity. Moreover, it has been found that while large firms tend to engage more in R&D, no significant impact on innovation outputs emerges. Importantly, a nuanced relationship between international trade and innovation activities has been identified. Being an exporter increases the likelihood of engaging in R&D, but too much competition seems to harm product innovation, while being part of a larger group of firms has positive spillover effects for innovation outputs. These findings suggest that while all firms can contribute to innovation; different firm characteristics and different ways of engaging in innovation activities play an important role in being a successful innovator. The next section examines the link between innovation and labour market outcomes.

C. How innovation is related to productivity and employment at the firm level: An empirical analysis

This section examines whether differences between innovative and non-innovative firms in transition and MENA economies (with a particular focus on various types of innovation) have consequences for the performance of firms in terms of productivity, employment creation and other labour market outcomes, such as type of employment contract (full-time temporary and permanent),[15] skills (education and training) and female employment. For this purpose, the section begins by analysing how different types of firm-level innovation impact labour productivity and whether they are associated with employment growth. It then explores the impacts of other labour market indicators.

Firm-level innovation has a positive impact on labour productivity

Innovation operates through various channels that can lead to increased productivity gains at the firm level.[16] The implementation of a new process might result in the use of fewer resources for the same output or allow better use of excess capacity (EBRD, 2014), while the introduction of a product new to the market could create a new source of demand for an enterprise (Mohnen and Hall, 2013) through increased quality or diversified goods (Antonucci and Pianta, 2002). Moreover, new organizational arrangements can result in reduced administration costs through new approaches to workplace organization or external relations, and marketing innovation can help "better address […] customers' needs, [and] open […] up new markets" (EBRD, 2014, p. 15).

The analysis shows that innovators are likely to have higher labour productivity than enterprises that are not engaged in innovation. These results – consistent with the literature – hold both for technological and non-technological innovations (figure 4.6) (Griffith et al., 2006; see Mohnen and Hall, 2013, for a literature review). In particular, labour productivity of firms introducing product innovation is on average around 174 per cent higher than the productivity of firms without product innovation. This magnitude might be explained by a wide variation in labour productivity between firms in transition and MENA economies. After the introduction of an innovation, the productivity effect for a firm with a low level of productivity is likely to be higher than for a high-productivity firm. Therefore, when low-productivity firms introduce successful innovations their productivity can increase considerably compared with non-innovators, pulling the results upwards (EBRD, 2014).

15. The type of contract is determined by the permanent vs. temporary status of employees. *Full-time permanent employees* are defined as all paid employees who are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and who work full shifts. *Full-time temporary employees* are defined as all paid short-term (i.e. for less than a fiscal year) employees with no guarantee of renewal of employment contract) and work 40 hours or more per week for the term of their contract.

16. There is strong empirical literature demonstrating the positive impact of innovation on firm productivity. See, for example, Baum et al. (2015), Mohnen and Hall (2013), Siedschlag and Zhang (2015) and Bartel, Ichniowski and Shaw (2005).

Figure 4.6

The impact of different types of innovation on labour productivity relative to non-innovators (percentage change)

Note: The figure shows the estimated impact of each type of innovation output on labour productivity and the 95 per cent confidence interval.

Source: ILO estimations based on BEEPS V and MENA ES databases, using the CDM model.

The analysis also shows that firms that implement marketing innovation are likely to be more productive by a factor of 136 per cent. This link between marketing innovation and productivity is rarely dealt with in the empirical literature, although the studies available find that changes in marketing can have a positive effect on a firm's performance (EBRD, 2014), especially as a complementary tool to product innovation (see, for example, Junge, Severgnini and Sørensen, 2016).

Finally, the findings on the impact of process innovation on productivity are not significant. This may be surprising, as from a theoretical point of view process innovation can be linked clearly to higher productivity, because improving production methods may result in a reduction in costs. However, in the empirical literature, findings are also mixed, with some studies finding insignificant results due to different market and demand dynamics or data issues (see, for example, Criscuolo, Squicciarini and Lehtoranta, 2010; see Mohnen and Hall, 2013, for a list of studies).

Studies find an increase in employment in innovative firms, especially for product innovation

In analysing the association between firm-level innovation and employment, it is found that there has been an increase in employment in innovative firms, across all types of innovation, over a three-year period (figure 4.7, panel A). While there has also been a sharp decline in employment in non-innovative firms, the overall impact of innovation on employment is positive, which is consistent with the findings in the literature.[17] However, heterogeneities are identified between different types of innovation. While there seems to be a consensus on the positive relationship between product innovation and employment creation, the evidence of the impact of process innovation is mixed (recent reviews of theoretical and empirical evidence are provided by Calvino and Virgillito, 2017; see Oberdabernig, 2016, for a list of studies). As for the impact of marketing and organizational innovations on employment, this topic has been less analysed.

17. Over the past decade, an increasing number of empirical studies at the firm level have explored the impact of innovation on employment. See, for example, Morikawa (2014), Harrison et al. (2014) and Peters, Riley and Siedschlag (2013).

Figure 4.7

Employment and firm-level innovation, 2012–15 (percentages)

Note: Based on ISIC Rev. 3.1. The figures represent the unweighted cross-sectorial change in employment over the last three years in all firms (existing and new). High-technology manufacturing sectors include chemicals (24), machinery and equipment (29), computer, electrical, electronic and optical equipment (30–33) and transport equipment (34, 35). Low-technology manufacturing sectors include food products, beverages and tobacco (15, 16), textiles (17, 18), leather (19), wood (20), paper, publishing and printing (21, 22) and other manufacturing (36, 37). Knowledge-intensive services include water and air transport (61, 62), telecommunications (64) and computer and related activities (72). Low-knowledge-intensive services include wholesale and retail trade (50–52), hotels and restaurants (55), transport (60, 63). Data available for 2012 for Russian Federation, 2014 for all other BEEPS transition economies and for 2013 and 2014 in MENA ES economies.

Source: ILO calculations based on BEEPS V and MENA ES databases.

Job dynamics across sectors are also examined here to provide additional insights into the relationship between innovation and employment (figure 4.7, panel B). Employment growth is higher among innovative firms compared with non-innovators in all sectors, with one exception, knowledge-intensive services, where the rates are quite similar (and positive).[18] This gives support to the idea that, in general, innovative firms tend to create more jobs than non-innovators. More interestingly, while employment growth is particularly strong in low-knowledge-intensive services, regardless of innovation status, there is a large contraction in employment among non-innovative firms in low-technology manufacturing. This outcome is in line with the general trend of the shift of jobs from manufacturing to services. The sharp employment decrease in non-innovative firms in low-technology manufacturing implies that many low-skilled workers have lost their jobs in these country groupings and may have to change sectors to find employment.

18. The knowledge-intensive services group is defined on the basis of the percentage of tertiary educated persons employed (more than 33 per cent of total employment). The definition of high-technology and low-technology manufacturing groups is based on the R&D intensity of economic activities, i.e. R&D expenditures in relation to value added. See the statistical classification of economic activities in the European Community (NACE) for more information (http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Statistical_classification_of_economic_activities_in_the_European_Community_(NACE)).

Innovative firms employ more skilled workers and provide more training

There has been much debate about whether innovation has favoured workers with different sets of skills. The *skill-biased technological change* (SBTC) approach indicates that innovation has mostly favoured workers with higher education levels and with competences that are complementary to new technologies, increasing the demand for them and raising their wages. This pattern has been supported by empirical evidence over several decades and is identified as one of the drivers behind the higher unemployment of low-skilled workers and increasing inequalities (Acemoglu and Autor, 2011; Autor, Levy and Murnane, 2003). However, this approach has not been as successful in explaining the recent trends. Therefore, a new framework based on the idea of *routine-biased technological change* (RBTC) approach has been proposed. The RBTC approach, which makes more nuanced distinctions between routine and non-routine jobs and manual and cognitive jobs, finds a U-shaped trend in the relationship between skills and unemployment.

The analysis in this chapter provides some support to the RBTC approach (figure 4.7, panel B). Notably, there seems to be a shift from the routine manual jobs common in non-innovative low-technology firms to non-routine jobs in services, both in innovative and non-innovative firms, which are likely to have more cognitive and manual jobs, respectively. In other words, in the services sector, the numbers of skilled and low-skilled jobs both seem to grow, while job destruction mostly seems to affect jobs in non-innovative manufacturing firms. This is in line with other findings that identify a U-shaped trend in the relationship between skills and unemployment, in which routine jobs tend to disappear, whether or not they are manual jobs (Autor and Dorn, 2013). Education level seems to play an important role in determining whether the workers occupying these routine jobs will shift to cognitive or manual non-routine jobs. Indeed, there is evidence showing that highly educated workers in routine occupations tend to move to high-paying non-routine cognitive jobs (such as management), while low-skilled workers in routine manual jobs move to low-paying non-routine manual jobs (such as homecare) (see Cortes et al., 2014). These shifts lead to the polarization of jobs, meaning that there is a hollowing-out in the middle of the employment distribution while relative gains are concentrated at the tails (Goos, Manning and Salomons, 2014; ILO, 2013; Acemoglu and Autor, 2011).

To investigate further how different types of innovation impact various aspects of employment and to take into consideration other factors affecting employment, a simple regression model has been estimated (see Appendix B for more details). Based on Berg (2016), this model analyses the impact of innovation on some selected indicators of labour market outcomes: skills (education, training), type of contract (full-time temporary/permanent) and female employment. Here the causality is reversed compared with the analysis in section B, in that what is explored is the impact of innovation on selected indicators related to employment.

After controlling for a range of factors, the analysis finds that innovative firms have, on average, a higher share of workers with a university degree (figure 4.8, panel A) than non-innovative firms. However, the difference is quite small: product and organizational innovations are associated, on average, with around 3.3 per cent and 4.3 per cent higher shares of educated workers, respectively, while no significant impact was found for process innovations. However, firms that engage in R&D tend to employ considerably more educated workers than those which do not engage in R&D (8.4 per cent). An interesting finding is that while innovative firms employ a slightly higher share of educated workers than non-innovative firms, they are far more likely to offer training, especially the firms that implement marketing and organizational innovations (figure 4.8, panel B). This reinforces the previous results that indicate that on-the-job training, rather than education, plays an essential role for successful innovation.

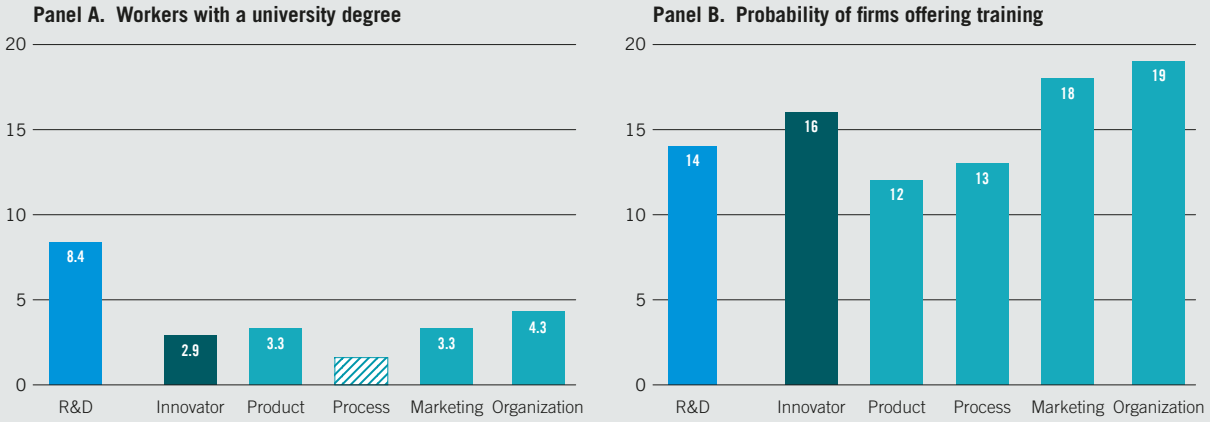
Innovative firms tend to employ more temporary and female workers

Recent developments, particularly the increased use of the Internet, have profoundly modified workplaces and how employers and workers connect. There is a growing literature on the new types of employment linked to the on-demand economy (for example, Berg, 2016; Drahokoupil and Fabo, 2016). Questions have also been raised about the impact of innovation on more traditional types of contract, such as permanent and temporary. However, very few studies to date have explored this link using innovation surveys.[19]

19. For example, Avenyo (2016) looks at the growth of permanent and temporary employment in innovative firms.

Figure 4.8

Innovation, education and training, by innovation type (percentage differences, relative to non-innovators)

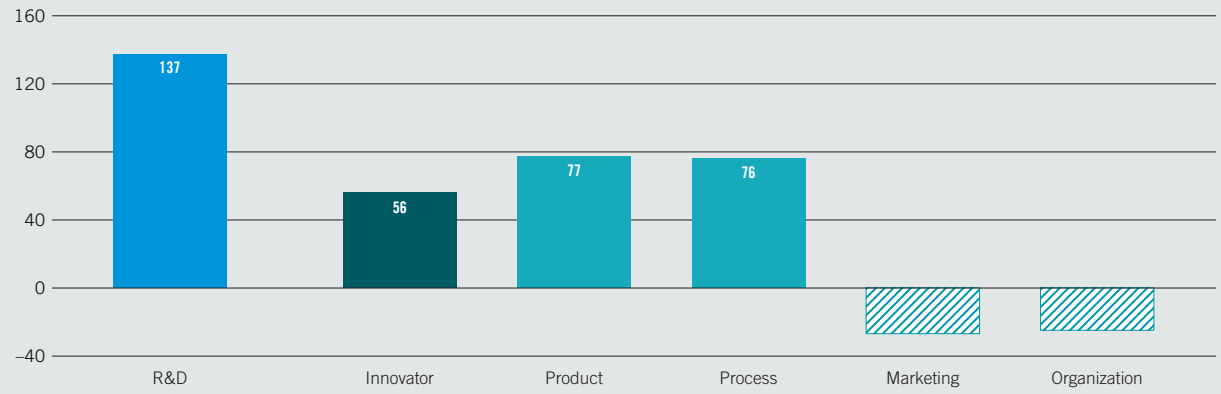


Note: Panel A shows the estimated relationship between R&D engagement and the innovation outputs on the share of workers with a university degree, by using an ordinary least squares estimation. Panel B shows the likelihood that an innovative firm will offer training, by using a probit estimation. The models control for firm size, firm age, exporting status, main market of distribution, ownership, productivity and labour cost, and include sector and country fixed effects. Striped bars indicate that the estimate is not significantly different from zero. These effects correspond to separate regressions and have as a comparison base the firms that do not engage in R&D and those that do not innovate, respectively. See Appendix B for the methodology.

Source: ILO estimations based on BEEPS V and MENA ES databases.

Figure 4.9

Firm-level innovation and temporary employment, by innovation type (percentage differences, relative to non-innovators)



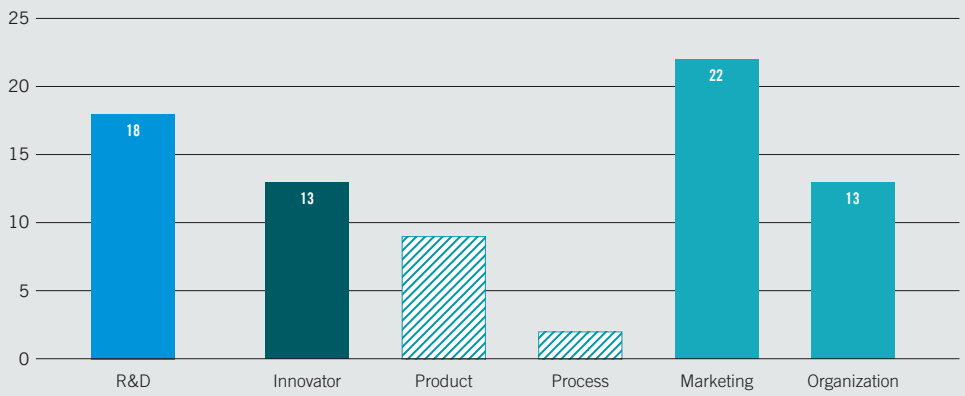
Note: The figure shows the estimated relationship between engaging in R&D and introducing different types of innovation outputs on the logarithm of the number of temporary workers, by using an ordinary least squares regression. The model controls for firm size, firm age, exporting status, main market of distribution, ownership, productivity and labour cost, and includes sector and country fixed effects. Striped bars indicate that the estimate is not significantly different from zero. These effects correspond to separate regressions and have as a comparison base the firms that do not engage in R&D and those that do not innovate, respectively.

Source: ILO estimations based on BEEPS V and MENA ES databases.

The analysis undertaken here confirms that innovative firms tend to employ more temporary workers than non-innovators (figure 4.9). The percentage differences are significant and particularly high for those who introduce product innovations (74 per cent) and process innovations (75 per cent) (i.e. firms that engage in technological innovation), in contrast to those who implement non-technological innovations (marketing and organizational), for which no significant difference was found. Evidence also shows that there are heterogeneities between innovative firms themselves. It appears that among innovative firms, most temporary workers are employed in large firms. A striking finding is that firms that engage in R&D tend to employ a considerably higher number of temporary employees than those which do not (by 137 per cent). While some argue that this shows there is a need for more flexibility in firms that are likely to innovate (see, for example, Bartelsman, Gautier and De Wind, 2016; Murphy, Siedschlag and McQuinn, 2016), there are also concerns regarding the quality of such jobs (in terms of social protection coverage, occupational health and safety, training, among others).

Figure 4.10

Innovation and female employment by innovation type (percentage differences, relative to non-innovators)



Note: The figure shows the estimated relationship between engaging in R&D and introducing different types of innovation outputs on the logarithm of the number of female workers, by using an ordinary least squares regression. The model controls for firm size, firm age, exporting status, main market of distribution, ownership, productivity and labour cost, and includes sector and country fixed effects. Striped bars indicate that the estimate is not significantly different from zero. These effects correspond to separate regressions and have as comparison base the firms that do not engage in R&D and those that do not innovate, respectively. See Appendix B for methodology.

Source: ILO estimations based on BEEPS V and MENA ES databases.

Another interesting issue is that of gender equality. The empirical analysis shows that innovative firms, particularly firms that introduce marketing and organizational innovations, employ more women in the workplace than their non-innovative counterparts (figure 4.10). This empirical pattern is yet to be fully understood. It can be partly explained by the fact that non-technological innovations are also associated with the types of occupations where women are highly concentrated, such as human resources or advertising and sales workers. Moreover, as mentioned above, firms that introduce non-technological innovations are also associated with a higher likelihood of providing on-the-job training. Thus, on the basis of a further analysis, on-the-job training also appears to be an important determinant of higher female labour participation. These results suggest that innovative firms are not only enhancing inclusion through employing more women, but also that they are more likely to offer on-the-job training and to contribute to the upskilling of these employees.

The literature also provides some evidence of a positive link between innovation and female labour participation. On the one hand, innovation may result in higher participation of women in the labour market through various channels, ranging from the diffusion of household appliances to improved transport and teleworking opportunities (Black, Kolesnikova and Taylor, 2014; see, for example, Dettling, 2017). In return, female employment can be an important asset for achieving innovation. Indeed, gender diversity seems to be a prerequisite for creativity, collaboration and, thus, innovation (Dezsö and Ross, 2012). However, more women are also represented in temporary employment, particularly in innovative firms. Therefore, more research is needed to improve our understanding of the linkages between innovation and female employment.

Overall, the analysis shows that there are considerable differences in terms of labour market outcomes between innovative and non-innovative firms. First, innovative firms are found to be more productive than their non-innovative counterparts, with product and marketing innovations being particularly relevant. Second, they tend to create more employment, employ more women and have higher shares of temporary workers. The higher incidence of temporary employment emerges more as a characteristic of firms that introduce technological innovations (product and process innovations), and less for those introducing organizational and marketing innovations. Finally, innovative firms slightly tend to favour educated workers. However, this effect seems stronger for firms that engage in R&D than for those that do not. More importantly, innovative firms are found to be far more likely to offer training than non-innovators, highlighting the importance of on-the-job training as a source of innovation.

D. Concluding remarks

While firm-level innovation is generally found to be associated with higher labour productivity at the aggregate level, the evidence on its relationship with other employment-related issues is mixed. Indeed, innovation leads to both job creation and job destruction, and the effects depend considerably on the characteristics of the workers, firms, sectors and countries. Moreover, jobs created due to innovation might not require the same skills as those that are lost, sparking the fears that those who lose their job might fall behind and their job prospects and earnings might be adversely affected. Due to complex mechanisms at play and the pace of change, the impact of innovation on future jobs is also difficult to predict. This chapter has nonetheless presented several findings at the firm level which could prove useful for informing policy-making.

First, it has found that innovative firms tend to create more employment in all sectors. However, considerable job contraction has also occurred in non-innovative low-technology firms, suggesting that low-skilled workers may bear the brunt of job losses. Second, on-the-job training offered by firms has been identified as one of the essential determinants of innovation. Nevertheless, temporary workers are rarely offered training. This is a cause for concern because innovative firms tend to employ more temporary workers (ILO, 2016). Not only might this prevent workers from improving their skills and their chances of success in the labour market, but it might also affect innovation in firms negatively. Innovative firms are also likely to employ more female workers, contributing to a closing up of gender employment gaps.

In this respect, adequate education, training and social protection policies can play an important role in both fostering innovation and preparing workers effectively for the changing job environment. The skills needed in the workplace are being rapidly transformed by technological changes and therefore institutions should provide workers with continuous opportunities to acquire up-to-date competencies, regardless of their employment contract. Moreover, consideration should be given to providing flexible and comprehensive social welfare cover to workers whose work arrangements differ from full-time permanent employment.

Further, this chapter has identified some characteristics of firms as important determinants for the successful introduction of innovations (such as belonging to a group of firms and receipt of public funding). This suggests that specific policies are needed to promote innovation in firms with particular characteristics; for example, in individual firms that are not part of an international group (Criscuolo, Squicciarini and Lehtoranta, 2010). The importance of public funding and publicly funded research to successful innovation at the firm level highlights the role that public institutions can play in promoting innovation.

More critically, questions regarding what types of jobs, skills and social protection will be relevant in the future should be addressed with the participation of social partners and other stakeholders, and tailored polices should be implemented accordingly. These groups should be involved not only in "building the scenario[s]" for the future labour market, "but also in the related policy initiatives" (UNCSTD, 2016), including the design and implementation of those policies. In this regard, the ILO's Future of Work initiative aims to serve as a platform on which social partners, academics and other stakeholders can have discussions and exchange ideas.

Appendix A. Innovation and productivity: The CDM model

The model developed by Crépon, Duguet and Mairesse (1998) (the CDM model) allows the interlinkages between innovation and firm performance to be captured. It is based on the assumptions "that innovation inputs determine innovation outputs, and that innovation output in turn affects productivity" (Criscuolo, Squicciarini and Lehtoranta, 2010, p. 7). The CDM framework is formalized as a three-stage system of four sequential equations.

The first stage is estimated using a generalized Tobit model, by maximum likelihood (Heckman, 1979), and comprises two equations capturing (1) whether or not firms decide to engage in R&D; and (2) how much firms invest in R&D. This stage aims to account for the *selection bias* that arises from the fact that a firm's innovative effort is observed only if it reports positive R&D expenditure, thus if it decides to innovate.

Therefore, the first equation is a selection equation showing whether the firm engages in R&D activities or not:

$$RD_i = \begin{cases} 1 \ if \ RD_i^* = \alpha X_i + \varepsilon_i > \bar{c} \\ 0 \ if \ RD_i^* = \alpha X_i + \varepsilon_i \leq \bar{c} \end{cases} \quad (1)$$

and can be empirically specified as:

$$RD_i = \alpha_0 + \alpha_1 Age_i + \alpha_2 Size_i + \alpha_3 Group_i + \alpha_4 Exporter_i + \alpha_5 Patent_i + \alpha_6 Fund_i + \alpha_7 Univ_i + \alpha_8 Training_i + \alpha_9 ICT_i + \alpha_{10} AcquisitionR\&D_i + \alpha_{11} Country_i + \alpha_{12} Sector_i + \varepsilon_i$$

where RD_i is the observed binary endogenous variable defining whether or not the firm i is engaging in R&D as long as the latent RD_i^* variable is above a certain threshold ($\bar{c}$). The explanatory variables (X_i) capture the factors that may determine the innovation investment decision, such as firm characteristics measured as firm size, firm age and sector type. In addition, proxies for international activities such as exports and being part of a larger group of firms, and proxies for human capital such as education and training, have been included. Other variables such as public funding, patents, acquisition of external knowledge and the use of information and communication technologies (ICT) are also included to account for incentives to invest in R&D, diffusion of innovation and the use of technology (see below for more information on the variables). Considering that most of the explanatory variables are dummies, the marginal effects of the variables are reported.

The second equation describes the intensity of innovation (log of R&D expenditure per employee), expressed as:

$$RDI_i = \begin{cases} RDI_i^* = \beta Z_i + e_i & \text{if } RD_i = 1 \\ 0 & \text{if } RD_i = 0 \end{cases} \quad (2)$$

and can be empirically specified as:

$$\log(RDI_i) = \beta_0 + \beta_1 AcquisitionR\&D_i + \beta_2 ICT_i + \beta_3 Group_i + \beta_4 Exporter_i + \beta_5 Patent_i + \beta_6 Fund_i + \beta_7 Training_i + \beta_8 Univ_i + \beta_9 Country_i + \beta_{10} Sector_i + e_i$$

where the innovation intensity (RDI_i) is explained by the previous control variables with the exception of firm age and size (Z_i), variables which affect specifically the decision to invest, but not necessarily the intensity of innovation per employee, as it is already implicitly controlled for. This *exclusion restriction* allows multicollinearity problems to be avoided to some extent.

The second stage consists in estimating a knowledge production function. Each innovation type (I_i) (i.e. product, process, marketing and organizational) is measured by a dummy variable that reflects whether or not the firm has implemented that particular type of innovation. The innovation output equation is estimated using probit equations, which can be written as:

$$I_i = \gamma RDI_i^* + \gamma W_i + u_i \quad (3)$$

and can be empirically specified as:

$$I_i = \gamma_0 + \gamma_1 \log(RDI_i^*) + \gamma_2 AcquisitionR\&D_i + \gamma_3 Age_i + \gamma_4 Size_i + \gamma_5 Size2_i + \gamma_6 Group_i + \gamma_7 Competition_i + \gamma_8 Fund_i + \gamma_9 Univ_i + \gamma\beta_{10} Training_i + \gamma_{11} Country_i + \gamma_{12} Sector_i + u_i$$

where along with initial control variables, firm size and firm age are reintroduced, as well as the variable controlling for too much competition pressure in order to control for market operation (W_i). Moreover, the predicted value of the innovation intensity (RDI_i^*) from the previous stage is used to account for selection and endogeneity issues.

The last stage estimates the impact of innovation on a firm's performance (Y_i), measured as labour productivity (log of output per employee), using an augmented Cobb–Douglas value added production function, where knowledge input is proxied by product, process, marketing and organizational innovation, respectively; human capital by labour cost and education degree; and the accumulation of capital by fixed assets costs. In order to control for endogeneity, the predicted values of innovation outputs (I_i^*) from the third equation are used. This equation can be written as follows:

$$Y_i = \pi I_i^* + \pi K_i + v_i \tag{4}$$

and empirically:

$$\log(Y_i) = \pi_0 + \pi_1 I_i^* + \pi_2 LabourCost_i + \pi_3 Capital_i + \pi_4 Exporter_i + \pi_5 Competition_i + \pi_6 Univ_i + \pi_7 Country_i + \pi_8 Sector_i + v_i$$

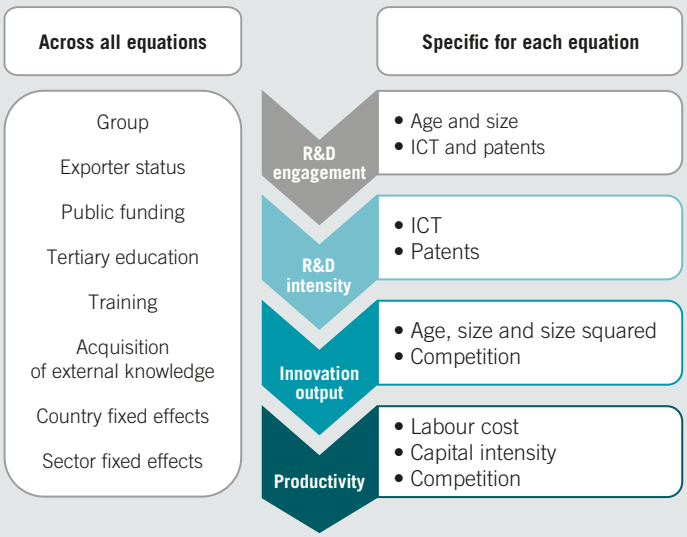
One of the main limitations of the survey, and respectively of the empirical analysis, is that there are a considerable number of missing observations and only a limited number of continuous variables. The R&D intensity variable, measured as R&D expenditure per employee or per sales, is particularly affected by the issue of missing observations, which considerably reduces the size of the database, from 22,000 to approximately 6,000. Moreover, the accuracy of the self-declared R&D expenditure and non-responses may also have an impact on the final results. In order to address this issue to some extent, some missing R&D investment observations were replaced by comparing their values with the answers given to the question on R&D engagement. In addition, various robustness checks were run with different R&D intensity measures, such as R&D expenditure per employee/per sales, in-house R&D and cumulative innovation expenditure. However, the results were not sensitive to these modifications.

Due to similar limitations, some papers adopt a simpler form of CDM model, reducing it to just three equations by excluding the R&D intensity equation; in other words, by using the binary R&D engagement variable instead of the continuous R&D intensity variable. However, as the presence of a selection bias in the BEEPS and MENA ES data was confirmed by the Wald test, such an option was not possible in this analysis. Finally, other control variables such as cooperation, obstacles and sources of innovation were included in the model but were not kept as they reduced the variability of the dependent variable and the model did not successfully iterate.

Variables

Figure 4A.1

The CDM framework and the list of variables



Innovation inputs	Description of the variables
R&D engagement	Dummy variable which takes the value 1 if the firm reports engagement in both in-house and external R&D activities
R&D intensity	R&D expenditure per employee (in logs)
Acquisition of external knowledge	Dummy variable which takes the value 1 if the firm reports acquisition of external knowledge and technology
ICT	Dummy variable which takes the value 1 if the firm uses email, website, high-speed Internet connection or cell phone in its activities
Training	Dummy variable which takes the value 1 if the firm provides in-house training for its permanent full-time employees
Innovation outputs	**Description of the variables**
Product innovation	Dummy variable which takes the value 1 if the firm reports having introduced new or significantly improved production process or offering service
Process innovation	Dummy variable which takes the value 1 if the firm reports having introduced new or significant improved product or service only to the firm
Marketing innovation	Dummy variable which takes the value 1 if the firm reports having introduced new marketing methods
Organizational innovation	Dummy variable which takes the value 1 if the firm reports having introduced new organizational structures or management practices
Technological innovation	Dummy variable which takes the value 1 if the firm reports having introduced at least one product or process innovation
Non-technological innovation	Dummy variable which takes the value 1 if the firm reports having introduced at least one marketing or organizational innovation
Innovator	Dummy variable which takes the value 1 if the firm reports having introduced at least one type of innovation, namely product, process, marketing or organizational innovation
Firm and labour characteristics	**Description of the variables**
Labour productivity	Sales per employee (in logs)
Capital intensity	Expenditure on purchase of fixed assets per employee (in logs)
Size	Number of full-time permanent employees (in logs)
Size squared	Number of full-time permanent employees (in logs) squared
Age	Firm's experience since the year of establishment
Sector	Set of sector dummies in which the firm operates, namely high-technology manufacturing, low-technology manufacturing, knowledge-intensive services and low-knowledge-intensive services
Group	Dummy variable which takes the value 1 if the firm reports being part of a larger firm
Public funding	Dummy variable which takes the value 1 if the firm received any subsidies from local, regional or national government, or EU sources
Patents	Dummy variable which takes the value 1 if the firm used patents to protect new innovations
Exporter status	Direct exports as a share of firm total annual sales
Competition	Dummy variable which takes the value 1 if the firm reports that the number of competitors in establishment's market are too many to be counted
Tertiary education	Share of employees with tertiary degree
Temporary workers	Number of full-time temporary or seasonal employees (in logs)

Appendix B. Labour market outcomes regressions

Methodology for analysing the relationship between innovation and selected labour market outcomes

This model analyses the impact of innovation on some selected indicators of labour market outcomes: skills (education, training), type of contract (temporary/permanent) and female employment. It is based on Berg (2016), which analyses the firm-level determinants of using temporary workers, and extends that model to various innovation types, as well as to other labour market outcomes. The baseline specification is empirically tested by using a probit in the case of training estimation and an ordinary least squares (OLS) for other dependent variables. The model can be written as follows:

$$LM_i = \alpha + \beta Inn_i + \delta X_i + \varepsilon_s + \varepsilon_c + \varepsilon_i$$

where LM_i stands for the following labour market outcomes: the logarithm of the number of permanent employees (1), the logarithm of the number of temporary employees (2), the logarithm of the number of female employees (3), the share of highly educated employees (4), and the dichotomous variable whether the permanent employees received on-the-job training or not (5).

The variable Inn_i is the main variable of interest and accounts for various innovation inputs and outputs. It is proxied by: R&D engagement; product, process, marketing and organizational innovations; and by innovator status (firms implementing at least one type of innovation output).

The explanatory variables (X_i) capture the firm characteristics such as size, age, ownership or being part of a larger group of firms. In addition, variables for market of operation and exporting status are included to control for competition and market flexibility. Moreover, the model includes labour productivity as a measure of efficiency and total labour costs per firm as a proxy for labour cost. The proxies for human capital such as education and training have been taken into account in equations (1) and (3), while in equation (2) only education is controlled for as there are no data on training provided to temporary employees. The estimation also includes sector (ε_s) and country (ε_c) fixed effects.

One limitation of the model is that it does not directly correct for endogeneity, as the CDM model does. This issue arises from the possible reverse causality between dependent and independent variables of the model. Some studies use lagged values of innovation outputs to tackle this issue (Bauernschuster, Falck and Heblich, 2009; Gyeke-Dako et al., 2016). While lagged variables are not available in the database used in this study, innovation outputs refer to outcomes in the last three years while other variables refer to the latest year, introducing a lag between many of them. While due to this drawback the results should be interpreted with caution, the analysis is useful for giving a better idea of the impact of innovation on labour market outcomes by including possible confounding variables.

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This edition of the *World Employment and Social Outlook* examines the issue of sustainable enterprises through an in-depth analysis of the characteristics of firms, their strategies and how they relate to enterprise performance and labour market outcomes. The focus is primarily on formal private sector enterprises and the ways in which they respond to changing global and national contexts. In particular, the report assesses the linkages between various internal strategies to manage and organize human and financial resources – including capital structure, innovation, trade and global supply chains – and competitiveness and labour market outcomes at the enterprise level.

In so doing, the report emphasizes the role of governments and social partners in fostering sustainable enterprises, notably by shaping supporting institutions and policies through effective social dialogue. Yet it highlights that decent and productive employment is fundamentally based on firms fostering equity in employment opportunities, workers' protection and rights, and investing in workers as well as other important factors of production.

The analysis of the report contributes to the Agenda for Sustainable Development, which places the promotion of job creation, entrepreneurship and the formalization and growth of micro-, small and medium-sized enterprises at the heart of achieving the goal of "decent work and economic growth", and to the ILO's Future of Work Centenary Initiative.

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