

# Global shifts in the employment structure



Torrejón Pérez, S.  
Fernández-Macías, E.  
Hurley, J.

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#### Contact information

Name: Sergio Torrejón Pérez

Email: [sergio.torreon-perez@ec.europa.eu](mailto:sergio.torreon-perez@ec.europa.eu)

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## **Abstract**

We investigate shifts in employment structures during the first decades of the twenty-first century at a global scale, focusing on a diverse set of countries, including eight EU countries, Canada, U.S., Mexico, Brazil, Chile, Argentina, Russia, India, and South Korea. Using the *jobs-based approach* as the common underlying methodology enhances the comparability of results. The findings highlight a lack of a singular prevailing pattern in employment changes, revealing a variety of shift patterns across countries and time periods. Nonetheless, job upgrading emerges as the most frequently observed pattern. A sectoral analysis underscores the pivotal role of private services as the primary driver of employment growth across most countries. A distinct contrast is evident between the dynamics of private and public services. Private services tend to foster job polarization, while public services lean towards job upgrading, with some notable exceptions. Examining the gender dimension over the past two and a half decades reveals a marked improvement in the status of female workers. In many instances, there has been a feminization of employment, and women have experienced more occupational upgrading than their male counterparts. While this represents a general trend, significant exceptions exist.

## **Foreword**

This report has been drafted jointly by the European Commission's Joint Research Centre and the International Labour Organization. The report is part of a series of four joint publications that together represent the main final outcomes of a 2.5-year joint research project on the changing nature of work at a global level. The project, entitled "Building Partnerships for the Future of Work" was carried out by the two institutions as close implementing partners between January 2021 and June 2023 and was financed by the European Union's Partnership Instrument in collaboration with the European Commission's Directorate-General for Employment and Social Inclusion. In particular, joint research activities were developed under the project's Fact-based Analysis component, aiming to develop new evidence around some specific, and understudied, future of work themes focusing on aspects of relevance to the EU and selected non-EU countries.

More information on the project and its other research findings is available here: <https://www.ilo.org/employment/Whatwedo/Projects/building-partnerships-on-the-future-of-work/lang--en/index.htm>

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## **Authors**

Sergio Torrejón Pérez

Enrique Fernández-Macías

John Hurley

## Executive summary

- At a global scale, there is no single pattern of employment change prevailing. Instead, we find a variety of employment shift patterns across countries and periods. Job upgrading (when employment growth is biased towards high-quality jobs) and polarization (employment growth being more intense in the extremes of the wage distribution) are the most commonly found patterns of employment restructuring.
- However, in our sample of 17 countries, occupational upgrading is the most commonly found pattern of structural change. Most European countries, Canada, Mexico, Brazil, Argentina, Chile, India and Russia have experienced different forms of job upgrading or mid-upgrading in the latest decades. Although job polarization appears in some cases, it tends to be observed mostly in the aftermath of the global financial crisis and/or in some isolated periods, while it has only been observed as a consistent long-term pattern in France, the US and South Korea.
- Private services have been the engine of employment growth in most countries in the latest decades. Public services have also experienced net employment gains, but employment growth rates have tended to be lower in this sector vis-à-vis in the private service sector. On the other hand, the goods producing sector (that includes construction, manufactures and agriculture) has reduced its size in most countries.
- There is a clear contrast between the dynamic of private and public services: while private services tend to promote job polarization (these jobs tend to be located in both, the lower-paid quintile and the higher-paid quintile), public services tend to promote job upgrading (public service jobs tend to be high-paid). South Korea constitutes a remarkable exception, being a country that generates many low-paid public service jobs.
- Although from a static perspective women are still in a disadvantaged position in the labour market all around the world, from a dynamic perspective the last two and a half decades have been a period of clear improvement in their position. In most cases, there has been a feminisation of employment (a relatively larger increase in employment for women than for men); and in most cases, women have experienced more occupational upgrading than men. Although this is the general pattern, there are important exceptions: in those countries which experienced job polarisation overall, women tended to also see more employment growth at the top and bottom of the occupational structure; whereas the most commonly observed pattern of occupational upgrading was frequently most beneficial for women.

## 1 Introduction: why this study now? On the importance of this research topic

Occupational change or structural change in employment are topics that have received a lot of attention by social scientists. From the seventies, some of the contemporary pioneering contributions came from authors such as the sociologist Daniel Bell, who made forecasts on the implications of the transition towards a post-industrial society (Bell, 1973), or the political economist Harry Braverman, that analysed long-term trends in employment across different occupational and skill-levels, discussing in detail the impact of technology on the task content of occupations (Braverman, 1974). Since then, a lot of attention has been paid to the structural transformations of work and the economy and to the factors explaining these dynamics.

Economists entered into this debate mainly from the nineties, trying to shed light on the impact the deployment of technologies, organisational changes and other transformations were having on workers by their skill level (Berman et al, 1998; Caroli and Van Reenen, 2001) or by the type of tasks or activities they perform in the workplace (Autor et al. 2003; CEA, 1996).<sup>1</sup>

In particular over the last two decades, there have been many different contributions to this debate from the Social Sciences, using different approaches and methodologies. While some researchers have categorised and grouped jobs by their wages or skill levels (of the workers in those jobs), others have classified them according to their task content or to some multidimensional measure of job quality. While some have used detailed occupations as units of analysis, others have used sectors or a combination of detailed occupation and sector (defined as “jobs” in many papers using this approach, including this one). There are many possible strategies to address a research topic that has broad socio-economic implications.

However, the aim of most of these studies is broadly the same: to unveil how the structure of employment is transformed over time, and how the occupational and the sectoral composition of the economies is evolving. In other words, these studies aim to see how the division of labour is structured and transformed over time both at the national and the job level, as consequence of multiple factors that are impacting labour markets: technological change, organisational change, globalization, demographic change, institutional change and many other factors.

That is why this and other related topics have received so much attention in the latest fifty years: because changes at work (in the task content and the methods of work), and on the sectoral/ occupational composition of the economy are a key explanatory force in economics, sociology and related fields, with these phenomena affecting many different spheres:

- Job quality and wages, depending on the type of jobs that became available.
- Inequality levels, depending on whether employment tends to grow in a polarised way or, on the contrary, its growth tends to be more evenly distributed, but also on the capacity to create employment and on unemployment.
- Skill and training needs, depending on the type of tasks that get more demanded.
- The intensity and direction of labour market transitions, depending on where employment is created (Low-paid jobs? Mid-paid jobs? High-paid jobs?), as well as on employment growth rates.
- Productivity, depending on the use of technologies and on how work is organised.
- Economic growth, depending on the sectoral specialisation of the economy.

In this context, it is pertinent to clarify the following questions: why do we want to contribute to this fertile strand of specialised literature from a global perspective? What is the value added of our proposal? In this sense, our aim is threefold:

1. We aim to update the evidence on occupational change by using the most recent data available. In all the countries covered in this study, the initial year tend to be close to 2000 and goes until 2020/2022. This way we can cover periods of around two decades. Covering relatively long periods is important, given that the focus in this type of analysis tend to be more on structural transformations (business cycles, the deployment of specific technologies, globalization and changes in trade, etc), rather than on

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<sup>1</sup> For a much deeper review on recent contributions to the topic see Section 2.

short-term trends or the impact of specific events. However, in the cases it is possible because there is data available, we also discuss the impact of COVID-19, in a way that we can say something on the impact the pandemic has had on employment structures.

2. To enlarge the sample of countries usually covered by these studies. Research in the area has been mainly focused on the cases of the United States, Europe and few other developed countries. Our perspective is in this sense limited, with this implying that there is a risk from our knowledge base to be Euro/US-centric and biased. Little is known on how employment structures in other developing and developed countries are evolving, and on the forces driving these transformations. By enlarging our sample of countries, then we are better positioned to understand the rich set of mechanisms that are capable of explaining employment transformations at the global level. This is important because otherwise we might still be omitting some relevant variables, but also because some of the factors we usually consider may produce different impacts on employment in different regions.

Globalization and deindustrialization, for instance, are two of the key forces explaining job polarization in some developed countries, since they make the share of middle-paid manufacturing jobs that are offshored to decrease. On the contrary, the same phenomenon may make industrial employment to gain importance in the developing countries where those activities are offshored (such as China). That is: the same factor can produce one effect and the opposite in different regions and countries.

For this reason, by enlarging our sample of countries: a) we can report on a larger set of factors and drivers explaining employment dynamics in different places, and b) we can have a better idea on the varying role these factors play in different regions. As a result, we can get a more precise and comprehensive view on employment transformations at the global level. Therefore, apart from covering the United States and eight European countries (France, Ireland, Germany, Spain, Italy, Romania, Sweden and the Czech Republic), in this study we also cover the cases of Canada, Mexico, Brazil, Chile, Argentina, India, Russia and South Korea.<sup>2</sup> As far as we know, this is the study on occupational change that covers the larger set of countries so far, and that does so by using common methodological guidelines. A previous attempt was made by Eurofound several years ago (2015), while other contributions were focused on specific regions or sets of countries, such as those focused on some European countries (Goos et al., 2009, 2014; Oesch and Piccitto, 2019; Oesch and Menés, 2011).

3. To produce comparable evidence at the global level. Evidence on structural change in employment is not only limited (in terms of its country coverage), but also fragmented. By this we mean that the data, approaches and methods used by analysts from different sub-disciplines and scholarly traditions vary in substantial ways. One can rely on occupations, sectors or workers as the main unit of analysis, and observe how they have evolved over time. If we use jobs instead (as combinations of occupations and sectors), then these categories can be ranked and grouped by using different proxies of job quality: wages, the educational attainment, a non-pecuniary index, etc. Other important decisions have to do with periodization, the use of mean or median wages, and so on. This is extremely important if we consider that results here are very sensitive to all these decisions. Accordingly, one cannot know whether differences between two different studies covering different countries or regions are due to differences in the nature of change itself, or whether these have to do with the use of different tools and strategies. To overcome these limitations, in this study we apply the same approach and methods in all the countries of our sample (for more details see section 3). In this sense, the evidence we obtain is fully comparable, minimizing the risk of differences between countries being attributable to the way the people is operationalising.

In short, in this report we update evidence available on occupational change with most recent data available, enlarge the sample of countries usually covered by this type of studies, and produce comparable evidence at the global level. This is the value added of this study, and what makes it currently so unique.

On the other hand, we are fully aware of its limitations: most importantly, we are only capable of generating (very visual) descriptions of employment trends at the global level. However, when we decompose employment trends by different variables, we are also capable of seeing where employment growth is concentrated by

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<sup>2</sup> Although we cover 'only' 17 out of the almost 200 countries there are in the world, it is also true that they represent more than one third of the total global labour force, according to data from the World Bank. Thus, this represents a good attempt of getting a global picture on the matter.

gender, sector and other potential breakdowns. This serves to provide some hints on the factors behind the different patterns of employment change: if employment growth in low-paid jobs was mostly for non-natives, one can conclude that migration flows have played a key role at the time of explaining job polarization. If these low-paid jobs that have grown at a considerable rate correspond with non-standard forms of work, one should put the focus into deregulation. In any case, the type of data produced is not valid to make causal inference, but an informed and suggestive descriptive analysis of global trends in occupational structures.

The report is organised as follows: the introduction is followed by a chapter presenting the debate on the main factors explaining employment trends at the global level, as well as the main theories of occupational change (chapter 2). Then we explain the approach and methods used (chapter 3). Main results are summarized in chapter 4, and the final section (chapter 5) is for the conclusions and the policy implications.

## 2 Context and literature review

### 2.1 A bit of context: main factors affecting global employment trends

In this report, we use a consistent methodology to systematically compare the changes in the occupational structure of 17 global economies for the period 1997-2021. The share of global economies included in our analysis covers a very significant proportion of the total global labour force (between one third and half, depending on the estimation). Therefore, the analyses presented in the rest of this report have to be contextualised in the broad trends affecting the global economy and global employment over the last 25 years. In this section, we will briefly discuss the main underlying factors behind these trends, in particular globalisation, technical change, demographic shifts, policy developments and economic cycles. In all these cases, we will discuss how these common global trends have affected differently the broad regions of the global economy, hinting at what implications they may have for the patterns of occupational change that we will discuss in the rest of this report.

#### **Box 1.** Countries and regions covered in this report

Before embarking in a discussion of the main factors affecting global employment trends, it is useful to explicitly discuss the countries that we will analyse in this report, and categorise them into broad groups which are relevant for our analysis.

First, we have the advanced North American economies of US and Canada. These are highly tertiarised market-oriented economies, with limited employment in manufacturing and agriculture. They have been characterised by high technological advancement, an ageing population with increasing demand for health care and social services, and relatively high female participation rates.

Second, we have the advanced European economies of Germany, France, Sweden, Italy, Spain and Ireland. These are all mature service-oriented economies with a low proportion of employment in agriculture and manufacturing, fast technical change, an ageing population and among the highest relative levels of gender equality in employment. A particular feature of this group is that it has high levels of social protection and labour regulation.

Then, we have the two Transition European economies of Czech Republic and Romania, which transitioned recently from centrally-planned to market-oriented economies, integrating within the EU. They have experienced fast convergence with advanced European economies in terms of economic development and living standards, with a fast restructuring and declines in agricultural employment.

Russia is also a transition economy, but it did not grow and develop to the same extent as the Eastern economies that joined the EU in this period. It is strongly dependent on natural resources (particularly oil and gas), and it has experienced stagnating manufacturing and growth in services. Despite being a developing economy, its population is ageing fast and its workforce shrinking, and it faces challenges in terms of governance, corruption and economic diversification.

Another group of countries covered in this report includes the Latin American economies of Chile, Mexico, Brazil and Argentina. Although they have diverse economic structures, they all underwent rapid urbanisation and declines in agricultural employment in this period, with growing tertiarisation. The adoption of technology in these economies was uneven, with pockets of low productivity and informality. And they all suffer from high levels of income inequality and social challenges.

India is the biggest country analysed in this report, accounting for more than 15% of the global labour force. From 1991, India shifted its economic policy towards liberalisation, deregulation and free-markets. In the last 25 years, it experienced rapid economic growth, in particular in the technology and service sectors, and a growing tertiarisation and urbanisation. However, it still has a very large share of agricultural employment, as well as a very large informal sector (also in urban services) and low technology adoption in some areas. It has a youthful and expanding population.

Finally, as a representative of the East Asian developed economies we have South Korea. It is an economy characterised by very rapid economic development and a very fast transformation from an agrarian to an industrialised and high-tech economy in the last few decades. It still has a very strong manufacturing sector, particularly in high tech. However, it is also highly tertiarised as all developed economies. Finally, it has an ageing population and low fertility rates, with a shrinking labour force.

We should also mention the countries and areas of the world which we are missing. In particular, in this report we do not cover any African, middle-Eastern or Australian economy. Also, we unfortunately could not include China in the analysis, which is particularly problematic because it accounts for nearly one fourth of the global labour force and it plays a particularly important role in the global division of labour, in practice concentrating a very significant share of global manufacturing employment.

The first factor affecting global employment trends in the period 1997-2021 is **globalisation**, which obviously started much earlier but accelerated and deepened during these years, contributing to changes in the employment structure everywhere. However, these effects were quite different across different global regions, depending on the location of each country in the global division of labour among other factors:

- **Deindustrialisation:** in developed economies, globalisation tended to contribute to the hollowing out of manufacturing, with production activities being offshored while design, marketing and managerial activities remained. In some developing economies of East Asia (notably China), there was a simultaneous expansion of employment in manufacturing. But in most other developing economies, manufacturing employment remained stagnant or even declined during this period. In other words, globalisation reallocated and concentrated manufacturing employment in a few economies of East Asia (mostly China), in practice contributing to deindustrialisation almost everywhere. How could deindustrialisation happen almost everywhere in a period of increasing material abundance? Because this reallocation and concentration of manufacturing activity increased overall efficiency, an effect which was reinforced by technical progress (Baldwin 2016; Rodrik 2016).
- **Tertiarisation:** also a global tendency, with varying speeds and depths. In developed economies, tertiarisation is very advanced and the majority of employment is already in services. In developing economies, tertiarisation is less advanced, but it is also progressing in most cases, because of the fast decline of agricultural employment and in many cases stagnation of manufacturing (Szirmai and Verspagen 2015; Ghani & O'Connell 2014). That is why, although in general services are less traded than manufacturing and agriculture (and thus they grow almost as a residual, as argued by Baumol 1967), their growth is also a result of globalisation.
- **Deagrarianization:** in developed economies, agricultural employment continued to decline from very low levels, reaching negligible proportions (1-2%). This is strongly linked to globalisation, with the production of agricultural goods being highly specialised and concentrated globally (Timmer 2009). On the developing economies side, the modernisation of agriculture also led to very significant declines of agricultural employment over this period (Christiaensen et al. 2011). In particular in East Asia, this decline has been enormous: whereas most people worked in agriculture in the early nineties, this sector employs one in three workers or less now. In India, the decline has been also steep but less so, and still today almost one in two workers are in agriculture. In South America, the percentage of agricultural workers was already lower in the early 1990s, but it continue to decline significantly in this period (from more than 20% in the early nineties, to 10% or less now in Brazil or Mexico).

A second main underlying driver of the structural transformation in employment everywhere is **technical change**. The last two and a half decades were the period of the maturing of the digital revolution, which started a bit earlier (Brynjolfsson & McAfee 2014). Technical change is deeply intertwined with globalisation as a driver of structural change: without digital network technologies, the recent wave of globalisation could not have gone so far; and globalisation itself has been a key driver for the diffusion of digital technologies on a global scale (Baldwin 2016). However, from a global perspective technical change over the last two and a half decades has not only been about digital technology: especially, in developed economies the last 25 years has also been a period of catch up and adoption of technologies that were adopted much earlier in developed economies, which contributed to economic modernisation.

- In developed economies, the main debate during this period was whether technical change was **polarising or upgrading** the employment structure (Autor 2015; Oesch & Piccitto 2019). Some argued that digital technologies (and continuing technical progress in general) had a particularly strong negative impact on mid-skilled occupations in manufacturing and services, while increasing the demand for complementary high-skilled occupations and also for low-skilled jobs providing personal services to those benefitted by the digital revolution (this hypothesis is often referred to as "Routine Biased Technical Change", or RBTC). Some others argued that digital technologies tended to simply increase the demand for complementary high-skilled occupations, leading to occupational upgrading but also

creating tensions towards inequality (“Skills Biased Technical Change”, or SBTC). In the next section we will return to this debate with more detail.

- While some of these debates were also reproduced in developing economies, it seems clear that the impact of digitalisation and advanced technologies has been smaller. In many developing economies, the main impact of technical change was in the **modernisation of agricultural production**, which accounts for the big declines in agricultural employment and rapid urbanisation of many developing economies (especially in East Asia). Although this modernisation led to a tertiarisation of the economy with some similarities to that of developed economies, in most developing economies there are still big pockets of traditional, labour-intensive sectors with low technology adoption and low productivity (World Bank 2019). However, in some developing economies such as India, Brazil or Russia, there was also a significant expansion of high-skilled service sector employment in ICT or business services, in some cases within global value chains, which contributed to the creation of well-paid jobs.

**Demographic change** has been another big driver of structural shifts in employment on a global scale over the last two and a half decades, although again it affected global regions in different ways.

- In developed economies, the main demographic trends were ageing and even shrinking working-age populations (Bloom et al. 2010), associated with an increasing demand for healthcare and social services, and with the possible emergence of labour shortages for some types of jobs. In developed economies, there has been some debate about how to confront these potential labour shortages, with automation and migration being among the most frequently mentioned possible solutions.
- For developing economies, we can differentiate two groups of countries (Dyson 2010). On the one hand, former Soviet Union countries and some East Asian economies are already experiencing similar processes of ageing and shrinking working-age populations as developed economies, without having equivalent social protection systems, which can lead to important social tensions and inequalities. On the other hand, many developing economies in Latin America, Asia and Africa are characterised by youthful populations which can often fuel the expansion of labour-intensive industries but also unemployment and migration.

Another key factor driving global employment trends, which is often conflated with demographic change but which is certainly important in its own right, is the **change in gender relations** and female labour market participation. Again, although there are some broadly shared common trends of increasing gender equality and female participation, there are big differences across global regions and countries which must be taken into account.

- In developed economies, the last 25 years have witnessed notable increases in female labour market participation, driven by factors such as improved access to education, changing societal attitudes and policies aimed at promoting gender equality (Goldin 2014). This rise in female employment has been associated with the growth of service-oriented sectors, in particular in areas such as healthcare, education and social services where women tend to be overrepresented. This has often involved an expansion in the presence of women in high-skilled occupations, although female employment is also associated with the expansion of low-paid personal services in some countries (Dwyer 2014; Mariscal de Gante et al. 2023).
- In developing economies, the evolution of female labor force participation has been more varied. While some countries have seen significant progress, with women entering the labor market in increasing numbers, others have experienced a slower pace of change, often due to persisting cultural and social norms. The case of India is particularly problematic in this respect, because female labour force participation stagnated since the late 1980s (Klasen and Pieters 2015), although it has regained its growth recently (Sarkar and Torrejón 2023). In regions like East Asia and Latin America, the increased participation of women has been driven by urbanization, modernization of agriculture, and the growth of labour-intensive industries, such as textiles and electronics. The expansion of female employment has contributed to economic development, poverty reduction, and enhanced household welfare in these areas (World Bank 2012). However, challenges remain, as women in developing economies often face higher levels of informality, lower wages, and a lack of social protection.

In terms of economic and employment policies, the last two and a half decades have broadly been a period of **liberalisation and deregulation**, austerity and neoliberalism. Liberalisation and deregulation policies have often resulted in expanding low-paid precarious employment, both in developed and developing economies (Kalleberg,

2011). In developing economies, this has often taken the form of expanding informal employment, which seems paradoxical in a period of economic modernisation and integration in global value chains (Chen 2012). But in countries like India or Mexico, urbanisation and tertiarisation have in fact been associated with expanding rather than contracting informal employment. Another more or less common trend in this respect is the stagnation or even decline of public sector employment in many countries, again both in developed and developing economies (Rodrik 2011). However, it is important to note that there are significant exceptions to these general trends. For instance, several Latin American countries saw increasing regulation and public sector employment in this period, while some successful East Asian economies also increased public sector employment and undertook ambitious industrial policy initiatives. And within Europe, many countries maintained high levels of social protection and labour protection policies, while increasing public sector employment especially in education and health.

Finally, we should also briefly mention the most important **cyclical economic developments** over the last two and a half decades, which affected all global regions although not always in the same ways:

- The Asian financial crisis of the late 1990s strongly affected South East Asian economies and more broadly developing economies. This crisis led to job losses in manufacturing and construction, but also to austerity and neoliberal policies in many developing countries (Radelet and Sachs, 1998).
- The 2008 Great Recession severely affected most of the global economies, with big job losses in finance, construction and manufacturing (Almunia et al., 2010). In many global regions, including Europe, austerity and structural reforms policies taken in response to the crisis made the recovery slow and painful, with large-scale and long-term unemployment and wage declines, and regulatory changes that facilitated the expansion of low-paid jobs.
- The 2020 COVID Pandemic again had a very general impact on most of the world. It had major negative effects on employment in some service sectors (hospitality, tourism, entertainment), and it disrupted value chains worldwide (Fana et al., 2020; Baldwin and Tomiura, 2020). The pandemic accelerated pre-existing trends (in particular, the digitalisation of economic activity), but also precipitated major turning points for some previous trends. In particular, the disruptions in global value chains made many countries reconsider the benefits of globalisation, and may bring about a reversal in this respect.

## 2.2 A review of the evidence and theories of occupational change

In the last two and a half decades, there has been a vibrant debate in the Social Sciences about the direction and drivers of occupational change. This debate has generated abundant empirical evidence and some theory. However, there are still significant controversies about the most basic empirical facts in this debate.

Many empirical analyses have tried to identify the dominant pattern(s) of change in the occupational structure, understood as a continuum of low to high-quality jobs which have grown or declined in employment to different extents. In this literature, jobs are typically defined at a reasonably granular level, as specific occupations or even specific occupations within specific sectors. Different variables have been used to rank these jobs by their quality, most commonly wages and skill levels. And in general, the focus has been on the marginal change in employment for the jobs across the job quality continuum for a given period of time (Oesch and Piccitto, 2019; Autor, 2015).

In terms of empirical evidence, most of the research has found one of two main patterns of change: job polarisation or upgrading. Job polarisation can be defined as a relative expansion of employment in the upper and lower extremes of the job quality continuum at the expense of the middle, whereas upgrading means an expansion of the top relative to the middle and bottom.

The US, where this empirical literature originated, has tended to be associated with job polarisation for the last two or three decades. Many prominent economists (Autor 2015) and sociologists (Wright and Dwyer, 2003) have found job polarisation more or less consistently. However, some recent papers have questioned this empirical evidence, finding methodological or conceptual flaws. For instance, some authors claim that the use of crosswalks to harmonise occupational codes for long-term analysis tends to create artificial patterns of polarisation (Hunt and Nunn, 2022; Mishel et al., 2014).

In Europe, there has been more controversy. Whereas some researchers, mostly from the field of labour economics, have found consistent and pervasive job polarisation (Goos, Manning and Salomons 2014; OECD, 2017), some others have found a diversity of patterns (Hurley et al., 2015) or even a more or less dominant pattern of occupational upgrading (Oesch and Piccitto, 2019). This surprising lack of consensus in the empirical evidence in Europe is the result of inconsistencies in the methods, analysis and interpretation. Some analyses

cover the entire employment structure, some leave key sectors out (for instance, agriculture or the public sector are in some cases excluded, which tends to minimise the extent of upgrading; see Oesch and Piccitto, 2019); some use a common trans-national ranking of jobs to categorise them into job quality tiers, some use country-specific rankings (the latter tends to produce more variation than the former, for obvious reasons; see Fernández-Macías, 2012); some have very granular definitions of jobs, some very coarse; some use standardised categories (such as quintiles), some ad-hoc and uneven groupings, etc. It is also important to note that there is no formal recognised definition of the main concepts of job polarisation or upgrading, which means that even the same empirical pattern can be interpreted differently by different analysts. For instance, even the most canonical cases of job polarisation in the literature tend to be strongly biased upwards (in other words: even if lower paid jobs grew more than mid-paid jobs, often higher paid jobs grew more than all the others), and yet many analysts tend to emphasise the pattern of polarisation rather than that of upgrading in their conclusions.

Outside Europe and the US, there have also been some empirical studies of occupational change, although they are not so numerous. In developed economies such as Canada, Japan or South Korea, the dominant finding has been job polarisation similar to the US (Green & Sand 2015; Furukawa and Toyoda, 2018; Park et al., 2022), although there is some debate too. In developing economies, the literature is less abundant, but without any doubt there is less evidence of job polarisation than in developed economies. After an extensive review of recent papers, Martins-Neto et al. (2021) conclude that job polarisation in developing economies is either entirely absent or only incipient in the majority of cases.

What factors are most often considered as drivers of these patterns of occupational change? As briefly mentioned in the previous section, the factor most frequently considered to be driving job polarisation in advanced economies is technological change. In particular, the theory that is most often used for explaining job polarisation is Routine-Biased Technological Change (RBTC). The argument, which is more or less dominant in the recent economic literature on this topic, is that recent technologies (in particular, computers and digital tools) are substitutive for routine cognitive and manual tasks, complementary to non-routine cognitive and social tasks, and neutral for non-routine manual and social tasks. Since routine tasks tend to be in the middle of the occupational structure (they tend to have mid-level wages and require mid-level skills), recent technological change tends to create polarisation according to this hypothesis (Autor, 2015). The main other factor discussed in recent economic literature is international trade: given that routine jobs are more standardised and easier to offshore, globalisation would have tended to hollow out the middle of the occupational structure, also contributing to job polarisation (Blinder, 2006). Although this factor is often mentioned and discussed, most economic studies find it to be of secondary importance with respect to technical change in explaining job polarisation in developed economies (Goos, Manning and Salomons, 2014).

A second strand of the literature, generally associated with the sociological studies that find more upgrading than polarisation or at any rate a diversity of patterns of occupational change, tends to emphasise the role of supply-side and institutional factors. In terms of supply-side factors, the most frequently mentioned are feminisation (increasing female participation in employment has driven the expansion of care jobs, which tend to be at the top and bottom of the occupational structure; Dwyer, 2013), educational upgrading (the increasing availability of high educated workers facilitates the expansion of high-skilled jobs, especially in the context of fast technical progress; Oesch and Piccitto, 2019) and migration (migrant workers are often more in need of employment but face discrimination or difficulties for skill recognition, and thus their availability facilitates the creation of low-paid jobs; Wright and Dwyer, 2003; Torrejón, 2019).

With respect to institutions and policy, they can directly affect the patterns of occupational change (i.e., by expanding or reducing public sector employment), but also mediate the effect of the other underlying factors (i.e., by facilitating or hindering the creation of some types of jobs). Institutional and policy differences can, from this perspective, at least partly explain the existence of diverse patterns of occupational change across developed economies which are subject to common underlying factors such as technical change, globalisation or demographic change. Relatively high minimum wages and bargaining-induced wage compression, for instance, have probably contributed to the historically limited expansion of low-paid jobs in Northern European economies which have experienced long-term occupational upgrading trends (Hurley et al., 2015; Maarek and Moiteaux, 2018). Policy changes, on the other hand, can generate different paths of occupational change: the deregulation labour market reforms of Spain in the 1980s or Germany in the 2000s are probably associated with the subsequent expansion of low-paid jobs in both countries (Fernández-Macías, 2012).

As previously mentioned, most of these debates have revolved around the explanation of observed patterns of occupational change in developed economies. In developing economies, on the other hand, there has been less

evidence of job polarisation and this has triggered a discussion of why that should be the case. Martins-Neto et al. (2021) speculate that this may be explained by limited technology adoption, economic modernisation and the offshoring of routine middle earning jobs from advanced to developing economies.

### 3 Approach and methods

The main goal of this project is to compare the recent patterns of change in employment structures around the globe, studying in a consistent and systematic manner what kinds of jobs grew more or less in terms of employment and exploring different trends by gender, sector and other factors. For this purpose, this project adopted a jobs-based approach as the main underlying methodology. As explained below, this approach is particularly well suited for international comparisons of structural occupational change, but it was not originally intended for this purpose. Initially, this method was proposed as a way to assess the quality of the jobs created and destroyed in some developed economies during particular periods, and to better understand the underlying drivers and socio-economic consequences of these changes.

Initially proposed by Stiglitz, refined by the sociologists Wright and Dwyer and the economists Autor and colleagues (CEA 1996; Wright and Dwyer 2003; Autor et al. 2006) for the US, this approach was later adopted by other social scientists in different developed economies (Goos and Manning 2007; Spitz-Oener 2006), contributing to the lively debate about job polarisation and upgrading. The core of this approach consisted in shifting the unit of analysis from the individual workers to the jobs, typically defined as occupations within specific sectors. These “jobs” were ranked by their average wages, and then assigned to job quality tiers initially equal in terms of employment: the change in the level of employment in those job quality tiers was then analysed, decomposed by gender or other factors, and linked to different possible explanatory variables.

Although this methodology was not initially intended for cross-country comparisons of structural change in employment, it is very well suited for that purpose. This is because most global economies have relatively standardised labour force statistics, which can be used to classify employment by occupation, sector, gender and the other variables typically used in this approach. This allows comparing very efficiently and parsimoniously the job structures of most global economies and their change, and exploring the broad socio-economic implications and underlying sectoral drivers of these patterns. These possibilities for international comparisons have been well exploited in Europe, where there is a highly harmonised and relatively accessible statistical system, and where the EU integration process provided additional motivation for cross-national comparisons of employment trends. Researchers such as Goos et al (2011), Oesch and Menés (2011) and Fernández-Macías (2012), and in particular the European Jobs Monitor project carried out by Eurofound (initially on its own and lately in collaboration with the Joint Research Center of the European Commission; see Eurofound 2008, 2015, 2021; see also contributions to Fernández-Macías et al. 2012), used this approach for international comparisons of occupational trends, providing a body of evidence and a set of analytical tools that served as foundation for the present project.

On the basis of these foundations, this project embarked on a comparative analysis of occupational trends around the world with a common methodology based on the jobs approach. It is important to emphasise that although the underlying methodology is common and the entire project has been highly coordinated, it has been implemented by separate national-level research teams and adapted to national specificities in terms of data available and in terms of the different socio-economic contexts. In other words, given the big differences in the data available and in the socio-economic structures of the countries included in this study, the common methodological guidelines were explicitly broad and flexible, to ensure some broad comparability but also sensitivity to national context and data. In this section, we will first summarise the broad common methodology followed, and then we will discuss some of the main departures from these common guidelines in the different participating countries.

#### 3.1 The common underlying methodology

For the analysis of change in the employment structures of the participating countries, this project consists in the quantitative analysis of national level data covering all people in employment over a period that, depending on data availability, spans from the mid-nineties to the most recent available data (as of 2023).

In most cases, this data comes from national-level labour force surveys, which are generally conducted under common guidelines provided by the ILO, with the purpose of producing official national statistics on the labour force, employment and unemployment. Unless otherwise specified in the following section, all of the countries participating in this project have used this type of data according to the following broad guidelines:

1. The analysis is carried out at the level of jobs, defined as specific combinations of the variables of sector (NACE, or equivalent classifications) and occupation (ISCO, or equivalent classifications). Specific in this context means at the two-digit level of detail, if possible. As we will discuss in the following section, in

practice most countries have used less detailed classifications, typically one digit for sector (NACE) and two digits for occupation (ISCO).

2. Each of these jobs (combinations of sector and occupation) have to be then ranked according to a country-specific metric of job quality, from low to high. Ideally, this metric should be the average hourly wage at the job level. If not available, other variables or proxies such as the average level of formal education of people in each job can be used.
3. Then, each of the job-quality-ranked jobs have to be assigned to five categories holding approximately the same number of workers in the initial year of each period of analysis. The first of these job quality or wage quintiles will hold around 20% of employment in lower-paid jobs in the initial year of the period, the second the following 20% and so on, until the top quintile holding around 20% of employment in the highest paid jobs in the initial year of analysis in the country.
4. Then, the analysis proceeds by representing the absolute or relative change in the level/numbers of employment in each of those job quality or wage quintiles for the period analysed. This is the key result of the analysis, the main synthetic comparable representation of occupational change in terms of job quality.
5. Finally, the represented change in the level/numbers of employment in each of the job quality or wage quintiles is decomposed by gender, broad sectors and other variables. The common guidelines specify gender and sectors as the main required decomposition variables, but encourages the use of other variables to the extent that they are available and relevant for each country, including: type of contract, formality of employment, nationality or ethnic group, rural vs urban employment, etc.

These common underlying guidelines have been followed by all of the participating countries, which provides the basis for the comparison presented in this report and also implicit in each of the country-specific reports produced for this project. However, there have also been some departures from these common guidelines, which are documented in the following section.

### **3.2 National adaptations from the common methodological guidelines**

The following table summarises the main national adaptations or departures from the common methodological guidelines explained in the previous section.

Table 1. National adaptations from the common methodological guidelines

Country	Data source	Data coverage	Periods covered	Definition of job	Job quality metric	Decomposition variables	Additional comments
<b>EU</b> (Germany, Italy, Spain, France, Czech Republic, Romania, Sweden, Ireland)	EU-LFS	Employed population	1997-2007; 2008-2010; 2011-2019; 2019-2021	ISCO 2 digits by NACE 1 digit	Mean hourly wages	Gender; broad sector; type of contract; working time arrangement	
<b>US</b>	Current Population Survey	Employed population, 18-65 (except the self-employed)	2000-2019; 2019(q2/4)- 2020(q2/4)	Occupation by sector (both at 2-digit level, based on U.S. Census Bureau codes)	Median hourly wages	Working time arrangement, broad sector; gender; ethnic group/ race	
<b>Canada</b>	Labour Force Survey (LFS)	Employed population	1997-2008; 2008-2009; 2009-2020; 2020-2022; 1997-2022	National Occupational Classification (NOC) 2016 v1.3 by 2-digit North American Industry Classification System (NAICS) 2017 v3	Mean hourly wages	Broad sector; gender; age	Additional analysis on wage trends by quintile
<b>Argentina</b>	Encuesta Permanente de Hogares (EPH)	Employed population	2003-2012; 2012-2019; 2003-2019	CNO 2001 at 2-digit level by CAES 1.0 at 2-digit level	Mean hourly wages	Gender; formal vs informal employment; educational level; age	Mean hourly wages of 2003 used for all subperiods analysed Additional analysis on wage trends by quintile included
<b>Chile</b>	Encuesta de Caracterización Socioeconómica Nacional (CASEN)	Employed population	2000-2009; 2009-2017; 2000-2017	CIUO-88 at 3-digit level, by CIU 3.1 at 2-digit level	Mean hourly wages	Gender; formal vs informal employment; educational level; age	Mean hourly wages of 2000 used for all subperiods analysed. Additional analysis on wage trends by quintile included

<b>Mexico</b>	Encuesta Nacional de Ocupación y Empleo (ENOE)	Employed population	2006-2010; 2010-2019; 2006-2019	CMO or SINCO-2011 at 2-digit level, by SCIAN 2007 at 2-digit level	Average years in education	Gender; formal vs informal employment; age	
<b>Brazil</b>	National Household Sample Survey (PNAD)	Employed population	2002-2014; 2015-2019; 2019-2021; 2002-2021	Brazilian Classific. For Occupations (CBO) by Brazilian Classific. Of Economic Activities (CNAE2.0), both at 2-digit level	Median monthly wages	Labour informality; educational attainment; urban vs rural employment; gender; age; broad sector.	Additional analysis of conditional probabilities of belonging to different quintiles for different profile of workers provided.
<b>India</b>	Periodic Labour Force Survey and the Employment and Unemployment Survey conducted by National Sample Survey Organisation (NSSO)	Employed population	2012-2020	2-digit National Classification of Occupations (NCO 2004) by 2-digit National Industry Classification (NIC 2008).	Median daily wages	Gender; sector; rural vs urban;	Additional analysis on employment trends by task content  Analysis performed for rural and urban India separately.
<b>South Korea</b>	Korean Labor and Income Panel Study (KLIPS)	Employed population	2000-2009; 2009-2019; 2019-2021	Korean Standard Classification of Occupations at 1-digit level by Korean Standard Industrial Classification at 2-digit level	Median hourly wages	Sector and sub-sectors; professional status; type of contract; employment status; working time arrangement; gender; education level.	
<b>Russia</b>	Labour Force Survey (LFS) and Household Survey of Incomes and Participation in Social Programs (SIPSP).	Employed population	2000-2008; 2009-2019	ISCO 2 digits by NACE 2 digits	Mean monthly wages	Gender; rural vs urban; educational level; age; cohorts.	Additional analysis of conditional probabilities of belonging to different quintiles for different profile of workers included.

## 4 Shifts in the employment structure: a global comparison

This is the analytical chapter where comparable evidence on patterns of employment change at the global level is presented. As previously mentioned, our sample includes some developed and developing countries, including eight European countries (Germany, Spain, Italy, Ireland, Czech Republic, Romania, Sweden and France), Canada, United States, Mexico, Brazil, Chile, Argentina, India, Russia and South Korea. Although we ‘only’ cover 17 out of the almost 200 countries there are in the world, it should be noted that our sample includes some of the largest countries in terms of employment. According to data from the World Bank, we can estimate that these countries account for more than one third of the global labour force. In this sense, this exercise is a good attempt of representing how employment structures are evolving globally.

Is employment polarising everywhere? Is by contrast job upgrading the pattern that has been prevailing in the latest decades, or is there no pervasive pattern prevailing across countries? These questions are tackled in section 4.1. In addition, in section 4.2. we qualify employment shifts by gender and economic sector, so to shed light on differences in employment dynamics by these variables in different countries and regions of the world.

### 4.1 Main patterns of employment change across countries

To ease the comparison of patterns of employment change across countries, we use the exact same representation for all countries and periods. In figures 1, 2 and 3 below we represent employment change by job-wage quintile. More precisely, we have opted for representing (average) annual change instead of the total change in the number of employees from the initial to the latest year of each subperiod. This is just a rescaling of the variable represented in the vertical axis of our figures, which does not alter the observed patterns themselves. However, the use of annual averages has a clear advantage for a comparative project like this one: it ‘controls’ for the length of the period, so that the size of columns represent in a more visual way the nature of structural change, and not so much the extension of the time lapse chosen. In other words, this strategy makes comparisons across countries and sub-periods more straightforward.

Figure 1 shows evidence on eight EU countries (Germany, Spain, Italy, Ireland, Czech Republic, Romania, Sweden and France), as well as for the EU8 as a whole; figure 2 do the same for our selection of Latin (Argentina, Chile, Brazil and Mexico) and North American countries (Canada and United States), and figure 3 for Russia and two Asian countries (South Korea and India).

#### 4.1.1 Employment shifts in Europe from 1997 to 2021<sup>3</sup>

In the EU8 as a whole, from 1997 to 2021 there was job upgrading: the higher the wages, the fastest the employment growth. This applies to the largest part of the period: both to the expansive phase of the business cycle preceding the global financial crisis (1997-2007) and to the periods following the global financial crisis (2011-2019 and 2019-2021). However, there is a clear difference between the previous periods and the period covering the pandemic: while from 1997 to 2007 and from 2011 to 2019 there was net employment growth, from 2019 to 2021 there were net employment losses. Accordingly, the upgrading pattern observed during the COVID-19 crisis has a more negative connotation, expressed in the form of significant employment losses in low-paid jobs (especially in quintile 1). On the other hand, in the period 2008 to 2010, covering the employment effects of the global financial crisis, we can observe a clear pattern of job polarization, with mid and mid-low paid workers being the hardest hit by employment losses.

Overall, in most European countries there was net employment creation from 1997 to 2008, net employment losses from 2008 to 2010, and again net employment creation from 2011 onwards (although employment growth rates from 2011 onwards has tended to be lower than those of the period 1997-2007). Germany is the only case where there have been net employment gains in all subperiods. This country also deviates from the general rule because employment growth rates in Germany were higher in the latest subperiod. Romania, on the other hand, experienced net employment losses from 1997 to 2010 (-502722 workers per year), and net employment creation (still, in low numbers) only from 2011.

In terms of patterns of occupational change, Sweden and Ireland are the only cases that, although with few small deviations, have reproduced the EU8 trends, with job upgrading prevailing over the latest decades (and again,

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<sup>3</sup> For more details on employment change in Europe, see Torrejón Pérez et al. (2023).

with the exception of what occurred after the Great Recession, that had a general polarising effect). However, if we look beyond aggregate trends and these two countries, we clearly see a diversity of patterns across countries and sub-periods:

- Germany: there was an asymmetric pattern of job polarization biased towards high-paid jobs until 2007 and job upgrading from 2008 onwards. This is the only country where there was net employment creation during the global financial crisis.
- France: the only country of our European sample where there has been a consistent process of job polarization through the whole period (biased towards high-paid jobs).
- Italy: there was a clear-cut pattern of job upgrading from 1997 to 2007; then the crisis affected mostly employment in quintiles 2 and 5 (like in the Czech Republic, producing some middling), and certain degree of job polarization from 2011 to 2019.
- Spain: there was mid-upgrading from 1997 to 2007, meaning that employment growth was more salient in mid-high and high-paid jobs. It should be noted that employment growth in Spain during the expansive phase of the business cycle was widespread and evenly distributed. From 2008 to 2010 there was job polarization, and again a mild form of job polarization from 2011 to 2019, characterised by employment growth rates that were much lower than those of previous years and decades.
- Czech Republic: employment growth was positive in quintiles 2, 4 and 5 and negative in quintile 1 and 3 from 1997 to 2007; then from 2008 to 2010 job losses were concentrated in the quintiles that grew the most in the previous period (quintile 2 and 5). From 2011 to 2019 there was job polarization skewed towards best-paid jobs. This is a curious case in which the manufacturing sector has a higher weight in the European context, being a major source of high-quality jobs.
- Romania: from 1997 to 2007 employment decreased mainly in low and mid-low paid jobs (producing job upgrading), while later (from 2008 to 2010) the financial crisis impacted negatively all types of jobs, and especially those located in the poles of the wage distribution (resulting in the opposite of job polarization, also known as middling). Employment continued decreasing in low-paid jobs from 2011 to 2019, although in this occasion these employment losses were offset by employment gains in the rest of the quintiles (especially Q3 and Q5), what produced mid-upgrading.

In summary, as figure 1 indicates (and table 1 summarizes), there is no single pattern of employment change prevailing in Europe, but a diversity of patterns across countries and periods. That being said, the patterns that are more visible are two: job upgrading and job polarisation. Only in few cases (Romania and the Czech Republic from 2008 to 2010) we find middling patterns (as opposed to job polarization, that is, an inverted ‘U’ shape) and a case of middling with some degree of downgrading (Italy, also after the global financial crisis).

Generally speaking, job upgrading tends to be prevalent in the long term, especially in periods of economic growth (especially during the long expansive phase that preceded the Great Recession). Job polarisation, on the other hand, is more likely to be found during the recession. Although it is also visible in four countries after 2011, in two of these cases (Spain and Italy) the shape of this pattern only acquired a mild form.

Table 2. Summary of main patterns of employment change by EU country and period

	1997-2007	2008-2010	2011-2019
EU8	upgrading	polarisation	upgrading
RO	upgrading	middling	upgrading
SE	upgrading	upgrading	upgrading
DE	polarisation	upgrading	upgrading
ES	upgrading	polarisation	polarisation
IT	upgrading	middling-downgrading	polarisation
IE	upgrading	polarisation	upgrading
FR	polarisation	polarisation	polarisation
CZ	upgrading	middling	polarisation

Source: author’s elaboration, figure 1

After paying attention to the shape of patterns of employment change across European countries, it also worth saying something on how employment growth rates have evolved over time. Figure 1 reveals that employment growth rates in the EU8 were higher from 1997 to 2007 (+1.6 million workers per year), in comparison to what happened from 2011 to 2019 (+1 million workers per year). Something similar (although with different intensities) has occurred in Spain, Italy, France and Ireland, while in Germany, Sweden, the Czech Republic and Romania the opposite has happened, with employment growth being faster in the latest subperiod.

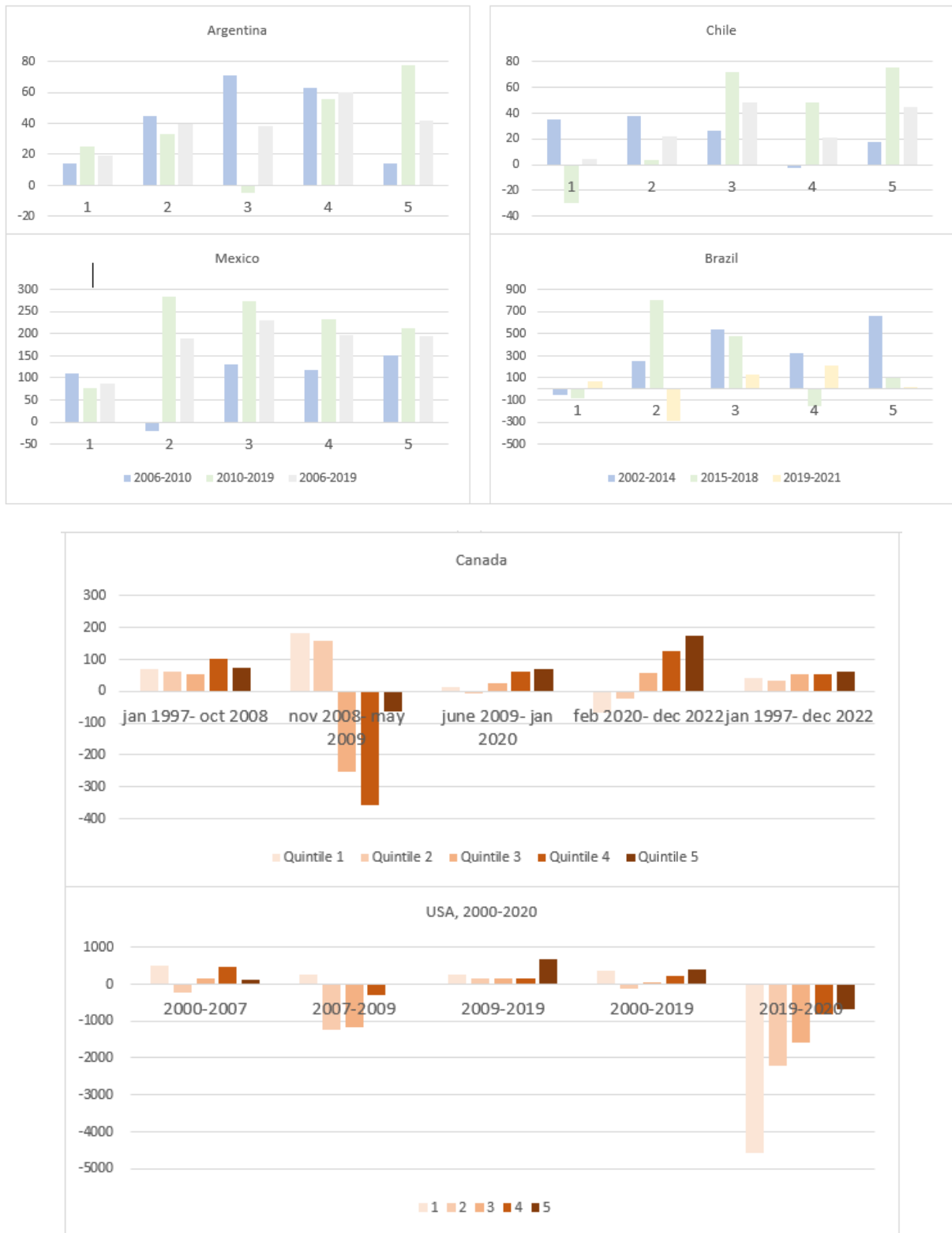
The lowering of employment growth rates through the latest decades is partially explained by the ageing of the population (due to the lowering of fertility rates, and also because of the retirement of the large cohort the baby-boomers represent, that is occurring in recent years), which is making the working age population to shrink. On the other hand, the working age population is also being reduced at the bottom, given that people (especially women) tend to spend more years than before in education. By contrast, the higher participation of women in employment and migration are in some cases offsetting these negative trends.

Figure 1. Employment change (annual, in thousands) in Europe by job-wage quintile



Source: authors elaboration, EU-LFS and SES.

Figure 2. Employment change (annual, in thousands) in America by job-wage quintile



Source: Argentina (Encuesta Permanente de Hogares); Chile (Encuesta de Caracterización Socioeconómica Nacional); Mexico (Encuesta Nacional de Ocupación y Empleo); Brazil (National Household Sample Survey); Canada (Labour Force Survey); US (Current Population Survey).

Figure 3. Employment change (annual, in thousands) in Russia and Asia by job-wage quintile



**Source:** South Korea (Korean Labor and Income Panel Study); India (Periodic Labour Force Survey and Employment and Unemployment survey); Russia (Labour Force Survey and Household Survey of Incomes and Participation in Social Programs).

#### 4.1.2 Employment shifts in North and Latin-America<sup>4</sup>

Focusing first on North America, we see a clear contrast: in the long term, there is evidence of job upgrading for Canada (from 1997 to 2022), while there has been strongest growth in the top and bottom quintiles of the wage structure (job polarization) in the US from 2000 to 2019. So far, the US is the only country, together with France in the European context, that has experienced a consistent process of job polarization through the whole period under study.

In the US and Canada, the Great Recession hit workers hardest in middle quintiles, although in Canada this impact was more weighted towards higher-paid jobs (Q3 and Q4 instead of Q2 and Q3). Another key difference relates to the impact of the COVID-19 crisis: although it has had an asymmetric impact which produced upgrading in both cases (the lower the wages, the higher the employment shock), the overall result was much more positive in Canada. This is because in this country, as in Europe, it only affected negatively low-paid workers (Q1 and Q2, having a net positive effect in terms of employment), while in the US all types of workers experienced employment losses (resulting in significant net employment losses over this short period).

In the four Latin American countries of our sample, the patterns of employment change in the different sub-periods covered are clearly contrasting. This responds to the changing behaviour of different labour and macro-economic indicators, such as the process of formalisation of work and its reversion, the sign of the business cycle, and other related phenomena (Maurizio et al. 2023). However, if we focus in the long term, it is clear that in the latest 15-20 years employment growth has been biased towards best-paid jobs.

Brazil slightly deviates from this general trend, given that in this country the quintiles that have produced more employment are located both in the middle and the top of the wage structure (generating mid-upgrading in the

<sup>4</sup> The following papers deal much more in-depth with the cases of Brazil (Rodrigues-Silveira, 2023), Argentina, Chile and Mexico (Maurizio et al., 2023), Canada (Willcox and Feor, 2023) and the US (Dwyer, 2023).

long term). Apart from this case, clear-cut patterns of job upgrading are visible in Argentina (2003-2019), Chile (2000-2017) and Mexico (2006-2019).

If we zoom into different subperiods, then as expected the evidence is more mixed:

- Argentina: it first experienced middling (or an inverted 'U' shape pattern) from 2003 to 2012, and then job polarization with some hints of job upgrading from 2012 to 2019.
- Chile: this is a curious case in which there was downgrading from 2000 to 2009 and the opposite trend (mid-upgrading) from 2009 to 2017. Given that employment growth rates were much higher during the second sub-period, this effect has prevailed and resulted in an aggregated pattern of mid-upgrading for the whole period.
- Mexico: from 2006 to 2010 rates of employment growth were relatively low and employment creation widespread across all quintiles (except quintile 2). As a result, there were no significant changes in the employment structure. From 2010 to 2019, employment growth was faster and a clear-cut pattern of mid-upgrading (biased towards high-paid jobs) emerged. Given that employment growth rates were much higher in the second sub-period analysed, this was determinant in the long term, and for this reason we find a similar pattern prevailing in the long run (from 2006 to 2019), that again contrasts with the polarization hypothesis.
- Brazil: there was job upgrading from 2002 to 2014 and different forms of middling patterns (as opposed to job polarization) from 2015 onwards. The main difference between what occurred from 2015 to 2018 and from 2019 to 2021 is that in the first subperiod the middling pattern was more marked and biased towards mid-low paid jobs, while in the second sub-period this pattern was biased towards mid-high paid jobs.

Despite the observed non-negligible differences across countries and sub-periods in the Latin-American context, most relevant finding is that in the long run these four countries have converged towards upgrading or mid-upgrading patterns of employment change. In this sense, structural transformations in the labour market in Latin America are aligned with those experienced in many EU countries and in Canada, while they clearly contrast with what happened in France and in the US. Below we provide some hints on some of the factors (mainly related to sectoral restructuring) that may explain the observed trends in all these cases.

#### 4.1.3 Employment shifts in Asia and Russia<sup>5</sup>

The last set of countries of our sample comprises two Asian countries (South Korea and India) and the largest country of the world, that spans between the territory of Europe and Asia: Russia. From this group, South Korea is the only country joining the short list of countries that have consistently experienced job polarization according to our analysis (together with the US and France). Russia and India make a better fit within the list of countries that have registered job upgrading patterns (that include most EU countries, Canada, Argentina, Chile, Mexico and Brazil).

More details on these cases are as follows:

- South Korea: according to our data, job polarization has occurred in the three subperiods under analysis (2000-2009, 2009-2019 and 2019-2021). However, there is an important qualification: in the first and the latest period, job polarization was clearly asymmetric and skewed towards best-paid jobs, meaning that although we can classify this country as one characterised by a consistent process of job polarization, for many years during the latest two decades some hints of job upgrading are identified. The COVID-19 impacts on employment were different from those experienced in Europe, Canada and the US. In this Asian country, the pandemic it mainly affected negatively workers located in the middle of the wage distribution (Q2 and Q3), and not low-paid workers. This implies that the COVID-19 crisis in South Korea had again a similar impact to the one the Great Recession had in most economies.
- Russia: since 2000, the share of low-paid jobs has been consistently decreasing. By contrast, employment growth has tended to be higher as we climb up through the wage structure. This has

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<sup>5</sup> See more information on the cases of South Korea (Hong, 2023), India (Sarkar and Torrejón, 2023) and Russia (Gimpelson and Kapeliushnikov, 2023).

resulted in a continuous process of job upgrading occurring in the first two decades of the new century. As in many other countries, employment growth was much more intense during the first subperiod analysed.

- India: similar patterns to those found in Russia are visible in India. However, there is an important deviation: quintile 2 breaking the monotonic relationship we could observe in the last panel of figure 3, given that employment growth was stronger precisely there over the whole period covered. The contribution to the aggregate job upgrading pattern came mainly from employment dynamics in rural India, where both the hollowing out of low-paid jobs and the employment gains registered in quintile 2 and 4 were stronger than in urban India. While job upgrading has been pervasive in rural India, in urban India employment growth was more intense in middle-wage quintiles.

In summary, India and Russia contribute to enlarge the list of countries where employment growth has been biased towards the top of the wage distribution, together with Romania, Sweden, Germany, Ireland, Canada, Argentina, Brazil, Mexico and Chile. South Korea, on the other hand, adds to the cluster where employment growth has been more intense in both poles of the wage structure, together with the US and France.

#### **4.1.4 Employment shifts at the global level: an overview**

Occupational upgrading is, in short, the most commonly found pattern of structural change at a global scale in the early XXI century. Although job polarization appears in some cases, it tends to be observed mostly in the aftermath of the global financial crisis and/or in some isolated periods, while it has only been observed as a consistent long-term pattern in France, the US and South Korea.

Therefore, we can conclude that the predominant pattern of occupational change at the global level over the last two decades is occupational upgrading, with job polarization being only observed in very few countries and periods. Our results, in this respect, align with those of some recent sociological literature that considers occupational upgrading to be the most widespread phenomenon but acknowledging some cross-country diversity in patterns of occupational change (Oesch and Piccitto, 2019; Fernández-Macías and Hurley, 2017; Oesch and Menés, 2011). On the other hand, our results contrast quite starkly with those of some recent economic literature that has tended to emphasize the pervasiveness of job polarization (Goos et al. 2014; Autor, 2015; OECD, 2017). It is interesting to note that our results also show job polarization in the country most thoroughly studied in this literature and most widely identified with this pattern of occupational change. What initially appeared as the archetypical case of the polarizing impact of recent technological change, is increasingly appearing as an exception instead.

What factors drive the observed patterns of occupational change? As discussed earlier in section 2, technical change has probably contributed to the observed pattern of upgrading, since recent technologies complements high-skilled labour. But there may be other factors behind the pervasive pattern of occupational upgrading, such as the increasing shares of people with secondary and tertiary education, the deagrarianization and the tertiarisation of the economies (as we will see in chapter 4.3), the incorporation of women in the labour market (see chapter 4.2), among others. And furthermore, there are surely country-specific factors at play, such as the institutional setting (minimum wages, union density, or the role the public sector plays as a service provider) or socio-demographic trends (ageing, migration flows). Depending on the nature of these institutions and changes, these factors can contribute in different ways to the creation of incentives for low-paid employment creation. Accordingly, these are often the factors that better explain contrasting patterns of employment change across countries, given that main differences are often located precisely in the bottom part of the wage structure. In fact, it is often the case that polarising trends emerge in countries where employment relations have been deregulated and thus labour is cheaper,<sup>6</sup> fostering low-paid employment creation. In line with this, it is important to highlight that we should avoid a deterministic view of technology or changes in trade irresistibly leading to job polarization across developed and developing economies. Instead, as we have just described, there are many global forces biasing employment creation towards the top of the wage structure. In addition, countries have some room to mediate the effects technology, trade and other factors create, via their institutional setting, regulations and the characteristics and composition of labour demand. The global evidence on occupational change summarised in this report, therefore, reinforces the argument found in some recent literature on this

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<sup>6</sup> As we will see later, South Korea is an exception in this regard, with most low-paid employment creation being driven by the public sector.

topic, according to which job polarisation may not be primarily the result of technological factors, but often more related with factors that ultimately have a political nature (Fernández-Macías and Hurley, 2016).

## **4.2 Employment shifts by gender**

At a global scale, there has been a continuous process of feminization of employment that was consolidating and already visible in the second half of the 20th century. This process was then intensified in the turn of the millennium, with different paces and intensities depending on the region and country. As a result, an important share of women have moved from informality and inactivity (for instance, unpaid labour at home) to formality and paid employment. This movement has been paralleled (and partly caused) by increasing levels of women engagement in formal education. In fact, in some countries participation rates in tertiary education are now higher for women than for men.

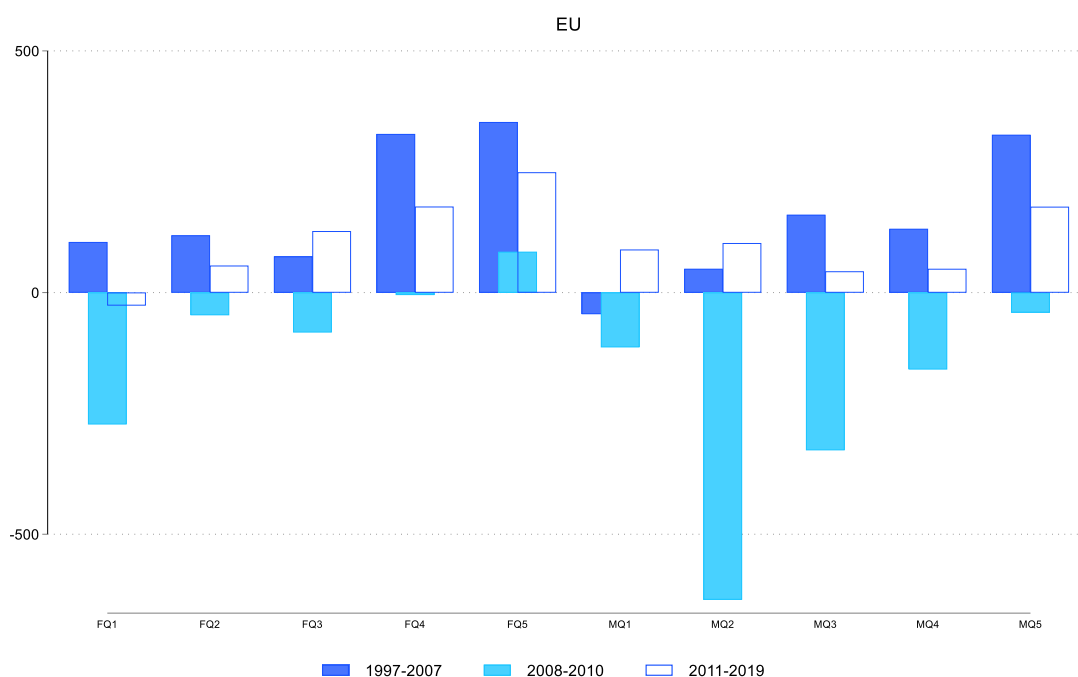
How has this process affected the structure of employment? Has employment growth in the latest decades benefited men and women equally? Which gender has been more affected by the hollowing out of employment during crises, and which by the occupational upgrading of the expansions? How is employment by gender distributed among the distinct job-quality tiers? Are male and female workers converging in terms of employment? In order to answer all these questions, this section briefly present patterns of employment change by gender in our full sample of countries.

### **4.2.1 Employment shifts by gender in Europe**

In the EU8, both men and women in all type of jobs (except male workers in low-paid jobs) benefited from the expansive phase of the business cycle (1997-2007). But female employment increased more than male employment. In this decade ending in the financial crisis of 2007, employment growth was strongest for high paid jobs for both genders, although this bias was more pronounced for women. The main difference by gender is that while women experienced a clear-cut process of job upgrading, in the case of men employment growth was also prominent in middle paid jobs.

The global financial crisis hit men much harder than women. Male workers in mid-paid jobs (Q2 and Q3) were those that experienced higher employment losses, and although women in low-paid jobs also suffered losses, they were much milder than for men. In the meantime, female employment in high-paid jobs continued increasing during the crisis. This partly explains why male employment developments contributed to polarize during this short period, while female employment developments continued to contribute to upgrading.

Figure 4. Employment change (annual, in thousands) by quintile and gender in the EU8, 1997-2019



Source: EU-LFS, SES (authors' elaboration). Note: 'F' stands for Female and 'M' for Male

From 2011 to 2019 there was again net employment creation benefiting men and women. And continuing previous trends, employment creation in this latest period was stronger for women than for men. In addition, female employment growth was again clearly weighted towards high-paid jobs, while male employment creation was more salient in the extremes of the wage distribution.

In summary, in Europe from the mid-nineties, female employment growth was stronger and more biased towards high-paid jobs, contributing in a sustained way to promote job upgrading, while male employment contributed more to polarisation (in particular from 2008 onwards). More details on employment shifts in Europe by quintile and gender can be found in Torrejón Pérez et al. (2023).

#### 4.2.2 Employment shifts by gender in North and Latin-America

##### *Argentina*

As already discussed, in the long term in Argentina (from 2003 to 2019) there was job upgrading. However, different patterns and employment dynamics by gender are found in different sub-periods. From 2003 to 2012, it was mostly men who contributed to the expansion of mid and mid-low paid jobs (Q3 and Q2), while women contributed more to the growth of mid-high and high-paid jobs (Q4 and Q5). Given that employment creation was stronger for men, this resulted in the middling pattern prevailing in this first sub-period. The contribution women made was to bias a bit that middling pattern towards high-paid jobs.

From 2012 to 2019, female employment growth was more polarised, meaning that it was more intense in low and especially high-paid jobs, while male employment growth was more salient in the middle and especially the top of the wage distribution, and negligible in low-paid jobs. Given that in this second case female employment growth was faster than male employment growth, this was decisive at the time of drawing a polarising trend in employment.

In summary, while in 2003-2012 in Argentina women contributed more than men to promote job upgrading, in 2012-2019 the opposite happened. This erratic behaviour has to do with the role different sectors played in different subperiods, as we will see later. More details on employment shifts in Argentina by quintile, gender and other variables can be found in Maurizio et al. (2023).

## *Chile*

In the years going from 2000 to 2009, female employment creation was more salient in the bottom and top of the wage structure (quintiles 1, 2 and 5), while male employment growth was only noticeable in the bottom three quintiles. Therefore, although men and women contributed to downgrade the employment structure, the contribution of men in this sense was much more decisive. Employment creation in high-paid jobs mostly benefited female workers. In the same sub-period, female employment creation was faster than male employment creation, with Chile experiencing a clear process of feminization of employment.

Feminization of employment continued in Chile from 2009 to 2017. In this second and more recent sub-period, both sexes contributed significantly to enlarge the share of mid and high-paid jobs. There were net employment losses only in male low-paid jobs.

Hence, although employment creation in Chile has been visible in all quintiles during the whole period, one can trace two general lines: first, the role of women has been more prominent, given their higher employment growth rates; and second, women have contributed more than men in the long run to upgrade the Chilean occupational structure. An in-depth description of employment trends in Chile by quintile, gender, and other variables can be found in Maurizio et al. (2023).

## *Mexico*

Most of the employment created in Mexico from 2006 to 2010 was male. Male employment increased in all quintiles but quintile 2. Female employment increased at a slower pace, and fundamentally in quintiles 3, 4 and 5. Although the role of female employment was not so prominent as the role of men in quantitative terms, given that female employment was located mostly in the top of the wage structure, it made a key contribution to bias employment growth towards the middle and the top of the employment distribution.

From 2010 to 2019, employment growth rates were much higher than in the previous years for both men and women. Male employment creation continued being faster than female employment creation, although there was some convergence in this regard. New male employment created in this period tended to be concentrated in mid-paid jobs, while female employment creation was intense in all areas but the bottom of the wage structure.

Mexico is a curious case where the generalised process of feminization of employment is still not happening: male employment growth rates outperform female employment growth rates in both sub-periods. Apart from this, the role of women is, although not so prominent, qualitatively similar to the role women is playing in most countries, with the distribution of female employment tending to be more skewed towards high-paid jobs. More details on employment shifts in Mexico by quintile, gender and other variables can be seen in Maurizio et al. (2023).

## *Brazil*

When patterns of occupational change are decomposed by gender in Brazil, the resultant figures reveal similar trajectories for men and women most of the time:

- From 2002 to 2014, male and female employment creation was strongest in mid and high-quality jobs. However, employment growth was faster for the latter: female participation in the fifth quintile, for instance, grew by 82%, double that of men. Both sexes but especially women benefited from job upgrading in this long period.
- From 2015 to 2019, employment growth was concentrated in quintile 2 and 3. In the case of women only, there were also net employment gains in quintile 5. Also in this second period, there were more new female jobs than new male jobs, meaning that the process of feminization of employment continued at least until 2019.
- Main differences by gender are found in the period covering the impact of the pandemic. During these two years (2019-2021), while men were on a path of downgrading (male employment creation continued occurring, but mostly in low-paid jobs, while the crisis generated employment losses for male workers in quintiles 2 and 5), women continued experiencing job upgrading, recording net employment gains in the top three quintiles and net employment losses in the bottom part of the wage distribution. The COVID-19 crisis hardest hit women than men, being this the main cause explaining why the process of feminization of employment was at least temporarily put on hold.

We can extract two main conclusions: first, that Brazil adds to the vast majority of countries where there has been a consistent process of feminization of employment through the latest decades, that was only reverted by the pandemic. In any case, we can expect from this effect induced by the COVID-19 crisis to be temporary. The feminization process could be attributed to the fact that traditional obstacles to incorporating women into the labor market have been and are being replaced with more flexible alternatives. Second, that the contribution of women to enlarge the size of high-paid jobs has been decisive (more than that of men) and constant over the whole period. An in-depth description of employment trends in Brazil by quintile, gender, and other variables can be found in Rodrigues Silveira (2023).

#### *Canada*

Overall, since 1997 women in Canada have been overrepresented in low-paid jobs, and underrepresented in the top three quintiles. During the 25 years under analysis, there has been a process of convergence in terms of earnings and job positions, meaning that the job quality gender gap has been reduced. This process of convergence was accelerated by the COVID-19 crisis, that hardest hit female low-paid workers. However, despite circumstances and progress made, in 2022 women continued being overrepresented in low-paid jobs and underrepresented in mid and high paid jobs. Given that women departed from a much worst scenario 25 years ago in terms of paying and job quality, this helps explaining why trajectories of female workers since then have been more often associated to job upgrading patterns.

In general, between 1997 and 2022, women benefited from job upgrading, with the biggest employment gains in quintile 4 accompanying gains across the entire wage distribution. Lower employment gains for women have been in quintiles 1 and 2. The employment trend for men is rather w-shaped, with highest gains at quintile 5, 3 and 1 respectively -for more information on occupational change in Canada, see (Willcox and Feor, 2023)-.

#### *United States*

In the US, racial and ethnic differences in job growth have been more pronounced than gender differences from 2000 to 2020. Main differences in patterns of employment change are structured by race, while the different sexes of a same race experienced similar patterns.

Still, the main differences by gender are found in these groups:

- The largest gender difference is for the Hispanic population, with women particularly weighted to the bottom relative to men, perhaps reflecting gender divides among immigrant populations. Hispanics in general, but especially Hispanic women, have contributed to employment increasing in low-paid jobs.
- Among non-Hispanic whites the opposite happened: female employment creation was particularly weighted towards the top of the wage structure relative to men. While white women experienced the most pronounced pattern of upgrading, white men experienced some degree of job polarization (skewed towards high-paid jobs). Both white men and women were the only ones suffering net employment losses from 2000 to 2020, with employment decreasing in both cases in mid-paid jobs.
- Among blacks, men and women experienced job polarization, but female employment growth was more skewed towards the extreme poles of the wage distribution.

In summary, female employment in the US has tended to be more weighted towards the extreme poles of the wage distribution. Their participation in the labour market has contributed more to polarize than that of men. This marks a clear difference with trends by gender in other countries, where female employment dynamics are more often associated to job upgrading.

In other words, the position of women in the labour market is and have got more polarised than the position of men, depending to a large extent on their race or ethnic group: while white women have benefited more than white men from employment creation in top quality jobs, Hispanic women have mostly registered (more than Hispanic men) employment gains in low-paid jobs. The contribution of black women to employment growth was also more weighted to the extreme poles than the contribution of black men. In short: new job positions for women have been more likely to be found in both high-quality jobs and low-paid jobs, while new job positions for men are more evenly distributed. Race and ethnic differences are more determinant for men than for women (Dwyer, 2023).

### 4.2.3 Employment shifts by gender in Asia and Russia

#### *South Korea*

During the first decade of the new century (2000-2009), male employment growth in South Korea was faster than female employment growth. Other key difference is that while male employment creation was more biased towards high-paid jobs (Q3, Q4 and Q5), female employment grew in a polarised way (being more salient in quintiles 1, 4 and 5). In the second decade (2009-2019), female employment growth rates converged with those of men. Still, we do not observe a process of feminization of employment neither in this second sub-period. South Korea represent in this sense, together with Mexico, an exception to the general rule. Apart from that, male workers exhibited a polarizing trend biased towards high-paid jobs, while women exhibited a polarizing trend but more biased towards low-paid jobs.

By considering what has happened in both sub-periods, one can conclude that the role of female employment as a polarizing force is more prominent and consistent than the role of male employment. As we have also seen with data on the US, it seems that female employment tend to grow in a polarised way precisely in the countries where polarising dynamics are more consistently found. This implies that job polarization has a differential impact by gender, affecting more and in a more negative way to women. This is because newly low-paid created jobs are more often occupied by women, while newly created high-paid jobs are more often occupied by men. Surprisingly, in South Korea many of these new low-paid jobs are very often public services in sectors such as health and education, as we will see below. More details on employment shifts in South Korea by quintile and gender can be found in Hong (2023).

#### *India*

In India, the large reduction of the size of low-paid jobs registered from 2012 to 2020 was mainly driven by large reductions in the number of male workers occupied there. Women also faced net employment losses in quintile 1, but these were not so marked. In quintiles 2-5, by contrast, there was net employment creation. Female employment creation in these other locations has been more intense than male employment creation. For both reasons, there has been a clear process of feminization of employment in India from 2012.

Females have contributed more than men to the growth of quintile 2, while men benefited slightly more than women from employment creation in quintile 4 and 5.

To put it simply: for males, main changes have occurred in the poles of the wage structure: a large contraction in quintile 1, and a not so large expansion of employment in quintile 5. These dynamics were determinant at the time of promoting job upgrading in India. But this upgrading force came at a price, and resulted in net employment losses for men.

On the other hand, main changes for females have occurred in quintile 1, 5 and especially 2. Employment variations have been more evenly distributed, and although their contribution to job upgrading was not so relevant, women at least registered net employment gains. These and additional results are discussed with more detail in Sarkar and Torrejón (2023).

#### *Russia*

In Russia, reallocation of men from bad jobs (quintile 1 and 2) to better paid jobs was marked in the first sub-period (2000-2008) and continued during the second sub-period (2008-2019), though at a slower pace. Reallocation of female workers went a bit differently. The first sub-period saw a massive hollowing out of the first quintile, partially to the benefit of the second quintile, partially to the benefit of the top ones. It was associated with a rapid contraction of low paid jobs in agriculture and manufacturing where the fraction of female employment was significant. During the second sub-period, the two lower quintiles lost employment and the rest gained employment. Though the change for both men and women has been towards upgrading in both sub-periods, the intensity of the change was stronger during the first one.

More generally speaking, downsizing of the bottom quintile from 2000 to 2019 was largely due to women who were leaving these jobs, while the employment expansion in the upper quintiles was provided mainly by men moving into these jobs. In other words, when considering the full period under analysis, we see that male workers have benefited more than female workers from employment creation in better paid jobs. Female workers have benefited by leaving the least paid jobs, though not always by getting the best ones. More details on employment shifts in Russia by quintile, gender and other variables are in Gimpelson and Kapeliushnikov (2023).

#### **4.2.4 Employment shifts by gender: an overview**

At the beginning of the period covered in this study (just before the turn of the millennium), women were in a disadvantaged position in the labour market in all of the countries analysed, in two respects. First, women were less likely to be in employment than men (female employment rates were lower). Second, women in employment tended to be in lower paid jobs. At the end of the period, this double disadvantage persisted, but in most cases, it had been reduced to a significant extent. In other words, although from a static perspective women are still in a disadvantaged position in the labour market all around the world, from a dynamic perspective the last two and a half decades have been a period of clear improvement in their position. In most cases, there has been a feminisation of employment (a relatively larger increase in employment for women than for men), and women have experienced more occupational upgrading than men.

Although this is the general pattern, there are important exceptions, especially with respect to the association between the feminisation of employment and occupational upgrading. In many cases, men saw expansions in mid-paid occupations rather than at the top during expansions, and declines in mid-paid jobs during recessions, while women tended to see more consistent upgrading across the cycle. But in the US, female employment tended to be more polarised than male, and something similar happened in South Korea and to a lesser extent France. It is interesting to note that these are specifically the same three countries where we observed more consistently job polarisation in the period analysed in this study: in other words, where the feminisation of employment is polarised, it tends to be associated with a general pattern of job polarisation overall; whereas feminisation with upgrading tends to be associated with occupational upgrading in the overall trends. As argued by Dwyer 2013, this may suggest that a particular type of polarised feminisation of employment associated with the care economy in the US case explains to some extent the overall pattern of job polarisation that characterises the US and other advanced economies. But what our evidence also shows is that there is nothing intrinsically polarising about the feminisation of employment and the growth of the care economy, because the same phenomena contributed to occupational upgrading instead in the majority of countries covered in this study.

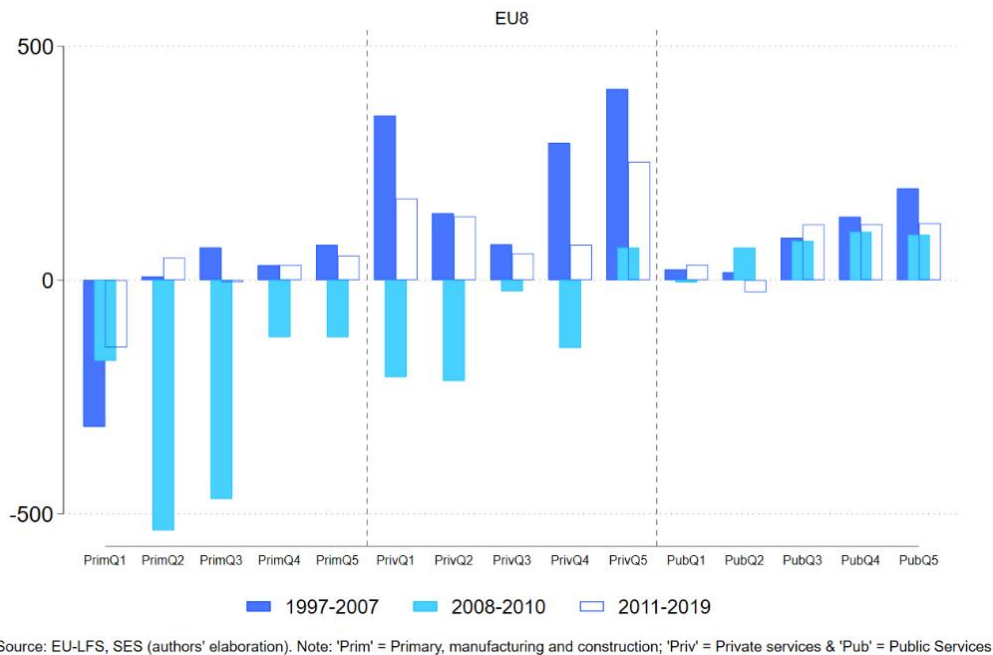
### **4.3 Employment shifts by economic sector**

In this final analytic sub-section, the focus is on employment shifts by broad economic sector. Transformations in the sectoral composition of the economies are directly linked to structural changes in employment, and thus are key to understand the patterns discussed in previous sections. What has been the impact of underlying processes of deagrarianization, deindustrialization and tertiarisation on the evolution of employment structures across the globe? How are these processes affecting job quality?

#### **4.3.1 Employment shifts by sector in Europe**

In periods of economic growth, private services have been the main engine of employment creation in Europe. Private services are diverse and include, for instance, wholesale and retail trade; accommodation and food service activities; information and communication; financial and insurance activities; professional, scientific and technical activities, and few other industries. 80% of newly created employment from 1997 to 2007 in the EU8 was in private services. Then this sector was hard hit by the global financial crisis, generating net employment losses between 2008 and 2010. But from 2011 to 2019 this sector grew in a significant way again, concentrating up to 65% of total new employment. Therefore, private services have been the main engine of employment growth in Europe in the last two and a half decades.

Figure 5. Employment change (annual, in thousands) by quintile and sector in the EU8, 1997-2019



But as we can see in figure 5, private services have another fundamental characteristic: during expansive phases of the business cycle, they tend to grow in a polarised way. That is, they mostly create low-paid and high-paid jobs. Given the importance of this sector as the main engine of employment growth in Europe, this implies that it must strongly contribute to job polarisation in Europe. But since in overall terms, it is occupational upgrading rather than job polarisation that has tended to dominate, the polarising dynamic of private services must have been compensated by trends in other sectors in very significant ways.

Public services have also grown in a consistent way over the last two decades, though at a slower pace. The main contrast vis-à-vis private services is that public services have counteracted the polarising effect induced by private services, promoting occupational upgrading: most new public service employment has been created in the top three quintiles, with this happening in all periods under analysis. Another peculiarity is that this is the only sector that did not experience net employment losses during the financial crisis. On the contrary, public services continued growing from 2008 to 2010. Therefore, although public services are not as dynamic as private services, they are more resilient in times of crisis.

Finally, the goods producing sector (the group that includes the primary sector, manufacturing and construction) clearly reduced its size during the latest decades. This contraction was accelerated by the global financial crisis (affecting all types of jobs, but especially mid and mid-low paid jobs) and persisted from 2011 onwards, although in this last period job losses were concentrated only in low-paid jobs.

Although the decline of the goods producing sector was particularly harsh during the global financial crisis of 2008-2010, it should be emphasized that this sector has been consistently reducing its share of employment over the entire period covered in this study. In contrast, the public sector experienced a consistent but slow expansion over the entire period, and the private service sector expanded very significantly overall despite having a more cyclical pattern (contributing to net job destruction during the financial crisis). These are the broad contours of an advanced process of tertiarization of the economy and employment, which in Europe has been associated with occupational upgrading. As figure 5 shows, this upgrading was driven by a secular decline in mid and low paid jobs in the goods producing sector and a mild but consistent expansion of public service employment. The combined upgrading effect of the goods producing and the public services sectors was strong enough as to dominate the consistently polarising effect of private services, positive in expansions and negative in recessions.

### 4.3.2 Employment shifts by sector in North and Latin America

#### *Argentina*

In Argentina, as in Chile and Mexico, there is a clear contrast between employment dynamics across different subperiods. This also affects to the way different sectors contributed to shape aggregate patterns. However, especially if we focus in the latest subperiod (2012-2019), we can identify some commonalities between Argentina, Europe and other countries. As in Europe, public services (health, education, public administration) fuelled the growth of high-paid jobs. Similarly, private services (cleaning, domestic services, transport...) tended to contribute to the growth of both, high-paid jobs (Q4) and low-paid jobs (Q1 and Q2), while other sectors, such as those related with the production of goods, tend to be located in the bottom of the employment structure.

#### *Chile*

The downgrading pattern found in Chile from 2000 to 2009 is largely explained by an increase in the share of agricultural, forestry and fishing workers in quintile 1. But also, by the growth of some private services, such as domestic services and recreation services (bartenders and butlers in hotels and restaurants) in quintile 2.

From 2009 to 2017, the number of agricultural workers and sales workers occupied in low-paid jobs decreased. By contrast, employment growth took place mostly in quintiles from 3 to 5: with the number of sales and retail workers and drivers increasing in quintile 3 and the number of public (mainly education) and private services (administrative professionals) increasing in quintile 5.

#### *Mexico*

From 2006 to 2010 in Mexico employment growth rates were low and the employment structure barely changed. From 2010, employment growth rates increased, and a middling pattern (skewed towards high-paid jobs) appeared. The main jobs contributing to the growth of intermediate quintiles in Mexico were food preparation workers and personal care workers.

While in most countries low-skilled private services such as the abovementioned ones tend to be located in the bottom of the employment structure, in the case of Mexico they are located in the middle part. This may be because these jobs do have better employment conditions in this country. But given that in Mexico the educational level of workers rather than their wages had to be used for classifying jobs into quintiles (because of lack of data), it may also be that food preparation and personal care workers in Mexico tend to be overeducated and are thus classified higher than they would be if we knew their wage levels. If this is the case, the overall pattern of Mexico would be partly biased, and the expansion of mid-paid jobs in this country would not be as large as it appears in our analysis.

#### *Brazil*

From 2002 to 2014 there was upgrading in manufactures and agriculture. Many high-paid jobs were created in both sectors, while the number of low-paid jobs decreased. Agriculture was particularly benefited, with a substantial increase (of about 150%) in quintile five. These processes of upgrading were accompanied (or explained) by a process of formalisation of work: a large increase of formal employment in all quintiles and a decrease of informal employment. Apart from that, professionals in administrative services and education outstand as the major occupational increases in top quintiles during the first period under analysis.

The next sub-period (2015-2018) was characterised by a minor reduction of jobs in manufacturing: job losses were concentrated in high-paid manufacturing jobs, while low-paid manufacturing jobs continued increasing. In other words, the manufacturing sector downgraded. Something similar happened with agriculture, that became stagnant. Employment in agriculture in quintile 2 continued increasing, but this dynamic was offset at a large extent by reductions in the number of agricultural workers in quintile 1 and especially 3 and 5. These downgrading patterns, as observed in the manufacturing and the agricultural sector, were accompanied by an increase of informal work in the Brazilian economy, that reverted progress made in previous years.

Finally, the COVID years (2019-2021) penalised low and high-paid jobs in manufactures, while manufacturing jobs in middle quintiles continued increasing. In the meantime, the agricultural sector was not negatively affected by the COVID-19 crisis, and many mid-paid agricultural jobs were created these years. Regarding services, the COVID-19 crisis negatively impacted upon those urban workers with lower wages. That is, those occupied in low-skilled services, such as personal services, and working in sectors such as retail trade, leisure, etc. These are the type of activities that require human contact, and thus were limited or forcefully closed (while those in rural

areas tend to be more occupied in the primary sector). During the COVID years, informal employment continued acquiring importance in Brazil.

#### *Canada*

Employment gains in private services have been concentrated in the poles of the wage distribution. In this sense, as in other countries, private services have had a polarising impact. Employment gains in public services have been concentrated in quintiles 2, 4 and 5, promoting mid-upgrading. The goods-producing sector has had a not so significant (as seen above, they have grown at a lower rate) but similar upgrading impact than public services, given that employment gains in this sector took place mostly in quintile 3 and 5.

Overall, employment at the bottom of the wage distribution is concentrated in private services, whereas employment at the top is more evenly distributed between the two service sectors and, to a lesser extent, the goods producing sector. Public services are concentrated in high-wage jobs (quintile 4 and 5), while private services are concentrated in low-wage jobs. However, the share of high-paid private services has been increasing over time. Consequently, the job upgrading experienced over time in Canada's labour market is a product of these converging sector forces. Public services continue being concentrated in high wage jobs, and their growth, along with the more recent trend of high-wage job growth from private services sectors has resulted in the job upgrading seen overall. On top of that, there is the goods-producing sector contributing to this upgrading pattern, given that it has added employment fundamentally in mid and high-paid jobs in the latest decades.

In summary, the dynamic of public services and the goods-producing sector, that have been able to generate many mid and high-paid jobs, have reshaped the polarising impact the service sector has had in Canada over the latest decades.

#### *United States*

Jobs grew in quite diverse patterns across the eight big industrial sectors in the US economy.<sup>7</sup> But as in other countries, private services tended to polarise, while public services promoted upgrading. The trough in job growth in the middle of the job wage structure was produced by a significant decline in extractive, manufacturing, and wholesale trade. The only sectors in the US economy that showed any kind of employment growth in the middle quintiles during this period was construction, transport and repair and health services.

### **4.3.3 Employment shifts by sector in Asia and Russia**

#### *South Korea*

The job polarisation pattern skewed towards high-paid jobs experienced in South Korea from 2000 to 2009 reproduce and is largely explained by the behaviour of employment in services, that grew most intensively in quintiles 1, 4 and 5. While private services are clearly polarising, public services grew at a lower rate, but are instead more weighted to the top of the wage distribution.

High-paid educational services have grown significantly in both the private and public sectors, while the services that have increased most in bottom quintiles are those related with health and social work, that have increased due to the ageing of the population.

The manufacturing sector also contributed to this polarising trend, with job losses in quintile 2 and job gains in quintile 4 and 5. This is due to increased imports of lower-cost consumer goods from China, and to the outsourcing of the manufacturing production.

From 2009 to 2019 there was again job polarisation, but in this case the pattern was more symmetric. It is striking that in this second period, services had again a polarizing effect, but in this case the pattern is clearly asymmetric and biased towards low-paid jobs. This is due to the creation of many private (food and other services) and especially public service jobs in the health and social work sector, as resulting from the ageing of the population. Health and social work service employment drove the increase in lower-wage public sector employment. This reflects the growing demand for medical and care services as the aging population increases.

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<sup>7</sup> All sectors (23) are combined into the following eight groupings: 1) extractive and manufacturing; 2) construction, transport, and repair; 3) communications, utilities, and sanitary service; 4) wholesale trade; 5) retail trade, private and personal services, and entertainment and recreational service; 6) business service, other professional service and finance, insurance and real estate (FIRE); 7) health services; and 8) educational service, social services, and public administration.

### *India*

In India, the decrease in employment in low-paid jobs was driven by agricultural jobs, while job gains in quintile 2 are also driven by the agricultural jobs. The jobs in the lowest quintile are elementary and subsistence agricultural jobs. The jobs in quintile 2 are the skilled agricultural jobs. Still, although there has been a restructuring of the agricultural sector in the period, employment losses overcome employment gains, resulting in the agriculture sector having reduced its size. On the other hand, and with the exception of manufactures, the rest of the sectors have expanded. The increases in high-paid jobs are mainly driven by the increase in employment in construction (quintile 4) and in a mix of sector that includes transport, storage and communications, wholesale and retail trade, and other services.

This expansion in non-agricultural and non-manufacturing industries has been accompanied by the rise in general education levels of the workforce. The transition towards an economy of services is responsible again of job upgrading patterns.

### *Russia*

All industries in Russia are aggregated into 7 groups, among which are agriculture, construction, manufacturing, trade/sales, other market services, nonmarket services, and other industries. In this country, the probability of belonging to quintile 1 for agricultural workers exceeds 0,5 but declines to close to 0 in quintile 5. In other words, this relates to low paid activities that are concentrated in the bottom quintiles. Second, this is the pattern of increasing probability observed construction and in other market services. The latter include finance and IT sectors. All these are relatively high paid activities. Third, this is a  $\cap$ -shaped trajectory when conditional chances for being in the middling part are higher. Examples are trade/sales and non-market services, in which most workers are concentrated in the middling jobs. Our data show how conditional probabilities over quintiles change over time. We observe here the same pattern that we discussed earlier. This is a rapid upgrading until 2008 and then the turn to stagnation during the following years. Such evolution in the job structure corresponds with the general trend in the Russian economic development.

#### **4.3.4 Employment shifts by sector: an overview**

In this subsection, the focus is on employment shifts by broad economic sector. Transformations in the sectoral composition of the economies are directly linked to structural changes in employment, and thus are key to understand the patterns discussed in previous sections. What has been the impact of underlying processes of deagrarianization, deindustrialization and tertiarisation on the evolution of employment structures across the globe? How are these processes affecting job quality?

First, we know that private services have been the engine of employment growth in most countries in the latest decades. Public services have also experienced net employment gains, but employment growth rates have tended to be lower in this sector vis-à-vis in the private service sector. On the other hand, the goods producing sector (that includes construction, manufactures and agriculture) has reduced its size in most countries.

There is a clear contrast between the dynamic of private and public services: while private services tend to promote job polarization (these jobs tend to be located in both, the lower-paid quintile and the higher-paid quintile), public services tend to promote job upgrading (public service jobs tend to be high-paid). These trends are observable in most countries of our sample. South Korea constitutes a remarkable exception, being a country that generates many low-paid public service jobs.

## 5 Conclusions

The “jobs approach” to describing structural employment shifts is descriptive and simple. It has been developed and refined in many iterations since first developed by American researchers in the 1990s (CEA 1996, Wright and Dwyer 2003). The fact that it relies on occupation and sector variables that exist in harmonised form in most national labour force surveys makes it ideal for cross-country comparison. The jobs approach has contributed in particular to an increasingly visible, international policy and research debate on whether aggregate employment is polarising or upgrading in advanced, post-industrial economies. This can provide a tentative answer to the important policy question of whether our labour markets are producing more good jobs than bad or middling jobs.

Much of this work has related to the USA on the one hand or European Union member states on the other. In this joint ILO / European Commission-JRC project, building on earlier work in Eurofound’s series of European Jobs Monitor reports, the same methodology has been extended to a selection of additional countries at different stages of development across two more continents (Asia and South America). This project has also updated existing jobs approach analysis in the US and eight EU member states to include the period of the COVID-pandemic in 2020-21. It highlights some important commonalities across countries despite different levels of economic development in GDP per head terms.

In each, the share of primary sector (primarily agriculture) employment has been contracting. The process of deagrarianisation is already more or less complete in the most technologically advanced economies where shares of agriculture are marginal, often in the range of 1-3% of total employment – compared to around 40% in 1900. Only in a small number of such countries – e. g. Romania – has the shift away from agriculture been an important contributor to structural shifts in employment over the last two decades. In countries such as India, however, agriculture remains the biggest sector by headcount and deagrarianisation remains the engine of labour market structural change.

Manufacturing employment has also been in more or less continuous decline over the period in question, and for largely similar reasons. Both food and goods production have been the principal beneficiaries of technology-based productivity enhancements going back over two centuries. These have reduced the labour required for a given quantity of output in both broad sectors. Output has expanded exponentially even with declining labour inputs. Globalisation – the integration of supply chains across countries and regions and related trade liberalising policy developments – has given further impetus in particular to deindustrialisation in advanced economies as it has freed up multinational companies to relocate production locations to lower-cost, developing countries.

The corollary has been the expansion of tertiary or service sector employment. A first important conclusion from the country-level analyses in this report is that employment headcount has tended to grow in all countries covered over recent business cycles. The growing service sectors, which account for approaching three quarters of employment in many developed economies, have absorbed more net new workers than have been shed in declining sectors such as manufacturing and agriculture. Growing labour market participation and higher employment rates, especially for women and older workers, have sustained employment growth. This has been the case even in the EU, Russia and South Korea where the demographic context has been especially challenging. Contracting working age populations has led to more subdued employment growth over the most recent decade; but headcounts have continued to increase due to increasing labour utilisation.

The “service transition” is evident in all of the national contributions and prompts a reflection on the nature of the employment expansion in the non-goods producing sectors. Some services are provided by private entities – retail, professional services, food/beverages for example – while others have significant state-funding supporting their provision – for example, health, education and especially the civil service or core public administration. The predominantly private service sectors tend in turn to divide between well-paid, knowledge-intensive services on the one hand and less well paid in-person services on the other. Services employment is less evident in most countries in the middle of the wage distribution. This divergence is more commonly observed in the more developed, higher-GDP per head countries. Here, the expansion of private services employment has as a result been a factor contributing to employment polarisation.

Public sector employment has also been expanding in most countries – austerity notwithstanding – as demand for the services provided is a/ income-elastic, b/ structurally growing for demographic reasons (healthcare) or because of the expansion of higher education and c/ because there has been limited technological displacement of the services provided to date. As public sector employment tends to be skewed towards higher qualified and

higher paid jobs, growth in these sectors has contributed to upgrading in most countries (though with South Korea as an important exception).

State-funded employment is of course directly impacted by public policy – governments do create jobs – and more public investment in such jobs results in more distinctively upgrading patterns. This has been the case, for example in the EU8 countries and in Canada over the most recent decade. Employment in these sectors has also tended to be more resilient to shocks with levels maintained or even strengthened during downturns.

A second important conclusion is that there is a variety of employment shift patterns observed across countries and periods. There is no single pervasive pattern in either developed or developing countries. And patterns tend to change over time in individual countries; in the USA, where employment growth has been polarising over the full period covered in this analysis (2000-19), employment shifts in the post global financial crisis decade (2009-19) are more obviously upgrading with highest employment growth in top quintile jobs. Earlier analysis by Autor (2013) and by Wright and Dwyer (2003) confirms how employment shift patterns have tended to change over time in the US. Of the EU member states covered, only France (polarisation) and Sweden (upgrading) show the same pattern of growth across the three periods covered.

Though some country-period pairs are either clearly upgrading (Russia, 2000-2008) or clearly polarising (South Korea, 2009-19), many exhibit hybrid patterns with elements of polarisation and upgrading. And many including the South American countries covered contribute distinctive patterns of their own with Argentina (2008-12), for example, an example of anti-polarisation with employment growth concentrated in mid-paying jobs and shading off in the tails of the wage distribution.

The extent to which broader structural shifts are upgrading or polarising or reflect some other pattern depends on where in the wage structure the growing services jobs as well as the structurally declining job-types. In the advanced economies that have hitherto featured most prominently in the debate on employment polarisation, the fact that much manufacturing employment – in particular, blue-collar production jobs – was mid-paid meant that deindustrialisation was one clear vector of polarisation. It contributed to ‘hollowing out’ the middle. It is no coincidence that the two countries (USA and UK) where the manufacturing share of employment contracted the most and where the sector now accounts for less than one in ten jobs are also those where the first diagnoses of employment polarisation were made in the 1990s. Similarly, in those countries such as India where the move from the land is ongoing, the contraction of agricultural employment has tended to be automatically upgrading as most of the losses are in low paid employment.

Taking account of a larger selection of countries, however, a variation in occupational wage structures across countries is more evident. In Russia, much construction and manufacturing employment tends to be in higher rather than mid-wage quintiles; in South Korea, employment growth in the health and care sectors has tended to be in lower-paid jobs and contribute to polarisation whereas in the EU, rapid employment growth in the same sectors contributes more to upgrading. One contributing factor then to different patterns of observed employment growth between countries is that the same jobs may be relatively better or worse paid in some countries than in others.

A third important conclusion is that the business cycle and in particular recessions are periods of intense reallocation of labour which tends to concentrate in particular groups of jobs. For the countries where the periodisation allowed to identify the effects of the global financial crisis or the COVID-crisis, the employment shifts were sharply polarising in the former (in the US, Canada, most of the EU8) but equally sharply and monotonically upgrading in the latter crisis – where employment destruction was concentrated in low-paying service jobs but where well-paid, knowledge intensive service employment remained resilient.

A fourth important conclusion is that the period covered from the beginning of the century has seen a significant feminisation of the workforce in most countries (exceptions: Mexico and South Korea) with a resulting differentiation in the employment shifts observed for either sex. There have been, for example, an additional two new jobs taken by women for every one new job taken by men in the EU over the last two decades. Men still outnumber women at work in nearly every country but gender employment gaps are closing. Meanwhile, the persistence of occupational segregation sees men and women continuing to predominate in specific jobs and sectors. Female employment has grown strongly in the mainly state-paid sectors (health, education, public administration). Men predominate in private services but also in some of the structurally declining sectors (agriculture, manufacturing). This is reflected in employment shifts that tend to be different for men and women in the same territory over the same period. In the EU and Brazil inter alia, female employment has been more upgrading while male employment has been more polarising.

Two important methodological caveats are relevant here to qualify impressions of rapidly improving gender equality. The first is that the jobs approach estimates median or mean wage per hour by job regardless of gender and is therefore blind to within-job gender gaps (and these tend to be greater in higher paid jobs). The second is that the approach emphasises marginal change in employment in a given period but abstracts from structural or ongoing disparities which disfavour working women; even in those countries where women have taken the majority of net new well-paid employment, they continue to be over-represented in low-paid jobs and under-represented in well-paid jobs. It's also worth noting that the gender patterns indicated above are not universal. We see them reversed for example in South Korea and Russia with men accounting for most top-paid recent job growth.

The canonical hypotheses regarding employment shifts in developed market economies come from the field of labour economics, are technological in nature – routine biased and skill biased technological change – and provide convincing accounts of the mechanisms underlying the two main patterns of employment shift observed, polarisation and upgrading. They also both predict relatively stronger growth in top quintile, well-paid jobs which has been the most consistent finding of jobs approach analyses across different country-periods.

But beyond technological advances (computerisation, digitalisation, automation) there are many other factors at play which may influence the occupational and sectoral composition of employment. These include changing trade arrangements and globalisation which impact the international location of production and division of labour. They also include labour market institutional factors (for example minimum wages, employment protection legislation, union coverage and bargaining power) which may shape the demand for jobs in particular in lower and mid-paid employment.

Increasing attention is also paid to factors on the labour market supply side. Factors such as educational upskilling, the increased labour market participation of women and levels of migrant labour contribute to changes in the employment structure. Growing inequality may also have a role in the changing distribution of employment across occupations. Employment polarisation has been observed for example in large metropolitan areas resulting from consumption spillover effects where demand from time-poor, higher paid workers feeds employment growth in personal services, hospitality and related sectors.

The variety of observed employment shift patterns in these country analyses should prompt scepticism of any single, overarching narrative about the determinants of employment shift in market economies. Patterns simply vary too much over time in the same country or across countries in a given period for there to be a single explanation or set of explanations. In addition to the technological factors transforming work and labour demand, there are many other socio-economic and institutional drivers operating at more local, regional or national level that bring their influence to bear on the changing structure of employment.

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