OECD Employment Outlook 2016

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Foreword

The OECD Employment Outlook *provides an annual assessment of key labour market developments and prospects in OECD member countries. Each edition also contains several chapters focusing on specific aspects of how labour markets function and the implications for policy in order to promote more and better jobs. This year's chapters cover vulnerable youth, job quality, skills use at work, the short-term effects of structural reforms, and labour market gender gaps in emerging economies. Reference statistics are also included.*

The 2016 OECD Employment Outlook *is the joint work of staff of the Directorate for Employment, Labour and Social Affairs. It has greatly benefited from contributions from national government delegates. However, the* Outlook*'s assessments of each country's labour market prospects do not necessarily correspond to those made by the national authorities concerned.*

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Editorial
Back in work, but still out of pocket

Labour markets continue to heal from the recent crisis – but only slowly

Labour markets continue to recover from the Great Recession, albeit in a painfully slow manner in many OECD countries. While progress has been made in reversing the crisis-related increase in unemployment, little progress has been made in recouping the lost ground on wages. Overall, three-quarters of OECD countries still face either a sizeable unemployment gap – an unemployment rate that is 2 percentage points or more above the pre-crisis level – or a sizeable wage gap – average wages at least 5% below the level they would be at if they had continued the trend increase during 2000-07 – or both.

The slow progress in mending the labour market is largely the result of the global economy being in a low-growth trap characterised by low investment, anaemic productivity gains and weak job creation with stagnant wages. There is an urgent need to make full use of all policy tools – macroeconomic and structural policies – at the international and national level to bring back stronger and sustainable growth while ensuring that its benefits are shared more widely. Employment policies can and should play an important role in this endeavour. This edition of the *OECD Employment Outlook* helps to define the nature of this challenge and identifies a number of policy actions that could play an important role in helping to make the labour market more dynamic and inclusive, even in the face of persistent economic headwinds.

OECD projections indicate that the jobs gap will close in 2017 in the OECD area, nearly ten years after the crisis erupted

The end is in sight as regards cyclically depressed employment rates, at least for the OECD area as a whole. The jobs recovery has been underway since the first quarter of 2010 when the OECD average employment rate reached its post-crisis trough with only 58.6% of the population (ages 15-74 years) employed. This was 2.2 percentage points lower than the employment rate in 2007, corresponding to 20.3 million missing jobs. Despite the slow and uneven nature of the economic recovery, the jobs deficit had fallen to 5.6 million by the end of 2015 and this edition of the *Outlook* reports that the OECD now projects that the jobs gap will close completely during the course of 2017. While this is welcome news, the fact that the Great Recession depressed employment for nearly ten years testifies to its severity and the price workers have paid.

As is usually the case, averages tell only a part of the story. Some countries experienced only a shallow or short recession and employment in these countries has long since returned to, or climbed above, its pre-crisis level. Indeed, employment rates are now more than 5 percentage points above their end-2007 levels in Chile, Germany, Hungary, Israel and Turkey. At the other extreme, the jobs deficit is still large in Greece, Ireland and

Spain (where the jobs gaps are currently 9, 7.9 and 8.5 percentage points and projected to remain sizeable, even if smaller, through 2017). While it is encouraging that employment is now rising quite rapidly in these hardest-hit countries, a full jobs recovery remains some way off and there is a risk that it will not be achieved before a new recession arrives.

Participation in the labour market is increasing putting further pressure on job creation

Despite the closing job gap in the OECD area, unemployment is projected to remain moderately above its pre-crisis level in 2017 because more people want to work than ever before. In particular, older workers are delaying their retirement, and more women wish to be in paid employment. As a result, the average unemployment rate is projected to remain modestly above its pre-recession level at the end of 2017. In effect, the goal posts have shifted and governments should aim to raise the employment rate above its pre-crisis level so as to accommodate the increased share of working-age persons who desire employment.

The crisis also adversely affected earnings and the resulting wage gap may be difficult to close

As in past recessions, the Great Recession was associated with slower wage growth. The surge in unemployment during the crisis was followed by falling wages in particularly hard-hit countries such as Greece, Ireland, Japan, Portugal, Spain and the Baltic States, but wages stagnated or barely grew almost everywhere. Real wage growth also slowed following the crisis, although somewhat less so than nominal wage growth due to falling price inflation. Comparing real wage growth during 2000-07 with that during 2008-15 suggests a sharp deceleration in some countries, including the Czech Republic, Estonia, Latvia and the United Kingdom. By 2015, real hourly wages in these countries were more than 25% below where they would have been if wage growth had continued at the rate observed during 2000-07, and this wage gap exceeded 20% in Greece, Hungary and Ireland.

Whether workers can ever recuperate the potential wage gains lost since 2007 is uncertain, especially if labour productivity growth remains weak. The prospects for returning to vigorous wage gains is closely tied to whether the global economy manages to move from the current low growth equilibrium characterised by low investment, subpar productivity growth and historically weak international trade, which in turn calls for a comprehensive policy response, including more ambitious use of fiscal policy and additional structural reforms. Labour market policies will need to contribute to this broader effort while also balancing the short-run need to complete the recover with the longer-run imperative to support a return to stronger and more inclusive growth.

Structural weaknesses in labour market performance are becoming more visible

As labour markets continue to heal from the impact of the Great Recession, longer-term weaknesses in labour market performance become more visible, including slow or non-existent wage gains in the lower and middle ranges of the earnings distribution, and important differences in the labour market opportunities available to different population groups. This issue of the *Outlook* provides insights into several of the ways that governments can more effectively address structural issues, as they transition from a period of intense focus on cushioning the adverse impacts of the crisis to an increased focus on longer run issues.

Making better use of workers' skills would provide a boost to productivity and wages

Skills policy can play an important role in boosting productivity and wages. In the past, however, most of the attention has been on skills development through the expansion of education and training programmes and improvements of the quality and timeliness of their offerings. Chapter 2 of the *Outlook* shows that it is equally important to assure that workers can make full use of their skills at work. Among equally educated and skilled workers, those who make fuller use of their proficiencies on the job are more productive, earn higher wages and have higher job satisfaction. Not all countries are equally successful at enabling workers to use of their skills on the job. For example, Japanese workers have considerably better literacy skills than their US counterparts, but use their reading skills significantly less at work. Governments can and should enact policies that nudge employers towards better skill use. Doing so would help to lower the risk of the overall economy becoming stuck in a low-growth equilibrium, even as it improves the well-being of workers

Expanding opportunities for vulnerable groups

One of the encouraging recent labour market developments is that the number of long-term unemployed finally started to fall in the past year, suggesting that this group is beginning to share more of the benefits of the overall labour market recovery. However, it is far too early to declare victory since the number of persons who have been unemployed for a year or longer was still 55% above its pre-crisis level at the end of 2015, when more than one-half of the 13.5 million long-term unemployed had been out of work for two or more years. Governments need to continue to assist this group, who are often shunned by employers, to move back into suitable jobs.

In a context of slow economic growth and high inequality, it also becomes more important to assure that governments are doing everything possible to dismantle the barriers that prevent certain population groups from realising their full potential in the labour market. For example, a slow job creation environment is likely to increase the risk that vulnerable youth – such as early school leavers who are neither employed nor in education or training (NEETs) – will be permanently left behind in the labour market. Similarly, the economic costs and unfairness associated with the persistence of large gender gaps in employment and wages become even more unacceptable when incomes are stagnant and opportunities for career advancement more rare.

Governments should redouble their efforts to level the playing field for these and other vulnerable groups. Doing so effectively requires paying careful attention to the myriad of distinct factors restricting labour market success for the different groups. For example, a number of OECD countries had shown that "second-chance" educational programmes, such as the *École de la Deuxième Chance* in France and the Jobs Corps in the United States, can provide an effective way to help school drop outs who are struggling in the labour market to obtain the basic skills they need to gain employment. As is illustrated by the Chapter 4 analysis of gender gaps in emerging economies, an effective policy response requires the co-ordinated use of multiple policy levers with the optimal mix varying depending on the specific national context. One of the key needs is to help women better reconcile their family responsibilities with employment. For example, subsidised childcare focusing on low-income households has proven to be very successful in enhancing women's employment in several Latin American countries, including programmes in Mexico (*Estancias Infantiles*) and Colombia (*Hogares Communitarios*).

A smarter approach to structural reform is also needed

Moving OECD economies away from the current slow growth equilibrium requires a renewed effort at structural reforms. While there is a broad consensus on the beneficial effects of well-targeted and fully-implemented reforms of product and labour markets on productivity and hence average living standards in the long run, these reforms often face strong political opposition due to growing concern about their short-term distributional effects. In a context of remaining labour market slack and high, if not growing, inequality, these concerns should receive due attention and guide the design and implementation of reforms. The new evidence presented in Chapter 3 of the *Outlook* points the way toward smarter reform strategies that reduce, or even avoid, the temporary disruptions associated with the implementation of structural reforms. For example, it is shown that reforms to employment protection rules, which can depress employment for some time following their introduction, tend not to have that effect if implemented during an economic expansion or combined with complementary measures to promote greater internal adaptability of firms and more effective unemployment benefits. Both the current weakness of productivity growth and the fact that most OECD countries are in the middle of an expansion indicate that now is a particularly good time to consider implementing additional structural reforms.

A review of the OECD Jobs Strategy will assure that these policy guidelines remain up to date in a rapidly changing world

These brief reflections suggest that policy priorities need to be rebalanced and the operation of many familiar policy measures recalibrated to take into account the current circumstances and the need to devote greater attention to their impact on vulnerable groups. Nonetheless, there appears to be no need to radically reorient labour market policies or invent totally new types of policies.

These reflections on the implications of a period of slow growth for labour market policy also highlight the more general need to continually update policy settings so as to adapt to changing economic conditions while taking full advantage of our improving understanding of the effectiveness of different policy measures. In that spirit, the OECD and its member governments have recently initiated a comprehensive reassessment of the labour market guidelines contained in the OECD Jobs Strategy. If countries do not respond to the challenges of digitalisation of the economy and demographic change by adopting innovative policies to boost growth and promote good quality jobs that pay adequate wages, then the stagnation that has afflicted our labour markets since the Great Recession could become "the new normal". This must not happen, and the new Jobs Strategy which will be delivered in 2018 will present a comprehensive policy framework for countries to promote more but also better jobs in an inclusive labour market.

Stefano Scarpetta,
OECD Director for Employment,
Labour and Social Affairs

Acronyms and abbreviations

CASEN	*Encuesta de Caracterización Socioeconómica Nacional*
CCT	Conditional Cash Transfer
EAHU	*Encuesta Anual de Hogares Urbanos*
ECE	*Encuesta Continua de Empleo*
EHPM	*Encuesta de Hogares de Propósitos Múltiples*
ELMPS	Egypt Labor Market Panel Survey
ENAHO	*Encuesta Nacional de Hogares*
ENOE	*Encuesta Nacional de Ocupación y Empleo*
ENPE	*Enquête Nationale sur la Population et l'Emploi*
EPH	*Encuesta Permanente de Hogares*
EPL	Employment protection legislation
ESJS	CEDEFOP's European Skills and Jobs Survey
ETCR	Energy, transport and communication
EUC	Emergency Unemployment Compensation
EU KLEMS	Statistical and analytical research project financed by the European Commission
EU LFS	European Union Labour Force Survey
EU SILC	European Union Statistics on Income and Living Conditions
GDP	Gross domestic product
GEIH	*Gran Encuesta Integrada de Hogares*
GPI	Gender parity index
HLFS	Household Labour Force Survey
HPWP	High-Performance Work Practices
ICT	Information and communication technology
INFE	OECD International Network on Financial Education
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification of All Economic Activities
ITT	Item Response Theory
JRA	Job Requirements Approach
KILM	Key Indicators of the Labour Market
NEET	Youth not in employment, education or training
NIDS	National Income Dynamics Study
NSS	National Sample Survey
OLS	Ordinary least square
PES	Public employment service
PIAAC	Survey of Adult Skills
PISA	OECD Programme for International Student Assessment
PMR	Product market regulation
PPP	Purchasing power parity

RLMS	Russia Longitudinal Monitoring Survey
RTO	Registered Training Organisations
SAKERNAS	*Survei Angkatan Kerja Nasional*
SIGI	Social Institutions and Gender Index
SME	Small and medium enterprise
STEM	Science, technology, engineering and mathematics
SWTS	School-to-Work Transition Survey
TiVA	Trade in Value-Added
VET	Vocational education and training
WBL	Work-based learning
WVS	World Values Survey

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Executive summary

The post-crisis jobs gap is finally closing, but governments need to address poor job quality and unequal opportunities in the labour market

Labour market conditions are continuing to improve in OECD countries and the share of the working-age population in work is projected to return to its pre-crisis level in 2017, nearly ten years after the onset of the global financial crisis. However, the recovery continues to be uneven and unemployment remains much too high in a considerable number of European OECD countries. Even in countries where labour market slack has been absorbed, low quality jobs and a high level of labour market inequality are of concern. Many of the workers who lost their jobs during the Great Recession are now back in work, but wage growth remains subdued and job stress is common. Many of the workers displaced from jobs in manufacturing and construction during the Great Recession found that their skills and experience did not qualify them for the better paying jobs that are being created in the services sector.

Low-skilled youth who are disconnected from both employment and learning risk being permanently left behind in the labour market

Despite the overall improvement in labour market performance, vulnerable groups such as low-skilled youth neither in employment nor in education or training (the so-called "NEETs") risk being left behind. In 2015, 15% of 15-29 year-olds in the OECD area were in this category, up moderately from just before the global crisis in 2007. On average, 38% of all NEETs have not finished upper secondary schooling in the OECD area and are less likely to be actively searching for a job than more educated NEETs (33% versus 45%). Nearly a third of low-skilled NEETs live in a jobless household (i.e. a household that does not contain an employed adult), suggesting that many in this group experience both low current incomes and limited labour market opportunities. Many members of this vulnerable group are likely to require targeted assistance to improve their long-term career prospects.

How skills are used at work affects productivity, wages and job satisfaction, and employers and governments should do more to foster better skills use

The extent to which workers use their information processing skills at work is a major determinant of productivity, wages and job satisfaction. A novel analysis of skills use – which draws on data for more than 25 OECD countries participating in the Survey of Adult Skills – documents the importance of skills use and identifies a number of factors that can improve it. In particular, High-Performance Work Practices, such as team work, job rotation, bonus pay and flexibility in working hours, are associated with a significantly better use of skills at work. Globalisation and offshoring also affect skills use, but their impact can be either positive or negative depending on the position of a country's firms within global value

chains. Certain labour market institutions, including collective bargaining and minimum wages, also improve skills use in most instances. Policy options for improving skills use are identified and illustrated by specific country examples of effective practices.

Structural reforms may result in short-term employment losses but governments can take steps to reduce or even avoid these costs

There is broad consensus among economists that structural reforms of product and labour markets have positive long-run effects on average because they raise overall efficiency. However these structural reforms may also entail short-run adjustment costs in the labour market. A new analysis of industry-level data show that reforms lowering barriers to entry and the cost of dismissal induce non-negligible transitory employment losses, a result that is confirmed by complementary evidence from case studies of three recently implemented EPL reforms. However, these short-term costs are shown to be smaller or even non-existent when these types of reforms are enacted during an economic expansion. Policy options are also identified that can help attenuate short-term employment costs, such as combining a reform easing hiring and firing rules with reforms to collective bargaining or unemployment benefits.

Closing gender gaps in emerging economies remains an important challenge

Despite unprecedented progress over the past century, gender gaps in the labour market persist throughout the world and are especially marked in emerging economies. While the proportion of jobs held by women has increased, female workers continue to have worse jobs than men. An up-to-date picture of gender gaps is painted for 16 emerging economies accounting for over half of the world's population. Recent trends in a broad range of labour market outcomes are highlighted and their key drivers are identified. In particular, the gender pay gap that persists across the world is analysed closely and unpacked into distinct components. Building on this wealth of evidence, a comprehensive set of policy levers to close gender gaps is identified.

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Chapter 1

Recent labour market developments and the short-term outlook

This chapter provides an overview of recent labour market trends and short-term projections. It also discusses the implications of these developments for policy, particularly the need to better assist the most vulnerable youth to integrate into employment and begin climbing the career ladder. Emphasis is placed on several areas of current policy concern, including: persistently high unemployment in countries where labour market recovery has lagged; the implications of recent wage developments for enabling full economic recovery and improving workers' living standards; the changing mix of jobs and its implications for matching workers with jobs that make good use of their skills; trends in job quality, including how it was affected by the crisis; and recent changes in the labour market prospects of vulnerable groups, particularly low-skilled youth.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Key findings

The economic recovery is continuing in the OECD area and translating into a gradual improvement in labour market conditions. Nonetheless, more than eight years after the onset of the crisis labour markets are not yet fully healed from the Great Recession, and the recent slowing of global economic growth raises the risk of another downturn before the recovery is completed in many countries. The difficult macroeconomic environment since 2007 has been characterised by lower employment, slower nominal wage growth and lower job quality due to greater labour market insecurity in most OECD countries, but these adverse impacts have gradually unwound as the recovery has progressed and they may leave no lasting effects. Certain vulnerable groups within the labour force have borne the brunt of the recession and slow recovery. These include workers who have endured long-term unemployment and low-skilled youth who are neither working nor enrolled in education or training (the NEETs).

This chapter provides an overview of recent labour market trends and the short-term outlook. It also discusses some of the implications of these developments for policy, particularly the need to better assist the most vulnerable youth to integrate into employment and begin climbing the career ladder. Key recent developments related to overall employment and unemployment include:

- *The employment rate is still below its pre-crisis level in many countries, but the jobs gap is projected finally to close in 2017.* For the OECD area as a whole, the share of the population aged 15 to 74 years in employment stood at 60.2% in the fourth quarter of 2015, 0.6 percentage points below its pre-crisis rate, representing a jobs deficit of 5.6 million jobs. According to the latest OECD economic projections, this jobs gap will shrink to 0.2 percentage points by the end of 2016 and fully close during 2017.
- *The strength of the jobs recovery varies across OECD countries.* Around two-thirds of the 34 OECD countries have yet to regain their pre-crisis employment rates and the jobs gap remains large in certain European countries, notably Greece, Ireland and Spain (at 9, 7.9 and 8.5 percentage points respectively). However, these hard-hit countries are currently achieving some of the most rapid rates of employment growth among OECD countries. Employment growth has also been quite strong in the United States, but the share of working-age adults who are employed remains 3.4 percentage points below its pre-crisis level. By contrast, the employment rate is currently more than 5 percentage points above its end-2007 level in Chile, Germany, Hungary, Israel and Turkey, while Estonia, Korea and Poland have also achieved significant increases.
- *Unemployment is continuing to fall in most countries but the OECD average rate is projected to still be above its pre-recession level at end 2017, almost ten years after the onset of the global crisis.* The OECD unemployment rate has been gradually declining since late 2013 and was 6.5% in the fourth quarter of 2015. This is 1.9 percentage points below its post-crisis peak, but still one percentage point higher than its level prior to the crisis. There were 40.2 million unemployed people in the OECD area in the fourth quarter of 2015, 7.9 million more than

before the onset of the global crisis. If the OECD projection of continued moderate economic growth is realised, unemployment will remain 0.6 percentage point above its end-2007 level at the end of 2017, despite the closing of the employment gap. This discrepancy reflects the post-crisis increase in participation rates which implies that governments should aim to raise the employment rate above its pre-crisis level. National unemployment rates continue to vary widely – ranging from under 4% in Iceland, Japan and Korea to more than one worker in five in Greece and Spain – but recently have been declining quite rapidly in many of the countries where they are highest.

- *Long-term unemployment is declining more slowly than total unemployment.* For the OECD area as a whole, around one in three unemployed people had been out of work for 12 months or more in the fourth quarter of 2015, meaning that 13.5 million people are long-term unemployed. And more than half of this group have been out of work for two years or longer, increasing the risk of their becoming discouraged and dropping out of the labour force. The number of long-term unemployed has increased by 54.6% since the end of 2007, more than double the percentage increase in the total number of unemployed during the same period. One reason why the long-term unemployed have been slow to benefit from increased hiring may be that employers view long periods of joblessness as a possible sign of demoralisation or obsolete job skills. However, despite the difficulties faced by the long-term unemployed, recent experience suggests that bringing the unemployment rate back to its pre-crisis level will also bring long-term unemployment back down, albeit with a considerable delay. This may be an indication that OECD labour markets have become somewhat less vulnerable to hysteresis (long-lasting or even permanent) effects than was the case during the recessions of the 1980s and 1990s.

The crisis and slow recovery have also affected wage setting in a number of ways:

- *High unemployment led to nominal wage restraint, but real wage growth was less affected due to falling price inflation.* Consistent with the concept of a relatively stable wage-Phillips curve (which measures the relationship between nominal wage growth and the unemployment rate), the surge in unemployment during the crisis was followed by lower nominal wage growth, and even falling wages in countries such as Greece, Ireland, Japan, Portugal, Spain and the Baltic States. Wage growth subsequently rebounded as unemployment receded, particularly in countries where labour market slack has been largely or totally reabsorbed. The impact of the crisis on real wage growth has been more muted because slowing price inflation counteracted some of the slowdown in nominal wage growth. Indeed, real hourly wages grew by 0.9% on average in the OECD area between the fourth quarter of 2012 and the fourth quarter of 2015, potentially supporting stronger consumption spending.
- *Wage moderation reduced the growth of nominal unit labour costs, particularly in countries where they had grown rapidly in the years preceding the crisis.* For the OECD area as a whole, nominal unit labour costs remained broadly flat in 2009-12 but have since resumed growing (albeit more slowly than in the pre-crisis period). The key issue for national competitiveness is international differences in the growth of unit labour costs. In fact, unit labour costs have fallen significantly in some of the countries hit hardest by the global and sovereign debt crises whereas they have grown relatively rapidly in Germany since 2011. However, relatively greater wage restraint in euro area countries with chronic trade deficits is only slowly restoring external balance through an expansion of the tradeable sector. Structural reforms could speed the translation of wage restraint into

the restoration of external trade balance, particularly reforms to increase competition in product markets or to expand assistance for workers moving from declining to growing sectors of the economy.

There have been significant changes in the composition of employment and job quality since 2007, with both temporary business cycle effects and longer-run trends playing a role:

- *The shift from goods producing to service jobs has continued.* On average for the OECD area, the goods-producing sector, particularly manufacturing and construction, accounted for 79% of the total fall in employment during the Great Recession, whereas service sector employment has accounted for essentially all of the jobs growth during the recovery period. Many workers who lost manufacturing and construction jobs during the recession may thus have faced difficulties in accessing the new jobs being created in the service sector or may have experienced a substantial wage penalty related to the poor match between their skills and those required by service sector employers. While manufacturing employment fell more rapidly in 2000-08 than in 2008-15, construction employment grew during the earlier period and may have reached an unsustainably high level in countries where there was a property price bubble.
- *Part-time employment has continued its long-term increase in the majority of OECD countries, apparently little affected by the Great Recession.* In 2015, 15.7% of workers in the OECD area had a part-time job, up from 14.6% in 2007. The incidence of part-time employment increased during this period in more than three-quarters of OECD countries and this increase was mainly the result of an increase in part-time jobs within broad groups of industries, rather than the shift in the job mix towards more service sector employment. The share of workers with part-time schedules grew particularly rapidly in Austria, Chile, Ireland, Italy and Spain.
- *Temporary employment fell sharply in the OECD area during the recession but has since rebounded somewhat.* Employment on fixed-term contracts fell sharply during the recession, since employers who have the choice typically prefer to downsize their workforce via the non-renewal of temporary contracts that have expired rather than the dismissal of workers with permanent contracts. However, employers have also made heavy use of fixed-term contracts when adding staff during the recovery period. In 2015, temporary employment accounted for 11.2% of total dependent employment on average in the OECD area, down modestly from its 12.1% share in 2007. Some countries deviated markedly from this pattern, with the share of temporary employment falling quite sharply in Japan, Korea and Spain, and rising in Chile, Hungary and the Slovak Republic.
- *The crisis appears to have had no general effect on the quality of earnings or the working environment, but it clearly increased labour market insecurity in most OECD countries.* The fall in labour market security was most noticeable in Spain and Greece due to the large increase in the incidence and duration of unemployment in those two countries. It seems likely, however, that the post-crisis reduction in job quality will prove to be largely or entirely temporary.

The recession and slow recovery have further underlined the difficult labour market situation confronting vulnerable youth as well as the need for targeted policy interventions to connect them with appropriate jobs:

- *Youth unemployment rose to very high levels during the recession, but has declined strongly during the recovery.* After increasing nearly twice as much as the overall unemployment

rate during the Great Recession, the youth unemployment rate has also declined more rapidly during the recovery. For the OECD area as a whole, 73% of the cyclical increase in the youth unemployment rate had been absorbed by the fourth quarter of 2015, compared with only 59% of the recessionary increase in the overall unemployment rate.

- *The share of youth neither employed nor in education or training (NEETs) remains above its pre-crisis level*. In 2015, 14.6% of 15-29 year-olds were in this category in the OECD area, up from 13.5% in 2007. The NEET rate increased in nearly three-fourths of the 33 OECD countries for which data are available, with a particularly large increase in euro area countries such as Greece, Ireland, Italy and Spain where labour market slack remains high. Other countries achieved significant declines in the number of NEETs, including Chile, Germany, Japan, Mexico and Turkey. While part of the recent increase in the NEET rate reflects the high cyclical level of youth unemployment, a majority of NEETs are inactive rather than unemployed (i.e. they are not actively searching for a job).
- *NEETs, especially those who have not completed upper secondary schooling, often live in jobless households and also appear to be at an elevated risk of permanent marginalisation in the labour market*. Low-skilled youth are more likely to be NEET than their better educated counterparts. In the OECD area, an average of 36% of all NEETs have not finished upper secondary schooling and the low-skilled share exceeds 50% in Mexico, Spain and Turkey where more than one-fifth of 15-29 year-olds are NEET. NEETs who have not completed upper secondary schooling are less likely than more educated NEETs to be actively searching for a job (33% versus 43% in 2015). Slightly more than one-third of 15-29 year-old NEETs live in a jobless household (i.e. a household that does not contain an employed adult). This share rises to 44% for low-skilled NEETs, suggesting that many in this group experience both low current incomes and limited labour market opportunities. Many members of this vulnerable group are likely to require targeted assistance to improve their long-term career opportunities.
- *The G20 target to reduce the number of vulnerable youth by 15% by 2025 highlights a priority issue for employment and education policy*. In 2015, G20 leaders endorsed a common policy goal of reducing the number of vulnerable youth by 15% by 2025. While they left the definition of vulnerable youth to be determined by national authorities, they suggested that low-skilled youth who are NEET – or who are employed informally in the case of emerging economies with a large informal sector – captures well the intended target group. The evidence presented in this chapter confirms that low-skilled NEETs represent a particularly vulnerable group among the youth in OECD countries. Effective policies to reconnect members of this group with the labour market and improve their career prospects are thus a high policy priority. The target of a 15% reduction in the size of this group by 2025 does not represent a very ambitious goal for many OECD countries since two-thirds of the OECD countries would meet or exceed this target if the rate of decline in the size of this group since 2000 should continue through 2025.

Introduction

This chapter provides an overview of recent labour market developments and the short-term outlook. In doing so, it highlights several areas of policy concern, including: i) persistently high labour market slack in countries where labour market recovery has lagged; ii) recent wage developments and their implications for enabling full economic recovery and workers' living standards; iii) the changing mix of jobs and its implications for

labour market mismatch; iv) recent trends in job quality, including how it was affected by the crisis; and v) recent changes in the labour market prospects of vulnerable groups, particularly low-skilled youth.

1. Recent labour market developments

Employment and unemployment

Labour market conditions are improving in the context of modest and uneven growth…

Even as the global economic growth and the medium-term outlook deteriorated during 2015, the economic recovery continued within the OECD area and spread to almost all OECD countries, with only Greece experiencing a fall in real GDP during 2015 (Annex Table 1.A1.1). The OECD average rate of expansion was 2.1%, up slightly from 1.9% in 2014. The May 2016 OECD projections indicate a mild slowdown in the OECD area growth rate during 2016 followed by a return to the 2015 growth rate in 2017 as in 2015, driven by somewhat faster growth in the euro area and the United States (Figure 1.1, Panel A). Whereas growth in the United States has somewhat outperform that of the OECD as a whole the past several years, it is projected to be very close to the average during 2016-17, while growth will strengthen a little in the euro area and continue to be quite erratic and well below the OECD average value in Japan.

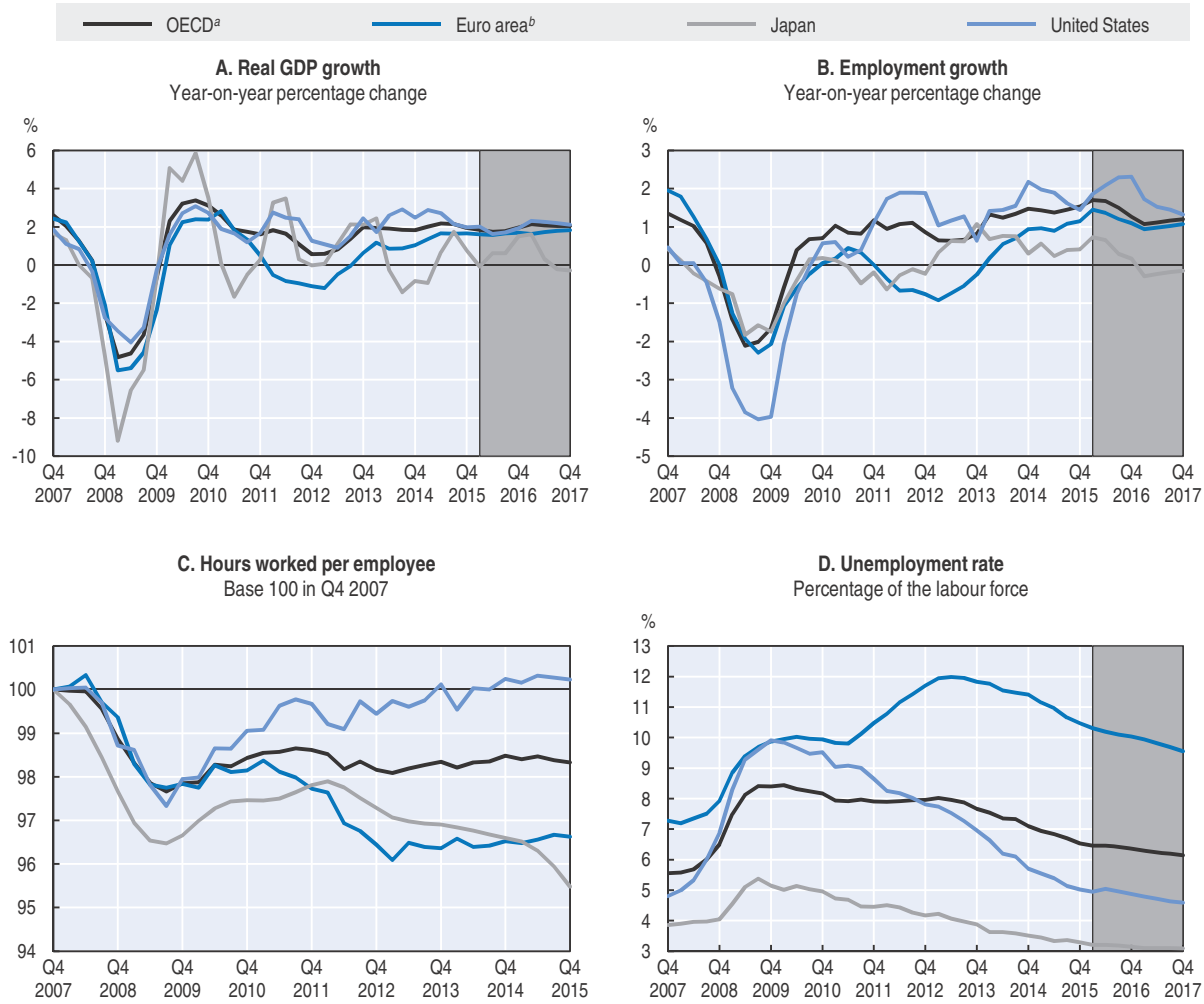
The ongoing and broadening economic recovery has been gradually healing the labour market impact of the global economic crisis during 2008-09, as is illustrated by the observation that real GDP and employment for the OECD area both bottomed out in 2009 and then resumed growing in 2010, albeit at a moderate pace. The OECD average growth rate of employment was 1.4% in 2015, slightly up from the previous year, and it is projected to strengthen further to 1.5% in 2016 before slowing somewhat in 2017 as employment growth slows in the euro area and the United States and turns (slightly) negative in Japan (Figure 1.1, Panel B). Employment grew particularly rapidly in 2015 in Iceland, Ireland, the Slovak Republic and Spain, while falling only nominally in Finland (-0.4%) (Annex Table 1.A1.1). The fact that the economic recovery started approximately four years earlier in Japan and the United States, than for the euro area as a whole, helps to explain why the unemployment rate remains so much higher in the latter area (Figure 1.1, Panel D). Even though unemployment rates are now falling much more rapidly in European countries where the 2008-09 and often 2012-13 recession(s) was (were) particularly deep and long, the unemployment rate in the euro area will remain substantially higher than the quite low rates in Japan and the United States at the end of 2017. Average hours per worker have also been very slow to return to pre-crisis levels (Figure 1.1, Panel C). Indeed, average hours worked per employee is still 1.7% below its level in the fourth quarter of 2007 for the OECD area, and even further below the pre-crisis level in the euro area and Japan.

… but labour market recovery is still incomplete in many OECD countries

For the OECD area as a whole, 60.2 of the population aged 15 to 74 years was employed in the fourth quarter of 2015, still 0.6 percentage points below its pre-crisis rate (Figure 1.2). This represents a 5.6 million jobs deficit. The jobs gap is projected to narrow to 0.2 percentage point by the end of 2016 and to close during 2017 implying that it will have taken a decade to restore the pre-crisis employment rate. A more appropriate policy goal would be to aim at a somewhat higher employment rate to take account of the fact that

Figure 1.1. **OECD labour markets continue to recover from the crisis, albeit slowly**

Recent and projected evolution of real GDP, employment, average hours and unemployment



Note: Shaded area refers to OECD projections.

a) OECD is the weighted average for the 34 countries except in Panel C, where it is the weighted average for 27 OECD countries (excluding Chile, Iceland, Korea, Mexico, New Zealand, Norway and Turkey).

b) Aggregate of 15 OECD countries of the euro area.

Source: OECD calculations based on *OECD Economic Outlook Database* in Panels A, B and D; and OECD estimates based on quarterly national accounts in Panel C.

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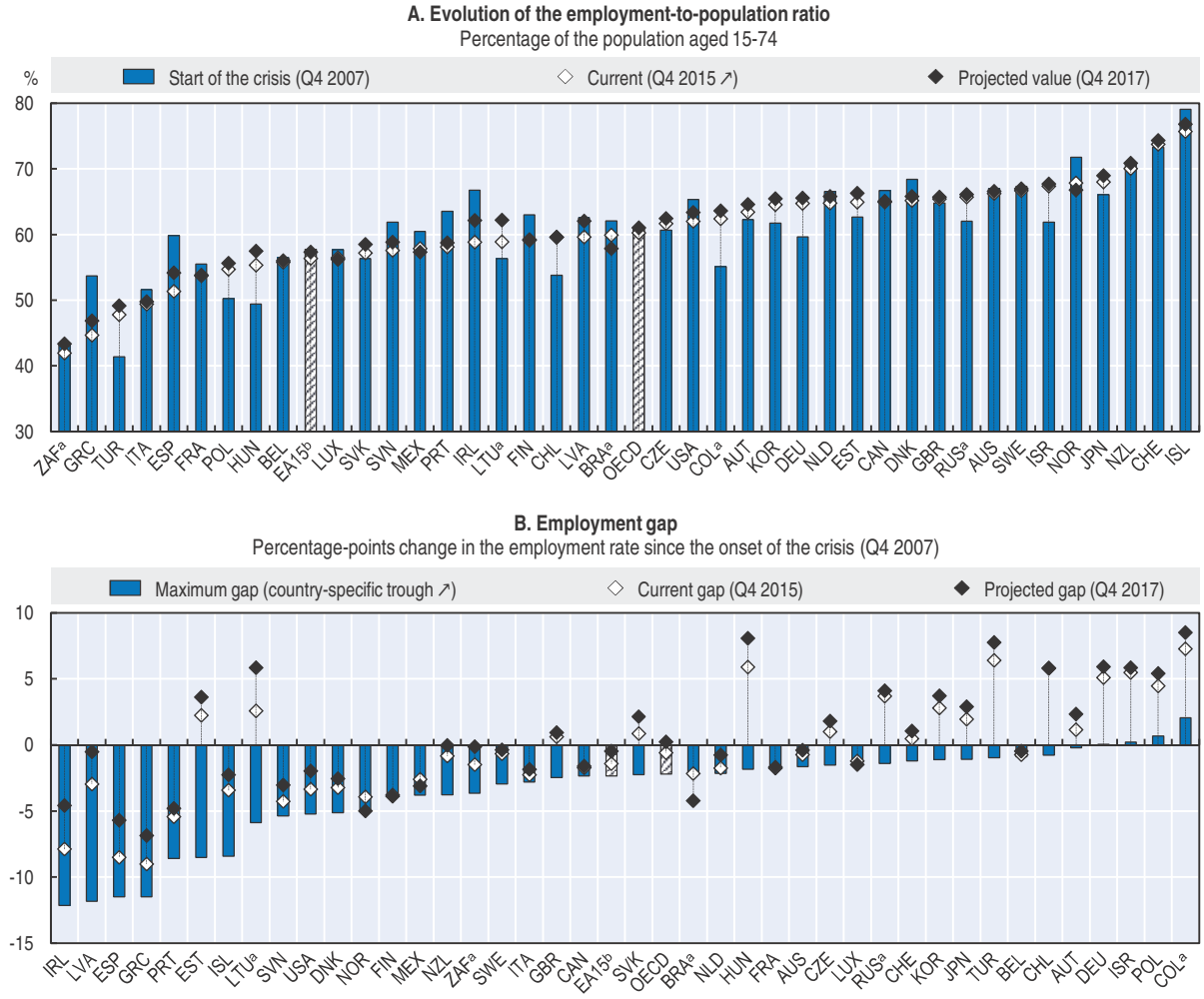
participation has risen since 2007 in most OECD countries, most notably for women and older workers.[1] Nonetheless, progress in restoring the pre-crisis employment rate provides a useful, simple indication of how far labour market recovery has progressed.

Overall, 20 of the 34 OECD countries have yet to regain their pre-crisis employment rates (Figure 1.2). The jobs gap remains particularly large in many of the countries that were hardest hit by the crisis, such as Greece, Spain and Ireland (9, 8.5, and 7.9 percentage points, respectively), although employment is now growing quite rapidly in these three countries. Estonia was also hard hit by the global crisis but has more than recovered from a jobs gap that reached a peak of 8.5% in the first quarter of 2010.[2] By contrast, employment exceeds its pre-crisis level in 14 OECD countries. Most notably, the employment rate is currently at least 5 percentage points above its level at the end of 2007 in Chile, Germany,

Figure 1.2. **The jobs recovery continues, but remains incomplete in the majority of OECD countries**



a) Annual values calculated using employment data from the *OECD Economic Outlook Database* and UN population projections.
b) Aggregate of 15 OECD countries of the euro area.
Source: OECD calculations based on *OECD Economic Outlook Database*; and United Nations, *World Population Prospects: The 2015 Revision*.

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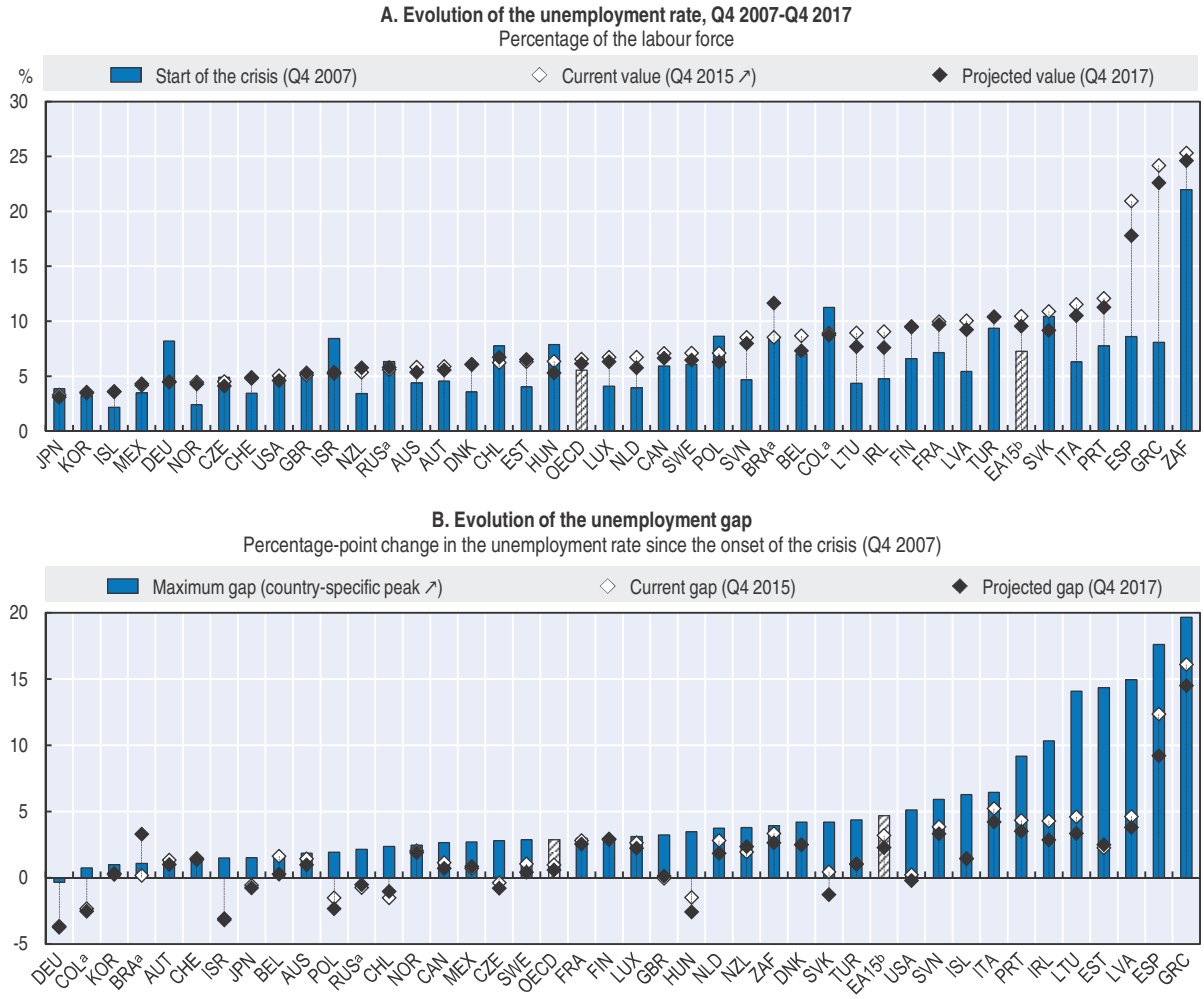
Hungary, Israel and Turkey. Achieving a full labour market recovery from the Great Recession remains a high policy priority in many countries, but others have long since achieved that goal.

By the end of 2017, the employment rate is projected to exceed its pre-crisis level in fewer than one-half of the OECD countries (14 out of 34). The jobs gap in the euro area is projected to decline from 1.4 percentage points in the fourth quarter of 2015 to 0.5 percentage point two years later, but the jobs gap will remain above 5 percentage points in Greece and Spain despite substantial further reductions. Another concern is that the jobs gap is projected to widen during the next two years in four countries, most notably Norway.

Unemployment has been declining since 2009 in the OECD area as a whole, but was still 1 percentage point above its pre-crisis level in the fourth quarter of 2015 at 6.5% (Figure 1.3). This represents 40 million unemployed persons, 7.9 million more than in the

Figure 1.3. **Unemployment has been falling but remains above its pre-crisis level in most OECD countries**



a) Annual values.
b) Aggregate of 15 OECD countries of the euro area.
Source: OECD calculations based on *OECD Economic Outlook Database*.

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fourth quarter of 2007.[3] The OECD projects that the size of this group will continue to decrease slowly through the end of 2017, but that a surplus of around 6.3 million unemployed persons will remain nearly ten years after the crisis began.

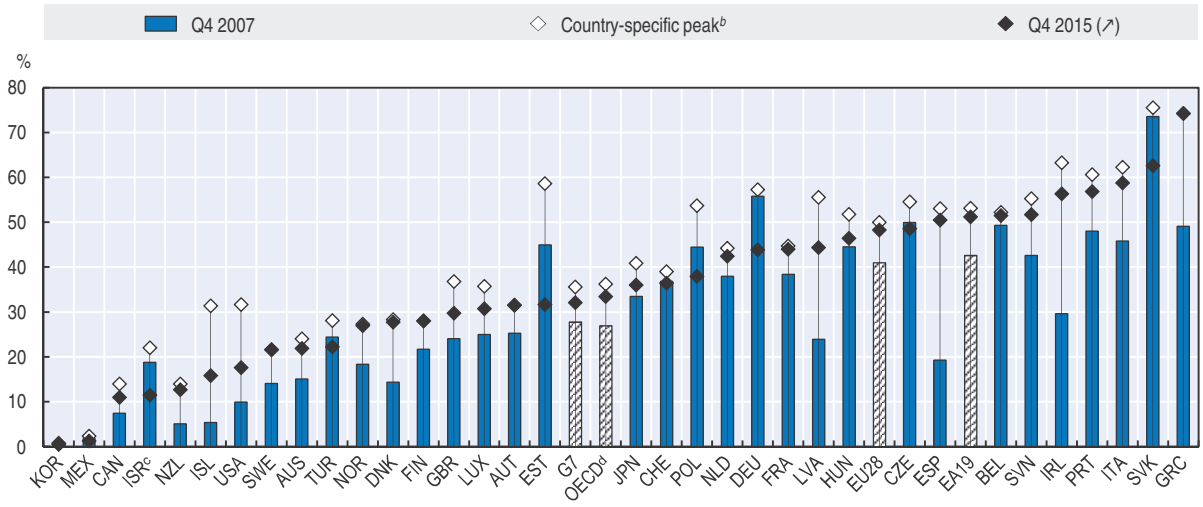
National unemployment rates continue to differ sharply. Unemployment in the fourth quarter of 2015 was below 4% in Iceland, Japan and Korea, and a little higher but still below 5% in the Czech Republic, Germany, Mexico, Norway and Switzerland. By contrast, joblessness is still far higher in many European countries with the average rate for the euro area being 10.5% in the final quarter of 2015. Unemployment remains particularly high in Spain (20.9%) and Greece (24.2%) and is also in double digits in France (10%), Italy (11.5%), Portugal (12.1%) and the Slovak Republic (10.9%), but is only 4.4% in Germany where unemployment is 3.7 percentage points below it pre-crisis level. Overall, unemployment in the fourth quarter of 2015 was above its level eight years earlier in 27 of the 34 OECD countries and this number is projected to fall only to 26 out of 34 in the fourth quarter of 2017.

Long-term unemployment has been slow to fall back to pre-crisis levels, but is now coming down in most countries

For the OECD area as a whole, around one in three unemployed persons (33%) had been out of work for 12 months or more in the fourth quarter of 2015, up from 27% in the fourth quarter of 2007 (Figure 1.4). This corresponds to 13.3 million persons who are long-term unemployed and more than half of this group have been out of work for two years or longer. The number of long-term unemployed has increased by 54.7% since the end of 2007, more than double the percentage increase in the total number of unemployed during the same period.[4] Nonetheless, the pool of long-term unemployed is now declining and their share of total unemployment has been falling since it reached a peak of 36% in the first quarter of 2014. One reason that the long-term unemployed were so slow to benefit from increased hiring may be that employers view long periods of joblessness as a possible sign of demoralisation or obsolete job skills. The recent decline in long-term unemployment suggests that any such barriers often can be overcome as labour market slack is progressively absorbed, although some of the recent decline could reflect labour force withdrawal due to discouragement, rather than delayed success at securing new jobs.

Figure 1.4. **Long-term unemployment has fallen more slowly than total unemployment**

Long-term unemployed (more than one year) as a percentage of total unemployed,[a] Q4 2007 and Q4 2015



a) Data are not seasonally adjusted but smoothed using three-quarter moving averages.
b) Country-specific peak is defined as the maximum value of the incidence of long-term unemployment since the start of the crisis (Q4 2007).
c) 2015 for Israel.
d) OECD is the weighted average of 33 OECD countries excluding Chile.
Source: OECD calculations based on quarterly national labour force surveys.

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The incidence of long-term unemployment differs greatly across OECD countries, ranging from being practically inexistent in Korea and Mexico to accounting for nearly three-quarters of all unemployment in Greece. These differences reflect both structural factors (e.g. long standing differences in labour market flexibility or the generosity of unemployment benefits) and differences in the size or persistence of the post-crisis increase in long-term unemployment. For example, the post-crisis increase in the incidence of long-term unemployment was larger in Spain than in Greece, but the level remained higher in Greece where the labour market has long been very susceptible to

long-term unemployment (Figure 1.4). Estonia and Spain provide another interesting contrast. Both experienced a very sharp increase in the incidence of long-term unemployment following the crisis, but this increase has been more than fully reversed during the economic recovery in Estonia, whereas it has been reversed only very partially in Spain up until now, probably because the recovery started much later in Spain and has not progressed as far. All in all, recent experience suggests that bringing the unemployment rate back to its pre-crisis level will also bring long-term unemployment back down, albeit with a considerable delay. This may be an indication that OECD labour markets have become somewhat less vulnerable to hysteresis effects than was the case during the 1980s and 1990s.[5]

Recent wage developments

The post-crisis surge in unemployment led to slower nominal wage growth, but this effect has now been reversed in some countries

The sharp rise in unemployment that began in 2008 led to slower nominal wage growth, even reductions in some cases. This often unprecedented wage restraint helped to limit job losses and set the stage for job growth during the recovery. However, wage restraint may also reduce workers' living standards and could become a brake on consumer spending and hence full recovery if not reversed sufficiently rapidly as unemployment rates fall back toward their pre-crisis levels. More than eight years after the crisis began, it is timely to review how wages have developed and the implications for achieving full economic recovery.

The wage-Phillips curves in Figure 1.5 show how nominal wages and unemployment have co-varied since the immediate pre-crisis period. In order to control (approximately) for cross-country differences in the structural rate of unemployment, nominal wage growth is juxtaposed with the unemployment gap, defined as percentage-points changes in unemployment since the start of the global financial crisis. A rising unemployment gap implies increased competition among workers for jobs allowing employers to lower their wage offers. Provided inflation expectations remained anchored, wage growth should decline as unemployment rises and then increase back to its pre-crisis level as the economy recovers and the unemployment gap shrinks.

The panel presenting OECD-average data shows that the steady rise in the unemployment gap from the end of 2007 until early 2013, when it reached a peak of 3.8 percentage points, went hand-in-hand with a progressive slowing of nominal wage growth from 4.7% to 1.1%. The unemployment gap then reversed course and had fallen by more than 40% to 2.1 percentage points in Q4 2015, by which time nominal wage growth had rebounded by to 1.6%. The relatively muted rebound in wage growth would appear to be consistent with concerns that a long period of depressed economic conditions could shift expectations in a way that locks in low wage growth and the risk of slipping into deflation.

The experience in OECD countries where the labour market recovery started sooner and is more advanced is more encouraging because it suggests that wage growth is likely to bounce back as labour market slack is absorbed, if often with a certain time lag. This pattern is perhaps most evident for the United States where rising unemployment during 2008-09 led to a period of stagnant wages. However, both the unemployment rate and the rate of nominal wage growth are now very close to their pre-crisis levels; that is, the economy appears to have shifted down and then back up along a stable wage-Phillips curve. This is also the case for Japan and the United Kingdom, although the Japanese case

Figure 1.5. **The post-crisis surge in unemployment led to slower nominal wage growth, but this effect has now been reversed in some countries**

Wage-Phillips curves: Relationship between nominal wage growth and change in the unemployment rate since the start of the crisis, Q4 2007-Q4 2015[a]

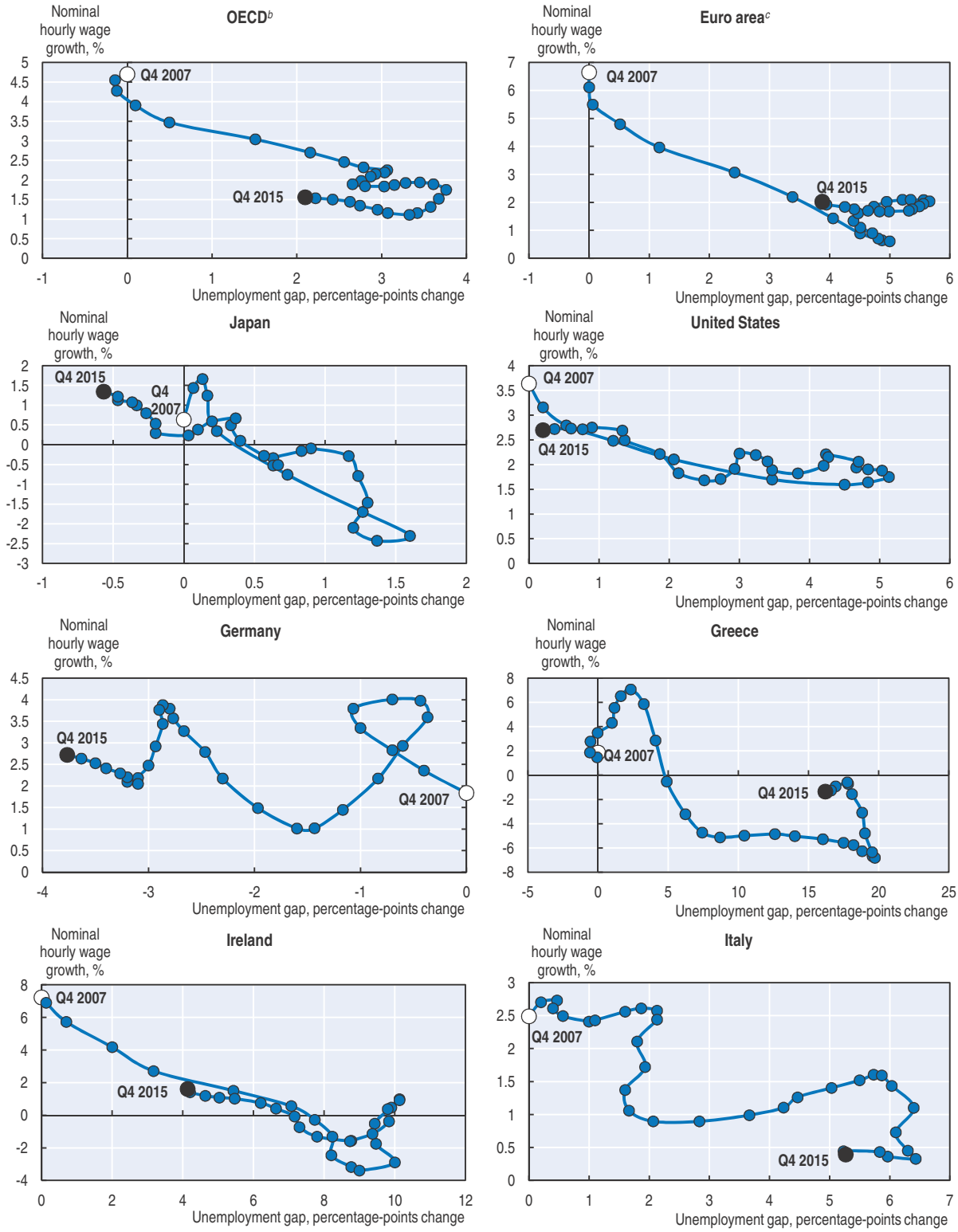
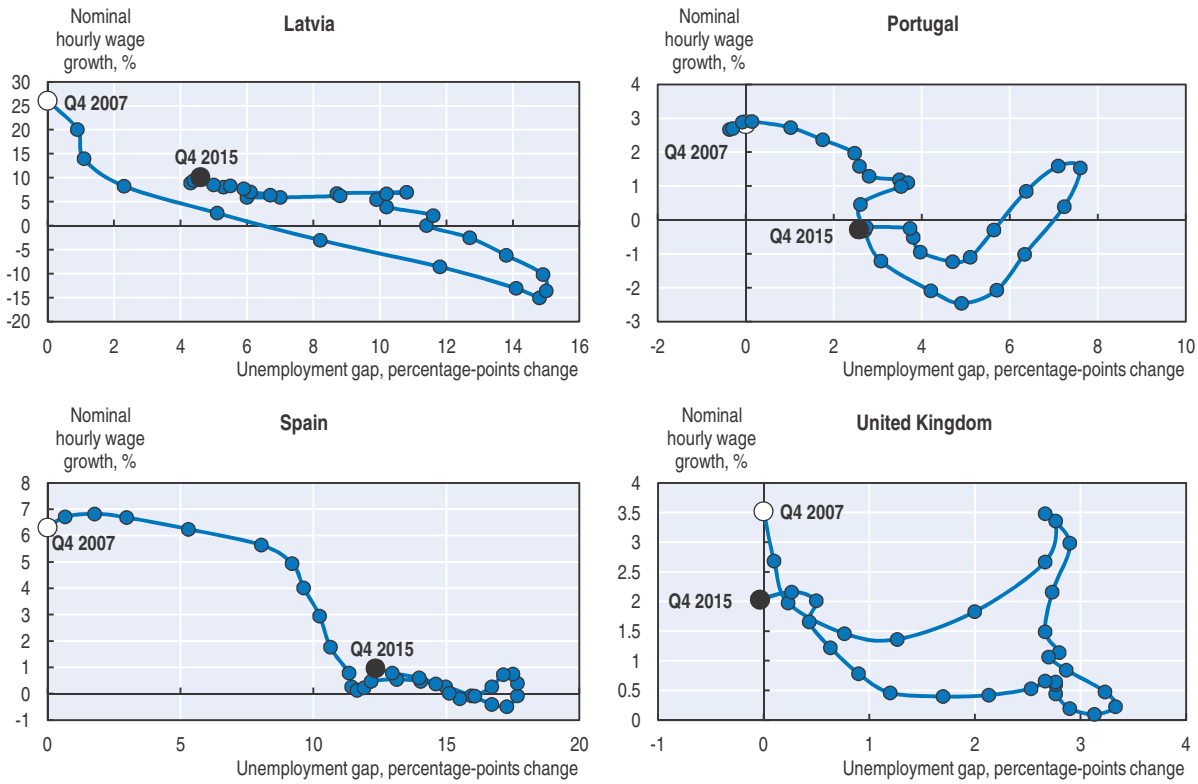


Figure 1.5. **The post-crisis surge in unemployment led to slower nominal wage growth, but this effect has now been reversed in some countries** *(cont.)*

Wage-Phillips curves: Relationship between nominal wage growth and change in the unemployment rate since the start of the crisis, Q4 2007-Q4 2015[a]



a) Nominal wage growth: year-on-year percentage change in nominal hourly wage (defined as total wages divided by hours worked of employees); unemployment gap: percentage-points change in the unemployment rate since the start of the crisis in Q4 2007.
b) Unweighted average of 27 OECD countries (excluding Chile, Iceland, Korea, Mexico, New Zealand, Norway and Turkey).
c) Unweighted average of the 17 euro area countries.
Source: OECD calculations based on quarterly national accounts and the *OECD Short-Term Labour Market Statistics Database*.

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stands out for the fact that nominal wages fell into negative territory for an extended period of time leading the Japanese government to take strong policy measures to encourage wage increases.

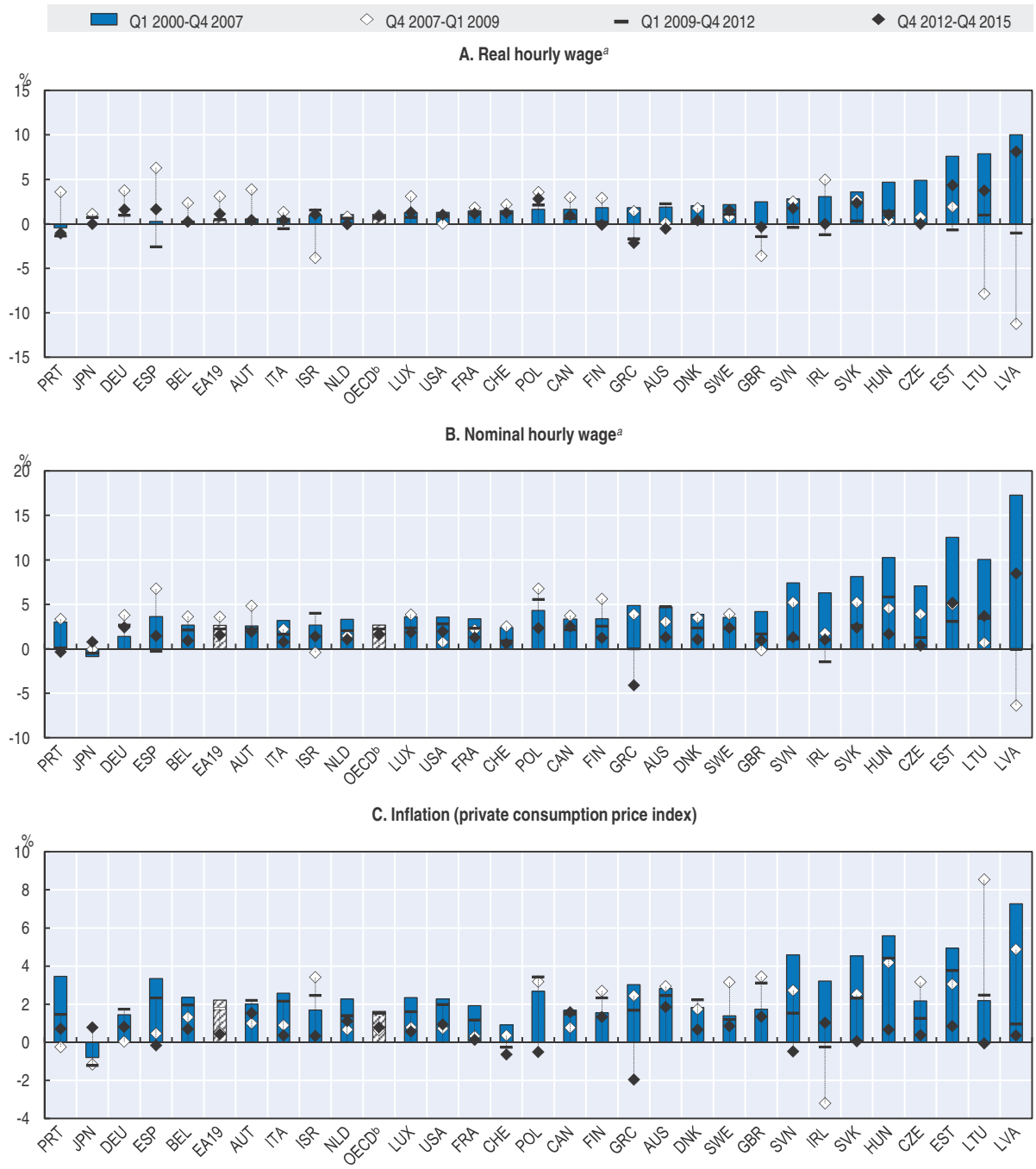
There is a lot of diversity in the experience of other OECD countries. Nonetheless, it is generally consistent with the presence of a fairly stable wage-Phillips curve relationship, indicative of well anchored inflation expectations in most cases. However, there is also a tendency for the recovery in wage growth to lag somewhat behind the decline in unemployment. In the Baltic States where price inflation was quite high prior to the crisis, there has been a downward shift in inflation expectations and thus the wage-Phillips curve.

Real wage growth has been less affected by the crisis due to slowing price inflation

Wage moderation during a recession will reduce the living standards of workers, even if they remain employed, if it causes nominal wages to grow more slowly (or fall more rapidly) than consumer prices. Real wage growth slowed only modestly during the crisis on average in the OECD area, declining from 1.1% just before the crisis to 0.7% at the depth of the crisis, between the first quarter of 2009 and the fourth quarter of 2012 (Figure 1.6,

Figure 1.6. **Real wage growth has been less affected by the crisis than nominal wage growth, due to slowing price inflation**

Average annualised percentage growth rate



Note: Countries are ordered by ascending order of the average annualised growth rate in real hourly wages in Q1 2000-Q4 2007.

a) Total wages divided by total hours worked of employees (deflated using the private consumption price index in Panel A).

b) OECD is the weighted average of the 27 OECD countries shown (not including Latvia and Lithuania).

Source: OECD calculations based on quarterly national accounts.

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Panel A). It then inched up to 0.9% the past three years. While nominal wage growth is still one percentage point below its pre-crisis level, this is nearly offset by the 0.9 percentage point decline in the private consumption price deflator. While the post-crisis decline in real wage growth has been muted on average over the OECD, it is still the case that real wage growth was somewhat slower during Q4 2007-Q4 2015 than during Q1 2000-Q4 2007 (annualised growth rates of 0.8% and 1.1%, respectively).

There is considerable cross-country diversity in how the crisis affected real wage growth. The slowdown at the depth of the crisis affected more than three-fourths of the 27 OECD countries for which data are available, with the slowdown tending to be more pronounced in the euro area. Hourly real wages declined in a number of the euro area countries that were hard hit by the sovereign debt crisis, including Greece, Ireland, Italy, Portugal and Spain. The most dramatic reductions in real wage growth were observed in Estonia, Latvia and Lithuania which had experienced rapid real wage growth just prior to the crisis. The combined impact of the global economic slowdown and a loss of labour cost competitiveness produced very deep recessions in the three Baltic States and a period of falling real wages. Outside the euro area, real wages declined during the crisis only in Israel and the United Kingdom, while wage growth slowed considerably in Canada and the United States falling from 1.6% and 1.3% before the crisis to 0.7% and 0.8% at the depth of crisis.

During the recovery, real wages rebounded somewhat in the OECD and the euro area, growing by 0.9% and 1.1% respectively from the fourth quarter of 2012 to the fourth quarter of 2015 (up from 0.7% and 0.5% at the depth of the crisis). Two-thirds of OECD countries recorded higher real wage growth in the past three years than at the depth of the crisis due to both tightening labour markets and falling energy prices. However, real wages continued to fall in Greece, Portugal, but also in Australia and the United Kingdom, causing further hardships for workers and their families. Similarly, real wage growth slowed markedly in Hungary and declined in Australia and Japan.

Real wage fluctuations during the crisis and subsequent recovery reflected the way both nominal wages and consumer prices adjusted to output and unemployment shocks (Figure 1.6, Panels B and C). In the OECD as a whole, nominal wage growth slowed from an annualised rate of 2.7% before the crisis to 2.2% at the depth of the crisis and 1.7% in the most recent period. While nominal wage growth has yet to bounce back from the crisis for the OECD as a whole, real wage growth has nearly done so because price inflation has fallen almost as strongly as nominal wage growth.

While the OECD average growth rate of real wages recently has been close to that before the crisis, it is still the case that cumulative real wage growth since Q4 2007 has been substantially lower than it would have been if wages had consistently grown at their average rate during Q1 2000 to Q4 2007 in a number countries. Annex Table 1.A2.1 shows that the real wage gap between actual wages at the end of 2015 and this counterfactual wage level averaged just 1.7% for the OECD area, but that the cumulative wage gap is over 20% in seven countries. While prospects appear quite good for achieving real wage growth rates similar to those obtained prior to the crisis, it is much less evident that the lost ground will be made up in countries where real wages now lie well below their pre-crisis trend line. Many of the countries where a large cumulative wage gap has developed have also developed a similarly large gap for labour productivity, suggesting that a restoration of stronger productivity growth is likely to be a precondition for closing the post-crisis wage gap.

Wage moderation in the wake of the crisis has slowed the rise of nominal unit labour costs

Wage moderation can play a role in restoring competitiveness for countries where unit labour costs exceed those of their trading partners, a particularly important consideration for countries belonging to a monetary union such as the euro area (see discussion on external rebalancing below). Figure 1.7 analyses the impact of the recent period of wage moderation, in combination with changes in labour productivity, in reducing nominal unit labour costs. For the OECD area as a whole, nominal unit labour costs were approximately flat during 2009-12, but have since resumed growing albeit quite slowly as nominal wage growth strengthened a little and labour productivity growth remained weak. Indeed, labour productivity is growing at a slower pace than before the crisis in the vast majority of the countries analysed (in 27 out of 29 countries).

The key issue for national competitiveness is international differences in the growth of unit labour costs. In fact, unit labour costs have fallen in some of the countries hit hardest by the global and sovereign debt crises, including Greece, Ireland, Latvia, Portugal and Spain, where the pre-crisis period was characterised by rapidly growing labour costs. In some cases, notably Ireland, Portugal and Spain, faster productivity growth reinforced the impact of wage restraint in reducing unit labour costs and thus helping to restore competitiveness. By contrast, labour costs have grown relatively rapidly in Germany since 2011.

Internal devaluation in euro area countries is only slowly restoring external balance through an expansion of the tradable sector

The rebalancing process in euro area countries with large current account deficits prior to the global financial crisis is further analysed in Figure 1.8. Internal devaluation by reducing nominal wage growth should help to restore competitiveness in countries with chronic current account deficits by inducing a reallocation of labour resources out of sectors that are not exposed to international trade and into export-oriented sectors (Blanchard, Jaumotte and Loungani, 2013). One prerequisite for this adjustment to occur is that unit labour cost in deficit countries fall relative to costs in surplus countries. However, it is also necessary for the relative price of non-tradable sector to fall relative to the tradable sector and for labour to shift out of the non-tradable sector into the tradable sector. While euro area countries with chronic trade deficits have experienced large wage and unit labour cost adjustments, these are only beginning to be translated into the needed shift toward greater exporting:

- Panel A shows that nominal unit labour costs in deficit countries have grown much more slowly or even fallen) since the onset of the crisis, largely due to downward pressure on wages. The same process has been present in many surplus countries, albeit to a less pronounced degree. The deceleration in the growth of unit labour costs between the pre- and post-crisis periods was particularly sharp in the Baltic States, Greece, Ireland, Portugal and Spain.
- Panel B indicates that wage adjustments have been stronger in the non-tradable sector than in the tradable sector in most deficit countries. It has also tended to be stronger in deficit than in surplus countries. However, in most countries prices in the non-tradable sector have not yet fallen significantly relative to prices in the tradable sector, which are largely set on world markets (Panel C). Greece and Slovenia are exceptions where the required adjustment of relative product prices appears to have begun. The delay before

Figure 1.7. **Wage moderation contributed to slower growth of nominal unit labour costs**

Index base 100 in 2000

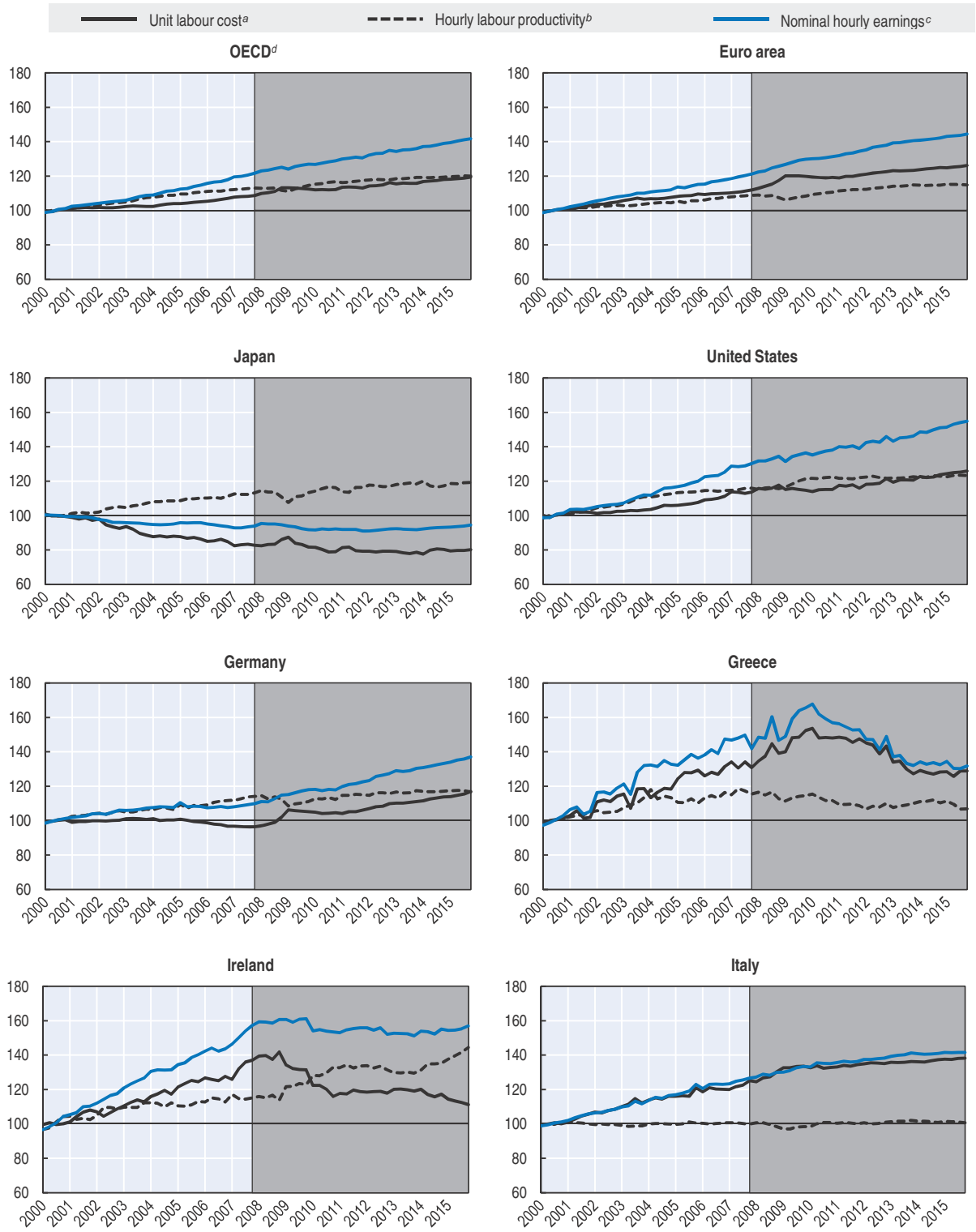
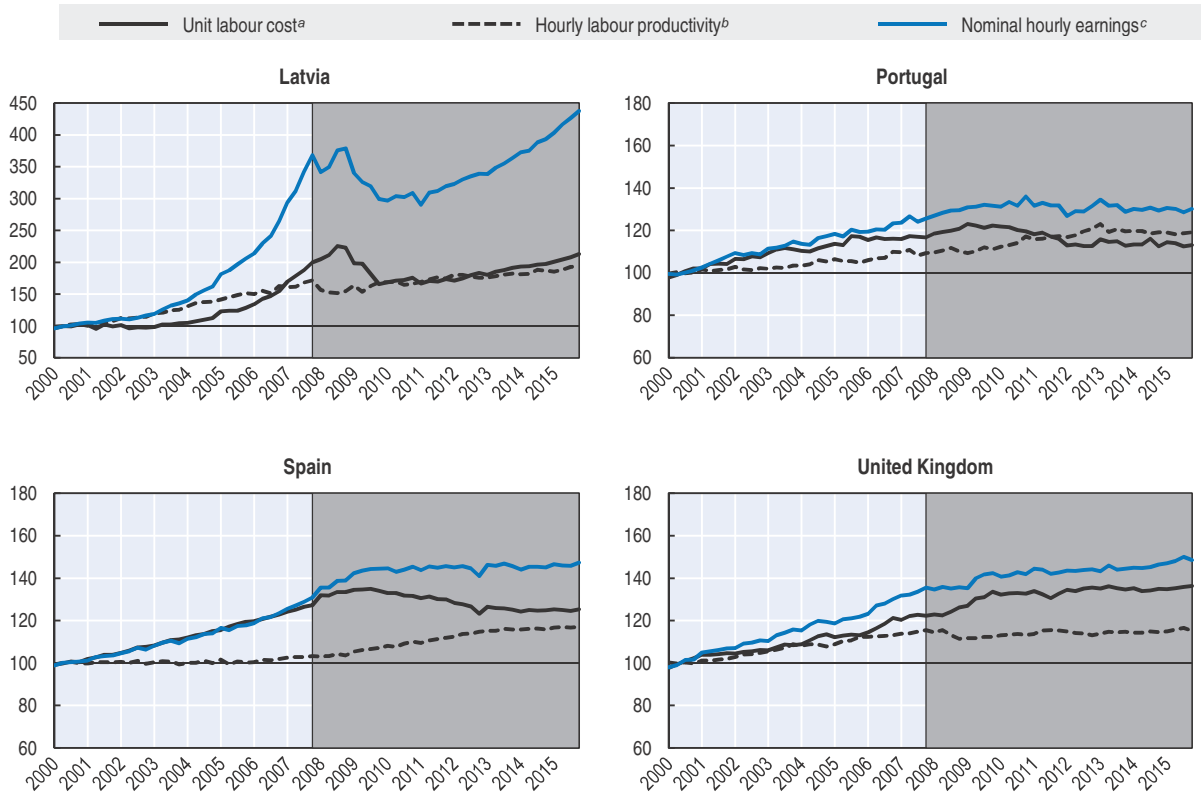


Figure 1.7. **Wage moderation contributed to slower growth of nominal unit labour costs** *(cont.)*

Index base 100 in 2000



a) Total wages in nominal terms divided by real GDP.
b) Real GDP divided by total hours worked.
c) Total wages divided by total hours worked of employees.
d) OECD is the weighted average of 27 OECD countries (excluding Chile, Iceland, Korea, Mexico, New Zealand, Norway and Turkey).
Source: OECD calculations based on quarterly national accounts.

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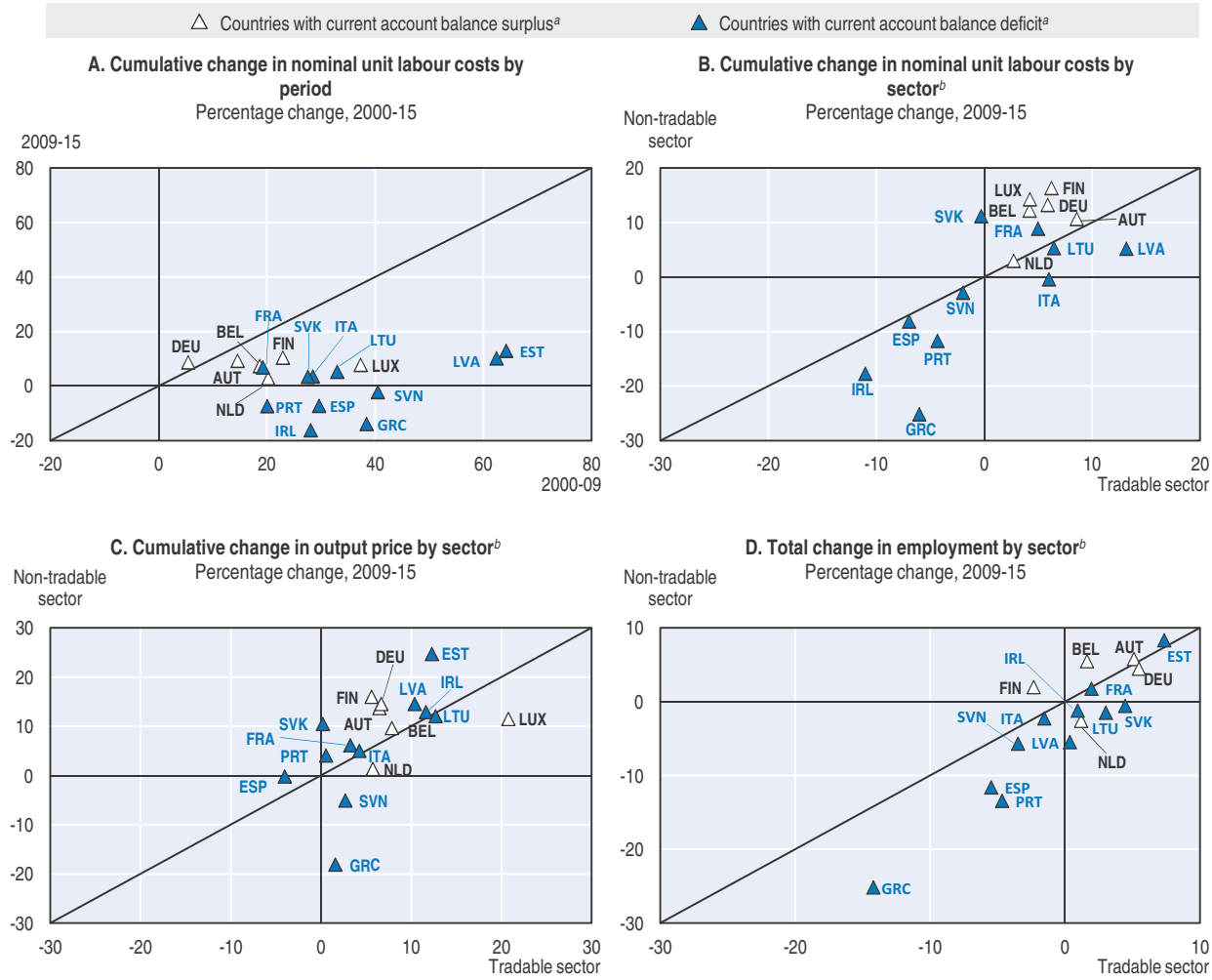
restraint in labour costs is reflected in product prices suggests that weak product market competition has allowed firms to pocket lower labour costs in the form of increased profits.

- A modest degree of labour reallocation from non-tradable to tradable sectors has been seen in the majority of the deficit countries in the sense that the employment share of the tradable sector has increased (Panel D). However, this is often a matter of employment losses having been steeper in the non-tradable sector and could represent income effects from recessionary conditions more than successful structural adjustment in the form of higher exports. It appears that wage restraint has not yet translated into major progress in balancing competitiveness within the euro area, perhaps due to both a lack of product market competition and often rigid labour markets that impede labour mobility.

Structural reforms, such as changes to product market regulation to be more supportive of competition and labour market policies to help workers move from jobs in declining into jobs in growing sectors could speed the translation of wage restraint into greater competitiveness and the achievement of external trade balance.

Figure 1.8. **Wage restraint is only slowly restoring external balance in the euro area**

Adjustments in nominal unit labour costs, output price and employment in the euro area



a) Countries are classified according to their structural current account balance at the onset of the global financial crisis in 2007.

b) The tradable sector includes: i) Agriculture, forestry and fishing; ii) Industry (except construction); iii) Wholesale and retail trade, transport, accommodation and food service activities; iv) Information and communication; v) Financial and insurance activities; and vi) Professional, scientific and technical activities; administrative and support service activities. The non-tradable sector includes: i) Construction; ii) Real estate activities; iii) Public administration, defence, education, human health and social work activities; and iv) Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organisations and bodies.

Source: OECD calculations based on Eurostat, *Annual National Accounts Database*.

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2. Recent changes in the composition of employment and job quality

Changes in the composition of employment

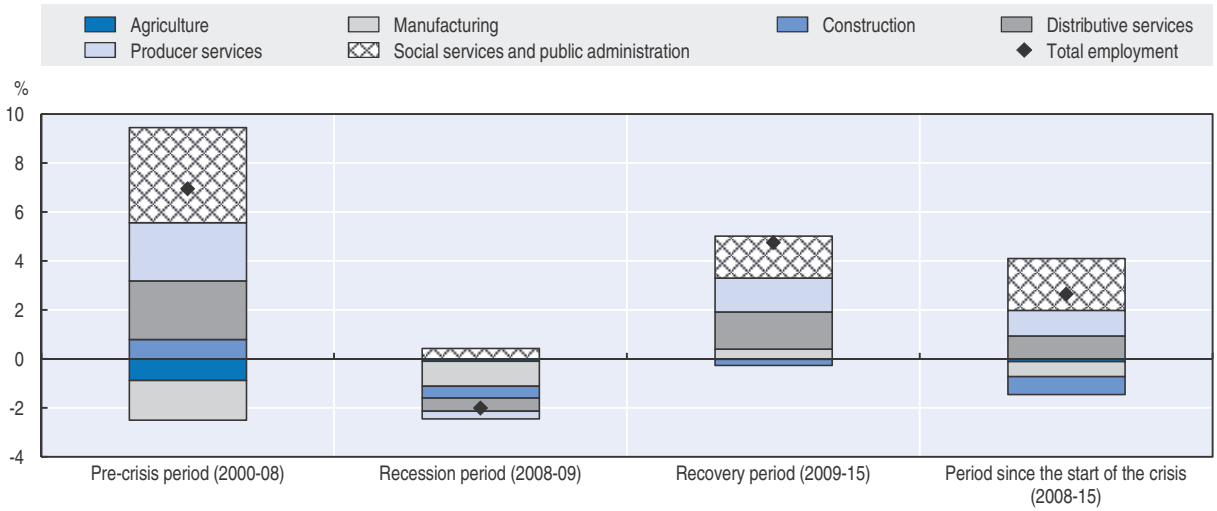
The analysis above documented recent changes in overall employment and average wages, with a focus on how they were affected by the Great Recession and the uneven recovery that followed. This section examines changes in the composition of employment and job quality during the same period. The analysis is descriptive in nature, but the respective contributions of cyclical variation and longer-run trends to the overall changes observed are tentatively assessed.

The goods producing sector accounted for most of the jobs lost during the recession, while the service sector accounted for essentially all of the jobs added during the recovery

Job losses were highly concentrated in the goods-producing industries during the recession that followed the global financial crisis, whereas job gains during the recovery have been highly concentrated in service industries. Figure 1.9 documents this pattern using six broad industry groupings and average data for the OECD countries. The goods-producing sector as a whole, accounted for most of the decline in employment during the Great Recession (79%), with manufacturing and construction accounting for a major share of the lost jobs. Service sector employment was moderately down during the recession, as continued job growth in social services and public administration (including industries such as health care and education) partially offset the job losses in distributive and business services. The recovery presents almost a reverse image of the recession, with employment being nearly unchanged in the goods-producing sector, due to off-setting effects among the more detailed industry groupings (i.e. modest gains in manufacturing combined with continued losses in construction and agriculture), while the service sector employment growth represented the major part of total job growth for the economy (97%). Employment growth resumed in the distributive and business services, while employment

Figure 1.9. **Many manufacturing and construction jobs lost during the Great Recession have not been replaced during the recovery**

Percentage-point contribution to OECD-average[a] employment growth of different industries[b] for the indicated period



a) Employment-weighted average of 29 OECD countries (Chile, Iceland, New Zealand, Switzerland and Turkey not included).

b) Industries shown in this figure are based on the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4 and are grouped as follows: **Manufacturing** refers to i) Mining and quarrying, ii) Manufacturing, iii) Electricity, gas, steam and air conditioning supply, and iv) Water supply; sewerage, waste management and remediation activities; **Distributive services** refer to i) Wholesale and retail trade; repair of motor vehicles and motorcycles, ii) Transportation and storage, iii) Accommodation and food service activities, and iv) Information and communication; **Producer services** refers to i) Financial and insurance activities, ii) Real estate activities, iii) Professional, scientific and technical activities, iv) Professional, scientific and technical activities, and v) Administrative and support service activities; **Social services and public administration** refer to i) Public administration and defence; compulsory social security, ii) Education, iii) Human health and social work activities, iv) Arts, entertainment and recreation, v) Other service activities, vi) Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use, and vii) Activities of extraterritorial organisations and bodies.

Source: OECD calculations based on the *OECD National Accounts Statistics Database*.

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growth in social services and public administration remained the most dynamic sector and accounted for more than one-third (36%) of total net employment gains for the economy as a whole.

There are large cross-country differences in the post-crisis evolution of employment by broad industry, but much of this variation reflects differences in the overall severity of the Great Recession and the vigour of the recovery (cf. Section 1 of this chapter). Annex Figure 1.A2.1 shows that employment growth between 2008 and 2015 ranged from double-digit declines in Greece (17%), Portugal (10%) and Spain (13%), to growth of more than 15% in Israel and Luxembourg. Countries where overall employment grew (declined) strongly tended to experience job gains (losses) across all industries. Despite the strong impact of overall growth on employment growth at the industry level, there is a broad tendency across OECD countries for the employment performance of the service sector to be relatively stronger than that for the goods-producing sector. Indeed, the shift of employment away from goods producing to service jobs tended to be stronger in the countries with the strongest overall employment growth during the crisis period.[6]

The net shift of employment away from the goods-producing sector and towards the service sector during the past eight years represents the continuation of a secular trend in advanced economies that was already evident in the decades preceding the Great Recession. Indeed, the decline in manufacturing employment for the OECD area was substantially faster during the eight years that immediately preceded the crisis than during the post-crisis period: manufacturing employment fell by 1.6% during 2000-08, as compared to 0.6% during 2008-15. The deceleration of the contraction of manufacturing employment since the crisis probably reflects the relative stagnation of international trade flows, which contrasts sharply with the rapid growth of trade – particularly imported manufactured goods from China and other emerging economies – that was experienced by OECD countries prior to the crisis. It is not clear whether that shift in trade patterns should be considered to be a result of the crisis or of other factors. However, the persistence of low growth in trade flows well into the recovery suggests that longer-term factors may dominate. Comparing the pre- and post-crisis periods does reveal a qualitative shift from growing to declining employment in the construction sector. This sector appears to have expanded beyond a sustainable level during the pre-crisis period in countries where a bubble in real estate prices stimulated a large increase in construction activity. If so, the recession could be viewed as having initiated a correction that would have happened in any case, albeit in a less precipitous manner. Even if future research confirms that the crisis had little lasting impact on the industrial composition of employment, it clearly did cause very large numbers of manufacturing and construction workers to be laid off during 2008-09. Many of these workers likely faced considerable difficulties in accessing the new jobs that were created in the service sector during the recovery or experienced a substantial pay penalty related to poor matches between their job skills and those required by service sector employers (OECD, 2013).[7]

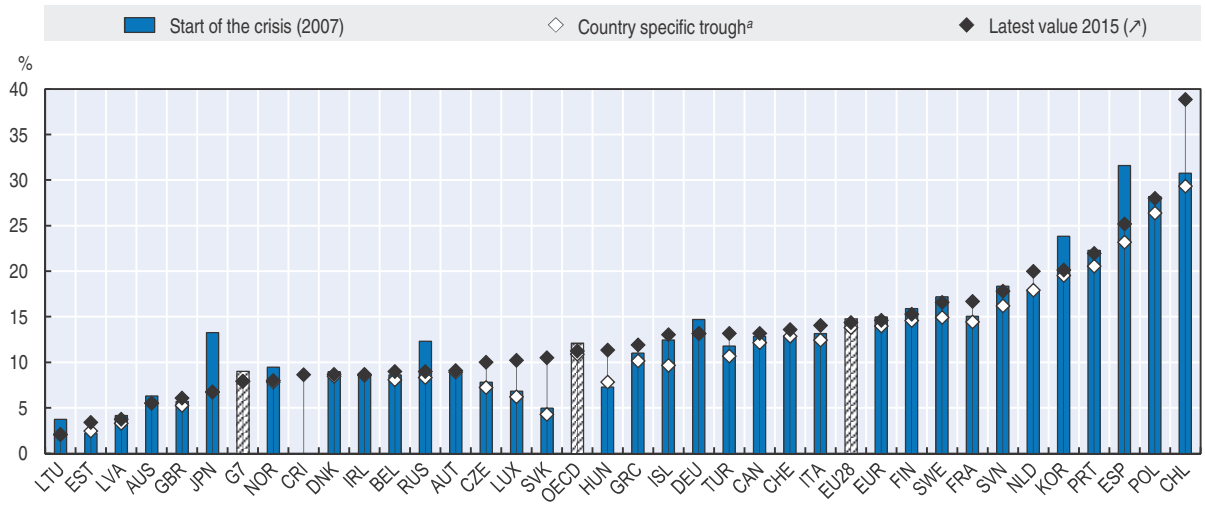
Temporary employment fell sharply during the crisis but has since rebounded

Workers with fixed-term contracts were disproportionately affected by the job losses that occurred during the Great Recession, presumably because employers generally prefer to downsize their workforce via the non-renewal of temporary contract that have expired, rather than the dismissal of workers with open-ended contracts. However, employment gains during the recovery have also been particularly strong for temporary jobs, leaving the incidence of temporary employment little changed. For the OECD area as a whole,

temporary employment fell from 12.1% of dependent employment prior to the crisis to a low of 10.9% in 2009, before rebounding to 11.2% in 2015 (Figure 1.10). The decline in the incidence of temporary employment during the Great Recession was particularly sharp in Iceland, Japan, Korea and Spain. These declines have been more than fully reversed only in Iceland. A few countries, including Hungary, the Slovak Republic and, especially, Chile have seen a significant increase in the incidence of temporary employment during the recovery period. Since the crisis, important labour market reforms were enacted in Spain that are intended to encourage employers to reduce their use of temporary contracts. Italy and Portugal have also enacted recent reforms intended, in part, to encourage employers to make greater use of open-ended contracts. As of 2015, there had been a considerable reduction in the incidence of temporary employment since 2007 in Spain, a small reduction in Portugal and a moderate increase in Italy. More time is required in all three of these countries, however, to judge the ultimate impacts of these reforms on employers' use of temporary contracts.[8]

Figure 1.10. **The incidence of temporary employment fell during the crisis, but has since rebounded**

Percentage share of temporary employment in dependent employment (persons aged 15-64)



a) Country specific trough is defined as the minimum value of the incidence of temporary employment since the crisis.
Source: OECD Employment Statistics Database.

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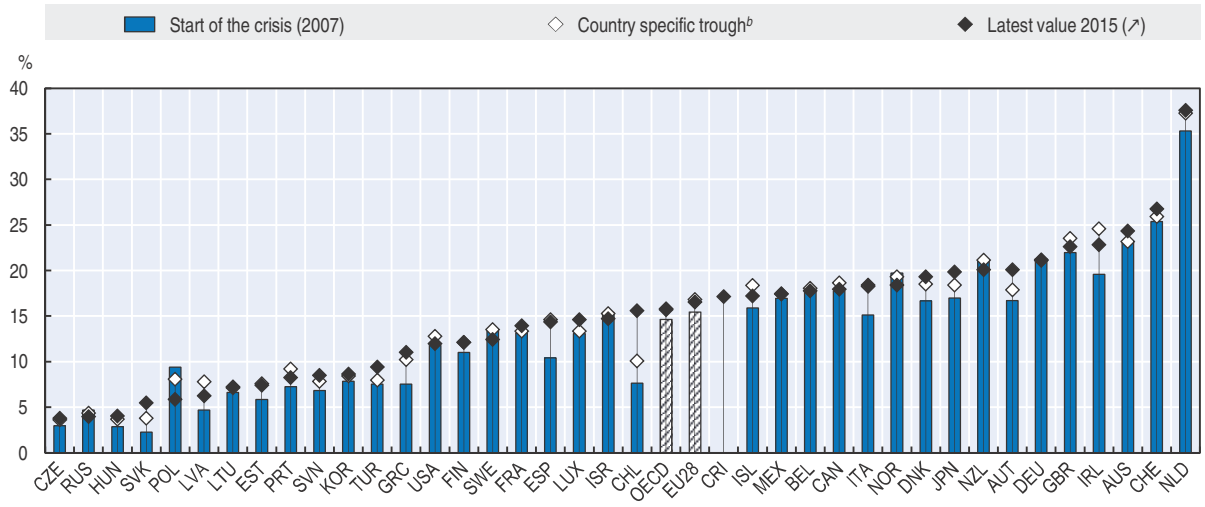
The evidence suggests that the crisis probably had no lasting effect on the incidence of temporary employment in the OECD area and Europe. However, the data for individual countries indicate instances where temporary employment appears to be trending either upward or downward. Along with Japan and Spain, Germany and Korea have seen a significant reduction in the incidence of temporary employment since 2007. In the case of Germany, this probably reflects the response of employers to an increasingly tight labour market. A larger number of European countries have experienced increases in the incidence of temporary employment. The largest increases occurred in Chile, Hungary and the Slovak Republic, but the Czech Republic, France, Luxembourg, the Netherlands and Turkey also experienced significant increases.

The incidence of part-time work has continued to rise

The average incidence of part-time employment rose during the Great Recession in OECD countries, increasing from 14.6% in 2007 to 16.1% at the trough of the recession (Figure 1.11). This pattern probably reflects, at least in part, the sectoral patterns discussed above: job losses during the recession were highly concentrated in manufacturing and construction, where part-time work is relatively rare, whereas employment held up better in the service sector which employs a higher share of part-time workers.[9] Another (clearly temporary) factor that contributed to a rising part-time share during the recession is that some workers who previously worked a full-time schedule were placed temporarily on part-time schedules when business conditions deteriorated, a managerial choice that was encouraged in a number of OECD countries by public short time work schemes. The increase in part-time incidence during the recession was particularly sharp in Ireland, Italy, Latvia and Spain (all at 3 percentage points or above), whereas the part-time share fell in only a few countries, most notably Poland.

Figure 1.11. **The incidence of part-time employment continues to increase in many countries**

Percentage share of part-time employment[a] in total employment (persons aged 15-64)



a) Part-time employment refers to persons who usually work less than 30 hours per week in their main job.
b) Country-specific trough is defined as the minimum value of total employment since the start of the crisis.
Source: OECD Employment Statistics Database.

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The rise in the part-time share of total employment during the recession has not been reversed during the recovery period, leaving a net increase in the incidence of part-time employment over the entire post-crisis period. For the OECD area as a whole, part-time incidence was 15.7% in 2015, 0.4 percentage point lower than at the recession trough and 1.1 percentage points above its pre-crisis level (Figure 1.11). This pattern suggests that the recessionary effect in raising the part-time share may have represented, in considerable part, a concentration during the recession years of the trend increase in part-time work that would otherwise have been spread more evenly across the 2007-15 period. Indeed, the rise in the OECD average incidence of part-time employment was as high during 2000-07 as during 2007-14 (1.1 percentage points), suggesting that the Great Recession was not the major factor accounting for the post-crisis increase in part-time employment, but may have moderately reinforced the pre-existing trend.

Changes in job quality

Since the crisis reduced the number of jobs available and affected the composition of employment, at least temporarily, it is important to ask whether there was also an impact on job quality. This section analyses the recent evolution of job quality making use of the framework that was presented in OECD (2014) and which allows job quality to be measured along three main dimensions:

- *Earnings quality.* Earnings quality refers to the extent to which the earnings received by workers in their jobs contribute to their well-being by taking into account both the average level as well as the way earnings are distributed across the workforce.
- *Labour market security.* Labour market security measures the risk of unemployment (the risk of becoming unemployed and the expected duration of unemployment) and the degree of public unemployment insurance (coverage of the benefits and their generosity).
- *The quality of working environment.* The quality of the working environment captures non-economic aspects of job quality and measures the incidence of job strain that is characterised by high demanding jobs that have few job resources to carry out these demands.

Box 1.1 provides a brief overview of variations in job quality across OECD countries and demographic groups.

Box 1.1. **Variations in job quality across OECD countries and demographic groups**

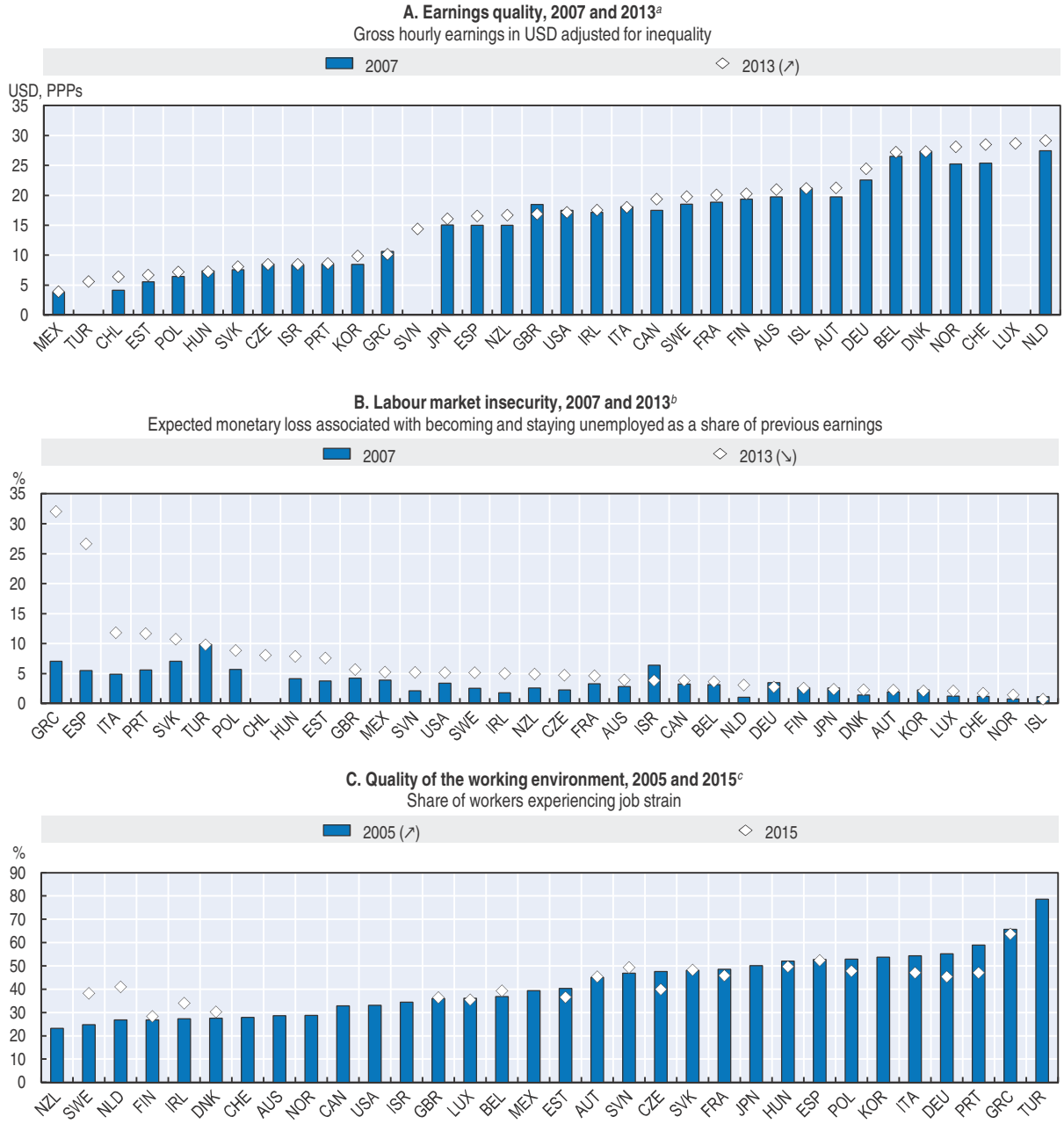
Countries show a high degree of heterogeneity in terms of job quality performance. However, three main groups of countries can be identified using the latest data available:

- Australia, Austria, Denmark, Finland, Germany, Luxembourg, Norway, and Switzerland have the highest job quality among OECD countries.
- Belgium, Canada, the Czech Republic, Estonia, France, Ireland, Israel, Japan, Korea, Mexico, the Netherlands, New Zealand, Slovenia, Sweden, the United Kingdom, and the United States display an average performance in terms of job quality.
- Greece, Hungary, Italy, Poland, Portugal, the Slovak Republic, Spain and Turkey do relatively badly in two or all of the three dimensions of job quality.

Substantial differences in job quality emerge also across different workers. Youth and low-skilled workers have on average poor earnings quality, high labour market insecurity and higher job strain (especially for low skilled). High skilled workers have higher job quality in all dimensions. Differences by gender are more mixed: women have lower earnings quality because of lower average earnings (women typically work in less paying occupations and sectors as a result of segregation or even outright discrimination). However labour market security is practically the same for men and women, while job strain is lower among women.

When comparing pre- and post-crisis values of the job quality indicators, it is clear that the crisis had a negative effect on job quality in most OECD countries by worsening considerably labour market security. This reflects the combined impact of a substantial increase in the risk of unemployment with lower effective income replacement via unemployment insurance due to more long-term unemployed workers exhausting their benefit entitlements (Figure 1.12, Panel A). The increase in insecurity between 2007

Figure 1.12. **Labour market insecurity increased in the wake of the crisis, but neither earnings quality nor the quality of the working environment has shown a clear trend**



a) 2013 data refer to: 2012 for France, Italy, Poland, Spain, Sweden and Switzerland; and 2010 for Estonia, Luxembourg, the Netherlands, Slovenia and Turkey. 2007 data refer to: 2006 for the Netherlands, Estonia, Italy and Switzerland; and 2008 for Denmark and Israel. Generalised means approach is used as an aggregation tool to compute earnings quality measures, assuming a high inequality aversion (more details in OECD, 2014).

b) The data for Chile refer to 2011 instead of 2013.

c) Data for 2015 available only for EU countries and are based on the sixth European Working Conditions Survey (forthcoming), while the data for 2005 are based on the fourth European Working Conditions Survey and the International Social Survey Program Work Orientations Module III for 2005.

Source: *OECD Job Quality Database* (2016).

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and 2013 was sharpest in Spain and Greece, but also quite large in Ireland and Portugal. However, much or all of this increase is likely to be temporary. Indeed, unemployment rates and unemployment inflows have declined significantly in most OECD countries since 2013 and as a consequence labour market security is also improving.

In contrast with the post-crisis rise in labour market insecurity, neither earnings quality nor the quality of the working environment appears to have been systematically affected by the crisis, although it cannot be excluded that compositional changes in employment have masked the impact of the crisis on these dimensions of job quality, particularly earnings quality.[10] The stability of earnings quality in most countries is consistent with the finding above that the crisis-related slowing of nominal wage growth had relatively little impact on real wages due to the decline in price inflation during the post-crisis period.[11] Similarly, the change in the quality of the working environment in the ten years between 2005 and 2015 shows no consistent trend: the incidence of job strain was quite similar in 2005 and 2015 in the majority of the countries where data are available for both year, while similar numbers of countries experienced either a significant increase or decrease.

A comprehensive assessment of how the crisis may have affected job quality needs to consider all three dimensions in combination (Annex Table 1.A1.2). Many diverse patterns are revealed, including:

- Germany, for instance, not only experienced an increase in the employment rate, but also an improvement in all aspects of job quality and it is now among the countries where job quality is the highest, while this was not the case before the crisis. This progress probably reflects largely secular trends, but may also reflect the mild and short impact of the crisis on the German labour market.
- Job quality has evolved very differently in Ireland. It was among the countries with the highest job quality before the crisis due, in particular, to high labour market security and low job strain. However, labour market insecurity increased substantially during the recession depressing job quality, at least for a considerable period of time.
- In Greece, job quality was already relatively low before the crisis and the severe recession further worsened earnings quality and labour market security (while the incidence of job strain remained stable).
- In the United Kingdom, where employment after the initial dip in the early years of the crisis is now almost back to pre-crisis levels, earnings quality and labour market security fell during 2007-13, while the quality of the working environment remained essentially unchanged. Despite some recent deterioration in overall job quality, the United Kingdom still ranks as a near average performer, as was also the case before the crisis.
- In Portugal, job quality was relatively poor before the crisis. The post-crisis data reveal little change in earnings quality, whereas labour market security fell considerably because of the upsurge in unemployment, which is still far from being reabsorbed, and the quality of the working environment improved slightly for those people still employed.
- Finally, earnings quality improved in Sweden, but labour market security decreased and the quality of the working environment worsened (albeit from a relatively high level).

3. The labour market situation of vulnerable youth

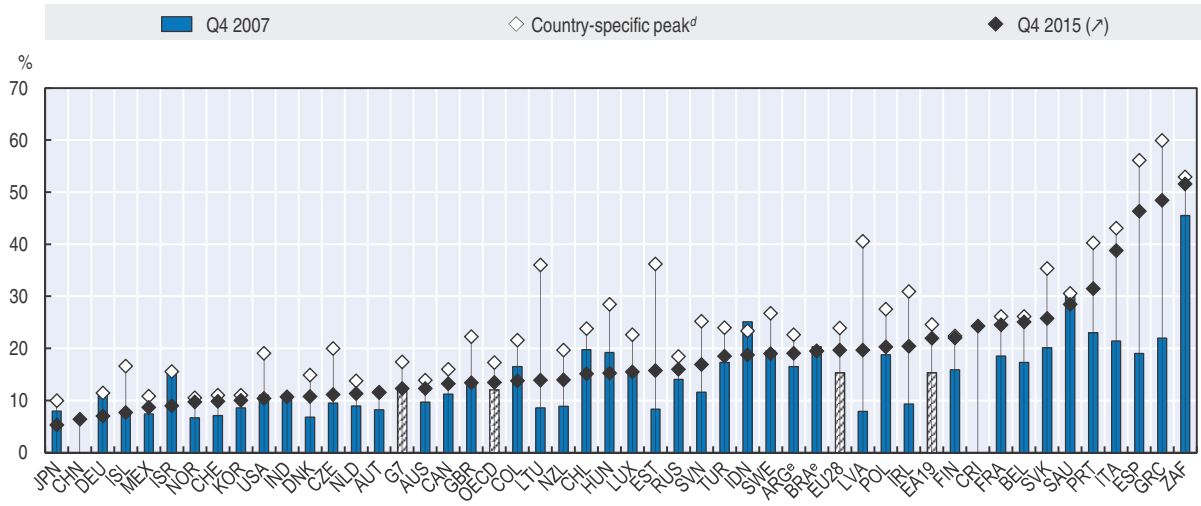
Youth have been one of the groups most affected by the Great Recession and the uneven recovery

Youth unemployment reached very high levels during the recession, but is coming down as the recovery progresses

The youth labour market is highly cyclical and young people were disproportionately affected by the labour market impact of the Great Recession. The youth unemployment rate for the OECD area increased from 12.1% in the fourth quarter of 2007 to a recessionary peak of 17.3% (Figure 1.13). This 5.2 percentage-point increase was approximately double that for older workers. However, the youth unemployment rate has also declined more rapidly than overall unemployment during the recovery, retreating to 13.4% in the fourth quarter of 2015. For the OECD area as a whole, 73% of the recessionary increase in the youth unemployment rate had been absorbed by the fourth quarter of 2015, as compared to only 59% of the recessionary increase in the overall unemployment rate. While the youth labour market has been very responsive to the economic recovery, youth unemployment remains above the pre-crisis level in 26 of the 34 OECD countries. Even once the cyclical increase in unemployment is fully re-absorbed, many of the youth who experienced prolonged joblessness after the crisis probably face permanently reduced career opportunities and may now be showing up in the statistics as unemployed, inactive or low-paid adults.[12] It also needs to be recalled that youth unemployment and underemployment was already too high prior to the crisis in many countries, with early school leavers at a particular risk of becoming trapped on the margin of the labour market (OECD, 2010).

Figure 1.13. **Youth unemployment has receded from its post-crisis peak, but remains very high in a few European countries**

Percentage of the youth (aged 15-24[a]) labour force, Q4 2007[b]-Q4 2015[c]



a) Youth aged 16-24 for China and the United States.
b) 2007-08 for India; 2008 for the Russian Federation; August 2007 for Indonesia; second semester of 2007 for Saudi Arabia; Q1 2008 for South Africa and Q2 2007 for Switzerland. No data available for China and Costa Rica.
c) 2010 for China; 2011-12 for India; 2015 for the Russian Federation; May 2014 for Indonesia; second semester of 2015 for Saudi Arabia; Q2 2015 for Argentina; Q3 2015 for Brazil; and Q1 2016 for Canada and the United States.
d) Country-specific peak is defined as the maximum value of the youth unemployment rate since the start of the crisis (Q4 2007).
e) Selected urban areas.
Source: OECD calculations based on the *OECD Short-Term Labour Market Statistics Database* and national labour force surveys.

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There have been large cross-country differences in the size and persistence of the post-crisis increase in youth unemployment. The unemployment rate for youth peaked 25 percentage points or more above its pre-crisis level in Estonia, Greece and Spain, with more than one in two active youth in the latter two countries being jobless at the worst of the recession (Figure 1.13). By contrast, there was essentially no increase in youth joblessness following the global crisis in Germany and Israel and the youth unemployment rates in these countries are now 4.3 and 6.9 percentage points lower than at the end of 2007. Among countries where there was a substantial increase in youth unemployment during the recession, the extent to which high joblessness has persisted also varies widely depending on how rapidly the overall labour market recovered. For example, the recovery started sooner and has been more vigorous in Estonia than in Greece and Spain, and this has translated into a much larger reduction in youth unemployment from its peak value in the former country (down 20.5 percentage points, as compared to around 10 percentage points in Greece and Spain), although youth unemployment recently has begun to decline quite rapidly in the latter two countries. Overall, these data confirm that youth have borne a disproportionate share of the burden of high joblessness since 2007, but also that the overall youth labour market has been recovering quite strongly where overall labour market slack has fallen. Indeed, the four countries where youth unemployment is still 10 percentage points or more above its pre-crisis level, namely, Greece, Ireland, Italy and Spain, are also the four countries with the largest overall unemployment gap in the fourth quarter of 2015 (Figure 1.3), whereas countries where youth unemployment is now substantially below its level in the fourth quarter of 2007, such as Germany and Israel, are also countries where the overall unemployment rate is below its pre-crisis level.

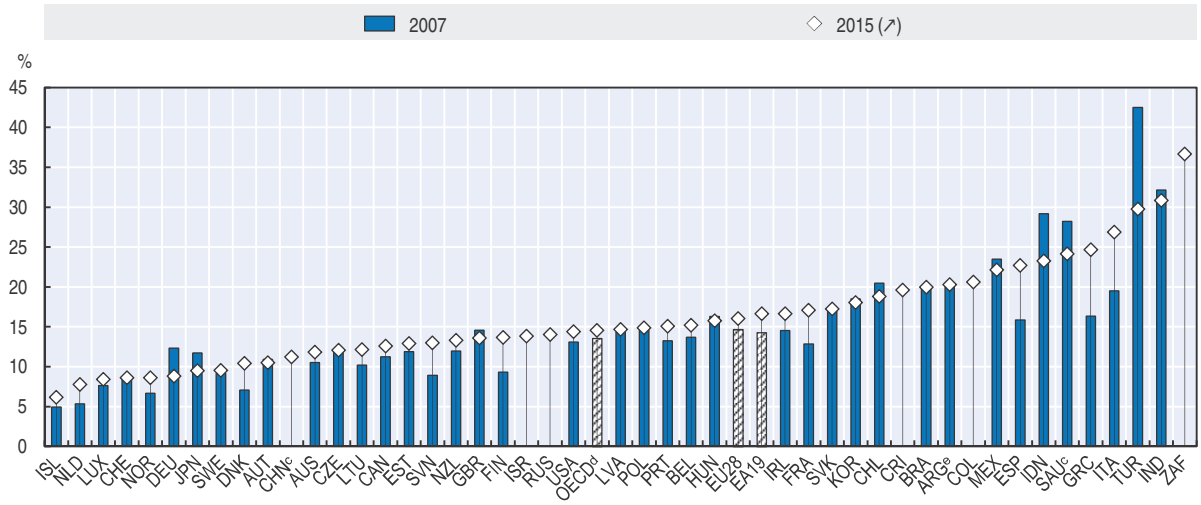
The number of NEET youth is worryingly high

The share of young people neither employed nor in education or training (NEETs) provides an additional measure of the labour market status of youth which is particularly useful for highlighting periods of non-employment – either unemployment or inactivity – that are not devoted to learning activities which can develop skills that will pay off later in terms of enhanced employability or greater opportunities for career advancement.[13] NEET status may thus be more closely connected to the risk of long-run marginalisation in the labour market than youth unemployment. However, the two measures overlap to a considerable extent.[14] It should also be emphasised that a significant share of young adults who are NEET and not actively searching for employment are mothers of young children who may have withdrawn from the labour force so as to have more time to devote to parenting activities, whether because they prefer this arrangement or they are unable to access affordable childcare or child friendly employment arrangements.[15]

In the OECD area, the share of NEETs among persons aged 15-29 was 14.6% in 2015, up from 13.5% before the onset of the crisis in 2007 (Figure 1.14). The NEET rate has increased since 2007 in 24 of the 33 OECD countries for which data are available. The European countries hit hardest by the global crisis – Greece, Ireland, Italy, Slovenia and Spain – have seen particularly large increases in the NEET rate. Among the smaller number of countries where the NEET rate has declined since 2007, the drop was especially large in Turkey, albeit from a very high level. NEET rates also declined significantly in Chile, Germany, Japan and Mexico. NEET rates are relatively high in some, but not all, emerging G20 economies. They are well above the OECD average in Argentina, India, Indonesia, Saudi Arabia and South Africa, whereas NEET rates in China and the Russian Federation are respectively below or close to OECD average.

Figure 1.14. **The NEET rate has increased in the majority of OECD countries**

Percentage of youth aged 15-29 who are neither employed nor in education or training, 2007[a] and 2015[b]



a) Data not available for China, Israel, the Russian Federation and South Africa; 2006 for Chile; 2005-06 for India; and 2008 for Korea.
b) 2010 for China; 2011-12 for India; 2013 for Chile and Korea; and 2014 for Argentina, Brazil, Indonesia, Israel and South Africa.
c) The NEET rate has been estimated and may include unemployed persons who are studying.
d) OECD is the unweighted average of the OECD countries shown (excluding Israel).
e) Selected urban areas only.
Source: OECD calculations based on national labour force surveys excepted Census data for China and *OECD Education Database* for Australia, Israel, Korea, New Zealand and the Russian Federation.

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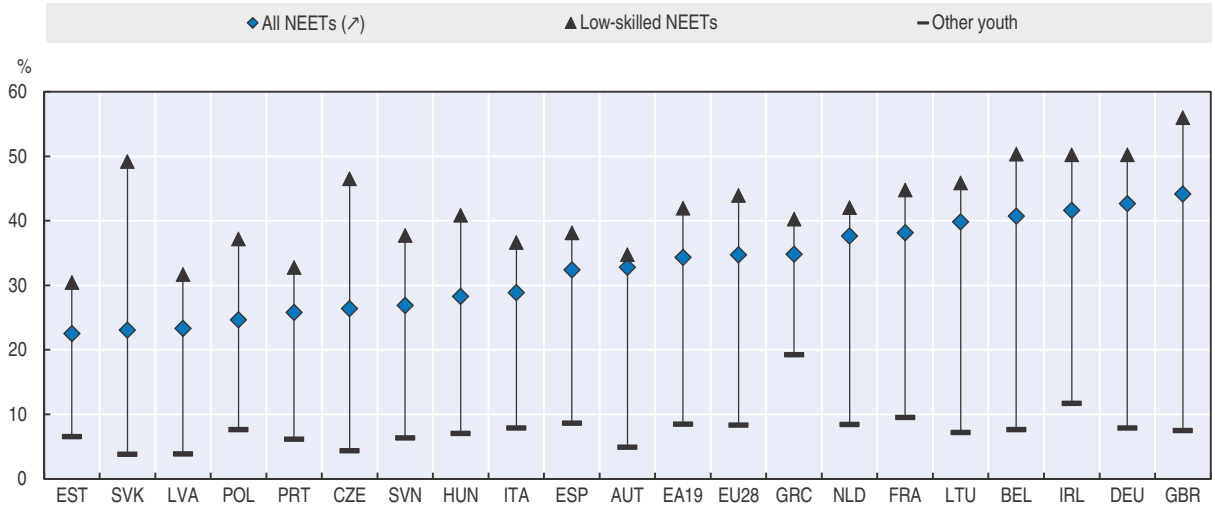
The short-run economic vulnerability of young people in NEET status depends largely on their household situation, whereas their long-run vulnerabilities relate more closely to their career prospects (Carcillo et al., 2015). NEETs are more likely to live in jobless households than other youth. On average for EU countries for which data are available, slightly more than one in three NEETs lives in a household where there is no employed person, whereas this rate is less than one in ten for other youth (34.7% and 8.4%, respectively; see Figure 1.15). The probability of living in a jobless household rises to 44% for low-skilled NEETs (i.e. those not having finished upper secondary schooling) suggesting that this group is at particular risk of poverty in the short-run, in addition to facing more limited career opportunities than better educated NEETs in the long run. The share of NEETs living in jobless households has increased by around 4 percentage points since the onset of the crisis in the European Union and by more than 7 percentage points for low-skilled NEETs (data not shown). The largest increases in the share of NEETs (more than 14 percentage points) occurred in some of the countries hardest hit by the crisis, including Greece, Lithuania and Spain.

Low-skilled NEETs are at risk of marginalisation and deserve particular policy attention

NEET youth are a heterogeneous group but a considerable share of this group cumulates disadvantages that leave them at risk of being left behind permanently in the labour market. Carcillo. et al. (2015) show that approximately 40% of all youth are NEET at some point during a four-year period, but only about one-half of this group cumulates more than 12 months of time in NEET status. Among the risk factors that increase the probability of becoming or remaining NEET are low educational attainment, being a sole

Figure 1.15. **NEETs are more likely to live in jobless households than other youth,[a] 2014**

Percentage of indicated group living in jobless households



a) Data shown apply to persons aged 15-29.

Source: OECD estimates based on the European Union Labour Force Survey (EU LFS).

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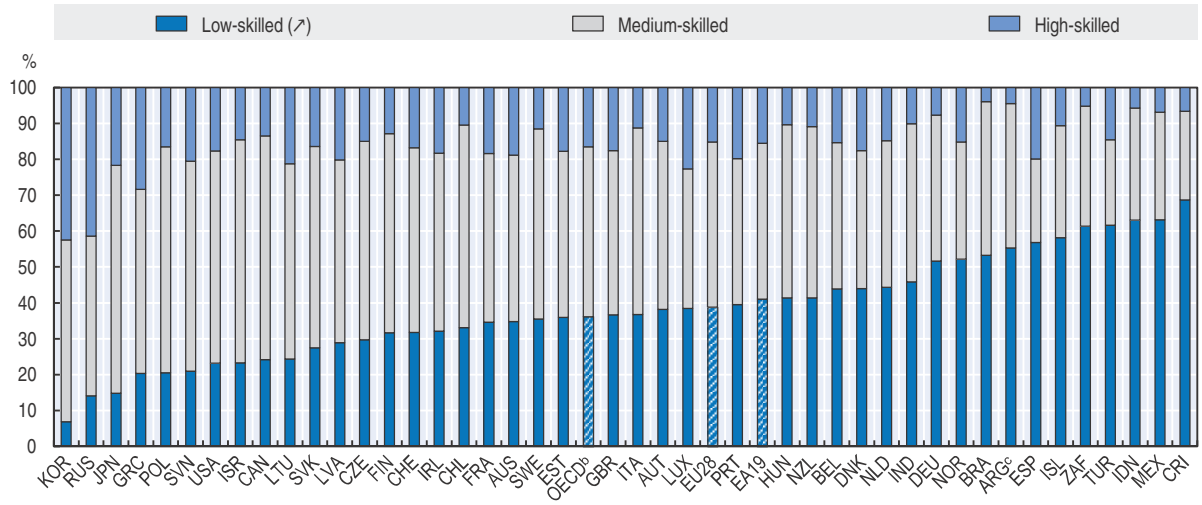
parent, living in a jobless household and reporting poor health.[16] Youth whose parents are less educated also have an elevated risk of being NEET. This latter pattern is likely to mean that NEET youth tend to be less well connected than other youth to informal social networks that can provide access to employment and career advancement opportunities.[17] Reducing NEET rates is, therefore, an important challenge for policy makers that is likely to require a broad strategy addressing a variety of barriers currently preventing some youth from succeeding in the labour market.

In the OECD area as a whole, more than one-third (36.1%) of NEETs aged 15-29 years are early school leavers (Figure 1.16). This is considerably higher than the 21% share of all out of school youth who have not finished upper secondary schooling. The share of NEETs with a medium level of education is moderately higher than the low-skilled share at 47.3%, while the high-skilled share is a lower 16.5% (OECD averages for 2015). The share of NEET youth who have not finished upper secondary schooling ranges from less than 7% in Korea, to more than 50% in Germany, Israel, Mexico, Norway, Spain and Turkey. Since the start of the crisis in 2007, the low-skilled share of NEETs has declined by nearly 6 percentage points on average in the OECD area, while the share of high-skilled NEETs increased by around 4 percentage points. This pattern is observed in a large majority of OECD countries and it largely reflects a rise in the share of high-skilled youth experiencing difficulties to enter the labour market during the recent economic downturn.[18] Nevertheless, low-skilled NEETs are of particular concern, as this group is particularly likely to face the most limited career prospects and the greatest risk of being left behind permanently, even after labour markets have fully recovered from the Great Recession.[19]

Under the Turkish Presidency in 2015, G20 leaders adopted the policy goal to reduce the share of young people who are most at risk of being left permanently behind in the labour market by 15% by 2025. While each government was left free to define vulnerable youth in the way that is most appropriate for their country, low-skilled NEETs were identified as a possible target group, particularly for the more advanced G20 economies.[20]

Figure 1.16. **Many NEETs have not finished upper-secondary schooling**

Percentage distribution of total NEETs aged 15-29 years by education, 2015[a]



a) 2011-12 for India; 2013 for Chile and Korea; and 2014 for Argentina, Brazil, Indonesia, Israel and South Africa.
b) OECD is the unweighted of the 34 OECD countries shown.
c) Selected urban areas.
Source: OECD calculations based on national labour force surveys excepted *OECD Education Database* for Australia, Israel, Korea, New Zealand and the Russian Federation.

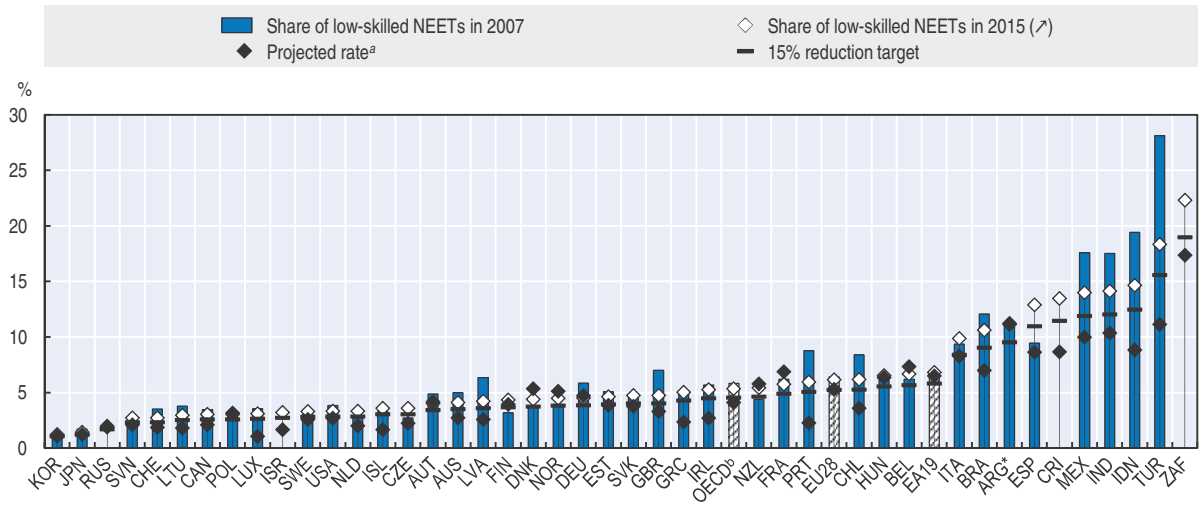
StatLink http://dx.doi.org/10.1787/888933384496

Figure 1.17 provides a simple assessment of how ambitious the G20 target appears to be in light of recent trends. Along with the historic incidence rates for 2007 and 2014, the figure presents the G20 target for 2025 (interpreted as equalling 85% of the incidence of low-skilled NEET status in 2014) and a simple projection of the 2025 incidence rate based on a linear regression model relating the share of youth who are low-skilled NEETs to the unemployment rate and a linear time trend. A separate regression was estimated for each country using all of the available data since 2000. The results of this exercise suggest that most OECD countries appear likely to meet the G20 target if recent trends continue and unemployment is relatively low in 2025:

- Two-thirds of the OECD countries (23 out of 34) will meet or exceed the G20 target provided unemployment in 2025 equals its minimum value during 2007-15 and the country-specific time trend in the incidence of low-skilled NEET status continues unchanged. Portugal, Spain and Turkey are on track to exceed the target by a wide margin, as are several non-OECD emerging economies including Brazil, India, Indonesia and South Africa, albeit starting from higher shares of low-skilled NEETs than is found in most OECD countries.[21] The widespread trend for a rising share of youth to complete at least upper secondary education is the main reason why many countries appear to be on track to meet the G20 target. Another reason why the unskilled NEET rate is projected to fall significantly in countries such as Greece, Ireland, Portugal and Spain is that the projections assume a large fall in the unemployment rate between 2014 and 2025.
- The G20 target will not be achieved according to these simple projections in one-third of the OECD countries, suggesting that it will be more difficult for these 11 countries to achieve the G20 target. However, the G20 target would be achieved in two of these, namely Finland and New Zealand, if the post-crisis increase in the incidence of low-skilled NEET status should reverse by 2025.[22]

Figure 1.17. **Many OECD countries appear likely to meet the G20 target of 15% reduction in the number of low-skilled NEETs by 2025, but this target could be difficult to attain in some countries**

Percentage of youth population aged 15-29



a) Based on regressions of the low-skilled NEET rate on the unemployment rate and a linear time trend. The projected value for 2025 is based on an unemployment rate that equals the minimum value observed in that country between 2007 and 2015. Due to data limitations, a simple linear extrapolation was used to project the low-skilled NEET rate in 2025 for Costa Rica, Israel, Korea, the Russian Federation and South Africa.

b) OECD is the unweighted average of 33 OECD countries (Israel not included).

c) Selected urban areas.

Source: OECD calculations based on national labour force surveys excepted *OECD Education Database* for Australia, Israel, Korea, New Zealand and the Russian Federation.

StatLink http://dx.doi.org/10.1787/888933384504

The evidence presented in Figure 1.17 is only suggestive as it is difficult to assess how likely it is that recent declines in the share of youth who are unskilled NEETs will continue through 2025, in countries where there has been a decline since 2007; nor how likely it is that countries where this share has risen since the crisis will see the increase reversed. There is also considerable uncertainty about how easily policy measures can reduce the incidence of low-skilled NEET status. However, there is considerable evidence that even the most disadvantaged youth can benefit from a variety of targeted policy interventions, including for instance special education programmes and mentoring (Carcillo et al., 2015; OECD, 2010). It is also clear that many disadvantaged youth require a co-ordinated package of services to allow them to surmount a variety of barriers to a successful integration into employment, including health problems, skills deficits and social isolation.

Conclusions

OECD labour markets are continuing to slowly heal from the impact of the Great Recession, but considerable labour market slack remains to be absorbed in a number of countries. The recent slowdown in global economic growth and persistent uncertainties about the short-term outlook raise the risk that the current economic recovery may give way to a new economic downturn before labour markets have completely healed across the OECD. This risk needs to be juxtaposed with the growing evidence presented above that aggregate labour market performance in terms of employment and unemployment generally has recovered along with the overall economy and that there are few signs of the sort of hysteresis effects that resulted in an upward ratcheting of unemployment and a

downward ratcheting of participation rates for older men during the recessions of the 1980s and 1990s. This is good news, but it also underlines the importance of achieving full cyclical recovery in countries where that has yet to happen.

Despite the uncertainty surrounding the short-term outlook, there is a growing need to focus employment policy priorities on addressing structural problems such as stagnant wages, low job quality and the labour market difficulties of vulnerable youth and the long-term unemployed. The evidence presented in this chapter suggests that the recent macroeconomic turmoil has not had large permanent effects on the composition of employment, job quality or the share of youth who risks being left behind in the labour market. However, policy makers need to redouble their efforts to address the aforementioned structural challenges, while continuing to assess how they can heighten the resilience of the labour market to future adverse shocks.

Notes

1. In the OECD area as a whole and in 25 out 34 of OECD countries, labour force participation rate has increased since the onset of the crisis (data not shown). Exceptions include Denmark, Ireland, and the United States where labour force participation dropped by at least 2 percentage points. In countries where participation has increased, this is largely a reflection of rising participation women and older workers, trends that pre-date the crisis. In many of these countries, participation actually fell for youth and sometimes also for men of all ages.
2. The same pattern of a steep fall and then a rapid recovery in employment rates is also observed in Latvia and Lithuania.
3. More recent monthly data for April 2016 indicate an OECD average unemployment rate of 6.4% which represents almost 39.4 million persons who are unemployed, 6.8 million more than in January 2008 (*OECD Short-Term Labour Market Statistics Database*).
4. The high level of long-term unemployment in some countries is of particular concern because of the risk of skill depreciation and loss of motivation of the individuals affected run the risk that some of the long-term unemployed may become discouraged and drop out of the labour force, while others may be compelled to accept new jobs where they are underemployed and low paid. In the OECD area as whole, the share of long-term unemployment in total unemployment has increased since the downturn for all gender and age groups. Long-term unemployment affected more than one-in-five unemployed youth, a little less than two-in-five adults and more than two-in-five older unemployed. Long-term unemployment has also increased for all skill groups (data not shown). Long and in particular very long-term unemployed may require selective re-employment assistance or retraining to successfully reintegrate into employment.
5. This is not to deny that the long-term unemployed often may require extra re-employment assistance or retraining to successfully reintegrate into employment. Indeed, improved national strategies to activate the unemployed might help to explain any reduction in hysteresis effects (OECD, 2015b).
6. The correlation between the growth rate of total employment during 2008-15 and the excess of service sector employment growth over goods-producing sector growth is 0.57.
7. Employment in distributive services – including wholesale and retail trade, accommodation and food services – has also been highly responsive to changing business cycle conditions since 2007. This may be because demand for these services is particularly sensitive to cyclical changes in the disposable incomes of consumers and their degree of optimism concerning the economy. This sector also employs a large number of workers with temporary work contracts whose termination costs are low, making it more attractive for employers to reduce their workforce when sales decline, even temporarily.
8. A shift-share analysis of the change in the incidence of fixed-term contracts by broad industries indicates that the post-crisis change in the sectoral mix of jobs significantly reduced temporary employment in Portugal and Spain (data not shown), probably due to the very sharp contraction of construction sector employment (see Figure 1.A2.1). Post-crisis changes in industry mix did not have a significant impact on the incidence of temporary employment in Italy (nor of any of the other EU countries).

9. A shift-share analysis confirms that the change in the industry mix of employment contributed to increase the incidence of part-time, but also suggests that increases in the share of part-time in total employment within broad industries played a larger role (data not shown).
10. As was seen above, job losses during the recession were concentrated in manufacturing and construction, and also particularly affected younger workers and those with temporary employment contracts. These patterns raise the possibility that the average quality of the jobs that survived the crisis differed from the average quality of all pre-crisis jobs, making it more difficult to isolate the impact of the crisis on the quality of surviving jobs. For example, any impact of the crisis in reducing earnings quality in ongoing jobs could have been masked by a shift in the composition of employment away from relatively low-paid jobs. A simple analysis suggests that a compositional effect probably did affect the measured change in earnings quality in this manner, but not the measured changes in the security and work environment dimensions of job quality (data not shown).
11. However, if one keeps the employment structure constant, two thirds of the countries experienced a deterioration of the earning quality.
12. OECD (2015) analyses earnings mobility in a large number of OECD countries and shows that the career prospects of workers are determined to a large degree in the first ten years after they enter the labour market. A considerable number of studies have also shown that school leavers who enter the labour market during a recession risk being in "scarring" effects that depress their earnings levels long after the economy has recovered (see Scarpetta et al., 2010 and the sources cited there).
13. OECD (2016) provides a more extensive analysis of NEETs.
14. On average for the OECD, 40% of NEETs were unemployed and 60% inactive in 2015 (OECD calculations using labour force survey data).
15. As highlighted in (OECD, 2015), NEET rates increase between ages 20-24 and ages 25-29 with the increase being particularly large for young adults who are not actively searching for a job. Much of this group of inactive NEETs are married women with young children. In certain OECD countries where traditional gender roles are still widely supported, including Mexico and Turkey, a significant proportion of young women choose not to combine raising a family with paid work (see also Chapter 4 of this publication).
16. In 2012, a little over 5% of NEETs in the OECD area reported poor health as compared to little under 2% for other youth (Carcillo et al., 2015).
17. The fact that a significant share of NEET youth live in jobless households (Figure 1.16) also tends to isolate them from the types of social contacts that can facilitate job search.
18. The long-run trend increase in educational attainment may also have played some role over this relatively brief period.
19. An additional indication that low-skilled NEETs are particularly at risk of long-term marginalisation in the labour market is that they are less likely than their more skilled counterparts to be actively searching for a job. In 2015, 67% of low-skilled NEETs were inactive on average in OECD countries, as compared to 57% of medium-skilled NEETs and 51% of high-skilled NEETs (OECD calculations based on labour force survey data).
20. The declaration of the 2015 G20 Labour and Employment Ministerial first put forward the quantitative target to reduce the share of young people who are most at risk of being left permanently behind in the labour market by 15% by 2025. Depending on national circumstances, it was proposed to focus on low-skilled youth who are NEET (largely for more developed economies) or who are informally employed (largely for emerging economies).
21. It should be emphasised, however, that the alternative G20 target based on lowering the share of youth who are low-skilled and informally employed is probably more relevant for several of these emerging economies. That target is not analysed here.
22. This is also true for Argentina.

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ANNEX 1.A1

Country-level data from OECD economic projections

Table 1.A1.1. **Recent and projected growth rates for real GDP and employment, 2007-17**

	A. Real GDP growth (%)											B. Employment growth (%)										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	*2016*	*2017*	2007	2008	2009	2010	2011	2012	2013	2014	2015	*2016*	*2017*
OECD countries																						
OECD	**2.7**	**0.2**	**-3.5**	**3.0**	**1.9**	**1.3**	**1.2**	**1.9**	**2.1**	***1.8***	***2.1***	**1.5**	**0.6**	**-1.8**	**0.3**	**1.0**	**1.0**	**0.7**	**1.3**	**1.4**	***1.5***	***1.1***
Euro area[a]	**3.0**	**0.4**	**-4.5**	**2.0**	**1.6**	**-0.9**	**-0.3**	**1.0**	**1.6**	***1.6***	***1.7***	**2.0**	**0.9**	**-1.9**	**-0.5**	**0.2**	**-0.6**	**-0.6**	**0.6**	**1.0**	***1.3***	***1.0***
Australia	4.5	2.5	1.8	2.4	2.6	3.6	2.0	2.6	2.5	*2.6*	*2.9*	3.1	2.8	0.7	2.0	1.7	1.2	0.9	0.7	1.9	*1.9*	*1.6*
Austria	3.5	1.2	-3.6	1.8	3.0	0.7	0.3	0.5	0.8	*1.3*	*1.6*	2.5	1.8	-0.3	0.9	0.9	0.8	0.5	0.2	0.9	*1.5*	*1.2*
Belgium	3.4	0.7	-2.3	2.7	1.8	0.2	0.0	1.3	1.4	*1.2*	*1.5*	1.7	1.8	-0.1	0.6	1.3	0.4	-0.4	0.3	0.9	*1.0*	*1.0*
Canada	2.1	1.0	-2.9	3.1	3.1	1.7	2.2	2.5	1.2	*1.7*	*2.2*	2.3	1.4	-1.6	1.4	1.5	1.3	1.4	0.6	0.9	*0.6*	*1.0*
Chile	5.2	3.3	-1.1	5.7	5.8	5.5	4.0	1.8	2.1	*1.5*	*2.5*	2.8	2.9	-0.6	7.8	5.1	1.9	2.1	1.5	1.5	*0.8*	*1.6*
Czech Republic	5.5	2.5	-4.7	2.1	2.0	-0.8	-0.5	1.9	4.3	*2.4*	*2.6*	1.9	1.6	-1.3	-1.0	-0.2	0.3	1.0	0.7	1.4	*0.6*	*0.4*
Denmark	0.8	-0.7	-5.1	1.6	1.2	-0.1	-0.2	1.3	1.2	*1.0*	*1.8*	-0.1	1.7	-2.9	-2.3	-0.1	-0.5	0.0	1.0	1.4	*1.2*	*0.9*
Estonia	7.4	-5.0	-14.3	1.8	7.5	5.1	1.7	2.9	1.2	*1.8*	*3.0*	0.8	-0.3	-9.4	-4.4	6.4	1.9	1.0	0.6	2.6	*-0.4*	*0.2*
Finland	5.2	0.7	-8.3	3.0	2.6	-1.4	-0.8	-0.7	0.5	*1.0*	*1.2*	2.0	1.6	-2.9	-0.4	1.1	0.4	-1.0	-0.4	-0.4	*-0.1*	*0.2*
France	2.4	0.2	-2.9	2.0	2.1	0.2	0.6	0.6	1.2	*1.4*	*1.5*	1.7	1.3	-1.0	0.2	0.1	0.2	-0.2	0.1	0.0	*0.4*	*0.5*
Germany	3.4	0.8	-5.6	3.9	3.7	0.6	0.4	1.6	1.4	*1.6*	*1.7*	2.1	1.0	-0.3	0.8	2.5	1.0	1.0	0.9	0.7	*1.6*	*0.8*
Greece	3.2	-0.2	-4.3	-5.5	-9.2	-7.3	-3.1	0.7	-0.3	*-0.2*	*1.9*	0.8	1.0	-1.2	-3.6	-7.6	-8.9	-4.9	0.7	2.1	*2.1*	*2.1*
Hungary	0.4	0.6	-6.4	0.7	1.8	-1.7	2.0	3.6	3.0	*1.6*	*3.1*	-0.7	-1.4	-2.6	-0.4	0.7	1.8	1.7	5.3	2.7	*2.2*	*1.6*
Iceland	9.5	1.5	-4.7	-3.6	2.0	1.2	4.4	2.0	4.0	*4.4*	*3.5*	4.4	0.8	-6.1	-0.3	0.3	1.1	3.1	2.5	3.4	*2.4*	*0.9*
Ireland	5.5	-2.2	-5.7	0.4	2.6	0.1	1.4	5.2	7.8	*5.0*	*3.4*	4.8	-0.7	-7.8	-4.1	-1.8	-0.6	2.3	1.8	2.6	*2.6*	*2.4*
Israel	6.2	3.2	1.2	5.4	5.0	2.9	3.4	2.6	2.5	*2.4*	*3.1*	4.3	3.4	2.0	3.5	3.0	3.3	2.6	3.1	2.5	*2.1*	*1.9*
Italy	1.3	-1.1	-5.5	1.7	0.7	-2.9	-1.8	-0.3	0.6	*1.0*	*1.4*	0.7	0.8	-1.6	-0.8	0.3	-0.3	-1.5	0.4	0.9	*0.8*	*0.9*
Japan	2.2	-1.0	-5.5	4.7	-0.5	1.7	1.4	0.0	0.6	*0.7*	*0.4*	0.6	-0.3	-1.5	-0.3	-0.1	-0.3	0.7	0.6	0.4	*0.5*	*-0.2*
Korea	5.5	2.8	0.7	6.5	3.7	2.3	2.9	3.3	2.6	*2.7*	*3.0*	1.2	0.6	-0.3	1.4	1.7	1.8	1.6	2.1	1.3	*1.2*	*1.2*
Luxembourg	8.4	-0.9	-5.4	5.7	2.6	-0.8	4.4	4.1	4.9	*3.7*	*3.8*	2.3	2.9	1.1	1.6	2.7	2.4	1.8	2.2	1.8	*2.1*	*2.1*
Mexico	3.1	1.2	-4.5	5.1	4.0	3.8	1.6	2.3	2.5	*2.6*	*3.0*	1.7	1.1	0.5	1.1	2.2	3.3	1.1	0.4	2.4	*2.0*	*1.6*
Netherlands	3.7	1.7	-3.8	1.3	1.7	-1.1	-0.4	1.0	2.0	*1.7*	*2.1*	2.9	2.3	0.0	-1.0	0.0	0.6	-0.8	-0.6	1.0	*0.9*	*0.9*
New Zealand	3.9	-0.4	0.3	2.0	1.9	2.8	1.7	3.0	3.4	*3.0*	*2.7*	1.7	0.7	-1.7	0.5	1.5	0.2	1.5	3.5	2.3	*2.2*	*1.3*
Norway	2.9	0.4	-1.6	0.6	1.0	2.7	1.0	2.2	1.6	*0.6*	*1.3*	3.4	3.3	-0.6	0.1	1.4	2.0	0.6	1.0	0.6	*0.1*	*0.6*
Poland	7.2	3.9	2.6	3.7	5.0	1.6	1.3	3.3	3.6	*3.0*	*3.5*	4.4	3.7	0.4	0.6	0.6	0.2	-0.1	1.9	1.4	*1.3*	*0.7*
Portugal	2.5	0.2	-3.0	1.9	-1.8	-4.0	-1.1	0.9	1.5	*1.2*	*1.5*	0.3	0.5	-2.9	-1.4	-3.2	-4.1	-2.6	1.6	1.1	*-0.3*	*0.7*
Slovak Republic	10.8	5.7	-5.5	5.1	2.8	1.5	1.4	2.5	3.6	*3.1*	*3.2*	2.4	3.2	-2.8	-2.0	-0.1	0.6	0.0	1.5	2.6	*1.8*	*1.1*
Slovenia	6.9	3.3	-7.8	1.2	0.6	-2.7	-1.1	3.0	2.9	*1.5*	*2.3*	2.5	1.1	-1.5	-1.5	-3.1	-1.3	-1.9	1.2	0.1	*0.4*	*0.8*
Spain	3.8	1.1	-3.6	0.0	-1.0	-2.6	-1.7	1.4	3.2	*2.8*	*2.3*	3.2	-0.5	-6.7	-2.0	-1.6	-4.3	-2.8	1.2	3.0	*2.9*	*2.1*
Sweden	3.5	-0.7	-5.1	5.7	2.7	0.1	1.2	2.4	3.8	*3.4*	*2.8*	2.6	1.1	-2.1	0.5	2.3	0.6	1.1	1.4	1.4	*1.6*	*1.2*
Switzerland	4.1	2.2	-2.1	2.9	1.9	1.1	1.8	1.9	0.9	*1.2*	*1.7*	2.3	2.3	0.4	0.1	2.2	1.2	1.2	1.6	1.4	*0.8*	*1.3*
Turkey	4.7	0.7	-4.8	9.2	8.8	2.1	4.2	3.0	4.0	*3.9*	*3.7*	1.5	1.7	0.3	6.0	6.1	3.1	2.9	5.1	2.9	*3.0*	*2.8*
United Kingdom	2.6	-0.5	-4.2	1.5	2.0	1.2	2.2	2.9	2.3	*1.7*	*2.0*	0.8	0.9	-1.6	0.2	0.5	1.1	1.2	2.3	1.5	*1.2*	*0.6*
United States	1.8	-0.3	-2.8	2.5	1.6	2.2	1.5	2.4	2.4	*1.8*	*2.2*	1.1	-0.5	-3.8	-0.6	0.6	1.8	1.0	1.6	1.7	*2.1*	*1.5*

Table 1.A1.1. **Recent and projected growth rates for real GDP and employment, 2007-17** *(cont.)*

	A. Real GDP growth (%)											B. Employment growth (%)										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	*2016*	*2017*	2007	2008	2009	2010	2011	2012	2013	2014	2015	*2016*	*2017*
Non-OECD countries																						
Brazil	6.1	5.1	-0.1	7.5	3.9	1.9	3.0	0.1	-3.9	*-4.3*	*-1.7*	1.6	3.2	0.5	0.7	0.7	1.7	1.4	1.5	0.0	*-1.6*	*0.7*
China	14.2	9.6	9.2	10.6	9.5	7.7	7.7	7.3	6.9	*6.5*	*6.2*	..	..	..	..	..	..	..	..	..	..	..
Colombia	6.9	3.5	1.7	4.0	6.6	4.0	4.9	4.4	3.1	*2.4*	*3.0*	1.2	2.0	5.6	4.3	4.2	3.4	1.7	2.2	2.4	*2.0*	*2.6*
Costa Rica	7.7	2.7	-0.9	5.0	4.7	5.1	3.3	3.5	2.9	*4.0*	*4.1*	..	..	..	..	-2.5	8.7	1.9	1.9	-0.3	*-0.9*	*1.6*
India	9.8	3.9	8.5	10.3	6.6	5.6	6.6	7.2	7.4	*7.4*	*7.5*	..	..	..	..	..	..	..	..	..	..	..
Indonesia	6.3	6.0	4.7	6.4	6.2	6.0	5.6	5.0	4.8	*5.2*	*5.9*	..	..	..	..	..	..	..	..	..	..	..
Latvia	10.0	-3.6	-14.3	-3.8	6.2	4.0	3.0	2.4	2.7	*1.9*	*3.5*	2.6	-0.2	-13.8	-6.4	1.3	1.6	2.1	-1.0	1.2	*0.0*	*0.4*
Lithuania	11.1	2.6	-14.8	1.6	6.0	3.8	3.5	3.0	1.6	*2.8*	*3.4*	1.2	-1.8	-7.7	-5.1	0.1	1.5	1.6	1.9	1.0	*0.9*	*0.6*
Russian Federation	8.5	5.2	-7.8	4.5	4.3	3.5	1.3	0.7	-3.7	*-1.7*	*0.5*	2.5	0.6	-2.3	0.7	1.5	1.0	-0.2	0.2	1.1	*0.0*	*-0.2*
South Africa	5.4	3.2	-1.5	3.0	3.3	2.3	2.3	1.7	1.3	*0.7*	*1.4*	1.3	7.2	-2.7	-2.9	2.0	2.5	3.1	1.9	3.9	*2.1*	*3.6*

Note: Values for 2016 and 2017 are OECD projections.
.. Not available.
a) Aggregate of 15 OECD countries of the euro area.
Source: OECD calculations based on *OECD Economic Outlook Database*.

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Table 1.A1.2. **Recent and projected employment and unemployment rates, 2007-17**

	A. Employment rate Percentage of population aged 15-74											B. Unemployment rate Percentage of total labour force										
	Q4 2007	Q4 2008	Q4 2009	Q4 2010	Q4 2011	Q4 2012	Q4 2013	Q4 2014	Q4 2015	*Q4 2016*	*Q4 2017*	Q4 2007	Q4 2008	Q4 2009	Q4 2010	Q4 2011	Q4 2012	Q4 2013	Q4 2014	Q4 2015	*Q4 2016*	*Q4 2017*
OECD countries																						
OECD	**60.8**	**60.2**	**58.7**	**58.7**	**59.0**	**59.1**	**59.2**	**59.7**	**60.2**	***60.6***	***61.0***	**5.6**	**6.5**	**8.4**	**8.2**	**7.9**	**8.0**	**7.7**	**7.1**	**6.5**	***6.4***	***6.1***
Euro area[a]	**57.8**	**57.6**	**56.3**	**56.3**	**56.2**	**55.7**	**55.4**	**55.9**	**56.4**	***56.8***	***57.3***	**7.3**	**7.9**	**9.9**	**9.9**	**10.5**	**11.7**	**11.8**	**11.4**	**10.5**	***10.0***	***9.6***
Australia	67.0	67.2	66.4	67.0	66.5	66.3	65.6	65.3	66.2	*66.2*	*66.6*	4.4	4.4	5.6	5.1	5.2	5.3	5.8	6.2	5.8	*5.5*	*5.4*
Austria	62.3	62.7	62.3	62.7	62.6	62.8	62.7	62.8	63.4	*64.0*	*64.6*	4.6	4.5	5.5	4.6	4.9	5.0	5.5	5.7	5.9	*5.7*	*5.5*
Belgium	56.5	56.9	56.3	56.5	56.7	56.3	55.7	55.6	55.7	*55.9*	*56.0*	7.0	6.8	8.1	7.8	7.0	8.2	8.5	8.5	8.7	*7.9*	*7.3*
Canada	66.7	66.2	64.4	64.7	64.8	65.2	65.1	65.0	64.9	*64.8*	*65.1*	5.9	6.5	8.5	7.7	7.5	7.3	7.1	6.7	7.1	*7.0*	*6.6*
Chile	53.8	54.1	53.3	57.7	58.4	58.7	59.3	59.3	59.6	*59.3*	*59.6*	7.8	8.2	9.3	7.6	7.2	6.4	6.2	6.4	6.2	*7.1*	*6.7*
Czech Republic	60.7	61.1	59.7	59.5	59.1	59.5	60.1	60.9	61.7	*62.1*	*62.5*	4.9	4.4	7.3	7.0	6.5	7.2	6.8	5.8	4.5	*4.3*	*4.1*
Denmark	68.4	69.8	65.7	64.9	64.4	64.0	63.5	64.8	65.2	*65.3*	*65.8*	3.6	4.0	7.0	7.6	7.7	7.3	7.0	6.3	6.1	*6.1*	*6.1*
Estonia	62.7	62.6	55.9	57.4	60.0	60.9	61.5	63.4	64.9	*65.6*	*66.3*	4.0	7.8	15.7	13.9	11.1	9.3	8.6	6.8	6.3	*6.3*	*6.5*
Finland	63.0	63.4	60.7	60.9	61.3	60.9	60.1	59.6	59.2	*59.1*	*59.1*	6.6	6.5	8.8	8.0	7.5	7.6	8.4	9.1	9.5	*9.5*	*9.5*
France	55.5	55.6	54.5	54.7	54.5	54.4	54.1	53.9	53.7	*53.8*	*53.8*	7.2	7.4	9.2	8.8	9.0	9.7	9.7	10.1	10.0	*9.8*	*9.7*
Germany	59.6	60.1	60.1	61.0	62.8	63.3	63.8	64.4	64.7	*65.1*	*65.6*	8.2	7.1	7.6	6.6	5.6	5.3	5.1	4.9	4.4	*4.5*	*4.5*
Greece	53.7	54.2	53.3	50.9	46.5	43.4	42.2	43.1	44.7	*45.4*	*46.8*	8.1	7.9	10.3	14.2	20.7	26.0	27.6	25.9	24.2	*23.9*	*22.6*
Hungary	49.4	49.0	47.8	47.9	48.6	49.7	51.2	53.6	55.3	*56.6*	*57.5*	7.9	8.2	10.7	11.1	11.0	10.9	9.4	7.3	6.4	*5.4*	*5.3*
Iceland	79.1	77.3	72.6	71.5	70.9	71.1	73.3	74.0	75.7	*76.8*	*76.8*	2.1	4.5	7.6	8.4	6.0	5.4	5.1	4.7	3.6	*3.5*	*3.6*
Ireland	66.7	63.5	57.9	55.6	55.0	54.8	56.5	57.4	58.9	*60.8*	*62.2*	4.8	7.9	13.0	14.7	15.0	14.2	12.2	10.4	9.0	*7.7*	*7.6*
Israel	61.9	62.3	62.5	63.8	64.1	65.1	65.9	66.7	67.4	*67.4*	*67.7*	8.4	8.1	9.0	8.1	6.8	6.9	5.7	5.7	5.2	*5.4*	*5.3*
Italy	51.6	51.4	50.4	50.2	50.1	49.6	48.8	49.0	49.4	*49.5*	*49.8*	6.3	6.9	8.2	8.3	9.2	11.4	12.4	12.7	11.5	*11.1*	*10.5*
Japan	66.1	65.9	65.0	65.4	65.5	65.7	66.7	67.3	68.0	*68.6*	*68.9*	3.9	4.0	5.1	5.0	4.5	4.2	3.9	3.5	3.3	*3.1*	*3.1*
Korea	61.8	61.3	60.8	61.2	61.9	62.3	63.2	63.9	64.5	*64.9*	*65.5*	3.2	3.3	3.6	3.5	3.2	3.1	3.1	3.5	3.5	*3.3*	*3.5*
Luxembourg	57.7	58.0	57.3	57.1	57.4	57.3	56.9	56.8	56.5	*56.3*	*56.2*	4.1	4.4	5.8	5.9	5.8	6.3	7.1	7.0	6.7	*6.4*	*6.3*
Mexico	60.5	58.3	58.7	56.9	58.6	58.0	58.2	57.0	57.9	*56.9*	*57.3*	3.5	4.2	5.3	5.3	4.9	4.9	4.6	4.4	4.2	*4.5*	*4.3*
Netherlands	66.5	67.6	66.4	66.0	65.9	65.8	64.8	64.7	64.8	*65.4*	*65.8*	3.9	3.6	4.8	4.9	5.3	6.2	7.6	7.2	6.7	*6.1*	*5.8*
New Zealand	70.9	70.5	67.9	67.8	68.0	67.2	68.4	69.9	70.1	*70.7*	*70.9*	3.4	4.6	7.0	6.7	6.4	6.8	6.1	5.8	5.3	*5.9*	*5.8*
Norway	71.7	71.8	70.1	69.6	69.8	69.5	69.1	68.8	67.8	*67.0*	*66.7*	2.4	2.8	3.2	3.5	3.2	3.4	3.4	3.7	4.4	*4.9*	*4.3*
Poland	50.2	51.8	51.4	52.0	52.2	52.3	52.6	53.7	54.7	*55.2*	*55.6*	8.6	6.9	8.7	9.5	9.9	10.3	10.0	8.3	7.1	*6.5*	*6.3*
Portugal	63.5	63.3	61.5	60.8	58.1	55.8	56.4	57.0	58.1	*58.1*	*58.7*	7.8	7.8	10.1	11.1	13.6	16.7	15.2	13.3	12.1	*11.9*	*11.3*
Slovak Republic	56.3	57.7	54.4	54.7	54.1	54.1	54.4	55.8	57.2	*57.8*	*58.5*	10.4	8.8	14.0	13.9	14.0	14.3	14.1	12.5	10.9	*10.2*	*9.2*
Slovenia	61.9	62.8	61.5	60.3	58.4	57.8	57.1	57.5	57.6	*58.3*	*58.8*	4.7	4.2	6.4	7.7	8.7	9.6	9.7	9.6	8.5	*8.5*	*8.0*
Spain	59.8	57.4	53.7	52.9	51.3	49.0	48.4	49.7	51.3	*52.7*	*54.1*	8.6	13.8	18.8	20.2	22.6	25.8	25.8	23.7	20.9	*19.3*	*17.8*
Sweden	67.3	66.7	64.6	65.0	65.7	65.7	66.1	66.4	66.7	*66.8*	*67.0*	6.1	6.7	8.8	8.1	7.8	8.2	8.0	7.8	7.1	*6.5*	*6.5*
Switzerland	73.3	73.9	72.6	72.5	73.3	73.0	73.5	74.3	73.8	*74.0*	*74.3*	3.4	3.3	4.8	4.2	4.0	4.4	4.2	4.2	4.9	*4.9*	*4.8*
Turkey	41.4	41.5	42.0	43.4	44.7	45.7	45.5	47.2	47.8	*48.5*	*49.1*	9.4	11.4	12.2	10.3	8.5	8.6	9.2	10.5	10.4	*10.2*	*10.4*
United Kingdom	64.8	64.1	62.7	62.7	62.4	63.2	63.6	64.6	65.4	*65.6*	*65.7*	5.2	6.4	7.8	7.9	8.4	7.8	7.2	5.7	5.1	*5.1*	*5.3*
United States	65.3	63.7	60.5	60.3	60.3	60.9	60.8	61.6	62.0	*63.0*	*63.4*	4.8	6.9	9.9	9.5	8.7	7.8	7.0	5.7	5.0	*4.9*	*4.6*
Non-OECD countries[b]																						
Brazil	61.1	62.1	61.4	61.0	60.4	60.6	60.7	60.7	59.9	*58.2*	*57.9*	9.3	8.3	9.4	8.7	7.9	7.4	7.1	6.8	8.5	*11.3*	*11.6*
Colombia	55.1	55.1	57.1	58.6	60.1	61.2	61.3	61.8	62.4	*62.8*	*63.6*	11.2	11.3	12.0	11.8	10.8	10.4	9.6	9.1	8.9	*9.1*	*8.7*
Costa Rica	..	..	..	56.9	54.6	58.4	58.5	58.7	57.6	*56.4*	*56.5*	..	..	..	8.8	10.3	10.2	9.4	9.6	9.6	*9.5*	*9.3*
Latvia	62.6	60.1	51.4	52.2	54.1	56.1	57.6	57.5	59.6	*60.7*	*62.1*	5.4	10.5	20.2	18.0	15.3	14.2	11.5	10.4	10.1	*9.9*	*9.2*
Lithuania	56.9	56.3	52.4	50.5	52.2	54.0	55.6	57.3	58.9	*60.5*	*62.2*	4.3	8.4	16.2	17.8	14.4	13.6	11.6	10.2	8.9	*8.3*	*7.7*
Russian Federation	61.7	62.0	60.6	61.2	62.5	63.6	64.0	64.6	65.7	*66.1*	*66.1*	6.1	6.3	8.5	7.5	6.5	5.5	5.5	5.2	5.6	*5.7*	*5.8*
South Africa	41.2	43.4	41.6	39.8	40.0	40.4	40.9	41.0	41.9	*42.3*	*43.3*	22.0	22.4	25.0	24.8	24.6	25.3	25.0	25.1	25.3	*26.5*	*24.6*

Note: Values for 2016 and 2017 are OECD projections.

.. Not available.

a) Aggregate of 15 OECD countries of the euro area.

b) Annual values except for unemployment rates for Lithuania and South Africa. Employment rates are calculated using employment data from the *OECD Economic Outlook Database* and UN population projections (except for Latvia and Lithuania).

Source: OECD calculations based on *OECD Economic Outlook Database*; and United Nations, *World Population Prospects: The 2015 Revision*.

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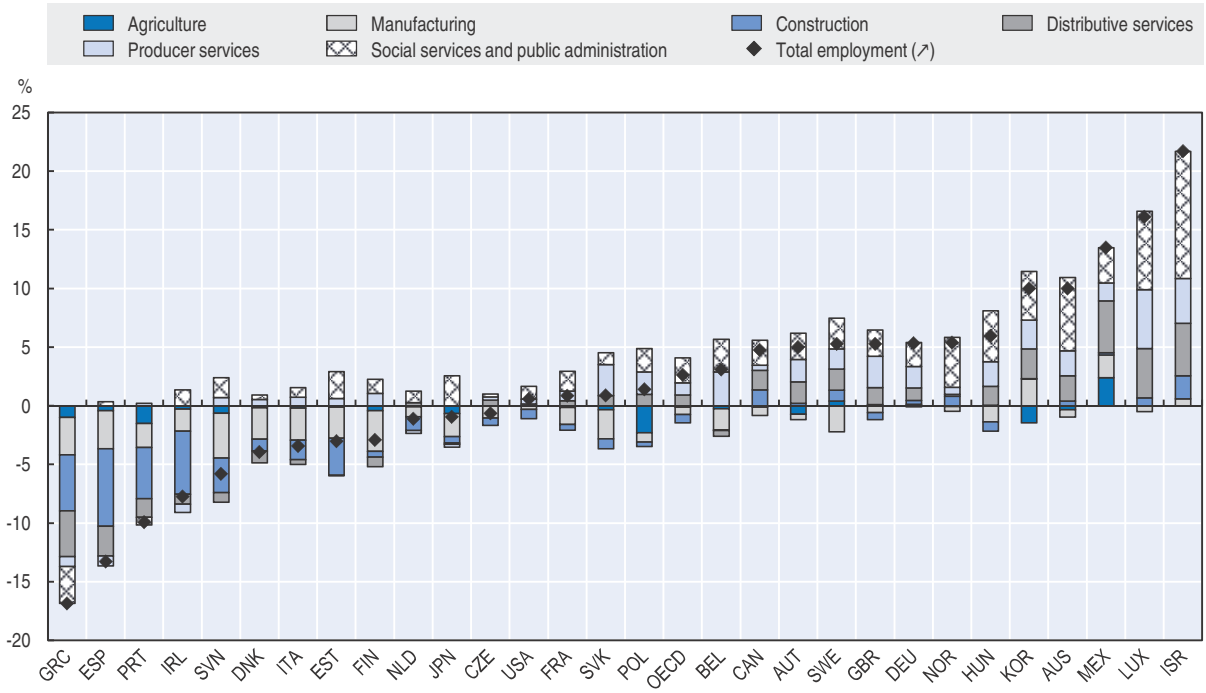
ANNEX 1.A2

Supplemental data on changes in the composition of employment, wage and productivity growth, and job quality

The material that follows provides further details which supplement the discussion in Sections 1 and 2 of the chapter.

Figure 1.A2.1. **The shift from goods producing to service jobs has continued since the onset of the crisis**

Percentage change in employment decomposed by industry[a] 2008 to 2015[b, c]



a) Industries shown in this figure are based on the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4 and are grouped as follows: **Manufacturing** refers to i) Mining and quarrying, ii) Manufacturing, iii) Electricity, gas, steam and air conditioning supply, and iv) Water supply; sewerage, waste management and remediation activities; **Distributive services** refer to i) Wholesale and retail trade; repair of motor vehicles and motorcycles, ii) Transportation and storage, iii) Accommodation and food service activities, and iv) Information and communication; **Producer services** refers to i) Financial and insurance activities, ii) Real estate activities, iii) Professional, scientific and technical activities, iv) Professional, scientific and technical activities, and v) Administrative and support service activities; **Social services and public administration** refer to i) Public administration and defence; compulsory social security, ii) Education, iii) Human health and social work activities, iv) Arts, entertainment and recreation, v) Other service activities, vi) Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use, and vii) Activities of extraterritorial organisations and bodies.

b) 2008-14 for Canada, Japan, Mexico and the United States.

c) Employment-weighted average of the 29 OECD countries shown (Chile, Iceland, New Zealand, Switzerland and Turkey not included).

Source: OECD calculations based on the *OECD National Accounts Statistics Database*.

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Table 1.A2.1. **Cumulative gaps in real hourly wage growth and real hourly labour productivity growth since the crisis**

Percentage shortfall of the Q4 2015 value with respect to a counterfactual value calculated assuming the pre-crisis growth rate (Q1 2000 to Q4 2007[a]) had continued after Q4 2007

	Real hourly wage gap	Hourly labour productivity gap
OECD countries		
OECD[b]	**1.7**	**7.4**
Euro area	**-5.8**	**4.2**
Australia	7.7	0.3
Austria	-2.1	10.8
Belgium	-1.9	7.3
Canada	4.0	0.7
Czech Republic	31.7	26.9
Denmark	11.7	10.1
Estonia	38.1	28.2
Finland	9.7	20.0
France	1.6	6.5
Germany	-14.6	12.1
Greece	22.5	21.1
Hungary	24.8	18.9
Ireland	20.4	-4.8
Israel	3.3	9.7
Italy	3.9	0.1
Japan	-4.9	7.4
Luxembourg	-0.6	5.3
Netherlands	4.9	10.3
Poland	-9.3	4.6
Portugal	0.1	1.1
Slovak Republic	15.6	27.6
Slovenia	14.4	21.6
Spain	-1.0	-8.7
Sweden	7.2	13.7
Switzerland	1.0	11.3
United Kingdom	26.3	13.8
United States	4.0	9.9
Non-OECD countries		
Latvia	52.1	38.0
Lithuania	43.9	31.9

a) Q1 2002 to Q4 2007 for Poland.
b) OECD is the weighted average of the 27 OECD countries shown (not including Latvia and Lithuania).
Source: OECD estimates based on national quarterly national accounts.

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Table 1.A2.2. **Dashboard of job quality in OECD countries for selected recent years**

Country rankings (1-34) from high to low performance on each main dimension

	Earnings quality			Labour market security			Quality of the working environment		
	2007[a]	2010[b]	2013[c]	2007	2010[d]	2013	2005	2010	2015
Australia	9	9	8	16	12	15	8	..	..
Austria	8	8	6	8	5	6	18	4	11
Belgium	3	4	4	17	14	12	15	11	8
Canada	15	16	12	18	16	13	10	..	..
Chile	30	32	28	..	26	..	..	..	..
Czech Republic	23	26	24	11	13	17	20	14	9
Denmark	2	3	3	6	10	7	6	1	2
Estonia	29	31	..	22	32	25	17	8	6
Finland	10	10	9	15	7	9	4	18	1
France	11	11	10	19	15	16	22	21	13
Germany	6	7	5	21	9	10	29	16	12
Greece	21	23	20	31	33	33	31	22	21
Hungary	27	30	26	24	27	26	24	9	19
Iceland	7	12	7	3	8	1	..	..	..
Ireland	17	13	14	7	24	19	5	6	3
Israel	25	27	23	30	20	14	12	..	..
Italy	14	15	13	26	25	31	28	13	15
Japan	18	21	19	14	11	8	23	..	..
Korea	24	24	21	10	6	5	27	..	..
Luxembourg	..	2	..	5	1	4	14	15	4
Mexico	31	34	29	23	21	23	16	..	..
Netherlands	1	1	..	2	3	11	3	7	10
New Zealand	19	20	17	13	18	18	1	..	..
Norway	5	5	2	1	2	2	9	3	..
Poland	28	29	27	29	28	27	26	10	16
Portugal	22	25	22	28	29	30	30	20	14
Slovak Republic	26	28	25	32	31	29	21	19	17
Slovenia	..	22	..	9	17	22	19	17	18
Spain	20	19	18	27	34	32	25	12	20
Sweden	12	14	11	12	19	20	2	2	7
Switzerland	4	6	1	4	4	3	7	..	..
Turkey	..	33	..	33	30	28	32	23	..
United Kingdom	13	17	16	25	22	24	13	5	5
United States	16	18	15	20	23	21	11	..	..

Top-third performers.
Bottom-third performers.
.. Not available.
a) 2007 refers to 2006 for Chile, Estonia, Italy, the Netherlands and Switzerland; and to 2008 for Denmark and Israel.
b) 2010 refers to 2010 for Chile.
c) 2013 refers to 2011 for Israel, and to 2012 for France, Italy, Poland, Spain, Sweden and Switzerland.
d) 2010 refers to 2011 for Chile.
Source: OECD Job Quality Database (2016).

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Chapter 2

Skills use at work: Why does it matter and what influences it?

This chapter analyses how skills are used at work, why skills use matters for workers and economies and its key determinants. It draws on data for the 28 OECD countries participating in the Survey of Adult Skills. The use of skills at work is just as important a determinant of individual and aggregate economic outcomes as the development of skills, but it is less studied. After explaining how skills use at work is measured in the survey, the chapter reviews how skills are used at work and how this varies across countries. It then shows that skills use has a substantial impact on productivity, wages and job satisfaction. The chapter also analyses several determinants of skills use, including High-Performance Work Practices, globalisation and offshoring, and labour market institutions. The chapter concludes by identifying policy options for improving skills use, drawing from specific country examples and the chapter's empirical findings.

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Key findings

Skills policies have tended to focus disproportionately on the supply side – the acquisition and adaptation of skills during the working life. However, in recent years there has been an increasing awareness that demand-side issues – how employers use skills in the workplace – are just as important as developing skills in the first place. It follows that supply-side interventions will not achieve the desired effects of promoting innovation and raising productivity and economic growth unless accompanied by demand-side interventions that foster the recognition and use of these skills. While the decision to acquire certain skills and the choice of field of study do not depend exclusively on the possibility of eventually using them in the labour market, a misalignment between the skills of the workforce and those required by employers will constrain innovation and hamper the adoption of new technologies.

Three main factors can affect skills use: i) workers' motivation to deploy their skills at work, partly influenced by incentive structures put in place by employers; ii) the flexibility that employers have in recognising and adapting job tasks to the skills of new hires and promoting a better allocation of workforce to required tasks; and iii) the skills required to carry out the specific job.

The chapter sheds light on these factors and their influence on the use of information-processing skills (reading, writing, numeracy, ICT and problem solving) as measured by the Survey of Adult Skills. The findings can inform policy choices in many ways:

- Having a large pool of highly proficient workers does not guarantee a more frequent use of these skills in the workplace. Only a few countries have a similar ranking position by skills proficiency and skills use. After accounting for workers' occupation and firm characteristics, skills proficiency explains only a small part of the variation in skills use.
- The extent to which skills are used at work matters for individuals and countries. For workers, higher skills use at work is associated with higher wages and higher job satisfaction, over and above the effect of skills proficiency. At the country level, the use of reading and writing skills are strongly related to labour productivity.
- Poor skills use can lead to job mismatch – the misalignment between workers qualifications and skills and those required by their job – which has consequences on individual workers and their companies. Jobs can be adjusted to reduce the consequences of mismatch. Measuring the mechanisms through which jobs are adapted or workers shifted to more suitable jobs is important to gauge the actual extent of the mismatch problem and its potential consequences for labour productivity at the firms and aggregate level.
- Management practices and the way work is organised can influence the use of information-processing skills at work. In particular, High-Performance Work Practices (HPWP) can increase firms' internal flexibility to adapt job tasks to the skills of new hires, while also promoting a better allocation of workforce to required tasks. HPWP are more

common in large firms and includes an emphasis on team work, autonomy, task discretion, mentoring, job rotation and applying new learning. HPWP also encompass management practices – bonus pay, training provision and flexibility in working hours – that provide incentives for workers to deploy their skills at work more fully.

- Labour market institutions can influence the link between skills proficiency and skills use at work. Strong collective bargaining institutions are found to be positively associated with a higher utilisation of workers' skills in the workplace. This finding is in line with evidence showing that good industrial relations institutions and practices, which encourage workers' participation in their firms' decisions, facilitate employees' buy-in to changes in work organisation and management practices associated with higher skills use.
- Skills use and skill requirements are evolving also in response to global pressures and, in particular, to the offshoring of production. The evidence presented in the chapter suggests that industries in which actual production is offshored to countries with low labour costs (so-called low-technology offshoring) use information-processing skills more intensively than industries retaining much of the actual production phase in the home country. This may be due to a shift of domestic activities towards high value-added cognitive tasks such as those involved in the research, innovation, design and marketing phases of production. Labour market policies can play an important role in reducing the impact of low-technology offshoring on workers displaced as a result of it – typically workers involved in routine tasks – by supporting unemployed workers' income and offering re-training and up-skilling opportunities to increase their employability in higher value added activities.
- Labour market institutions may also influence the extent to which employers make productive use of the skills of their workforce via their impact on labour costs. While institutions that raise labour costs are associated with better skills use and, consequently, potentially higher productivity, this benefit is outweighed by dis-employment effects when labour costs increase beyond productivity gains.

Introduction

Skills policies have tended to concentrate on the supply side, but recently there has been a growing awareness that how well employers use skills in the workplace may be just as important as the skills their workers possess. Supply-side interventions often will only achieve the desired productivity gains if they are accompanied by simultaneous actions to boost the demand for and effective use of skills. Indeed, the failure to fully utilise skills could result in a waste of the initial investment in human capital and the depreciation and obsolescence of the skills that are left unused (Guest, 2006).

Country rankings of skills proficiency and skills use at work differ, demonstrating that a larger pool of highly proficient workers does not automatically ensure effective use of these skills at work. Only a few countries have a similar ranking on the two scales. In addition, several measures of mismatch suggest that, even at the individual level, a sizeable share of workers is in jobs that are not appropriate to their skills or qualifications. This is a source of productivity losses at the country and industry level (Adalet McGowan and Andrews, 2015; OECD, 2013a), and also of wage penalties for individuals (Quintini, 2014).

In this context, it is crucial to understand why employers often do not make full use of their workers' skills. On the one hand, employers may not be fully aware of the skills possessed by new hires, leading them to select candidates mainly on the basis of their

educational qualifications. This issue was explored in detail in a previous edition of the *OECD Employment Outlook* (OECD, 2014a) which highlighted how information asymmetries are particularly relevant for young people without work experience. On the other hand, several factors may constrain skills use at work. Notably, firms may lack the necessary internal flexibility to adapt job tasks to the skills of new hires or to put in place incentive mechanisms that encourage workers to deploy more of their skills on the job (Osterman, 1994). Similarly, skill requirements may change as a result of external factors such as the decision to offshore part of the production process (Shepherd and Stone, 2013; Timmer et al., 2014), while it may take a considerable time to adapt the skills proficiency of the workforce to the firm's changed demand for skills. Finally, labour and product market settings may influence the extent to which firms use the skills of existing employees and are able to adapt the workforce to changing skill requirements.

Evidence on skills use and its determinants can inform the design of policies to enhance productivity and welfare. Such evidence would clarify a number of issues, including the extent to which governments need to focus on: i) protecting the potentially increasing number of workers left out of the labour market as a result of rapidly changing skill requirements; ii) ensuring that skill formation policies account for these changes in employers' skill needs; and iii) encouraging firms to adopt management practices that make the most of existing skills.

This chapter exploits data from the Survey of Adult Skills (also known as PIAAC) to shed light on the issues outlined above. It builds on previous work conducted by the OECD (OECD, 2013a, 2016a; Quintini, 2014) to show how the use of information-processing skills at work (reading, writing, numeracy, ICT and problem solving) matters for individual workers and national economies. It then explores determinants of skills use, including some that are internal to the firm and others that are external. Among internal determinants, the application of High-Performance Work Practices (HPWP) is shown to increase skills use. Particular attention is paid to incentive systems that employers can use to motivate more intense skills use – these include bonus payments, training opportunities and flexible working hours. Among external determinants of skill requirements and skills use at work, both institutional settings and the extent and nature of offshoring at the industry level are analysed. Offshoring is, along with technological change and other so-called megatrends, shifting the occupational structure of the economy and skill requirement of jobs, but much remains to be learned about its influence on skills requirements and use. Labour market institutions are one of the direct policy levers available to countries to enhance skills use. For both sets of determinants, causal relationships are difficult to pin down in the cross-sectional PIAAC data. This is particularly the case when looking at the association between institutional settings – for which only one observation per country can be exploited – and skills use. Nonetheless, the analysis yields a number of interesting policy-relevant conclusions and interesting questions that can be investigated more deeply in future analyses.

The chapter is organised as follows. Section 1 defines skills use, discusses measurement issues and briefly summarises previous work on how skills are used at work, including differences in skills use across different socio-demographic and firm characteristics. Section 2 examines the effect of skills use on individual wages, job satisfaction and country-level labour productivity. Section 3 focuses on internal determinants of skills use while Section 4 examines factors external to the firm. Section 5 draws policy conclusions.

1. Skills use at work: Definition, measurement and some descriptive statistics

Skills use at work can be defined as the level of skills that is observed in a worker's current job within a given skill domain. This is rooted in sociological theory making a distinction between "own skills" (the skills that individuals have) and "job skills" (skills as defined by jobs). Discrepancies between job-holders' skills and the level of skills use observed in their job are possible.

In fact, skills use is affected both by the extent to which workers deploy their skills in the workplace – which in turn may depend on the incentives they face and on their own innate motivation – and by the skills required to carry out the specific job. Some individuals may have an excess supply of some skills and not be using them fully on the job; others may have insufficient skills for the job they are doing but may maintain their job, at least in the short run, despite the resulting poor performance. These mismatches are dynamic: they can appear and disappear as both jobs and people change.

After a general discussion on measurement and on the importance of skills use at work for workers, countries and firms, this chapter will look at factors that are likely to influence skills use through two key channels: the internal flexibility allowing employers to adapt job tasks to the skills of new hires or to put in place incentive mechanisms that may encourage workers to deploy more of their skills on the job and the skills requirements of their job. The focus is placed on the use of information-processing skills, as opposed to job-specific skills, soft skills or socio-emotional skills.

Measuring skills use at work: The approach taken by PIAAC

The data used for the chapter are drawn from the first two rounds of the Survey of Adult Skills (PIAAC). Data collection was completed in 2012 for the 22 OECD countries and regions taking part in Round 1 and in 2015 for another six OECD countries participating in the survey's second round.[1]

The survey directly tests skills proficiency, the skills workers have, in three domains – literacy, numeracy and problem solving in technology-rich environments – and aims at assessing the extent to which respondents are able to process information and solve problems they face in everyday life. In the background questionnaire, the survey collects socio-demographic and job characteristics as well as enquiring about the use of five information-processing skills – reading, writing, numeracy, ICT and problem solving. To ensure that the measures reflect the skill requirements of the job, rather than the proficiency of workers, the survey does not ask directly about skills use; rather it collects information on the tasks that respondents carry out in the context of their job and maps them into the use of information-processing skills. For instance, workers are asked the frequency with which they read documents of various types, such as directions, instructions, letters, memos, e-mails, articles, books, manuals, diagrams and maps. The approach used in PIAAC follows the Job Requirements Approach (JRA) pioneered in the UK Skills Survey (Felstead et al., 2007). This information is then aggregated to derive a measure of the use of reading at work. Box 2.1 provides more detail on how each skills use variable is derived. Following a similar methodology, PIAAC also collects information on the use of information-processing skills in everyday life. Skills use in everyday life is used in some parts of this chapter to complement the data on the use of skills at work.

Box 2.1. **Measuring the use of information-processing skills in PIAAC**

The Survey of Adult Skills (PIAAC) provides quantifiable and internationally comparable information about the use of a number of information-processing skills at work and in everyday life. These include: reading, writing, numeracy, ICT and problem solving. Rather than asking workers directly about their skills use, the survey enquires about the frequency with which tasks relevant to each skill are carried out (a complete list is provided in the table below).

Skills use construct	Set of measured tasks
Reading	Reading documents (directions, instructions, letters, memos, e-mails, articles, books, manuals, diagrams, maps).
Writing	Writing documents (letters, memos, e-mails, reports, forms).
Numeracy	Calculating prices, costs or budgets; use of fractions, decimals or percentages; use of calculators; preparing graphs or tables; algebra or formulas; use of advanced math or statistics (calculus, trigonometry, regressions).
ICT skills	Using e-mail, Internet, spreadsheets, word processors, programming languages; conducting transactions on line; participating in online discussions (conferences, chats).
Problem solving	Facing hard problems (at least 30 minutes of thinking to find a solution).

Frequency is measured as follows: a value of 1 indicates that the skill is never used; a value of 2 indicates that it is used less than once a month; a value of 3 indicates that it is used less than once a week but at least once a month; a value of 4 indicates that it is used at least once a week but not every day; and a value of 5 indicates that it is used every day.

For most skills use constructs, information is collected for a large number of tasks, improving reliability of the derived variable. The only exception is problem-solving skills, the use of which is measured through a single question asking "How often are you usually confronted with more complex problems that take at least 30 minutes to find a good solution?". More information on the skills use module of the Survey of Adult Skills and its development is available in its technical report (OECD, 2013b); the specific questions used in the PIAAC background questionnaire are available online at *www.oecd.org/site/piaac/publicdataandanalysis.htm*.

The composite variables measuring each skills use construct are derived from the multiple task-related questions; they are constructed using sum scales. Cronbach's Alpha, a statistical technique, is used to test that the items used to derive each skills use variable are grouped appropriately. The resulting scale for these variables is continuous but ranges from 1 to 5 as it is the case for the underlying items: a value close to 1 indicates that the person does not use that particular skill at work while a value close to 5 suggests that the person uses the skill every day. Item Response Theory (IRT) techniques can also be used to construct skills use indices. Using them does not alter the relationships discussed in this report. Sum scales are used instead because their values, which range continuously from 1 to 5, are more easily interpretable.

It should be noted that questions concerning ICT-related tasks at work are only asked to individuals who report using a computer at work, thus few individuals report "never" using their ICT skills at work. In order to ensure comparability with the other skills use scales, individuals who report not using a computer at work are assigned to "never" carrying out ICT-related tasks at work.

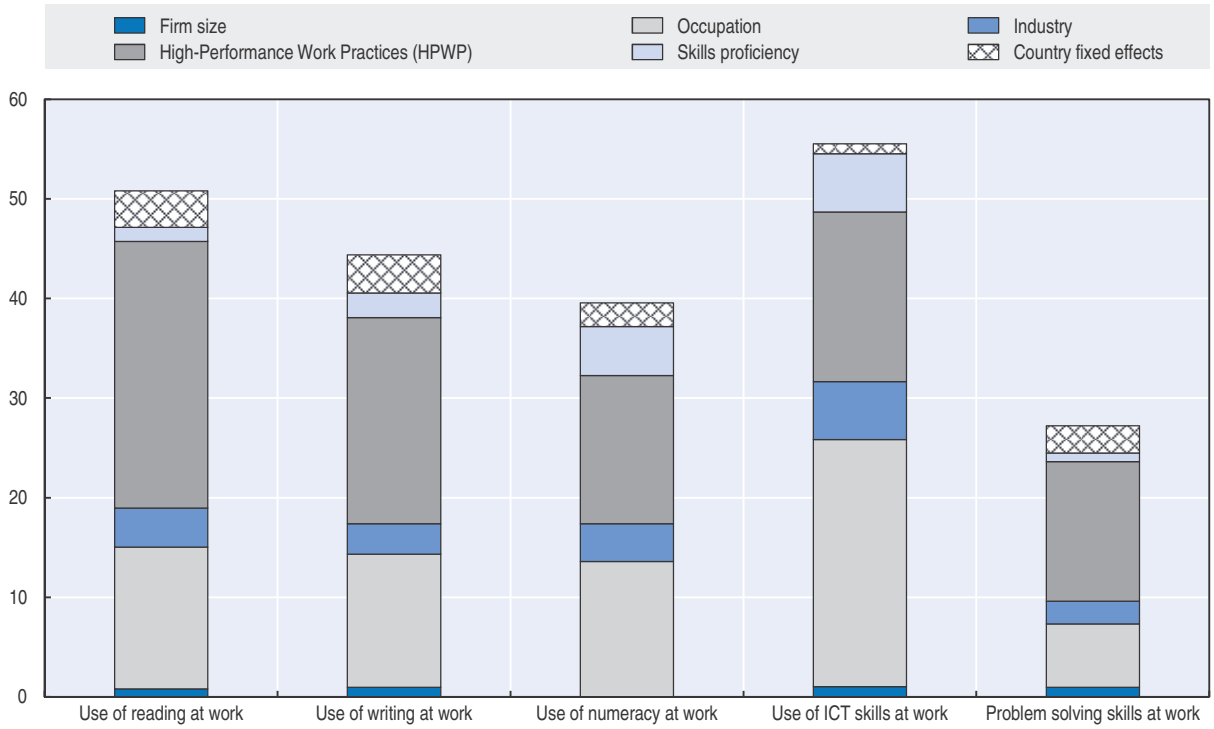
Because all indices are expressed on the same scale ranging from 1 to 5, numerical comparisons between countries and indicators are possible. Nevertheless, some comparisons may not be conceptually meaningful. For instance, the appropriate frequency of use of reading skills may not be the same as the frequency with which workers are required to solve complex problems.

Two criticisms are often raised in relation to measures of skills use derived from information provided by workers: i) these measures are developed from workers' self-reports and, as a result, could be affected by workers' proficiency and perceptions more than by their actual skills deployment in or their jobs' skills requirements; and ii) because the measures are based on task frequency, they may not appropriately capture the complexity of the tasks involved in each job nor capture the full array of tasks in which a skill is used.

Figure 2.1 addresses the first issue by showing to what extent various factors – including individual proficiency and job/firm characteristics – contribute to the variation of skills use at work. As the figure shows, proficiency explains a small part of the variance of skills use at work across individuals (1 to 6%), with the main role played by industry, occupation, firm size and High-Performance Work Practices.[2] The relationship between skills proficiency and skills use is thus likely to be mediated by workers' sorting into occupations, industries and

Figure 2.1. **The contribution of skills proficiency and other factors to the variance of skills use at work**

Share of the variance in skills use explained by each factor



Note: Results obtained using regression-based decompositions proposed by Fields (2004) with one model estimated for each skill. The height of the bar corresponds to the total R-squared of the full regression model. The subcomponents show the contribution of each factor (or set of regressors) to the total R-squared. The Fields decomposition is explained in more detail in *OECD Employment Outlook 2014*, Box 5.4 (OECD, 2014a). Occupation and industry are included as 1-digit codes of the International Standard Classification of Occupations (ISCO) and 1-digit codes of the International Standard Industrial Classification (ISIC) Rev. 4 codes, respectively. High-Performance Work Practices include whether workers have any flexibility in deciding on the sequence of tasks they perform, how they do the work, the speed of the work, and working time; how often they organise their own time and plan their own activities; how often they co-operate or share information with others; how often they instruct, teach or train other people; whether they received education/training in the past 12 months; and whether they received a bonus payment. Skills proficiency corresponds to literacy proficiency for the use of reading and writing at work, to numeracy proficiency for the numeracy at work, and problem solving in technology-rich environments for ICT and problem solving at work. Italy, France and Spain are excluded from the regressions on the use of ICT and problem solving at work because they did not administer the problem solving in technology-rich environments module in the Survey of Adult Skills. Including them, by using literacy or numeracy scores as controls for proficiency, does not change the results.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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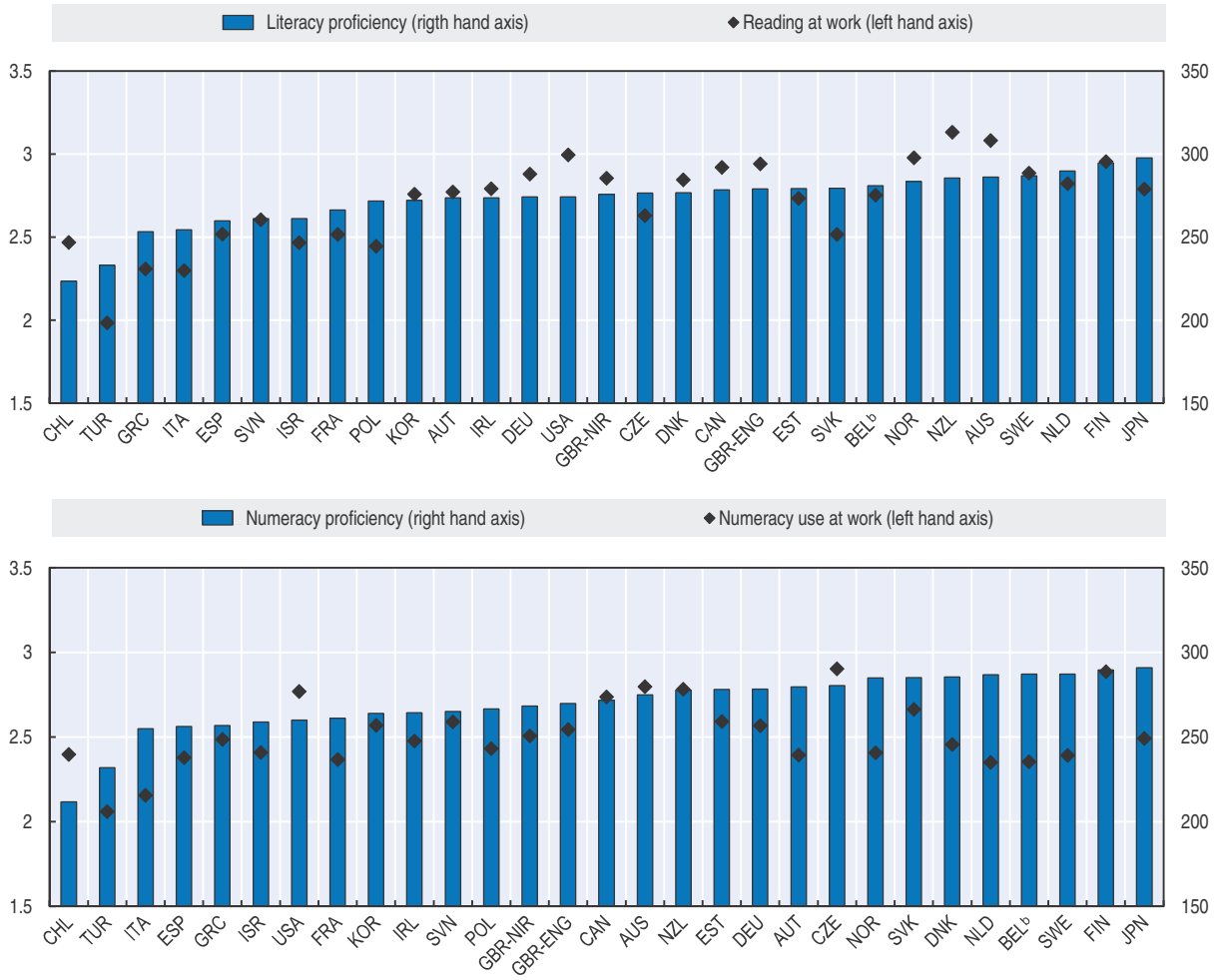
firms, rather than reflecting a reporting bias. The relationship between workers' occupation, work organisation and management practices and skills use will be discussed in more detail below.[3]

Figure 2.2 sheds further light on the relationship between skills proficiency and skills use. The figure shows average skills proficiency and skills use at work by country. It is apparent that countries rank differently on the two dimensions, particularly in the case of numeracy, suggesting that proficiency and use are two different, albeit to some extent related, concepts.[4]

Concerning the second limitation, referring to the frequency with which tasks are carried out rather than their complexity, it should be stressed that the approach based on frequency adopted in PIAAC ensures better cross-country comparability of the results. Alternatives include measuring the importance of the task for the job or the level of complexity at which a given task is performed. Importance is conceptually very close to

Figure 2.2. **Skills proficiency and skills use across OECD PIAAC countries**

Average proficiency scores and average skills use at work among the working 16 to 65-year-old population[a]



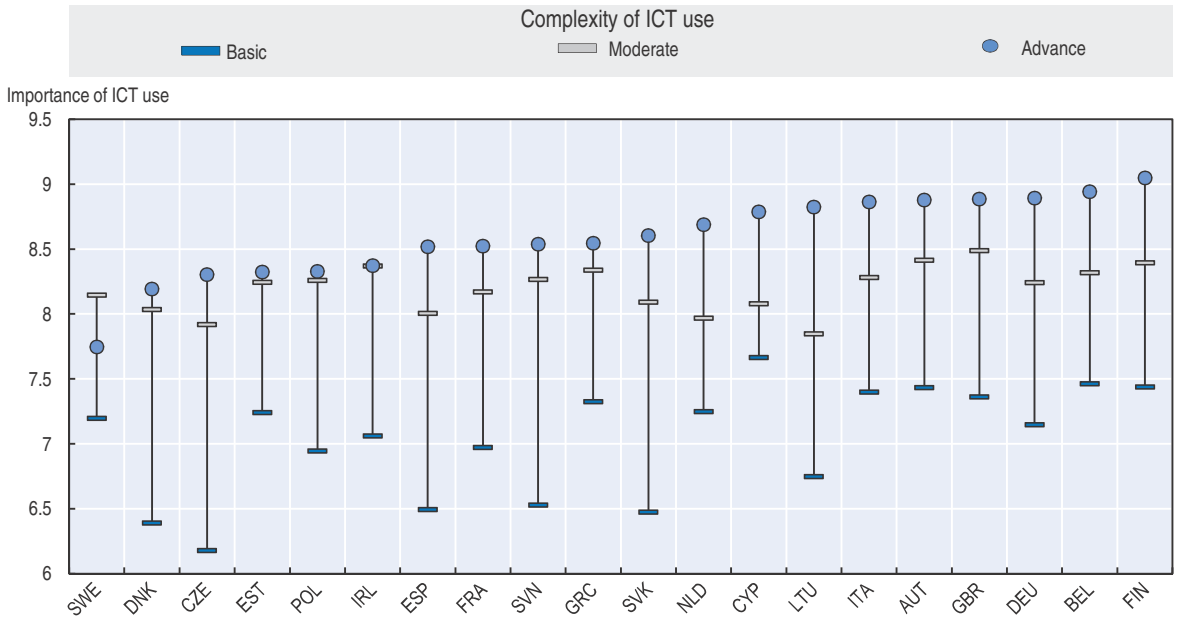
a) Countries are ranked by their average proficiency score in literacy and numeracy.
b) Data for Belgium correspond to Flanders.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384534

frequency – a task that is performed very frequently could be described as very important for the job – but more subject to self-reporting bias. Task complexity, on the other hand, is a distinct concept reflecting the level of difficulty of each task performed. Some surveys, notably *O*NET* for the United States and CEDEFOP's European Skills and Jobs Survey (ESJS), measure both the importance and complexity or level of different skills used in the workplace. In the case of *O*NET*, the correlation between the importance of a skill in an occupation and the level of this skill required to carry out the occupation (954 occupations) is extremely high and statistically significant, ranging from 0.91 for reading comprehension and complex problem solving to 0.94 for mathematics. In the ESJS, the questions are asked differently making correlations less meaningful.[5] Nevertheless, Figure 2.3 suggests that there is a strong link between the level of task complexity reported by workers and the level of importance of each domain. This is true for ICT and numeracy, with the sole exception of Sweden for ICT, but a little less robust for literacy.

Figure 2.3. **Importance versus complexity of ICT skills at work in selected European countries**

Importance of ICT use at work, by level of complexity in the use of ICT at work,[a] 2014



a) Complexity is measured as basic, moderate or advanced while importance is measured on a scale ranging from 0 (not at all important) to 10 (essential).

Source: CEDEFOP, European Skills and Jobs Survey (2015).

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PIAAC measures skills use through the Job Requirement Approach (JRA), that is, by measuring the self-reported frequency with which workers carry out specific tasks at work. Questions refer to specific facts, events and behaviours, rather than attitudes, evaluations and holistic judgments. It suffers the potential limitation that the set of measured tasks may not encompass the full array of tasks associated to a specific skill. As shown in Box 2.1, reading skills use is measured in PIAAC by the frequency with which workers read directions, instructions, letters, memos, e-mails, articles, books, manuals, diagrams and maps. Other skills use surveys (e.g. the European Skills and Jobs Survey) measure skills use with one broad skills question (e.g. "How important are problem-solving skills for doing

your job?"), but this approach may be more sensitive to self-reporting biases and lack of comparability because, among other things, it is unclear what frame of reference and skills definitions respondents are taking into account. The JRA approach used in PIAAC and the resulting indices have a comparable, objective and easily interpretable scale.[6]

Finally, it is important to draw a distinction between skills use at work and skill mismatch. The use of information-processing skills at work reflects primarily job-specific skill requirements as well as the level of skills that workers are able and willing to deploy at work. This is different from the concept of skill mismatch whereby workers hold jobs that do not make optimal use of all their skills. Indeed, skill mismatch implies a comparison between skills proficiency and skills use which is not the topic of this chapter. Box 2.2 offers some additional reflections on the importance of accurate skills use measurement to gauge the actual extent of the mismatch problem and its potential consequences on labour productivity.

The use of information-processing skills at work

Several studies have looked at how the use of skills at work varies across countries (OECD, 2013a, 2016a; Quintini, 2014). Figure 2.4 summarises this descriptive information, presenting cross-country averages as well as highest and lowest use for each information-processing skill.

Reading skills are used at work most frequently in Australia, New Zealand and the United States, writing skills are used most frequently in Japan and Norway, and numeracy skills are most frequently used in Finland and the Czech Republic (see OECD, 2016a; and Quintini, 2014 for country-specific values not shown in Figure 2.4). Denmark, the Netherlands and New Zealand are the countries where ICT skills are used most often at work, while problem-solving skills are most frequently used in Australia and the United States. For all five information-processing skills, the highest frequency of use corresponds to about 3, hence to an average frequency of "less than once a week but more than once a month". These results show surprisingly little consistency across the rankings of countries for the average use of the different information-processing skills at work, emphasising the importance of measuring these skills separately. Australia, New Zealand and the United States are the three countries that rank most consistently near the top of the distribution in all the skills domains measured, while Chile, Greece, Italy and Turkey tend to rank near the bottom for reading, writing and numeracy skills.

Figure 2.1 shows that, along with firms' internal characteristics (as measured by the application of High-Performance Work Practices) occupations are important predictors of skills use at work. Occupations explain 25% of the variance in ICT skills use at work, around 14% of the variance in reading, writing and numeracy skills and 6% of the variance in problem-solving skills use at work. Given the relationship between skills proficiency and skills use observed in the Survey of Adult Skills (OECD, 2016a), Figure 2.1 suggests that this relationship is largely mediated by proficiency influencing how workers are sorted into industries, occupations and firms which, in turn, largely determine their skill use. Figure 2.5 shows that skills use varies strongly by occupation: skills use is lowest among workers in elementary occupations and highest among Managers and Professionals. ICT and writing skills use differs particularly sharply across occupations. While managers, professionals, technicians and clerical support workers use these skills relatively often, workers in service and sales, agriculture, forestry and fishery, craft and trades, plant and machine operators and elementary occupations use these skills with much lower frequency.

Box 2.2. **Skills use and mismatch: Do employers adapt job requirements to the worker's skills?**

Skills mismatch – the discrepancy between the skills possessed by workers and those required by their jobs – is rarely measured at the moment of hiring, rather, it reflects the comparison of skills possessed and required for existing employees, some of whom will have a fairly long tenure with their employer. As a result, measured mismatch accounts for any adjustments to job content made by employers to ensure a better match between workers and jobs. This applies both to mismatch in information-processing skills and mismatch in qualifications (Montt, 2015; OECD, 2013a; Pellizzari and Fichen, 2013).

Evidence of this adjustment can be found by looking at skills use for mismatched individuals. Table 2.1 below suggests that over-qualified workers use their information-processing skills more at work than well-matched workers in similar jobs, controlling for skills proficiency. In other words, workers in jobs for which a lower qualification is required are still able to use some of their excess competences compared to their less qualified counterparts in a similar job (see second row of the top panel of the table). However, the adjustment of job content to their qualifications is not full as over-qualified workers still suffer a "skills use penalty" compared with their counterparts with similar qualifications holding jobs for which they are well matched (see second row of the bottom panel of the table).* A similar, but opposite, reasoning can be applied to the under-qualified: when holding jobs requiring higher qualifications, workers use their skills less than better qualified counterparts in a similar job – i.e. the job requirements are "downgraded" to adapt to the skills of the job holder – but more than if they were holding a job that was well-matched to their qualification.

Table 2.1. **Qualification mismatch and skills use**

OLS regression coefficients[a]

	Use of reading skills	Use of writing skills	Use of numeracy skills	Use of ICT	Use of problem solving
	A. Skills use controlling for the level of education required to get the job				
Under-qualified	-0.24***	-0.22***	-0.09***	-0.12***	-0.12***
Over-qualified	0.17***	0.21***	0.08***	0.22***	0.00
Skills proficiency	0.20***	0.32***	0.49***	0.59***	0.23***
Upper secondary required	0.71***	0.89***	0.52***	0.83***	0.53***
Post-secondary required	1.15***	1.39***	0.75***	1.18***	0.84***
Tertiary required	1.56***	1.68***	1.03***	1.88***	1.24***
Number of observations	107 263	107 267	107 268	80 395	80 313
	B. Skills use controlling for skills proficiency and years of education				
Under-qualified	0.42***	0.48***	0.33***	0.64***	0.39***
Over-qualified	-0.50***	-0.49***	-0.35***	-0.56***	-0.52***
Skills proficiency	0.21***	0.36***	1.47***	0.00***	0.00***
Years of completed education	0.18***	0.17***	0.11***	0.22***	0.14***
Number of observations	107 263	107 267	107 268	80 395	80 313

a) Estimates from OLS regressions with each skills use as the dependent variable. Models in Panel A control for the level of education required to get the individual's job, as reported by the workers themselves. Models in Panel B control for individuals' skills proficiency (literacy scores for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT and problem solving use at work) and years of education. Italy, France and Spain are excluded from the regressions on the use of ICT and problem solving at work because they did not administer the problem solving in technology-rich environments module in the Survey of Adult Skills. Including them, by using literacy or numeracy scores as controls for proficiency, does not change the results. Country fixed effects are included in all models.

***, **, * statistically significant at 1%, 5% and 10% levels respectively.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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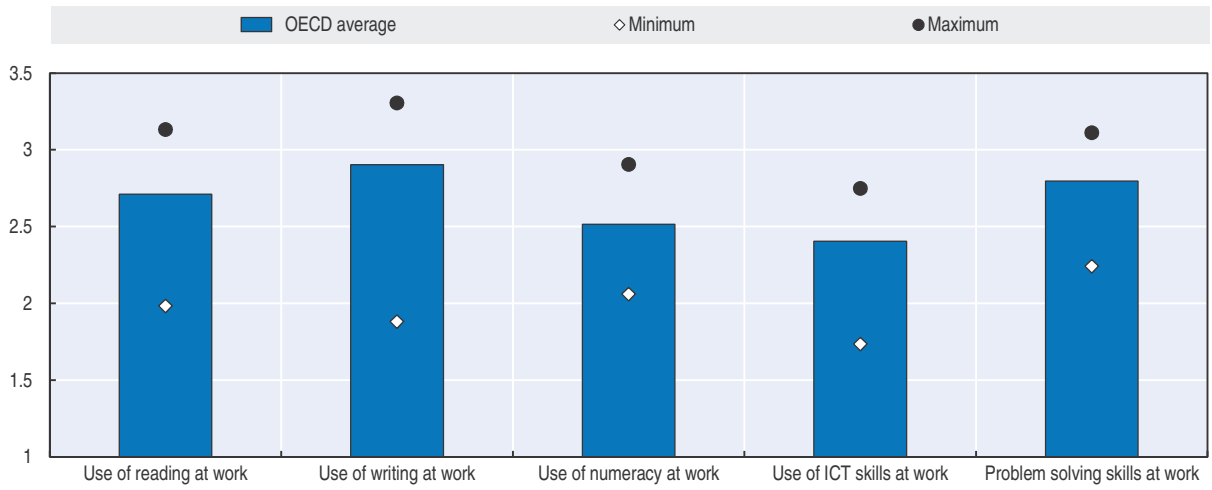
Box 2.2. **Skills use and mismatch: Do employers adapt job requirements to the worker's skills?** *(cont.)*

Overall, these results suggest that while jobs can and are adapted to reduce the consequences of mismatch for employers and employees, some discrepancies remain. Measuring the extent to which jobs can be adapted – or workers shifted to more suitable jobs (within the same occupation) elsewhere in firm/establishment is important to gauge the actual extent of the mismatch problem and its potential consequences on labour productivity. Work in this direction is being undertaken in the context of the redevelopment of the PIAAC background questionnaire for the second wave of the Survey of Adult Skills planned for 2022.

* A similar exercise for skills mismatch is not possible as skill requirements are expressed as a range rather than a single score. However, the rather small size of wage penalties when focusing on mismatch in information-processing skills suggest that some adjustment is taking place in order to make the best use of over-skilled workers' skills.

Figure 2.4. **Skills use at work**

OECD average, highest and lowest country average use of each skill



Note: Skills use scales range from 1 (never used) to 5 (used every day). Max. (min.) represents the highest (lowest) country average among OECD countries participating in the Survey of Adult Skills. OECD (2016a) presents the detailed country-specific skills use at work estimates.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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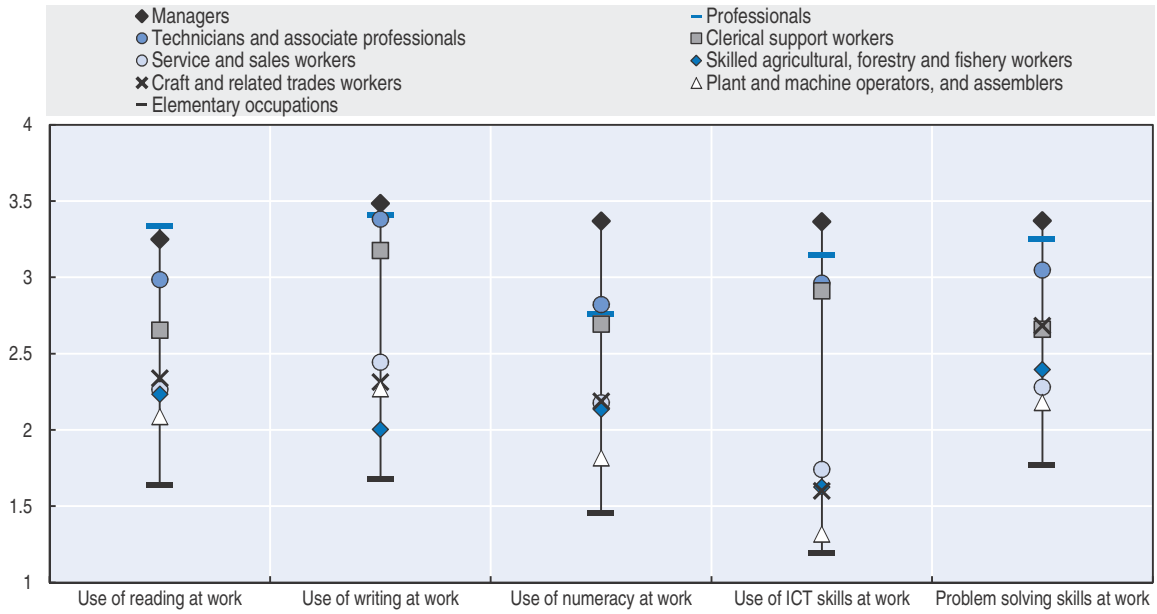
The strong relationship between skills use and occupations can be interpreted, at least in part, as reflecting differences in job skill requirements. However, other research has shown that jobs in similar occupations can vary in the specific tasks carried (Autor and Handel, 2013). This variation is a function of the firms' organisation, highlighting the relevance of analysing the organisation of work and firm dynamics when understanding skills use.

Looking at how the use of skills at work correlates with socio-demographic and firm characteristics, Quintini (2014) finds that, *ceteris paribus*,[7] gender, age, qualification level, firm size, working hours, and industry and occupation are important determinants of skills use:

- Women are less likely to use information-processing skills at work than men, even after controlling for job characteristics and skills proficiency.
- Young people make the least use of information-processing skills at work, including ICT, but older workers are also less likely than prime-age workers to use these skills.

Figure 2.5. **Skills use at work by occupation**

OECD average skills use by occupation



Note: Skills use scales range from 1 (never used) to 5 (used every day). For each estimate, unweighted cross-country averages are reported.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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- Unsurprisingly, within countries, the use of information-processing skills increases with the level of education.
- Workers in larger firms use more writing, reading and problem-solving skills at work; the use of numeracy skills at work exhibits a U-shape relationship with firm size – i.e. workers in small firms and larger firms both use numeracy skills more frequently than those in mid-size firms.
- The use of skills in the workplace increases with job stability, although in most cases the differences between contract types are small.
- Differences between working hours arrangements are more sizeable with part-time workers using their skills significantly less than their full-time counterparts.[8]
- Coefficients by occupation and by industry are rather unsurprising, with managers and finance workers using information-processing skills the most and workers in elementary occupation and in the agricultural sector using them the least.
- Finally, a higher literacy score is associated with higher use of all information-processing skills. However, the correlation is extremely small.

One interesting question is whether the level of skill use in each job varies across the different information-processing skills, or, alternatively, whether jobs tend to require a similar level of use across skill types. In other words, do jobs that require a high (low) use of reading also require a high (low) use of writing, numeracy, ICT and problem solving or do jobs more often require a very frequent use of one or two skills but a moderate or low use of the others? To answer this question, one can look at the share of jobs that use a given bundle of skills with the same frequency.

Across countries, only 10% of jobs require the use of all five information-processing skills with the same frequency.[9] Interestingly, the vast majority of these jobs use these information-processing skills with very low frequency (never or close to never) – 7% out of the 10% – leaving only 2% of workers who use all five skills at work with high frequency (close to at least once a week). Even when considering smaller sets of information-processing skills, the share using all of them at high frequency remains small, reaching a maximum of 9-15% when problem solving is coupled with either reading, writing or numeracy at work. Finally, relaxing this definition and allowing workers to use skills with similar frequency, the share increases quite significantly to about 37% with 15% of workers using all skills less than once a month and 15% using them all once a week or more.

Looking at individual skills, some patterns emerge. Problem solving is a skill that is not necessarily used with other information-processing skills – i.e. jobs requiring a frequent use of complex problem-solving skills do not necessarily require a frequent use of reading, writing, numeracy and ICT.[10] ICT stands out as a more transversal skill in the workplace: more than half of all jobs use ICT coupled either with reading or numeracy with the same frequency; and about 30% require a combination of ICT with two other skills among numeracy, reading and writing.

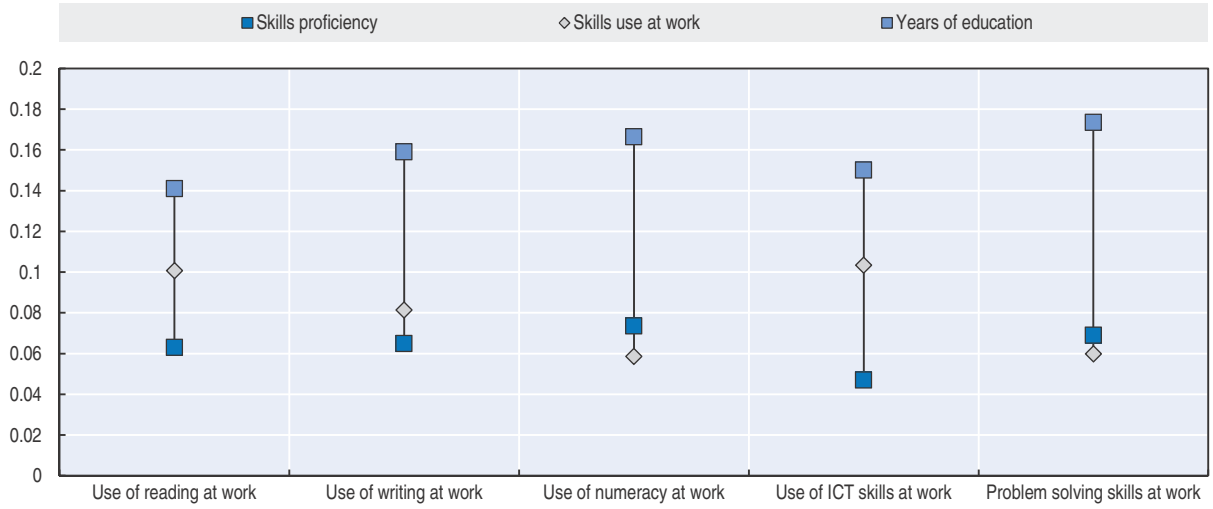
2. Why skills use matters

Workers who make fuller use of their information-processing skills at work also tend to have higher wages. Figure 2.6 shows that, controlling for education and skills proficiency, workers who use their skills more frequently earn higher wages. The size of the relationship between wages, years of education, skills proficiency and skills use varies somewhat across countries, but the patterns are very similar. ICT use at work is about as important as years of education for workers' wages. Reading use also has a stronger relationship with wages than years of education and literacy proficiency. On the other hand, while numeracy and problem-solving use at work matter for wages as much as proficiency, their partial correlation with wages is only about one-half as strong as that of ICT or reading. The estimated relationships between the use of information-processing skills and gross hourly wages are statistically significant with the sole exception of reading at work in Italy. Finally, the relationship between skills use and wages remains statistically significant when controls for occupation are added, although the estimated coefficients are smaller.

More effective skills utilisation has also been linked to greater job satisfaction and employee well-being. For this reason, the concept of skills utilisation has sometimes been closely associated with that of job quality (e.g. Green et al., 2013), with possible spill-over effects into life satisfaction more generally as well as better health. Figure 2.7 shows how, across OECD PIAAC countries on average, skills use relates to the likelihood of being extremely satisfied at work, once skills proficiency, educational attainment,[11] gross hourly wages and a number of socio-demographic characteristics are accounted for. It emerges that the use of information-processing skills has a larger effect on job satisfaction than workers' actual skills or years of education.[12] Although magnitudes vary, patterns across countries are very similar to that emerging at the PIAAC average. The relationships between the use of reading, writing and ICT skills at work and job satisfaction are statistically significant in nearly all countries, while this is rarely the case for the use of numeracy and problem solving.

Figure 2.6. **Wage returns to education, skills proficiency and skills use**

Percentage change in wages associated with a standard deviation[a] increase in skills proficiency, skills use at work and years of education[b]



a) One standard deviation corresponds to the following: 2.9 years of education; 47 points on the literacy scale; 53 points on the numeracy scale; 44 points on the problem solving in technology-rich environments scale; 1 for reading use at work; 1.2 for writing and numeracy use at work; 1.1 for ICT use at work; and 1.3 for problem solving at work.

b) Estimates from OLS regressions with log wages as the dependent variable. Wages for Round-2 countries were converted into 2012 nominal wages using annual consumer prices indices; then, wages for Round-1 and Round-2 countries were converted into USD PPPs using 2012 USD PPPs for private consumption. The wage distribution was trimmed to eliminate the 1st and 99th percentiles. One model is estimated for each skill, with years of education and the corresponding skills use and proficiency as independent variables (literacy scores for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT and problem-solving use at work). Regressions are run individually by country. The coefficients reported in the figure correspond to the unweighted average of country-specific values. All models include controls for age, age squared, gender, foreign-born status and tenure. Italy, France and Spain are excluded from the regressions on the use of ICT and problem solving at work because they did not administer the problem solving in technology-rich environments module in the Survey of Adult Skills. Including them, by using literacy or numeracy scores as controls for proficiency, does not change the results. OECD (2016a) presents detailed country-specific estimates of the relationship between skills use at work and wages.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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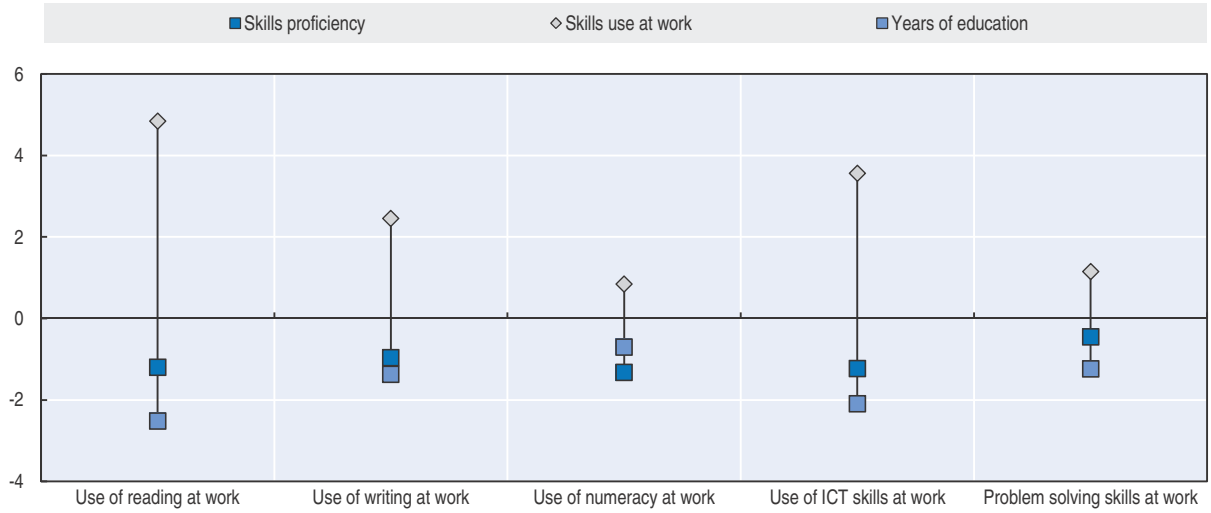
At the level of the firm, better skills utilisation is associated to higher productivity (UKCES, 2014) and lower staff turnover, and some have argued that it also stimulates investment, employees' engagement and innovation (Wright and Sissons, 2012). In some countries (e.g. the United Kingdom) low skills utilisation has been linked to a "low-skills equilibrium" (Finegold and Soskice, 1988; Keep, 2000) – i.e. a situation in which the economy is characterised by low wages, low-specification companies that compete on cost rather than on quality, and a low demand for high-level skills. To a large extent, skills use is derived by demand and, as argued by Wright and Sissons (2012), many employers with low-cost strategies view their workers as "an easily substitutable factor of production, or as a cost to be minimised rather than as assets and sources of competitive advantage in their own right". This business strategy results in forms of job design which require low levels of skills use and give workers little task discretion, autonomy or flexibility. In contrast to this, employers who compete on the basis of quality, with differentiated products or services, will tend to see their employees and their skills as an integral part of their competitive advantage (Skills Australia, 2012). Under such a strategy, the level of skills utilisation will be high.

OECD (2013a) shows that the use of reading skills at work correlates strongly with output per hour worked. This is also the case for writing skills (Table 2.2). The results are robust to the inclusion of controls for proficiency – i.e. they are not driven by a relationship

Figure 2.7. **How education, skills and skills use relate to job satisfaction**

Percentage-point change in job satisfaction associated with a standard deviation[a] increase in skills proficiency, skills use at work and years of education[b]



a) See footnote *a)* to Figure 2.6.

b) Marginal probability estimates from probit regressions with individuals' reporting being extremely satisfied in their current job as the dependent variables. One model is estimated for each skills use variable, with years of education and the corresponding skills use and proficiency as independent variables (literacy scores for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT and problem-solving use at work). Regressions are run individually by country. The coefficients reported in the figure correspond to the unweighted average of country-specific values. All models include controls for age, age squared, gender, foreign-born status, tenure and gross hourly wages. Italy, France and Spain are excluded from the regressions on the use of ICT and problem solving at work because they did not administer the problem solving in technology rich environments module in the Survey of Adult Skills. Including them, by using literacy or numeracy scores as controls for proficiency, does not change the results.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384580

between skills proficiency and productivity. The strength of the link across countries varies, depending on a number of factors such as the capital stock, the quality of production technologies, the efficiency of the match between workers and jobs.[13]

An alternative way of exploring the link between skills use and productivity is to exploit cross-country, industry-level data. Average operating revenue per worker at the industry level is derived from firm-based data available in the *ORBIS Database* which have been weighted by firm size (see Adalet McGowan and Andrews, 2015; and Andrews and Cingano, 2014). As can be seen in Table 2.2, consistently with country-level results, reading use is associated with higher labour productivity. Problem solving is also associated with productivity once the industry dimension is accounted for and this is also the case for ICT use, although the positive association is only statistically significant after controlling for skill proficiency.

In the longer term, the degree to which information-processing skills are needed to perform various jobs will also influence the risk that these jobs will be automated and thus likely to disappear. Some alarming estimates have been made that nearly 50% of workers in the United States are employed in occupations at high risk of automation (Frey and Osborne, 2013). However, using the results of the Survey of Adult Skills to take account of differences in the tasks performed by workers within the same occupation, Arntz, Gregory and Zierahn (2016) find that only a modest share of between 6 to 12% of workers are currently in jobs that are highly susceptible to being automated with another 25% of jobs

Table 2.2. **Labour productivity[a] and skills use in selected countries[b]**

	GDP per hour worked	Industry-based productivity
	A. Unadjusted[c]	
Reading use	0.66**	0.30**
Writing use	0.58**	0.10
Numeracy use	-0.39	0.06
ICT use	0.85**	0.18
Problem solving skills	0.57	0.24*
Number of observations	22	205
	B. Adjusted for skills proficiency[c]	
Reading use	1.22***	0.24*
Writing use	1.08***	0.10
Numeracy use	-0.46	0.07
ICT use	1.21***	0.28*
Problem solving skills	0.65	0.27*
Number of observations	22	205

a) Estimates from OLS regression models with each labour productivity measure as the dependent variable. GDP per hour worked is measured at the country level and expressed in USD current prices. Industry-based labour productivity is measured at the industry-level and derived from firm-level data. Industry-based labour productivity is the weighted average productivity with firm's weights equal to the firm's employment share. The relationship between each measure of labour productivity and each skills use variable is estimated in separate model.

b) Due to limitations in the availability of industry-based productivity measures only the following PIAAC countries are included: Australia, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Japan, Korea, the Netherlands, Norway, Poland, Spain, Sweden, the Slovak Republic, the United Kingdom and the United States. Skills use and proficiency measures for Belgium correspond to Flanders and those for the United Kingdom to England and Northern Ireland.

c) Models for GDP per hour worked consider countries as observations. Models for industry-based labour productivity consider 1-digit ISIC Rev. 4 industries within a country as observations. Unadjusted regressions are run using average country (country-industry) values for writing, reading, numeracy, ICT and problem-solving skills use at work. Adjusted regressions control for skills proficiency with literacy scores as the control in models for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT and problem-solving use at work. Adjusted regressions are run in two steps so as to account for the potential direct and indirect (through skills use) effects of skills proficiency on labour productivity. In the first step, two sets of regressions are estimated: a) productivity at the country (country/industry) level is regressed on skills use; similarly; and b) skills use is regressed on skill proficiency. In the second step, the residuals and the constant term of the a) regressions are regressed on the residuals and constant term of b) regressions. The coefficients for the second stage regressions are reported in the table. All regressions include industry and country fixed effects.

***, **, * statistically significant at 1%, 5% and 10% levels respectively.

Source: OECD Productivity Database (2015); ORBIS (2015); Survey of Adult Skills (PIAAC) 2012.

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likely to change substantially from their current make-up as they respond to increased automation. Moreover, jobs that require workers to make a more frequent use of information-processing skills are at a lower risk of being automated (Box 2.3).

3. Factors influencing the use of information-processing skills at work: What goes on inside the firm

One reason why research and policy interest have tended to focus on skill proficiency is that it is relatively easy to identify its determinants and design policies to impact it. In contrast, factors influencing skills use are more difficult to pinpoint and it is often the case that policies can only influence skill demand indirectly.

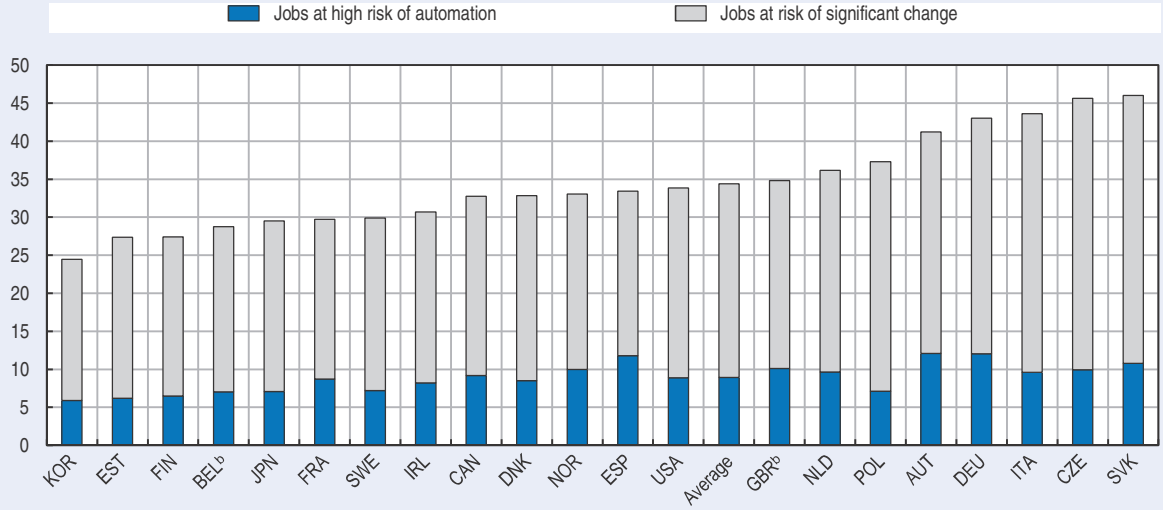
Box 2.3. **Skills use and the risk of automation**

Technological change and digitalisation often raise fears that workers will be replaced by computers and computer-enabled robots, resulting in what has been called technological unemployment. These fears have not materialised for past technological advances as the creation of new jobs outweighed the labour-saving impact of technology. However, it has been argued that recent and future advances in computing power and artificial intelligence may lead to the automation of a much broader range of tasks than just routine tasks, including those that were previously the exclusive domain of humans, such as reasoning, sensing and deciding. This could result in a much more profound and disruptive impact on employment than during previous episodes of major technological innovation. Frey and Osborne (2013) have estimated that 47% of US workers are in occupations that could be performed by computers and algorithms within the next 10 to 20 years. Using the same methodology, similar results have been found for European countries, ranging from 35% in Finland to 59% in Germany of jobs at risk of automation, with the variation across countries reflecting differences in occupational structures.

However, these studies disregard the considerable differences across jobs with the same occupational title in the tasks that are performed. These differences are accounted for in a recent study by Arntz, Gregory and Zierahn (2016) who conclude that the share of jobs at a high risk of automation is just 9% in the United States and ranges between 6 and 12% in other OECD countries participating in the Survey of Adult Skills (Figure 2.8). In each job, the frequency of tasks relating to the use of reading, writing and complex ICT at work significantly reduces the likelihood of automation, while tasks related to complex problem solving and numeracy do so to a much smaller extent. On the other hand, tasks involving physical dexterity increase the likelihood of automation. A significantly larger share of jobs faces a medium risk of automation. These are jobs where many – but not all – tasks are at risks of being automated. The jobs will not be replaced entirely, but will be significantly retooled.

Figure 2.8. **Risk of job automation**

Percentage of workers in jobs at high risk of being automated or in jobs facing significant change[a]



a) Jobs are at high risk of automation if the likelihood of their job being automated is at least 70%. Jobs at risk of significant change are those with the likelihood of their job being automated estimated at between 50 and 70%.

b) Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) 2012; and Arntz, Gregory and Zierahn (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", *OECD Social, Employment and Migration Working Paper*, No. 189, OECD Publishing, Paris.

StatLink http://dx.doi.org/10.1787/888933384592

Box 2.3. **Skills use and the risk of automation** *(cont.)*

To obtain these results, Arntz, Gregory and Zierhan (2016) assess whether specific jobs, rather than whole occupations, are exposed to the risk of automation, analysing jobs in terms of on the tasks workers perform. Their approach is less restrictive than occupation-based approaches, which rely not only on the assumption that task structures are identical for all jobs with the same occupational title but also on the assumption that occupation task structures are the same in the US and other countries. The procedure still assumes, however, that workers with the same task structure face the same automation risk in all OECD countries and regions participating in PIAAC.

Differences in the risk of automation of jobs across OECD countries and regions are only partly due to differences in the industry or occupation structure of their workforce. Since workers in the same industries or occupations tend to perform different tasks in different countries, they can be more or less at risk of seeing their job automated. This is particularly the case with tasks related to work organisation – such as instructing, training and teaching others, planning one's own activities, influencing others – which are found to be associated with differences in the risk of automation across countries. Interestingly, the authors argue that observed cross-country differences in the task content of occupations may reflect differences in the extent to which countries have already invested in new automation technologies – i.e. the extent to which countries have already replaced labour by capital for performing tasks at risk of automation.

Both internal and external factors to the firm are discussed in this chapter. Internal factors, examined in this section, include work organisation and management practices that are likely to affect workers' performance and motivation as well as the flexibility of employers to adapt job content to the skills of new hires. External determinants, analysed in the next section, involve both institutional settings and offshoring. It is important to note that this is not meant to be an exhaustive set of determinants. In addition, the two sets may not be entirely independent of one another: external factors may affect the way work is organised or workers are managed at the firm/industry level; and labour market institutions are likely to affect the extent of offshoring observed in each industry and country and the likelihood that firms adopt modern human resource practices.

High-Performance Work Practices and how they can be measured in PIAAC

What happens inside the workplace – the way work is organised and jobs are designed as well as the management practices adopted by the firm – is a key determinant of how skills are used. In particular, it has been argued that better skills use and higher productivity can be achieved by implementing what are called High-Performance Work Practices (HPWP) which include both aspects of work organisation – team work, autonomy, task discretion, mentoring, job rotation, applying new learning – and management practices – employee participation, incentive pay, training practices and flexibility in working hours (Johnston and Hawke, 2002).[14]

While robust evidence of the impact of HPWP on skills use is rare, studies have shown strong links between HPWP and productivity and company performance. For example, Applebaum et al. (2000), link work organisation to higher wages, higher job satisfaction, lower job-related stress and, at the company level, to better competitiveness, efficiency and responsiveness – all of which have the potential to increase productivity. In their literature review, Becker and Huselid (1998) draw the link between management practices and firm-level turnover, labour productivity (sales/employee), gross rate of return on assets, and a variant of Tobin's Q (i.e. firm market value/book value), controlling for a range

of other firm and industry characteristics. Concerning management practices, Boning, Ichniowski and Shaw (2007) look at production lines in US steel minimills and find that group incentive pay raises productivity in all lines, while problem-solving teams increase productivity in lines with more complex production processes (see also Ichniowski, Shaw and Prennushi, 1997). Also on incentive pay, Bloom and van Reenen (2010) summarise the available evidence and find that both individual and group performance-based bonuses (including in the public sector) have a positive effect on productivity. They also find that the introduction of new forms of incentive pay is generally more effective when combined with other complementary practices, such as team work, decentralisation and the adoption of information technology.

The Survey of Adult Skills collects information on a number of job aspects that are often associated with HPWP, including: whether workers have any flexibility in deciding on the sequence of tasks they perform, how they do the work, the speed of the work, and working time; how often they organise their own time and plan their own activities; how often they co-operate or share information with others; how often they instruct, teach or train other people; whether they received education/training in the past twelve months; and whether they received a bonus payment.[15]

As was discussed above, Figure 2.1 confirms that these practices contribute quite substantially to explain the variation of skills use across individuals. The share of skills use variance explained by HPWP varies from 27% in reading to about 14% in problem solving. This makes HPWP the largest contributors to skills use variance in all domains with the exception of ICT for which the share explained by occupation is higher.

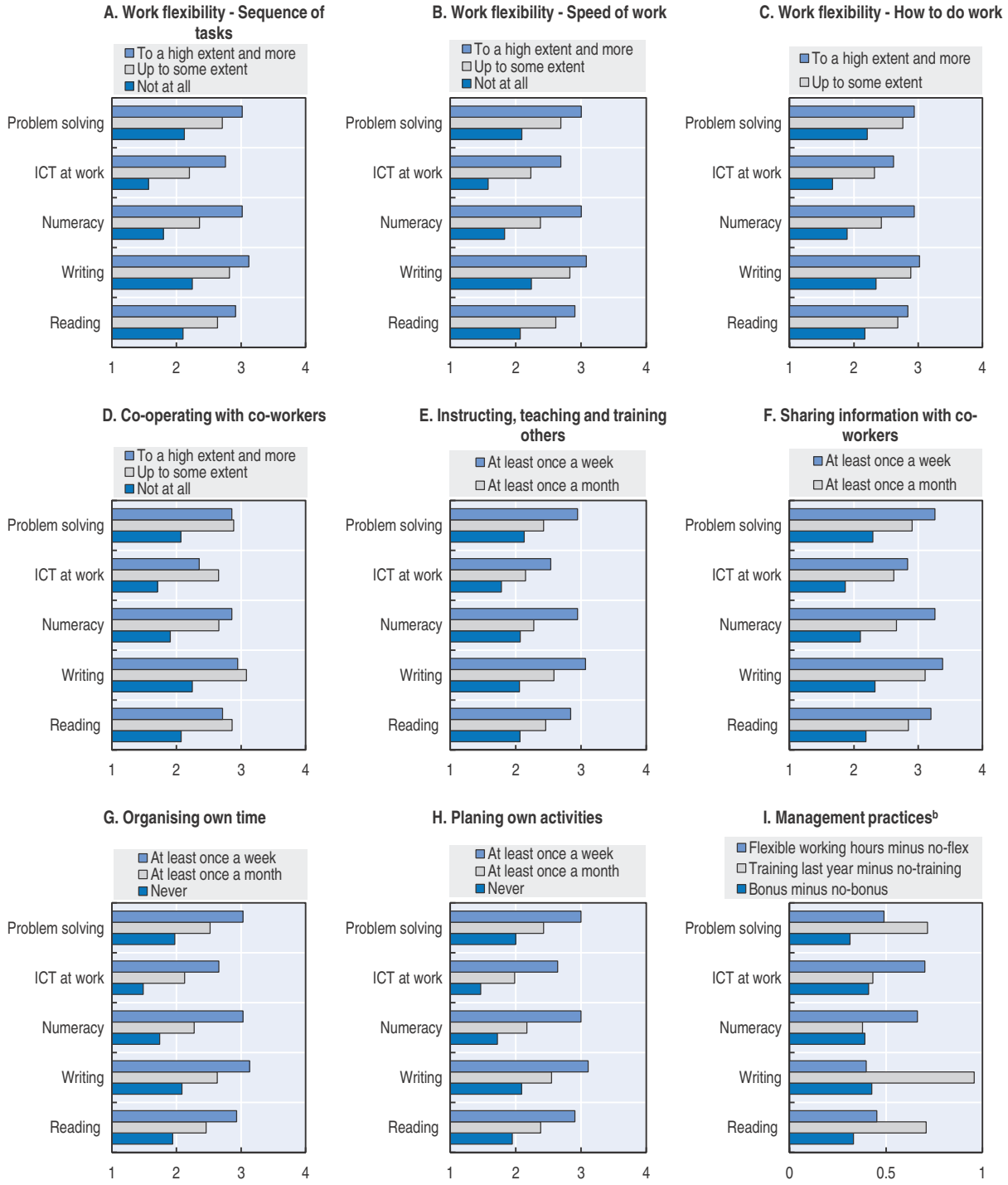
It is important to keep in mind that there is probably causation running in both directions between skills use and HPWP: many HPWP enable and/or motivate workers to use their skills better, but it can also make sense for employers to apply HPWP particularly to jobs that inherently require intense use of information-processing skills. For instance, workers required to solve complex and varied problems need considerable flexibility about how to pace, organise and perform their work as well as being able to consult with colleagues. This is much less true for workers required to perform simpler, more routine tasks.

Figure 2.9 provides more information about the relationship between HPWP practices and skills use, by showing how the use of information-processing skills varies with HPWP intensity. Without exception, workers who benefit from any degree of HPWP make greater use of numeracy, writing, reading, ICT and problem-solving skills than those who do not. Skills use also increases with HPWP intensity with the sole exception of co-operation with co-workers. While individuals working in teams use all five information-processing skills more often than those who never work in teams, skills use is somewhat lower for workers engaging in team work more than half of the time than for those engaging in team work up to one-half of the time.

Management practices also show consistent relationships with skills use at work (Panel I of Figure 2.9). Flexible working hours, training provision and bonus payments are all associated with higher skills use. Interestingly, the association with training is strongest with problem solving, reading and writing on the job, while the least training goes to workers using ICT skills intensively. Another interesting pattern is that workers who make heavy use of problem solving, ICT and numeracy skills are particularly likely to be offered flexible working hours. Country-specific results follow similar patterns.

Figure 2.9. **Skills use at work and High-Performance Work Practices**

Average skills use at work, by HPWP intensity[a, b]



a) Unweighted cross-country averages are reported for each figure.

b) Estimates for "Panel I Management practices" show the difference in average skills use between: workers who have flexibility in working hours and those who do not; workers who participated in training over the previous year and those who did not; workers who receive an annual bonus and those who do not.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384607

To get a sense of how widespread HPWP are across OECD countries and to simplify regression analysis, a sum scale aggregating the individual HPWP items is constructed.[16] As shown in Figure 2.10, countries vary in the intensity of HPWP at work. The figure shows the intensity of HPWP (Panel A) as well as the prevalence of its subcomponents: work organisation factors (Panel B) and management practices (Panel C). Two measures of the overall prevalence of HPWP are shown in the figure: the average score and the share of jobs applying HPWP at least once a week. The two measures rank countries very similarly, with HPWP being most frequent in several Nordic countries and least frequent in Greece, Italy, Korea, the Slovak Republic and Turkey. Very similar rankings are observed for work organisation factors and for the prevalence of training and flexible working hours. On the other hand, the cross-country distribution of the prevalence of bonuses follows a very different pattern, with bonuses being widespread in Austria, Belgium (Flanders) and the Netherlands and least common in Australia, Northern Ireland and Norway.[17] Figure 2.11 confirms these patterns by showing the full distribution of HPWP across jobs for six selected countries.

Looking at the distribution of HPWP scores across firm characteristics reveals some interesting patterns (see also Lorenz, 2016). As Figure 2.12 indicates, firm size shows a slight U shape: HPWP is most widespread among jobs in large firms, but micro (1-10 employees) firms are more likely to apply these practices than small, mid-size establishments with 11-50 employees. The use of HPWP in small firms may be a deliberate choice for small start-ups in the high-tech sector (see right-hand panel of Figure 2.12, focusing on the Computer Programming sector) or a necessity in more traditional sectors as workers in small firms need to keep flexible in what tasks they carry out as well as how and when they do so (see also White and Bryson, 2016). The U shape is more pronounced when focusing on work organisation only and excluding management practices. This is not surprising as small firms are less likely to have the financial means to set up performance-pay systems or provide formal work-related training.

Patterns by industry, occupation, contract type and hours worked go largely in the expected direction:

- Across occupations, average HPWP declines with occupational status: managers, professionals and associate professionals are the most likely to see HPWP applied to their jobs. However, the decline is not monotonic and craft and agricultural workers enjoy more flexibility at work than shop and sales assistants.
- Across industries, jobs with the highest average HPWP score are found in: computer programming, consultancy and related activities; scientific research and development; programming and broadcasting activities; and information service activities. On the other hand, traditional manufacturing and service industries are among those with the lowest prevalence of HPWP: manufacture of leather and related products; services to buildings and landscape activities; postal and courier activities; and land transport and transport via pipelines.
- There is a sizeable difference in average HPWP score by hours worked, in favour of full-time jobs.
- Jobs under indefinite contracts have the highest HPWP score, while those on fixed-term contracts or on temporary agency jobs have the lowest.

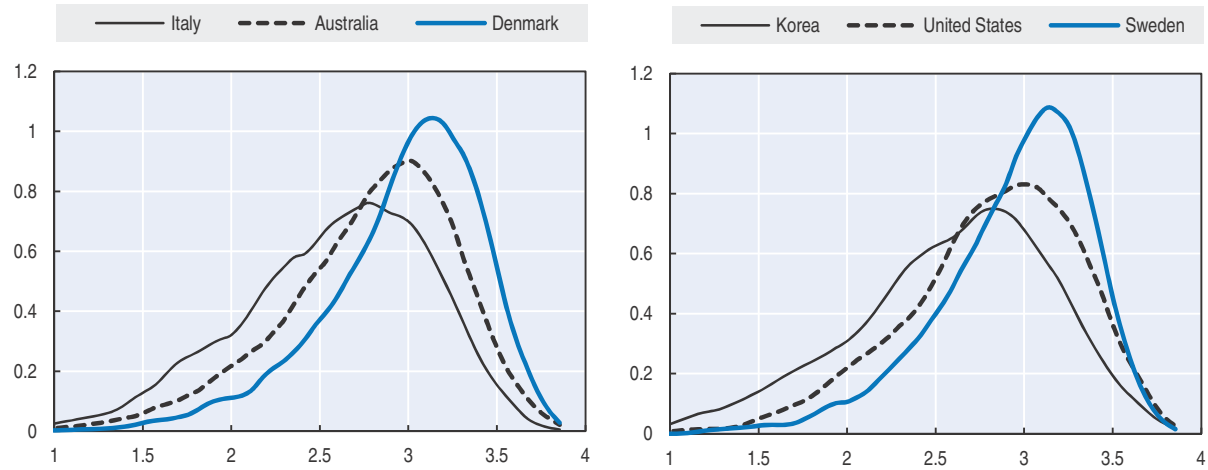
Figure 2.10. **High-Performance Work Practices**

a) Share of workers in jobs where the summary HPWP is above the top 25th percentile of the pooled distribution.
b) Average value, across jobs, of the HPWP index. The HPWP index is a sum scale of all subcomponents shown in Figure 2.9 (Panel A) or summing the scales of the work organisation subcomponents only (Panel B).
c) Share of workers receiving bonuses (bonus), having participated in training over the previous year (training) or enjoying flexibility in working hours (flexible working hours).
d) Data for Belgium corresponds to Flanders.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384612

Figure 2.11. **Distribution of High-Performance Work Practices across jobs in selected countries**

Distribution of jobs by HPWP index score[a]



a) The HPWP index is a sum scale of all subcomponents shown in Figure 2.9. Curves represent kernel densities.
Source: Survey of Adult Skills (PIAAC) 2012.

StatLink http://dx.doi.org/10.1787/888933384624

Figure 2.12. **High-Performance Work Practices and firm size**

Average HPWP score[a] by firm size and industry

a) The HPWP index is a sum scale of all subcomponents shown in Figure 2.9.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384638

High-Performance Work Practices and skills use

The simple relationships between HPWP and skills use at work presented in Figure 2.9 are robust to the inclusion of individual and job characteristics. Table 2.3 shows the change in skills use resulting from a unit change in the HPWP score, controlling for age, gender, years of education, skill proficiency, occupation, industry, firm size and country fixed effects. The coefficients are large and statistically significant. A unit change in HPWP – corresponding to one standard deviation – would result in a change in the various indices of skills use of between 0.58 points for numeracy and 0.68 points for writing and problem-solving at work – approximately half of a standard deviation of the dependent variables.[18]

Table 2.3. **Adjusted relationship between High-Performance Work Practices and skills use at work**

OLS regression coefficients including controls for individual, job and firm characteristics

	Reading at work	Writing at work	Numeracy at work	ICT at work	Problem solving at work
High-Performance Work Practices (HPWP)	0.62***	0.68***	0.58***	0.62***	0.68***
Age (Ref.: 16 to 29 years old)					
30-49	0.09***	0.05***	0.02	0.12***	0.01
50-65	0.09***	0.01	-0.10***	0.14***	-0.09***
Female (Ref.: Male)	-0.22***	-0.11***	-0.08***	-0.07***	-0.16***
Proficiency					
Literacy	0.05***	0.16***			
Numeracy			0.29***		
Problem solving in technology-rich environments				0.41***	0.08***
Years of education	0.06***	0.05***	0.04***	0.06***	0.03***
Contract type (Ref.: Indefinite)					
Fixed term contract	0.05***	-0.02	-0.05**	-0.06***	0.00
Temporary employment agency contract	-0.09**	-0.13**	-0.16***	-0.11*	-0.08
Apprenticeship or other training scheme	0.27***	0.13**	0.13**	-0.07	0.10
No contract	-0.06***	-0.09***	-0.02	-0.11***	-0.03
Part-time (Ref.: Full-time)	-0.25***	-0.40***	-0.30***	-0.33***	-0.41***
Occupation fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	2.22***	2.24***	1.95***	1.09***	2.52***
Number of observations	119 930	119 927	119 926	88 563	88 478

Note: Estimates from OLS regression models with each skills use as the dependent variable. Italy, France and Spain are excluded from the regressions on the use of ICT and problem solving at work because they did not administer the problem solving in technology-rich environments module in the Survey of Adult Skills. Including them, by using literacy or numeracy scores as controls for proficiency, does not change the results. Occupation and industry fixed effects included as 1-digit ISCO and ISIC Rev. 4 codes, respectively. ***, **, * statistically significant at 1%, 5% and 10% levels respectively.
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384999

The specific role played by management practices within HPWP

As mentioned above, HPWP includes both work organisation factors and management practices and these two components may affect skills use through different channels. More specifically, management practices can be seen as incentive mechanisms that employers use to encourage skill deployment at work (Frey and Jegen, 2000). This is the case for some kinds of annual bonus payments, the participation in training and the flexibility of working hours. For instance, the literature argues that investments in employee training increase the capacity of employees to develop flexibility and versatility in their skills while variable pay systems provide incentives for employees to invest in their skills and to contribute their ideas for improving product quality and productivity (Osterman, 1994). These mechanisms are often labelled in the literature as external motivation factors, to contrast them to internal motivation factors for the deployment of skills at work (Bénabou and Tirole, 2003). A theoretical model behind these incentive mechanisms is presented in online Annex 2.A1 while a non-technical summary can be found in Box 2.4 where the possible direct (positive) and indirect (positive and negative) effects of incentives on skill deployment are outlined.

The overall relationship between management practices and skills use at work remains an empirical issue (see Granados Zambrano and Quintini, 2016 for further details). While Figure 2.9 suggests that, on balance, positive effects may prevail, other factors may

Box 2.4. **Deploying skills at work: The role of internal and external motivation**

Under the incentive framework developed by Frey and Jegen (2000), the effort exerted by individuals in most of their daily life activities, and specifically at work, is affected by external incentives as well as by the individual's personal motivation. Applied to skills use, external incentives would be designed to be "positive reinforcements" for the employee receiving them, i.e. to get a higher level of skill deployment (or "use") than without the external intervention.

However, these interventions could have both positive and negative indirect effects:

- On the positive side, incentives may affect the internal motivation of individuals with direct implications on performance. For instance, if the external incentive further stimulates personal motivation, the final skill deployment could be even higher than the pure effect of the incentive.
- On the other hand, the external intervention could also damage the motivation of individuals reducing performance. For example, an external intervention (e.g. a training offer) might be interpreted as a criticism of the employee's performance. Furthermore, if the external incentive is public information, it could also generate a negative externality on total performance because of the potential impact on the motivation of individuals not subject to the treatment. If "not being eligible" for the incentive damages motivation, overall skill deployment could be negatively affected.

The nature of the incentive mechanisms used by employers may also influence the balance between positive and negative effects:

- *Annual bonus payments:* in general, the entitlement and amount of the payment are private information and therefore, only the individuals getting the incentive payment should experience (or not) improvement in their skills use at work, with or without the reinforcement effect on innate motivation.
- *Training activities:* these are generally public information. Therefore, there is a potential effect on skills use through internal motivation both for individuals who receive training and for those who do not. The PIAAC data allow identifying individuals who are required by their employer to participate in training activities vis-à-vis those who freely participate in training, with potentially different effects on personal motivation.
- *Flexible working hours:* this is also observable by peers. As a result, this practice could negatively affect the internal motivation of individuals with rigid working-time schedules.

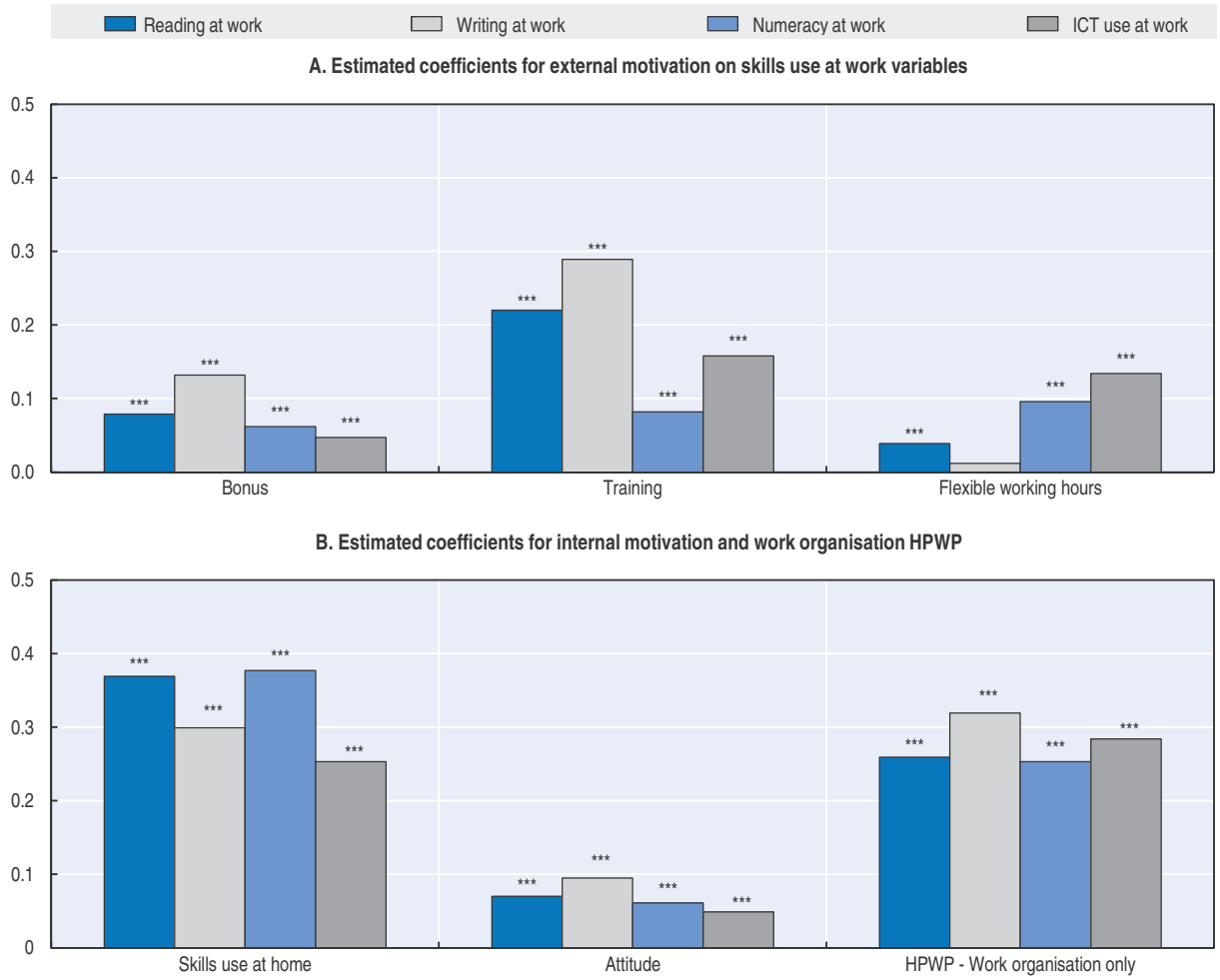
For all of these reasons, the actual overall effect of incentive mechanisms on skill deployment at work is largely an empirical issue.

drive the positive correlations shown. For instance, workers vary in their innate motivation and attitudes towards skill deployment and this may confound the relationship between external motivation mechanisms and skills use.[19] Although these innate motivation and attitudes are not directly measured in PIAAC, the use of skills in everyday life could be seen as a proxy of internal motivation, *ceteris paribus*. Similarly, the way individuals approach learning, new ideas and difficult problems[20] can be used to gauge workers' attitudes towards skills use at work.

Figure 2.13 shows how management mechanisms relate to skills use at work, after controlling for innate motivation, individual attitudes, HPWP factors relating to work organisation and a number of individual, job and firm characteristics.[21] The association with skills use is strongest for participation in training and writing, reading and ICT use at

Figure 2.13. **Skills use at work: Singling out the role of external motivation factors**

OLS regression coefficients of skills use on external and internal motivation factors, attitudes and other HPWP[a]



a) Estimates from OLS regression models with each skills use as the dependent variable. Models include controls for age group, years of education, skills proficiency, occupation, hours worked, contract type, firm size and 1-digit ISIC Rev. 4 industry and country fixed effects. Models control for individuals' skills proficiency (literacy scores for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT). The use of problem solving at work is excluded from this analysis because the Survey of Adult Skills does not measure the use of problem solving in everyday life.

*** statistically significant at 1% level.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

StatLink http://dx.doi.org/10.1787/888933384641

work.[22] Flexible working hours also have a sizeable relationship with ICT use at work as do bonus payments with writing at work. Attitudes towards learning play a smaller role in the deployment of skills at work than internal motivation mechanisms – measured as the use of skill in private life – and the remaining HPWPs.

In a regression analysis it is not possible to compare the magnitude of the coefficients on internal motivation vis-à-vis external motivation because the variables are expressed in different metrics. However, variance decomposition of the kind shown in Figure 2.1 suggests that innate motivation plays a bigger role than external motivation when it comes to deploying skills at work. Nevertheless, external motivation factors explain about 5% of the variance in the use of reading and writing skills at work, while work organisation factors explain approximately twice as much.

4. External determinants of skills use at work

The degree to which skills are used can also be affected by factors external to the firm. Although analysing all the possible determinants of skills use is beyond the scope of this chapter, two aspects are looked at in detail in this section: the extent of offshoring and labour market institutional settings. Offshoring is, along with technological change, ageing and other structural trends, shifting the occupational structure of the economy and the skill requirements of jobs, thereby meriting attention to its influence on skills use as a driver of changing skill requirements. Labour market institutions are one of the direct policy levers available to countries to enhance skills use, thereby also meriting analysis to identify potential policy measures to enhance skills use.

Offshoring and skill requirements

Global production networks – and the resulting Global Value Chains (GVCs) – can affect skill requirements through the offshoring of specific stages of the production process. In this context, skill requirements depend on the production specialisation of the industry in the country in which the firm operates[23] – notably, what value is added by each country/industry in the production of goods and services that are consumed worldwide.

In the task-based framework adopted in this chapter, workers of a given skill level can perform a variety of tasks and it is this set of tasks – and the intensity with which they are performed – that is likely to change as a result of offshoring (Acemoglu and Autor, 2010). Industries primarily offshoring low-skilled phases of production can be thought as concentrating on activities such as product design and marketing requiring higher-order skills, such as complex problem solving, writing and numeracy, rather than on routine manufacturing tasks requiring physical and fine-motor skills. By way of example, industries in which the actual physical production is offshored to countries with low labour costs (e.g. the textile industry in Italy and France), will focus on pre-production (e.g. fashion design) and post-production (e.g. labelling, marketing, etc.) tasks implying a very different use of skills – both in terms of skill type and frequency – than industries retaining much of the actual production phase in the home country. However, offshoring can also be structured so as to exploit production complementarities across firms in countries where labour costs are similar, in which case high-skill tasks may also be affected with less clear-cut effects on overall skill requirements.

One way or another, offshoring can be expected to affect which skills are used in the workplace, their frequency and/or their level of complexity. The outcome of this process has important policy implications. On the one hand, there will be a need to protect workers who are displaced or left behind by the offshoring process. On the other hand, education and training systems will need to respond to the changes in skill requirements.

Measurement and trends

This chapter draws on the joint *OECD-WTO Trade in Value-Added* (TiVA) database which assesses the value added by each country in the production of goods and services that are consumed worldwide (for more details, see OECD-WTO, 2012). For the purpose of this chapter, the intensity of offshoring is measured as imports of intermediate products divided by total value added. In other words, this is the share of intermediate imports that are used, directly or indirectly, in producing goods and services as a per cent of total value added generated in a country. The unit of observation is an industry in a given country.

As mentioned above, the overall effect of offshoring on skill requirements may hide off-setting effects depending on the types of tasks being offshored. While information on the latter is not available, the types of intermediates being imported provide some indication. Imported intermediates from low-technology processes (e.g. assembly work), which require low-skilled workers, might provide an indication of the offshoring of lower skilled tasks. By contrast, imported intermediates from high-technology manufactures (e.g. pharmaceuticals) might be an indication of high skilled tasks being offshored. To distinguish low-technology and high-technology manufacturers, the approach outlined in Shepherd and Stone (2013) is used,[24] although the industry classifications and respective levels of disaggregation available in the Survey of Adult Skills and the TiVA database somewhat limit its application: only low-technology manufacturers and business services can be clearly identified, along with a small subset of high-technology manufacturers – the remaining high-technology manufactures are lumped together with other manufacturing industries for which a clear classification is not possible.[25, 26]

Figure 2.14 reports offshoring activity by country as well as the breakdown of total intermediate imports by low and high technology manufacturers and business services. Based on these data, offshoring is most intensive in Ireland and some Eastern European countries and least intensive in Australia, Japan and the United States. Although the breakdown is imperfect, low-technology manufacturers represent only a small part of total offshoring, while business services are its major component.

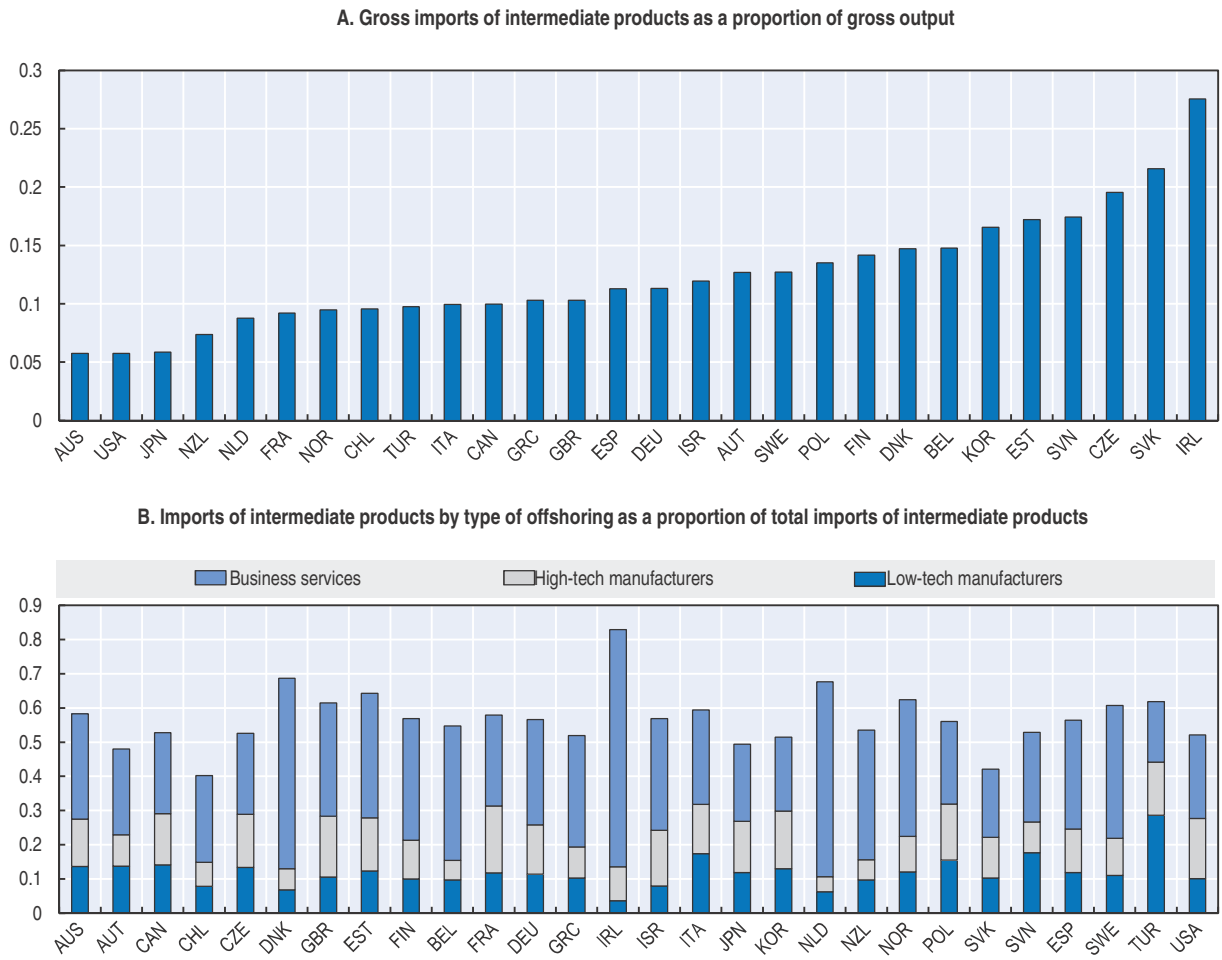
Offshoring and skills use

The relationship between the intensity of offshoring and skills use at work is explored in a regression analysis where the use of information-processing skills is related to the intensity of offshoring and the sign and strength of this relationship is allowed to vary between low-technology, high-technology and business-services offshoring.

When the intensity of offshoring is not differentiated by the nature of the offshoring activities, the results are not consistent with the traditional job polarisation hypothesis that implies an increase in the employment share of high-skilled occupations, a decline in that of mid-level occupations and a modest rise in that of low-skilled occupations (Acemoglu and Autor, 2010).[27] As reported in Table 2.4, the intensity of offshoring is negatively related to the use of reading, writing, numeracy and ICT at work, while it is positively related to problem solving and the use of physical skills at work. While the rise in the frequency of abstract tasks – such as facing hard problems requiring more than 30 minutes to solve – but also that of tasks requiring physical skills would lend support to the polarisation hypothesis, this is not the case for the fall in reading, writing, numeracy and ICT use at work or the fall in the adoption of HPWP. Overall, this suggests that a significant share of offshoring may not fit the common story about which types of jobs are offshored.

The bottom panel of Table 2.4 sheds some light on how different types of offshoring may relate differently to skills use. As argued above, the relationship between offshoring and skills use at work is likely to depend on the nature of offshoring itself. To disentangle these differences, the intensity of offshoring is interacted with sector-specific dummies for low-technology manufacturing, service-sector offshoring and a residual category: the omitted sector dummy represents high-technology offshoring. To interpret the results, it is important to recall that low-technology offshoring has been interpreted in the literature as indicating that low-skilled tasks are being offshored while the opposite is true for high-technology offshoring.[28]

Figure 2.14. **Offshoring activity, by type of offshoring**[a]



a) Low technology manufactures are defined as sectors covering ISIC Rev. 4 Codes 12-18, 58, 31-33 (equivalent to ISIC Rev. 3 Codes 15-22 and 36-37); Business services include ISIC Rev. 4 Codes 45-47, 95, 49-52, 79, 53, 61, 64-66, 68, 77, 62-63, 69-75, 78, 80-82 (equivalent to ISIC Rev. 3 Codes 50-74); and High-technology manufactures include ISIC Rev. 4 Codes 20-21, 26, 30 (equivalent to ISIC Rev. 3 Codes 24, 30, 32-33, 35).

Source: OECD Trade in Value Added Database (2015).

StatLink http://dx.doi.org/10.1787/888933384658

With this interpretation in mind, the results for low-technology offshoring go in a direction consistent with the job polarisation hypothesis (Acemoglu and Autor, 2010): compared to high-technology offshoring, low-technology offshoring appears to have a positive relationship with skills use at work. This same relationship holds and is even stronger and more often statistically significant for services offshoring, with the exception of the use of physical skills at work. When different types of offshoring are accounted for in the analysis, the link between HPWP and offshoring turns positive, although not statistically significant, for the low-technology sector: the offshoring of low-technology tasks seems to have a positive relationship with HPWP in the offshoring country. Given results shown above, this positive link may further reinforce the use of high-level skills in the workplace.

The results presented in Table 2.4 are clearly tentative and highly speculative.[29] Given the state of disaggregation level of available data on offshoring in TiVA and the accent on the frequency of skills use in the Survey of Adult Skills, going beyond these tentative

Table 2.4. **Offshoring and skills use at work**

OLS regression coefficients

	Reading	Writing	Numeracy	ICT	Problem solving	High performance work practices	Physical
	A. Intensity of offshoring activity						
Offshoring	-0.051***	-0.048***	-0.049***	-0.051***	0.015***	-0.012***	0.042***
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	619	619	619	619	619	619	619
R-squared	0.79	0.81	0.68	0.79	0.69	0.72	0.82
	B. Interactions of offshoring intensity with sector dummies						
Offshoring	-0.156	-0.196	-0.022	-0.111	-0.275	-0.042	-0.763
Interaction of offshoring intensity with:							
Low-technology sector	0.313	0.077	0.109	0.163	0.586*	0.168	0.752
Service sector	0.952**	1.249**	0.344	0.869	0.824**	0.034	-0.614
Other	0.115	0.169	-0.011	0.073	0.301	0.035	0.784
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	619	619	619	619	619	619	619
R-squared	0.41	0.36	0.3	0.25	0.29	0.55	0.20

Note: Estimates from OLS regressions with the average skills use per industry within country as the dependent variable. Offshoring is measured as imports of intermediate products divided by total value added. Low technology manufactures are defined as sectors covering ISIC Rev. 4 Codes 12-18, 58, 31-33 (equivalent to ISIC REV. 3 Codes 15-22 and 36-37); Business services include ISIC Rev. 4 Codes 45-47, 95, 49-52, 79, 53, 61, 64-66, 68, 77, 62-63, 69-75, 78, 80-82 (equivalent to ISIC Rev. 3 Codes 50-74); and High-technology manufactures include ISIC Rev. 4 Codes 20-21, 26, 30 (equivalent to ISIC Rev. 3 Codes 24, 30, 32-33, 35). Trade in Value Added variables for England and Northern Ireland correspond to the United Kingdom. Trade in Value Added variables for Flanders correspond to Belgium. ***, **, * statistically significant at 1%, 5% and 10% levels respectively.

Source: Survey of Adult Skills (PIAAC) 2012, 2015; and *OECD Trade in Value Added Database* (2015).

StatLink *http://dx.doi.org/10.1787/888933385007*

findings is not possible. As a result, while the analysis in this chapter provides some direction for skill-development policies, particularly for displaced workers (see the final section), it also highlights the areas where existing data should be improved to provide more robust guidance to policy making.

How labour market institutions affect skills use

Labour market institutions may affect the way skills are used by employers and may represent potential policy levers for governments wishing to enhance skills use. For example, stringent employment protection legislation (EPL) on permanent workers reduces labour market flexibility and the efficient allocation of workers to jobs, which likely increases mismatch – one possible cause of poor skills utilisation (Adalet McGowan and Andrews, 2015; Box 2.2 in the chapter). However, stringent EPL may also increase labour costs and average tenure, which could encourage employers to better utilise the skills of their workforce – especially, if the use of temporary contracts is restricted by tight rules on their use and renewal. Higher minimum wages and tax wedges could encourage improved skills use, since one possible channel of adjustment for firms coping with higher wage costs is to use the skills of their existing staff more efficiently (Hirsch, Kaufman and Zelenska, 2015). Finally, policies promoting good industrial relations and collective bargaining could also help improve skills use. For instance, countries that have developed

good industrial relations institutions and practices tend to find it easier to implement the high-performance working practices that were found to be an important means of improving skills use at work earlier in this chapter. These findings and conjectures suggest that not only are labour market institutions likely to affect skills use directly but also to influence how effectively employers utilise the skills possessed by their workforce – i.e. to influence the relationship between skill proficiency and use.

To test this, Table 2.5 (Panel A) presents results from a regression analysis of skills use as a function of skill proficiency, where the latter is allowed to interact with labour and product market institutions.[30] In two further steps, individual and job characteristics likely to affect skills use are also included in the regression (Panel B) along with HPWP (Panel C). The estimated results go in the expected direction, although their statistical strength is reduced as other controls are added. Overall, given the limitations entailed in assessing the link between institutional settings and skills use based on one cross section of individual data, they should be taken as just suggestive of the actual underlying relationships.

Table 2.5. **Labour market institutions and skills use at work**[a]

OLS regressions coefficients: Interaction of proficiency score with selected institutional variables[b, c, d]

	Reading	Writing	Numeracy	ICT	Problem solving
	A. With country fixed effects				
Proficiency score[e]	-0.47**	-0.24	0.87***	-0.05	0.58*
Interaction of proficiency score with:					
Tax wedge	0.02***	0.02***	0.01**	0.04***	0.02***
Minimun to median wage ratio	1.36***	1.61***	0.33	3.12***	0.80
Minimun wage setting centralisation	0.03*	0.12***	0.06***	0.03	0.06
Employment protection legislation (permanent workers)	-0.20**	-0.52***	-0.27***	-0.54***	-0.36
Employment protection legislation (temporary workers)	0.16***	0.35***	0.19***	0.33***	0.32***
Union density	0.02***	0.04***	0.02***	0.06***	0.04***
Mandatory extension of bargaining outcomes	0.20***	0.40***	0.27***	0.50***	0.35***
Bargaining level	-0.70***	-0.98***	-0.38***	-1.63***	-1.03***
Co-ordination in wage bargaining	0.24***	0.39***	0.14***	0.48***	0.34***
Articulation of sectoral bargaining	0.25***	0.17***	0.02	0.48***	0.25**
Product market regulation	-0.04	-0.63***	-0.67***	-0.90***	-1.07***
Number of observations	76 324	76 325	76 324	55 005	54 943
	B. With job and individual characteristics and country fixed effects				
Proficiency score[e]	-0.50***	-0.04	0.50***	0.17	0.84***
Interaction of proficiency score with:					
Tax wedge	0.003	0.003	0.004	0.02***	0.01
Minimun to median wage ratio	0.28	0.07	-0.07	1.22***	-0.77
Minimun wage setting centralisation	-0.06***	0.02	0.01	0.02	0.08
Employment protection legislation (permanent workers)	0.13*	-0.17*	-0.12	-0.43***	-0.37*
Employment protection legislation (temporary workers)	-0.06	0.07	0.02	0.18**	0.27**
Union density	0.00	0.01	0.00	0.03***	0.02
Mandatory extension of bargaining outcomes	-0.05	0.11**	0.08	0.24***	0.20*
Bargaining level	-0.14	-0.27*	-0.12	-0.74***	-0.26
Co-ordination in wage bargaining	0.02	0.10**	0.04	0.28***	0.14*
Articulation of sectoral bargaining	0.19***	0.10**	0.03	0.16**	-0.04
Product market regulation	0.54***	0.05	-0.16	-0.34	-0.74**
Number of observations	74 271	74 271	74 267	53 787	53 738

Table 2.5. **Labour market institutions and skills use at work**[a] *(cont.)*

OLS regressions coefficients: Interaction of proficiency score with selected institutional variables[b, c, d]

	Reading	Writing	Numeracy	ICT	Problem solving
	C. Without HPWP, with other job and individual characteristics and country fixed effects				
Proficiency score[e]	-0.67***	-0.22	0.34*	0.32	1.00***
Interaction of proficiency score with:					
Tax wedge	0.01	0.01	0.01*	0.02***	0.01
Minimun to median wage ratio	0.61	0.44	0.29	1.08***	-0.91
Minimun wage setting centralisation	-0.04***	0.04**	0.03*	0.01	0.07
Employment protection legislation (permanent workers)	0.12	-0.18*	-0.13	-0.41***	-0.34
Employment protection legislation (temporary workers)	-0.06	0.08*	0.04	0.14*	0.23**
Union density	0.00	0.01*	0.01*	0.03***	0.02
Mandatory extension of bargaining outcomes	0.00	0.16***	0.14**	0.25***	0.21*
Bargaining level	-0.25*	-0.39**	-0.24*	-0.77***	-0.30
Co-ordination in wage bargaining	0.06	0.14***	0.08*	0.27***	0.14*
Articulation of sectoral bargaining	0.22***	0.12***	0.07*	0.22***	0.02
Product market regulation	0.47***	-0.03	-0.26*	-0.31	-0.71**
Number of observations	74 271	74 271	74 267	53 787	53 738

a) The following countries are included in the regression Belgium (Flanders), Canada, the Czech Republic, Estonia, France, Greece, Ireland, Korea, the Netherlands, New Zealand, Poland, the Slovak Republic, Slovenia, Spain and the United Kingdom (England and Northern Ireland). Other OECD countries participating in the Survey of Adult Skills are excluded because of missing information on one or more institutional variables. Institutional variables for England and Northern Ireland correspond to the United Kingdom. Institutional variables for Flanders correspond to Belgium.

b) Estimates from OLS regression models with each skills use as the dependent variable. All institutional variables enter the model simultaneously (entering institutional variables individually yields similar results). Models control for individuals' skills proficiency (literacy scores for reading and writing use at work, numeracy scores for numeracy use at work and problem solving in technology-rich environment scores for ICT and problem-solving use at work), Models in Panel A include country fixed effects. Models in Panel B add controls for HPWP, age, gender, years of education, contract type, hours worked, occupation, industry and firm size in addition to those in Panel A. Models in Panel C exclude HPWP.

c) Institutional variables included in the regression models are defined as follows: the tax wedge for a single person, earning 100% of the average wage, with no children; the ratio of the statutory minimum wage to median wage; minimum wage setting centralisation is an index ranging from 0 for no statutory minimum wage, no sectoral or national agreements to 8 for those set by the central government without a fixed rule; the employment protection legislation applying to workers on permanent contracts is the OECD strictness index; the rules regulating the use of fixed-term contracts and temporary work agency contracts is the OECD strictness index; union density is net union membership as a proportion of wage and salary employment; the existence of mandatory extensions of collective agreements by public law to non-organised firms in measured by an index ranging from 0 for no extension to 3 for virtually automatic and general extension; the bargaining level is measured by an index ranging from 1 for bargaining at the firm or plant level to 5 for government-level bargaining; the co-ordination of wage setting is measured by an index ranging from 1 for fragmented wage bargaining at plants and firms to 5 for highly co-ordinated and centralised wage bargaining with or without government intervention; the articulation of sectoral bargaining on pay is measured by an index ranging from 0 for no or limited sectoral bargaining on pay to 5 for no additional bargaining on pay; and the regulation of product markets is measured by the OECD index.

d) Values for institutional variables correspond to the year of countries' participation in PIAAC (2012 for Round-1 countries, 2015 for Round-2 countries) or latest year available.

e) Skills proficiency corresponds to: literacy for models predicting the use of reading and writing at work; numeracy for the use of numeracy at work; and problem solving in technology-rich environments for the use of problem solving and ICT at work.

***, **, * statistically significant at 1%, 5% and 10% levels respectively.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

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Higher labour costs – such as those due to a higher minimum wage or to a higher wedge between the net wage received by workers and the gross wage cost to the firm – provide an incentive to employers to better exploit the skills possessed by their workforce (i.e. the interaction between these variables and skill proficiency is positive). In the case of minimum wages, this appears to be all the more the case if minimum wages are set at the national (federal) level, as indicated by the positive coefficient on the index of centralisation in minimum wage setting.

The strictness of the rules governing the hiring and firing (EPL) of permanent workers is associated with a weaker link between skill proficiency and skills use at work. This is in line with the expectation that stringent EPL reduces mobility and hence increases the likelihood of skills mismatch. This effect dominates the potentially positive relationship due to the stronger incentives for using available skills given the higher cost of dismissals in cases of more stringent EPL. However, this cost/tenure aspect appears to dominate when considering the difficulty of using temporary contracts, which is associated with a stronger link between skill proficiency and skills use. When the overall strictness of EPL is considered (the weighted sum of the two indicators discussed above – not shown here),[31] it is found to relate positively to the link between skill proficiency and use at work. The percentage difference between the two indicators of employment regulation (the difference between the indicator of hiring and firing difficulties for permanent employees and the indicator of strictness of use of temporary contracts divided by the latter – not shown; see OECD, 2004), representing a measure of duality in labour market regulation, is associated with lower skills use when no individual controls are included but this relationship disappears when individual controls (including contract type) are added. This could be due to the fact that the prevalence of temporary contracts captures the relationship between labour market duality and skills use reducing the relevance of the duality in regulation that causes it.

Unionisation has a positive interaction and the same is true for other aspects of the collective bargaining process: bargaining that is co-ordinated, conducted at the level of the firm/plant and extended to non-unionised firms is associated with a stronger link between skills proficiency and use. This positive association possibly comes from the fact that unionisation and collective bargaining more generally facilitate a better deployment of skills in the workplace through its positive effect on workers' involvement in the firms' management. In addition, as argued for EPL, the minimum wage and the tax wedge, unionisation and collective bargaining may also strengthen the association between skill proficiency and use due to their impact in raising labour costs.

The strictness of product market regulation is negatively related to the link between skills proficiency and use. This may be due to the potential barriers this type of regulation poses for firms' growth, innovation and competitiveness more generally, including their propensity to develop HPWP.

Finally, it is worth underlying once more that the inclusion of individual and job controls as well controls for HPWP tend to reduce the strength and statistical significance of the relationships outlined above, although the sign is generally preserved. In some cases, this need not invalidate the results but rather suggest that labour market institutions may have an additional indirect effect on skills use by fostering (or not) the adoption of HPWP or by affecting the prevalence of different contract types. Interestingly, the relationship between institutional settings and the use of ICT at work – as measured in the specifications reported in Table 2.5 – appears to be robust to the inclusion of other controls.

5. Lessons for policy

The analysis presented above shows how several factors, internal and external to firms, can influence skills requirements and use in the workplace. This section draws out the main implications of those relationships for policy. One of the most important findings of the chapter for assessing policy choices is that the way work is organised and which

management practices are adopted are strongly associated with the use of information-processing skills at work. The chapter also presents more tentative evidence that offshoring may influence the skills requirements, with the direction of that effect depending on the nature of the tasks being offshored. Similarly, labour market institutional arrangements appear to affect the relationship between skill proficiency and skills use at work.

All the factors listed above can be influenced by public policy although in some cases this requires initiatives that influence firms' business strategies and internal organisation. This is precisely the reason why skills policies have tended to focus on the supply-side: it is easier for governments to affect the supply of skills through education and training policies than to induce employers to make better use of the skills of their workforce. In particular, the government's role in enhancing skills use is likely to be more indirect. The disconnect between the two types of policies is also a result of the fact that one government department is likely to be responsible for developing skills, while another is responsible for helping firms to better use the skills of their workforce (Keep, Mayhew and Payne, 2006). This does not mean that skills use at work should be ignored by policymakers, only that a different policy approach will generally be required.

The way work is organised within the firm: How can policy affect it?

Many countries have taken policy initiatives to promote better skills utilisation through workplace innovation. In a few cases, these programmes make a clear reference to HPWP, but in most instances they refer more generally to changes in organisational practices which overlap significantly with the components of HPWP.[32] The background to most interventions is the recognition that many firms, if offered expert advice and encouragement to adopt more effective managerial practices, can better utilise existing skills and reap the productivity gains.

Many of these initiatives have focused on *raising awareness* of the benefits of better skills use, and presenting HPWP as a win-win option for both employers and workers so that possible resistance can be overcome. Countries have also focused on *disseminating good practice* and sharing expert advice. Critical in this respect is the identification of *role models*. Because it is unrealistic to expect government to help every firm to improve their work organisation and job design, initiatives have often supported the development of HPWP in a limited number of businesses and then used these for *demonstration effects*. As Stone (2011) points out, a one-size-fits-all approach is unlikely to work, which underlines the importance of developing *supportive expertise* and creating opportunities for *knowledge transfer*. At the same time, countries can develop *diagnostic tools* to help companies identify bottlenecks and measures that will promote a better use of the skills of their workforce. When resources are scarce, it is also important to make sure that interventions are well *targeted*. In particular, because smaller employers are less likely to implement these practices and may find it more difficult/costly to adopt them, it is important to target interventions on small and medium enterprises (SMEs) with growth potential. *Tax policy* can be leveraged to incentivise and support firms in adopting HPWP, especially considering that some firms may not have the incentive or financial capacity to promote workplace innovation. To a large extent, a firm's ability to implement and benefit from HPWP will depend on the quality of its managers to implement changes in work practices in a productive way. Low management skills can be a bottleneck to workplace innovation. Policies that seek to promote the development of HPWP may need to be complemented with *management skill development* programmes.

Box 2.5 presents some examples of good practice in this policy area, along the lines highlighted above.

Box 2.5. **Policies to encourage workplace innovation: Examples of good practice**

The **Finnish** Workplace Development Programme ran as a national government programme from 1996 to 2003 (TYKE programme) and continued from 2004 until 2010 with expanded resources (TYKES programme). The programme's introduction was motivated by the belief that sluggish productivity growth in Finland and the ensuing weakened competitiveness of firms in many traditional industries were due to inadequate utilisation of skills in the workplace. The programme aimed to disseminate new work, organisational and management practices, models and tools, and to develop a "learning organisation" culture in Finland. The programme initially focused on individual enterprises, but *networks* played an increasing role and there was also a strong emphasis on disseminating good practice and mutual learning. A special focus in the programme, which supported more than 1 800 development projects in Finnish workplaces between 1996 and 2010, was on innovative solutions to work-related and organisational issues. In 2008, the programme was transferred to Tekes (the Finnish Funding Agency for Innovation) and the promotion of workplace innovation was given a permanent position in the agency's service production to companies. Today, Tekes funds the development of work organisation through a new programme entitled "Liideri – Business, Productivity and Joy at Work". Qualitative evaluations suggest that the TYKE and TYKES programmes were effective in promoting workplace innovation and productivity (Oosi et al., 2010; Arnkil, 2003).

In **Australia**, policy engagement with HPWP has been driven by a perceived need to increase innovation and productivity. A number of Australian initiatives have sought to promote *best practice* in this area, dating from the Best Practice Demonstration Programme in the early 1990s to the more recent Partners at Work Grants Programme, currently operated in Victoria (Stone, 2011; Wiesner, McDonald and Banham, 2007). This programme offers competitive grants to assist workplace changes that benefit all stakeholders, and is designed to encourage the development of co-operative practices in the workplace. It provides funding to support the appointment of consultants to work with organisations and for relevant training investments. There is evidence to show that some targeted firms have successfully adopted HPWP and that these firms have experienced improved performance. On the other hand, clear evidence that this has underpinned more widespread adoption throughout the business population is lacking.

Various initiatives take place in **the Netherlands** aimed to increase the awareness and managerial applicability of High Performance Workplace Practices led by the government, companies, and knowledge institutes. For example, in the Dutch province of Noord-Brabant, the regional government collaborates with various stakeholders to stimulate HPWP and to increase the cohesion among various initiatives in that area. Additionally, the regional government has introduced subsidies for HPWP. Companies in that region can also win a Social Innovation Award as recognition for a promising HPWP initiative. According to a large scale survey by the research institute INSCOPE – Research for Innovation from the Erasmus University Rotterdam – the region of Noord-Brabant is one of the leading regions in the Netherlands on various types of innovation. Another interesting initiative is the Expedition Social Innovation, funded by the Dutch government, in which a group of entrepreneurs and managers meet and discuss what HPWP can mean for their organisation and how they can introduce them into the organisation.

The pursuit of workplace innovation in **New Zealand** has centered on improving its productivity performance. In fact, the country has singled out the poor utilisation of skills in the workplace as a key policy issue. In this context, the High-Performance Working Initiative (HPWI) provides business coaching for small- to medium-sized businesses to help streamline work practices to improve performance while also increasing employee engagement and satisfaction. Business improvement consultants work with firms to improve their productivity. Funding is provided by the government agency Callaghan Innovation, with the firm providing half the funding also. The HPWI is part of a wider suite of services provided by Callaghan Innovation to help businesses improve their performance through lifting their innovation skills.

Box 2.5. **Policies to encourage workplace innovation: Examples of good practice** *(cont.)*

Sweden is often cited as having a highly developed and progressive system of work organisation which underpins high levels of innovation and productivity (Isaksson, 2008). Organisational models built on trust, teams and empowerment – embodying the principles of HPWP – are widespread. In addition, policy in the country has been concerned with promoting progressive forms of work organisation for several decades, although without specific reference to HPWP. One notable feature of the Swedish system is that *employee involvement* in the management of businesses is *mandated by legislation*. Sweden's co-determination laws require employers to negotiate with unions before making major changes to business strategy or practice. However, current initiatives are taking a more direct and explicit stance at promoting HPWP. Vinnova's – Sweden's Innovation Agency – Organising Work for Innovation and Growth programme sponsors a range of projects intended to promote and support the adoption of what are essentially HPWP.

In some countries, the adoption of working practices that promote better skills use is facilitated by the existence of a strong dialogue between workers and employers – and the latter can be influenced by government action. For example, Stone (2011) argues that legislation that mandates work councils and co-determination could encourage innovation in the workplace. In Sweden, for example, employee involvement in the management of businesses is mandated by legislation: Sweden's co-determination laws require employers to negotiate with unions at the workplace before making changes to business strategy or practice. HPWP are both widespread and largely unquestioned in Sweden. Even in countries where there is no (or a much more limited) legislative requirement for employers to involve unions in management decisions, there are many examples of collaboration between employers and unions on developing and applying vocational skills. For instance, Unionlearn is the United Kingdom's Trade Union Confederation's education, learning and skills arm. It trains workers and engages with employers to develop training plans and has successfully trained more than 30 000 representatives who have, in turn, provided training to more than 220 000 over the past 12 years. Evaluations have pointed to an increased awareness and disposition towards training for both employers and workers (Unionlearn, 2016).

More generally, countries have realised that initiatives to promote a better use of skills require buy-in from all stakeholders and therefore a "holistic approach" (Wright and Sissons, 2012). This underlines the importance of activities at a national and industry-wide level which involve employers, employees, training providers, universities, sector skills councils, unions, and the state.

Does the impact of offshoring on skill requirements require a policy response?

The chapter's findings on the impact of offshoring on skills use, if confirmed by future research, could justify policy actions that extend beyond labour market and education policy to also cover trade- and industry-related initiatives. This is particularly the case for interventions aimed at affecting the intensity and nature of offshoring. For example, findings that low-technology offshoring is positively related to the use of information-processing skills at work, while high-technology offshoring can penalise the use of high-level skills in the country, may lead policy makers to take measures to encourage specialisation in the initial and final phases of production, including product development and innovation, design and marketing. This could allow countries to gain from the

offshoring of routine and relatively low-skilled work to developing countries with low labour costs, by building a competitive advantage in the high value-added initial and final phases of production.

Understanding the link between offshoring and skill requirements is also crucial to ensure that the supply of skills is in line with existing and future demand. For example, it is important that workers whose jobs/tasks are easily offshorable are offered re-training and upskilling opportunities and receive the financial support they require in the event of redundancy.

In light of the tentative evidence in this chapter that low-technology offshoring is positively related to the demand for higher-level skills, skill supply policies should focus on ensuring that graduates and adult learners possess these skills, particularly in countries where offshoring predominantly takes this form. This, in turns, calls for systems of initial education and lifelong learning that are responsive to the needs of the sectors and firms where the offshoring of low-technology tasks is more prominent or on the rise. This flexibility is not easy to achieve as incentives for education and training institutions to adapt to changes in the demand for skills are typically weak. In most countries, funding for learning programmes is still based on student counts and unrelated to post-completion outcomes and contacts between education providers and employers are usually limited (OECD, 2016b). Exceptions exist, including outside the OECD, and some example of good practices are reported in Box 2.6.

Box 2.6. **Education and training programmes that are responsive to changing labour market needs**

Sweden's Teknikcollege

The Swedish Teknikcollege is an initiative from the social partners within the manufacturing sector with the purpose to improve the quality of technology-oriented education on upper secondary and post-secondary level. The model is based on the idea that education providers from a minimum of three municipalities co-operate through explicit agreements with the objective of increasing resource efficiency and improving the quality of the educational offer at the local level. A more rational use of the available resources, which are sometimes insufficient to provide high-level vocational courses in smaller municipalities, helps meeting the needs of regional labour markets more effectively (OECD, 2016c).

The Teknikcollege initiative has a flexible design which ensures that large and smaller actors can contribute and benefit from it. Small firms, for instance, can collaborate with education providers by hosting study visits, giving lectures or providing inputs to education courses such as problems and exercises taken from real-life daily job tasks. Within this setting, employers and education providers are able to build strong links at the local level and to adjust the design of the educational offer to the fast-changing needs of the local labour market effectively.

The establishment of close co-operation with universities is an additional important requirement to create a certified Teknikcollege. The linkages with universities are important to raise the attractiveness of the Teknikcollege's educational offer and to provide students with the much needed additional incentives to enrol in VET courses. The regions and municipalities in Teknikcollege are, also, encouraged to form part of a larger national network whose aim is to promote the exchange of experiences and provide quality assurance of the different local education providers in a co-ordinated manner (OECD, 2016c).

Box 2.6. **Education and training programmes that are responsive to changing labour market needs** *(cont.)*

Mexico's entreprise development

Mexico has promoted sustainable enterprise development in the sugar and tourism industries as well as in SMEs over the past six years. The ageing workforce in the sugar industry – 40% of its workforce over the next five years will retire – is the starting point for a quality apprenticeship intervention in that sector. This initiative will focus on developing the set of skills that new workers will require, focusing on the implications of higher automation, quality management, new work organisation and new product mixes, and the combination of technical and core skills in the sector.

England's Employer Ownership of Skills pilot

The Employer Ownership pilot offers all employers in England direct access to up to GBP 250 million of public investment over two years to design and deliver their own training solutions, including apprenticeships, training courses and pre-employment opportunities (Green, 2012). The pilot is jointly overseen by UKCES, the Department for Business, Innovation and Skills and the Department for Education, and will test new employer-led delivery models. The prospectus invites employers to work with employees, trade unions, colleges and training providers, and other partners to develop proposals that establish how they will invest in skills to drive enterprise, jobs and growth within a sector, supply chain or locality.

Australia's market-based steering for the provision of VET courses

Australia uses market-based mechanisms to steer provision of a broad range of its VET programmes. There are 5 000 Registered Training Organisations (RTO) which deliver nationally recognised courses accredited within the Australian Qualifications Framework. While RTOs must apply to have permission to deliver a specific course or qualification, the funding available is a key determinant of the actual mix of provision. As funding is administered through states, there is diversity within Australia. However, in general, there is a trend towards demand-driven models (OECD, 2014b). For example, starting in 2014, Queensland moved to a fully contestable and demand-driven skills market which expanded choice for individuals and employers to select the qualifications and training providers that best meet their needs (Queensland Department of Education, 2014). Public subsidies for courses vary, with lower level qualifications (i.e. qualifications at certificate III level) and "higher priority" qualifications given higher subsidies. Priority courses are determined at the state level and include, among others, those that: i) support skills priorities identified by the Ministerial Industry Commission; and ii) are assessed as highly effective in generating outcomes for graduates, based on occupational demand and supply, projections for employment and relative earnings of qualified and unqualified persons employed in relevant occupations.

India Institute/Enterprise Flexi-MOU

Industrial Training Institutes (ITI) in India are public and private training institutions under the Ministry of Labour and Employment that form the backbone of the Indian skills training system. Operating within centrally fixed curriculum systems they have had limited flexibility to develop and deliver programmes that meet the specific needs of enterprises in their local catchment area. Under the recently introduced flexi-MOU system, ITIs are able to work with enterprises to develop customised programmes of six months to one year duration using existing national curricula as the programme core. MOUs will be signed with enterprises that guarantee to provide 80% of participants a minimum of six months employment. Delivery and assessment can take place in the institution and/or the workplace involving the ITI and enterprise staff working together to train and assess. These arrangements reflect a departure from the highly centralised system of specific schemes and curricula that operate in India. Whilst this initiative only covers those institutions administered by the Ministry of Labour, it represents an example of how training institutions are being encouraged to be more responsive to the needs of enterprises in India.

How can institutional settings help promote better skills use at work?

Two mechanisms emerge as linking labour market institutions with skills use at work. On the one hand, there appears to be a price mechanism whereby higher labour costs brought about by higher minimum wages, higher tax wedges, stricter employment protection legislation and stronger collective bargaining institutions tend to be associated with a stronger link between skill proficiency and skills use, as firms attempt to make the most of their workers' human capital. On the other hand, stronger collective bargaining arrangements also have the potential to strengthen the association between skill proficiency and skills use at work through the positive effect of workers' participation and co-determination on the adoption of HPWP in the workplace.

While there is some evidence that in countries with a more generous minimum wage and higher tax wedges, employers have stronger incentives to use better available skills, attention should be paid to the possible dis-employment effects of such policies. If increased within reasonably bounds, minimum wages may not only contribute to address in-work poverty but also promote skills use and productivity, without having negative employment effects (Dube, Lester and Reich, 2010; OECD, 2015). While stricter employment protection legislation (EPL) may be associated to skills use, any policies relating to EPL should consider the potentially negative effects on labour market segmentation (OECD, 2014a).

Strengthening workers' participation in firms' decisions on the modernisation of work organisation and management practices could be considered as a viable option to encourage a better use of skills in the workplace, highlighting the role the social partners play in skills policies. Some countries – such as Germany – mandate employee involvement in both strategic and operational decisions within the firm. In practice, workers participation is indirect in that it functions through employee representatives and formalised bodies such as works councils which are required by law. While this solution may not be easily applicable in other countries, other approaches are less prescriptive. For example, in Sweden, law requires that employers negotiate with unions at the workplace before major changes to business strategy or practice are made (see Box 2.5). Similarly, Finland requires companies to submit annual training plans to a Joint Enterprise Committee and to negotiate reasons, effects and possible alternatives with employees' representatives. Businesses with less than 30 employees are not required to set up works councils but the Workplace Innovation scheme (see Box 2.5) requires that participant organisations pursue the project's implementation collaboratively. Finally, beyond legislated co-determination practices, England's Employer Ownership pilot (see Box 2.6) encourages co-operation between employers, employees and trade unions to develop proposals that establish how they will invest in skills to drive enterprise growth.

Conclusions

This chapter analyses the extent to which skills are used in the workplace as measured in the OECD Survey of Adults Skills. It highlights the importance of skills use for individual earnings and job satisfaction as well as, at the aggregate level, for productivity growth. The chapter also explores some of its key determinants and reviews different policy measures to improve it. In doing so, it also identifies some knowledge gaps and suggests directions for further research.

Findings in the chapter suggest that the use of information-processing skills at work is important for individuals and countries, beyond the question of skill proficiency. High-Performance Work Practices (HPWP), including work organisation and management practices, are found to be positively linked to skills use. More specifically, incentive systems that employers can put in place to make better use of the skills of their workforce – bonus payments, training opportunities and flexible working hours – are shown to positively influence skills use over and above the influence of innate and external motivation mechanisms.

The chapter also suggests that the relationship between offshoring and skills use depends on the nature of offshoring itself. Low-technology offshoring is positively related to the use of information-processing skills at work, a finding that is consistent with the job polarisation hypothesis. By contrasts, high-technology offshoring is likely to penalise skills use in the country. Moreover, low-technology offshoring is related to the adoption of HPWP, potentially reinforcing further the use of high-level skills in the workplace.

Finally, a number of labour market institutions are found to influence the link between skills proficiency and skills use at work, including minimum wages, the tax wedge, employment protection legislation and the characteristics of the collective bargaining system. These factors could influence the extent to which employers make productive use of the skills of their workforce through their effect on labour costs: higher labour costs would encourage employers to use existing skills more fully, although higher labour costs may also have a negative effect on overall employment. Strong collective bargaining institutions can play a crucial role by encouraging workers participation in their firms' decisions, thus facilitating employees' buy-in to changes in work organisation and management practices that would improve skills use.

In light of these results, the chapter presents examples of good policy practices to: i) encourage the adoption of HPWP at work; ii) ensure that education and training systems are responsive to skill requirements at work, notably in sectors and firms affected by low-technology offshoring; and iii) strengthen the co-operation of employers, employees and unions in the adoption of business and production practices that promote skills use.

Several knowledge gaps emerge from the analysis conducted in the chapter, many of which will be addressed by the OECD in the future. First, the measurement of skills use in the Survey of Adult Skills could be improved. In this context, OECD is currently reviewing the structure and content of the survey ahead of the second wave of data collection in 2022 and is considering the inclusion of measures of task complexity, job crafting and job design, as well as additional information on work organisation. An employer survey that would run in parallel with, and possibly be linked to, PIAAC is also under consideration. If developed, this survey would provide crucial insights into employers' views of existing and future skill requirements. Second, the OECD is about to embark on a study of incentive mechanisms for education and training systems to adapt to changing skill needs. The OECD will also explore the relationship between skills use and other drivers of changing skill requirements (e.g. technological change). Finally, a study of collective bargaining is planned for next year's edition of this publication. All these are likely to contribute to a better understanding of the relationships emerging from this chapter and to the identification of a broader range of policy solutions.

Notes

1. Of the 28 OECD countries covered in this chapter, Chile, Greece, Israel, New Zealand, Slovenia and Turkey carried out the survey in 2015. Individuals in all other countries were surveyed in 2012. Between Round 1 and Round 2, an additional five non-OECD country and regions took part in the Survey of Adult Skills. Non-OECD countries are not covered in this chapter.

2. This variance analysis presented here uses the regression-based decomposition technique presented in Fields (2004). This approach is only one way of comparing the importance that a factor plays as a correlate of skill use. An alternative would be to use regression analysis. The advantage of the variance decomposition approach is that it allows factors that are measured on different scales to be compared. See also OECD (2014a), Chapter 5.

3. A comprehensive description of the distribution of skills use across countries by individual, firm and employment characteristics is available in OECD (2016a).

4. An additional concern often expressed when measuring skills use is that employees may not be the best placed to describe the skill requirements of their job and that asking employers is the only way to obtain unbiased information. The extent to which this is case depends largely on who within the firm answers questions on the tasks involved with the execution of each job. HR managers or direct supervisors would be better placed to provide information on this, while Directors and other high-level figures may not be sufficiently informed about what each job involves. In addition and specifically for small firms, while most employers are at ease when expressing job requirements in terms of qualification levels and fields of study, they are less used to reasoning in terms of specific skills. Overall, the collection of employers' views on skill requirements in each job would be a welcome complement to the information provided by employees, but by no means a substitute.

5. Respondents are first asked about the level of complexity of their literacy, numeracy and ICT use and then, for each level of complexity, the importance of tasks in their job on a scale from 0 to 10.

6. PIAAC's job requirement approach is also referred to as explicit scaling and used and has been validated in other skills use surveys like the UK Skills Survey and the Skills, Technology and Management Practices (STAMP) survey.

7. This is a summary of the results obtained when running OLS regressions of the use of information-processing skills on a set of explanatory variables including: gender, age group, educational attainment, contract type, full-time status, occupation, industry, firm size, education status (whether the worker is also a student), private/public sector, literacy proficiency score and country fixed effects.

8. Differences by hours worked could be due to the way in which part-time respondents report the frequency of tasks. While the frequency thresholds have been chosen to fit both part-time and full-time jobs, they may not be easily applicable to "usual" part-time schedules. To minimise this issue, most of the analyses conducted in this chapter include controls for hours worked.

9. To calculate the share of jobs requiring the *same* skills use, each skills use index is recoded into five categories ("1" or "low frequency" if the index value ranges between 1 and 2, "2" if the index value ranges between 2 and 3 and so on for values "3", "4" and "5" or "high frequency"). The recoding is then relaxed to identify the share of workers with *similar* skills use by recoding values so that "Around 2" considers index values below 3, "Around 3" considers index values between 2 and 4 and "Around 4" considers values 4 between 3 and 5.

10. For instance, excluding problem solving, the share of workers using the other information-processing skills with the same frequency almost doubles. And the share of workers using information-processing skills at a frequency higher than once a week increases to about 5%.

11. Years of education is negatively related to job satisfaction in Figure 2.3. This is expected once gross hourly wages are taken into account and could reflect perceived mismatch. For individuals with similar gross hourly earnings, those with more years of education may feel they should be paid more (they may perceive themselves as mismatched), affecting their job satisfaction.

12. It is also noteworthy that the negative effect of proficiency and years of education on job satisfaction is not due to the inclusion of skill use as a control variable – hence is not a result of multicollinearity. One possibility is that the negative link between skill proficiency or education and job satisfaction works through the status achieved in work (as proxied by wages) thanks to better competencies. On the other hand, the relationship between skills use and job satisfaction could be attributable to the content of the job – the tasks carried out – and hence less affected by the inclusion of gross hourly wages as a control. One way to test this is to look at the simple correlation between each skill-related

variable – skills use, skills proficiency and education – and job satisfaction. Indeed, when controls for hourly wages, job characteristics and socio-demographic characteristics are omitted, all three variables are positively associated with job satisfaction.

13. It is possible that the link between skill use at work and productivity may reflect the association between reading (or writing or problem solving) use and the use of other skills or the link between use and the nature of the work environment (e.g. capital intensity).

14. The literature on organisational capital – covering practices that are very similar to those listed as High-Performance Work Practices – provides additional insights in the potential role of management practices on skills use (Squicciarini and Le Mouel, 2012).

15. The Survey of Adult Skills documents whether individuals received a bonus and its amount. It does not ask whether these bonuses are performance-related or not. The majority of the high prevalence of bonuses in Austria, for example, is not performance-related but is a common way to allocate worker leave and other allowances which receive a different tax treatment than wages.

16. To construct a single scale, items are standardised – across countries – to have mean of 2.79 and variance equal to one. The value of Cronbach's alpha for the resulting sum scale is 0.7, suggesting that the items are well suited to form a single scale.

17. See note 15.

18. The relationships observed in the regression analysis should not be considered evidence for a causal link between HPWP and skills use. For example, models do not account for other simultaneous processes that could be driving skills use (e.g. HPWP-firms' ability to recruit high-skilled workers in domains not assessed in PIAAC). Also, adopting HPWP may not necessarily bring about increases in skills use if other attributes – non-measured in the regression model – need to be in place for HPWP to translate on to higher skills use. This includes, for example, managerial quality.

19. Analyses not presented here also show that individuals receiving the incentives do not differ significantly from those that do not in terms of their proficiency or their use of skills in everyday life. On the other hand, the distributions of skills use at work for the two groups are very different, suggesting that differences between the two groups in skills use at work may indeed be due to external motivation factors such as training, flexible working hours or bonus pay.

20. The variables used to proxy attitudes are all included in Section I of the PIAAC Background Questionnaire. They ask respondents how they deal with new tasks and problems they encounter.

21. Controlling for internal motivation is key to ensure that the relationship between skills use and training/work hour flexibility/bonus pay is isolated from that of the innate motivation of individuals. As a result, the use of problem solving at work is excluded from this analysis because the Survey of Adult Skills does not measure the use of problem solving in everyday life.

22. It is important to remember that the relationship is adjusted for the role played by proficiency, year of education and attitudes to learning – all factors that influence the likelihood of participating in training. This increases the chances that training is capturing an incentive mechanism put in place by firms to encourage higher deployment of skills at work. In addition, only a very small share of training is compulsory.

23. Offshoring decisions are related to the nature of the production process and the cost structure within a country and, as a result, are generally common across firms within the same industry. However, it is possible that individual firms make different offshoring decisions than those prevailing in the industry. Unfortunately, the firm dimension cannot be explored using PIAAC. Hence, the offshoring effects estimated in this section refer to the industry average.

24. Low technology manufactures are defined as those sectors covering ISIC Rev. 4 Codes 12-18, 58, 31-33 (equivalent to ISIC Rev. 3 Codes 15-22 and 36-37); Business services include ISIC Rev. 4 Codes 45-47, 95, 49-52, 79, 53, 61, 64-66, 68, 77, 62-63, 69-75, 78, 80-82 (equivalent to ISIC Rev. 3 Code 50-74); and High-technology manufactures include ISIC Rev. 4 Codes 45-47, 95, 49-52, 79, 53, 61, 64-66, 68, 77, 62-63, 69-75, 78, 80-82 (equivalent to ISIC Rev. 3 Code 50-74).

25. This is due to the level of disaggregation of ISIC Rev. 4 available in the Survey of Adult Skills and TiVA.

26. Although very rich, the TiVA data has certain limitations. Offshoring and engagement in Global Value Chains (GVCs) is a phenomenon that takes place at the firm level, with frontier firms playing a different role than lagging firms in engaging in GVCs. In being aggregated at the industry level, TiVA data provides an indication of general trends in the relationship between offshoring and skills use at work.

27. Other phenomena, including routine-biased technological change – technical progress displacing jobs that are intensive in routine tasks – may also contribute to both task and job polarisation (OECD, 2015).

28. The coarseness of the definition of the different types of offshoring may explain the fact that results are not always statistically significant.

29. The relationships observed in the regression analysis should not be considered evidence for a causal link between offshoring and skills use. On the one hand, models do not account for other simultaneous processes that could be driving skills requirements (e.g. technological change). On the other, rather than promoting skills use across firms, it may that firms that make a more active use of skills drive offshoring and survive in new context.

30. Unfortunately, only one wave of the Survey of Adult Skills is available so far – yielding one observation for each of the 28 participating OECD countries – which limits the options to test the links between labour and product market institutions. The approach used in this chapter is similar to the one followed by Hanushek et al. (2013) who use a similar model to assess how institutions influence returns to proficiency using the Survey of Adult Skills. This approach allows exploiting individual-level data and testing whether institutional settings affect the link between skills proficiency and skills use at work.

31. In line with OECD work, the weights used are 7/12 for employment protection of permanent workers in the context of individual and collective dismissals and 5/12 for the rules governing and use of temporary contracts.

32. It is interesting to note that, in recent years, promoting the adoption of HPWP has become a more explicit goal in policy initiatives aimed at fostering workplace innovation and productivity.

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ANNEX 2.A1

Frey and Jegen's (2000) external and internal motivation model

The model

The principal (firm/employer) wants to foster the employee (the "agent") performance/effort *(P)* through external intervention *(E)* (for example, by implementing performance payments, training, close supervision, flexible timetables, etc.).

The agent gets a benefit *B(P,E)* for her performance *(P)* given the principal's external intervention *(E)* with an associated cost of performance *C(P,E)*. Both the benefit and the cost of performance are increasing in performance, i.e. $B_P = \partial B / \partial P > 0$ and $C_P = \partial C / \partial P > 0$.

Higher performance has diminishing marginal returns

$$B_{PP} = \partial B^2 / \partial P \partial P < 0 \tag{1}$$

and increasing marginal cost

$$C_{PP} = \partial C^2 / \partial P \partial P > 0 \tag{2}$$

A rational agent chooses the value of *P* that maximises her utility function, P^*, given the principal's external intervention *E*:

$$\max_{P^*} B(P,E) - C(P,E) \text{ such that } E \text{ is given.}$$

The first order condition for P^* is given by

$$\frac{\partial BP(P^*,E)}{\partial P} = \frac{\partial C(P^*,E)}{\partial P} \tag{3}$$

In setting *E*, the principal needs to take into account how the P^* value chosen by the agent varies with *E*.

$$\max_{E} B_P(P^*,E) = C_P(P^*,E)$$

Differentiating the agent's optimal condition with respect to *E* shows how the optimal performance P^* is affected when the principal changes the extent of external intervention.

Therefore,

$$B_{PE} + B_{PP}\frac{dP^*}{dE} = C_{PE} + C_{PP}\frac{dP^*}{dE}$$

or

$$\frac{dP^*}{dE} = \frac{B_{PE} - C_{PE}}{C_{PP} - B_{PP}} \lesseqgtr 0 \tag{4}$$

The denominator is always positive; the sign of the numerator will determine whether external motivation raises or diminishes performance.

Case A: $\frac{dP^*}{dE} > 0$, i.e. external motivation raises performance.

In Case A, external intervention raises performance by imposing a higher marginal cost on shirking or, equivalently, by lowering the marginal cost of performing ($C_{PE} < 0$). The numerator of condition (4) is then unequivocally positive for any value of $B_{PE} \geq 0$.

$B_{PE} = 0$ if external motivation has no effect on the personal/internal motivation of the agent. $B_{PE} > 0$ implies that external intervention also has an indirect effect on performance by raising internal motivation. For example, a bonus directly makes the agent want to increase her effort (payment effect), but could also increase her confidence in the job improving her intrinsic motivation to perform.

Case B: $\frac{dP^*}{dE} < 0$, i.e. external motivation decreases performance.

In Case B, $B_{PE} < 0$ and $C_{PE} \geq 0$. The first condition implies that external intervention undermines the agent's intrinsic motivation and thus negatively affects the marginal benefit of increasing performance. The second condition implies that that external motivation E fails to lower the marginal cost of performance as expected when the principal designed it. For example, too much supervision could make the employee lose confidence. She would not feel the incentive to perform because of the risk of failing under the eyes of the supervisor, and the reduced confidence brought about by increased supervision would also prevent her from performing.

In general, both $C_{PE} < 0$ and $B_{PE} < 0$ are satisfied, so that external intervention has two off-setting effects on the agent's performance. The benefit of intervening for the principal will depend on the relative size of these two countervailing effects.

With public information it could be the case that the external intervention affects directly the cost of performance and/or the motivations of their peers. This is independent of what happens with individuals under the treatment. For example, not receiving the external incentive could act as negative reinforcement for motivation ($B_{PE} < 0$). It is also be possible that the marginal cost of performance increases without the external incentive ($C_{PE} \geq 0$). This would be the case of a worker who is unhappy about not receiving the incentive and makes it harder to work, reducing performance.

Implications of the model for skills use

If external incentives have no effect on internal motivation, only E's direct effect is observed and more people should increase their skills use when incentives are offered. If external motivation fosters internal motivation, the effect is larger and skills use would increase more. However, if external motivation undermines internal motivation, then the positive direct effect could be crowded out by decreased motivation.

For people not under treatment, even if internal motivation is not affected, a direct effect of not getting the treatment could lower skills use.

The model in the Survey of Adult Skills (PIAAC)

Three types of external incentives (E) can be identified in the Survey of Adult Skills (PIAAC). In the background questionnaire, workers are asked about whether they receive performance payments (bonus payments), training and flexibility in working hours.

Two relevant measures of intrinsic motivation are measured in PIAAC: attitudes and skills use in everyday life. Attitudes can be considered as the endowment of intrinsic attitude outside work. Skills use in everyday life can be considered as the deployment of internal motivation outside work or in an environment free of external incentives.

Skills used at work correspond to P^*. For the purposes of this model, skills use at work is, then, the observed effort or performance. It results from the internal and external motivation and incentives acting simultaneously.

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Chapter 3

Short-term labour market effects of structural reforms: Pain before the gain?

There is broad consensus that well-designed structural reforms of product and labour markets can have positive effects in the long run. And yet, structural reforms often involve significant reallocation of resources which might entail costly adjustments, especially in the labour market. This chapter exploits long time series of industry-level data in a group of OECD countries to analyse the short-term labour market effects of reforms lowering barriers to entry and the cost of dismissal. It finds that both policies induce non-negligible transitory employment losses on average, a result that is confirmed by complementary evidence from case studies of three recently implemented EPL reforms. The strength of these effects varies depending on the underlying industry and labour market structure, and on cyclical conditions. The chapter also discusses policy options that could help attenuate these costs, and whose applicability and aptness may vary across countries.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Key findings

In the context of sluggish global labour market conditions and government debts limiting the fiscal policy space, structural reforms feature prominently in the political agenda to boost and sustain growth. A large body of research confirms that reforms of product and labour markets can significantly improve productivity growth and employment in the long run. And yet, structural reforms often involve significant reallocation of resources across firms and sectors that may entail costly adjustments, especially in the labour market. In particular, these reforms may further aggravate households' economic conditions in countries with persistent economic and employment slack.

The chapter exploits long time series of industry-level and aggregate data to provide evidence on the short-term labour market effects of structural reforms. The analysis looks in particular at two types of structural reforms: reductions in barriers to entry in product markets and increased flexibility in regulation governing the dismissal of workers on regular (open-ended) contracts. The chapter also discusses several complementary labour-market policy actions which could be coupled with structural reforms to help attenuate any negative short-term consequences.

The key findings can be summarised as follows:

- Reforms increasing the level of competition in network industries (energy, transportation and communication industries) that are characterised by the presence of large incumbents induce non-negligible short-term losses, with employment in the industry falling below the pre-reform level during the first three to four years. The employment loss is more pronounced when reforms are implemented during an economic downturn. In the long run, neither employment nor average wages are affected by these reforms. However, the analysis also shows that reforming network markets has beneficial long-term consequences for the employment performance of downstream industries (that is those that use network markets' products and services as inputs). These findings differ from those obtained in several earlier studies for the case of retail trade, where regulation typically shelters a large number of relatively small firms against competition from large (and efficient) distributors and reforms have been found to entail no short-term employment losses. Taken together, these results suggest that the characteristics of the reformed market affect the dynamics of employment in the aftermath of pro-competitive reforms.
- Reforms of employment protection legislation (EPL) that reduce dismissal costs are also associated with short-term employment and wage losses, but these are reversed within a few years on average. Moreover, these losses are not statistically significant when reforms are implemented during an economic upswing. The analysis also shows that these short-term costs are less acute in countries with significant labour market dualism, as measured by a high share of fixed-term contracts in employment. Importantly, such countries are also those that experience the greatest benefits from reforms that lower the relative use of fixed-term contracts. Evidence from country case

studies shows that these benefits tend to materialise relatively quickly. In the long run, more flexible dismissal legislation is associated with greater average wages, consistent with previous studies of the relationship between EPL and productivity.

- Labour market reform packages can be designed and implemented in ways that significantly attenuate, if not eliminate, these initial costs. The choice of complementary policies crucially depends on political economy considerations, the stage of the business cycle, the capacity to expand spending and the country-specific labour market institutional framework.
- The adverse effects of structural reforms are likely to be smaller in countries with an effective activation strategy to support jobseekers, especially when activation systems are geared around early interventions of the public employment service (PES) during the notice period preceding job displacement. Yet, if efficient programmes are not already in place, there are limits to how rapidly active labour market policies can be scaled up when unemployment rises, since fine-tuning of these institutions typically takes several years.
- In addition, recent experiences suggest that, in countries with national, regional or branch-level collective bargaining, allowing scope for individual firms to adapt wages and working conditions to their individual situation can limit any short-term job losses resulting from the relaxation of dismissal regulations. More flexibility in working conditions and wage setting allows firms to make use of variables other than employment when adjusting to the required restructuring.
- Alternatively, more flexible dismissal legislation could be introduced and applied only to new hires. There is evidence that such "grandfather clauses" more than offset short-term employment costs of EPL reforms. However, they also clearly delay the desired effects of EPL reform on reallocation and allocative efficiency.
- Finally, countries characterised by relatively low unemployment-benefit entitlements (or tight eligibility rules) and relatively strong fiscal positions, could consider cushioning the short-term effect of structural reforms undertaken in downturns, for example by temporarily extending benefit durations. Recent evidence suggests that, in recessions, such measures have, at worst, no adverse welfare effects.

Introduction

The 2006 reassessment of the OECD Jobs Strategy outlined a number of structural reforms aimed at fostering countries' adaptability to structural changes and increasing employment and productivity in the long run (OECD, 2006). Reaping the full benefits of such reforms takes time, however, as they often materialise gradually through hiring, firm entry and innovation. In the short run the significant amount of resource reallocation engendered by such policy changes is likely to induce costly labour market adjustments, notably job and income losses (although these may only be transitory). Assessing the relative strength of these opposing effects has clear policy relevance. Nonetheless, the substantial amount of work which has been produced quantifying the long-run benefits of structural reforms contrasts with the much more limited evidence on their short-run consequences. If certain structural reforms entail short-run costs, a second important policy question that arises is whether they should be implemented during a recession, when their urgency often becomes more evident and political opposition is weaker, or, rather, timed to accompany an economic upswing when job creation is stronger and short-term costs potentially lower and/or of shorter duration. Finally, policy makers are

interested in knowing whether and to what extent complementary policy actions can be coupled with structural reforms in order to help offset their negative short-term consequences and strengthen political support.

The chapter provides new empirical evidence on these issues by using mostly aggregate and industry-level data. The analysis largely adopts gross or net job losses (gains) as the metric to quantify costs (benefits) and looks, in particular, at reforms that lower barriers to entry in product markets and make regulations on the dismissal of regular workers more flexible. While the menu of structural policies analysed could potentially be broader, the chapter focusses on these two types of reforms for two reasons. First, the idea that lowering entry barriers and dismissals costs might be accompanied by short-run employment losses is supported by theory. Second – and unlike, for example, trade policies – there are significant margins for further liberalisation in the regulation of both market entry, especially in network industries, and dismissals in many OECD countries. The statistical analysis quantifies the effect of each type of reform at different time horizons, and explores whether the short-term effect varies with the stage of the business cycle and the characteristics of the labour market. This approach provides the basis for a broad assessment of the extent and timing of the labour market consequences of future policy action in these areas.

The analysis of policies that might facilitate the reallocation of resources spurred by structural reforms begins with a brief discussion of the existing evidence on the potential effectiveness of macroeconomic policies, as well as the constraints on their use. The microeconomic evidence is then considered in greater detail, including both recent reform packages aimed at smoothing the transition to the new institutional setting and the potential for active and passive labour market policies to attenuate the negative side effects of structural reforms on jobs and earnings.

The chapter is structured as follows. Section 1 focuses on the short- and long-run effects of lowering entry barriers, looking particularly at the liberalisation of network service industries and distinguishing between direct impacts and indirect effects on service users. Section 2 looks at the consequences of an easing of regulations on dismissals, their interaction with the cycle and with the degree of labour market segmentation, relying on both cross-country/cross-industry regression analysis and case studies of recent reform experiences. Finally, Section 3 discusses the political economy of structural reforms and the potential role of complementary labour market policies in attenuating short-run reform costs. This section assesses the relative attractiveness of alternative reform packages and the implications in terms of reform design.

1. Product market regulation

Product market reforms that lower barriers to entry aim at improving efficiency in the production of goods and services, and making the price setting process more competitive. They include measures to open up markets to domestic or foreign competition by removing, for example, permits and licences, tariffs or non-tariff barriers as well as legal and administrative barriers. Competition enhancing policies of this type have been shown to be beneficial in the long run not only in terms of lowering final prices, but also for enhancing firms' productivity and innovative efforts and improving the efficiency of resource allocation across existing and new production units (i.e. market incumbents and entrants; see Boeri et al., 2015 for a review). Indeed, over the past decade many

OECD countries have approved significant reforms of product markets, particularly in non-tradable service industries, which implied sizable reductions in regulation indicators. Yet, resource reallocation can involve significant frictions and thus result in significant adjustment costs, particularly in the labour market. For example, incumbent firms may react to increased competitive pressure through re-organisation and downsizing (in some case, exit) with the aim of reducing costs and lowering prices; their response is likely to be quick or even anticipated as it aims, in considerable part, at deterring entry. The positive employment contribution of new firms, however, takes longer to materialise as successful entrants expand only gradually. As a result, the reallocation of workers from shrinking to growing firms may end up being a lengthy and costly process involving considerable unemployment.

Several previous studies have shown that pro-competitive product markets regulatory reforms generally have had a positive effect on total employment in the long run (e.g. Peoples, 1998; Alesina et al., 2005; Griffith, Harrison and Macartney, 2007; and Fiori et al., 2012) and involve a significant reallocation of jobs from less to more productive firms (Andrews and Cingano, 2014). Empirical analyses focussing on employment dynamics in the aftermath of reforms in the retail sector show that such reallocation has no negative impact on employment even in the short run (Bertrand and Kramarz, 2002; Viviano, 2008; Skuterud, 2005; Burda and Weil, 2005; and Boeri, Cahuc and Zylberberg, 2015, for a survey). This finding, however, likely reflects the particular competitive situation in the retail industry, where deregulation often implies the entry of large, efficient competitors, whereas incumbents are too small to strategically anticipate entry by cutting staffing. As suggested by Bassanini (2015), employment dynamics are likely to be very different in more concentrated markets or cases in which regulation rather shelters large dominant players. Recent studies have shown that, in such cases, the incumbent response often consists of reducing prices and increasing efficiency, even before new competitors enter the market (e.g. Goolsbee and Syverson, 2008; Bridgman, Gomes and Teixeira, 2011; and Brueckner, Lee and Singer, 2013). Hence, the initial impact of pro-competitive reforms on industry-level employment could be negative because large incumbents re-organise and downsize well before entrants start hiring.

This section extends the research literature by focusing on the reduction of entry barriers in three network industries: energy (electricity and gas), transport (air, rail, road transport) and communications (post and telecommunications). Network industries provide an interesting case study of the labour market consequences of pro-competitive reforms for a number of reasons. First, large incumbent firms usually play an important role in these industries. In contrast to retail trade, deregulation is likely to impact on the employment decisions of players that can significantly affect the overall labour market, at least in the short run. Hence, the results of the analysis are likely to be relevant for, and extend to, the case of pro-competitive reforms implemented in industries or markets characterised by the presence of large dominant players. Second, the services produced by these industries serve as key inputs to most other branches, inducing strong forward linkages to the rest of the economy. Hence, the benefits from achieving greater efficiency are likely to extend beyond these markets. Another advantage of focussing on network industries is that the markets for energy, transportation and communication continue to offer substantial room for further deregulation in many OECD countries, despite the recent waves of reforms, and nearly all emerging economies (OECD, 2014a). Despite their accounting for a relatively small share of total employment, reforming network industries

has the potential to generate non-negligible labour market adjustments, both directly and indirectly. Finally, the focus on network industries takes advantage of the availability of long time series of detailed OECD indicators of the level of anti-competitive barriers for a large cross-section of countries.

The chapter's focus on network industries does limit the scope of the analysis of product market reform, since barriers to competition certainly are not confined to these industries, nor are they limited to the specific regulatory impediments that are quantified by the OECD indicators. Indeed, economy-wide administrative barriers to entry remain high in some OECD countries (notably, Mexico and Turkey) and in most emerging economies. The regulation of firm exit has long been recognised as an important determinant of the entrepreneurship and entry rates in any branch of economic activity (Brandt, 2005), yet is inefficiently designed in several OECD countries.[1] It is also the case that cross-border trade and investment are still limited in a number of key economic activities, ranging from business/professional services to the construction sector, due to regulations such as the requirement that foreign firms work through local partners.[2] Similarly, significant barriers to domestic and cross national competition exist in public procurement, which accounts for a large fraction of public spending in most advanced economies.[3] Finally, poor judicial enforcement of property rights or of competition laws can continue to blunt the incentive to invest in a market even after reforms have formally eliminated entry barriers.

The analysis presented in this section is divided into two main subsections. The first looks at the (short- and long-term) consequences of reforms lowering barriers to entry in network industries on own industry employment and wages (the *direct* effect of reforms). The second assesses the impact of these reforms on the labour market performance of all other industries in the business-sector (the *indirect* effect).

The direct labour market consequences of competition-enhancing reforms

The empirical analysis in this subsection will quantify the labour market consequences of product market reforms implemented over the past three decades in three network industries (energy, transport and communication) exploiting industry level data for 23 OECD countries (and up to 37 years) (see Box 3.1).[4] Pro-competitive reforms of product market regulation (PMR) are quantified on the basis of changes in the OECD indicator of barriers to entry (sourced from the *OECD Product Market Regulation Database*), with reductions indicating competition-enhancing reforms and increases indicating increased protection of market incumbents.[5] Examples of reforms in network industries include the separation (unbundling) of energy supply and generation from the operation of transmission networks, ensuring non-discriminatory access to bottleneck infrastructure (natural monopolies) to potential competitors, removing regulations restricting the number of competitors in the postal services, or lowering the licensing requirements in road freight transport.

The basic regression model indicates that lowering barriers to entry in network industries induces a net loss in employment which reaches its maximum 3 years after the reform and begins being reabsorbed afterwards (see Figure 3.1; see Box 3.1 for details on the estimation method). Based on the estimated impulse response coefficients (measuring average effects across the three broad network industries), industry employment would be around 1.2% below its initial level in the third year following a reform that lowered the regulation index by 1 point (the index ranges from 0 to 6).[6] This response pattern is

Box 3.1. **Estimating the labour market consequences of regulatory reforms: The case of network industries**

Short-term analysis. A simple way to investigate the relationship between industry regulation and employment (or another measure of labour market performance) in the short run is to estimate a first-difference dynamic equation allowing for both contemporaneous and lagged impacts of regulation (see OECD, 2016a; and Bassanini, 2015):

$$\Delta E_{cit} = \beta_0 \Delta BE_{cit} + \sum_{k=1}^{T} \left(\beta_k \Delta BE_{cit-k} + \delta_k \Delta E_{cit-k} \right) + X_{cit}\gamma + D_{ct} + D_{it} + D_{ci} + \varepsilon_{cit} \quad (1)$$

where $\Delta E_{cit} = lnL_{cit} - lnL_{cit-1}$ is the annual change in the logarithm of employment in country *c*, industry *i* and time *t*, and ΔBE is the change in regulation. The vector *X* accounts for the potentially confounding role of other forms of industry regulation (i.e. the extent of public ownership) or the burden of barriers to entry in other industries; ε stands for a standard error term. Including lagged values of the dependent variable accounts for possible persistence in employment changes. The number of lags *T* is chosen based on statistical criteria as the Bayesian's (BIC) or Akaike's (AIC). In all estimations, standard errors are clustered at the country-industry level.

The bi-dimensional fixed-effects D_{ct}, D_{it} and D_{ci} are intended to capture, respectively: i) country-specific shocks to employment growth common to all industries (e.g. the business cycle and economy-wide policy reforms); ii) industry-specific shocks to employment growth common across countries (such as those related to the evolution of technology and global demand); and iii) country-industry specific linear trends in the evolution of employment (e.g. due to changes in the long-run patterns of international specialisation). Conditional on this large set of controls identification hinges on comparing employment growth in a reform year across industries and over time. The comparison with other industries, however, might not be a valid counterfactual if there are spillover effects, e.g. if PMR reforms in the energy market affects employment dynamics in the transport industry. To check for the presence of cross-industry spillovers, the baseline specification is therefore augmented with the average change in regulation in "other" network industries.* This control attracts a small and highly non-significant coefficient, suggesting a minor role for spillover effects within network industries.

With this rich set of controls, the estimated coefficients would not be interpretable as the aggregate impact of deregulation on employment in the presence of country-industry shocks to employment growth that are neither common to all other industries in the country, nor shared with the same industry across countries, nor captured by long term country-specific industry trends, nor reflecting cross-industry spillover effects, and yet are systematically correlated with PMR deregulation. To further account for these concerns the analysis presents alternative tests of reverse-causality. One consists of including forward terms of regulation. A finding that future regulation affects current employment would provide evidence of reverse causality. Granger-causality tests are also performed, which amount to regressing the change in regulation at time *t* (ΔBE) on lagged employment changes, and testing that the latter have no individual or cumulative impact.

Augmenting specification (1) to include interactions between the change in regulation (ΔBE) and the change in the output gap (ΔOG) makes it possible to test whether the impact of deregulation varies over the business cycle. Because the output gap is defined as the difference between current and potential output (as drawn from the *OECD Economic Outlook Database*), ΔOG takes negative values when the economy is contracting. Hence, for example, a negative sign on this interaction term would suggest that the short run impact of deregulation on employment levels is more negative when economic activity is contracting while it is less harmful during recoveries. Clearly, specification (1) also allows examining the impact of deregulation on other industry outcomes such as wages or prices.

Box 3.1. **Estimating the labour market consequences of regulatory reforms: The case of network industries** *(cont.)*

The results of the short-term analysis are represented plotting impulse-response functions obtained using the local-projection estimator developed by Teulings and Zubanov (2014). Impulse response functions provide a simple way to illustrate how the impact of deregulation (if any) evolves over time. Because the estimated contemporaneous coefficient (β_0) might still be affected by simultaneity or reverse causality biases, the functions are obtained using only the coefficients estimated on lagged regulation (β_k) and no statement is made as regards the effect of deregulation in its immediate aftermath. See OECD (2016a) for more details, where alternative impulse-response figures are presented that include the contemporaneous coefficient.

Long term analysis. The longer term relationship between regulation and labour market outcomes is estimated in a static panel setting:

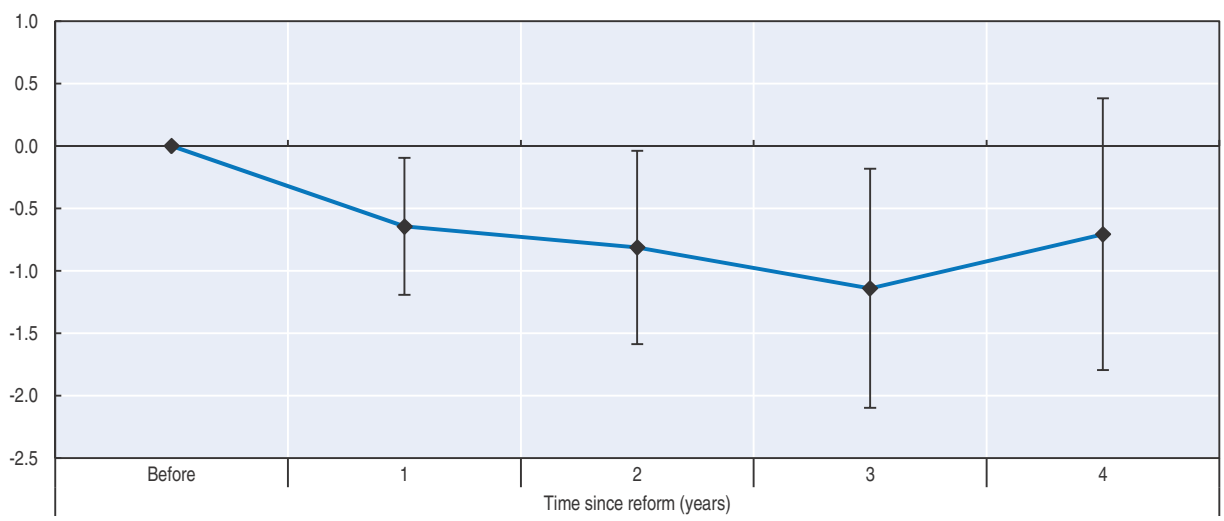
$$E_{cit} = \beta_{LR} BE_{cit} + \eta_{ct} + \eta_{it} + \eta_{ci} + \epsilon_{cit}$$

where E_{cit} is the (log of) employment in country c, industry i and time t, BE is the level of regulation in the industry and the ηs are bi-dimensional fixed-effects.

* Specifically, equation (1) is augmented with the annual change in the term: $WBE_{dit} = \Sigma_{-i}\, Exp_{i,-i} * BE_{c,-i,t}$, where $Exp_{i,-i}$ are coefficients from the US Inverse Leontief Matrix measuring how many units of input –i have to be produced (at any stage of the value chain) to produce one additional unit for final demand in industry i.

Figure 3.1. **Competition-enhancing reforms and employment in network industries**

Estimated cumulative change in industry employment up to four years following the reform, in percentage



Note: The figure reports point estimates and 90%-confidence intervals of the cumulated employment effect of PMR reforms lowering entry barriers. Estimates refer to the case of a reform lowering the OECD indicator of regulatory barriers to entry in network industries (energy, transport and communication, ETCR) by one point. Employment levels before the reform are normalised to 0. The underlying parameters are estimated allowing employment growth in each network industry to depend on lagged values of industry regulation as well as on lagged employment changes. Confidence intervals are obtained by clustering errors on countries and industries.
Source: OECD estimates based on EU KLEMS and the *OECD Product Market Regulation Database*.

StatLink http://dx.doi.org/10.1787/888933384668

confirmed across a number of alternative specifications of the estimating equation (for example accounting for the potentially confounding role of changes in the degree of public ownership – another dimension of regulation captured by the OECD indicators) or of the dependent variable (i.e. using salaried as opposed to total employment).[7] Moreover, the results are robust to extending the time window to include the Great Recession years and to variations of country sample (see OECD, 2016a).[8] No evidence is found that the impact of the reforms varies with the initial level of regulation or that the impact of pro-competitive reforms is non-linear in initial regulation (being, for example, stronger in high than low regulated countries).[9] Finally, the employment response does not vary depending on the specific network industry implementing the reform. The short-term loss is not insignificant from an economic point of view if compared with the average growth rate of employment in the sample between 1975 and 2007 (0.3%).[10]

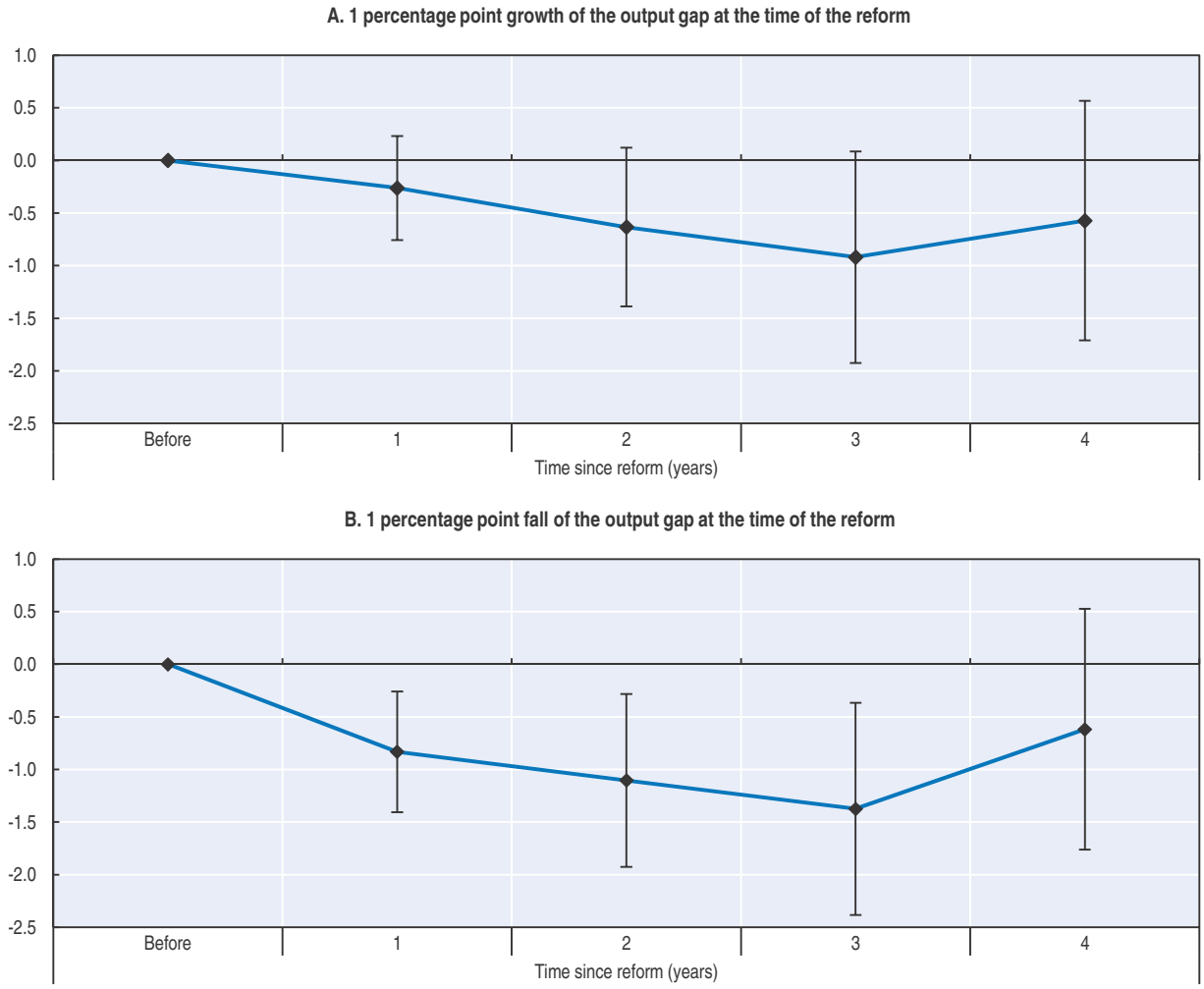
The U-shaped pattern of employment is consistent with the idea that labour market outcomes following the removal of entry barriers in network industries reflect two offsetting but asynchronous forces: the immediate re-organisation of (large) incumbents and the gradual expansion of successful entrants. This interpretation is also consistent with preliminary evidence by Gal and Hijzen (2016) who find that, in the short run, deregulation depresses employment in large firms with respect to small firms in network industries.[11] While new jobs tend to eventually compensate for the initial losses, the analysis does not find evidence that competition enhancing reforms increase employment in the long run, as other researchers have found in the case of retail trade (see OECD, 2016a, Table 3.A1.6). Looking across alternative empirical specifications and samples for estimating the long-run impact of industry employment reveals no significant impact.[12]

Importantly, the analysis does not provide evidence that the short-term employment adjustments are accompanied by a significant fall in wages. In fact, replicating the analysis using average hourly industry wages reveals no significant effect. The positive but small and statistically insignificant estimated wage impact in the base model disappears when the model is extended to control for composition effects (by including changes in employment and in the share of employees with less than upper secondary education in total hours worked). This suggests that the burden of the employment adjustment weighs disproportionately on low-wage, low-productivity workers, whose displacement artificially raises the average of observed wages (for more details see OECD, 2016a).

Economic downturns are often seen as good times to implement structural reforms; their urgency and public support are often higher than in good times (see Section 3 for a discussion). But are the short-term economic costs of reform smaller or larger in an economic downturn? On the one hand, the contribution of deregulation to labour shedding would be marginal in a period of large job destruction. On the other hand, the high uncertainty characterizing downturns might also significantly slow the job creation stimulated by structural reforms, by lowering the number of new firms or how rapidly they grow.[13] Allowing the employment impact of deregulation to vary along the cycle provides supportive evidence for the latter hypothesis, as is illustrated by Figure 3.2. The two panels plot the employment response to a reform implemented when the growth rate of output is, respectively, larger (upturns) and smaller (downturns) than potential output growth. Comparing these two scenarios suggests more pronounced employment losses for pro-competitive reforms implemented during downswings than during an expansionary

Figure 3.2. **The employment effects of competition-enhancing reforms in upturns and downturns**

Estimated cumulative change in industry employment up to four years following the reform, in percentage



Note: The figure reports point estimates and 90%-confidence intervals of the cumulated employment effect of PMR reforms lowering entry barriers. Estimates refer to the case of a reform lowering the OECD indicator of regulatory barriers to entry in network industries (energy, transport and communication, ETCR) by one point. Employment levels before the reform are normalised to 0. The underlying parameters are estimated allowing employment growth in each network industry to depend on lagged values of industry regulation as well as on lagged employment changes. Panel A plots the employment effects of reforms implemented as the output gap grows by 1 percentage point (i.e. the growth rate of output is 1 percentage point larger than the growth of potential output, indicating an economic upturn). Panel B refers to periods when the output gap falls by 1 percentage point (indicating an economic downturn). Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Product Market Regulation Database*.

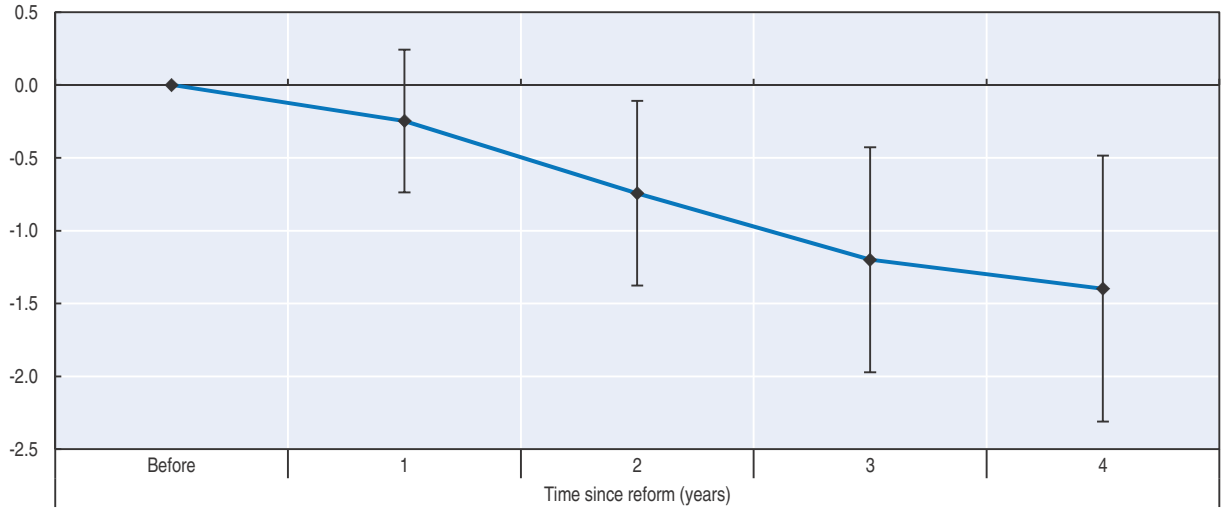
StatLink http://dx.doi.org/10.1787/888933384674

phase. In both cases, industry employment reaches a minimum three years after the reform, but this is 1.4% below the level that would have been observed absent for the reform during a downturn and is smaller and statistically insignificant in the upturn scenario.

Consistent with the idea that pro-competitive reforms induce an efficiency-enhancing re-structuring process, lower regulation is followed by falling prices. The level of the industry output deflator falls on impact and continues decreasing in the years following the reform (Figure 3.3). Taking the estimated coefficients at face value, four years after the reform the industry price index is nearly 1.5% below its pre-reform level. In the long run,

Figure 3.3. **Competition-enhancing reforms and prices in network industries**

Estimated cumulative change in industry output deflator up to four years following the reform, in percentage



Note: The figure reports point estimates and 90%-confidence intervals of the cumulated price effect of PMR reforms lowering entry barriers. Estimates refer to the case of a reform lowering the OECD indicator of regulatory barriers to entry in network industries (energy, transport and communication, ETCR) by one point. Price levels before the reform are normalised to 0. The underlying parameters are estimated allowing price changes in each network industry to depend on lagged values of industry regulation as well as on lagged price changes. Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Product Market Regulation Database*.

StatLink http://dx.doi.org/10.1787/888933384682

this fall approaches 3% (see OECD, 2016a). Significant declines in price are consistent with the large literature emphasising the sizable efficiency gains in terms of total factor (or labour) productivity (e.g. Olley and Pakes, 1996; Disney, Haskel and Heden, 2003; and Schmitz, 2005) and of production costs per unit of output (Knittel, 2002; and Fabrizi, Rose and Wolfram, 2007). The magnitude of the price declines estimated here probably understate the broader gains from enhanced competition, which likely include better quality services. While the quality dimension is difficult to capture with the data used in this chapter,[14] the positive association between deregulation and service quality has been highlighted in a number of works exploiting detailed microdata in the case of transportation (Mazzeo 2003; and Greenfield, 2014), legal services (Domberger and Sherr, 2003), retail trade (Matsa, 2011), health (Bloom et al., 2015; and Cooper et al., 2011) and education (Hoxby, 2000).

The indirect labour market consequences of competition-enhancing reforms

Improved outcomes in network industries are in turn likely to have spill-over effects on the performance of activities using these services as production inputs (i.e. downstream industries). For example, if deregulation implies that service inputs become cheaper or that their quality improves, the unit cost of production among users of such input would lower, potentially favouring their competitiveness and expansion. Moreover, lower monopoly power upstream would increase users' incentives to improve efficiency and innovate if it reduces the share of rents that would be appropriate by suppliers (Bourlès et al., 2013).[15] These predictions are confirmed in the long run, as intensive users of services tend to benefit from input deregulation both in terms of their value added and export shares (Barone and Cingano, 2011) and in terms of productivity (Arnold et al., 2011;

and Bourlès et al., 2013). Similar findings might be expected when looking at employment or wages, though (as in the case of the reformed industries) the underlying adjustments might imply non-negligible transition costs.

The strength of the indirect effects of deregulation is examined assuming that, if increased competition in input production benefits downstream employment (e.g. because of the lower input price, better quality or improved market efficiency) then these benefits should be relatively stronger for intensive input users. This assumption, which has been exploited in single-country investigations (Forlani, 2010; and Arnold, Javorcik and Mattoo, 2011) and cross-section analyses (Allegra et al., 2004; Faini et al., 2006; Barone and Cingano, 2011; and Bourlès et al., 2013), can be brought to the chapter's richer data by estimating an interaction model where the effect of upstream regulation is allowed to vary across users depending on their dependence on the regulated input (see Box 3.2, and OECD, 2016a for details).

For the purpose of this chapter, the input-dependence models described in Box 3.2 are estimated on a sample covering 19 non-agricultural/non-mining business-sector industries, 22 OECD countries and up to 37 years.[16] Consistent with the existing evidence on productivity, the analysis shows that network deregulation has a positive impact on users' employment in the long run; whether this effect already materialises in the short run is, however, unclear.

The implied long-run effects are highly statistically significant and can be large enough to be of considerable economic importance. Comparing two industries whose overall dependence on network industries differs by one percentage point, a policy uniformly lowering regulation in each network industry by one point would increase long-run employment in the most dependent industry by 0.65 percentage points relative to the least dependent industry. Aggregating the effect at the country level following the methodology and assumptions illustrated in Box 3.2, the same policy would raise employment in a representative country by around 1% (see OECD, 2016a).

Figure 3.4 further illustrates the potential indirect benefits from deregulation plotting the aggregate long-run employment gains from adopting the "lightest regulatory practice" observed around 2012 in each upstream industry. This best-practice benchmark is defined as the average of the three lowest levels of anticompetitive regulation observed across countries and should therefore be considered an ambitious, although not unrealistic, policy goal. The baseline specification implies that the long-run employment gains from such reforms would exceed 3% in the most highly regulated countries (Mexico, Israel and Korea), while falling below 1% in countries that are already close to (or represent) the best practices in some sectors (e.g. the United Kingdom and Australia). The (simple) average gains across OECD countries would be of about 2%.

This result is robust to a number of alternative specification and variable choices (see OECD, 2016a). These include using unweighted as opposed to weighted estimation,[17] using salaried (rather than total), employment as the dependent variable, or augmenting the specification to account for the extent of public ownership in the deregulated industry. They are also robust to extending the time window to include the Great Recession years, and to variations of country sample.[18] On the other hand, no evidence is found that the impact of upstream reforms varies depending on the initial level of regulation (being, for example, stronger in a more highly regulated country). Finally, the analysis reveals that the benefits from service deregulation are stronger (and only statistically significant) among

Box 3.2. **Estimating the indirect effects of deregulation in network industries**

To assess whether reforming network industries matters for labour market outcomes in the rest of the economy, the chapter exploits the methodology originally developed by Rajan and Zingales (1998) which exploits cross-country/cross-industry variation to assess the relevance of country-level policies while accounting for country fixed effects. This approach attenuates the estimation concerns that would arise in a standard cross-country regression (e.g. omitted variables, reverse causality). The approach relies upon the assumption that each industry has a "technological" characteristic implying a specific degree of exposure to regulation in upstream network industries (*i*) and that this characteristic varies across downstream industries (*j*). If a measure of industry exposure (Exp_{ji}) is available, then the impact of upstream regulation on downstream employment can be estimated looking at the interaction model $E_{cj} = \theta(Exp_{ji} * BE_{ci}) + \eta_c + \eta_j + \xi_{cj}$, where E_{jc} measures the (log of) employment in industry *j* and country *c*, *BE* captures the level of anti-competitive regulation in the market for input *i*, and the fixed effects η capture country and industry time invariant characteristics. If upstream regulation matters for downstream employment E_{jc} then one would expect high exposure industries to react more strongly to deregulation (i.e. to estimate $\theta < 0$).

For the purposes of this chapter, the above *input-dependence model* is adapted to fit a time-series framework. The adapted model can be used to estimate both short and long term coefficients and to the impact of deregulation in more than one network industry. To examine the short run consequences of deregulation on employment the following equation is estimated:

$$\Delta E_{cjt} = \theta_0 \, \Delta WBE_{cjt} + \sum_{k=1}^{T} \left(\theta_k \, \Delta WBE_{cj,t-k} + \rho_k \, \Delta E_{cjt-k} \right) + \nu_{ct} + \nu_{jt} + \nu_{cj} + \xi_{cjt} \qquad (1)$$

where $WBE_{djt} = \Sigma_i \, Exp_{i,j} * BE_{cit}$ measures the overall exposure to the stringency of product market regulation in network industries *i* (Energy, Transport and Communication) in each downstream industry *j*, and ΔE_{cjt} measures year-on-year employment growth. The set of bi-dimensional fixed-effects ν are intended to capture potential confounding factors as described in Box 3.1.

Following the literature, Exp_{ji} is measured using input-output coefficients. Specifically, the exposure of industry *j* to each service is measured by the corresponding coefficient of the Inverse Leontief Matrix, which describes how many units of input *i* are required (at any stage of the value chain) to produce one additional unit for final demand in industry *j* (*input dependence*). Hence, the identification assumption is that high-intensity users of a regulated input would benefit more than low intensity users from policies that enhance competition in the production of that input. To reduce the estimation concerns arising if input dependence responds to the level of regulation, the analysis exploits country invariant input-output coefficients. Following the literature, these correspond to those measured in a benchmark (or frictionless) country characterised by low levels of regulation. US input-output coefficients are used for this purpose. Accordingly, the United States is excluded from the estimation sample. An alternative approach is also used which consists of taking industry-averages of input-output coefficients measured across all countries, after having netted out input intensities specific to each country or to the level of regulation (see OECD, 2016a for details). Based on this approach, the most dependent industries include food products, basic metals, non-metallic and rubber and plastics products; and the least dependent industries include electrical and optical equipment, real estate activities, wholesale and retail trade, and financial intermediation.

As in the case of direct effects (see Box 3.1), impulse-response functions are obtained using the local-projection estimator developed by Teulings and Zubanov (2014). Differently from that case, however, the employment responses will be computed also accounting for the contemporaneous coefficient (θ_0), as reverse causality issues are less of a concern in the framework of indirect effects. See OECD, 2016a, for more details.

The long-run, indirect effects of regulation in network industries are estimated in the static version of the input-dependence model:

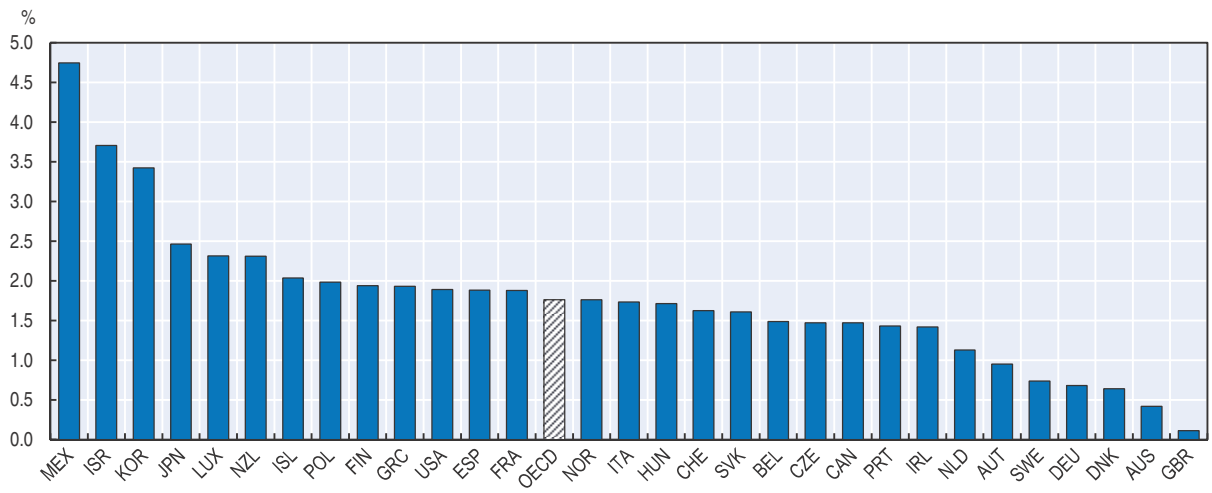
$$E_{cjt} = \theta_{LR} WBE_{cjt} + \mu_{ct} + \mu_{jt} + \mu_{cj} + \epsilon_{cjt} \qquad (2)$$

Box 3.2. **Estimating the indirect effects of deregulation in network industries** *(cont.)*

Strictly speaking, country-industry interaction models such as (2) only allow the differential impact of regulation on industry outcomes to be estimated. The aggregate consequences on overall employment can be recovered only by imposing the (strong) assumption that one or more low-exposure industries would actually *not* be affected by the reform (see Guiso et al., 2004; and Bassanini, Nunziata and Venn, 2009 for a discussion). In this case, the aggregate effect of reforms can be computed in two steps (see Guiso et al., 2004). In the first step, the estimated coefficient θ is used to predict the employment gains in country c and industry *j*: $\widehat{\Delta lnE_{cj}} = \hat{\theta}_{LR} \sum_i Exp_{i,j} * \Delta BE_{ci}$, where the changes in entry barriers (ΔBE_{ci}) can be hypothetical or reflect actual reforms. In the second step, industry specific gains are aggregated to the country level $\widehat{\Delta lnE_c} = \sum_j Sh_{jc} * \widehat{\Delta lnE_{cj}}$, where Sh_{jc} is the (employment) share of industry *j* in country c. Importantly, all of the aggregation exercises presented in this chapter impose the (conservative) assumption that, the reforms in any regulated service *i* have no effect on industries whose exposure to the regulated service (Exp_{ij}) is lower than (or equal to) the first quartile of the distribution of exposure.

Figure 3.4. **Long-run indirect effects of competition-enhancing reforms in network industries**

Aggregate employment changes in downstream industries from reaching "lightest practices" upstream, in percentage



Note: The figure reports the estimated long-run percentage point increase in employment in the non-agricultural/non-mining business sector (excluding network industries) following deregulation of barriers to entry in network industries. Regulation and employment levels in 2013 are taken as starting points. The underlying parameters are obtained estimating an input-dependence model, which assumes that the downstream impact of deregulation is greater the greater users' exposure to the regulated input. Business-sector aggregation is computed assuming that reforms of barriers to entry would have no effect on employment in a hypothetical industry whose exposure is equal to or lower than the first quartile of the distribution of exposure. The figures plotted refer to a thought experiment in which regulation in each network industry is reduced to the "lightest practice", defined as the average of the three lowest levels of industry regulation observed across countries.

Source: OECD estimates based on EU KLEMS and the *OECD Product Market Regulation Database*.

StatLink http://dx.doi.org/10.1787/888933384698

manufacturing producers than it is for other service producers (e.g. in the retail sector). This finding is in line with the idea that efficiency improvements generate the largest gains in industries or markets exposed to international competitive pressures, where even small productivity advantages can induce large increases in market shares.

In the short term, by contrast, the estimated strength of indirect effects of upstream deregulation is not robust to the estimation method. Weighted estimates would suggest that the long term employment benefits unfold quickly, with aggregate employment increasing by 0.2% in the reform year and in excess of 0.4% three years after the reform. In

sharp contrast, unweighted estimates show negative and non-significant short-term responses of users' employment. The results remain unclear when looking at salaried employment, extending the sample to include the Great Recession years or allowing the coefficient to vary between manufacturing and service users. Overall, the analysis is unable to determine how quickly the long-run positive employment effects unfold.

Overall, the evidence provided in this section suggests that increasing the level of competition in network industries induces modest, but non-negligible, direct costs in terms of industry-level employment losses. These losses are rapidly reabsorbed, but the reform does not result in significant long-run employment or wage gains in the industries directly affected by the reform. Both findings contrast with prior evidence on the impact of lowering entry barriers in retail trade, which appears to cause no short-term employment losses and long-term gains. One plausible explanation for these discrepancies is the different conditions in the underlying market. Lifting entry barriers is likely to entail short-term job losses in concentrated markets, as large incumbents react to (the threat of) enhanced competition by re-organizing and reducing overstaffing in an attempt to increase productivity and lower prices. Retail trade regulation, on the other hand, typically limits the presence of large and efficient distributors in a market dominated by many relatively small firms. The results of this section therefore underline the likelihood that whether or not competition-enhancing reforms induce short-term employment costs is likely to depend on the characteristics of the regulated industry. In particular, the extent to which large players dominate the market is likely to be important, because large firms are probably more likely to re-organise and downsize in an attempt to deter entry. On the positive side, the analysis also shows that reform-induced reorganisation in upstream markets can have a positive long-term impact on the employment performance of downstream industries. The following section will apply a similar estimation framework to analyse the labour market impacts of reforms of employment protection legislation.

2. Employment protection legislation

The employment protection legislation (EPL) is defined in this chapter as the set of rules governing the hiring and, especially, firing of workers. There is a theoretical consensus that inefficient statutory dismissal protection may inhibit efficient job separations and, indirectly, reduce efficient job creation by imposing implicit and explicit costs when a firm adjusts its workforce to keep it at its optimal level (e.g. Mortensen and Pissarides, 1994, 1999). In principle, the inefficiencies otherwise implied by job security provisions could be avoided via wage adjustments, private payments or the design of efficient contracts (Lazear, 1990). However, wage rigidities, financial market imperfections or uncertainty about the future of the firm appear to prevent these channels from operating fully so that EPL creates positive firing costs which imply that the optimal strategy for firms is to reduce both hiring and firing, with an ambiguous effect on average employment and its fluctuation over the business cycle (e.g. Bentolila and Bertola, 1990; and Mortensen and Pissarides, 1999). The inefficiently slow resource reallocation that results from firing regulations is also likely to result into lower productivity (e.g. Hopenhayn and Rogerson, 1993). Moreover, excessively stringent layoff regulations might discourage firms from experimenting with new technologies, which are characterised by higher mean returns but also higher variance, due to the associated risk of paying high firing costs in the case of venture failure (Saint-Paul, 2002; and Bartelsman et al., 2004).

Employment protection is also a key determinant of the degree of labour market dualism – that is the extent to which employment is divided between protected permanent contracts and precarious temporary contracts with high barriers of transitions between the two types of positions. When the use of fixed-term contracts is liberalised while maintaining strict employment protection regulations for open-ended contracts, firms react by substituting temporary for regular workers (since the former are cheaper to terminate at the end date of the contract), with no long-run effect on employment. In addition, a large asymmetry between the employment protection provisions applying to the two types of contracts reduces the conversion rate of fixed-term contracts into permanent ones, thereby transforming fixed-term contracts into a trap rather than a stepping stone into more stable employment. Overall, the theoretical literature suggests that a large wedge between regulations for temporary and permanent contracts is likely to contribute to the emergence of a persistent divide across workers holding different types of contract in terms of both current working conditions and future prospects (e.g. Boeri, 2011; and Bentolila, Dolado and Jimeno, 2008).

Most empirical studies investigating medium/long-term effects of flexibility-enhancing EPL reforms suggests that they have, at worst, no or a limited positive impact on employment levels in the long run (see OECD, 2013, for a survey). There is also strong evidence that flexible dismissal regulations increase both separations and hirings in the long run, and foster a more efficient reallocation of resources (see Martin and Scarpetta, 2012, for a survey). As a result, reducing the cost of dismissal for firms is typically found to have a positive impact on productivity and economic growth in the long run (see e.g. Autor, Kerr and Kugler, 2007; Bassanini, Nunziata and Venn, 2009). A vast empirical literature tends to confirm the theoretical prediction on the effect of EPL on labour market dualism by showing that the incidence of temporary contracts usually is higher the more rigid the regulations concerning dismissal for permanent contracts and the less restrictive the legislation about hiring on and renewal of temporary contracts (see OECD, 2014b for a survey).

The short-term consequences of liberalisation of dismissal restrictions have been less studied. In a standard search and matching theoretical model, a reduction in termination costs induces the immediate destruction of those job matches that, before the reform, were inefficient (that is, yielding negative revenue) but were not destroyed only to save adjustment costs in the expectation of a future rebound of product demand and employment needs. By contrast, due to matching frictions those job vacancies becoming viable because the reduction in termination costs has increased their expected profitability are filled only after a slow search and hiring process. In addition, newly-profitable high-risk activities may require building up new infrastructure and equipment, which takes time. This implies that, in the short run, separations would be expected to increase faster than hiring, causing employment to fall (see e.g. Mortensen and Pissarides, 1999; Cacciatore and Fiori, 2016; and Cacciatore et al., 2016).

Empirical analyses explicitly examining the short-term effects of EPL reforms on employment and worker flows are rare, since the objective of most micro-econometric studies has been to estimate the steady-state effect of these reforms. However, a few of these studies focus on a short time window around the reform and, as such, provide some evidence on short-term effects.[19] For example, von Below and Thoursie (2010) study a 2001 Swedish reform that introduced an exemption for small firms to the rigid application of the

last-in-first-out principle for the selection of redundant workers. Comparing firms just above and below the threshold, they find that the reform increased both hiring and separations in a similar way in the medium-run. However, separations increased faster in the first two years after the reform while the effect on hiring was more gradual. Malk (2013) looked at the effect of a 2009 reform that radically relaxed dismissal regulations in Estonia using Lithuania as a comparison group. She finds no significant effect on hiring in the two years following the reform, while separations, particular involuntary ones, increased. Martins (2009) evaluate the effect of a 1989 reform in Portugal which enlarged the definition of fair dismissal and somewhat simplified dismissal procedures, in particular for small firms. Comparing the effects between small and large firms, he finds no effect on separations, but a significant positive impact on hiring and thus net job creation, which however materialised no earlier than 3 years after the reform. Similar results are found by Behaghel, Crépon and Sédillot (2008), who assess the introduction in France of an exemption to the tax on firing workers aged 50 years or more. In 1992, firms were exempted from paying the tax if the employee was recruited after having reached age 50. The authors do not study the short-term effect of this reform on firing patterns, but find that the reform increased transitions from unemployment to employment for older men, with the effect becoming larger as time goes by. Overall, these studies tend to find that the impact of flexibility-enhancing reforms of dismissal restrictions on employment and worker flows tend to become more positive (less negative) over time.[20]

There is even less research on short-term effects of relaxations of EPL on earnings. Martins (2009) also explores the effect on average wages and finds that the reform reduced them by 3% in the first three years, but half of this negative effect had already disappeared two years later. Similarly, van der Wiel (2010) finds that a 1999 Dutch reform – which reduced notice periods and suppressed their dependency on worker age – had a significant negative effect on the wages of affected workers.

The short-term effects of EPL reforms have almost never been analysed in the cross-country comparative literature. The reason is that it is very difficult to control for an exhaustive list of confounding factors in cross-country/time-series empirical models. This identification issue is even more severe in the case of short-term effects since dynamic models with many lags are typically required, thereby limiting further the number of confounding factors that can be included.[21] The typical solution to solve the omitted-variable problem in macro panels is to run difference-in-difference experiments by adding to the data one additional dimension – that has to do with the predicted intensity of the effect of policy of interest while being unrelated with possible omitted factors. In the case of EPL, the literature has typically resorted to cross-country/cross-industry data, identifying the effect of regulations by comparing their effect across industries with different propensities to make staff adjustments and, therefore, where dismissal restrictions are more or less likely to be binding (see e.g. Bassanini, Nunziata and Venn, 2009; Cingano et al., 2010; Haltiwanger, Scarpetta and Schweiger, 2014; Griffith and Macartney, 2014; and Caroli and Godard, 2016). In the next subsection, this approach is used to study short-term effects of EPL reforms, how these effects vary over the business cycle and whether they differ across economies with different degrees of labour market dualism. Complementary evidence stemming from three additional country case studies is also provided.

Short-run labour market effects of EPL reforms: Evidence from industry-level, cross-country data

For the purpose of this chapter, the difference-in-difference approach is adapted to study the short-term impact of reforms of dismissal legislation on wage and salary employment (see Box 3.3) on a sample covering 22 non-agricultural/non-mining business-sector industries, 21 OECD countries and up to 27 years.[22] EPL reforms are quantified on the basis of changes in the indicator of stringency of EPL for individual dismissals of workers on permanent contracts,[23] with reductions indicating flexibility-enhancing reforms and increases indicating protection-raising reforms.[24] More precisely, to the extent that changes in the indicator are typically small and often imprecisely

Box 3.3. **Estimating the effect of employment protection reforms for regular contracts: Industry-level difference-in-difference estimates**

For the purpose of this chapter, the effects of employment protection reforms on dependent employment,[a] wages and skill shares have been estimated using a reduced-form model on industry-level data, with an approach similar to that followed in the previous section (see Box 3.2). The estimation strategy is based on the assumption that dismissal regulations are more binding on firms' behaviour in industries that, in the absence of regulation, have greater propensity to make staff adjustments on the external labour market. Formally, the model can be written as:

$$\Delta E_{cjt} = \theta_0 D_j \Delta EPL_{ct} + \sum_{k=1}^{T} \left(\theta_k D_j \Delta EPL_{ct-k} + \rho_k \Delta E_{cjt-k} \right) + X_{cjt}\delta + \nu_{ct} + \nu_{jt} + \nu_{cj} + \xi_{cjt}$$

where E measures the (log of) employment (or one of the other performance variables) in industry j country c and time t, EPL captures the stringency of dismissal regulation on permanent contracts and D stands for the propensity to make staff adjustments in response to shocks. As in the case of the previous section, the optimal number of lags is chosen on the basis of Akaike's and Bayesian information criteria. The set of bi-dimensional fixed-effects ν aim at capturing potential confounding factors, as described in Box 3.1. X stands for a vector of additional confounding factors that vary across countries, industries and years. Among these, it is key to control for (simultaneous and lagged) changes in the output gap interacted with the staff adjustment propensity, since it has been shown that more volatile industries tend to suffer from larger employment swings over the business-cycle (e.g. OECD, 2012). Following Bassanini, Nunziata and Venn (2009), the propensity to make staff adjustments is measured through US dismissal rates, and excluding the United States from the analysis. Using a benchmark defined for the United States – the least regulated country in the OECD as regards legislation for individual dismissals – avoids possible estimation bias resulting from a correlation between EPL stringency and the cross-industry dismissal distribution.[b]

The objective of this chapter, however, is to identify the short-term effect of flexibility-enhancing reforms. As the recent history of OECD countries also includes protection-raising EPL reforms that increased the EPL indicators, it is crucial to separate positive and negative changes of EPL in the analysis. Another complication is that changes in the EPL indicators are typically small, rare and measured with significant error (see OECD, 2013). For this reason, the baseline model makes use of a dummy variable taking value 1 when the EPL indicator decreases and 0 otherwise to measure flexibility-enhancing EPL reforms. A separate dummy variable taking value 1 when the EPL indicator increases and 0 otherwise is also included in the model. The estimated coefficient of the dummy for decreases in the EPL indicator captures the change in wage and salary employment associated with a reform of historically average extensiveness, as measured by the average negative changes of indicator across all reform episodes of the sample. Formally the estimation model can be written:

$$\Delta E_{cjt} = \theta_0 D_j FE_{ct} + \mu_0 D_j PR_{ct} + \sum_{k=1}^{T} \left(\theta_k D_j FE_{ct-k} + \mu_k D_j PR_{ct-k} + \rho_k \Delta E_{cjt-k} \right) + X_{cjt}\delta + \nu_{ct} + \nu_{jt} + \nu_{cj} + \xi_{cjt} \quad (1)$$

where FE and PR stand for the flexibility-enhancing and protection-raising reform dummies, respectively.

Box 3.3. **Estimating the effect of employment protection reforms for regular contracts: Industry-level difference-in-difference estimates** *(cont.)*

This approach has become increasingly popular in the literature as a way to overcome omitted variable and reverse causality issues in the analysis of the effects of EPL. In fact, all omitted aggregate institutions whose impact on the performance variable is unlikely to vary across industries as a function of their dismissal intensity are controlled for through fixed effects.[c] Reverse causality is also less of a concern in this framework since it would imply that economy-wide reforms are significantly affected by idiosyncratic fluctuations of specific industries. The sign of the estimated θ parameters can therefore be given a causal interpretation.

Rigorously speaking, the approach adopted here allows identifying only differential effects between EPL-binding and other industries. As discussed in e.g. Bassanini, Nunziata and Venn (2009) and Bassanini and Garnero (2013), inferring a lower bound to the aggregate effect of EPL reforms from interaction models such as (1) requires assuming that the sign of the effect in industries where EPL is not binding is either zero or the same as in EPL-binding industries (see also Box 3.2). In principle, this assumption would be violated if, for example, by increasing dismissals in EPL-binding industries EPL reforms expanded the supply of labour in other industries, whose employment would therefore grow. In practice, however, these *general-equilibrium* effects tend to be negligible, as discussed in OECD, 2016a. Moreover, as the effect of EPL on firms' staff adjustment policies (the *direct*, partial-equilibrium effect of EPL) depends on the extent to which regulations are binding, it is unlikely that reforms of the latter have opposite effects on these policies in binding and non-binding industries. This suggests that the sign of the estimated θ parameters provides also an indication of the sign of the aggregate effect of EPL reforms, as in standard difference-in-difference models.[d]

A quantitative estimate of aggregate effects is then derived based the same conservative assumption made in the previous section (see Box 3.2), that is, by taking into account the relative size of business-sector industries and imposing the assumption that EPL reforms would have no short-term effect on employment in an hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Finally, impulse-response functions are derived using local projection estimators *à la* Teulings and Zubanov (see Boxes 3.1 and 3.2).

The long-term effects are estimated by adapting the above model to a simple static framework assuming the strength of the effect of protection-raising and flexibility-enhancing reforms on steady-state equilibrium employment is the same:

$$E_{cjt} = \theta_{LR} D_j EPL_{ct} + X_{cjt}\delta_{LR} + \nu_{ct} + \nu_{jt} + \nu_{cj} + \xi_{cjt}$$

where the *LR* suffix indicates long-run parameters.

a) In contrast with the PMR analysis, the analysis of this section is performed in terms of the effect on wage and salary employment. In the PMR analysis, total employment was used instead, in order to exploit longer time series of reliable data, with wage and salary employment being used only in sensitivity analyses. This consideration is less important for the analysis of EPL reforms, because the sample is anyhow limited by the availability of EPL data to the post-1985 period. Wage and salary employment also appears a more suitable dependent variable since EPL reform effects are expected to be stronger for dependent employment.

b) Industry-level data on dismissals are available only for few countries, which prevents the use of the alternative benchmark-construction method adopted in the previous section.

c) As standard in this literature, the validity of the statement that other economy-wide reforms are controlled for in this framework is checked by including one-by-one interactions between the industry-specific US dismissal rate and other labour market reforms, such as of unemployment benefit generosity, labour tax wedge, collective bargaining and regulation for hiring on temporary contracts. These interactions always turn out to be insignificant as expected (see OECD, 2016a). The variables considered refer to changes in the policies and institutions that are typically included in aggregate unemployment studies (e.g. Blanchard and Wolfers, 2000, Nickell, Nunziata and Ochel, 2005, Bassanini and Duval, 2009; and Gal and Theising, 2015).

d) Clearly there might be other potential general-equilibrium mechanisms at play, offsetting the direct impact of EPL reforms. In order to check their relevance, the next subsection will compare the aggregate effects on employment computed here with those on unemployment estimated using a regression-discontinuity approach on high-frequency aggregate data. If offsetting general equilibrium mechanisms were relevant, the two exercises should lead to very different conclusions on the labour market consequences of EPL reforms. In fact, the regression-discontinuity results also clearly indicate that EPL reforms are followed by short-term costs.

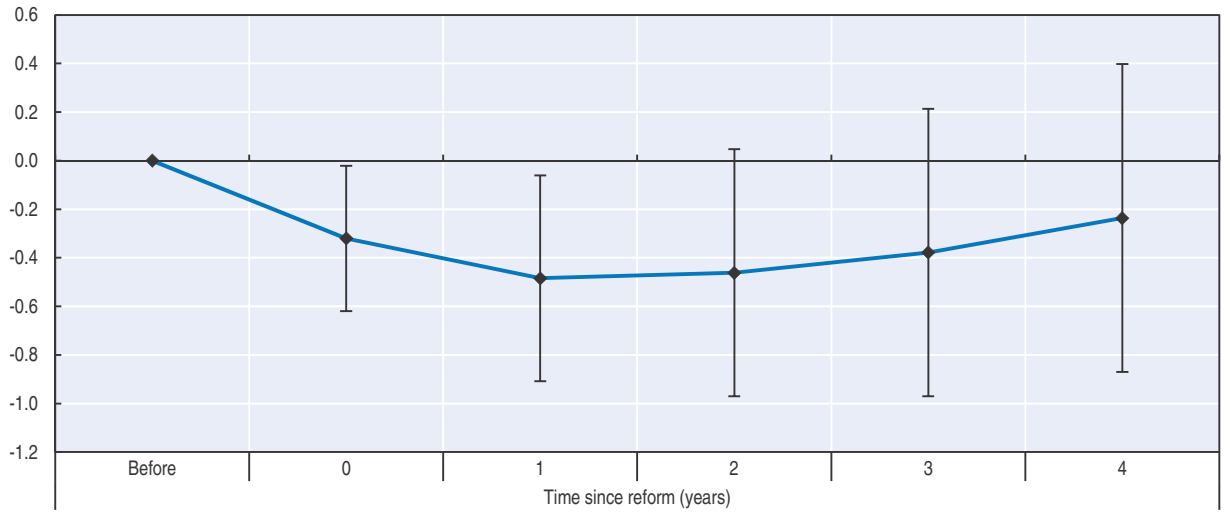
measured,[25] flexibility-enhancing EPL reforms are measured through a dummy variable taking value 1 when the EPL indicator decreases and 0 otherwise.[26] It follows that the estimated coefficients capture the change in wage and salary employment associated with a reform of historically average extensiveness, as measured by the average change across the indicator in the reform episodes of the sample.[27] The estimation procedure is based on the assumption that EPL is more frequently binding on firms' behaviour and thereby its changes have potentially stronger effects on gross worker flows and employment in industries that, in the absence of regulation, have a greater propensity to make staff adjustments on the external labour market, as measured by US dismissal rates.

Flexibility-enhancing reforms of dismissal legislation are estimated to significantly lower employment in the short run.[28] Taking the model at face value and comparing two industries that are 1 percentage point apart in terms of dismissal rates,[29] the contraction of wage and salary employment in the year following an average EPL reform is estimated to be larger by 0.29% in the most dismissal-intensive industry. Deriving aggregate effects subject to the same assumptions used in the previous section (see Box 3.3), this translates into an aggregate employment fall of 0.32% of business-sector wage and salary employment (Figure 3.5). The cumulative fall of business-sector wage and salary employment is estimated to reach a peak of 0.48% about one year after the reform, after which point employment begins to recover.[30]

The overall short-term employment cost of reforms is also significant from an economic point of view. In fact, the statistics of Figure 3.5 imply that the typical flexibility-enhancing EPL reform between 1985 and 2007 lowered the business-sector employment

Figure 3.5. **Flexibility-enhancing EPL reforms and business-sector employment**

Estimated cumulative change in business-sector employment up to four years following the reform, in percentage



Note: The figure reports point estimates and 90%-confidence intervals of the cumulated effect of changes in employment protection legislation (EPL) for regular contracts on wage and salary employment levels in the non-agricultural/non-mining business sector, obtained from difference-in-difference estimators, with levels before the reform normalised to 0. Estimates refer to the effect of an indicator variable taking value 1 when the quantitative indicator of EPL for regular contracts decreases and 0 otherwise. They can therefore be interpreted as the effect of a flexibility-enhancing reform of an average size (reducing the indicator by 0.2 points). Estimates are obtained by assuming that, in each industry, the impact of EPL is greater, the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no short-term effect on employment in an hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

StatLink http://dx.doi.org/10.1787/888933384707

growth rate in the first two years by as much as 25% – a figure that would be even larger if average employment growth is computed including the Great Recession.[31] This confirms the insight from standard search and matching models which point to a short-lived employment contraction following reforms that reduce firing costs due to an immediate increase in firing and a slow reaction of hiring (see above). In turn, the same theories would suggest that the greater – albeit temporary – unemployment induced by the reform would moderate wage claims, thereby inducing downward pressure on wages. A rough look at average patterns of hourly wages in the aftermath of the reform using the same methodology does not suggest any short-term effect of EPL reforms on average wages (Figure 3.6, Panel A). Yet, this result could be a consequence of unaccounted compositional effects since those who were fired because of the reform and would have not been laid-off otherwise are likely to have been on average less productive and less well paid than retained workers. Controlling for compositional effects, flexibility-enhancing EPL reforms appear to have a small lagged effect on wages, while no immediate effect is observed (Figure 3.6, Panel B). In particular, one year after the reform, average wages appear to be significantly lower by 0.44%[32] than in the pre-reform period. Moreover, in contrast with employment patterns, this wage contraction is still significant two years after the reform.[33]

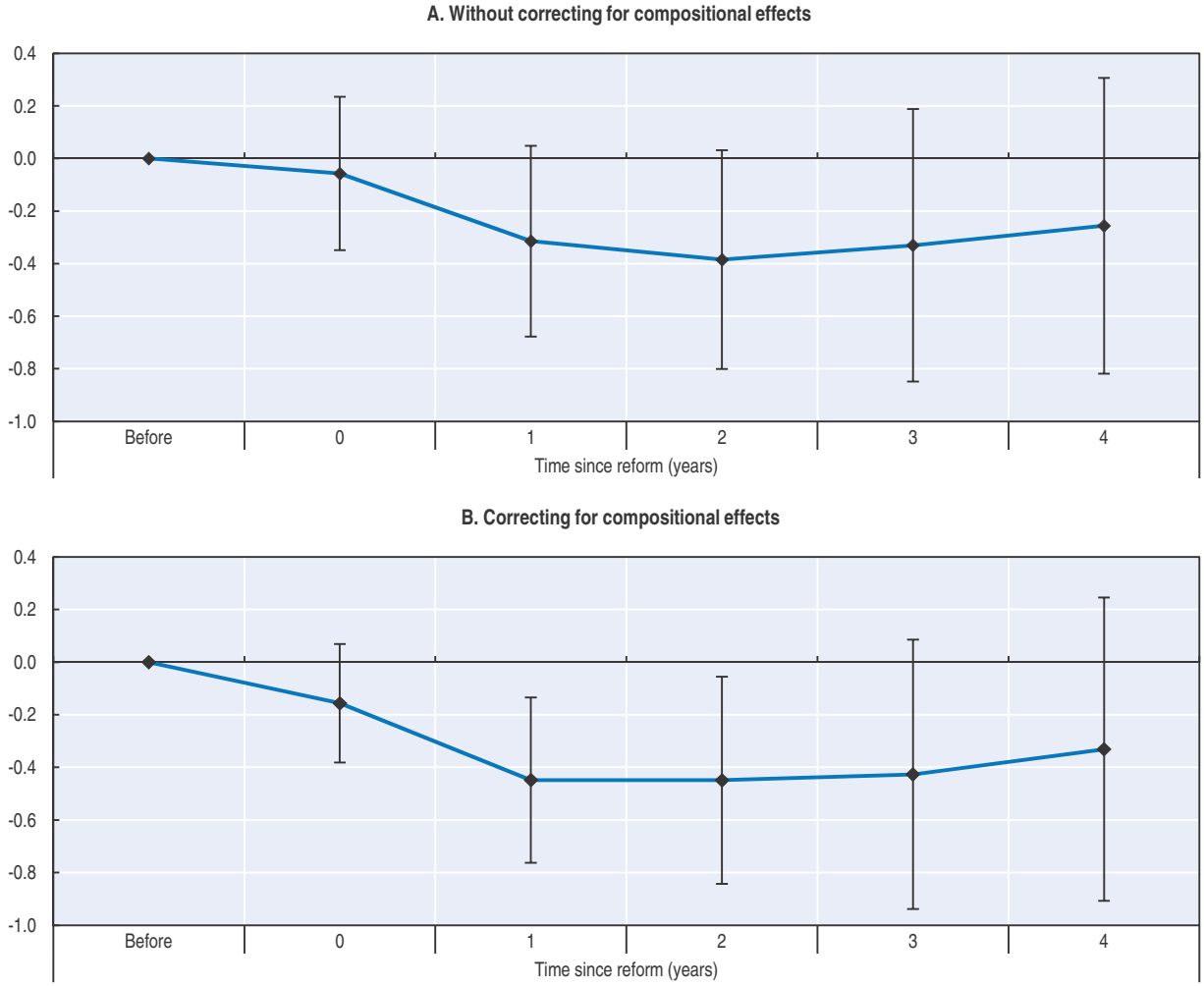
Overall, these results provide evidence that EPL reforms tend to be costly in the short run, both in terms of employment and wages, although these effects tend to disappear within few years. Does this imply that EPL reforms have no significant impact on employment and wages in the long run? As-discussed above, theory yields ambiguous predictions on the impact of EPL on employment levels in the long run and most empirical work tends to suggest that this impact is at best minor. The analysis conducted for this chapter is no exception in this respect, as shown by the first bar in Figure 3.7, which reports an insignificant negative effect of EPL reforms on wage and salary employment in the business-sector in the long run, obtained using the same methodology as above applied to a simple static model (see Box 3.3 for details).

Reforms aimed at reducing the cost of dismissals, however, are undertaken first and foremost to reduce duality and increase productivity growth in the long run. Indeed there is empirical evidence that these reforms tend to foster productivity growth and reduce the share of temporary contracts in total employment (see for example previous OECD work – e.g. OECD, 2010 and 2012; and Bassanini, Nunziata and Venn, 2009 – as well as OECD, 2013 and 2014b for surveys). In turn, greater productivity is likely to translate into higher wages.[34] Figure 3.7 indeed shows a positive long-run impact of EPL reforms on the wage level. Taking estimated coefficients at face value and under the same assumptions used to evaluate short-term effects, a flexibility-enhancing reform of dismissal legislation of average historical size would raise average hourly wages by 0.4% in the long run. This effect does not appear to be due to changes in the composition of labour. This is perhaps not surprising since EPL reforms are estimated here to have a positive effect on the relative employment of the low-skilled, which would tend, if anything, to lower average wages. The typical flexibility-enhancing reform is found to increase the share of those with less than upper secondary education in total hours worked by 0.2 percentage points, or 6.6% at the sample average.

Bélot, Boone and van Ours (2007) suggests that, from a growth perspective, the optimal level of employment protection is strictly positive since excessively lax regulations can reduce employees' incentives to invest in firm-specific knowledge. On the basis of their

Figure 3.6. **Flexibility-enhancing EPL reforms and business-sector wages**

Estimated cumulative change since the reform in business-sector average hourly wages up to four years following the reform, in percentage



Note: The figures report point estimates and 90%-confidence intervals of the cumulative effect of changes in employment protection legislation (EPL) for regular contracts on average wage levels in the non-agricultural/non-mining business-sector, obtained from difference-in-difference estimators, with levels before the reform normalised to 0. Estimates refer to the effect of an indicator variable taking value 1 when the quantitative indicator of EPL for regular contracts decreases and 0 otherwise. They can therefore be interpreted as the effect of a flexibility-enhancing reform of an average size (reducing the indicator by 0.2 points). Estimates are obtained by assuming that, in each industry, the impact of EPL is greater, the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no short-term effect on employment in a hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Figures reported in Panel B are obtained from a specification controlling for changes in wage and salary employment and the share of the low-educated in total hours worked. Confidence intervals are obtained by clustering errors on countries and industries.

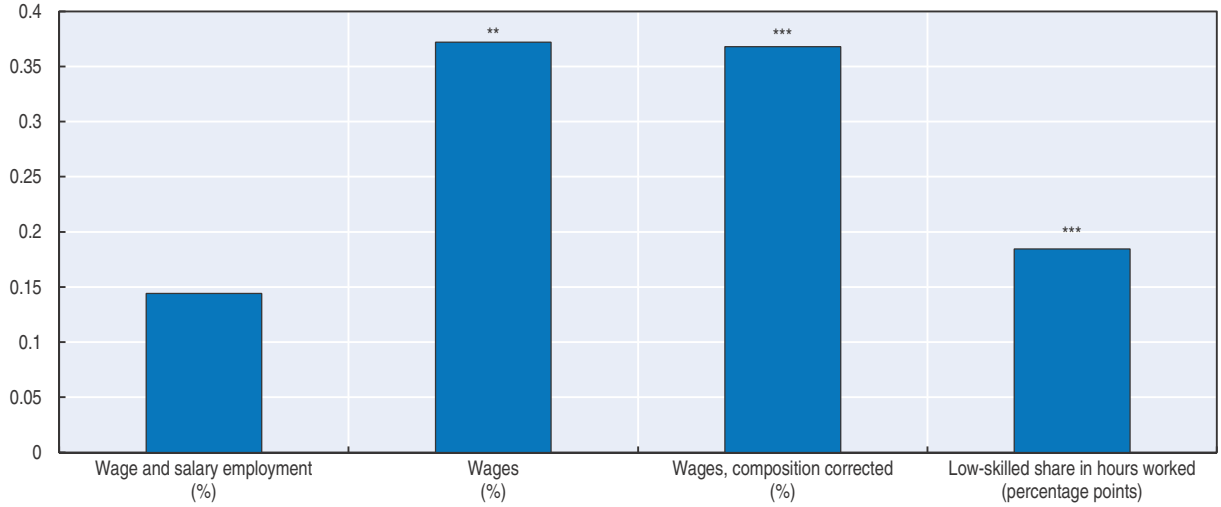
Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

StatLink http://dx.doi.org/10.1787/888933384711

theoretical work, one could expect to find a positive long-run impact of dismissal regulations on either employment or wages in countries where these regulations are less stringent. However, no evidence supporting this theory is found, when heterogeneous effects of EPL for regular contracts between high and low-EPL countries are included in the empirical model considered here. If anything, there is some weak evidence that the effect of reforms on wages becomes stronger as regulation decreases (see OECD, 2016a).

Figure 3.7. **Long-run labour market effects of flexibility-enhancing EPL reforms**

Estimated business-sector effects of a 0.2-point reduction in the EPL indicator for individual dismissals



Note: The figure reports point estimates and significance of the level of the strictness indicator for employment protection legislation (EPL) for regular contracts in the non-agricultural/non-mining business sector, obtained from difference-in-difference estimators. Estimates are normalised by multiplying them by the average annual fall in the EPL indicator computed over the sample of negative changes in that indicator. Thus, they can be interpreted as the estimated long-run impact of a reform of average size. Estimates are obtained by assuming that, in each industry, the impact of EPL is greater the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no effect on employment in a hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Reported impacts are in percentages for employment and wages and percentage points for the share of the low educated. ***, ** denote significance at the 1%, 5% level, respectively, obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

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In an economic downturn job losses are already widespread, often implying much financial hardship for households (see e.g. Venn, 2011). Assessing whether flexibility-enhancing reforms of dismissal regulations amplify job destruction when they are implemented during downturns is of key importance for policy-makers in order to evaluate the best time for enacting reforms. On the one hand, standard adjustment-cost models would suggest that the share of unprofitable jobs that survives only because of high firing costs is larger in downturns, leading to greater immediate job destruction when these costs are lifted (see e.g. Cahuc and Zylberberg, 2004; and Cacciatore et al., 2016 for a recent contribution). On the other hand, the number of firms at risk of bankruptcy soars in bad times (see e.g. OECD, 2013, Chapter 4). In this case, high dismissal costs and, in particular, binding restrictions on collective dismissals are likely to result in elevated rates of firm destruction in downturns, since in most countries firms pay no or lower dismissal costs if redundancies are due to firm closure. As a consequence, reducing dismissal costs in downturns might end up lowering the number of jobs that are destroyed, even if it increases the frequency of dismissals conditional on firm survival.

Additional results obtained by extending the models estimated in this section show that flexibility-enhancing EPL reforms appear to result in larger and longer-lasting short-run employment losses when they enacted in downturns, rather than during upturns.[35] The specifications underlying Figure 3.5 have been re-estimated after including interaction terms between EPL reform dummies and the year-on-year change in the output gap, measured at the time when the reform was implemented (see OECD, 2016a, Table 3.A2.2).[36] Estimation results suggest that employment contracts temporarily following

flexibility-enhancing EPL reforms that are enacted at all stages of the business cycle, but the estimated losses are smaller in upturns and just miss being significant when reforms are undertaken at a time when the output gap is improving by one percentage point (Figure 3.8, Panel A).[37] By contrast, a reform implemented when the output gap falls by an equal magnitude – that is in a downturn – induces an employment contraction that not only is twice as large, as in upturns, but also persists for at least two years before becoming statistically insignificant (Figure 3.8, Panel C).[38] Taking estimates at face value, if reforms are undertaken when the output gap is falling by 1 percentage point, business-sector wage and salary employment is estimated to be 0.7% lower two years after a reform of average depth than it would have been in the absence of the reform. Moreover, the estimated recovery path following the employment trough is estimated to be quite flat, whereas it is steeper for reforms enacted during an economic upturn.[39] Finally, with a stable output gap – representing approximatively the 4th decile of the distribution – flexibility-enhancing reforms of dismissal legislation induce statistically significant but short-lived employment losses (Figure 3.8, Panel B), quite similar to the baseline case (cf. Figure 3.5).[40]

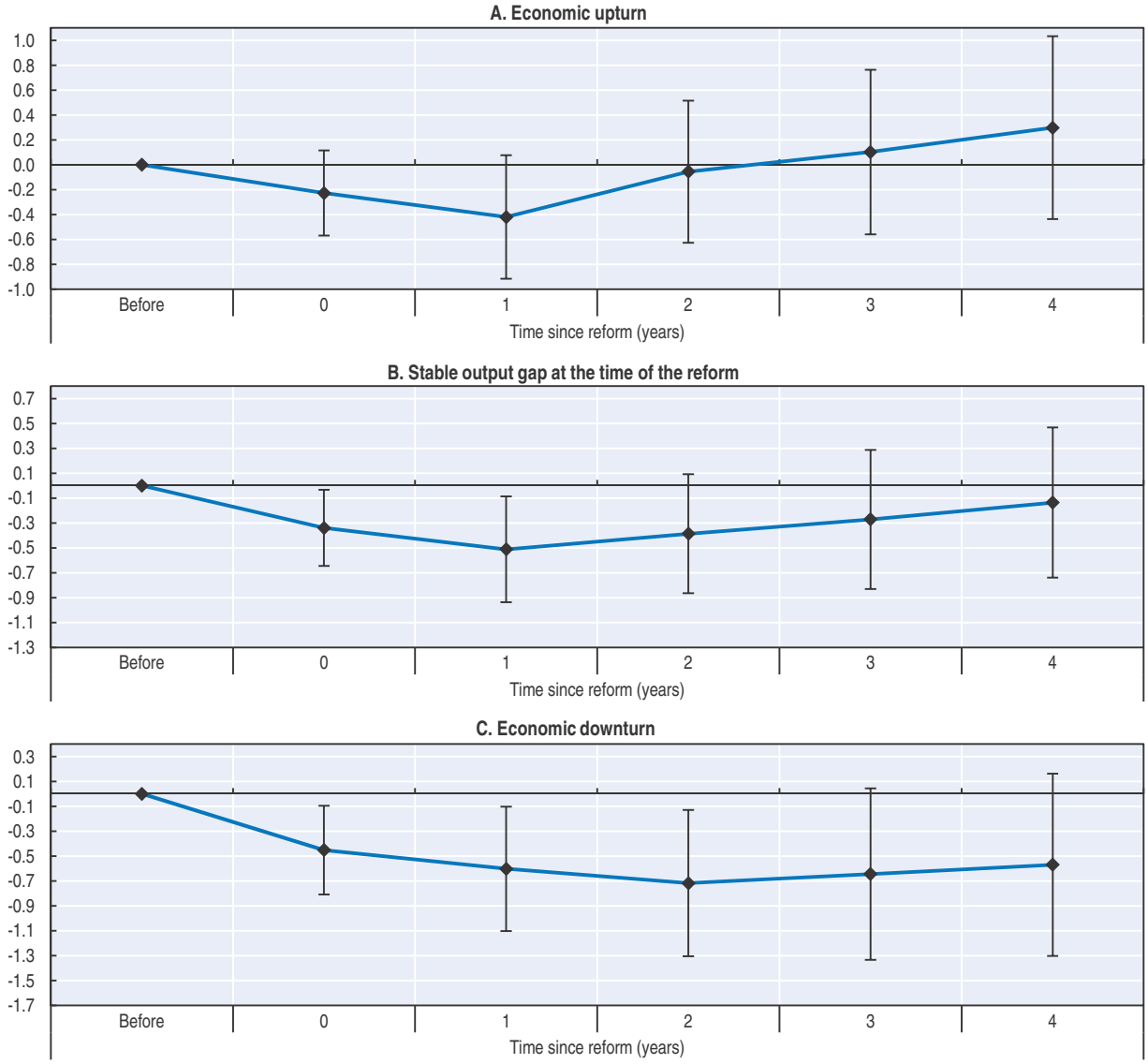
Interactions between the reform indicator and the level of the output gap (instead of its annual change) at the time of the reform were also included in a separate specification but they always turned out insignificant. This suggests that whether the economy is contracting or expanding matters more than the position with respect to potential output as regards short-time effects of EPL reforms. To put it another way, implementing reforms when the economy is starting to recover, despite being still in a situation of high cyclical unemployment, seems less likely to yield significant adverse effects on employment in the short- run than reforms implemented when the output gap is higher but falling.[41]

The evidence presented up to here is consistent with the idea that firing costs induce employers to hoard labour in bad times. That is, firms will retain some workers in jobs that, in the absence of regulation, would be terminated when the firm is hit by a negative shock and then replaced when demand perspectives improved. In dual labour markets, however, where fixed-term contracts can be used in a relatively flexible way and the gap in termination costs between open-ended and fixed-term contracts is large, employers have a strong incentive to use fixed-term contracts for positions that become uneconomical in downturns or when the firm is hit by a negative idiosyncratic shock. In fact, there is evidence that the larger the share of temporary contracts in an economy the higher the rate of separation and, in downturns, the greater the job destruction rate (see e.g. OECD, 2012; and Bassanini and Garnero, 2013). In the long run, flexibility-enhancing EPL reforms affecting regulations for regular, open-ended contracts are typically found to reduce the dualism of these labour markets (see e.g. OECD, 2010, 2014b; and Lepage-Saucier, Schleich and Wasmer, 2013). But, this type of reform can be expected to have only a limited impact on job destruction in the short-term, in dualistic economies, since temporary contracts are likely to be used to fill volatile positions and the incentive to terminate these contracts is unaffected by the reform.[42]

Estimation results suggest that the impact of flexibility-enhancing EPL reforms is insignificant in countries where the share of employees with a fixed-term contract is high (Figure 3.9).[43] For example, the employment impact of these reforms is estimated to be only marginally significant when this share is at the sample median (10.35%). By contrast, for a share of fixed-term contracts around 15%, the cumulated employment impact of these reforms is estimated to be close to 0 immediately after the reform and already higher than what would have occurred without policy action two to three years later, albeit not

Figure 3.8. **Flexibility-enhancing EPL reforms and employment in different stages of the business-cycle**

Estimated cumulated change of business-sector employment up to four years since the reform, in percentage



Note: The figures report point estimates and 90%-confidence intervals of the cumulative effect of changes in employment protection legislation (EPL) for regular contracts on average wage and salary employment in the non-agricultural/non-mining business-sector, obtained from difference-in-difference estimators, with levels before the reform normalised to 0. Economic upturn (economic downturn) stands for a scenario in which the output gap was growing (falling) by 1 percentage point at the time of the reform. Estimates refer to the effect of an indicator variable taking value 1 when the quantitative indicator of EPL for regular contracts decreases and 0 otherwise. They can therefore be interpreted as the effect of a flexibility-enhancing reform of an average size (reducing the indicator by 0.2 points). Interaction terms between EPL reform dummies and changes in the output gap are included in the specifications and used to infer the effects reported in different panels. Estimates are obtained by assuming that, in each industry, the impact of EPL is greater, the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no short-term effect on employment in a hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

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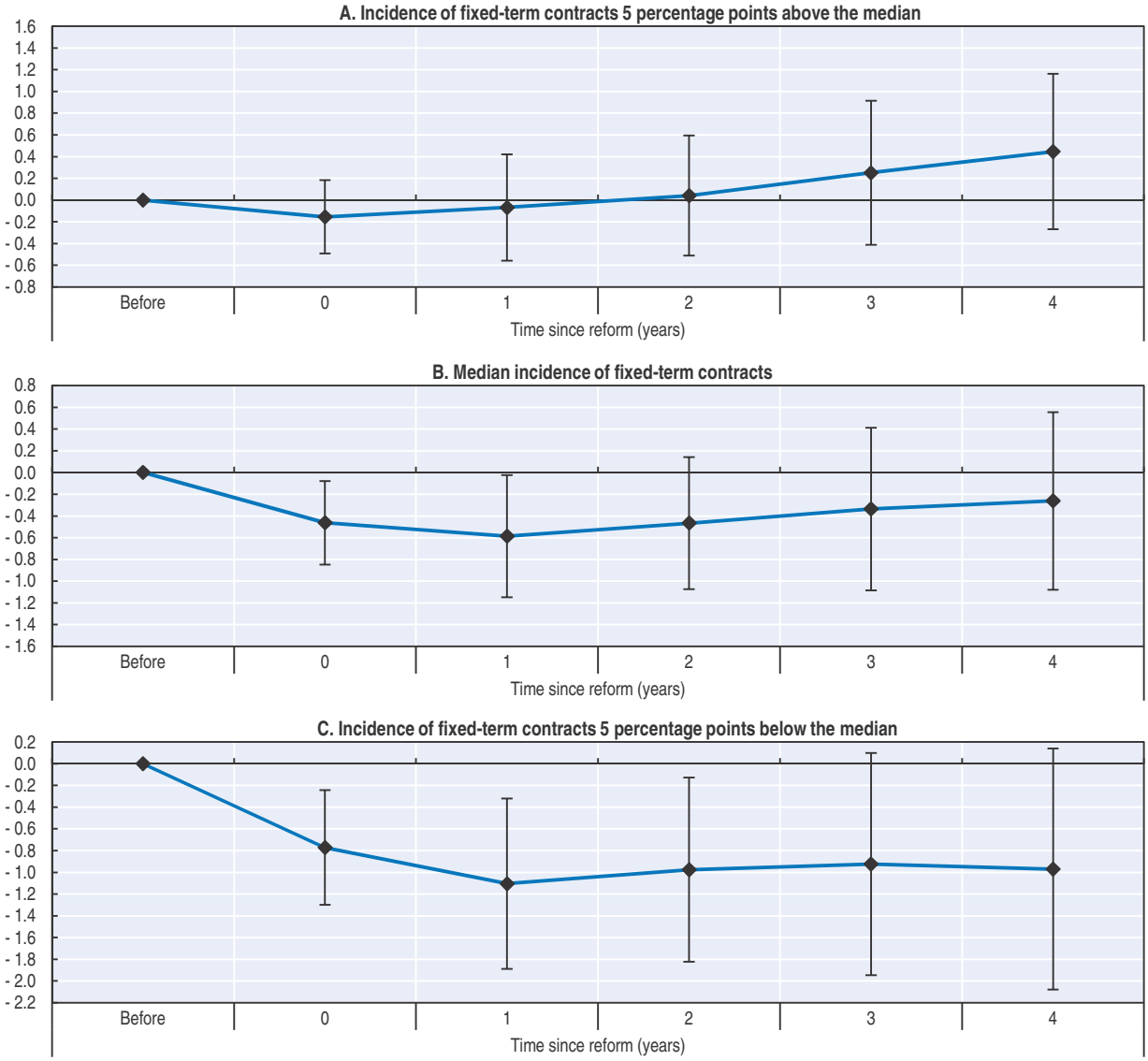
Figure 3.9. **Incidence of fixed-term contracts, flexibility-enhancing EPL reforms and employment**

Estimated cumulative change of business-sector employment up to four years following the reform, in percentage



Note: The figures report point estimates and 90%-confidence intervals of the cumulative effect of changes in employment protection legislation (EPL) for regular contracts on average wage and salary employment in the non-agricultural/non-mining business-sector, obtained from difference-in-difference estimators, with levels before the reform normalised to 0. Estimates refer to the effect of an indicator variable taking value 1 when the quantitative indicator of EPL for regular contracts decreases and 0 otherwise. They can therefore be interpreted as the effect of a flexibility-enhancing reform of an average size (reducing the indicator by 0.2 points). Interaction terms between EPL reform dummies and the average share of fixed-term contracts in wage and salary employment are included in the specifications and used to infer the effects reported in the different panels. Estimates are obtained by assuming that, in each industry, the impact of EPL is greater, the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no short-term effect on employment in a hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Incidence of fixed-term contracts is defined as the share of these contracts in wage and salary employment. Its median, computed on all observations in the sample, is 10.35%. Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

StatLink http://dx.doi.org/10.1787/888933384743

significantly so. In addition, in these more highly-dual labour markets, reforms of dismissal legislation appear to benefit low-educated workers, whose share in total hours is estimated to become quickly higher than would have occurred without the reform (Figure 3.10). As these workers are typically over-represented in fixed-term contracts and are highly-exposed to firm-specific shocks,[44] this finding tends to confirm that in dual labour markets the boost to hiring from EPL reforms tends to offset any hike in job destruction in the immediate aftermath of the policy change for the workers who are most at risk of precarious employment.

The short-term effect of reforms lowering dismissal costs on the level and composition of business-sector employment appears to be much more adverse in labour markets characterised by low incidence of temporary contracts.[45] In a country with a share of fixed-term contracts 5 percentage points below the sample median, a flexibility-enhancing reform of EPL for regular contracts of historically average depth is estimated to induce a contraction of wage and salary employment in the business-sector of up to 1.1% one year after the reform, before recovering very slowly (Figure 3.9, Panel C). Moreover, in this case, EPL reforms do not appear to have any significant effect on the skill mix of employment (Figure 3.10, Panel C).

The evidence presented in this subsection suggests that flexibility-enhancing reforms of EPL for regular contracts tend to induce short-term employment losses. These losses, however, appear to be smaller if not insignificant when reforms are implemented in booms and especially when they are undertaken in countries with a significantly dual labour market. This latter finding is remarkable in the sense that countries with dual labour markets are also those that can expect the greatest long-run benefits from these reforms, due to their impact in reducing the relative use of fixed-term contracts. The next subsection supplements this cross-country evidence by looking at a few recent reform episodes while making use of complementary identification strategies. These country studies also allow to analyse the short-term benefits of the reforms, (in particular, their effectiveness in reducing dualism).

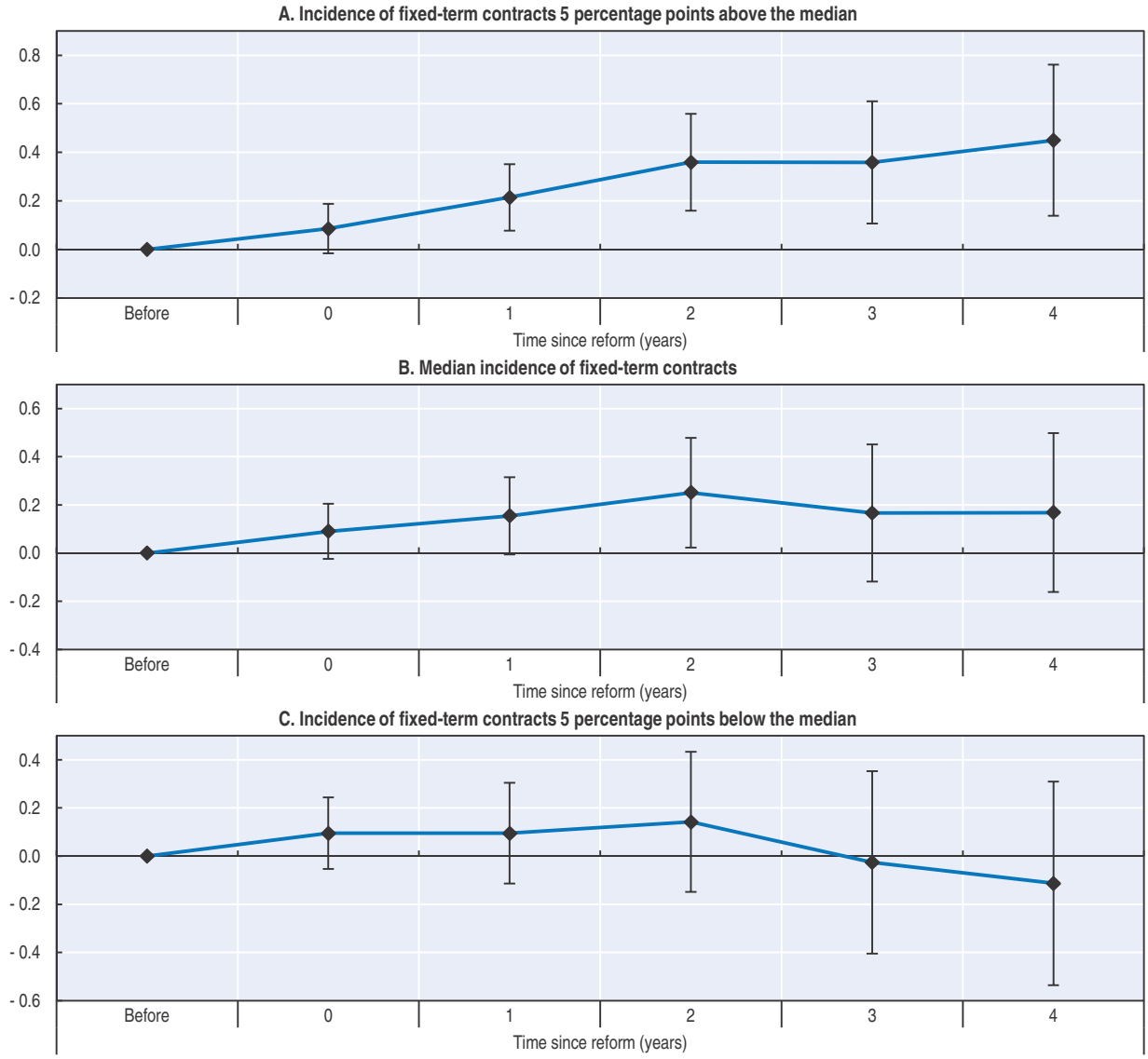
Short-run labour market effects of EPL reforms: Evidence from three country studies

This subsection studies the three, recent labour market reforms implemented in Estonia (July 2009), Spain (February 2012) and Slovenia (April 2013). Although there were important differences between these reform packages, EPL liberalisation for regular contracts was a key pillar of all of them (see Box 3.4). In the case of Estonia and Slovenia, complementary reforms in other areas played a minor role. However, in the case of Spain EPL reforms were accompanied by a simultaneous decentralisation of collective bargaining and measures allowing employers to achieve greater internal flexibility so as to avoid redundancies (e.g. by adapting hours worked, wage and working conditions). In all three cases, the change in EPL for regular contracts was large in historical perspective.[46]

In terms of the analysis of their short-run impact, the advantage of the three reform episodes considered in this subsection is that all or most of the new regulations entered in force at a single date, with subsequent changes being relatively small and by and large in the same direction. This temporal pattern allows the identification of the effects using a regression discontinuity approach (see Box 3.5). By contrast, key framework conditions, as identified by the previous subsection, differed across these countries at the time the reforms were implemented. In fact, they were introduced just after the onset of a large

Figure 3.10. **Incidence of fixed-term contracts, flexibility-enhancing EPL reforms and low-skilled employment**

Estimated cumulative change in the share of low-educated workers in total hours worked in the business-sector up to four years following the reform, in percentage points



Note: The figures report point estimates and 90%-confidence intervals of the cumulative effect of changes in employment protection legislation (EPL) for regular contracts on the share of wage and salary employees with less than upper secondary education in total hours worked in the non-agricultural/non-mining business-sector, obtained from difference-in-difference estimators, with levels before the reform normalised to 0. Estimates refer to the effect of an indicator variable taking value 1 when the quantitative indicator of EPL for regular contracts decreases and 0 otherwise. They can therefore be interpreted as the effect of a flexibility-enhancing reform of an average size (reducing the indicator by 0.2 points). Interaction terms between EPL reform dummies and the average share of fixed-term contracts in wage and salary employment are included in the specifications and used to infer the effects reported in the different panels. Estimates are obtained by assuming that, in each industry, the impact of EPL is greater, the greater the US dismissal rate in that industry. Business-sector aggregation is obtained by assuming that EPL reforms would have no short-term effect on employment in a hypothetical industry whose US dismissal rate would be equal to or lower than the first quartile of the distribution. Incidence of fixed-term contracts is defined as the share of these contracts in wage and salary employment. Its median, computed on all observations in the sample, is 10.35%. Confidence intervals are obtained by clustering errors on countries and industries.

Source: OECD estimates based on EU KLEMS and the *OECD Employment Protection Legislation Database*.

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Box 3.4. **Recent EPL reforms in Estonia, Slovenia and Spain**

In *Estonia*, a new Employment Contracts Act came into force on 1 July 2009, in the middle of a sharp GDP contraction. Notice periods were shortened and made more dependent on job tenure. Moreover, severance pay was significantly reduced, with some additional compensation being provided by the Estonian Unemployment Insurance Fund (but with no upfront cost for employers at the time of dismissal). Last but not least, reinstatement in the case of unfair dismissal was made conditional on the mutual agreement of the parties while compensation was reduced to a maximum of three months wages, except in exceptional circumstances. The only additional significant policy change brought about by the reform was an increase in employers' contributions to the Unemployment Insurance Fund from 0.9% to 4.2% of the gross wage.

The *Spanish* labour market reform was approved by the government in 12 February 2012. Substantial changes were introduced with respect to dismissal legislation. The reform redefined the conditions for a fair dismissal, specifying that a redundancy is always justified if the company faces a persistent decline in revenues or ordinary income and that the employer does not have to prove that the dismissal is essential for the future profitability of the firm. Monetary compensation for unfair dismissal was reduced by more than 25% and a much lower ceiling was introduced. At the same time, the reform removed a worker's right to interim wages between the effective date of dismissal and the final court ruling. Prior to this change, employers often exercised the option to declare a dismissal unfair and pay upfront the corresponding compensation, so as to close the procedure and avoid paying interim wages. Indeed, this was the most commonly-used dismissal mechanism by employers before the reform rendered it obsolete. Finally, the reform eliminated the requirement that employers obtain administrative authorisation for collective redundancies. The reform of EPL was also accompanied by a large reform of collective bargaining which allowed increased flexibility on the intensive margin. In particular, a greater priority was given to collective bargaining agreements at the firm level over those at the branch or regional level and firms were allowed greater latitude to opt-out from a collective agreement and adopt measures to enhance internal flexibility so as to limit job destruction. In addition, the reform limited the extension of collective bargaining agreements to a maximum period of one year after their expiration in the absence of agreements on their renewal.

A new Employment Relations Act entered into force in *Slovenia* on 12 April 2013. The proposed reform reduced notice periods, making them more dependent on service duration. A few amendments were also made to severance pay. Moreover, the reform suppressed the requirement that employers provide proof of having attempted redeployment within the company before making redundancies. In addition, opposition by trade unions can no longer delay the date of dismissal. The reform was accompanied by some changes as regards temporary contracts. In particular, it is no longer possible for employers to hire a series of workers on fixed-term contracts to fill the same post for a cumulative period of more than two consecutive years. In addition, the reform has imposed a maximum quota on temporary-work-agency employment in the user-firm, if fixed-contracts are used. Unemployment insurance contributions are no longer paid for the first two years after hiring a worker on an open-ended contract, while they were increased for fixed-term contracts.

Source: OECD (2013, 2014b); Malk (2013).

Box 3.5. **Estimating the impact of EPL reforms using regression-discontinuity models**

The estimation strategy followed in this subsection identifies the joint effect of all the provisions included in each reform by comparing labour market performance before and after the date when the reform took effect. Two performance variables are examined: the standardised unemployment rate and the share of open-ended contracts in new contracts (new hires plus conversions). The key identification assumption is that, conditional on control variables included in the model, labour market performance evolves in a relatively smooth way, so that any discontinuous jump in performance can be attributed to the labour market reform (and other institutional changes occurring simultaneously). In order to properly isolate the effect of the reform from that of the business-cycle (which is key for the validity of the smoothness assumption), the estimation models include a number of aggregate covariates and, most importantly, polynomial time trends up to the 5th order. Following standard practice (see e.g. Imbens and Lemieux, 2008; and Card and Lee, 2008), polynomial trends are allowed to differ before and after the reform). The general regression-discontinuity model, which is estimated on monthly data, can be written as:

$$P_t = Y_t\beta + \delta I_{t>R} + \sum_{s=1}^{5}\lambda_s(t-R)^s + \sum_{s=1}^{5}\mu_s I_{t>R}(t-R)^s + D_t + \varepsilon_t$$

where P is the performance variable (unemployment rate or share of permanent contracts) at time t, R is the date of the reform, I is the indicator function (which equals 1 after the reform and 0 before), D stands for monthly dummies, and Greek letters stand for parameters to be estimated, except for ε, which represents a standard error term. The sample window covers five years before the reform and two years after.[a] Y is a vector of aggregate confounding factors that include the changes in the logarithms of the industrial production and real turnover in the retail sector,[b] when the unemployment rate is the dependent variable, and the level and change in the unemployment rate as well as the share of youth and older workers in new contracts, when the share of open-ended contracts is the dependent variable.

The parameter of interest is δ. A significant estimate for this parameter suggests a significant impact of the reform. In order to account for the possibility that the effects of the reform are short-lived, an additional dummy is included that takes value 1 one year after the enforcement date in certain specifications.

Misspecification of the empirical model might cause a discontinuous shift in performance around the date of a reform even when this shift occurs before the reform (and cannot therefore be attributed to it). To validate the empirical model, in the light of this possibility, placebo tests are run by fictitiously setting the value of R to some date preceding the reform (but sufficiently close to it). If discontinuous shifts in performance are really induced by the reform, then no effect should be found at these earlier dates. This is the case for all the results discussed in this subsection, where placebo tests are run by anticipating the date of the reform by three months (see OECD, 2016a).

A second issue concerns possible manipulations around the threshold. For example, if the reduction in firing costs were anticipated, employers could delay firing to the post-enactment period in order to take advantage of the new rules. As an additional robustness check, baseline models are re-estimated by excluding from the sample a three-month window centred on the reform date. While this appears a sufficiently long period in the case of Spain,[c] it could remain too short in the case of Estonia and Slovenia. In Slovenia the elements of the bill concerning the EPL reform were made public in June 2012, although the final approved text was much different from the initial bill. In Estonia, the new draft of the Employment Contracts Act was made public in the first half of 2008. The results presented in this subsection are however robust to excluding the period from June 2012 to May 2013 for Slovenia and from July 2008 to July 2009 in Estonia, which suggests that these findings are not invalidated by manipulation issues.

a) Standardised unemployment rates are from the OECD Labour Force Statistics. Industrial production and retail turnover are from national statistical offices (Eurostat in the case of Estonia). The shares of open-ended contracts, youth and older workers in new contracts are from national administrative sources (SEPE for Spain as well as SRDAP and IMAD for Slovenia).

b) These indicators are lagged three months to take into account lags between output shocks and employment effects (see e.g. OECD, 2012). The three-month window was chosen because that maximised the significance of these variables.

c) The details and breadth of the Spanish reforms were never mentioned in the programme of the party that won the November 2011 elections and were not made public until well after the inaugural address that the Prime Minister gave in front of the parliament at the end of December 2011 (see OECD, 2014c for more details). It is therefore reasonable to assume that if threshold manipulation occurred, that is if firms postponed certain choices until the approval of the reform, this phenomenon concerned, at worst, only the period January-March 2012.

Figure 3.11. **Incidence of fixed-term contracts in total wage and salary employment and new hires**

Percentage of wage and salary employees with a fixed-term contract, 2006-07 and 2011-12

Note: Estonia, Slovenia and Spain are indicated in black.
Source: OECD calculations based on *OECD Labour Force Statistics Database* and EU LFS microdata.

StatLink http://dx.doi.org/10.1787/888933384766

downturn in Estonia, while they were undertaken at or close to the crisis trough in Slovenia and Spain. Moreover, Estonia, on the one hand, and Slovenia and Spain, on the other hand, represented two extremes in terms of labour market dualism before the reforms: Estonia was one of the countries with the smallest share of fixed-term contracts in the OECD, while Slovenia and Spain were close to the top of that distribution, both in terms of stocks and as regards hiring patterns (Figure 3.11).

Table 3.1 presents the estimated average unemployment effect of the reforms in the first two years as obtained from regression-discontinuity models. Conditional on observable controls and a 5th order polynomial time trend, the Spanish reform is estimated to have had no short-term consequences on unemployment. By contrast, the reforms in Slovenia and Estonia appear to have been associated with an increase in the unemployment rate of at least one half of a percentage point (representing at least a 5% increase in unemployment).[47] Most of the increase in unemployment was concentrated in the first year of implementation. Indeed, in both cases, the post-reform unemployment hike is estimated to have become statistically insignificant in the second year following the reform.[48]

Results from regression-discontinuity models such as those presented in Table 3.1 must be taken with much caution, however, since, by design, estimated coefficients capture the effects of all other changes occurring in the same month of the reform, provided that they are not controlled for by observable confounding factors. Moreover, standard errors in Table 3.1 are remarkably large suggesting that these models deliver relatively imprecise estimates, particularly in the case of Estonian and Spanish reforms.[49]

In the case of Estonia, however, additional evidence can be obtained by considering individual data from the European Labour Force Survey and using other Baltic countries as a control group, as suggested by Malk (2013).[50] In particular, Lithuania appears to be a

Table 3.1. **Recent EPL reforms and unemployment**

Estimated average effect within two years from the reform in percentage points

	Estonia	Slovenia	Spain
Estimated average effect (% points)	1.92***	0.55*	0.08
	(3.29)	(1.88)	(0.13)
Observations	84	84	84
R-squared	0.995	0.990	0.997

Note: The dependent variable is the standardised unemployment rate. Estimates based on regression-discontinuity models fitted on monthly data. Each specification controls for the three-month-lagged changes of the industrial production and retail turnover indexes, a 5th order polynomial time trend (heterogeneous between the pre- and post-reform period) and month dummies. Robust t-statistics are in parentheses. ***, **, * statistically significant at 1%, 5% and 10% levels, respectively.

Source: OECD calculations based on *OECD Labour Force Statistics Database*, and aggregate time series from Eurostat, Instituto Nacional de Estadistica (INE) and Statistical Office of the Republic of Slovenia (SORS).

StatLink http://dx.doi.org/10.1787/888933385026

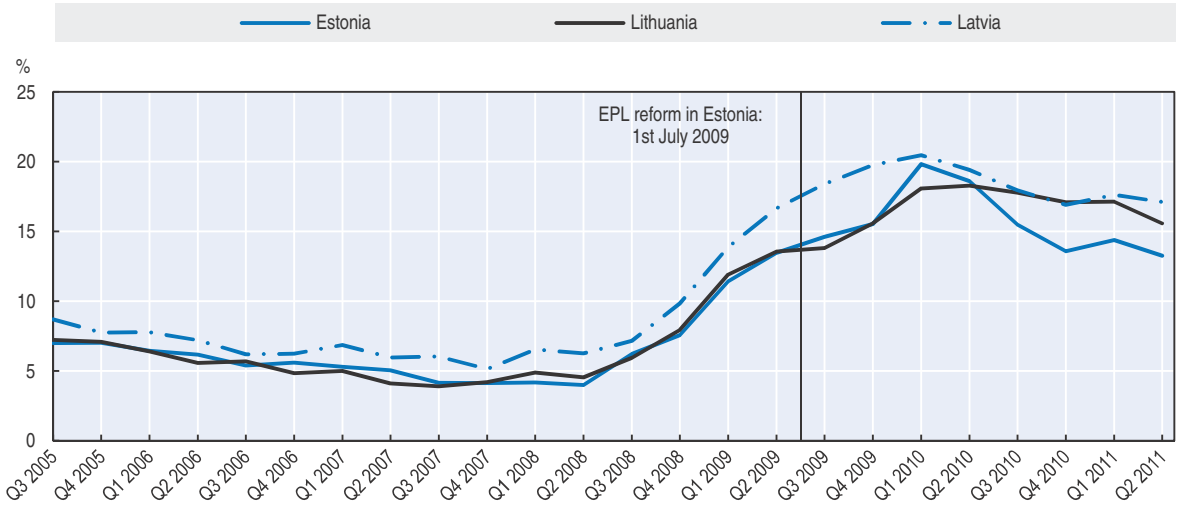
suitable control group: both countries are small open-economies with the same trading partners; they display a similar evolution of real GDP, industrial production and retail turnover before and after July 2009 (see OECD, 2016a, Figure 3.A2.5); before the Estonian reform they were characterised by very similar trends in unemployment (Figure 3.12) as well as stocks and flows of temporary contracts (see Figure 3.11 above); and no significant changes in labour market policies and institutions occurred in Lithuania in this period. This suggests that different unemployment performance after the Estonian reform could be cautiously attributed to that policy intervention.

A simple comparison of the time series of the unemployment rates in the Baltic States after July 2009 suggests that unemployment did rise faster in Estonia in the first year after the reform, when it was 0.7 percentage points above the Lithuanian one on average, with a peak reached in the first quarter of 2010. After that peak, the Estonian unemployment rate went down more rapidly than in the other Baltic countries, and two years after the reform it was lower than in both Latvia and Lithuania.

However composition effects and confounding factors might be in play. In particular, despite many similarities in the demographic structure of the labour markets of the two countries (see e.g. Malk, 2013), the Estonian labour market is more open to immigrants (with 14% of employment being foreign born in 2009 against only 4% in Lithuania). As immigrants are often at higher risk of unemployment in recessions (see e.g. OECD, 2015a), not controlling for this factor could overstate the adverse effect of the Estonian reform. On the other hand, the Lithuanian business-cycle appears to lag slightly behind the Estonian one (see OECD, 2016a, Figure 3.A2.5), which could instead understate the effect of the reform. In order to overcome these issues, a probit model is estimated on the joint sample of the two countries in which the probability of being unemployed in a given month is a function of a large set of individual and aggregate covariates and is allowed to diverge between Lithuania and Estonia in the aftermath of the Estonian reform.[51] This difference-in-difference model suggests that the Estonian reform was associated with an average 1.5-percentage-point increase in the probability of being unemployed – significant at the 5% level – in the two years following the reform (see OECD, 2016a, Table 3.A2.9), a figure strikingly close to that estimated with regression-discontinuity aggregate models (cf. Table 3.1 above).[52]

Figure 3.12. **Evolution of the unemployment rate in the Baltic countries**

Q3 2004-Q2 2011, in percentage of the labour force



Note: The vertical line indicates the date of enforcement of the Estonian labour market reform (1 July 2009, that is at the beginning of Q3 2009).

Source: OECD calculations based on quarterly EU Labour Force Survey microdata.

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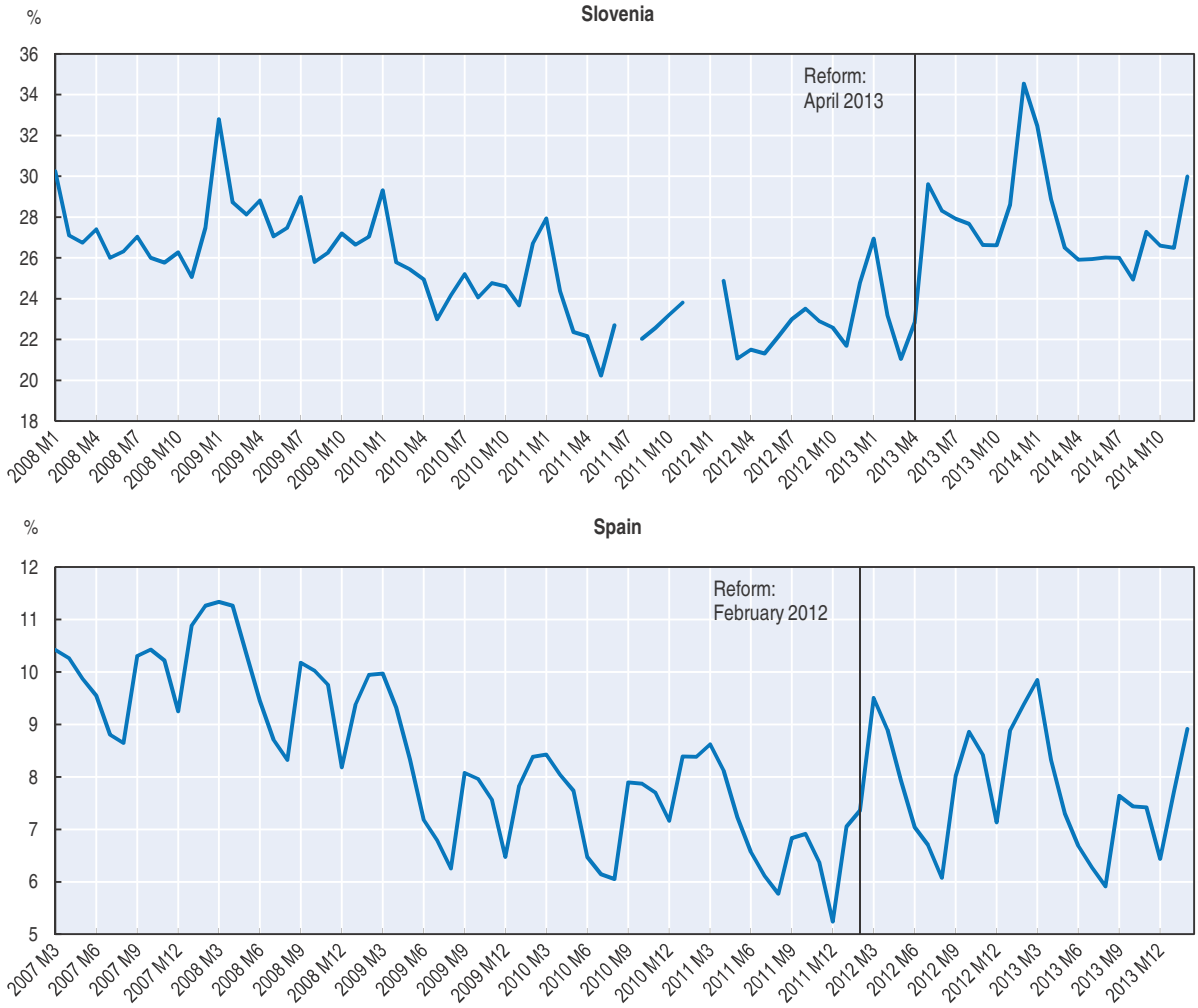
Overall the estimates presented in this subsection appear consistent with the findings emerging by the estimation of industry-level difference-in-difference models presented above and tend to confirm that flexibility-enhancing EPL reforms may induce some short-term employment losses. A crucial question is, therefore, how fast benefits from these reforms materialise. Empirical evidence available in the literature suggests that benefits in terms of productivity growth may take time to unfold fully (see e.g. Autor, Kerr and Kugler, 2007; and Bassanini, Nunziata and Venn, 2009). By contrast, it seems natural to expect that, by reducing the gap in termination costs between open-ended and temporary contracts, flexibility-enhancing reforms should immediately raise the share of the former in total hiring (see e.g. Lepage-Saucier, Schleich and Wasmer, 2013).

Administrative data available for Spain and Slovenia shed some light on the latter issue by looking at the monthly evolution of new contracts (including any change of contracts with the same employer). Visual examination of the raw time series suggests that in both countries the reforms stopped (and possibly managed to reverse) the downward trend in the share of open-ended contracts in new contracts (Figure 3.13).[53]

These reforms occurred, however, in a period of large economic fluctuations. This suggests that visual inspection of the time series should be handled with care. For this reason, regression-discontinuity models similar to those estimated for unemployment were fit by replacing the dependent variable with the share of open-ended contracts and adjusting the list of confounding factors (see Box 3.5). Baseline estimates suggests that, in the two years following EPL reforms, the average share of open-ended contracts in new contracts increased by 10.8 and 3.1 percentage points in Slovenia and Spain, respectively (Table 3.2). In both cases the increase amounted to almost 50% of the share of open-ended contracts before the reforms – a large impact in economic terms.[54] Moreover, the analysis reveals that this dualism-reducing effect was already sizable in the first year.[55]

Figure 3.13. **Share of permanent contracts in new contracts in Slovenia and Spain**

Percentages



Note: The vertical lines indicate the date the labour market reforms came into effect. The Slovenian data exclude groups of ten Social Security registrations with the same employers on the same day. Data for July and December 2011 as well as January 2012 were excluded from the figure, since administrative changes implied a re-registration of a large number of existing contracts.

Source: OECD calculations based on data from Servicio Público de Empleo Estatal (SEPE), Statistični register delovno aktivnega prebivalstva (SRDAP) and Institute of Macroeconomic Analysis and Development (IMAD).

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These findings are robust to excluding observations close to the reform date (see OECD, 2016a, Table 3.A2.8).[56] Moreover, as in the case of unemployment-rate regressions, placebo experiments in which the date of each reform is fictitiously anticipated by three months yield insignificant results, confirming that the observed shift in the share of open-ended contracts did not occur before the reform. Interestingly, a more disaggregate analysis suggests that 80% of the impact of the Spanish reform is due to new hires and only 20% is due to conversions.[57]

Overall, these findings suggests that extensive EPL reforms, such as those considered in this subsection, tend to quickly modify the hiring patterns of employers by strengthening the relative attractiveness of open-ended contracts with respect to temporary contracts. In other words, the benefits in terms of reducing dualism emerge very rapidly. However, this

Table 3.2. **Recent EPL reforms and share of permanent contracts in new contracts**

Estimated average effect within two years from the reform in percentage points

	Slovenia	Spain
Estimated coefficient (% points)	10.82***	3.12***
	(6.46)	(6.41)
Observations	63	84
R-squared	0.932	0.978

Note: The dependent variable is the share of permanent contracts in new contracts. Estimates based on regression-discontinuity models fitted on monthly data. Each specification controls for level and changes in the standardised unemployment rate, the share of youth and older workers in new contracts, a 5th order polynomial time trend (heterogeneous between the pre- and post-reform period) and month dummies. The specification for Slovenia excludes data for July, December and January of each year. Robust t-statistics are in parentheses. *** statistically significant at the 1% level.

Source: OECD calculations based on *OECD Labour Force Statistics Database* and data from Servicio Público de Empleo Estatal (SEPE), Statistical Office of the Republic of Slovenia (SORS), Statistični register delovno aktivnega prebivalstva (SRDAP) and Institute of Macroeconomic Analysis and Development (IMAD).

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encouraging evidence must be considered in combination with the findings presented above suggesting that flexibility-enhancing EPL reforms might also engender temporary declines in total employment. Indeed, the results reported in this section are remarkably consistent in suggesting that non-negligible employment contraction (and unemployment expansion) is likely to follow EPL liberalisations – despite the variety of methodologies employed. This is especially the case if reforms are undertaken in the middle of a downturn (before the crisis trough) and in less dual labour markets.[58] Yet, the comparison of the Spanish and Slovenian experiences, where reforms were undertaken at approximatively the same point of the business cycle and in a similar context in terms of dualism, suggests that complementary reforms can be put in place that limit short-term adverse effects on employment. Indeed, the Spanish EPL reform was accompanied by a major reform of collective bargaining. The next section examines reform design and complementary policy actions that are likely to minimise or even offset potential short-term costs of flexibility-enhancing structural reform (and/or limit their short-term negative effects on individual welfare).

3. Designing structural reforms that limit short-term costs

The results shown in this chapter suggests that the expansionary stage of the business cycle is the best time to implement reforms of product and labour market regulations, at least as regards minimising their possible short-run employment costs. However, there are political economy reasons why many reforms take place during economic downturns and this heightens the importance of strategies to minimise the associated short-run costs.

There is considerable evidence that structural reforms – defined in the broadest sense to also include, e.g. fiscal, trade and capital-market reforms – are typically undertaken in bad economic times (e.g. Drazen and Easterly, 2001), when it is easier to form large coalitions favouring policy changes. This occurs for several reasons. On the one hand, crises increase the perception that there is no alternative to reforms. As Dani Rodrik put it, "reform naturally becomes an issue only when policies are perceived not to be working. A crisis is just an extreme case of policy failure" (Rodrik, 1996, p. 27). On the other hand, severe deterioration of economic performance may lead interest groups to accept more easily reforms requiring them to give up some of their advantages, either in exchange for greater long-run benefits or under the social pressure of other groups whose conditions are worsening (see e.g. Drazen, 2000). In the words of John Williamson, "a sufficiently acute

crisis may also create a consensus that the old order has failed and needs to be replaced, leading individuals and groups to accept that their special interests need to be sacrificed (along with those of other special interest groups) on the altar of the general good" (Williamson, 1994, p. 19).

The argument that costly reforms are more easily implemented in bad times might also be applied to liberalisations of dismissal regulations, insofar as the share of protected workers shrinks in downturns, while the number of workers who are unemployed or precariously employed expands and this latter group increasingly demands policy action. This argument is also likely to apply to the case of rent-reducing reforms affecting specific industries to the extent that policy-makers can then argue that a more equal sharing of the costs of the economic crisis requires measures to reduce the rents enjoyed by specific firms and workers. However, the political equation is complicated. For example, the demand for protection of insiders is also likely to become more intense in bad times, as unemployment risk increases, and this can induce governments to postpone costly reforms. In practice, there is some evidence that EPL reforms become more frequent in economic downturns, although many of them appear to have been undertaken only close to or after recession troughs.[59] By contrast, there is no evidence that reforms of barriers to entry in network industries are undertaken more frequently in bad than in good times.[60] Moreover, comparing the reform patterns in retail trade and professional services in recent years with those of the pre-crisis period suggests that reforms in these sectors are also no more frequent in bad times than in good times (Koske et al., 2015).

A growing body of macroeconomic research strengthens the case that structural reforms undertaken in bad economic times should be coupled with complementary policy actions to minimise adverse effects. This includes the recent debate in the theoretical literature as regards whether structural reforms should be accompanied by expansionary macroeconomic policy (e.g. Eggertsson and Krugman, 2012; Correia et al., 2013; and Cacciatore et al., 2016). Similarly, recent model-based simulations calibrated to the euro area countries indicate that reforms implemented when monetary policy has hit the zero lower bound would magnify the negative effect of the high uncertainty characterizing downturns on job creation (Eggertsson, Ferrero and Raffo, 2014). However, it is hard to find a consensus for expansionary fiscal policy in a period of mounting government debt. Similarly, in the present context of weak recovery from the deep financial and economic crisis, the margin of manoeuvre for monetary policy can be limited as interest rates are already closed to the zero or even negative. This might require the use of unconventional monetary policy such as expanding the central bank's balance sheet and channelling liquidity to the real economy (see e.g. Coeuré, 2014).

In these circumstances EPL and PMR reforms could also be accompanied by additional labour market reforms. The remainder of this subsection reviews evidence from recent country experiences to shed light on possible policy packages and reform designs that are likely to reduce or even fully offset short-term costs of EPL and PMR reforms, especially those undertaken in bad economic times.

Scaling-up activation strategies in times of crisis?

During the past three decades, many OECD countries have sought to transform their welfare states by linking benefit systems with services to promote employment, so-called "activation" strategies. Effective activation policies typically combine measures to ensure that jobseekers have the *motivation* to search actively and move quickly to a new job with

actions to expand labour demand and *opportunities* – for example, increasing the range of job vacancies registered with the public employment service (PES) – and interventions to increase the *employability* of those who are less employable – who are typically offered intensive case management and placement services, and/or participation in other programmes such as training or subsidised employment (see OECD, 2015b).

It is often suggested that active measures have little net impact in a recession because the economy is demand-constrained and "there are no jobs". *A fortiori*, one would be tempted to apply this argument even more forcefully to situations where job losses are increased by specific structural reforms undertaken in downturns. In the recent recession, however, many of the countries with a strong activation approach, such as, for example, Australia, Austria, Norway, Switzerland and the United Kingdom, did not allow unemployment spells to become passive and experienced relatively modest or short-lived increases in unemployment (OECD, 2013, 2015b). There is also some evidence that training has a more positive impact in bad than in good economic times (because of a weaker "lock-in effect" – see e.g. Lechner and Wunsch, 2009; Nordlund, 2009; and Kluve, 2010). This finding is particularly important in the context of structural reforms, since workers who are displaced because of the new policy measures and would not have been made redundant otherwise are likely to require requalification and guidance towards new careers.

Systems that work better in the case of displaced workers are geared around early interventions of the PES, possibly occurring already during the notice period. However, various factors including lack of incentives for both employers and workers can make early intervention ineffective in practice (OECD, 2015c). Providing better incentives to various actors involved in these interventions, including employers and employees may help to address these challenges. On the employer side, sanctions for non-compliance of the legislation concerning advance notice of mass layoffs are used as one way to improve employer incentives to co-operate with public authorities early on. On the worker side, in order to ensure early contact with employment services, several countries have resorted to extending job-search obligations to workers even before the announced date for employment termination. For example, in Switzerland, as part of the required job-search efforts, unemployed workers also need to give proof of job-search activities between dismissal notification and the first interview at the PES to receive unemployment benefits (Duell et al., 2010). A similar preventative approach was adopted in Germany as part of the Hartz reforms, where workers are obliged to register as jobseekers three months before their job ends or, for those with shorter notice, within three days after receiving notice of dismissal (Mosley, 2010). This registration obligation allows the PES to make referrals to vacancies before the first unemployment benefit payment. In Sweden, effective early interventions is achieved through the co-operation of social partners in setting-up specialised institutions (Job Security Councils) that provide re-employment services to workers on notice of displacement and are funded by employer contributions, which has, however, the drawback of increasing the tax wedge (OECD, 2015d).

Even though there is some evidence that certain activation programmes that were set up during a recession worked well (see e.g. Michaelides, 2013; Martins and Pessoa e Costa, 2014), there are limits to how rapidly active labour market policies can be set-up or up-scaled when unemployment rises in an economic downturn. The effective functioning of the PES, as well as high-quality training and job creation measures, all depend on having assembled the necessary skilled professionals and infrastructure, such as buildings, equipment and IT systems, where rapid change has an up-front organisational cost. As a

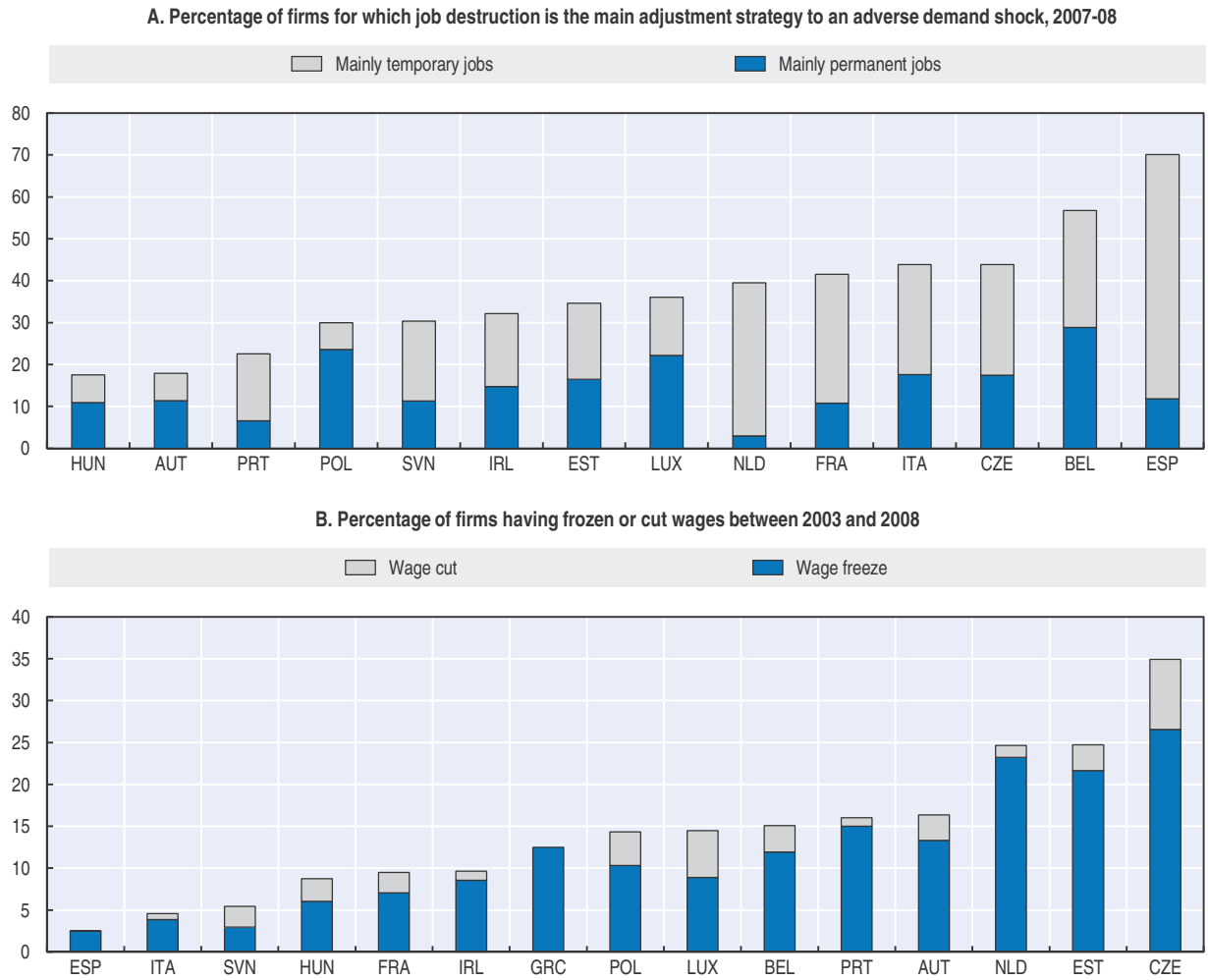
result, scaling up efforts during an adverse shock may be difficult (OECD, 2015b), except when the upscaling in downturns is well planned in advance and fully integrated in the functioning of the system (as in Denmark and Switzerland). Indeed, fine tuning these types of organisational changes in order to make them effective typically takes several years (see OECD, 2013). It is therefore probable that structural reforms have more modest adverse effects where an effective activation strategy is already in place or where specific rapid-intervention packages have been previously set-up in anticipation of liberalisation reforms.[61] However, it is unlikely that combining reforms of product market and dismissal legislation in bad economic times with simultaneous activation reforms would reduce adverse employment effects in the short run.

Reforming collective bargaining: Evidence from Spain

Decentralising collective bargaining and facilitating the possibility for employers to opt-out of higher level agreements in times of crisis could dampen the short-term job destruction induced by PMR and EPL reforms. It has often been argued that centralised or co-ordinated bargaining allows wage-setters to internalise externalities associated with wage increases and may thus deliver better outcomes in terms of average unemployment over the business cycle. However, these bargaining structures may also impede idiosyncratic wage adjustments in times of crisis which can be a major problem if the variance of firm or industry shocks is large. Bargaining at the sectoral (or regional) level often induces cross-sector imitation, pushing wages upwards in boom times and delaying the required wage adjustments in times of crisis. The relative flexibility associated with firm-level bargaining, by contrast, allows a better adjustment of wage growth to firm-level productivity growth, and may thus contribute to saving jobs in bad times insofar as they allow firms to use margins other than employment (e.g. wages, working time or working conditions) to adjust to negative shocks (see e.g. OECD, 1994, 2006; Flanagan, 1999; Haucap and Wey, 2004; and Boeri, 2014).[62] In practice, two-tier systems combining firm-level and multi-employer agreements are common. In most countries with a two-tier system, however, the so-called "*favourability principle*" implies that firm level agreements are applicable only if they are more favourable to employees than higher-level agreements. The evidence suggests that this setup leaves firms as unable to adjust wages and working hours as their peers in systems covered only by branch agreements (Boeri, 2014).

The 2012 labour market reform in Spain coupled a relaxation of dismissal regulations with greater flexibility in the collective bargaining system (see Box 3.2 above). Before the reform, the latter was essentially a two-tier system with branch and regional agreements dominating firm-level agreements. Derogation clauses were possible, but they were seldom applied since they could be voided by a court ruling. This helps to explain why the Spanish economy was characterised by a strong reliance on employment adjustments to absorb shocks. For example, before the onset of the crisis, the main adjustment strategy to a demand shock for about 70% of Spanish firms was to reduce employment – mainly by suppressing temporary jobs – while this strategy was preferred by only 40% of firms, on average, in other EU countries according to the Eurosystem's WDN Survey (Figure 3.14, Panel A). In fact, wage cuts or wage freeze were very rarely undertaken by Spanish firms in the five years preceding the crisis (Figure 3.14, Panel B). Evidence from the follow-up WDN surveys show that wage cuts and wage freezes remained much less frequent in Spain than in most other European countries until 2012, despite the severity of the Great Recession in that country (European Central Bank, 2010; and Boeri and Jimeno, 2015).

Figure 3.14. **Adjustment strategies to adverse shocks used by European firms before the crisis**



Note: Countries are selected on the basis of available data.
Source: Eurosystem's WDN Survey (Fabiani et al., 2010; Babecký et al., 2009; European Central Bank, 2010).

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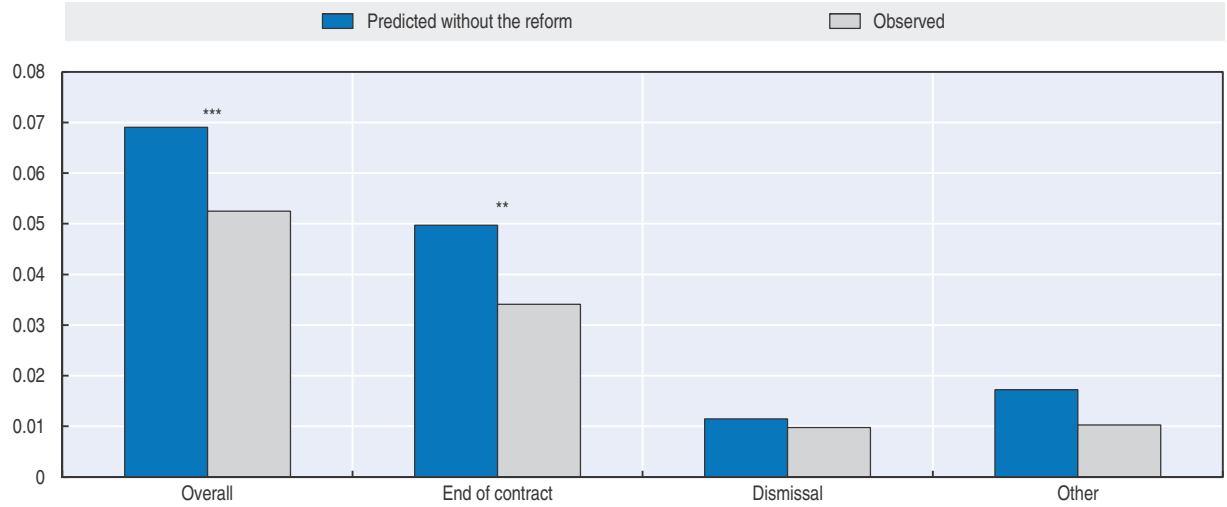
The 2012 reform raised the incentives for firms to adopt internal-flexibility measures as an alternative to terminations. In particular, it introduced the principle of the dominance of firm-level agreements over higher-level agreements. It also made it easier for employers to opt-out of collective agreements or to introduce internal-flexibility measures even in the absence of consensus among social partners at the company level, while simultaneously reducing the possibility that these derogations could be voided by a court ruling (see OECD, 2014c for more details). At the same time, the reform simplified firing procedures and reduced the associated costs to employers. As a consequence, the overall effect of the reform package on job losses was *a priori* ambiguous.

The available evidence suggests that the reform resulted in a marked reduction of separations, particularly for temporary workers. Estimates of regression-discontinuity models similar to those used in the previous section show that the average separation rate fell by 24% in the aftermath of the reform (Figure 3.15; see OECD, 2014c, for more details). The aggregate effect is almost entirely driven by contract terminations for temporary workers (which fell by almost one-third), while no impact is found on dismissal rates.

Figure 3.15. **The effect of the 2012 labour market reform in Spain on quarterly separation rates at the establishment level**



Note: The figure shows predicted average establishment-level separation rates in the post-reform period as obtained from the estimation of a regression-discontinuity model on quarterly data for the period 2006-12. "Predicted without the reform" indicates the empirical predictions of what separation rates would have been in the absence of the reform. For each establishment, separation rates are defined as the ratio of separations in a quarter divided by the average of total employment between the start and the end of the period. The asterisks refer to the significance level of the estimated effect of the reform on each separation rate. ***, **, * significant at the 1%, 5% and 10% level, respectively.

Source: OECD estimates on the basis of data from the Encuesta de Coyuntura Laboral (ECL). See OECD (2014b) for the detailed estimation method and results.

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The differential effect on separations by type of contract sheds light on the possible complementarity between EPL and collective-bargaining reforms. In principle, terminations of temporary contracts should not be much affected by an EPL reform lowering the costs of dismissals on permanent contract. Hence, the fall in temporary-contract termination rates can be interpreted as the effect of the measures facilitating internal flexibility as an alternative to job destruction. In turn, this implies that dismissal rates would have significantly increased absent these measures.[63] This suggests that, in countries with higher level collective-bargaining regimes, coupling reforms relaxing employment protection with others geared to make collective bargaining more flexible can effectively offset short-term job losses.[64]

Grandfather clauses in EPL reforms

One way to dampen the upsurge of dismissals following EPL reforms is to introduce "grandfather clauses". This means preserving workers' accrued entitlements at the date of the reform, for example by applying the new rules only to new hires or allowing workers to choose between their entitlements with the new rules and those with the old rules, but with the old rules applied as if the dismissal occurred on the date the reform was enforced.[65] From a theoretical viewpoint, this type of reform should have no impact on dismissals since it does not lower the cost of destroying existing job matches. By contrast, new vacancies would become *ex ante* more profitable, since the expected cost of destruction (i.e. in the case of a negative shock) is lower. The combination of these two effects should in principle result in a temporary increase in the number of new hires and employment levels (the so-called "Honeymoon effect", see Boeri and Garibaldi, 2007). As

time goes by, the share of employees eligible for the old, more protective rules shrinks via attrition, so that the dismissal and separation rates increase and, possibly, employment goes down to the initial level. On the negative side, such a reform is likely to delay the effect of EPL liberalisation in improving overall reallocation and efficiency, by temporarily maintaining inefficient job matches. By preserving the protection level of current insiders, grandfather clauses in EPL reforms are also likely to weaken the initial impact on reducing labour market segmentation.[66]

The limited available evidence suggests that EPL reforms with grandfather clauses indeed allow avoiding the expected short-term negative effects and actually have a small positive impact on employment and hiring on permanent contracts in the short run.[67] For example, Kugler, Jimeno and Hernanz (2005) find that the 1997 Spanish reform that introduced a new type of open-ended contract with lower protection had, in the first three post-reform years, a positive effect on employment levels of eligible groups with respect to non-eligible ones. Similarly Sestito and Viviano (2016) use data from one Italian region (Veneto) to evaluate the 2015 Jobs Act that introduced a new type of contract for large employers with no right to reinstatement in case of unfair dismissal. This new contract applies to all new hires on open-ended contracts since 13 March 2015. By comparing firm hiring behaviour just above and just below the threshold of eligibility, the authors find that, in the first 9 months of implementation of the new regulations, the share of open-ended contracts in new hires and the rate of conversions from temporary to permanent contracts increased significantly in the Veneto region. Similarly, current work undertaken by the OECD to evaluate the recent reforms of dismissal regulation in Portugal shows, using a difference-in-differences approach, that the large reduction of severance pay, implemented with preservation of accumulated rights by means of three reforms between 2011 and 2013, resulted in an expansion of on-the-job search, hiring and the share of open-ended contracts in new hires, but had no effect on transitions from employment to non-employment (OECD, 2016b).[68] Overall, these findings suggest that grandfathering of EPL reforms might effectively dampen short-term employment costs. However, more research is needed to investigate the effects on economic efficiency and inequality when this type of clauses is applied.

Sustaining the income of displaced workers: Evidence from the United States

A few countries that reformed dismissal regulations during the Great Recession tried simultaneously to cushion the earnings losses of the displaced workers by raising average income levels during the unemployment spell. They did so by making the unemployment benefit system more universal and, in some cases, raising benefit levels for the lowest-income households.[69] Whether unemployment benefit generosity should be pro-cyclical, however, is the subject of an intense debate. The answer depends on whether the effects of benefit generosity on individual welfare (through better opportunities of consumption smoothing) and on agents' behaviour (such as recipients' job-search effort and firms' labour-demand) also vary with the cycle.[70]

Most of the recent evidence on these issues is based on the extension of potential benefit duration in the United States during the recent recession (and its phasing-out). Unemployment insurance in the United States is available for up to six months following job loss in normal times in most states, plus 20 additional weeks in states experiencing high unemployment rates. In past recessions, the Congress has frequently authorised additional weeks of insurance on an ad hoc basis. In June 2008, the Congress enacted the

Box 3.6. **The US unemployment insurance system and the business-cycle**

Since the Social Security Act of 1935, in the United States unemployment insurance (UI) benefits are normally available for 26 weeks [under the joint federal-state Unemployment Compensation (UC) programme]. The conditions for eligibility (e.g. regarding individual work history and wages preceding job loss, availability for work and active job search) vary across states as do the benefit levels, typically amounting to about half of the claimant's pre-separation weekly wage. States provide most of the funding and pay for the actual benefits provided to workers; the federal government pays only the administrative costs.

Normal UI benefits can be supplemented and extended, through a combination of permanent and temporary programmes, during episodes of economic distress. The permanent Extended Benefits (EB) programme, enacted in 1970, provides up to 20 weeks of additional unemployment compensation in states whose unemployment rate is above a specified threshold. Typically, an overall unemployment rate above 8% combined with a 10% increase in the unemployment rate over the previous two years triggers a 20-week extension (a rate above 6.5% is required for a 13-week extension). Normally the federal government and the states split the cost of EB, but the 2009 Recovery Act temporarily authorised full federal funding, which continued through 2013.

In response to the recent Great Recession, Congress further enacted the Emergency Unemployment Compensation (EUC) in 2008. This was a temporary programme further extending the maximum benefit period which was fully funded at the federal level. At its peak, after four tiers of extensions, the EUC provided up to 34 weeks of emergency federal benefits in all states and up to 53 weeks in states with unemployment rates of 8.5% or higher. Overall, between November 2009 and September 2012, individuals in states that met eligibility requirements for EB and all EUC tiers could receive up to 99 weeks of UI payments (26 weeks of regular benefits, 20 weeks of EB, and 53 weeks of EUC). Starting in September 2012, many states had become ineligible for EUC tiers and EB benefits due to declines in their unemployment rates. Moreover, the maximum number of UI weeks available was lowered from 99 to 93. The programme expired in 2013. Since January 2014, no state has had UI benefits available beyond the normal duration.

Source: US Social Security Administration (1997); Isaacs and Whittaker (2014); Whittaker and Isaacs (2015); and Hagedorn, Manovskii and Mitman (2015).

Emergency Unemployment Compensation (EUC) programme, which, in a series of extensions, brought maximum statutory benefit durations to as long as 99 weeks between late 2009 and 2013, when it expired (see Box 3.6).

Recent work focusing on individual job search response to such extensions found only small effects on the duration of unemployment spells (Rothstein, 2011; and Farber and Valletta, 2015). More specifically, these studies found that benefit extensions slightly reduced the exit rate from unemployment, but this largely occurred through increased labour force attachment (i.e. higher incentives to engage in and report active job search, increasing the recorded active population) rather than reduced job finding. Marinescu (2015) showed that this latter finding can be explained (at least in part) by the increased hiring rate per application sent (a "search externality" whereby non-eligible job seekers benefit from the lower job search by benefit recipients).[71]

The evidence on the role of labour-demand externalities – which would imply that lower number of applicants for each job and/or higher reservation wage would induce firms to post fewer vacancies – is more controversial. Using random variation in

the application of extension rules in the recent recession,[72] Chodorow-Reich and Karabarbounis (2016a, 2016b) find that extension of potential benefit duration had only very limited effects on overall unemployment and the reservation wage of the unemployed during the recession. By contrast, Hagedorn et al. (2013, 2015) argue that the extensions had a strong negative impact on job creation. They obtain this result by exploiting the geography of benefit extensions as well as their recent abrupt withdrawal on 1 January 2014. Comparing neighbouring county pairs exposed to different reductions in potential duration (i.e. due to being located in different states) they estimate very large positive effects of the benefit cut on labour demand, concluding that 1.8 million additional jobs were created in 2014. However, this result is contradicted by Marinescu (2015) who finds no effect of the benefit extensions on vacancies posted on a large American online job aggregator. Furthermore, she shows that the border county design cannot recover the causal impact of unemployment insurance on applications and vacancies due to large cross-county spillovers. In particular, she shows that employment and unemployment levels of residents in the smaller county of a pair are more heavily affected by benefit generosity in the larger county than by benefit generosity in their own county, which invalidates Hagedorn et al. (2013, 2015) identification strategy.

Finally, several studies have considered the possibility that the positive effect of benefit generosity on duration might not be exclusively driven by moral hazard. In the presence of imperfect credit and insurance markets, unemployment benefits allow liquidity-constrained unemployed individuals to smooth consumption, thereby increasing welfare while continuing to search for a good job match (see, for example, Chetty, 2008). Using cross-state/over-time variation in unemployment duration and consumption patterns in the United States, Kroft and Notowidigdo (2011) found that that the elasticity of consumption levels to benefit generosity increases more during economic downturns than the elasticity of unemployment duration. These results could be affected by omitted cross-state institutional changes, but Schmieder, von Wachter and Bender (2012b) find consistent results exploiting a German age-discontinuity in benefit entitlement on a large microdata sample. In particular, they find that the effect of potential unemployment insurance duration on the length of non-employment spells is at worst slightly negative in bad times, while the effect on the duration of benefit receipt is strongly countercyclical. These findings appear to be due to the fact that benefit exhaustion increases dramatically in slumps and suggest that the liquidity-constraint effect dominates the moral hazard effect during economic downturns.

Overall, the available evidence suggests that extending unemployment benefit programmes in bad times has, at worst, no adverse welfare effects. This suggests that countries characterised by relatively low benefit entitlements (or tight eligibility rules) and undertaking structural reforms in bad times could consider cushioning their short-term effect on displacement by temporarily extending benefit durations and/or enlarging benefit coverage. Such measures are likely to be more effective if coupled with strict enforcement of rigorous job-search requirements to limit moral hazard (as discussed above). Yet, the policy would be costly and, as discussed above, harder to implement in countries with large and mounting government debt.

Conclusions

This chapter investigated the short-term effects of reforms that ease anti-competitive product market regulation and employment protection legislation. The key finding of the

chapter is that, while yielding benefits in the long run, these reforms can entail short-term employment losses. This cost is higher in industries most directly affected by the reforms and when the policies are introduced during downswings. By contrast, the estimated employment losses are much smaller and statistically insignificant when reforms are implemented during upswings. Moreover, reforms of dismissal legislation appear to have no adverse effects in segmented labour markets with a high share of fixed-term contracts – those where this type of reform is likely to be most needed.

While these results suggest that it might be desirable to enact regulatory reforms of product and labour markets at the beginning of a recovery or during an expansionary phase, political-economy considerations may often induce policy makers to make structural reforms during economic downturns, when it is easier to build sufficient political support for action. The chapter discusses the pros and cons of complementary policies that can be put in place to minimise short-term employment costs and/or cushion their impact on the income of workers who lose their jobs – such as activation schemes, reforms of collective bargaining and/or temporary extensions of unemployment insurance. The choice of complementary policies crucially depends on the available resources and on the availability of the necessary infrastructure (particularly regarding effective early interventions during the period of unemployment). In the case of the relaxation of dismissal regulations, grandfathering could be an alternative way of reducing short-run costs, albeit at the price of slowing the beneficial effects of the reform on efficiency and segmentation.

Notes

1. A good insolvency regime should inhibit premature liquidation of sustainable businesses, favour a rapid reallocation of resources in case of bankruptcy and offer bankrupt entrepreneurs the chance for a "fresh start". According to the World Bank indicator measuring weaknesses in existing insolvency law (see World Bank, *Doing Business Database 2016*) several OECD could better address existing procedural and administrative bottlenecks (including Turkey, Hungary, Poland Greece, Italy, Israel, Spain and Mexico).
2. For a discussion of the case of the European Single Market, see European Commission (2015a).
3. In the European Union, for example, government expenditure on works, goods and services represents around 19% of EU GDP, accounting for more than EUR 2.3 trillion annually (European Commission, 2015b). Distortions to competition can be associated with the several steps and criteria used in the tendering procedures, or deriving from the market power and potential abuses of the public buyer (see Graells, 2015).
4. The base sample covers annual data from EU KLEMS for the period 1975-2007 for three industries (energy, transport and communication) as defined in the ISIC Rev. 3 classification (these industries representing an intermediate level between 1 and 2-digits of that classification). Countries in the sample include: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, the Netherlands, Poland, Portugal, the Slovak Republic, Spain, Sweden, the United Kingdom and the United States. For those countries for which OECD STAN data are available, the time coverage of the sample is extended to the period 1975-2012 by collating EU KLEMS data with data from the last version of OECD STAN. As this dataset adopts the ISIC rev.4 classification, a mapping has been established by using employment data at the 3-digit level from EU LFS (tested on years for which both classifications are available). Such mapping is however imperfect and breaks in the industry classification can severely alter the estimated short-run dynamics; moreover, the extension likely exacerbated measurement error. Accordingly, in this chapter, the collated sample is used only in sensitivity analyses. The analysis of the effect of barriers to entry mainly focusses on total employment, since reliable EU KLEMS data for dependent employment are not available for most countries before the mid-1980s. Results are however robust to replacing total employment with wage and salary employment as dependent variable.

5. The analysis exploits the ETCR section of the *OECD PMR Database* (see Koske et al., 2015, and the references therein for more details on the data and methodology underlying the *PMR Database*). The ETCR indicators measure the level of regulation in three network industries: Energy (electricity and gas), Transport (air, rail, road transport) and Communications (post and telecommunications). More specifically, this chapter focuses on the sub-indexes capturing legislated entry barriers and vertical integration (when applicable), varying from 0 (lowest regulation) to 6 (highest regulation). For example, in the case of the electricity industry, the indicator of industry-specific entry barriers is the simple average of three sub-indicators concerning third-party access (free, regulated, no access), existence of a wholesale pool and minimum consumption threshold that consumers must exceed in order to be able to choose their electricity supplier. The ETCR indicators have now been computed for a time series spanning the years 1975 up to 2013. Table 3.A3.1 in OECD (2016a) reports the latest available values by network industry. Looking at the time patterns of the indicators suggest that product markets have been almost exclusively subject to deregulating reforms, with rare episodes of re-regulation.

6. For reference, more than one-sixth of the reform episodes in the sample implied a fall of the index of at least one point in one year. In one third of the reform episodes in the sample a one point fall is obtained cumulating changes over two consecutive years. Based on the methodology illustrated in Conway and Nicoletti (2006), a 1-point reduction in the regulation index could be obtained, for example by: guaranteeing regulated third party access (TPA) to the electricity transmission grid *and* liberalising the wholesale market for electricity; allowing free entry to competitors in at least some markets in gas production/import *and* opening the retail market to consumer choice; removing regulations restricting the number of competitors allowed to operate a business in national post or other courier activities; removing restrictions on the number of airlines allowed to operate on domestic routes; or disallowing professional bodies or representatives of commercial interests from specifying or enforcing pricing guidelines or entry regulations in road transport. In the data, changes by 1 point or more in the indicator correspond to, for example, the implementation of the British Telecommunications Act in 1982 (opening a second fixed link network in competition with British Telecom), or the Electricity Act and the unbundling of the UK Central Electricity Generating Board (CEGB) in 1989; the Canadian National Transportation Act (NTA) and Motor Vehicle Transport Act (MVTA) of 1988; the Japanese Telecommunication Laws of the late 1980s and the Australian Telecommunications (Consumer Protection and Service Standards) Act of 1999; the 2003 French Electricity Law allowing any EU supplier to trade on the French territory (and more broadly the consequences of the EU liberalisation directives of the electricity and gas markets adopted since the mid-1990s).

7. Note that the response function plotted in Figure 3.1 does not account for the estimated contemporaneous effects, which might be affected by simultaneity or reverse causality biases. As shown in Figure 3.A1.2 of OECD (2016a), factoring these effects in would make the short-term negative impact of entry deregulation on employment significantly larger.

8. Bassanini (2015) shows that these results are also robust to including additional industry-level confounders such as the growth in intermediate inputs and real value added.

9. This was obtained allowing the estimated impact of changes in the regulation at *t* to vary depending on the level of regulation being above/below the sample median at *t-1*.

10. The average annual growth rate of total employment in network industries was a tiny 0.014% between 1990 and 2007 (and -0.039% between 1990 and 2012).

11. By contrast, these results differ from those of Bouis, Duval and Eugster (2015) who do not find significant short-term employment costs of reforming network industries using industry-level OECD STAN data. Two factors might explain this difference. One is that in the most updated *STAN Database*, before 2008 ISIC Rev. 3 industries are mapped into ISIC rev.4 through an inevitably imperfect conversion table. By increasing measurement error, this might bias estimates towards 0. The other is that Bouis, Duval and Eugster (2015) use a large-reform approach, in which reforms events are identified through a dummy variable taking value 1 if the indicator changes by more than two standard deviations. The difference between their results and those presented here could suggest that large reforms induce a more rapid entry of new competitors thereby speeding up hiring and limiting short-term costs relative to the case of smaller or more gradual reforms.

12. The average estimate is an employment loss of around 1.8%, but this estimate is nowhere near being significant at standard levels of statistical acceptance.

13. These supply side effects might be aggravated by negative interactions with aggregate demand. This would be the case, for example, of reforms implemented when monetary policy has hit the zero lower bound (ZLB), according to recent model-based simulations calibrated on the case of euro area countries (Eggertsson, Ferrero and Raffo, 2014). Absent the room for appropriate accompanying monetary stimulus, structural reforms would not support economic activity in the short run, and may well be contractionary. In the model, this occurs because reforms fuel expectations of prolonged deflation, increase the real interest rate, and depress aggregate demand.

14. EU KLEMS data report quality-adjusted deflators for ICT goods and services, but the database relies on national deflators for the remaining industries (Timmer et al., 2007). This issue is particularly important for the analysis because hedonic deflators are much less frequently-used in services.

15. Bourlès et al. (2013) show that, if markets for intermediate inputs are imperfect and downstream firms have to negotiate with (and share their rents with) service suppliers, then high regulation would increase suppliers' market and bargaining power, reducing incentives to improve efficiency downstream. Their framework also allows for greater entry upstream favouring competition among users, as access to downstream markets is constrained by the amount and quality of available inputs. For example, they argue that restrictive licensing or business conduct regulations in transport services would discourage development of efficient and innovative distribution channels.

16. The base sample covers annual data from EU KLEMS for the period 1975-2007 and the same countries as in the previous subsection with the exception of the United States (whose input intensities are used to construct the interaction term). The industry classification is an intermediate level between 1 and 2 digit levels of the ISIC Rev. 3 classification, and corresponds to the 2-letter NACE Rev. 1 classification. As in the previous subsection, the sample is extended to cover the period 1975-2012 in robustness checks.

17. With weighted estimation, each country-industry cell is weighted by its employment share (average taken over 1975-2007). Hence, larger industries in each country contribute more to the estimated coefficients. With unweighted estimation, each cell is attributed the same weight.

18. The results are also robust to the choice of the input intensity measure (United States vs. average).

19. There is a more abundant literature studying short-term effects of reforms tightening the stringency of dismissal rules (e.g. Autor, Donohue III and Schwab, 2006; Autor Kerr and Kugler, 2007; Marinescu, 2009; Kugler and Pica, 2008; Centeno and Novo, 2012; and Cingano et al., 2016). However, the impacts of protection-raising and flexibility-enhancing EPL reforms are not necessarily symmetric. It is therefore not obvious that findings concerning the effect of the former could be used to predict the impact of the latter.

20. The only exception is Bauer et al. (2007), who study the short-lived increase in the exemption threshold for certain EPL rules in Germany in the 1990s. In 1996, the size threshold for exemption from certain limitations concerning fair dismissal was raised from five to ten employees. A new government, however, moved this threshold back to five in 1999. Bauer et al. (2007) compare firms just above and just below the 10-employee threshold and find no impact on either hiring or separations in the three years in which the new threshold was active.

21. For example, Bouis et al. (2012a) analyse the effect of several structural reforms using a dynamic model with several lags but including policies one at a time. It is therefore impossible to gauge whether estimated effects are due to the policy under study or to other policy changes occurring at a close-by date. Moreover, the approach followed by Bouis et al. (2012a), by focussing only on large reforms, appears particularly unsuitable to study the effects of liberalisations of dismissals, which are relatively rare events. As a result of adopting that approach, the estimated effect of EPL in that study depends entirely on only two EPL reforms (Spain in 1994 and Korea in 1998). These issues apply to large extent also to IMF (2016) that controls for large reforms but not for small but frequent policy changes in other institutions.

22. The base sample covers annual data from EU KLEMS for the period 1985-2007 and the same countries and industries as in the previous section with the exception of the United States (whose dismissal rates are used as a benchmark) and Korea (because output-gap data are unavailable). As in the previous section the sample is extended to cover the period 1985-2012 in robustness checks.

23. The level of these indicators for each OECD country and the latest available year is reported in Table 3.A3.2 in OECD (2016a).

24. In contrast with the case of product market deregulation, where episodes of re-regulation are rare and minor, EPL reforms have historically gone in both directions. As this chapter focuses on flexibility-enhancing reforms, it is crucial that the estimated specifications allow for short-run-effect heterogeneity between the impacts of liberalisation and protection-increasing reforms.

25. All reform episodes in the main sample (1985-2007) entail a change in the indicator of EPL stringency for regular contracts by less than 0.4 points, in absolute terms, except for the 1994 Spanish reform which is quantified by the EPL indicator for individual dismissals as a reduction of 1.19 points. Yet, the suppression of the procedure for administrative authorisation of dismissals limited to the case of individual redundancies – which characterised that reform – is typically overstated in the quantitative EPL indicators (see OECD, 2013, for a discussion). Not surprisingly, therefore, results obtained using directly the change in the EPL indicator as reform variable are extremely sensitive to the inclusion of this outlier. Once Spain is excluded from the sample, the use of either quantitative or qualitative indicators yields essentially the same results. These findings are also robust to further exclusion of additional countries (see OECD, 2016a).
26. Baseline models include three lags of all variables, as suggested by on Akaike's and Bayesian information criteria.
27. That is 0.2 points, no matter the sample used (1985-2007 or 1985-2012).
28. This result is robust to the number of lags included in the specification (2 or 3), the choice of the estimation sample (EU KLEMS only – 1985-2007 – or matched EU KLEMS-STAN – 1985-2012) and the use of weighted or unweighted estimators. The estimates are also robust to the elimination of countries one-by-one from the sample. By contrast, no evidence is found that the impact of the reforms varies with the initial level of dismissal regulation (see OECD, 2016a).
29. Corresponding to about 60% of a standard deviation of the cross-industry distribution of US dismissal rates.
30. Business-sector employment is estimated to become already insignificantly different from what the level would have reached in the absence of the reform two years after the reform's enactment, although this result is partly due to widening standard errors as a function of time (see Figure 3.5). The recovery from the initial employment fall is, however, estimated to be much faster when unweighted estimators are used (see OECD, 2016a, Figure 3.A2.1), suggesting that recovery is possibly faster in smaller industries (typically manufacturing industries, where greater competition is likely to make output and employment more sensitive to firm efficiency).
31. The average annual growth rate of wage and salary employment in the non-agricultural non-mining business sector was 1% between 1990 and 2007 and 0.8% between 1990 and 2012. The cumulative effect of the average EPL reform within the first two years is found to be 0.44% when estimated in the latter sample.
32. Significant at the 5% level.
33. By contrast, the share of low-educated workers appears unaffected by EPL in the short run.
34. As shown in OECD (2012), however, not all productivity gains shows up in nominal wage gains of the industries more directly affected by the policy reform. The main reason for this is that, due to competitive pressures, most of the improvement in productivity is translated into lower quality-adjusted prices, suggesting that workers also benefit from these reforms as consumers.
35. By contrast, the impact of EPL reforms on wages does not seem to vary over the business cycle (see OECD, 2016a).
36. The output gap measures the difference between actual and potential GDP. A negative value of the interaction term indicates downturns.
37. The output gap was improving by one percentage point or more in about one quarter of the sample observations and falling by that amount in about a quarter of the sample.
38. Aggregate effects are obtained under the same assumptions as for Figure 3.5.
39. The cumulative employment impact of an EPL reform during an upturn is even estimated to be positive 4 years after the reform, albeit not significantly so.
40. By contrast, the impact of EPL reforms on wages does not seem to vary over the business cycle (see OECD, 2016a, Table 3.A2.2).
41. This result is broadly in line with those reported in IMF (2016).
42. Since these reforms will reduce the cost for employers of converting fixed-term contracts into open-ended ones, thereby increasing the opportunity cost of termination, it is even possible that job destruction will fall in the short run.

43. Aggregate effects are obtained under the same assumptions as for Figure 3.5. Caution must be exerted in interpreting interactions between aggregate structural variables since they often yield unstable estimates (see e.g. Bassanini and Duval, 2009, for a discussion). However, the same specification underlying Figure 3.5 has been re-estimated with similar results replacing the aggregate share of fixed-term contracts in wage and salary employment with the industry-specific one.

44. The cost of filling an unskilled position is typically lower than in the case of skilled workers. As a consequence, employers have greater incentive to terminate unskilled jobs in the event of a negative shock and then to re-open these positions when the business climate improves (see e.g. Dolado, Felgueroso and Jimeno, 2000; Gautier et al., 2002).

45. Although more frequent in countries with highly-dual labour markets, reforms relaxing dismissal legislation are not uncommon in countries with a low incidence of temporary contracts. For example, this was the case for the 2003 Austrian reform, which introduced a system of individual savings accounts to replace redundancy payments for dismissals in a labour market with only about 7% of temporary workers. Similar examples can also be found in many other economies, and in particular, since 2000, in the United Kingdom, Ireland and many Eastern European countries (see the next subsection for the case of the 2009 reform in Estonia).

46. The OECD indicator of stringency of employment protection against individual and collective dismissals counts 36 flexibility-enhancing reform episodes in OECD countries since 1998. The reforms considered in this subsection are all among the ten largest episodes in terms of magnitude of the reduction in the indicator.

47. These results are robust to excluding observations close to the date of reform enforcement – to take into account the fact that once the measures are announced employers could postpone dismissals until their implementation, thereby artificially reducing unemployment before the reform enactment (see OECD, 2016a, Table 3.A2.7). Moreover, placebo experiments suggest that the estimated coefficients of Table 3.1 are not due to the shift of omitted variables occurring at a different date close to the date of reform enforcement (see Box 3.5). The findings for Estonia and Spain are also consistent with the evaluations of Malk (2013), Izquierdo, Lacuesta and Puente (2013) and Puente and Font (2013). The former finds that separations increase more than hires in Estonia immediately after the reform, while the latter two finds that employment levels did not worsen after the Spanish reform while the elasticity of employment changes to declines in GDP decreased.

48. With respect to the first year after the reform, the unemployment rate is estimated to have dropped in the second year by 1.5 and 0.7 percentage points in Estonia and Slovenia, respectively. Both these estimates are statistically significant at the 1% level. No difference between the first and the second year is estimated in the case of Spain.

49. In the case of Estonia and Spain standard errors are as large as 0.6 percentage points. By contrast, in the case of Slovenia, the standard error is smaller than 0.3 percentage points.

50. Latvia and Lithuania have been also used as a control group to evaluate the 2000 corporate tax reform in Estonia (Masso et al., 2013).

51. Included controls are the 3-month-lagged industrial production and retail turnover indexes, gender, 3 educational attainment classes, 15 age classes, 3 classes for the degree of urbanisation, a dummy for the country of birth, 23 classes for the duration of residence in the country if foreign born, 12 month dummies, 2 country dummies, one post-2009 indicator and its interaction with country dummies. The sample window is restricted to 2 years before and after the date of enforcement of the Estonian reform.

52. These findings are robust to excluding observations close to the date of reform enforcement, controlling for polynomial time trends or including also Latvia in the control group (see OECD, 2016a, Table 3.A2.9). Moreover, a placebo experiment in which the date of the reform is fictitiously anticipated by three months yields an insignificant estimate coefficient.

53. The Slovenian data exclude bunches of ten Social Security registrations with the same employers on the same day. Data for July and December 2011 as well as January 2012 were excluded from the figure, since administrative changes implied a re-registration of a large number of existing contracts.

54. More precisely, these EPL reforms are associated with an increase of 47% and 45% of the share of open-ended contracts in new contracts in Slovenia and Spain, respectively, as compared to the average share in the 12 months preceding each reform.

55. A slight but insignificant increase in the effect in the second year is estimated in Slovenia (0.3 percentage points), while no change in the effect between the two years is observed in Spain.

56. Results are also robust to the exclusion of a 10-month window before the reform in Slovenia, as in the case of unemployment models. In the baseline model for this country, observations for July, December and January of each year are excluded from the sample, to avoid that missing values bias the estimates of month dummies. Results are however robust to the inclusion of these observations (see OECD, 2016a, Table 3.A2.8).

57. Data on conversions and new hires are available only for Spain. The estimates suggest that the Spanish reform raised the share of new hires on permanent contracts in new contracts by 2.5 percentage points. By contrast, the share of conversions in new contracts increased by 0.6 percentage points. To put these figures into context, in the 12 months preceding the reform, these two shares averaged 3.7% and 3.2% of new contracts, respectively. These findings are consistent with those of OECD (2014c), which are nonetheless based on a shorter post-reform time window.

58. In this case, however, EPL reforms cannot yield benefits in term of further reduction of dualism.

59. Between 1985 and 2012 the correlation between changes in the EPL index for regular contracts and the output gap is 0.10, rising up to 0.29 since the onset of the Great Recession. Over the same periods, the correlations between changes in the EPL index and changes in the output gap are 0.07 and 0.19, respectively. The comparison of these sets of correlations suggests that, at least in recent years, EPL reforms tend to be undertaken slightly more frequently in bad times but not necessarily in the recession phase.

60. Between 1975 and 2012 the correlation between changes in the indicator of stringency of anti-competitive regulation of entry barriers in network industries and the output gap is 0.05 and with the change in the output gap is -0.01. Restricting the attention to the period since the onset of the Great Recession, these correlation coefficients become slightly more negative, which does not support the idea that the worse the cyclical conditions the greater the probability and size of the reforms in this area.

61. For example, a few countries (such as Australia or the United States) set-up programmes for trade displaced workers in anticipation of trade liberalisation episodes.

62. Jimeno and Thomas (2013) show that sectoral or centralised bargaining systems can deliver the same flexibility as decentralised systems if companies can easily opt-out of collective agreements in times of crisis.

63. Available evidence also suggests that the newly-introduced measures to foster internal flexibility and flexible collective bargaining played an important role in the decline in unit labour costs in Spain since 2012 relative to other euro area countries (see e.g. Izquierdo, Lacuesta and Puente, 2013; BBVA, 2013).

64. Collective bargaining reforms decentralising the level of negotiation, however, could lead to wage losses and worse working-conditions in the short-run that could offset job gains. Another issue, which is left for future research is whether such measures concerning collective bargaining should be permanent or temporary.

65. For example, the 1999 Dutch reform of notice periods included a partial grandfather clause insofar that the employer had to calculate both the new term of notice at the time of dismissal and the old one for the employee's tenure and age on the 1 January 1999 and then apply the most generous of the two to the employee.

66. Workers on precarious jobs are initially given access to opportunities that remain less protected than the jobs of insiders and this difference would only disappear gradually by attrition. In fact, dismissal of those already on a permanent contract at the time of the reform becomes relatively more costly than that of workers hired after the reform. As a consequence, firms might be induced to apply a last-in-first-out principle to save on dismissal costs, which will introduce inequalities into the system.

67. The effect on wages is, however, less clear, since the outside option (which depends also on the severance pay the employee would be entitled to when switching to a different job) of those with an open-ended contract at the time of the reforms would be reduced, exerting downward pressure on wages. Van der Wiel (2010) finds that wages of affected workers went down after the 1999 reform of notice periods in the Netherlands, which is likely to reflect lower bargaining power or outside option.

68. Honeymoon effects are also documented as regards two-tier reforms in which temporary contracts are liberalised while maintaining regulation on permanent contracts unchanged (see e.g. Boeri, 2011). In this case, however, steady-state employment might end up being lower than in the previous equilibrium (see e.g. Kahn, 2010).

69. The 2012 labour market reform in Italy, that restricted the conditions under which courts could order reinstatement as a remedy for unfair dismissal, simultaneously reformed the unemployment benefit system by extending its coverage and making it more generous for certain family situations. The 2012 Portuguese reform of unemployment benefits also extended unemployment insurance coverage and, for jobless households, temporarily increased its initial replacement rate, even though benefit generosity, and in particular unemployment assistance, was tightened in other cases (see OECD, 2016b).

70. On the effects of benefit generosity on welfare, job search effort and externalities, see for example, Levine (1993); Card, Chety and Weber (2007); Chetty (2008); Schmieder, von Wachter and Bender (2012a); Tatsiramos and van Ours (2014); Lalive, Landais and Zweimüller (2015); and Mitman and Rabinovich (2015).

71. Marinescu (2015) used new data on state-level job applications and job vacancies from a large American online job board covering about 30% of all vacancies in the United States to show that unemployment-insurance extensions did generate a negative impact on the number of applications submitted (suggesting a decrease in average job search effort), but that this also increased the hiring rate per application sent (the search externality), and therefore contributed to reducing the unemployment rate.

72. Extensions rules are triggered by state unemployment, as measured in real time (see Box 3.6). It is not infrequent that UI extensions are erroneously triggered because of measurement error in real-time unemployment time-series. These non-systematic errors can be identified once the corrected series are produced some time later, and provide a natural experiment to distinguish the effect of the worsening economic conditions triggering extensions from the effect of the extensions themselves.

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Chapter 4

Closing gender gaps in the labour markets of emerging economies: The unfinished job

Despite unprecedented progress over the past century, gender gaps in the labour market persist throughout the world and are especially marked in emerging economies. While the quantity of jobs held by women has increased, the quality has not: female workers continue to have worse jobs than men. This chapter paints an up-to-date picture of gender gaps in the labour markets of 16 emerging economies accounting for over half of the world's population. It focuses on recent trends in a broad range of labour market outcomes and it offers a discussion of their key drivers. The analysis unpacks and explains the gender pay gap that persists across the world. The chapter is grounded in original empirical work based on several data sources, including the World Values Survey, PISA, the Gallup World Poll, national labour force surveys and time-use data. Building on this wealth of evidence, the chapter identifies a comprehensive set of policy levers to close gender gaps.

Key findings

This chapter provides an up-to-date account of gender gaps in the labour markets of 16 emerging economies, covering over half of the world population. It focuses on recent trends in a broad range of labour market outcomes. Despite significant improvement in a number of areas, the labour market gaps confronting women in emerging economies continue to be wider than those in OECD countries.

The key results can be summarised as follows:

- The gender gap in labour market participation is shrinking in many emerging economies, but progress has been very uneven. The most significant improvements have been recorded in Latin America, particularly in Chile and Costa Rica where the gap has fallen by 1 percentage point per year since the mid-1990s, while the largest gaps persist in the Middle East, North Africa, India and Indonesia.
- The participation gap varies significantly across socio-economic groups, with low skilled women from the poorest families typically facing the largest disparities with men.
- The share of young people not in employment, education or training (NEET) is higher among women than men, partly reflecting motherhood at a young age in some emerging economies. The largest disparities are recorded in India, followed by Egypt, Turkey, Mexico and Indonesia. The gap is smallest in South Africa, China and the Russian Federation.
- Enrolment rates in primary and secondary education are almost identical for boys and girls and in many countries women are now attending tertiary education more frequently than men. The most remarkable improvements have been recorded in Morocco, Egypt, Tunisia, China, Turkey, Indonesia and India. However, girls' educational performance lags behind in mathematics and often in science, which results in a lower propensity of girls to study and work in STEM-related fields (science, technology, engineering and mathematics).
- The distribution of men and women across sectors differs substantially. On average, men are more likely to be employed in goods-producing sectors and in construction, while women are considerably more likely to be employed in social and personal service sectors. The sectors where men most typically work tend to be more productive and pay higher wages.
- Women are significantly less likely than men to be in top management positions, but the picture is very diverse across the world. The Russian Federation and all the Latin American countries analysed, except Peru, have a higher share of female executives than the average OECD country. By contrast, the share is below 15% in Egypt, Morocco, Turkey, India and Tunisia.
- A large share of working women (often the majority) are self-employed, but they own smaller and less profitable businesses than men as a result of credit constraints and gaps in financial literacy and business-related knowledge. Self-employed women are more likely than self-employed men to work informally.

- In all the countries analysed, women earn significantly less than men per hour worked (19% less, on average, compared with 15% less in OECD countries). Wide gender pay gaps persist when comparing workers with the same level of education and in similar jobs.
- Women who are employed full time spend a larger share of their time than men on housework (including childcare), which poses severe constraints on their labour market opportunities. When paid work and housework are combined, women typically work longer hours than men.
- Women have less secure jobs than men, facing both a higher unemployment risk and a higher risk of extreme low pay.

Building on this rich evidence, the second part of the chapter provides a comprehensive set of policy recommendations for closing gender gaps in emerging economies. They can be summarised as follows:

- *Close remaining gender gaps in education.* Policy makers should focus on further reducing the direct and indirect costs of schooling for poor families. Conditional cash transfer programmes, which make income support dependent on school attendance, have proved to be especially effective in a number of countries. Gender segregation by field of study and the resulting knowledge gaps in scientific subjects should be addressed by removing gender bias in curricula, raising awareness on the likely consequences of choosing different fields of study and by facilitating women's access to STEM-related jobs through apprenticeships and counselling.
- *Facilitate access to credit.* Introducing policies to facilitate the establishment of credit records would help relax credit-constraints on women. Closing gaps in financial literacy and business knowledge is equally important. Several countries have made women a target group of their national strategies for financial education. A broad range of smaller programmes in other countries have also proven to be successful in raising women's skills, including training on financial product awareness and day-to-day financial management. When inheritance laws favour men, they should be changed. Specific legislation prohibiting discrimination by credit providers on the basis of gender or marital status should be introduced where absent.
- *Free women's time and promote flexible employment.* Policy makers can ease the burden of caring duties borne by women and encourage men to get more actively involved in housework. Subsidised childcare and other forms of social assistance (particularly health insurance) can play an important role, together with a broad range of other interventions to help people reconcile market work with household responsibilities (including investment in electricity, transport and ICT infrastructure). Well-designed working time regulations that promote flexibility and facilitate part-time work can be equally valuable.
- *Make parental leave more effective.* A well-structured system of parental leave can have positive effects on women's labour force participation and employment. It should be publicly funded and not place excessive costs on employers, to avoid adverse effects on their willingness to hire mothers. It should also provide incentives for fathers to take leave.
- *Fight gender discrimination in the labour market.* Specific legislation prohibiting discrimination in hiring and pay on the basis of gender should be introduced when absent. Discrimination against pregnant women must also be addressed. Access to the legal system should be made as simple as possible, and the costs of legal action kept low to allow poorer workers to file complaints against abuses. Employers should face a

transparent schedule of sanctions and enforcement should be swift to minimise uncertainty. When discrimination is the result of persistent stereotypes and misperceptions, affirmative action can play an important role by helping women to seize good job opportunities and prove their worth. Careful behavioural design can help overcome deep-seated gender biases in hiring and management practices.

- *Curb informal employment*. An effective strategy to reduce informal employment should encompass a broad range of policies aimed at reducing the costs of formalisation, increasing its benefits and strengthening enforcement of labour codes. Special attention should be paid to minimising existing disincentives to formality that disproportionately affect women, such as high marginal tax rates on secondary earners. Removing obsolete legislation that impedes women's access to certain sectors of the economy will further reduce reliance on informal employment.
- *End violence against women*. All countries should have a modern legal framework to deal with violence against women and especially domestic violence. Such a system should include special courts and the possibility for judges to issue protection orders. Countries that lack encompassing legislation on sexual harassment should introduce it. Such legislation should cover not only employment, as it is typically the case, but also education.

Introduction

The integration of women into the labour market was one of the most momentous trends of the 20th century. In 1900 fewer than one in five women worked for pay in the United States. By the turn of the century, about 60% did (Costa, 2000). In 1950, women worldwide only had three quarters of the years of schooling that men had. Today the education gap has disappeared in advanced economies and is rapidly closing in developing countries. Similarly fast advances have been recorded in a number of other domains, such as women's participation in politics and corporate life. Yet, the process of convergence is far from complete. Indeed, progress has slowed in a number of areas and the remaining gender gaps are often very large in emerging economies. Further improvements are not inevitable, but will depend on effective policy action.

Closing the gender gap is not only a moral imperative, but also a matter of economic efficiency. The recovery from the global economic crisis has been weak in large portions of the developed world and clear signs of a slowdown are evident in many emerging economies. In this context, increasing female labour market outcomes represents a very important untapped resource with the potential to boost productivity and revive economic growth (Ferrant and Kolev, 2016; Hsieh et al., 2013; World Bank, 2012).

This chapter paints an up-to-date picture of gender gaps in 16 emerging economies accounting for over half of the world population: Argentina, Brazil, Chile, China, Colombia, Costa Rica, Egypt, India, Indonesia, Morocco, Mexico, Peru, the Russian Federation, South Africa, Tunisia, and Turkey.[1] The analysis focuses on recent trends in gender gaps defined in terms of a broad range of labour market outcomes. It also attempts to identify the key drivers of the patterns that are documented. The chapter then offers a detailed discussion of the mechanisms driving the persistence of the gender pay gap. The chapter is largely grounded in original empirical work based on several data sources, including national labour force surveys, the World Values Survey, PISA, the Gallup World Poll, time-use data and the *Social Institutions and Gender Index (SIGI) Database*.[2] Building on this wealth of evidence, a comprehensive set of policy recommendations is identified.

An effective strategy to curb gender gaps in the labour market should encompass a number of policy domains, as indicated in the OECD Recommendation of the Council on Gender Equality in Education, Employment and Entrepreneurship (OECD, 2013a). First, remaining gender gaps in skills and access to capital should be closed. Second, policy action should address all those factors that hamper women's labour market prospects even when they have the same endowments of skills and capital as men. In particular, policy makers should concentrate on freeing women's time by easing the burden of caring duties and by encouraging men to be more actively involved in housework. Promoting flexible work arrangements and making parental leave more effective can play an important role in this respect. Additional efforts are needed to fight discrimination, curb informality and end violence against women. Crucially, policy makers should intervene early in women's lives to prevent the scarring effects of prolonged exclusion from the labour market. Such policy actions will be crucial to ensure progress towards the G20 target to reduce the gender gap in workforce participation by 25% by 2025.

The chapter is divided into two sections. Section 1 paints a comprehensive picture of recent trends in gender gaps, spanning a wide range of labour market outcomes and discussing their key drivers. Section 2 provides a comprehensive set of policy recommendations, drawing on recent OECD work, as well as on the efforts of other international organisations and on a large policy evaluation literature.

1. Despite significant progress, women continue to hold worse jobs than men

Over the past three decades women throughout the emerging world have been catching up with men in a number of labour market outcomes. The most notable improvements have been an unprecedented increase in female labour force participation in some parts of the world and a rapidly shrinking gender education gap. However, progress has been extremely uneven, both across and within countries, and female workers continue to have worse jobs than men.

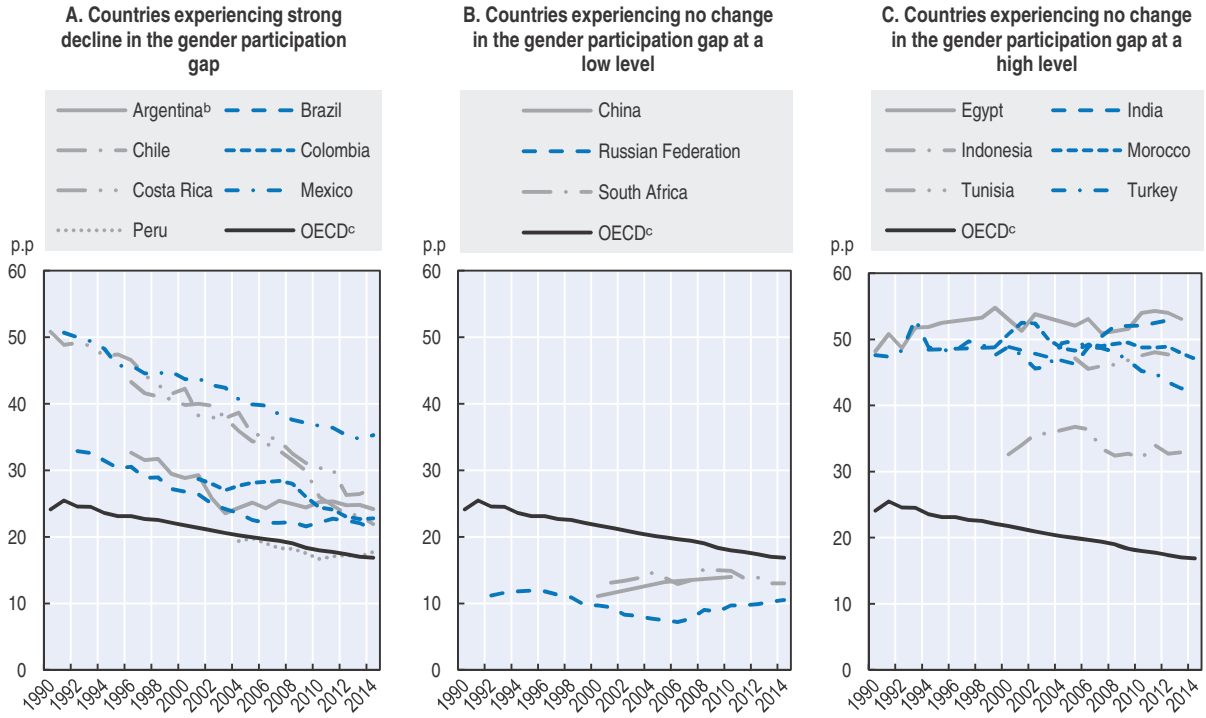
The participation gap is not shrinking evenly across countries and social groups

In many emerging economies the gap in labour market participation between men and women has shrunk considerably over the past three decades, but progress has been very uneven across the world (Figure 4.1). Significant improvements have been recorded in Latin America, particularly in Chile and Costa Rica where the gap fell by about 1 percentage point per year over the period analysed. By comparison, the average OECD country reduced the participation gap by only 0.3 percentage points over the same period.[3] On the other hand, the participation gap remained very high in the Middle East and North Africa, India and Indonesia. In all those countries except Indonesia, women's labour market participation is about 50 percentage points lower than male participation. Some minor improvement was recorded in Turkey. The gap remained stable, but low in China, South Africa and the Russian Federation.

The participation gap also varies significantly within countries and the most disadvantaged socio-economic groups typically display the largest gender disparities. The most striking differences are driven by education (Figure 4.2, Panel A). While highly-educated women have, on average, 16.5 percentage points lower participation rates than men,[4] for low-educated women the gap is 41 percentage points. High education leads to low participation gaps even in countries where overall female participation is low. Tunisia is the most evident example, with highly educated women facing a smaller

Figure 4.1. **Many countries are converging to low participation gaps, but progress is uneven**

Percentage-point difference in labour force participation rates between men and women of working age[a]



a) Persons aged 16-64 for China and 15 or more for Morocco.
b) Selected urban areas.
c) OECD is the unweighted average of the 34 OECD member countries.
Source: OECD Labour Force Statistics Database for Brazil, Chile, Colombia, Mexico, the Russian Federation, South Africa and Turkey; census data for China; data provided by the Instituto Nacional de Estadística y Censos (INEC) based on the EHPM and the ECE for Costa Rica; *ILOSTAT Database* for Egypt; Enquête nationale sur l'emploi, Haut Commissariat au Plan (Direction de la Statistique) for Morocco; and OECD calculations based on the EPH for Argentina, the NSS for India, the SAKERNAS for Indonesia, the ENAHO for Peru, and the ENPE for Tunisia.

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participation gap than in the OECD, while low-skilled women suffer from the widest gap among all the countries considered. The only exception to this pattern is India, where high- and low-education women face similarly high disparities with men.

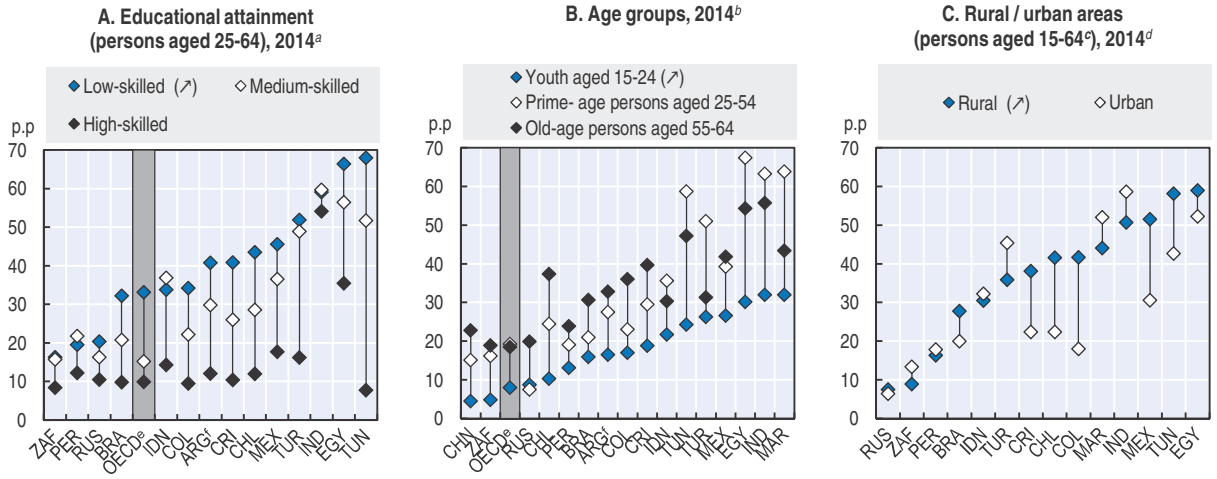
The participation gap is lowest among youth and it grows among older workers (Figure 4.2, Panel B). In over one half of the countries analysed, it is highest among workers aged 55-64, but in Egypt, India, Indonesia, Morocco, Turkey and Tunisia, it is prime-aged women (25-54) who have the lowest participation levels relative to men.

Women from poorer families face a wider participation gap than women from richer households. On average, female workers in the bottom decile of the income distribution have participation rates that are 33 percentage points lower than men. Among women in the top decile, the gap is only 23 percentage points.[5]

Differences between rural and urban areas show mixed patterns (Figure 4.2, Panel C). In most Latin American countries (except Peru) and in Tunisia and Egypt, gender participation gaps are typically smaller in urban areas than in rural areas. By contrast, in India, Indonesia, Morocco, Turkey and South Africa, the participation gap is smaller in rural areas. Additional factors that interact with income to widen the participation gap include ethnicity, caste, geographical isolation, race, disability and sexual orientation (World Bank, 2012).

Figure 4.2. **The participation gap is largest among the most disadvantaged social groups**

Percentage-point difference in labour force participation rates between men and women for the indicated group



a) 2011-12 for India; 2012 for Egypt and Tunisia; and 2013 for Brazil, Chile and the Russian Federation.
b) 2010 for China; 2011-12 for India; 2012 for Morocco and Tunisia; 2013 for Egypt.
c) Persons aged 15 or more for Morocco.
d) 2011-12 for India; 2012 for Tunisia; and 2013 for Chile, Egypt and Turkey.
e) OECD is the weighted average of 33 member countries (Japan not included) in Panel A and of the 34 member countries in Panel B.
f) Selected urban areas.

Source: **Panel A:** *OECD Education Database* for Brazil, Chile, Colombia, Costa Rica, Mexico, the Russian Federation and Turkey; and OECD estimates based on the EPH for Argentina, the ELMPS of 2012 for Egypt, the NSS for India, the SAKERNAS for Indonesia, the ENAHO for Peru, the QLFS for South Africa and the ENPE for Tunisia. **Panel B:** *OECD Labour Force Statistics Database* for Brazil, Chile, Colombia, Mexico, the Russian Federation, South Africa and Turkey; *ILOSTAT Database* for Egypt and Morocco; census data for China; data provided by the Instituto Nacional de Estadística y Censos (INEC) based on the EHPM and the ECE for Costa Rica; and OECD estimates OECD estimates based on the EPH for Argentina, the NSS for India, the SAKERNAS for Indonesia, the ENAHO for Peru and the ENPE for Tunisia. **Panel C:** *ILOSTAT Database* for Morocco; data provided by the Instituto Nacional de Estadística y Censos (INEC) based on the EHPM and the ECE for Costa Rica; and OECD estimates based on the PNAD for Brazil, the CASEN for Chile, the GEIH for Colombia, the ELMPS of 2012 for Egypt, the NSS for india, the SAKERNAS for Indonesia, the ENOE for Mexico, the ENAHO for Peru, the RLMS for the Russian Federation, the QLFS for South Africa, the ENPE for Tunisia and the HLFS for Turkey.

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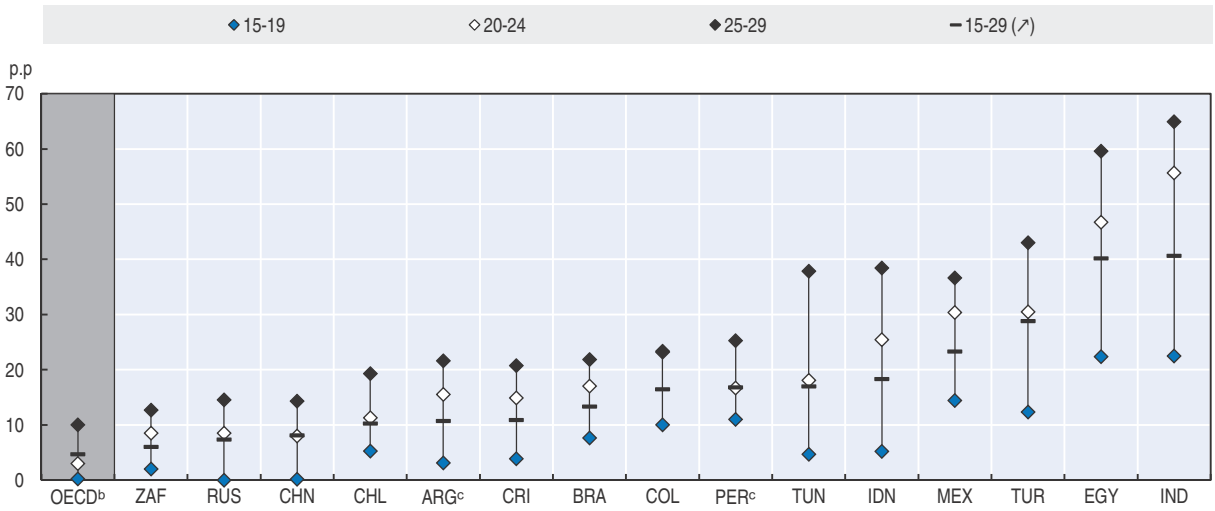
Participation gaps among youth are also reflected in a significantly higher share of young women neither in employment nor in education or training (NEET), relative to men. The gap is observed in all the countries analysed and is much larger than in the average OECD country (Figure 4.3). The gap is smallest among the youngest NEETs (15-19) and it grows larger with age, reflecting the fact that while the gender gap in school enrolment has disappeared in most countries, gender differences in labour force participation persist.[6] The largest disparities are recorded in India, followed by Egypt, Turkey, Mexico and Indonesia. The gap is smallest in South Africa, the Russian Federation and China.

Women's educational attainments have improved throughout the world

Increased female employment has been accompanied by a steady reduction in the gender education gap throughout the world. In 1950, women worldwide only had 73% of the years of schooling that men had. By 2010, the ratio had almost reached 90% and it continues to increase (Barro and Lee, 2013). The rate of convergence was even higher in developing countries, where the same figure went from only 57% in 1950 to 86% in 2010. Today, in the countries considered in this chapter enrolment rates in primary and secondary education are almost identical between boys and girls (Figure 4.4), and women have largely overtaken men in their propensity to attend tertiary education. This is consistent with the trends observed in advanced economies (Goldin, Katz and Kuziemko,

Figure 4.3. **The NEET rate is significantly higher among women**

Percentage-point difference in NEET rates between women and men in 2014[a]



a) 2010 for China and Tunisia; 2011-12 for India; 2012 for Egypt; 2012-13 for Peru; and 2013 for Chile.
b) OECD is the unweighted average of 33 OECD countries (Japan excluded).
c) Selected urban areas.
Source: *OECD Education Database* for Brazil, Chile, Colombia, Costa Rica, Mexico, the Russian Federation, Turkey and the OECD average; ILO STWTS for Egypt and Peru; census data for China; and OECD estimates based on the EPH for Argentina, the NSS for India, the SAKERNAS for Indonesia, the QLFS for South Africa and the ENPE for Tunisia.

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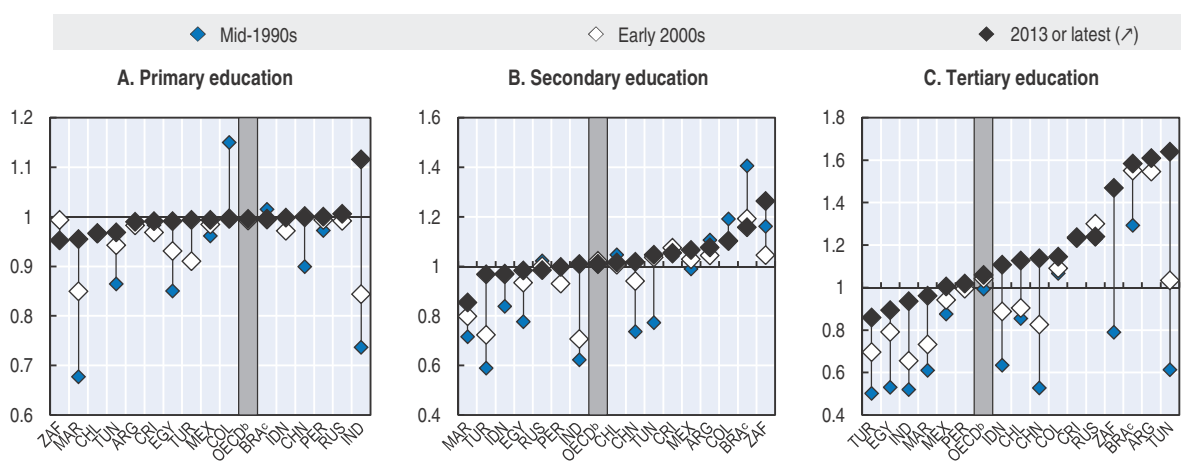
Figure 4.4. **Gender gaps in school enrolment have largely disappeared or turned in favour of women**

Gender parity index (GPI) of school enrolment ratios by education level[a]



Note: The gross enrolment ratio refers to the number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the five-year age group starting from the official secondary school graduation age.
a) Ratio of female to male gross school enrolment ratio.
b) OECD is the unweighted average of OECD countries included in the UNESCO, UIS database.
c) Proportion of youth aged 16, 20 and 24 years old who have successfully obtained primary, secondary and tertiary-level degrees, respectively.
Source: UNESCO, UIS.Stat and OECD estimates based on PNAD (Brazil).

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2006). Only two decades ago, the situation was very different, with sizable gaps still present in a number of countries at all levels of schooling. The most remarkable improvements have been recorded in Morocco, Egypt, Tunisia, China, South Africa, Turkey, Indonesia and India. In all those countries, except South Africa, women in the 1990s were 40 to 50% less likely than men to be enrolled in tertiary education.

In recent years the most significant reductions in educational disparities have been attained in countries where participation rates among women are still relatively low. To the extent that higher educational attainments take time to translate into higher labour market participation, we might expect the labour market integration of women to accelerate in these countries in the coming years. However, gender-biased social norms regarding the role of women in society and in the labour market constitute a major obstacle to progress and can be very persistent (see Box 4.1 for an analysis based on the World Values Survey). As social norms of this kind tend to be acquired at a young age, policy action should intervene early in people's lives.

Average improvements in school attainment hide the fact that progress has been markedly different across socio-economic groups. Girls from poorer families are much less likely to be enrolled in school at all levels of education. For instance, among Indian children in the bottom fifth of the distribution, an education gap of almost five years persists between boys and girls aged 15-19. By contrast, boys and girls from the top quintile

Box 4.1. **Social norms are hard to change**

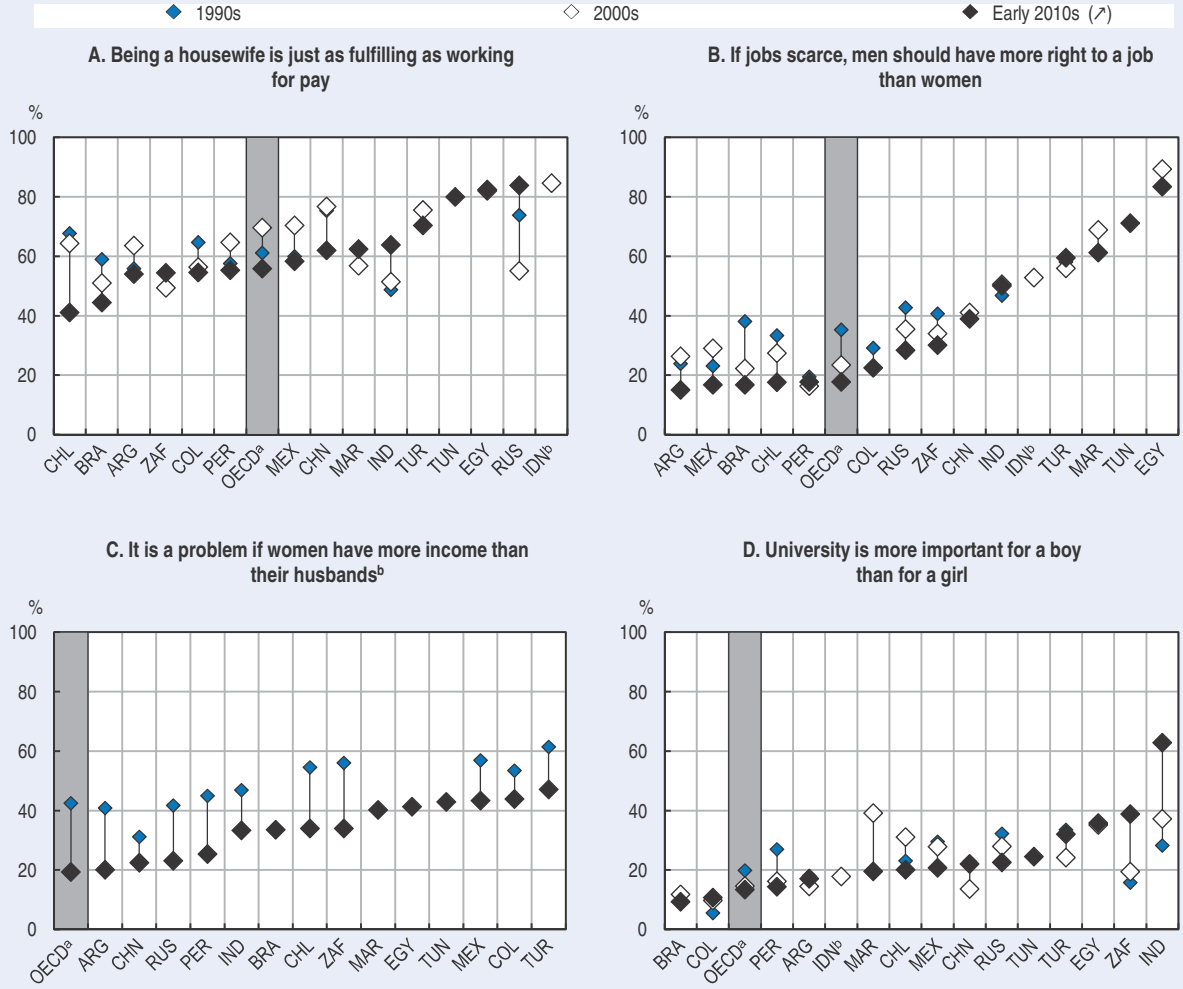
Increased female participation in the labour market and the near disappearance of the gender gap in education has been accompanied by a shift in social norms about women's role in society and in the labour market. Change in these norms is, however, slow and uneven across countries.

The World Values Survey (WVS) paints a rich picture of the evolution of social norms throughout the world. Data are available for most emerging economies between the 1990s and the early 2010s, for four questions regarding women's employment and the value of female education (Figure 4.5). In all countries except South Africa, India, Morocco and the Russian Federation, the percentage of people who declare that *being a housewife is as fulfilling as working for pay* has shown a negative trend, but changes have often been limited (Panel A). Almost no change has been recorded in the percentage of people who agree that *men should have more right to a job than women*. The share is highest in South and South-East Asia, in the Middle East and North Africa (Panel B), where it is typically above 50%. On the other hand, people have generally become less likely to declare that *a woman earning more than her husband can be problematic* (Panel C), but data are only available for a subset of countries. Only two decades ago, the percentage of respondents who agreed or strongly agreed with that statement in OECD countries was above 40%. Finally, the perceived value of female education has shown mixed trends. In most countries, a sizable minority of people affirms that *education is more important for a boy than for a girl* (Panel D). The share has decreased in a number of countries (most notably Peru and Morocco), while it has increased in others (e.g. India and South Africa). While international comparisons may suffer from subjectivity in the interpretation of survey questions, the anti-egalitarian views captured by WVS display strong negative correlations with female employment rates and with the gender pay gap across OECD countries (Fortin, 2005). In the countries analysed, a strong negative correlation exists between the share of respondents who agree or strongly agree with the statements in Figure 4.5 and female employment rates. Moreover, investigating how social norms evolve over people's lifetime reveals that anti-egalitarian views consolidate at a young age and only change marginally later on, lending support to policy interventions that focus on youth.

Box 4.1. **Social norms are hard to change** *(cont.)*

Figure 4.5. **Social norms are moving, but change is slow and uneven**

Percentage of respondents who agreed or strongly agreed with:



Note: The data reported are the unweighted averages of frequencies in 1989-93 and 1994-98 for the 1990s, 1999-2004 and 2005-09 for the 2000s and 2010-14 for the early 2010s.

a) OECD is the unweighted average of 26 OECD member countries (excluding Austria, Belgium, Denmark, Greece, Iceland, Ireland, Luxembourg and Portugal).

b) Indonesia is only available for the period 2005-09. No data available for Panel C.

Source: OECD calculations based on the World Values Survey.

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participate in school at similar rates (World Bank, 2012). Minority groups are another stark example of persistent gender disadvantages. It is estimated that almost two-thirds of out-of-school girls globally belong to ethnic minority groups in their own countries (Lewis and Lockheed, 2006).

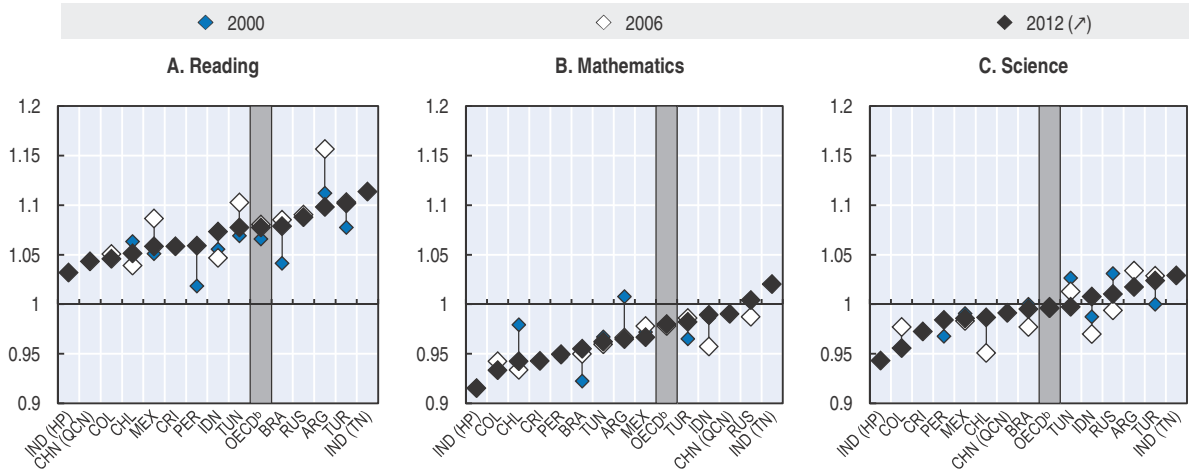
Important gender gaps remain in key subjects which foster occupational segregation

While gaps in school enrolment have often disappeared, gender differences in school results persist in most countries. The OECD Programme for International Student Assessment (PISA) tests the skills of 15-year-old students in three key areas of learning:

reading, mathematics and science. The results show that girls typically outperform boys in reading, while they lag behind in mathematics, with the largest gaps registered in parts of India (Himachal Pradesh), Colombia and Chile (Figure 4.6). In science, the picture is more varied, with girls lagging behind in India (Himachal Pradesh), Colombia and Costa Rica, while they slightly outperform boys in Argentina, Turkey and other parts of India (Tamil Nadu).[7] With few exceptions, these performance gaps have been quite stable since 2000 and are important because they are a potential driver of occupational segregation. In particular, gaps in mathematics and science at the age of 15 may explain why girls are less likely to pursue further studies in science, technology, engineering and mathematics (STEM) subjects (OECD, 2012, 2015a) and later to work in STEM-related sectors.

Figure 4.6. **Significant gender gaps persist among students in key areas of learning**

Ratio of female-to-male mean PISA scores, 2000, 2006 and 2012[a]



Note: CHN (QCN): China (Shanghai); IND (HM): India (Himachal Pradesh); IND (TN): India (Tamil Nadu).

a) 2000 refers to 2003 for Tunisia and Turkey; and 2012 refers to 2009 for India (Himachal Pradesh and Tamil Nadu). No data available in 2000 for China, Colombia, Costa Rica and India; in 2006 for China, Costa Rica, India and Peru.

b) OECD is the weighted average of OECD countries included in each release of the PISA Survey.

Source: OECD, *PISA 2000, 2003, 2006, 2009 and 2012* databases.

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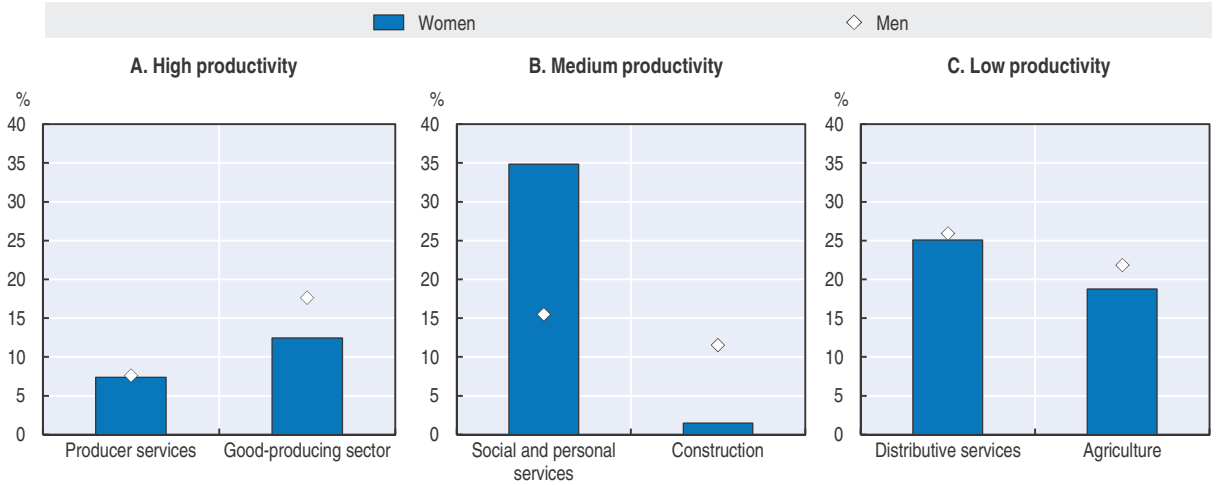
Men and women work in different sectors

Despite some convergence in recent decades, there are still differences in the distribution of male and female workers across different sectors of the economy. Figure 4.7 shows the average distribution of male and female employment across sectors in the emerging economies analysed in this chapter. It reveals that men are more likely than women to be employed in construction, while women are considerably more likely to be employed in social and personal services.[8] Men are also slightly more likely than women to be employed in goods-producing sectors, which are among the most productive ones in the economy. This may be one of the factors explaining the gender pay gap, but given the small magnitude of the difference, it is unlikely to play a major role (see below).[9]

There are also significant differences in the types of occupations men and women hold within each sector. Most notably, women are significantly less likely than men to be in top management positions, although this disadvantage is much stronger in some countries than in others (Figure 4.8). In most of the countries considered the share of top

Figure 4.7. **Men and women are unevenly distributed across sectors**

Female employment by industry[a] (as a percentage of total female employment), average over 13 countries,[b] 2014 or closest year



Note: Industries are ordered by decreasing order of labour productivity defined as the ratio of GDP to total employment. Estimates of employment by industry based on national labour force surveys have been adjusted on the basis of total domestic employment (national accounts) by industry for: Argentina, Brazil, Chile, Mexico, the Russian Federation and South Africa.

a) Industry aggregates based on ISIC classifications (ISIC Rev. 3 or ISIC Rev. 4) grouped as follows: agriculture, goods-producing (mining, manufacturing and utilities), construction, distributive services (wholesale and retail trades, transport, communication and accommodation), producer services (finance, real estate and business services) and social and personal services (public administration, health, education and other non-business services).

b) Unweighted average of the following countries: Argentina, Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Mexico, Peru, the Russian Federation, South Africa and Turkey.

Source: **Employment data:** *OECD Annual Labour Force Statistics Database* for Brazil, Chile, Colombia, Mexico, the Russian Federation and Turkey; OECD estimates based on the EPH for Argentina, the ENAHO for Costa Rica, the NSS for India, the SAKERNAS for Indonesia, the ENAHO for Peru and the QLFS for South Africa; and census data for China. **National accounts data:** *OECD Annual National Accounts Database* for Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Mexico, the Russian Federation, South Africa and Turkey; and national data for Costa Rica and Peru.

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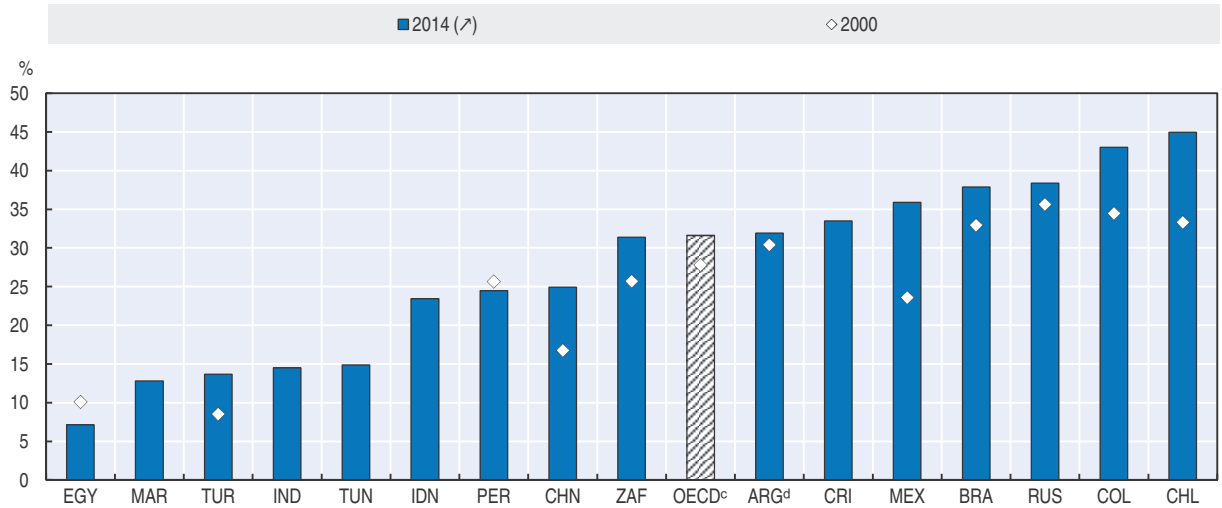
managers who are women is below one third. However, the Russian Federation and all the Latin American countries analysed except Peru have a higher share of female executives than the average OECD country (31.6%). By contrast, in Egypt, India, Morocco, Tunisia and Turkey the share is below 15%. In all the countries analysed, except Egypt and Peru, the share of women in top-management positions has grown since 2000. The most significant improvements, relative to the initial level, have been recorded in Chile, China, Mexico and Turkey.

Many of the jobs that women hold throughout the developing world are informal.[10] The incidence of informal work is typically higher in the sectors and occupations that employ women in larger numbers. This is confirmed by the available data (Figure 4.9), which show that women are more likely to work informally than men in almost all countries although these differences are not large. Informal firms are typically less productive and provide workers with fewer opportunities for human capital accumulation (La Porta and Shleifer, 2008, 2014). This represents an additional drag on female earnings and on their opportunities for career advancement. Moreover, recent OECD work shows that informal jobs are typically of lower quality than formal ones, with detrimental effects on workers' well-being. It also shows that female workers find it more difficult than men to move into a formal job, if they start their career in an informal job (OECD, 2015b, Chapter 5).

Figure 4.8. **Top management positions are dominated by men, but progress has often been sizable**

Women's share of top management or executive positions as a percentage of all top management or executive positions,[a] 2000 and 2014[b]



Note: Persons aged 15-64 except 16 or more for China, 15 or more for Egypt (in 2000) and Morocco, 14 or more for Mexico and 15-72 for the Russian Federation.

a) Occupations based on ISCO-68 for Colombia; ISCO-88 for Brazil, Chile, Egypt, India, Indonesia, Mexico (in 2000), Morocco, Peru, the Russian Federation, Tunisia and Turkey (in 2000); and ISCO-08 for Argentina, Costa Rica, Mexico (in 2014), the OECD average and Turkey (in 2014); and national occupation classification for China.

b) 2003-14 for Argentina and South Africa; 2002-14 for Brazil; 2000-13 for Chile, Egypt and the Russian Federation; 2000-10 for China; 2001-14 for Colombia and Turkey; 2014 only for Costa Rica; 2011-12 only for India; 2014 only for Indonesia; 2008 only for Morocco; 2004-14 for Peru; and 2012 only for Tunisia.

c) OECD is the unweighted average of the 33 OECD member countries (Israel not included).

d) Selected urban areas.

Source: ILO KILM 2015 for Egypt, Morocco, the Russian Federation, South Africa and the OECD average; ILOSTAT data for Mexico; EU LFS data for Turkey; census data for China; and OECD estimates based on the EPH for Argentina, the PNAD for Brazil, the CASEN for Chile, the GEIH for Colombia, the ENAHO for Costa Rica, the NSS for India, the SAKERNAS for Indonesia, the ENAHO for Peru and the ENPE for Tunisia.

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Self-employment is very common, but female-owned businesses are smaller and less profitable

A large share of working women throughout the developing world is self-employed (a category that includes all business owners, both those who work by themselves and those who employ others). In the emerging economies analysed in this chapter, self-employment represents 20% of total female employment (compared to an OECD average of 10%) and it reaches very high levels in countries like Colombia (42%) and Peru (37%). Existing evidence shows that female-owned businesses are typically smaller than male-owned ones whether judged in terms of employees, sales, costs or physical capital (e.g. World Bank, 2012; Bruhn, 2009; Mead and Liedholm, 1998).[11] Female-owned businesses are also less profitable on average. However, evidence from Latin America shows that this difference disappears when larger firms with similar labour and capital inputs are compared (Bruhn, 2009). These patterns span both urban and rural areas. In the agricultural sector, women tend to farm smaller plots with lower yields and less profitable crops than men (World Bank, 2012).

One of the most significant constraints on female entrepreneurship is limited access to financial capital and this problem is particularly acute in developing countries. Data from the *Global Financial Inclusion (Findex) Database* on 98 developing countries show the existence of a significant gender gap in the use of savings and credit products

Figure 4.9. **Informality is more common among women in the majority of emerging economies**

Percentage of employed persons working informally aged 15-64 by type of employment, 2014 or latest available year[a]

Note: Informality is defined to include: i) employees who do not pay social security contributions; and ii) self-employed who do not pay social security contributions (Chile, India, Indonesia and Turkey), or whose business is not registered (Argentina, Brazil, Colombia, Costa Rica, Egypt, Mexico, Peru and South Africa). The figure for India is based on the assumption that all employed workers with missing information on paying social contributions work in the informal sector. Informality rates for China, Morocco, the Russian Federation and Tunisia are missing given the unavailability of comparable data on social security contributions and business registration.

a) 2007 for Indonesia; 2010 for Tunisia; 2011-12 for India; 2012 for Egypt; and 2013 for Chile and Turkey.

b) Selected urban areas.

Source: OECD calculations based on the EPH for Argentina, the PNAD for Brazil, the CASEN for Chile, the GEIH for Colombia, the ECE for Costa Rica, the ELMPS of 2012 for Egypt, the NSS for India, the SAKERNAS for Indonesia, the ENOE for Mexico, the ENAHO for Peru, the QLFS for South Africa and the HLFS for Turkey.

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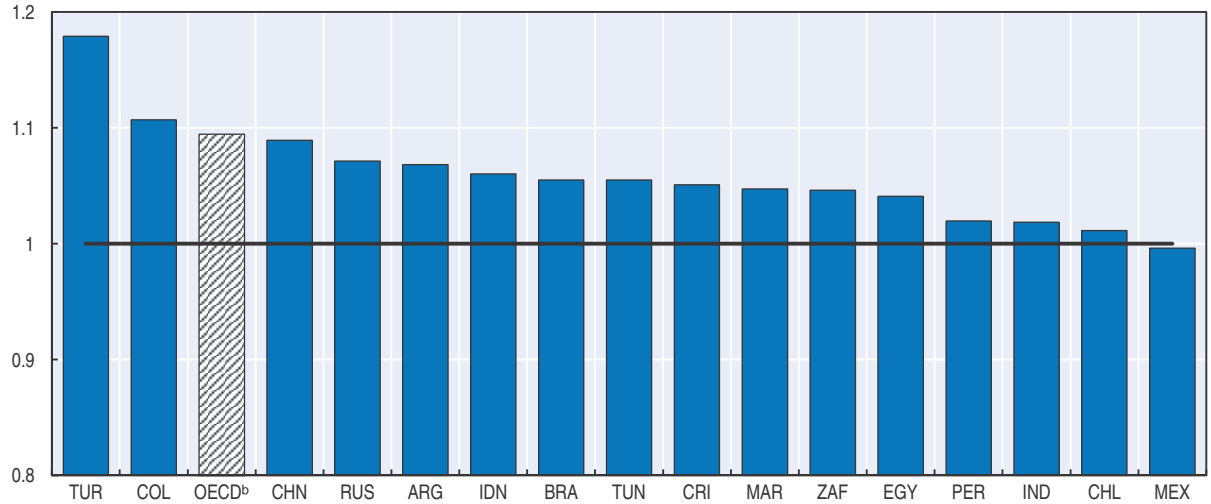
(Demirguc-Kunt, Klapper and Singer, 2013). This phenomenon has its roots in the gender wealth gap and is exacerbated by institutions and social norms favouring men's control over household resources (see the next section for a detailed discussion). Indeed, Demigruc-Kunt, Klapper and Singer (2013) also find that women are less likely to access credit in countries where they face legal restrictions in their ability to work, head a household, freely choose where to live and receive inheritances. These findings are confirmed by data from the Gallup World Poll on perceptions of credit constraints (Figure 4.10). In all of the countries considered, with the exception of Mexico, women report facing difficulties in accessing credit more frequently than men. The difference is especially large in Turkey, while it is negligible in Chile.

Limited access to business-specific human capital and training may also help to explain the gap in business success between men and women. Among the students who took part in the PISA assessment of financial literacy in 2012, girls typically perform worse than boys throughout the OECD. Out of the emerging economies where the assessment was carried out, China (Shanghai) and the Russian Federation show a similar gender gap, while the gap is in favour of girls in Colombia (OECD *PISA Database*, 2012). A similar test carried out in South Africa and Peru also showed girls having lower financial literacy than boys (Atkinson and Messy, 2012; OECD, 2012). Additional evidence on the gender gap in business-related skills can be found in Gallup data on access to business training and business advice. Across the countries analysed, women are more likely than men to report having no access to the necessary training on how to start a business (Figure 4.11, Panel A). The differences are particularly large in Argentina, Tunisia and Turkey, which are above the

Figure 4.10. **Women are more often credit-constrained than men**

Female to male ratio of the percentage of people who perceive being credit constrained[a] in 2012



a) Measured as the percentage of negative responses to "Do you have access to the money you would need if you wanted to start a business?".

b) OECD is the unweighted average of the 34 OECD member countries.

Source: OECD estimates based on the Gallup World Poll.

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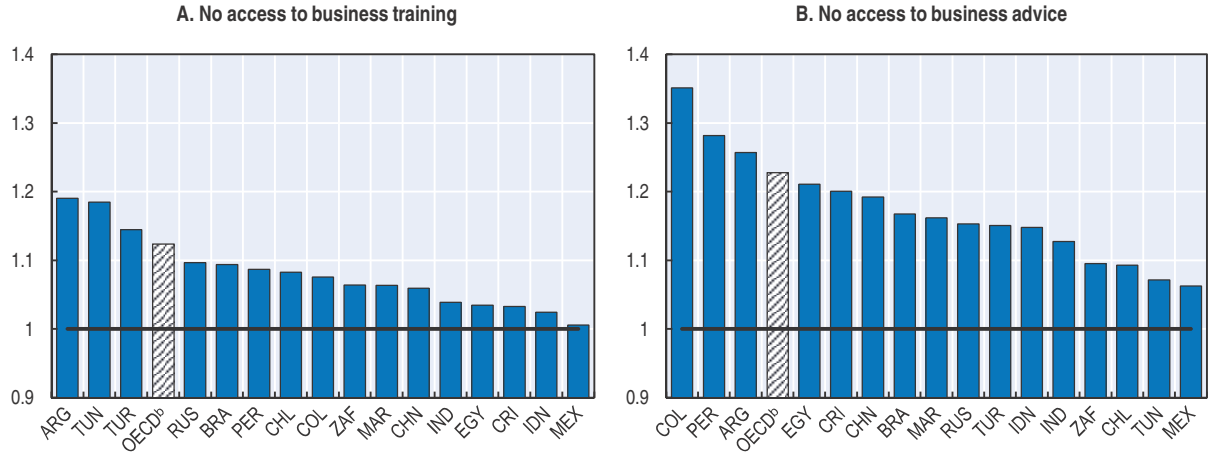
Figure 4.11. **Women have limited access to management advice and business training**

Female to male ratio of the percentage of people who report having no access to business training and advice[a] in 2012



a) Measured as the percentage of negative responses to "Do you have access to training on how to start a business, or not?" in Panel A and "Do you, personally, know anyone who would be able to give you advice about managing a business?" in Panel B.

b) OECD is the unweighted average of the 34 OECD member countries.

Source: OECD estimates based on the Gallup World Poll.

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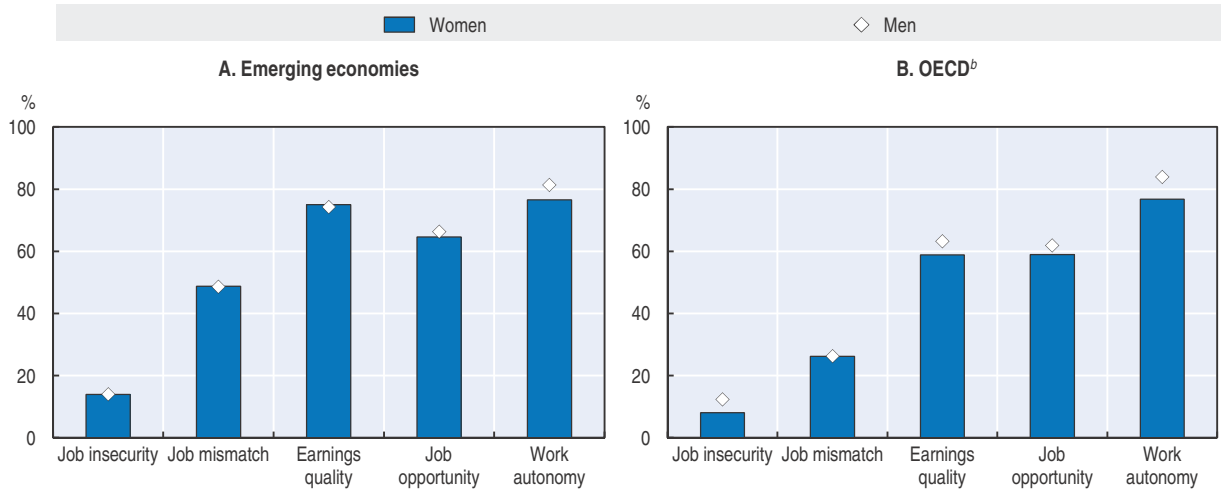
OECD average, and lowest in Mexico, where men and women report having equal access to training. Women are also considerably more likely than men to report having no access to business advice, with the widest gap recorded in Colombia and the lowest in Mexico (Figure 4.11, Panel B).

An additional possible explanation for the gender gap in business success is that women are more likely than men to become self-employed out of necessity, rather than for the sake of pursuing profitable investment opportunities. In developing countries, where the

welfare state is often weak, self-employment is an occupation of last resort for many (Falco and Haywood, 2016). The fact that women find it more difficult to access good jobs suggests that female-owned businesses may be less likely to grow because they are more likely to be driven by subsistence concerns, rather than by profitable business opportunities. Unfortunately, this hypothesis cannot be formally tested with the available data. However, some light can be shed on this issue by analysing the reasons that motivate men and women to start a business. In fact, data from the Gallup World Poll show that men and women have very similar motivations for starting an entrepreneurial activity (Figure 4.12), both in OECD countries and in emerging economies. The most common reasons for starting a business are the desire for higher earnings and greater work autonomy.

Figure 4.12. **Men and women start businesses for the same reasons**

Percentage of positive responses,[a] average across countries, 2011



a) Percentages of positive answers of business owners to the following questions related to the most important reasons they had to start their current business: "Had a great idea for a business" (Job opportunity); "Afraid of losing their current job" (job insecurity); "Could not find a suitable job" (Job mismatch); "Seen an opportunity to make more money" (Earnings quality); and "Wanted to be their own boss" (Work autonomy).

b) OECD is the unweighted average of 31 OECD member countries (Iceland, Norway and Switzerland not included).

Source: OECD estimates based on the Gallup World Poll.

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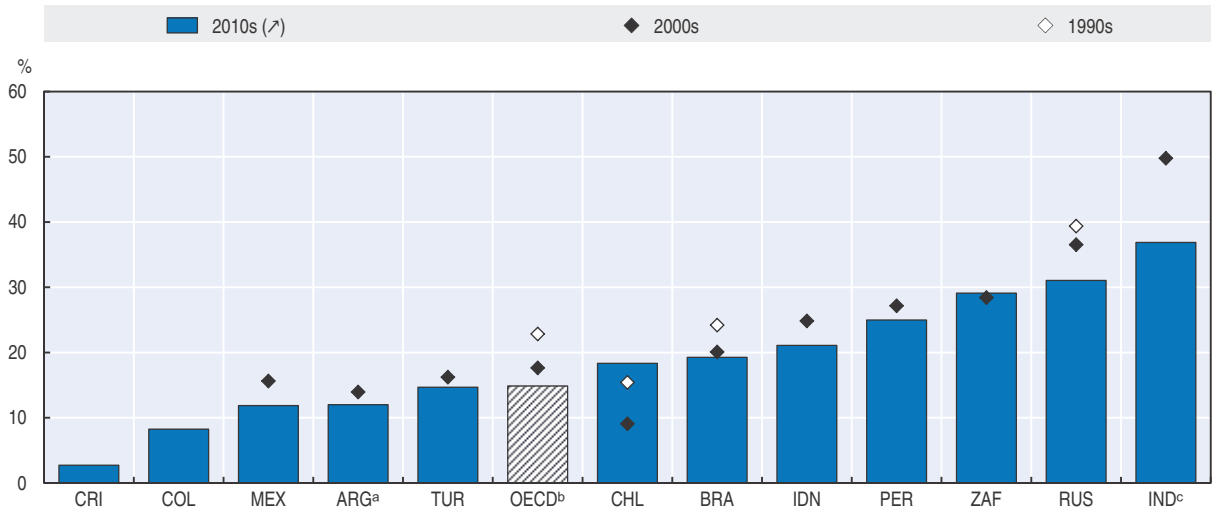
Women earn less than men

The combined impact of the multiple constraints outlined above results in a significant gender gap in earnings. Throughout the world, women earn less than men for every hour of work they do. Figure 4.13 shows that in all the countries analysed the median monthly earnings of full-time employees are significantly lower for women than for men. The average OECD country has a pay gap of nearly 15%, which has shrunk significantly over the past two decades (OECD, 2015c).[12] In emerging economies, the average gap is 19%, with the lowest value recorded in Costa Rica (3%) and the highest in India (37%). In most of the countries where historical data are available, the pay gap has shrunk since the 1990s. However, change has generally been limited, except in India where the gap fell by a quarter over the past decade.

A very large literature has attempted to explain the factors underlying the gender pay gap and a broad set of potentially important drivers have been identified (see World Bank, 2012 for a recent review). A common approach is to separate the impact of measured differences in worker and job characteristics (skills, sector and occupation) on the pay gap

Figure 4.13. **The gender pay gap remains substantial in most countries**

Difference between male and female median earnings divided by male median earnings



Note: Earnings refer to the monthly earnings of full-time employees (usually persons working at least 30 hours per week). The pay gap has been averaged over the available years within each decade.

a) Selected urban areas.

b) OECD is the unweighted average of the gender pay gap for the 34 OECD member countries.

c) Weekly earnings for India.

Source: OECD estimates based on the EPH for Argentina, the PNAD for Brazil, the CASEN for Chile, the GEIH for Colombia, the ENAHO for Costa Rica, the NSS for India, the SAKERNAS for Indonesia, the ENOE for Mexico, the ENAHO for Peru, the RLMS for the Russian Federation, the NIDS for South Africa, the EU SILC national files for Turkey and the *OECD Earnings Distribution Database* for the OECD average.

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from the remaining unexplained earnings gap that is attributed to other (unobserved) factors, including discrimination (see Box 4.2). This type of analysis was conducted for 12 of the economies analysed in this chapter, where up-to-date microdata are available. The results are summarised in Figure 4.14 and they show how the unexplained gender gap in hourly earnings changes as one compares workers with increasingly similar characteristics and jobs (starting by holding education constant, then sector and occupation).[13] The overarching conclusion is that even when comparing men and women with similar education and in similar jobs, large unexplained gaps persist in all the countries analysed.

The gender pay gap is not the result of women having less education than men. In fact, the gap among workers with the same level of education (the second bar for each country in Figure 4.14) is typically larger than the raw gap (in sharp contrast with existing evidence from OECD countries, e.g. Blau and Kahn, 2016). The main explanation is that participation in the labour market is strongly correlated with education (see Figure 4.2) and highly educated women are significantly more likely to be employed than low-educated ones (the only exception is India, which indeed shows a different pattern in Figure 4.14). As a result, working women have higher levels of education than working men, on average, and calculating the raw earnings gap without controlling for education leads to an underestimation of the differential.[14]

A sizable pay gap also exists within the same sector and occupation. Figure 4.14 shows that upon comparing men and women with not only the same level of education, but also the same sector of employment, the unexplained gap shrinks only marginally in most countries; and, once sector is held constant, the additional inclusion of occupational type makes little difference.[15] Even though women find it more difficult than similarly educated

Box 4.2. **Decomposing the gender pay gap**

The Oaxaca-Blinder decomposition is the most common approach to decompose the gender pay gap into a component that can be explained by differences in observable characteristics, such as education and sector of employment, and an unexplained component capturing differential returns to those observables (Blinder, 1973; Oaxaca, 1973). The unexplained part is typically attributed to a range of unobserved factors, including discrimination.

The first step is the estimation of two separate Mincerian log-wage regressions for male and female workers:

$$lnw_i = \beta X_i + \varepsilon_i \quad (1)$$

Based on the results of the estimation, the raw earnings differential between men and women can be decomposed as follows:

$$\overline{lnw_m} - \overline{lnw_f} = \underbrace{\beta_m\left(\bar{X}_m - \bar{X}_f\right)}_{Explained\ Difference} + \underbrace{\left(\beta_m - \beta_f\right)\bar{X}_f}_{Unexplained\ Difference} \quad (2)$$

where $\overline{lnw_m}$ and $\overline{lnw_f}$ are the means of male and female log-earnings, respectively; $\bar{X}_m$ and $\bar{X}_f$ are vectors containing the means of the independent variables for men and women; β_m and β_f are the coefficients obtained from estimating the earnings model in (1) for male and female workers, separately.

The first term on the right-hand-side of equation (2) captures the earnings differential that can be attributed to differences in observables characteristics between male and female workers. The second term captures the share of the gap that cannot be explained by observable differences and is typically associated with differential returns to those characteristics. The exact drivers of that differential are subject to a long-standing debate.

The results of the decomposition can be sensitive to the choice of the benchmark level of returns to observables, which is made to calculate the explained difference. In equation (2) the chosen benchmark is the male rate of return (β_m), but it would be equally plausible to use β_f as the benchmark set of coefficients. As the choice between these two alternatives may appear somewhat arbitrary and can give rise to differences in the results of the decomposition, a widely used alternative is to calculate a benchmark coefficient β^* from a pooled earnings regression over the joint sample of male and female workers (Neumark, 1988). The resulting decomposition can be written as follows:

$$\overline{lnw_m} - \overline{lnw_f} = \underbrace{\beta^*\left(\bar{X}_m - \bar{X}_f\right)}_{Explained\ Difference} + \underbrace{\left[\left(\beta_m - \beta^*\right)\bar{X}_m + \left(\beta^* - \beta_f\right)\bar{X}_f\right]}_{Unexplained\ Difference} \quad (3)$$

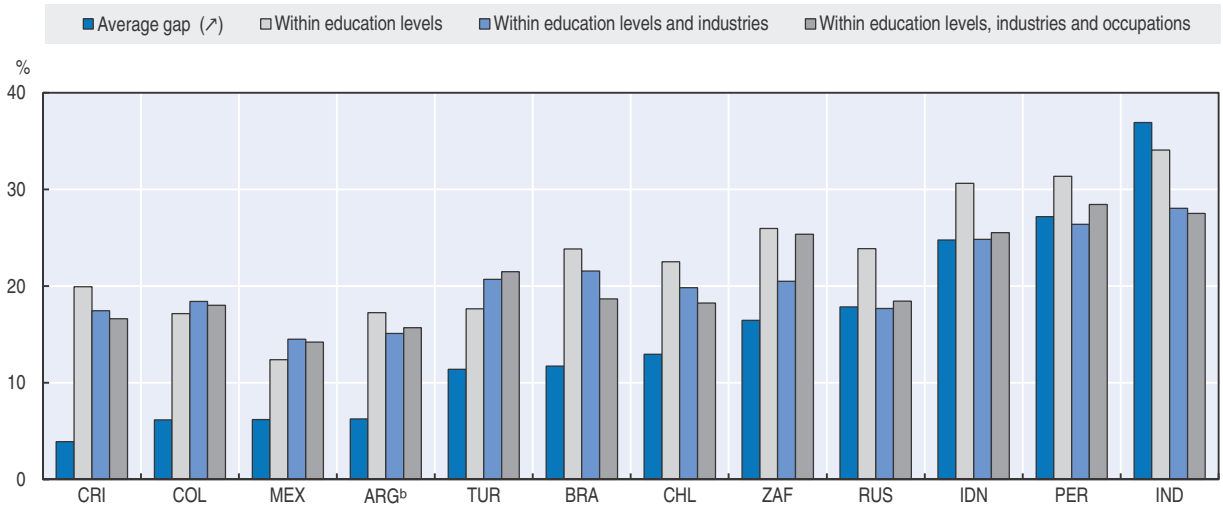
This workhorse model is used to estimate the results presented in Figure 4.14.

men to access the best-paid sectors in the economy and the best jobs within those sectors, these results suggest that industry and occupational wage premia explain only a modest share of the overall gender pay gap.

A number of explanations have been advanced in the literature to account for the existence of a pay gap that is not explained by observable worker characteristics, but none of them is fully satisfactory. The most prominent explanations include differential bargaining abilities between men and women (Babcock and Laschever, 2003), different risk-preferences (Croson and Gneezy, 2009; Charness and Gneezy, 2012), women's lower willingness to compete (Gneezy, Niederle and Rustichini, 2003; Niederle and Vesterlund, 2007) and pure discrimination (OECD, 2008, Chapter 3). Discrimination may result from

Figure 4.14. **Large unexplained pay gaps exist within education levels, industries and occupations**

Oaxaca-Blinder unexplained differences in hourly earnings, 2014[a]



Note: Earnings refer to the hourly earnings of full-time workers (usually working at least 30 hours per week), calculated using actual reported hours of work excepted for Brazil and Turkey (usual hours worked). Data refer to regular employees for India.

a) 2011-12 for India; 2012 for South Africa and Turkey; and 2013 for Chile.

b) Selected urban areas.

Source: OECD estimates based on the EPH for Argentina, the PNAD for Brazil, the CASEN for Chile, the GEIH for Colombia, the ENAHO for Costa Rica, the NSS for India, the SAKERNAS for Indonesia, the ENOE for Mexico, the ENAHO for Peru, the RLMS for the Russian Federation, the NIDS for South Africa, and the EU SILC national files for Turkey.

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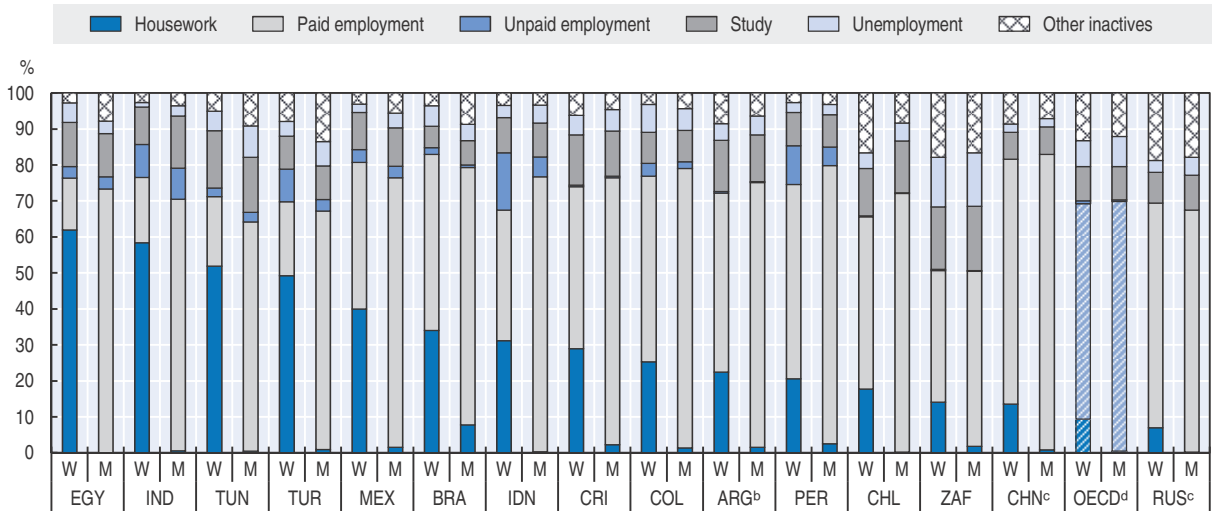
employers holding negative priors on women's productivity, which may in turn be reinforced by the difficulties women encounter in accessing good jobs, where they can prove their worth (a detailed discussion of gender discrimination will be offered in the next section). Social norms and the relative weakness of women's networks may also play a role. These theories are intuitively appealing, but recent evidence from developed countries shows that they are unable to account for some crucial patterns in the development of the gender gap over workers' lives. Most notably, these theories are unable to explain why male and female workers with similar characteristics have similar wages upon entering the labour market but experience a divergence later on in their working lives (with men's earnings growing faster). Goldin (2014) attributes the unexplained pay gap and the way it widens with work experience to the fact that many well-paid occupations offer high rewards (in terms of pay and career advancement) to people who are able to work long hours while accepting relatively inflexible schedules (e.g. bankers and lawyers).[16] As women throughout the world are typically expected to take on a larger share of unpaid housework and family care than men, they often have a greater need for scheduling flexibility, which comes at the cost of lower earnings and fewer opportunities for career advancement. Motherhood fosters this pattern. Pregnancy, childbirth, recovery and child caregiving increase women's need for flexibility and make it more difficult for them to work long hours. As a result, empirical evidence from advanced economies shows that the gender pay gap tends to be more substantial for mothers, while women who are not mothers tend to earn as much as men (Correll, Benard and Paik, 2007, Budig and England, 2001). Agüero, Marks and Raykar (2011) document a significant motherhood wage penalty in a large sample of women from 21 developing countries.

In line with Goldin's argument, the share of women whose main activity is housework (including childcare) is substantial in most of the emerging countries considered in this chapter, while the share among men is almost zero in all countries except Brazil (Figure 4.15). The gap is widest in Egypt and India, where approximately 60% of working-age women identify housework as their main activity, followed by Turkey and Tunisia, where the figure is about 50% (the average for European OECD countries and the United States is only 12%).[17] These data underline the profound disparities in the division of household responsibilities between men and women throughout the emerging world, but provide little information about the extent to which women's participation in paid employment is constrained by their family responsibilities.

Figure 4.15. **Women bear the brunt of household duties**

Distribution of the working-age population by main activity, 2014[a]



Note: The classification is based on ILO standard definitions and respondents' self-reported main activity during the reference week. Countries are ordered in descending order of women in housework.

M: men; W: women.

a) 2010 for China and Tunisia; 2011-12 for India; 2012 for Egypt, and 2013 for Chile, the OECD average and Turkey.

b) Selected urban areas.

c) Unpaid family workers are included in paid employment for China and the Russian Federation.

d) OECD is the unweighted average of 21 OECD countries: Austria, Belgium, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland and the United States.

Source: OECD estimates based on the EPH for Argentina, the PNAD for Brazil, census data for China, the CASEN for Chile, the GEIH for Colombia, the ENAHO for Costa Rica, the ELMPS of 2012 for Egypt, the NSS for India, the SAKERNAS for Indonesia, the EU LFS microdata (European countries) and the March Supplement of the Current Population Survey (United States) for the OECD average, the ENOE for Mexico, the ENAHO for Peru, the RLMS for the Russian Federation, the QLFS for South Africa, the ENPE for Tunisia and the HLFS for Turkey.

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More detailed evidence about how household responsibilities particularly burden women comes from the time-use data that are available for a sub-set of these countries (see Box 4.3 for a detailed discussion of time-use data). By allowing a detailed breakdown of people's time, this type of survey provides a more nuanced picture of gender roles. Interestingly, if one adds up the time spent on paid and unpaid work (including housework and childcare), women typically spend more hours working than men and have less time

for leisure. Most importantly, the data show that even women who undertake paid work as their main activity dedicate a considerably larger share of their time to family work than men (Figure 4.16, Panel B). This directly supports Goldin's argument, since trying to reconcile paid work with family responsibilities may be costly for women's careers and thus foster gender gaps in labour market outcomes.

Persistent disparities in the division of housework and family care may be particularly difficult to overcome since they are closely tied to anti-egalitarian social norms and feed into stereotypes that limit the role of women in society and the labour market. Indeed, in countries where women are more likely to work at home, people tend to hold views that are less conducive to women's participation in the labour market (as discussed in Box 4.1). This pattern is also confirmed by the *OECD Social Institutions and Gender Index (SIGI) Database*, which shows that discriminatory social institutions are linked to higher inequality in unpaid work between men and women across the world (OECD, 2014a).

Box 4.3. **Time-use data highlight the severe constraints on women's time**

Time-use surveys are a useful tool to investigate time-constraints on women's participation in the labour market. By recording workers' activities throughout the day, these surveys provide a precise estimate of the time devoted to paid work, unpaid work (including housework), leisure and personal care.[a] Rather than simply classifying workers on the basis of their main activity (typically obtained from labour force data), these data provide a portrait of how time use is distributed across different activities. As the collection of this type of data is particularly onerous, time-use surveys are not conducted regularly and they are especially rare in emerging economies. Nonetheless, data are available for seven of the countries analysed in this chapter at some point over the past decade (the only exception is India, where the latest available survey is from 1998). The picture that emerges is very consistent across all of the countries analysed.

In all countries, the time-use data show that women spend more time than men doing unpaid work and less time in paid work or study (Figure 4.16, Panel A). The disparity is striking. Men typically spend between 60% and 70% less time than women doing unpaid work. In India, they only spend half an hour on unpaid work for every five hours spent by women. By comparison, in OECD countries men dedicate about half as much time as women to unpaid work (Miranda, 2011). When paid and unpaid work are combined, women are seen to spend a higher share of their time working and have less time for leisure than men.[b]

Crucially, women spend a significant share of their time on housework even when they have full time jobs (Figure 4.16, Panel B). Comparing men and women in full-time employment reveals that women typically spend 3.4 hours per day on additional housework, compared to 1.4 hours per day spent on housework by men. As women's time in paid employment increases, their time dedicated to unpaid work decreases less than proportionately.

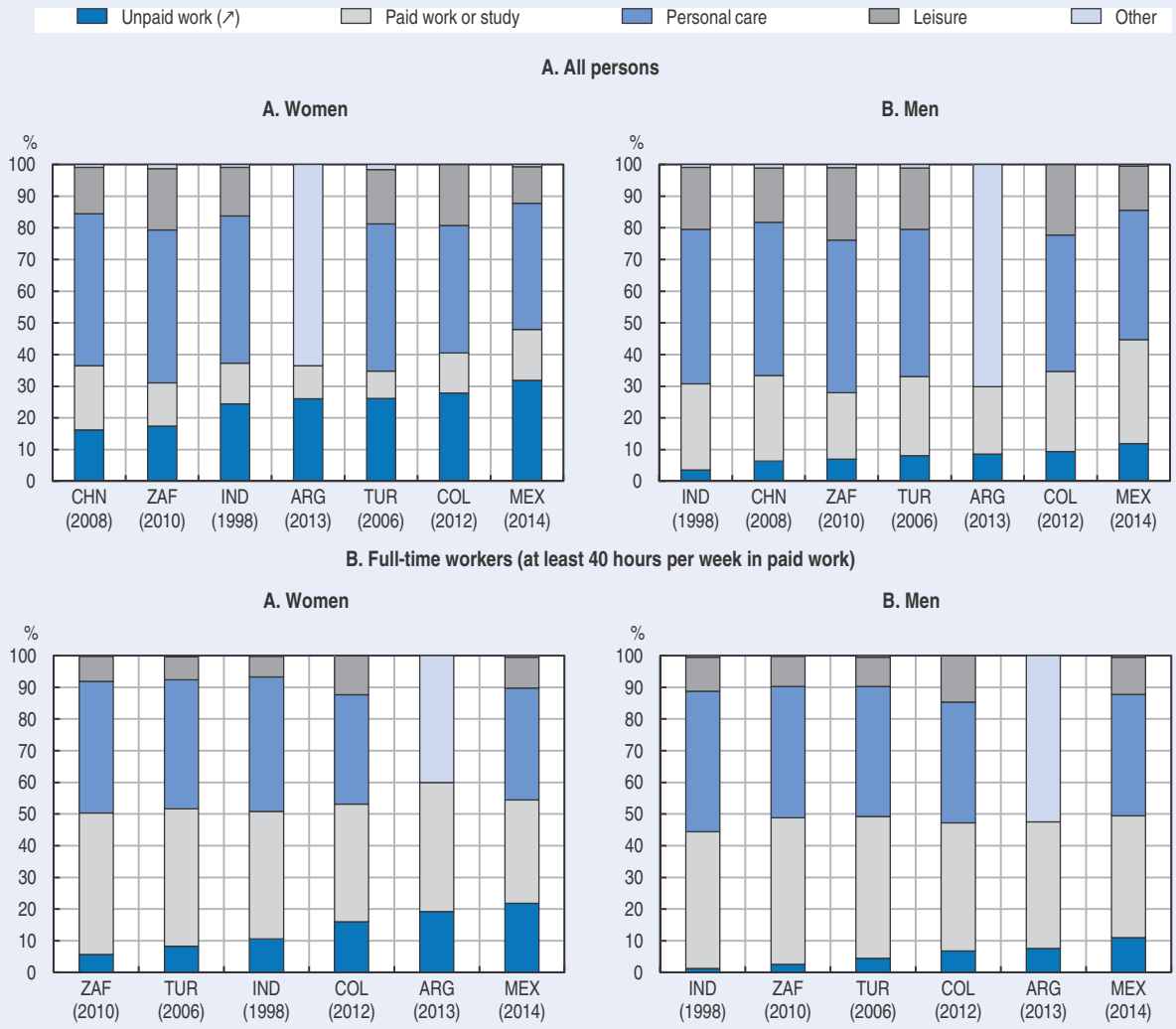
Overall, time-use data suggest that women who participate in the labour market typically carry a heavy burden of household responsibilities, which is likely to reduce their competitiveness *vis-à-vis* men and may explain the persistence of gender gaps in the labour market (Goldin, 2014).

a) This is a standard categorisation, consistent with previous work in this field (e.g. Miranda, 2011).
b) The time spent on personal care, which largely accounts for sleeping, is typically the same for men and women.

Box 4.3. **Time-use data highlight the severe constraints on women's time** *(cont.)*

Figure 4.16. **Women devote much more time than men to household duties**

Percentage of total time use[a] of persons aged 15-64[b]



a) For Argentina, "unpaid work" does not include travel related to household activities and "paid work and study" refers only to hours in paid job.

b) Persons aged 15-74 for China.

Source: OECD estimates based on a special module on unpaid work and time use of the Encuesta Anual de Hogares Urbanos (EAHU) for Argentina, and on National Time Use Surveys for China, Colombia, India, South Africa and Turkey.

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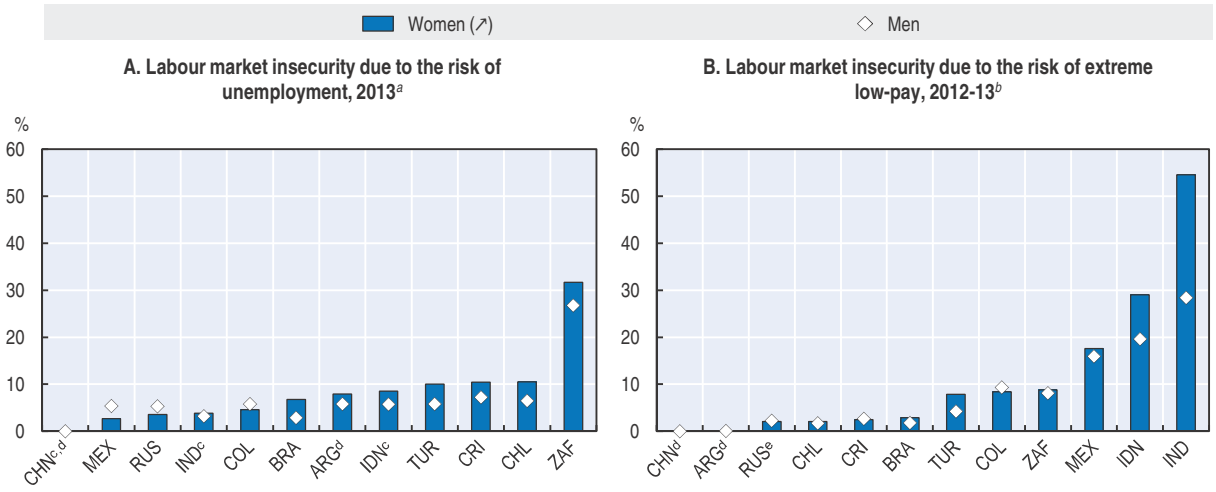
Women's jobs are less secure

Not only do the jobs that women hold typically pay less than the jobs held by men, they also tend to be less secure. The OECD Job Quality framework provides a new tool for measuring labour market insecurity along two important dimensions: insecurity generated by the risk of unemployment and insecurity due to the risk of extreme low pay while employed (OECD, 2015, Chapter 5). Both dimensions are measured so as to account for the compensatory role of social transfers (including unemployment benefits) and can

Figure 4.17. **Women's jobs are less secure**



Note: **Panel A:** Due to the lack of satisfactory data to calculate flows into and out of unemployment, unemployment risk is approximated by the unemployment rate. Unemployment insurance captures the effective net individual replacement rate of unemployment and social assistance benefits in terms of previous earnings. Overall insecurity from unemployment is calculated as the product of unemployment risk and one minus unemployment insurance, and may thus be interpreted as the average expected earnings loss associated with unemployment, which is expressed as a share of previous earnings. **Panel B:** The extreme low-pay threshold corresponds to a disposable income per capita of USD 2 (PPP) per day in a typical household of five members with a single earner. The probabilities of entering and exiting extreme low-pay status represent annual concepts and are calculated by means of the pseudo-panel methodology by Dang and Lanjouw (2013), who extend the method proposed by Dang et al. (2011; see OECD, 2015b, Chapter 5, for a detailed discussion). The overall risk of extreme low pay is calculated by (the scaled transformation) of the product of the probability of entering extreme low-pay status and the expected duration of remaining there. Calculations are based on net hourly earnings adjusted for social transfers.

a) 2013 refers to 2011 for Chile, 2012 for India, Mexico, the Russian Federation, South Africa and Turkey.

b) 2012-13 refers to 2009-11 for Chile, 2011-12 for India and Turkey, 2010-12 for Mexico and South Africa, and 2012 for the Russian Federation.

c) Data do not contain transfers, hence an insurance rate of zero percent is assumed.

d) Selected urban areas.

e) Transition probabilities could not be estimated on categorical earnings data. The corresponding risk figure therefore represents the share of employed working-age individuals living in households with a monthly disposable income of less than 6 000 Russian rubles (this corresponds to an hourly low-pay threshold of 1.14 PPP-adjusted international dollars for a member of a two-earner family working full-time).

Source: OECD calculations based on national household and labour force surveys (EPH, Argentina; PNAD, Brazil; CASEN, Chile; UHS, China; GEIH, Colombia; ENHAO, Costa Rica; NSS, India; SAKERNAS, Indonesia; ENIGH, Mexico; NIDS, South Africa), the EU SILC national files (Turkey) and the European Social Survey (Russian Federation).

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therefore be interpreted as the uninsured component of each risk. In most countries where data are available, women's jobs are less secure than men's along both dimensions (Figure 4.17).

Labour market insecurity due to the risk of unemployment is higher among women in all countries except Mexico, the Russian Federation and Colombia, where female unemployment rates are typically lower (Figure 4.17, Panel A). Focusing on the risk of unemployment *per se*, however, does not paint a comprehensive picture of labour market risks in emerging economies, as the lack of effective safety nets makes unemployment unaffordable for many workers and pushes them into jobs of "last resort" (OECD, 2015b, Chapter 5). A useful and complementary dimension of insecurity is thus the risk of falling into such undesirable jobs, defined as falling beneath a threshold of "extreme low pay" (Figure 4.17, Panel B). In most countries, this second source of insecurity is equally important for men and women. In India and Indonesia, however, where insecurity due to unemployment is rather low for both male and female workers, women face a significantly larger risk than men of falling into extreme low pay.

2. Policy recommendations

Closing gender gaps in emerging economies will require concerted action across a broad spectrum of policy domains. First, policy makers should tackle the remaining gaps in education and access to capital that continue to put women at a severe disadvantage in a number of countries. Second, policy action should address all those factors that hamper women's labour market prospects even when they have the same endowments of skills and capital as men. Such additional constraints may often be more difficult to remove. They include discrimination, constraints on women's time, fiscal disincentives and other regulations that limit female participation in the formal labour market (or make women less competitive in the eyes of employers). The weight of each factor may vary considerably across countries and effective policies should be tailored to the specific needs of each country.

Close remaining gaps in education

Remaining gaps in enrolment rates between boys and girls can be closed by reducing the direct and indirect costs of schooling. While the gender gap in primary education has almost disappeared throughout the economies analysed, there are still significant differences in enrolment at higher levels of education among workers from poorer socio-economic backgrounds in a number of countries. Secondary and tertiary education are typically more expensive than primary school, as a result of both higher direct costs (tuition fees, books, uniforms, etc.) and indirect costs (the forgone pay a student could earn if employed, or the housework they could perform). Even when education is provided for free, poor families may be unable to enrol their children in school as this may entail a significant loss of earnings and a reduction in the resources available for housework. As girls are typically expected to take on a larger share of housework than boys, this explains why gender enrolment gaps are wider among poorer households, even when education is provided free. Another driver of these gaps is the fact that poor parents perceive boys' education as a better investment if girls are expected to be married off, while boys will take care of their parents later in life (OECD, 2012). This mechanism is likely to be more important in countries with weak social safety nets and poor pension systems.

Conditional Cash Transfers (CCTs) have proven to be an effective tool to boost enrolment rates of children from low-income families. Eligible households typically receive a monetary transfer if certain behavioural conditions are met. Children's regular enrolment in school is commonly the main condition for receiving the transfer. By conditioning social assistance on children's school attendance, such interventions effectively succeed in aligning parents' incentives with the students' best interests. A number of such programmes have been effectively implemented in several countries across the world and a large literature has documented their effectiveness (see Rawlings and Rubio, 2005, for a review of the impacts of CCTs in several emerging economies).[18]

Increasing enrolment *per se* may be insufficient to improve women's labour market outcomes when school quality is low and social norms foster gender disparities and segregation by field of study. Data from PISA clearly show that even in countries where enrolment gaps have disappeared (or reversed in favour of women), such as India, Colombia, Costa Rica and Peru, a performance gap between boys and girls persists in key areas of learning, such as Mathematics and Science. This has direct implications for labour

market outcomes and contributes to occupational segregation. Existing evidence shows that female students are less likely than males to study disciplines with higher labour market returns (e.g. STEM subjects), as discussed above (OECD, 2014b, 2015a).

In light of this evidence, policy makers should move beyond a narrow focus on boosting female enrolment and concentrate as well on the contents and quality of teaching. Special efforts should be made to get girls more interested in mathematics and science and boys more interested in reading. Gender bias in curricula should be removed (e.g. by phasing out gender stereotypes from textbooks, promoting female role models, and using learning materials that appeal to girls). Awareness should be raised on the likely consequences of choosing different fields of study for careers and earnings (OECD, 2012). Teachers should be adequately selected, trained and incentivised to attain greater gender parity in the choice of subjects and learning outcomes. A growing literature shows that the quality and motivation of school personnel can be a crucial bottleneck in the process of improving school quality in emerging economies (e.g. Duflo, Rema and Ryan, 2012). Recent evidence also shows that hiring more female teachers may have a positive impact on girls' school outcomes (Glewwe and Kremer, 2006). Special efforts should be made in countries where social norms are most conducive to occupational segregation; and gender gaps should be tackled early in students' lives, when returns to education are highest and before gender-biased social norms may be absorbed.

Apprenticeships can also be used as a tool to close gender gaps. Work-based learning (WBL) and apprenticeship schemes can facilitate the transition from school to work and encourage labour market participation among young women at high risk of becoming inactive. Moreover, apprenticeships can be an effective measure to encourage women who have completed their science, technology and mathematics studies to work in scientific fields (OECD, 2012). Evidence from OECD countries shows that even when women pursue STEM studies, they are less likely than men to subsequently work in physics, mathematics and engineering. The design of effective apprenticeship systems requires concerted action between the public and the private sector. Employers should work closely with schools (particularly, but not exclusively, with technical and vocational education and training institutions) to ensure that curricula reflect the needs of the labour market, and to design apprenticeship schemes that are well-suited to the students' competences.

In recent years, several emerging economies have attained positive results in reducing segregation by field of study, as documented by recent OECD work on the share of degrees awarded to women in different subjects (OECD, 2014b). The analysis covers seven of the countries considered here.[19] The data show that Mexico is now the OECD country that awards the largest share of degrees in the field of computing to women (about 40% compared to an OECD average of 20%). It is followed closely by South Africa (37%). Argentina and Colombia are the emerging economies where the largest share of degrees in the field of engineering, manufacturing and construction is awarded to women (over 35%, compared to an OECD average of 27%). Women in Argentina are also awarded 70% of all degrees in Mathematics and Statistics, compared to an OECD average of 46%. In most of the emerging world, however, severe gender gaps persist and improving women's educational attainments should remain a primary concern for policy makers.

Facilitate access to credit

Throughout the world, female entrepreneurs are less likely to make use of bank loans than their male counterparts (OECD, 2012). As access to credit is fundamental for business

growth and innovation, this may partly explain why female-owned enterprises tend to be smaller and less productive (Bruhn, 2009). Moreover, a vicious cycle of low productivity and limited access to capital may become self-reinforcing and foster poverty traps. This can happen if the general credit constraints faced by female entrepreneurs stifle investment in their businesses, causing productivity to remain low and further reducing their credit-worthiness. Policy action can play a crucial role by helping women access collateral and build solid credit-records, by closing gender gaps in financial literacy and business skills, and by strengthening anti-discrimination legislation.

Female access to credit is constrained by lack of collateral assets, as the wealth distribution is typically skewed in favour of men. Moreover, in most countries analysed there exist laws or customary, traditional or religious practices that prevent women from having the same access to land, non-land assets or financial services as men (*SIGI Database*). This problem is often exacerbated by family codes and social norms granting more control over family assets to men, and inheritance law that favours men over women. The *SIGI Database* shows that two thirds of the countries analysed in this chapter have medium to very highly discriminatory family codes.[20] In some countries, such as Indonesia, Morocco, Tunisia and Egypt, sons and daughters do not have equal rights to inherit property from their parents, nor do men and women have equal rights to inherit assets from a deceased spouse (*WBL Database*, 2016). Where still in place, such discriminatory legislation should be removed.

Being able to document a solid credit history is an important requirement for accessing credit. For women, who are less likely to have access to credit markets (and banking instruments more generally), this can be an important obstacle. To facilitate the build-up of credit records, over half of OECD countries require retailers or utility companies to provide information to private credit bureaus or public credit registries. A record of successful repayments to such companies can help women build their credit histories and access finance. Some emerging economies have adopted similar measures and have extended their coverage to microfinance institutions. In China, India, Indonesia, Morocco, the Russian Federation, Tunisia and Turkey, however, such measures have not been introduced yet (*WBL Database*, 2016).

Limited financial literacy can be another important constraint to accessing credit. Evidence from OECD countries and a number of emerging economies shows that girls typically have lower levels of financial literacy than boys (Atkinson and Messy, 2012). They are also typically less confident in their financial knowledge and skills (OECD, 2013b). In light of this gap, a number of countries, including developing and emerging economies, have developed financial education programmes. A few emerging economies, including Brazil and Turkey, have made women a specific target group of their national strategies for financial education (Grifoni and Messy, 2012);[21] and a broad range of smaller programmes have been implemented in several other countries. These training programmes span a broad range of subjects, including financial product awareness, day-to-day financial management, borrowing, long-term financial planning and consumers' rights (OECD, 2013b). In Colombia, Brazil, Mexico and Peru financial education is one component of some CCT programmes (García et al., 2013; Maldonado et al., 2011). Most of these schemes are targeted at specific groups of women, such as youth, elderly/widows, unemployed and low income women, often in disadvantaged areas. Female entrepreneurs in micro-enterprises are another primary recipient category. The project "Femmes Entrepreneuses en Méditerranée" (FEM) implemented in 2006-08 in Tunisia and Egypt, for instance, was

targeted at small business owners and included a strong training component. In India, the Self-Employed Women's Association (SEWA) organises financial literacy training for female entrepreneurs. A growing body of impact evaluations shows that such programmes can be successful in raising women's financial literacy and inclusion (see OECD, 2013b for a full review). However, evidence from the OECD International Network on Financial Education (INFE) stock-tacking exercise also shows that policy awareness about the need to address gender differences in financial literacy remains low in many countries.

Even when female entrepreneurs possess the necessary collateral and skills to apply for credit, they may be less willing than men to do so. This may be the result of different risk-preferences (Croson and Gneezy, 2009) or lower expectations of success. Evidence from the United States shows that fear of rejection is more likely to discourage women than men from applying for a loan, even though women are no more likely to be rejected when they do apply (Cole and Mehran, 2009). Despite the lack of direct evidence, it is reasonable to expect that similar mechanisms might be at play in emerging economies and they may be exacerbated by stronger anti-egalitarian social norms (Box 4.1) and by the lack of effective social safety nets. In such cases, providing better information on the success rate of female-led businesses at school or through broader awareness campaigns may have a positive effect on female entrepreneurship.

Female entrepreneurs may also suffer from pure discrimination in credit markets, driven by prejudice or misperceptions of women's credit-worthiness. As such misperceptions are often the result of lack of experience with female borrowers, facilitating women's access to credit through the policy levers discussed above may have the added positive effect of dissipating harmful stereotypes. Effective anti-discrimination laws can also play an important role. A recent report by the World Bank shows that none of the countries analysed except Mexico, Peru, Morocco and South Africa have laws explicitly prohibiting discrimination by creditors on the basis of gender and marital status (World Bank, 2015).[22]

Free women's time and promote flexible employment

Despite their increased participation in the labour market, women continue to shoulder most housework and family care throughout the world (Box 4.3). This places significant constraints on their time availability for paid employment with detrimental effects on their labour market outcomes. In particular, household commitments may force women to seek less competitive career paths and greater flexibility at work, which puts them at a disadvantage in occupations that reward long and inflexible working hours. As discussed in the previous section, this is a leading explanation for the persistence of the gender pay gap (Goldin, 2014). In light of this evidence, policy action should aim to free women's time by easing the burden of household responsibilities and by encouraging men to participate more actively in housework. It should also promote greater flexibility in the workplace.

Subsidised childcare focusing on low-income households has proven to be very successful in enhancing women's employment in emerging economies. Such programmes have been introduced in Mexico (*Estancias Infantiles*) and Colombia (*Hogares Communitarios*), as well as in Argentina and Brazil. These programmes have helped increasing women's labour market participation and hours worked (Mateo Diaz and Rodriguez-Chamussy, 2013; Paes de Barros et al., 2010). In countries like India, where publicly provided childcare services are lacking, such programmes have often been provided by private actors and NGOs (World Bank, 2012). Childcare can also be made more affordable through tax deductions. In

over one third of OECD countries, childcare benefits are tax deductible. In emerging economies, that is only the case in Argentina, Brazil and Mexico (*WBL Database*, 2016). Such deductions, however, are likely to be less effective than free provision of childcare in countries with a large informal sector (where many workers do not pay taxes). Furthermore, the schedule of deductions should be designed so as to avoid disproportionate benefits to richer parents.

More generally, the introduction of stronger safety nets and, in particular, of universal (non-contributory) health insurance may facilitate women's access to the labour market. For instance, Del Valle Suarez (2014) and OECD (2011, Chapter 2) show that the introduction of *Seguro Popular* (a non-contributory health insurance scheme) in Mexico helped to bring more women into the labour force by freeing them from some of their caring duties. Similarly, strengthening unemployment benefits and other forms of social assistance may help women attain formal employment by reducing the risk of falling into occupations of last resort (a broader discussion of policy initiatives to curb informality will be provided below).

Less evidence exists on the effect of improved assistance for the elderly on female labour market participation, but it is likely to have a positive impact in countries where elderly people are largely reliant on their family and cannot count on state-provided support. Moreover, appropriate legislation should be in place to protect workers with caring responsibilities against employers' abuses. In all OECD countries, employers must allow workers to take leave in order to care for sick relatives. Of the 16 emerging countries analysed in this chapter, only Argentina, Chile, Peru, the Russian Federation and South Africa have such a provision. Such legislation should be gender-neutral and should avoid imposing excessive costs on employers, which would have detrimental effects on the employment prospects of protected workers.

The range of policies that may help to free women's time extends far beyond childcare services and care for the elderly. Documenting the full spectrum is beyond the scope of this chapter, but investment in infrastructure, such as water, electricity and roads, provides an example of such a policy. These types of investments may facilitate access to the labour market for women by increasing the efficiency of housework and facilitating their commute to work. South Africa's rural electrification programme, for instance, is estimated to have increased women's labour market participation by about 9% (Dinkelman, 2010). Clearly, potential solutions may not be equally applicable across countries and policy makers should select the most appropriate design for each specific context.

Finally, greater flexibility in working time arrangements facilitates women's access to the labour market and reduces gender disparities. Evidence from the United States shows that industries where working arrangements are more flexible typically display lower gender pay gaps (Goldin, 2014). Those are typically industries where tasks can be easily split into self-contained units that can be more easily distributed among multiple workers without requiring each one of them to work long (and inflexible) hours.[23] Technological progress (particularly the fast development of ICT) is the primary driver of increased flexibility. Where possible, governments should encourage technological transformations that are conducive to more flexible work arrangements and eliminate unnecessary legislative obstacles. Infrastructure investment can also help in this respect. Promoting fast Internet access in disadvantaged regions, for instance, could play an important role in helping parents work more flexibly.

Well-designed working time regulations can also facilitate women's access to the labour market, for example by granting parents the flexibility they need. OECD countries such as the Netherlands allow new mothers to switch to a part-time schedule in the same job, thus giving them the opportunity to smoothly transition from maternity leave to employment and reducing the risk of an abrupt break in their career. This type of flexible arrangements has been successful in raising female participation. Such provisions, however, should be carefully balanced between men and women to avoid increasing the relative cost of hiring mothers, to promote more involvement of fathers in family care and to minimise the risk that part-time arrangements may trap mothers in lower ranking career tracks and damage their future prospects. Flexible work-arrangements may also be less appropriate in countries where only a minority of women can afford to opt for part-time work.

Make parental leave more effective

The vast majority of countries in the world have a law requiring employers to grant women a period of paid or unpaid leave following the birth of a child. Maternal leave constitutes a cornerstone of modern welfare states and can have positive impacts on female labour market outcomes. Recent evidence from OECD countries shows that paid maternity leave increases the likelihood that women work, as it gives them an incentive to work prior to childbirth and offers them employment protection to facilitate their return to the labour market afterwards (Adema, Clark and Frey, 2015). However, when maternal leave is excessively costly for employers (and paternal leave is considerably less generous), it may also play a role in perpetuating gender gaps by increasing the cost of employing a woman relative to a man. In order to avoid this perverse effect, a number of measures can be introduced.

The costs of maternity leave should be collectivised. In most OECD countries, the benefits paid during maternity leave (either a fraction or the entirety of the worker's wage) are covered entirely by the government or are part of a social insurance system (*WBL Database*, 2016). That is also the case in a number of emerging economies, but in several others employers have to pay part of the benefits (China, Costa Rica, Egypt) or the full amount (India and Indonesia). By increasing the cost of hiring women, this latter setup may have a significant detrimental impact on female employment.

Even when the public purse pays for maternity leave, employers face additional costs that may discourage them from hiring women (e.g. the costs of hiring and training a replacement, the cost of business disruption, etc.). Fiscal incentives can help to tackle this problem. Spain, for instance, has made firms exempt from paying social security contributions when hiring a temporary worker to replace an employee on maternity leave.

Strengthening and encouraging the take-up of paternity leave may help level the playfield between men and women by reducing the relative cost of hiring female workers and by encouraging fathers to carry out childcare-related activities. It may also be beneficial for children's development.[24] Recent evidence from advanced economies shows that women's employment is higher in countries that mandate paternity leave compared to those that do not (Amin, Islam and Sakhonchik, 2016). In the emerging economies analysed in this chapter, the law mandates employers to give fathers a period of paternity leave in the majority of cases. However, the number of days of leave granted to men is typically very low compared to women. On average, a man gets 1 day of leave for every 28 days granted to a woman, similar to the ratio observed in OECD countries

(*WBL Database*, 2016). To get around this problem, some OECD countries have introduced measures to incentivise paternity leave. In Germany, for instance, the two parents can choose how to split the parental leave entitlement between them and the total number of months at their disposal increases if men decide to take part of it. Incentives of this kind may help overcome (and eventually change) the social norms that often discourage men from taking paternity leave. Increasing the generosity of paternal leave, however, may not be feasible when employers bear its full costs. This is currently the case in all the countries analysed in this chapter except Colombia, Morocco and Tunisia.

Fight gender discrimination in the labour market

Part of the gender gap may be driven by pure discrimination on the part of employers.[25] Several theories exist for the persistence of discriminatory behaviour in the labour market and each of them has important implications concerning the types of government actions that are needed to improve the situation (see OECD, 2008, Chapter 3, for a detailed discussion).

The most straightforward explanation for labour market discrimination is based on preferences (Becker, 1957). If employers dislike employing female workers, they will prefer hiring a man over an equally (or possibly, more) productive woman. Such choices are harmful for economic efficiency, but employers with sufficiently strong discriminatory tastes will be willing to shoulder the associated costs. Moreover, if such preferences are sufficiently wide-spread, market competition will not necessarily eliminate discriminatory employers and discriminatory practices may persist in the long run.[26] This type of discrimination may not only drive a gender gap in employment, but may also be responsible for gender differences in pay.[27]

Another mechanism that can produce discriminatory hiring practices is statistical discrimination (Arrow, 1973; Phelps, 1972; and Donohue, 2005). If employers cannot perfectly observe an applicant's productivity but believe that women are on average less productive than men, they will tend to discriminate against female employees so as to enhance the overall productivity of their workforce.[28] This type of discrimination might progressively disappear as women close the skills gap, but if stereotypes and social norms adjust with a lag, change will be slow to materialise. Employers' perceptions may be particularly hard to change in countries where discrimination is strong. In such contexts the fact that women are unable to access the best jobs (itself a result of discrimination) may reinforce employers' misperceptions and fuel a vicious cycle of self-reinforcing discrimination and stereotypes. An equally dangerous vicious cycle may arise if employers' discriminatory practices lead women to under-invest in their human capital or adversely affect their choice of study field.[29] Measuring employers' biases is a major empirical challenge, but experimental methods can help overcoming it. A recent study from sub-Saharan Africa, for instance, finds that male employers tend to underestimate the productivity of female workers (Caria and Falco, 2014).

In order to tackle these problems of preferences, information and misperception, several policy options are available, including affirmative action initiatives. The idea behind such policies is to help create a critical mass of women in key sectors by promoting preferential hiring and by setting quotas. Reaching such a critical mass helps to change social norms and curbs the informational problem, as women are given the opportunity to prove their abilities to employers and to the public. Some controversy remains on the potential adverse effects of affirmative action policies in terms of efficiency, but existing

studies from the United States suggest that such effects may be small (Holzer and Neumark, 2000). For the system to be effective, carefully designed sanctions for non-compliance need to be in place. Moreover, to prevent efficiency losses from occurring, the affirmative action initiatives should be removed once the desired critical mass is attained. Active labour market policies that are specifically tailored to women's needs are another useful tool to help female workers seize good jobs and give employers the opportunity to experiment with a diverse labour force. In addition, competition policy and lower product market regulation can help to drive inefficient discriminatory practices out of the market (Weichselbaumer and Winter-Ebmer, 2007; OECD, 2008, Chapter 3). In countries where social norms, traditions or customary practices enhance discrimination, however, interventions of this kind may not be sufficient. In such cases, the education system should place a stronger focus on curbing discriminatory social norms among youth, while broader awareness campaigns can help to foster change in employers' views. They should be coupled with specific policies to foster change in hiring and management practices. A growing body of research shows that careful behavioural design can help employers overcome deep-seated (and often uncontious) gender biases. An interesting example was the introduction of blind auditions in US orchestras in the 1970s, which significantly increased the fraction of female musicians that were hired (Goldin and Rouse, 2000). Similar results could be attained by removing names from CVs before scrutinising job applicants (see Bohnet, 2016 for a detailed discussion of such designs). Measures of this kind will not only reduce the gender gap, they are also likely to increase firm productivity as they allow hiring decisions to be based solely on talent. Throughout the OECD, employers are increasingly aware of the value of diversity in the workplace and they are showing a growing willingness to take concrete steps to promote it (BIAC and Deloitte, 2014).

A closely linked problem is that jobs are often obtained through social networks and personal connections (Cingano and Rosolia, 2012; World Bank, 2012). The weaker position of women in the labour market results in weaker networks, thereby sustaining gender gaps in access to employment and job quality. Specific interventions may be devised to strengthen women's networks. Such programmes typically aim to build women's social capital, but need not be limited to that objective. For example, they may be coupled with training and upskilling programmes. A prominent example is the Self Employed Women's Association in India which gathers together a large number of informal sector workers and entrepreneurs in order to represent their interests, and provides support, information and training.

Another important instrument in the fight against discrimination is a legal framework that explicitly outlaws gender discrimination in hiring practices and pay, and defines a transparent structure of sanctions. All the countries analysed in this chapter except Argentina, Chile, China, Morocco and the Russian Federation, have an anti-discrimination clause in their constitutions and that clause typically mentions gender explicitly (except in Costa Rica and Indonesia). However, a larger number of these countries do not have specific laws prohibiting discrimination in pay and hiring on the basis of gender and pregnancy (*WBL Database*, 2016). Indeed, the only countries that have such legislation are Chile, Costa Rica, Egypt, Indonesia, the Russian Federation and Tunisia. Perspective employers are not prohibited from asking about family status in any of the sixteen economies analysed.[30]

Once a legal framework is in place to fight discrimination, public authorities should ensure that workers and employers are informed about the law. Existing evidence from OECD countries shows that the public is often ill-informed about workers' rights (OECD, 2008, Chapter 3). This can be a crucial problem as existing laws can only be effective insofar as victims of abuses make use of the tools available to them. National equality bodies exist in a number of OECD countries and part of their workload consists of informing individuals of their legal rights. Similarly, firms are often ill-informed about the legal rules they should abide by. Providing employers with a code of good practice can help them to navigate the existing legislation, which can often be complex, and reduce non-compliance.

Awareness of legal instruments against discrimination may not be sufficient to induce victims of abuses to make use of them, if the cost of taking legal action is high and the benefits uncertain, and there is a lack of conveniently accessible psycho-social support services. Lowering the burden of proof for plaintiffs and shifting it to employers can be a step in the right direction, but should be accompanied by measures to help complainants gather the necessary evidence to initiate the case and sustain the costs of the trial (OECD, 2008, Chapter 3). In the early 2000s, most European countries lowered the burden of proof for plaintiffs, who are now only required to provide evidence of differential treatment without having to prove that it was indeed due to discrimination. The burden of proof was thus shifted to employers, who are required to prove that the differential treatment was disconnected from any discriminatory intention or practice (for a full discussion, see OECD, 2008, Chapter 3). This is a desirable change in the institutional framework, since employers are typically better positioned and resourced to provide courts with the evidence that is necessary to judge the intent underlying differential treatment. However, such a measure should be coupled with reinforced assistance for workers, as even providing the necessary *prima facie* evidence to courts may be challenging. National equality bodies may play a crucial role in this respect. In many OECD countries such bodies have the necessary investigative powers to help workers gather the evidence needed to bring their case before the courts.[31] However, equality bodies are generally not empowered to offer legal representation to plaintiffs, with the result that lodging complaints with courts may remain overly expensive for a large share of workers. In emerging economies, this may be particularly important, as a larger share of the population may lack the necessary resources to sustain the costs of a trial.[32] Trade unions and other bodies of worker representation can play an important role in this respect by providing counselling and legal assistance.

A way to reduce the costs of legal action for both workers and employers is to promote mediation and conciliatory procedures prior to going to court. As such procedures typically do not require professional legal representation, they are less costly for both parties. They can also be less expensive for the public purse, as they help resolve disputes more swiftly without engaging the courts. Moreover, by virtue of being less adversarial than court proceedings, mediation can avoid damaging the relationship between employers and employees prior to a resolution being reached. This is especially important in light of the risk that retaliation by employers may occur after a worker lodges a complaint.

Giving employers strong incentives to comply with anti-discriminatory laws plays an equally important role. Designing a transparent structure of sanctions for wrongdoing and effectively enforcing them is the first step in the right direction. Equality bodies and labour inspectorates should be empowered to conduct investigations on their own initiative, so as to compensate for the fact that victims of abuse are often unwilling to file a complaint or cannot afford the costs of legal action. Employers who are found to be in breach of the law

should be sanctioned through a transparent system of fines, reductions of public subsidies or bans from tendering for public procurement contracts. Ideally, equality bodies should be enabled to directly enforce sanctions when discriminatory behaviour has been proven. Information about the application of sanctions should be made public to foster anti-discriminatory attitudes. The risk of an overly harsh system, however, is that employers will be less prone to hire women for fear of potentially breaching anti-discrimination laws in the workplace. In these circumstances, affirmative and positive action may play a compensatory role (see OECD, 2008, Chapter 3 for a full discussion). More generally, a complement to this coercive approach is to provide employers with rewards for the implementation of best practices. Such rewards range from the distribution of labels to financial incentives for fostering diversity in the workplace.

Finally, capacity constraints limiting the state's ability to enforce existing legislation are a major obstacle in the fight against discrimination in emerging economies. Even countries with modern anti-discrimination laws and well-designed incentives for employers may find it difficult to curtail discriminatory practices if, *de facto*, the law is not enforced. Policy makers should ensure that equality bodies, labour inspectorates and other agencies that are in charge of enforcing anti-discrimination laws are sufficiently resourced and staffed with adequately trained personnel. Similar concerns apply to the policy initiatives to curb informality outlined in the next section.

Curb informal employment

Informal employment continues to be widespread throughout the emerging world, particularly among women (Figure 4.9), and policy measures to reduce informality can be expected to have positive effects on female labour market outcomes. Fighting informality requires concerted policy action based on three pillars: increasing the benefits of formalisation, reducing the costs of formal employment and strengthening enforcement mechanisms (see OECD, 2015b; and OECD, 2008, Chapter 2 for a detailed discussion). The following measures can be particularly beneficial for women.

High rates of taxation (including relatively high social security contributions) tend to discourage low-paid workers from formalising. To counter this problem, countries like Mexico provide low-wage earners with tax credits to incentivise formal employment (OECD, 2015b, Chapter 1). This is particularly important for women as their earnings are often cumulated with the earnings of a working husband when calculating tax liabilities (and hence attract higher marginal rates). In countries where female labour force participation is still relatively low and informal employment is common, appropriate tax incentives could be devised to tackle this problem. One solution is to apply (or, at least, offer the option of) separate taxation for spouses, as it is typically the case in OECD countries. In addition, even when the tax treatment of secondary earners is perfectly neutral, a careful design of tax schedules may encourage spouses to split working hours among them. A more progressive system, for instance, may encourage female employment, since the total tax liability of a household will be higher when the husband earns all the income.

Several countries maintain legislation that, by discouraging certain forms of employment, inadvertently harms women's economic opportunities and encourages informality. Most notably, existing regulation may discourage part-time work, either by means of implicit fiscal disincentives (e.g. high mandated minimum social security contributions) or by placing excessive restrictions on the use of part-time contracts. When

Argentina removed a ban on part-time work, the result was a significant shift from informal work to formal part-time employment among women (Bosch and Maloney, 2010; and World Bank, 2012). The desirability of such policies will depend on the specific circumstances of each country and on a careful assessment of the potential drawbacks that removing existing regulations might entail (such as the potential scarring effects of part-time work on women's career progression discussed above).

In most of the countries analysed, restrictions limit the sectors and occupations where women can work. When restricted jobs are in high-paying sectors, this type of regulation reinforces the gender pay gap. That is the case, for instance, in the mining and oil industry, where certain jobs are deemed too hazardous and thus not accessible to women in a number of countries, such as the Russian Federation. Restrictions may also apply to the hours men and women are allowed to work. In Costa Rica, Tunisia and Turkey, for instance, women cannot work the same night hours as men (World Bank, 2015). Even if such regulations may be circumvented in practice, they help to sustain inequalities in pay, foster occupational segregation and increase the risk of informality for women. Hence, they should be re-assessed and removed when found to be obsolete or counter-productive.

End violence against women

Throughout the world, violence against women is a dramatic human right violation and a major public health problem. Globally, over half of all women experience violence in their lifetime.[33] Sexual violence and intimate partner violence are the most prominent forms of violence against women. Recent estimates suggest that one woman in three has experienced physical and/or sexual intimate partner violence or non-partner sexual violence in her lifetime. Intimate partners commit 38% of murders of women (WHO, 2016).

Violence against women and especially domestic violence by an intimate partner can have major repercussions for female labour market outcomes. By limiting women's voice and agency within the household, and their control over household finance and assets, domestic violence may adversely affect women's human capital accumulation, occupational choices and entrepreneurial initiative. All the countries analysed in this chapter have explicit laws on domestic violence, except Egypt, Morocco, Tunisia and the Russian Federation. In Morocco and Tunisia, however, the issue has been addressed by intensifying penalties when criminal offences are committed against spouses or within the family (*WBL Database*, 2016). In all the countries analysed, domestic violence can be prosecuted under general criminal law. Nonetheless, specific laws on domestic violence should be introduced, where missing, to provide a clear framework to address the specificities of intra-family violence and introduce assistance and protection mechanisms for women seeking support (World Bank, 2015). Protection orders are a very important element in a legal framework on domestic violence and they have shown to be an effective tool to increase victims' safety, reduce further violence and contain the costs of legal action (United Nations, 2010; World Bank, 2015).[34] Protection orders for domestic violence exist in all the countries analysed in this chapter except China, Egypt, Morocco, the Russian Federation and Tunisia. These are also the only countries that do not have specialised courts for cases of domestic violence. Such courts exist in the vast majority of OECD countries.

In many parts of the world, women are also exposed to a severe risk of violence outside their home. Recent estimates indicate that 7% of women globally have been sexually assaulted by someone other than a partner (World Bank, 2015). This can pose severe constraints on women's labour market opportunities. For instance, fear of violence

can influence the hours when women feel safe working and the commute they feel safe taking on. It may also affect the types of jobs women feel safe taking on, as the risk of violence in the workplace may change across occupations. In addition, violence can take the form of sexual harassment in both employment and education.[35] All the countries considered in this chapter have legislation that specifically addresses sexual harassment except Indonesia and the Russian Federation. In a number of countries, however, there are no criminal penalties for sexual harassment (see World Bank, 2015 for further details). Moreover, while legislation on sexual harassment in employment is fairly common, the majority of countries analysed do not have specific legislation on sexual harassment in education and should introduce it.

Conclusions

This chapter has documented gender gaps in the labour markets of 16 emerging economies that account for over half of the world's population. The main conclusion is that women continue to hold fewer and worse jobs than men, despite significant improvements in labour force participation and educational attainment in recent decades. Furthermore, progress has been very uneven both across countries and for different groups of women within the same country, with women from the most disadvantaged social groups typically facing the widest gender gaps.

Female workers are more likely to work in less productive sectors than male workers. They are also less likely to hold the best occupations and are considerably less likely to be in top-management positions. Many women are self-employed, but they own smaller and less successful businesses than men, as a result of credit constraints and gaps in financial literacy and business-related knowledge. In most countries, women are more likely than men to work informally.

The combined impact of the multiple constraints faced by women results in a significant earnings gap. In all the countries analysed, women earn significantly less than men for every hour of work they do and the gap is typically larger than in OECD countries. Even when comparing workers with the same level of education and in similar jobs, women earn significantly less than men in all the economies analysed. The likely mechanisms behind this result have been discussed and empirical evidence has been presented in support of the hypothesis that the heavy burden of household responsibilities borne by women limits their success in the labour market.

On the basis of this wealth of evidence, a comprehensive set of policy recommendations has been identified and discussed in detail. Closing the gender gap will require concerted policy action across a broad range of domains. In particular, policy makers should focus on closing remaining gaps in education, facilitating access to credit and freeing women from the heavy constraints that family responsibilities place on their availability to participate in paid employment. Action is required to promote flexible work arrangements, make parental leave more effective and encourage men to take a more active role in family care. And additional efforts are needed to fight gender discrimination, curb informal employment and end violence against women. Crucially, policy makers should intervene early in women's lives to prevent the scarring effects of prolonged exclusion from the labour market. These policy initiatives are not equally relevant in all parts of the world and additional analysis will be necessary to tailor policy packages that best meet the specific needs of each country.

Notes

1. Data for Argentina should be interpreted with caution due to the state of emergency in the national statistical system declared by the government of Argentina on 7 January 2016 (*www.boletinoficial.gob.ar/pdf/linkQR/QlFlS1dmVmpOWXMrdTVReEh2ZkU0dz09*).
2. The Social Institutions and Gender Index (SIGI), published by the OECD Development Centre, is a multi-dimensional index that combines quantitative and qualitative data to capture both *de jure* and *de facto* gender discrimination in social institutions, through information on laws, attitudes and practices (for additional information, see *www.genderindex.org*).
3. The average rate of change in OECD countries would be even lower if one did not include the fast-changing Latin American countries that are also OECD members (Chile and Mexico). More generally, upon comparing the performance of emerging economies with the OECD average, one should bear in mind that OECD countries are a highly diverse group and the average may conceal large differences among them.
4. This falls to 11.7% if one excludes India and Egypt.
5. Calculations based on data from ten countries: Argentina, Brazil, Chile, Colombia, Costa Rica, India, Mexico, Peru, the Russian Federation and Turkey.
6. Moreover, in contrast with OECD countries, in emerging economies the gap in NEET rates is already substantial among younger workers (15-19 and especially 20-24), partly reflecting motherhood at a younger age.
7. Moreover, OECD work based on PISA results shows that girls typically have less self-confidence than boys in their ability to solve mathematics or science problems, and they are more likely to express strong feelings of anxiety towards mathematics (OECD, 2015a).
8. These averages conceal notable differences across countries. In Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, the Russian Federation and South Africa the dominant sector for female employment is "social and personal services". In Indonesia, Peru and Turkey, "agriculture" and "social and personal services" are equally common. In India and China, agriculture dominates female employment.
9. If one were to replace the unweighted averages in Figure 4.7 with weighted ones, the result that women work in less productive sectors would become stronger, as China and India (where employment in agriculture is most common for women) would largely drive the observed pattern.
10. The definition of informal employment used in this chapter follows the principles outlined by Jütting and de Laiglesia (2009), who indicate that "the operational criteria for defining informal employment are mainly that the job has no written contract and lacks social protection". In practice, informal employment is defined in this chapter (consistently with OECD, 2015b, Chapter 5) to include employees who do not pay social security contributions and self-employed workers who do not pay social security contributions (Brazil, Chile, China, Colombia, India, Indonesia, Turkey), or whose business is not registered (Argentina, Costa Rica, Mexico, South Africa). It should be noted that according to this definition informal salaried employment may be found both in formally registered enterprises (i.e. in the formal sector) and in unregistered (informal) enterprises (i.e. in the informal sector). Still, the majority of informal employment occurs in the informal sector. For example, two out of three informal jobs are in the informal sector in India (ILO, 2014). Nonetheless, a significant number of workers in formal enterprises are informally employed.
11. A significant share of female-owned businesses in many emerging economies are home-based and have no employees other than the owner herself.
12. In OECD countries the reduction in the wage-gap was driven by a reduction of disparities in the extra-wage components of pay, rather than in the wage itself (OECD, 2015c).
13. By focusing on hourly earnings, the analysis purges the estimates of the potentially confounding effect of differences in working hours between men and women. It should be noted that the gaps presented in Figure 4.14 are not entirely comparable to those in Figure 4.13 for the following reasons. First, the analysis that underlies Figure 4.14 identifies gaps in average earnings, while Figure 4.13 shows differences in median earnings. Second, Figure 4.14 focuses on the latest available year of data, while Figure 4.13 computes the average gap over a range of years. Third, the estimation samples used to produce Figure 4.14 are slightly smaller due to missing observations for some of the variables included in the analysis. Finally, Figure 4.14 uses hourly earnings, while Figure 4.13 uses monthly earnings. Since both figures focus on full-time employees, however, this final difference should not lead to major discrepancies. Despite these differences, the two figures deliver consistent results.

14. As it effectively amounts to comparing less educated men with more educated women, on average.
15. The only notable exception is South Africa, where the gap grows sizably upon comparing men and women within the same occupational category, with respect to a comparison across all occupations within a given sector.
16. Another, more technical way, to express the idea is to say that in those occupations the relationship between pay and working hours is not linear but convex.
17. The data may over-estimate the gap if men under-report being house-workers. This might be the case if a negative stigma is attached to doing housework among men. It is unlikely, though, that such under-reporting could be a major driver of the very large disparities in the occupational breakdown observed between men and women.
18. Since remaining gender gaps in education are larger among low-income families, this type of intervention may be expected to have disproportionately positive effects for girls.
19. Argentina, Brazil, Chile, Colombia, Mexico, South Africa, Turkey.
20. Gender discrimination in family codes is defined on the basis of four dimensions: whether men and women have the same legal age of marriage, percentage of women married between 15 and 19 years of age, parental authority in marriage and divorce, and inheritance regulation (for further details see *www.genderindex.org*).
21. In Brazil, women who receive the conditional cash transfer programme *Bolsa Familia* became one of the priority targets of this national strategy in 2012.
22. Discrimination on the basis of gender is outlawed in about three quarters of OECD countries, but in some of those countries the law does not explicitly prohibit discrimination on the basis of marital status (*WBL Database*, 2016).
23. Among the examples she offers, Goldin (2014) mentions pharmacists as a profession where workers are easily substitutable with each other and work can be efficiently split into units that can be distributed among them.
24. Taking paternity leave increases fathers' involvement in childcare activities; and children with highly involved fathers tend to perform better in terms of cognitive test scores (Huerta et al., 2013).
25. The definition of discrimination employed in this chapter is "a situation in which persons who provide labour market services and who are equally productive in physical or material sense are treated unequally in a way that is related to an observable characteristics such as race, ethnicity or gender" (see OECD, 2008; Altonji and Blank, 1999).
26. If discriminatory practices are widespread throughout the population, the distribution of discriminating employers will include some employers with high ability who will be able to survive longer in the market than less able unprejudiced employers (OECD, 2008, Chapter 3).
27. If job-search is costly for workers, unprejudiced employers (who hire women) may take advantage of the fact that female workers find it harder to be employed in a market with (even only few) prejudiced employers, and offer them lower wages (Black, 1995).
28. Gender gaps may also persist in the absence of strong negative priors if male employers are better at judging the talents of male employees than of female ones (Aigner and Cain, 1977).
29. Education is a costly investment and employers' underestimation of women's talents reduces its value for women. As a consequence, women who think they will be judged on the basis of employers' misperceptions may under-invest in education, thereby confirming employers' beliefs. The same mechanism may influence women's choice of their fields of study. If employers are biased against female engineers, for instance, female students will tend to shun STEM subjects.
30. That is also the case in the vast majority of OECD countries, although Australia, Canada, the Czech Republic, Estonia, Portugal and the Slovak Republic are exceptions.
31. Such powers are often higher in countries where the burden of proof is mainly on the plaintiffs (who can effectively count on the assistance of equality bodies to gather the evidence). In countries where different bodies collaborate in the investigations (e.g. the labour inspectorate and the equality body), effective co-ordination between them can greatly improve the efficiency of the investigative process.
32. The risk of retaliatory behaviour by their employers further increases the costs of filing a complaint for workers. Protection against this risk should be part of the legal framework to fight discrimination.

33. UN estimates including different forms of violence: physical, emotional, sexual and financial violence. For additional details, see: *www.un.org/en/globalissues/briefingpapers/endviol/index.shtml*.

34. A protection order can be issued by a judge to protect a person who has allegedly been victim of domestic violence by impeding certain actions (including contact with the perpetrator of the alleged violence) and hence preventing further violence from happening.

35. Sexual harassment is any unwelcome sexual advance, request for sexual favour, verbal or physical conduct or gesture of a sexual nature, or any other behaviour of a sexual nature that might reasonably be expected or be perceived to cause offense or humiliation to another (World Bank, 2015; UNHCR, 2005).

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Statistical annex

Sources and definitions

The tables of the statistical annex show data for all 34 OECD countries. Data for Brazil, China, Colombia, Costa Rica, India, Indonesia, Latvia, Lithuania, the Russian Federation and South Africa are included in a number of tables.

In general, Tables A to K and Table M report annual averages of monthly and quarterly estimates, when they are available, based on labour force surveys. The remaining Tables L, N, O, P and Q are based on a combination of survey and administrative sources. Data shown for a number of European countries in Tables B, C, D, H, I, J, K and Table M are based on the European Labour Force Survey (EU LFS), which are more comparable and sometime more consistent over time than data series from national LFS (i.e. France).

Statistical tables showing data for Israel are supplemented with the following footnote: "The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law".

Data on employment, unemployment and the labour force are not necessarily the same as the series used for analyses and forecasting by the OECD Economics Department that are reported in the *OECD Economic Outlook* and included in the first three figures and annex tables of Chapter 1 of this publication.

Most of the statistics shown in these tables can also be found in the OECD central data repository *OECD.Stat* (*http://stats.oecd.org*) accessible from the web page dedicated to employment statistics (*www.oecd.org/employment/database*).

The database contains both raw data and derived statistics. It contains longer time series and more detailed datasets by age group, gender, educational attainment, employee job tenure intervals, part-time employment, involuntary part-time employment, temporary employment, duration of unemployment, and other series than are shown in this annex, such as, the distribution of employment by weekly usual hours worked intervals, people not in the labour force marginally attached to the labour force, etc. The datasets include information on definitions, notes and sources used by member countries. The on-line database also contains additional series on working time, earnings and features of institutional and regulatory environments affecting the functioning of labour markets. Among these are the following:

- Annual hours worked for comparisons of trends over time.
- Average gross annual wages per dependent employee in full-time equivalent unit.
- Distribution of gross earnings of full-time workers by earnings decile and by sex for earnings dispersion measures.

- Statutory minimum wages.
- Public expenditure on labour market programmes, number of beneficiaries and inflows into the labour market.
- Union members and employees.
- Synthetic indicators of employment protection.

Conventional signs

.. Data not available

. Decimal point

| Break in series

- Nil or less than half of the last digit used

Major breaks in series

Table A: Breaks in series have been adjusted in most countries to ensure that harmonised unemployment rates are consistent over time.

Tables B to K and Table M: Most of the breaks in series in the data shown in the tables occurred for any of the following reasons: changes in survey design, survey questionnaire, survey frequency and administration, revisions of data series based on updated population census results. These changes have affected the comparability over time of employment and/or unemployment levels and to a certain extent the ratios reported in the aforementioned tables:

- *Introduction of a continuous survey producing quarterly results:* Austria (2003/04), France (2002/03), Germany (2004/05), Hungary (2005/06, monthly results), Iceland (2002/03), Italy (2003/04) and Luxembourg (2002/03, quarterly results as of 2007), Turkey (2013/14).
- *Redesign of labour force survey:* Introduction of a new survey in Chile since April 2010 (see below), Germany (2010/11), Hungary (2002/03), Portugal (2010/11), Poland (2004/05) and Turkey (2004/05 from quarterly to monthly results). In Israel (2011/12), change from quarterly to monthly survey results and a change from "civilian" to "total" labour force (including those who are in compulsory or permanent military service). New continuous quarterly survey in Mexico since 2005 (*Encuesta Nacional de Ocupación y Empleo*, ENOE) with a different questionnaire from that of the previous survey.
- *Change in the operational definition of employment:*
  - Neat application of the criterion of "at least one hour worked in a gainful job" in the Chilean *Nueva Encuesta Nacional de Empleo* (NENE), a quarterly continuous survey, from April 2010 onward.
- *Change in the operational definition of unemployment regarding:*
  - Active job-search methods: In particular a change from registration to contact with the public employment service: France (2002/03) and Spain (2000/01).
  - Duration of active job search: In Australia (2014/15) the duration of unemployment has been replaced by duration of job search. In Belgium (2010/11), the duration of job search has been changed from an unlimited duration to previous four weeks including the survey reference week. In Chile (2009/10), the duration of active job search has been shortened from last two months to previous four weeks including the survey reference week.

Major breaks in series *(cont.)*

- Availability to work criterion: In Sweden (2004/05), the work availability criterion changed from the reference week to two weeks from the reference week to be consistent with the operational definition in other EU countries. In Chile, the work availability criterion did not exist prior to 2010 in the *Encuesta Nacional de Empleo* (ENE) and has been introduced in the *Nueva Encuesta Nacional de Empleo* (NENE) since April 2010. It has been fixed to two weeks from the end of the reference week.
- Persons on lay-off considered as employed instead of unemployed: Norway (2005/06).
- Other minor changes: Australia (2000/01) and Poland (2003/04).

- *Changes in the questionnaire with impact on employment and unemployment estimates:* Germany (2010/11): new questionnaire design ensures better coverage of small jobs. This leads to higher than normal annual employment increase. Spain (2004/05): impact on employment and unemployment and impact on unemployment estimates in Norway (2005/06) and Sweden (2004/05).
- *Change from seasonal to calendar quarters:* Switzerland (2009/10) and the United Kingdom (2005/06). However, there is no break in series between 2005 and 2006 for the United Kingdom as calendar-quarter- based historical series are available since 1992.
- *Introduction of new EU harmonised questionnaire:* Sweden (2004/05) and Turkey (2003/04).
- *Change in lower age limit from 16 to 15 years:* Iceland (2008/09), Norway (2005/06) and Sweden (2006/07).
- In Norway, since 2006, age is defined as years reached at the survey reference week, instead of completed years at the end of the year, as in previous years.
- *Inclusion of population controls based on census results in the estimation process:* Israel (2007/08), Mexico (2009/10) and Turkey (2006/07).
- In Japan, data for 2011 exclude three prefectures (Iwate, Miyagi and Fukushima) due to the temporary suspension of the labour force survey operation following the Great East Japan earthquake.

Further explanations on breaks in series and their impact on employment and unemployment levels and on ratios can be found at *www.oecd.org/employment/outlook*.

Colombia, Costa Rica and Lithuania are currently undergoing an accession process.

Table A. **Harmonised unemployment rates in OECD countries**

As a percentage of civilian labour force

	1991	1995	2000	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Australia	9.6	8.5	6.3	5.4	5.0	4.8	4.4	4.2	5.6	5.2	5.1	5.2	5.7	6.1	6.1
Austria	..	4.2	3.9	5.5	5.6	5.3	4.9	4.1	5.3	4.8	4.6	4.9	5.4	5.6	5.7
Belgium	6.4	9.7	6.9	8.4	8.4	8.3	7.5	7.0	7.9	8.3	7.2	7.6	8.5	8.5	8.5
Canada	10.3	9.5	6.8	7.2	6.8	6.3	6.1	6.1	8.4	8.1	7.5	7.3	7.1	6.9	6.9
Chile	8.2	7.3	9.7	10.0	9.2	7.8	7.1	7.8	9.7	8.2	7.1	6.4	5.9	6.4	6.2
Czech Republic	..	4.0	8.8	8.3	7.9	7.1	5.3	4.4	6.7	7.3	6.7	7.0	7.0	6.1	5.1
Denmark	7.9	6.7	4.3	5.5	4.8	3.9	3.8	3.5	6.0	7.5	7.6	7.5	7.0	6.5	6.2
Estonia	..	..	14.5	10.1	8.0	5.9	4.6	5.5	13.6	16.7	12.4	10.0	8.6	7.4	6.2
Finland	6.6	15.4	9.8	8.8	8.4	7.7	6.9	6.4	8.2	8.4	7.8	7.7	8.2	8.7	9.4
France	9.6	12.0	9.6	8.9	8.9	8.8	8.0	7.4	9.1	9.3	9.2	9.8	10.3	10.3	10.4
Germany	5.5	8.3	8.0	10.5	11.3	10.3	8.5	7.4	7.6	7.0	5.8	5.4	5.2	5.0	4.6
Greece	..	..	11.2	10.6	10.0	9.0	8.4	7.8	9.6	12.8	17.9	24.5	27.5	26.6	25.0
Hungary	..	..	6.3	6.1	7.2	7.5	7.4	7.8	10.0	11.2	11.1	11.0	10.1	7.7	6.8
Iceland	..	..	..	3.1	2.6	2.9	2.3	3.0	7.2	7.6	7.1	6.0	5.4	5.0	4.0
Ireland	14.8	12.3	4.3	4.5	4.4	4.5	4.7	6.4	12.0	13.9	14.7	14.7	13.1	11.3	9.4
Israel	..	6.9	8.8	10.4	9.0	8.4	7.3	6.1	7.5	6.6	5.6	6.9	6.2	5.9	5.2
Italy	8.5	11.2	10.1	8.0	7.7	6.8	6.1	6.7	7.8	8.4	8.4	10.6	12.1	12.7	11.9
Japan	2.1	3.2	4.7	4.7	4.4	4.1	3.8	4.0	5.1	5.1	4.6	4.4	4.0	3.6	3.4
Korea	2.5	2.1	4.4	3.7	3.7	3.5	3.3	3.2	3.7	3.7	3.4	3.2	3.1	3.5	3.6
Luxembourg	1.7	2.9	2.2	5.0	4.7	4.6	4.2	4.9	5.1	4.6	4.8	5.1	5.9	6.1	6.5
Mexico	2.7	6.3	2.5	3.9	3.6	3.6	3.7	4.0	5.5	5.4	5.2	5.0	4.9	4.8	4.4
Netherlands	5.7	8.4	3.7	5.7	5.9	5.0	4.2	3.7	4.4	5.0	5.0	5.8	7.2	7.4	6.9
New Zealand	10.6	6.5	6.2	4.0	3.8	3.9	3.7	4.2	6.1	6.6	6.5	6.9	6.2	5.8	5.8
Norway	5.5	4.9	3.2	4.3	4.5	3.4	2.5	2.6	3.2	3.6	3.3	3.2	3.5	3.5	4.4
Poland	..	..	16.1	19.1	17.9	14.0	9.6	7.0	8.1	9.7	9.7	10.1	10.3	9.0	7.5
Portugal	4.2	7.2	5.1	7.8	8.8	8.9	9.1	8.8	10.7	12.0	12.9	15.8	16.5	14.1	12.7
Slovak Republic	..	..	18.9	18.4	16.4	13.5	11.2	9.6	12.1	14.5	13.7	14.0	14.2	13.2	11.5
Slovenia	..	..	6.7	6.3	6.5	6.0	4.9	4.4	5.9	7.3	8.2	8.9	10.1	9.7	9.0
Spain	15.5	20.8	11.9	11.0	9.2	8.5	8.2	11.3	17.9	19.9	21.4	24.8	26.1	24.5	22.1
Sweden	3.1	8.8	5.6	7.4	7.6	7.0	6.1	6.2	8.3	8.6	7.8	8.0	8.0	7.9	7.4
Switzerland	..	..	..	..	..	..	..	..	..	4.5	4.0	4.2	4.4	4.5	4.5
Turkey	..	..	..	..	9.2	8.8	8.8	9.7	12.6	10.7	8.8	8.2	8.7	10.0	10.3
United Kingdom	8.6	8.5	5.4	4.7	4.8	5.4	5.3	5.6	7.6	7.8	8.1	7.9	7.6	6.2	5.3
United States	6.8	5.6	4.0	5.5	5.1	4.6	4.6	5.8	9.3	9.6	9.0	8.1	7.4	6.2	5.3
OECD[a]	6.6	7.4	6.1	6.9	6.6	6.1	5.6	6.0	8.1	8.3	7.9	7.9	7.9	7.4	6.8

Note: The OECD harmonised unemployment rates are compiled for 34 OECD member countries and conform to the guidelines of the 13th Conference of Labour Statisticians of the International Labour Office (referred to as the ILO guidelines). In so far as possible, the data have been adjusted to ensure comparability over time. All series are benchmarked to labour-force-survey-based estimates. The unemployment rates for the European Union member countries, Norway and Turkey are produced by the Statistical Office of the European Communities (Eurostat). For the remaining OECD countries, the OECD is responsible for collecting data and calculating unemployment rates. Please refer to the following URL for methodological notes: *www.oecd.org/std/labourstatistics/44743407.pdf*.

a) Weighted average.

Source: OECD (2016), *Main Economic Indicators*, Vol. 2016/5, OECD Publishing, Paris, *http://dx.doi.org/10.1787/mei-v2016-5-en*.

StatLink *http://dx.doi.org/10.1787/888933385041*

Table B. **Employment/population ratios by selected age groups**

As a percentage of the population in each age group

	Total (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	69.1	72.8	71.6	72.2	61.7	64.1	57.7	58.5	76.2	79.9	78.8	79.3	46.1	56.5	61.5	62.1
Austria	68.3	69.9	71.1	71.1	52.8	53.8	52.1	51.3	82.5	82.9	83.4	83.5	28.3	36.0	45.1	46.3
Belgium	60.5	62.0	61.9	61.8	29.1	27.5	23.2	23.4	77.4	79.7	79.1	78.5	26.3	34.4	42.7	44.0
Canada	70.9	73.5	72.3	72.5	56.2	59.5	55.5	55.8	79.9	82.2	81.2	81.4	48.1	57.0	60.4	60.9
Chile	53.3	56.3	62.2	62.4	26.4	26.4	30.1	30.2	65.0	69.5	74.9	74.9	47.5	54.4	64.2	64.5
Czech Republic	65.2	66.1	69.0	70.2	38.3	28.5	27.1	28.4	81.6	83.5	83.8	84.5	36.3	46.0	54.0	55.5
Denmark	76.3	77.0	72.8	73.5	66.0	65.3	53.7	55.4	84.2	86.1	82.0	82.1	55.7	58.9	63.2	64.7
Estonia	60.6	69.6	69.6	71.8	34.9	34.6	34.4	37.4	74.4	84.6	80.7	82.8	42.8	59.4	64.0	64.5
Finland	67.5	70.5	68.9	68.7	42.9	46.4	43.0	42.4	80.9	83.3	80.4	79.9	42.3	55.0	59.2	60.0
France	61.7	64.3	63.8	63.8	28.2	31.2	27.9	27.8	78.4	82.1	79.8	79.4	29.4	38.2	46.9	48.6
Germany	65.6	69.0	73.8	74.0	47.2	45.9	46.1	45.3	79.3	80.3	83.5	83.7	37.6	51.3	65.6	66.2
Greece	56.5	60.9	49.4	50.8	27.6	24.0	13.3	13.0	70.5	75.4	62.4	64.5	39.0	42.7	34.0	34.3
Hungary	56.0	57.0	61.8	63.9	32.5	21.1	23.5	25.7	73.0	74.7	79.2	80.6	21.9	32.2	41.8	45.3
Iceland[a]	84.6	85.7	82.2	84.2	68.2	74.3	69.7	72.6	90.6	89.4	85.7	87.8	84.2	84.9	84.1	84.5
Ireland	65.1	69.2	61.3	63.1	49.3	50.4	27.2	28.0	75.5	78.8	72.3	74.1	45.3	54.2	52.6	55.4
Israel[b]	62.1	64.5	67.9	68.3	48.1	46.4	44.5	44.4	71.3	74.0	78.2	78.7	46.5	57.1	65.1	66.2
Italy[a]	53.9	58.6	56.5	57.1	27.8	24.5	17.2	17.3	68.0	73.4	67.9	68.2	27.7	33.7	46.2	48.2
Japan	68.9	70.7	72.7	73.3	42.7	41.4	40.3	40.7	78.6	80.2	82.1	82.5	62.8	66.1	68.7	70.0
Korea	61.5	63.9	65.3	65.7	29.4	25.7	25.8	26.9	72.2	74.0	75.7	75.9	57.8	60.6	65.6	65.9
Luxembourg	62.7	64.2	66.6	66.1	31.8	22.5	20.4	29.1	78.2	81.9	83.7	82.6	27.2	32.0	42.5	38.4
Mexico	60.1	61.0	60.4	60.6	48.9	44.3	41.2	40.3	67.4	70.2	70.2	70.9	51.7	54.7	55.0	54.4
Netherlands	72.1	74.4	73.9	74.1	66.5	65.5	61.1	60.8	81.0	84.4	81.9	82.2	37.6	48.8	60.8	61.7
New Zealand	70.3	75.1	74.2	74.3	54.2	58.0	51.7	53.1	78.2	81.8	81.8	81.7	56.9	71.8	76.2	75.2
Norway[a]	77.9	76.9	75.3	74.9	58.1	55.1	50.9	51.1	85.3	85.8	83.9	83.1	67.1	69.0	72.2	72.2
Poland	55.0	57.0	61.7	62.9	24.5	25.8	25.8	26.0	70.9	74.9	78.4	79.5	28.4	29.7	42.5	44.3
Portugal	68.3	67.6	62.6	63.9	41.8	34.4	22.4	22.8	81.8	80.9	77.4	78.8	50.8	51.0	47.8	49.9
Slovak Republic	56.8	60.7	61.0	62.7	29.0	27.6	21.8	23.3	74.7	78.0	76.8	78.1	21.3	35.7	44.8	46.9
Slovenia	62.8	67.8	63.9	65.2	32.8	37.6	26.8	29.6	82.6	85.3	81.9	82.9	22.7	33.5	35.4	36.6
Spain[a]	57.4	66.8	56.8	58.7	36.3	43.0	18.5	20.0	68.4	77.1	67.4	69.4	37.0	44.5	44.3	46.9
Sweden[a]	74.3	74.2	74.9	75.5	46.7	42.1	42.6	43.7	83.8	86.1	85.4	85.6	65.1	70.1	74.2	74.6
Switzerland	78.3	78.6	79.8	80.2	65.0	62.6	61.6	61.0	85.4	86.1	86.9	87.3	63.3	67.2	71.6	72.8
Turkey	48.9	44.6	49.5	50.2	37.0	30.2	33.5	34.2	56.7	53.2	58.8	59.5	36.4	27.1	31.4	31.9
United Kingdom[a]	72.2	72.4	72.6	73.2	61.5	56.4	51.2	52.5	80.2	81.4	82.0	82.2	50.4	57.3	60.8	61.8
United States[a]	74.1	71.8	68.1	68.7	59.7	53.1	47.6	48.6	81.5	79.9	76.7	77.2	57.8	61.8	61.3	61.5
OECD[c]	65.5	66.5	65.8	66.3	45.6	43.3	40.1	40.5	75.9	77.0	76.0	76.5	47.6	53.4	57.3	58.1
Brazil[d]	64.3	67.4	67.5	..	50.7	52.9	49.0	..	73.1	76.1	77.2	..	51.2	53.8	54.9	..
China[e]	79.3	..	75.1	..	61.9	..	53.7	..	88.0	..	85.8	..	59.2	..	59.0	..
Colombia[d]	60.3	60.2	67.1	67.6	41.4	38.0	44.4	45.0	71.0	72.0	78.2	78.6	52.0	51.9	61.6	62.5
Costa Rica	..	..	61.7	60.7	..	..	36.1	35.3	..	..	74.2	73.1	..	..	55.8	54.4
India[e]	..	..	53.3	..	..	..	30.7	..	..	..	64.1	..	..	..	52.5	..
Indonesia[e]	..	62.4	64.6	..	..	39.1	37.9	..	..	72.1	75.1	..	..	67.6	66.7	..
Latvia	57.3	68.1	66.3	68.1	29.2	38.1	32.5	34.5	73.5	82.1	78.2	79.2	35.9	58.0	56.4	59.4
Lithuania	58.8	65.0	65.7	67.2	25.2	24.8	27.6	28.3	75.0	82.2	80.8	81.6	40.3	53.2	56.2	60.4
Russian Fed.	63.3	68.5	69.3	69.3	34.6	33.7	33.4	31.8	80.2	84.7	85.7	85.6	34.8	52.0	47.4	47.8
South Africa[d]	44.1	44.4	42.8	43.7	15.9	15.7	12.3	13.3	60.3	60.6	57.5	58.3	43.2	42.2	40.6	40.0

Table B. **Employment/population ratios by selected age groups** *(cont.)*

As a percentage of the male population in each age group

	Men (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	76.9	79.5	77.1	77.5	62.6	65.0	57.5	58.2	85.6	88.1	85.8	86.2	57.6	65.7	69.1	69.3
Austria	77.3	76.3	75.2	75.1	57.6	57.0	54.3	54.0	91.4	89.0	86.6	86.6	40.5	46.0	54.3	54.1
Belgium	69.5	68.7	65.8	65.5	32.8	29.9	24.5	25.0	87.3	87.0	83.2	82.5	36.4	42.9	48.4	48.9
Canada	76.2	77.0	75.2	75.6	56.7	59.2	54.2	54.4	85.8	86.2	85.1	85.3	57.4	63.5	65.0	66.0
Chile	71.9	72.3	72.8	73.0	34.2	32.7	35.0	35.2	87.4	89.0	86.8	86.9	71.6	77.2	82.5	82.9
Czech Republic	73.6	74.8	77.0	77.9	42.8	32.8	32.3	33.1	89.3	91.7	91.5	91.9	51.7	59.6	64.8	65.5
Denmark	80.8	80.8	75.8	76.6	68.5	66.5	52.7	54.6	88.5	89.8	85.5	85.9	64.1	64.9	68.9	69.8
Estonia	64.1	73.2	73.0	75.4	40.8	39.1	35.4	41.4	75.8	89.4	85.5	87.5	51.0	58.1	65.1	63.1
Finland	70.5	72.4	69.8	69.7	45.7	47.9	42.9	41.9	84.1	85.9	82.8	82.5	43.7	55.1	56.8	57.4
France	68.8	69.2	67.3	67.1	31.3	34.2	30.1	29.7	87.3	88.4	84.4	83.7	32.9	40.5	48.8	50.6
Germany	72.9	74.7	78.1	78.0	49.7	48.2	47.7	46.5	87.2	86.4	88.0	88.1	46.4	59.4	71.4	71.3
Greece	71.5	74.2	58.0	59.3	32.7	29.1	15.8	15.2	88.5	90.1	71.8	73.7	55.2	59.1	44.0	44.9
Hungary	62.7	63.7	67.8	70.3	36.0	24.4	26.4	28.1	79.2	81.6	85.3	86.8	32.8	40.1	49.6	54.4
Iceland[a]	88.2	89.5	84.4	86.6	66.1	73.6	66.6	69.4	95.1	94.2	89.4	91.5	94.2	89.6	87.6	88.7
Ireland	76.3	77.5	66.3	68.7	53.4	53.2	28.0	29.1	88.4	87.9	78.3	80.5	63.6	68.1	60.3	65.1
Israel[b]	68.9	70.1	71.5	72.1	51.2	49.3	45.7	45.5	79.6	80.6	82.2	83.4	56.9	65.1	72.9	73.2
Italy[a]	68.2	70.6	65.7	66.5	33.2	29.4	20.1	20.6	84.9	87.4	78.2	78.6	40.9	45.0	56.5	59.3
Japan	80.9	81.7	81.5	81.8	42.5	41.3	39.6	40.4	93.4	92.8	92.1	92.1	78.4	81.5	81.5	82.4
Korea	73.1	74.7	75.7	75.7	24.6	20.5	21.8	22.9	88.0	87.3	88.3	88.0	68.5	74.7	79.6	79.1
Luxembourg	75.0	72.3	72.6	71.3	35.3	26.5	21.9	29.4	92.8	92.2	90.5	89.3	37.9	35.6	49.8	43.0
Mexico	82.8	80.9	77.9	78.2	64.7	58.0	53.3	52.7	93.8	92.9	90.2	91.0	78.1	79.3	76.1	75.7
Netherlands	81.2	81.1	78.6	79.0	67.9	66.9	61.4	59.9	91.4	91.4	86.5	87.5	49.7	60.0	70.7	71.1
New Zealand	77.8	82.0	79.7	79.6	56.2	60.3	53.9	55.0	87.0	90.0	89.2	88.9	67.9	80.7	80.8	80.5
Norway[a]	81.7	79.7	77.1	76.6	61.0	54.0	49.5	50.0	88.8	89.2	86.3	85.3	73.1	73.9	75.8	75.6
Poland	61.2	63.6	68.2	69.3	27.3	29.2	30.0	30.5	77.6	81.1	83.9	84.9	36.7	41.4	53.1	54.2
Portugal	76.3	73.6	65.8	66.9	47.3	38.5	22.9	24.1	90.0	87.2	80.6	81.8	62.2	58.7	54.3	55.9
Slovak Republic	62.2	68.4	67.6	69.4	29.8	30.9	26.8	28.4	79.6	85.0	83.2	85.1	35.4	52.6	53.1	53.6
Slovenia	67.2	72.7	67.5	69.2	35.7	43.2	29.5	32.0	85.7	88.1	84.6	86.1	32.3	45.3	41.8	42.6
Spain[a]	72.7	77.3	61.6	64.0	43.2	48.6	19.3	20.9	85.6	87.5	72.5	75.1	55.2	59.6	51.2	54.0
Sweden[a]	76.3	76.5	76.6	77.0	47.9	41.9	41.4	42.2	85.9	89.0	87.8	87.9	67.7	73.1	76.6	77.0
Switzerland	87.3	85.6	84.4	84.4	66.5	65.4	62.4	59.8	95.2	93.6	91.9	92.3	77.0	76.4	78.7	78.9
Turkey	71.7	66.8	69.5	69.8	49.7	41.5	45.0	45.2	85.0	80.7	82.8	83.1	51.9	40.5	45.6	46.4
United Kingdom[a]	78.9	78.7	77.6	77.9	64.0	57.9	51.1	52.2	87.4	88.3	88.0	88.0	59.7	66.0	67.7	68.5
United States[a]	80.6	77.8	73.5	74.2	61.9	54.4	48.2	49.0	89.0	87.5	83.6	84.4	65.7	67.4	66.8	67.1
OECD[c]	76.1	75.9	73.7	74.2	50.3	47.2	43.2	43.5	88.2	87.9	85.3	85.8	59.2	63.9	66.1	66.8
Brazil[d]	78.2	79.7	78.9	..	62.0	63.0	57.6	..	88.1	89.0	89.0	..	68.1	70.1	71.3	..
China[e]	84.6	..	82.0	..	61.8	..	55.9	..	94.2	..	93.3	..	70.4	..	70.1	..
Colombia[d]	75.5	75.2	79.6	79.9	52.1	47.9	53.9	55.0	87.6	88.9	91.3	91.1	73.4	72.8	79.6	80.3
Costa Rica	..	..	75.2	73.9	..	..	44.7	42.6	..	..	89.5	88.2	..	..	74.9	73.9
India[e]	..	..	78.5	..	..	..	44.3	..	..	..	95.2	..	..	..	80.3	..
Indonesia[e]	..	78.4	80.1	..	..	47.9	45.5	..	..	91.8	93.7	..	..	83.4	83.3	..
Latvia	61.1	72.7	68.4	69.9	34.3	43.8	36.5	37.1	74.4	86.0	80.4	81.2	48.1	64.3	56.3	60.1
Lithuania	60.1	68.2	66.5	68.0	28.3	29.4	31.0	30.8	73.8	84.2	80.7	81.8	49.9	60.7	58.8	62.4
Russian Fed.	67.6	72.0	74.3	74.4	38.2	36.6	37.3	35.4	82.7	87.0	89.2	89.4	46.8	63.9	57.9	58.4
South Africa[d]	50.7	52.2	48.9	49.9	18.0	18.8	14.4	15.8	69.4	71.3	65.2	66.1	55.0	55.3	49.9	48.1

Table B. **Employment/population ratios by selected age groups** *(cont.)*

As a percentage of the female population in each age group

	Women (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	61.3	66.1	66.1	66.8	60.8	63.2	58.0	58.7	67.0	71.9	72.0	72.5	34.2	47.3	54.1	55.2
Austria	59.4	63.5	66.9	67.1	48.1	50.6	49.9	48.7	73.6	76.7	80.3	80.3	16.8	26.5	36.4	38.8
Belgium	51.5	55.3	57.9	58.0	25.4	25.0	21.8	21.7	67.2	72.3	74.9	74.5	16.6	26.0	37.0	39.3
Canada	65.6	69.9	69.4	69.4	55.7	59.8	56.9	57.2	73.9	78.2	77.4	77.5	39.1	50.7	56.0	55.8
Chile	35.1	40.4	51.7	51.9	18.2	19.6	24.5	24.4	43.4	50.6	63.4	63.4	24.6	32.5	46.9	47.3
Czech Republic	56.9	57.3	60.7	62.4	33.6	23.9	21.6	23.4	73.7	74.9	75.7	76.7	22.4	33.5	43.8	45.9
Denmark	71.6	73.2	69.8	70.4	63.3	64.0	54.9	56.2	79.8	82.3	78.4	78.3	46.6	52.9	57.6	59.6
Estonia	57.3	66.1	66.2	68.4	28.5	29.8	33.3	33.2	73.2	79.9	76.0	78.0	36.5	60.5	63.0	65.6
Finland	64.5	68.5	67.9	67.7	39.9	44.7	43.1	42.9	77.6	80.7	78.0	77.3	40.9	54.8	61.6	62.6
France	54.8	59.6	60.4	60.6	25.1	28.1	25.7	25.9	69.6	76.0	75.4	75.2	26.1	36.0	45.2	46.8
Germany	58.1	63.2	69.5	69.9	44.6	43.5	44.3	44.0	71.2	74.0	78.8	79.2	29.0	43.4	60.0	61.2
Greece	41.7	47.7	41.1	42.5	22.4	18.8	10.9	10.9	52.7	60.9	53.1	55.4	24.3	27.0	25.0	24.7
Hungary	49.6	50.7	55.9	57.8	28.8	17.7	20.5	23.1	66.9	67.9	73.2	74.4	13.1	25.8	35.2	37.7
Iceland[a]	81.0	81.7	80.0	81.8	70.5	75.0	73.0	76.0	86.0	84.1	82.1	84.1	74.4	80.0	80.6	80.3
Ireland	53.7	60.6	56.4	57.6	45.1	47.6	26.4	27.0	62.6	69.5	66.6	68.0	26.8	40.0	44.9	45.8
Israel[b]	55.5	59.0	64.2	64.6	44.8	43.4	43.1	43.3	63.5	67.7	74.3	74.3	36.8	49.3	57.9	59.7
Italy[a]	39.6	46.6	47.5	47.8	22.1	19.5	14.1	13.8	50.9	59.6	57.6	57.9	15.3	23.0	36.6	37.9
Japan	56.7	59.5	63.6	64.6	43.0	41.5	41.0	40.9	63.6	67.4	71.8	72.7	47.9	51.2	56.1	57.8
Korea	50.0	53.2	54.9	55.7	33.7	30.4	29.5	30.7	56.0	60.5	62.7	63.3	47.9	46.9	52.0	53.1
Luxembourg	50.0	56.1	60.5	60.8	28.3	18.4	18.8	28.8	63.0	71.7	76.8	75.7	16.8	28.6	35.0	33.7
Mexico	39.6	43.5	44.5	44.4	34.0	31.5	28.8	27.8	44.3	50.8	52.6	53.1	27.7	32.6	36.3	35.9
Netherlands	62.7	67.5	69.1	69.2	65.1	64.0	60.7	61.7	70.3	77.3	77.4	77.0	25.5	37.5	50.8	52.4
New Zealand	63.1	68.6	69.1	69.2	52.1	55.6	49.4	51.1	69.9	74.2	74.9	75.0	46.1	63.2	71.8	70.2
Norway[a]	74.0	74.0	73.4	73.0	55.0	56.3	52.5	52.2	81.6	82.3	81.4	80.7	61.2	64.0	68.5	68.7
Poland	48.9	50.6	55.2	56.6	21.8	22.4	21.3	21.3	64.3	68.8	72.7	73.9	21.4	19.4	32.9	35.5
Portugal	60.5	61.8	59.6	61.1	36.1	30.2	21.9	21.5	73.9	74.8	74.3	76.1	40.9	44.3	42.1	44.5
Slovak Republic	51.5	53.0	54.3	55.9	28.2	24.1	16.5	18.0	69.8	71.0	70.2	70.9	9.8	21.2	37.2	41.0
Slovenia	58.4	62.6	60.0	61.0	29.7	31.4	24.0	27.1	79.3	82.4	79.1	79.5	13.8	22.2	29.0	30.5
Spain[a]	42.0	56.0	52.0	53.4	29.0	37.2	17.7	19.2	51.0	66.3	62.3	63.7	20.1	30.2	37.8	40.2
Sweden[a]	72.2	71.8	73.2	74.0	45.4	42.2	43.9	45.3	81.7	83.0	82.8	83.2	62.4	67.2	71.7	72.3
Switzerland	69.3	71.6	75.1	76.0	63.4	59.7	60.9	62.2	75.6	78.5	81.8	82.2	50.1	58.1	64.4	66.7
Turkey	26.2	22.8	29.5	30.5	24.8	19.3	22.0	23.2	27.6	25.6	34.6	35.7	21.5	14.6	17.5	17.7
United Kingdom[a]	65.6	66.3	67.8	68.6	59.1	54.9	51.3	52.8	73.1	74.6	76.1	76.6	41.4	48.8	54.3	55.3
United States[a]	67.8	65.9	63.0	63.4	57.4	51.8	47.1	48.2	74.2	72.5	70.0	70.3	50.6	56.6	56.3	56.4
OECD[c]	55.0	57.2	58.0	58.6	40.9	39.3	36.9	37.4	63.7	66.3	66.9	67.4	36.6	43.6	49.1	49.9
Brazil[d]	51.2	55.9	56.8	..	39.7	42.7	40.2	..	59.2	64.3	66.4	..	36.5	39.5	40.8	..
China[e]	73.8	..	68.0	..	62.1	..	51.5	..	81.6	..	78.0	..	47.1	..	47.8	..
Colombia[d]	46.0	46.0	55.2	56.0	30.8	28.2	34.9	35.1	55.4	56.3	65.9	66.8	32.9	33.4	45.8	47.1
Costa Rica	..	..	48.0	47.2	..	..	26.1	27.0	..	..	59.0	57.8	..	..	38.0	37.2
India[e]	..	..	27.3	..	..	..	15.5	..	..	..	33.0	..	..	..	25.2	..
Indonesia[e]	..	46.3	49.0	..	..	30.0	30.1	..	..	52.8	56.5	..	..	50.3	49.6	..
Latvia	53.8	63.9	64.3	66.4	23.8	32.2	28.3	31.9	72.6	78.4	76.0	77.3	26.8	53.4	56.4	58.9
Lithuania	57.5	62.0	64.9	66.5	22.1	20.0	24.1	25.7	76.1	80.2	80.9	81.4	33.0	47.5	54.3	58.8
Russian Fed.	59.3	65.3	64.8	64.6	30.9	30.8	29.5	28.0	77.8	82.5	82.5	82.0	25.9	43.1	39.6	39.9
South Africa[d]	38.1	37.4	36.9	37.7	14.0	12.6	10.2	10.7	52.3	51.2	49.9	50.7	33.8	31.8	32.9	33.3

a) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
b) There is a break in series between 2011 and 2012 with the introduction of a redesigned monthly labour force survey since January 2012. Therefore, data prior to 2012 are spliced using new-to-old chaining coefficients between monthly and quarterly surveys based on data of fourth quarter of 2011.
c) Weighted average.
d) Data for 2000 refer to 2001.
e) Data for 2014 refer to 2010 for China, 2012 for India and 2013 for Indonesia.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

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Table C. **Labour force participation rates by selected age groups**

As a percentage of the population in each age group

	Total (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	73.8	76.2	76.3	77.0	70.2	70.8	66.6	67.3	80.3	82.7	82.8	83.4	48.2	58.1	64.1	64.9
Austria	70.8	73.5	75.4	75.5	55.7	59.4	58.0	57.4	85.2	86.5	88.0	88.0	29.8	37.2	46.9	48.6
Belgium	65.1	67.1	67.7	67.6	35.3	33.9	30.2	30.0	82.4	85.3	85.6	85.1	27.1	35.9	45.1	46.6
Canada	76.2	78.3	77.8	78.0	64.4	67.0	64.2	64.2	84.8	86.6	86.2	86.4	50.9	60.0	64.4	64.8
Chile	58.8	60.8	66.6	66.8	33.6	32.1	36.0	35.7	70.4	73.9	79.3	79.4	50.3	56.5	66.6	66.5
Czech Republic	71.6	69.8	73.5	74.0	46.1	31.9	32.2	32.5	88.4	87.8	88.8	88.6	38.2	48.2	56.8	58.0
Denmark	80.0	80.1	78.1	78.5	70.7	70.6	61.5	62.1	87.9	88.9	87.1	87.1	58.2	61.0	66.4	67.6
Estonia	71.1	73.0	75.2	76.6	44.8	38.4	40.1	42.8	86.6	88.3	87.0	87.7	48.3	61.6	67.6	68.6
Finland	74.9	75.7	75.5	75.9	53.8	55.0	53.3	53.7	87.9	88.0	86.6	86.6	46.6	58.8	63.9	65.3
France	68.8	69.7	71.1	71.2	35.5	38.4	36.9	36.9	86.4	87.9	87.9	87.5	31.7	40.0	50.7	52.5
Germany	71.1	75.6	77.7	77.6	51.5	52.0	50.0	48.8	85.3	87.2	87.6	87.6	42.9	57.2	69.1	69.4
Greece	63.8	66.5	67.4	67.8	39.0	31.0	28.0	26.0	78.1	81.8	84.3	85.4	40.5	44.2	41.1	41.6
Hungary	59.9	61.6	67.0	68.6	37.2	25.7	29.5	31.0	77.3	80.1	85.0	85.8	22.6	33.7	44.6	48.1
Iceland[a]	86.6	87.8	86.7	87.9	71.6	80.1	77.5	79.5	92.2	90.6	89.6	90.7	85.7	85.7	86.8	87.3
Ireland	68.2	72.7	69.7	70.1	53.6	56.2	37.3	36.1	78.7	82.1	81.0	81.4	46.5	55.5	58.1	60.1
Israel[b]	69.9	71.2	72.2	72.2	58.2	55.5	49.7	49.0	78.7	80.3	82.6	82.6	50.9	61.2	67.9	68.9
Italy[a]	60.3	62.4	64.9	65.0	39.5	30.8	30.0	29.0	74.3	77.5	77.0	76.8	29.0	34.5	48.9	51.1
Japan	72.5	73.6	75.5	75.9	47.0	44.9	43.0	43.0	81.9	83.3	85.1	85.4	66.5	68.4	71.0	72.2
Korea	64.4	66.2	67.8	68.3	33.0	28.2	28.6	30.1	75.2	76.4	78.2	78.5	59.5	62.0	67.3	67.8
Luxembourg	64.2	66.9	70.8	70.9	34.0	26.5	26.3	35.2	79.8	84.7	88.0	87.7	27.6	32.7	44.5	40.3
Mexico	61.7	63.2	63.7	63.4	51.5	47.4	45.6	44.3	68.6	72.1	73.2	73.5	52.4	55.5	56.5	55.7
Netherlands	74.3	77.1	79.3	79.6	70.8	70.4	68.2	68.5	83.1	86.8	87.1	87.1	38.5	50.8	65.4	67.1
New Zealand	75.0	78.1	79.0	79.0	62.7	64.5	60.8	62.2	82.0	84.0	85.6	85.4	59.7	72.9	78.7	78.1
Norway[a]	80.7	78.9	78.1	78.4	64.7	59.4	55.2	56.7	87.6	87.5	86.8	86.6	68.0	69.7	73.1	73.4
Poland	65.8	63.2	67.9	68.1	37.8	33.0	33.9	32.9	82.4	81.7	85.1	85.1	31.3	31.8	45.6	46.9
Portugal	71.2	73.9	73.2	73.4	45.7	41.3	34.3	33.5	84.8	87.7	88.6	88.8	52.5	54.6	55.3	57.0
Slovak Republic	69.9	68.2	70.3	70.9	46.0	34.5	31.0	31.7	88.4	86.8	87.3	87.3	24.3	38.8	50.1	51.8
Slovenia	67.5	71.3	70.9	71.8	39.2	41.8	33.6	35.3	87.4	89.3	90.3	90.8	24.0	34.6	38.4	39.7
Spain[a]	66.7	72.8	75.3	75.5	48.5	52.5	39.6	38.8	78.0	83.1	87.3	87.4	40.9	47.4	55.4	57.6
Sweden[a]	79.0	79.1	81.5	81.7	52.9	52.1	55.3	54.9	88.2	90.0	90.8	90.9	69.3	73.0	78.4	78.9
Switzerland	80.5	81.6	83.8	84.1	68.3	67.4	67.4	66.7	87.4	88.9	90.8	91.0	65.1	69.3	74.0	75.8
Turkey	52.4	49.8	55.1	56.1	42.5	37.7	40.8	42.0	59.6	58.2	64.4	65.5	37.2	28.3	33.4	34.2
United Kingdom[a]	76.4	76.5	77.6	77.6	69.7	65.7	61.2	62.0	83.9	84.5	86.1	85.8	52.7	59.2	63.5	64.0
United States[a]	77.2	75.3	72.7	72.6	65.8	59.4	55.0	55.0	84.0	83.0	80.9	80.9	59.2	63.8	64.1	63.9
OECD[c]	69.9	70.5	71.2	71.3	51.9	49.2	47.2	47.1	80.2	81.0	81.5	81.6	50.0	55.7	60.5	61.1
Brazil[d]	71.1	73.5	72.6	..	61.8	63.6	59.0	..	78.5	81.1	81.4	..	53.4	55.4	56.2	..
China[e]	82.3	..	77.4	..	67.9	..	57.4	..	90.5	..	88.0	..	59.4	..	59.7	..
Colombia[d]	71.3	68.0	74.0	74.5	57.1	48.8	54.6	54.7	80.6	79.1	84.4	84.9	56.5	55.2	65.1	66.1
Costa Rica	..	..	68.4	67.3	..	..	48.2	45.9	..	..	79.5	78.9	..	..	58.2	57.2
India[e]	..	..	55.4	..	..	..	34.4	..	..	..	65.6	..	..	..	53.2	..
Indonesia[e]	..	68.9	69.0	..	..	52.3	48.3	..	..	76.4	77.7	..	..	68.8	67.5	..
Latvia	67.0	72.6	74.6	75.7	37.4	42.6	40.4	41.3	85.5	87.1	87.2	87.6	39.8	60.7	62.6	65.5
Lithuania	70.5	67.9	73.7	74.1	36.2	27.1	34.2	33.8	88.8	85.6	89.7	89.3	45.4	55.3	63.0	66.2
Russian Fed.	70.9	72.9	73.1	73.4	43.6	39.4	38.7	37.9	88.3	89.2	89.7	89.9	37.5	53.7	49.1	49.6
South Africa[d]	59.1	57.2	57.1	58.5	31.5	29.3	25.3	26.6	76.5	74.5	74.1	75.6	47.2	44.8	44.0	43.8

Table C. **Labour force participation rates by selected age groups** *(cont.)*

As a percentage of the male population in each age group

	Men (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	82.3	83.0	82.1	82.7	71.9	71.8	66.9	67.9	90.2	90.8	89.9	90.3	60.9	67.7	72.2	72.8
Austria	79.9	80.0	80.0	80.1	60.6	62.9	60.7	60.7	94.0	92.5	91.5	91.6	42.8	47.6	56.8	57.4
Belgium	73.7	73.6	72.4	72.2	38.7	36.1	32.3	32.8	91.8	92.5	90.7	89.9	37.5	44.4	51.3	52.2
Canada	81.9	82.4	81.3	81.8	65.8	67.4	63.8	64.1	91.0	91.1	90.5	90.9	60.7	67.0	69.7	70.7
Chile	78.9	77.4	77.6	77.7	42.5	39.0	40.8	40.8	94.4	93.9	91.7	91.8	76.5	80.2	85.8	85.6
Czech Republic	79.4	78.1	81.2	81.4	51.3	36.7	38.1	37.4	94.9	95.0	95.6	95.4	54.5	62.4	67.9	68.3
Denmark	84.2	83.7	81.1	81.6	73.4	72.0	61.0	61.7	91.7	92.3	90.3	90.8	66.7	66.9	72.6	72.7
Estonia	76.3	77.5	79.3	80.4	52.1	44.3	43.1	47.5	89.2	93.2	92.0	92.4	60.0	62.4	69.1	67.7
Finland	77.6	77.4	77.1	77.4	56.4	56.3	54.1	54.1	90.7	90.3	89.6	89.6	48.1	59.2	61.9	63.1
France	75.2	74.7	75.3	75.3	38.6	41.9	40.2	40.1	94.3	94.1	92.9	92.4	35.5	42.5	53.1	55.0
Germany	78.9	81.8	82.5	82.1	54.7	54.9	52.1	50.5	93.4	93.8	92.6	92.5	52.4	65.8	75.5	75.3
Greece	77.4	78.4	76.0	75.9	41.7	34.4	30.0	27.7	94.4	94.6	93.1	93.1	57.3	60.9	53.4	54.9
Hungary	67.5	68.6	73.4	75.3	41.8	29.5	33.0	34.4	84.4	87.2	91.2	92.0	34.1	42.1	53.2	57.8
Iceland[a]	89.8	91.6	89.1	90.3	70.1	80.0	76.6	77.7	96.1	95.3	92.9	93.9	94.7	90.4	90.3	91.5
Ireland	80.0	81.6	77.1	77.6	57.8	59.6	38.9	38.3	92.3	91.7	89.7	89.8	65.2	69.8	68.3	71.5
Israel[b]	77.5	77.0	76.1	76.1	61.9	58.3	50.9	49.9	87.5	87.0	86.8	87.3	63.5	70.3	76.2	76.6
Italy[a]	74.3	74.3	74.7	75.2	44.6	36.0	34.3	33.7	90.6	91.0	87.7	87.7	42.7	46.2	60.2	63.3
Japan	85.2	85.2	84.9	85.0	47.4	45.1	42.7	43.0	97.1	96.3	95.6	95.5	84.1	84.9	84.8	85.6
Korea	77.1	77.6	78.6	78.6	28.4	23.1	24.6	25.9	92.2	90.5	91.3	91.1	71.3	76.8	82.0	81.8
Luxembourg	76.4	75.0	77.2	76.0	37.4	30.6	29.6	36.2	94.2	94.9	94.9	93.9	38.6	36.4	52.1	45.5
Mexico	84.7	83.7	82.1	81.8	67.7	61.8	58.8	57.5	95.2	95.3	94.1	94.2	79.3	80.9	78.7	78.0
Netherlands	83.2	83.8	84.6	84.6	71.6	71.4	68.0	67.5	93.2	93.5	92.2	92.1	50.9	62.6	76.5	77.6
New Zealand	83.1	84.9	84.1	84.2	65.8	67.1	63.0	64.4	91.1	92.1	92.4	92.2	71.9	81.9	83.6	83.5
Norway[a]	84.8	81.8	80.2	80.5	67.5	58.6	54.3	56.3	91.4	90.9	89.3	89.1	74.4	74.7	77.0	76.9
Poland	71.7	70.0	74.6	74.8	40.9	36.5	38.8	38.4	88.3	87.9	90.5	90.6	40.4	44.8	57.2	57.5
Portugal	78.9	79.2	76.7	76.7	50.5	44.7	34.8	34.2	92.5	92.9	91.6	91.7	64.5	63.2	64.0	65.0
Slovak Republic	76.8	75.8	77.6	77.5	49.4	38.7	38.1	38.3	93.9	93.0	94.0	93.6	41.0	56.9	58.9	58.4
Slovenia	71.9	75.8	74.3	75.4	41.7	47.6	36.6	38.9	90.6	91.3	92.2	92.9	34.6	46.7	45.7	46.4
Spain[a]	80.4	82.6	80.7	80.9	53.6	57.3	41.5	40.6	93.0	92.5	92.6	92.6	60.5	62.8	64.3	66.2
Sweden[a]	81.5	81.4	83.6	83.5	54.4	51.5	54.7	53.6	90.7	92.9	93.5	93.3	72.6	76.4	81.7	82.0
Switzerland	89.4	88.2	88.5	88.5	70.5	70.2	68.2	65.9	96.7	95.8	95.8	96.0	79.3	78.4	81.4	82.5
Turkey	76.9	74.4	76.6	77.0	57.6	51.6	54.0	54.2	89.5	88.1	89.8	90.4	53.4	42.9	49.3	50.3
United Kingdom[a]	84.1	83.3	83.1	82.8	73.6	68.7	62.7	63.1	91.9	91.7	92.4	91.7	63.2	68.8	70.9	71.1
United States[a]	83.9	81.7	78.5	78.5	68.6	61.5	56.4	56.2	91.6	90.9	88.2	88.3	67.3	69.6	69.9	69.8
OECD[c]	80.9	80.4	79.7	79.7	57.1	53.8	51.1	50.9	92.6	92.2	91.2	91.2	62.5	66.7	70.0	70.5
Brazil[d]	84.7	84.9	83.5	..	72.6	72.3	66.9	..	93.0	92.8	92.4	..	71.1	72.3	72.8	..
China[e]	87.8	..	84.3	..	68.0	..	59.6	..	96.8	..	95.4	..	70.8	..	71.0	..
Colombia[d]	86.1	82.6	85.7	85.8	67.2	58.2	63.1	63.4	96.5	95.2	96.2	96.1	80.2	77.7	84.3	85.1
Costa Rica	..	..	82.0	80.4	..	..	56.9	53.3	..	..	94.3	93.4	..	..	78.7	78.0
India[e]	..	..	81.4	..	..	..	49.5	..	..	..	97.2	..	..	..	81.4	..
Indonesia[e]	..	85.6	85.4	..	..	62.8	57.7	..	..	96.3	97.0	..	..	84.9	84.4	..
Latvia	72.3	77.9	77.8	78.9	43.4	49.2	45.3	45.2	87.8	91.6	90.5	90.6	53.9	67.6	63.7	68.0
Lithuania	74.3	71.3	76.0	75.8	41.6	31.6	38.6	36.7	89.7	87.7	90.8	90.4	57.9	63.3	68.2	69.8
Russian Fed.	75.9	76.9	78.6	79.1	47.5	42.7	43.0	41.9	91.4	92.0	93.6	94.0	50.6	66.3	60.5	61.0
South Africa[d]	66.0	64.3	63.7	65.1	33.9	32.0	27.7	29.5	85.6	84.0	82.3	83.5	60.6	59.1	54.3	53.6

Table C. **Labour force participation rates by selected age groups** *(cont.)*

As a percentage of the female population in each age group

	Women (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	65.3	69.4	70.5	71.2	68.5	69.7	66.2	66.7	70.5	74.8	75.9	76.6	35.3	48.6	56.2	57.3
Austria	61.8	67.1	70.8	70.9	50.8	56.0	55.4	54.1	76.3	80.5	84.5	84.4	17.6	27.5	37.5	40.2
Belgium	56.4	60.4	63.0	63.0	31.8	31.6	28.1	27.1	72.7	78.0	80.6	80.2	17.1	27.5	39.0	41.2
Canada	70.4	74.2	74.2	74.2	62.9	66.5	64.6	64.4	78.5	82.1	81.9	82.0	41.4	53.3	59.2	59.0
Chile	39.1	44.4	55.7	55.8	24.2	24.8	30.6	29.9	47.3	54.6	67.3	67.5	25.5	33.7	48.4	48.6
Czech Republic	63.7	61.5	65.6	66.5	40.6	26.9	26.1	27.4	81.8	80.3	81.6	81.4	23.7	35.2	46.3	48.3
Denmark	75.6	76.4	75.0	75.3	67.8	69.1	62.0	62.5	84.0	85.3	83.8	83.4	49.0	55.1	60.3	62.6
Estonia	66.3	68.8	71.2	72.9	37.1	32.1	37.0	37.7	84.1	83.4	81.8	82.8	39.4	61.0	66.5	69.4
Finland	72.1	73.9	73.8	74.4	51.1	53.7	52.5	53.3	85.0	85.6	83.4	83.5	45.2	58.3	65.8	67.4
France	62.5	64.9	67.2	67.3	32.4	34.9	33.4	33.8	78.6	82.0	83.1	82.7	28.2	37.6	48.5	50.2
Germany	63.3	69.4	72.9	73.1	48.2	49.0	47.7	47.1	76.9	80.6	82.4	82.5	33.5	48.9	62.9	63.8
Greece	50.5	54.8	59.0	59.9	36.2	27.5	26.1	24.3	62.0	69.2	75.6	77.7	25.4	28.2	29.9	29.5
Hungary	52.6	54.9	60.7	62.2	32.5	21.8	25.9	27.5	70.5	73.2	78.8	79.6	13.3	26.9	37.4	39.9
Iceland[a]	83.3	83.6	84.2	85.5	73.2	80.1	78.4	81.5	88.2	85.4	86.3	87.5	76.8	80.7	83.3	83.0
Ireland	56.3	63.5	62.5	62.8	49.2	52.7	35.5	33.8	65.1	72.2	72.6	73.4	27.6	40.8	48.1	48.8
Israel[b]	62.5	65.5	68.4	68.3	54.3	52.5	48.5	48.0	70.3	73.9	78.4	78.1	39.1	52.4	60.3	61.8
Italy[a]	46.3	50.6	55.2	54.9	34.3	25.4	25.5	24.0	57.9	64.1	66.4	65.9	16.1	23.4	38.3	39.6
Japan	59.6	61.9	66.0	66.7	46.6	44.7	43.4	43.1	66.5	70.1	74.5	75.2	49.7	52.5	57.5	59.2
Korea	52.0	54.8	57.0	57.9	37.0	32.7	32.5	34.1	57.8	62.0	64.8	65.4	48.8	47.6	53.0	54.2
Luxembourg	51.7	58.9	64.2	65.6	30.6	22.3	23.0	34.1	64.9	74.7	80.9	81.3	16.8	29.1	36.5	35.0
Mexico	41.0	45.2	46.8	46.6	36.3	34.0	32.2	31.0	45.4	52.4	54.8	55.2	28.0	32.8	36.9	36.4
Netherlands	65.2	70.4	74.0	74.7	70.0	69.4	68.4	69.4	72.7	79.9	82.0	82.1	25.9	38.9	54.3	56.7
New Zealand	67.2	71.5	74.1	74.1	59.5	61.9	58.5	59.9	73.4	76.5	79.3	79.1	47.8	64.1	74.2	73.0
Norway[a]	76.5	75.9	75.9	76.2	61.8	60.3	56.2	57.2	83.5	84.0	84.1	83.9	61.6	64.6	69.2	69.8
Poland	59.9	56.5	61.1	61.4	34.8	29.3	28.7	27.0	76.5	75.6	79.6	79.6	23.7	20.6	35.2	37.3
Portugal	63.8	68.7	70.0	70.3	40.9	37.8	33.8	32.8	77.3	82.7	85.8	86.0	42.0	47.0	47.5	49.9
Slovak Republic	63.2	60.7	62.8	64.3	42.6	30.1	23.6	24.9	82.9	80.5	80.4	80.8	10.7	23.3	42.1	45.8
Slovenia	62.9	66.6	67.2	67.9	36.4	35.4	30.4	31.7	84.2	87.3	88.3	88.6	14.1	23.1	31.1	32.9
Spain[a]	52.9	62.8	69.8	70.0	43.3	47.5	37.6	36.8	62.8	73.3	82.0	82.0	22.6	32.7	46.9	49.4
Sweden[a]	76.4	76.8	79.3	79.9	51.2	52.6	55.9	56.3	85.6	87.1	88.0	88.3	65.9	69.6	75.2	75.7
Switzerland	71.6	75.0	79.0	79.8	66.0	64.5	66.6	67.6	78.0	81.9	85.7	85.9	51.3	60.3	66.5	69.1
Turkey	28.0	25.7	33.6	35.0	28.1	24.4	27.7	29.8	28.9	28.0	38.8	40.3	21.6	14.8	17.9	18.3
United Kingdom[a]	68.9	69.8	72.1	72.5	65.7	62.7	59.6	60.9	76.2	77.5	80.0	80.0	42.5	49.9	56.4	57.1
United States[a]	70.7	69.1	67.1	66.9	63.0	57.2	53.6	53.8	76.7	75.4	73.9	73.7	51.9	58.3	58.8	58.5
OECD[c]	59.1	60.9	62.8	63.0	46.6	44.5	43.1	43.2	67.9	70.0	72.0	72.1	38.3	45.3	51.5	52.2
Brazil[d]	58.3	62.8	62.4	..	51.2	54.7	51.0	..	65.1	70.2	71.2	..	37.9	40.6	41.9	..
China[e]	76.7	..	70.3	..	67.8	..	55.1	..	84.0	..	80.4	..	47.2	..	48.3	..
Colombia[d]	57.4	54.2	62.9	63.7	47.2	39.5	46.1	46.0	65.7	64.2	73.2	74.3	35.3	35.2	48.3	49.7
Costa Rica	..	..	54.6	53.9	..	..	38.1	37.5	..	..	64.9	64.2	..	..	39.0	38.9
India[e]	..	..	28.5	..	..	..	17.5	..	..	..	34.0	..	..	..	25.6	..
Indonesia[e]	..	52.1	52.5	..	..	41.3	38.6	..	..	56.8	58.4	..	..	51.3	50.1	..
Latvia	62.1	67.8	71.6	72.8	31.2	35.8	35.3	37.1	83.3	82.8	84.0	84.6	29.2	55.7	61.7	63.5
Lithuania	67.1	64.9	71.6	72.5	30.5	22.3	29.6	30.8	87.9	83.6	88.7	88.2	35.9	49.2	58.9	63.3
Russian Fed.	66.2	69.2	68.1	68.2	39.7	36.0	34.3	33.7	85.3	86.6	86.1	85.9	27.8	44.2	40.7	41.2
South Africa[d]	52.9	50.8	50.7	52.1	29.3	26.6	22.8	23.8	68.6	66.2	66.1	67.8	36.4	33.3	35.4	35.8

a) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
b) There is a break in series between 2011 and 2012 with the introduction of a redesigned monthly labour force survey since January 2012. Therefore, data prior to 2012 are spliced using new-to-old chaining coefficients between monthly and quarterly surveys based on data of fourth quarter of 2011.
c) Weighted average.
d) Data for 2000 refer to 2001.
e) Data for 2014 refer to 2010 for China, 2012 for India and 2013 for Indonesia.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

StatLink http://dx.doi.org/10.1787/888933385065

Table D. **Unemployment rates by selected age groups**

As a percentage of the total labour force in each age group

	Total (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	6.4	4.4	6.2	6.2	12.1	9.4	13.3	13.1	5.0	3.4	4.8	4.9	4.5	2.7	4.1	4.3
Austria	3.5	4.9	5.7	5.8	5.1	9.4	10.3	10.6	3.1	4.2	5.2	5.2	5.2	3.4	3.8	4.7
Belgium	7.0	7.5	8.6	8.6	17.5	18.8	23.2	22.1	6.1	6.6	7.6	7.7	3.0	4.2	5.4	5.6
Canada	6.9	6.1	7.0	7.0	12.7	11.2	13.5	13.2	5.8	5.1	5.8	5.8	5.5	5.1	6.2	6.1
Chile	9.4	7.4	6.6	6.5	21.3	17.8	16.5	15.5	7.6	6.0	5.5	5.7	5.6	3.8	3.6	3.1
Czech Republic	8.8	5.4	6.2	5.1	17.0	10.7	15.9	12.6	7.7	4.9	5.6	4.6	5.2	4.6	4.9	4.4
Denmark	4.6	3.8	6.8	6.3	6.7	7.5	12.6	10.8	4.2	3.1	5.9	5.7	4.4	3.4	4.8	4.4
Estonia	14.8	4.7	7.5	6.3	22.2	9.9	14.3	12.6	14.0	4.2	7.2	5.5	11.5	3.6	5.4	6.0
Finland	9.8	6.9	8.7	9.5	20.3	15.7	19.3	21.1	8.0	5.3	7.1	7.7	9.4	6.5	7.3	8.0
France	10.3	7.7	10.3	10.4	20.6	18.8	24.2	24.7	9.3	6.6	9.2	9.2	7.3	4.4	7.5	7.4
Germany	7.8	8.7	5.1	4.7	8.4	11.7	7.8	7.2	7.0	8.0	4.7	4.4	12.3	10.3	5.1	4.7
Greece	11.6	8.5	26.7	25.1	29.2	22.7	52.4	49.8	9.7	7.8	26.0	24.4	3.9	3.4	17.2	17.5
Hungary	6.4	7.5	7.8	6.8	12.7	18.0	20.4	17.3	5.7	6.9	6.8	6.0	3.0	4.4	6.4	5.8
Iceland[a]	2.3	2.3	5.1	4.2	4.7	7.2	10.0	8.7	1.7	1.3	4.3	3.2	1.7	0.9	3.1	3.2
Ireland	4.7	4.9	12.1	10.0	7.9	10.3	26.9	22.4	4.0	4.0	10.7	9.0	2.6	2.3	9.6	7.8
Israel[b]	11.2	9.4	6.0	5.3	17.3	16.3	10.6	9.3	9.4	7.8	5.3	4.7	8.7	6.8	4.1	3.9
Italy[a]	10.6	6.2	12.9	12.1	29.7	20.4	42.7	40.3	8.5	5.3	11.8	11.2	4.5	2.4	5.5	5.5
Japan	5.0	4.1	3.8	3.5	9.2	7.7	6.3	5.5	4.1	3.7	3.6	3.4	5.6	3.4	3.3	3.1
Korea	4.6	3.4	3.7	3.7	10.8	8.8	10.0	10.5	4.0	3.1	3.3	3.3	2.9	2.2	2.5	2.8
Luxembourg	2.4	4.1	5.9	6.7	6.4	15.2	22.6	17.3	2.0	3.4	4.9	5.8	1.4	2.1	4.3	4.7
Mexico	2.6	3.4	5.1	4.5	5.1	6.6	9.6	9.0	1.8	2.7	4.1	3.6	1.4	1.6	2.8	2.4
Netherlands	3.1	3.6	6.9	6.9	6.1	7.0	10.5	11.3	2.5	2.8	5.9	5.6	2.1	4.0	7.1	8.1
New Zealand	6.2	3.8	6.0	6.0	13.5	10.1	15.0	14.7	4.7	2.6	4.4	4.4	4.7	1.4	3.2	3.7
Norway[a]	3.5	2.6	3.6	4.5	10.2	7.3	7.8	10.0	2.6	1.9	3.3	4.1	1.3	1.0	1.3	1.7
Poland	16.4	9.7	9.1	7.6	35.2	21.7	23.9	20.8	13.9	8.4	7.9	6.6	9.4	6.8	6.8	5.4
Portugal	4.2	8.5	14.5	12.9	8.6	16.7	34.8	32.0	3.5	7.7	12.7	11.2	3.2	6.5	13.5	12.5
Slovak Republic	18.8	11.0	13.2	11.5	37.0	20.1	29.7	26.4	15.5	10.1	12.0	10.5	12.3	8.1	10.6	9.3
Slovenia	6.9	5.0	9.9	9.1	16.3	10.1	20.2	16.3	5.6	4.5	9.3	8.7	5.3	3.3	7.8	7.8
Spain[a]	13.9	8.3	24.6	22.2	25.3	18.1	53.2	48.3	12.3	7.2	22.8	20.6	9.4	6.0	20.0	18.6
Sweden[a]	5.9	6.2	8.1	7.6	11.7	19.2	22.9	20.3	4.9	4.4	6.0	5.8	6.1	3.9	5.4	5.3
Switzerland	2.7	3.7	4.7	4.7	4.8	7.1	8.6	8.6	2.3	3.1	4.2	4.1	2.7	3.1	3.3	3.9
Turkey	6.7	10.5	10.1	10.5	13.1	20.0	17.9	18.5	4.9	8.5	8.7	9.1	2.1	4.3	6.0	6.7
United Kingdom[a]	5.5	5.3	6.4	5.7	11.7	14.2	16.3	15.4	4.4	3.8	4.8	4.2	4.4	3.3	4.2	3.5
United States[a]	4.0	4.7	6.3	5.4	9.3	10.5	13.4	11.6	3.1	3.7	5.2	4.5	2.5	3.1	4.3	3.8
OECD[c]	6.4	5.8	7.6	7.0	12.1	12.0	15.0	14.0	5.4	4.9	6.8	6.2	4.9	4.0	5.2	4.9
Brazil[d]	9.6	8.3	7.1	..	17.9	16.8	17.0	..	6.9	6.1	5.1	..	4.1	2.9	2.2	..
China[e]	3.7	..	2.9	..	8.8	..	6.4	..	2.8	..	2.5	..	0.4	..	1.2	..
Colombia[d]	15.4	11.5	9.4	9.2	27.6	22.2	18.7	17.7	11.9	9.0	7.3	7.4	7.9	5.9	5.4	5.5
Costa Rica	..	..	9.8	9.8	..	..	25.1	23.0	..	..	6.7	7.3	..	..	4.1	4.9
India[e]	..	..	3.7	..	..	..	10.7	..	..	..	2.3	..	..	..	1.4	..
Indonesia[e]	..	9.5	6.4	..	..	25.1	21.6	..	..	5.6	3.3	..	..	1.8	1.3	..
Latvia	14.5	6.2	11.1	10.1	22.1	10.6	19.6	16.3	14.0	5.7	10.4	9.5	9.6	4.5	9.9	9.3
Lithuania	16.7	4.3	10.9	9.3	30.2	8.4	19.3	16.3	15.6	4.0	9.9	8.6	11.2	3.7	10.7	8.7
Russian Fed.	10.7	6.1	5.2	5.6	20.7	14.4	13.7	16.0	9.2	5.1	4.4	4.8	7.3	3.1	3.6	3.7
South Africa[d]	25.4	22.3	25.1	25.3	49.6	46.5	51.3	50.1	21.2	18.6	22.5	22.8	8.4	5.6	7.7	8.7

Table D. **Unemployment rates by selected age groups** *(cont.)*

As a percentage of the male labour force in each age group

	Men (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	6.6	4.1	6.1	6.2	12.9	9.5	14.1	14.3	5.1	3.0	4.6	4.6	5.3	2.8	4.3	4.8
Austria	3.3	4.6	5.9	6.2	5.0	9.3	10.6	11.1	2.8	3.8	5.4	5.5	5.4	3.4	4.5	5.7
Belgium	5.8	6.7	9.1	9.2	15.3	17.1	24.0	23.8	4.9	5.9	8.2	8.2	3.0	3.6	5.6	6.3
Canada	7.0	6.5	7.5	7.6	13.8	12.3	15.0	15.0	5.7	5.3	6.0	6.2	5.5	5.2	6.7	6.6
Chile	9.0	6.5	6.3	6.1	19.4	16.1	14.3	13.8	7.4	5.2	5.3	5.3	6.3	3.8	3.8	3.2
Czech Republic	7.4	4.3	5.2	4.3	16.7	10.6	15.0	11.3	6.0	3.5	4.3	3.7	5.0	4.5	4.6	4.0
Denmark	4.1	3.5	6.6	6.1	6.8	7.6	13.7	11.6	3.5	2.7	5.4	5.4	3.9	3.0	5.1	4.0
Estonia	16.0	5.5	7.9	6.3	21.7	11.8	17.8	12.9	15.0	4.2	7.1	5.3	15.0	6.9	5.8	6.9
Finland	9.1	6.5	9.4	10.0	18.9	14.8	20.6	22.5	7.2	4.8	7.6	7.9	9.3	6.9	8.3	9.1
France	8.6	7.3	10.6	10.9	19.0	18.3	25.1	25.8	7.4	6.1	9.2	9.5	7.3	4.7	8.0	8.0
Germany	7.6	8.6	5.4	5.1	9.2	12.2	8.4	7.9	6.6	7.8	5.0	4.7	11.5	9.7	5.5	5.2
Greece	7.6	5.3	23.8	21.9	21.6	15.5	47.4	45.2	6.2	4.7	23.0	20.9	3.7	2.9	17.7	18.1
Hungary	7.1	7.2	7.6	6.6	13.8	17.4	20.0	18.3	6.2	6.5	6.5	5.6	3.7	4.8	6.7	6.0
Iceland[a]	1.8	2.3	5.2	4.1	5.7	8.0	13.1	10.7	1.1	1.2	3.8	2.6	0.5	0.9	2.9	3.2
Ireland	4.7	5.0	14.0	11.4	7.6	10.7	28.0	24.2	4.2	4.2	12.7	10.4	2.5	2.4	11.6	9.0
Israel[b]	11.1	9.0	6.0	5.2	17.3	15.3	10.1	8.9	9.1	7.4	5.3	4.5	10.4	7.4	4.3	4.4
Italy[a]	8.2	5.0	12.1	11.6	25.4	18.4	41.3	38.8	6.3	4.0	10.8	10.4	4.4	2.6	6.2	6.4
Japan	5.1	4.1	4.0	3.7	10.4	8.3	7.1	5.9	3.9	3.6	3.6	3.5	6.8	4.1	3.8	3.7
Korea	5.1	3.8	3.7	3.8	13.5	11.4	11.2	11.3	4.5	3.6	3.3	3.3	3.9	2.7	2.9	3.3
Luxembourg	1.8	3.6	6.0	6.2	5.7	13.5	26.1	18.9	1.4	2.8	4.7	5.0	2.0	2.3	4.4	5.4
Mexico	2.3	3.3	5.1	4.4	4.4	6.1	9.2	8.3	1.5	2.5	4.2	3.5	1.5	2.0	3.4	2.9
Netherlands	2.5	3.2	7.0	6.6	5.3	6.3	9.7	11.3	1.9	2.3	6.2	5.0	2.5	4.2	7.6	8.4
New Zealand	6.4	3.5	5.3	5.5	14.5	10.0	14.3	14.6	4.6	2.2	3.4	3.6	5.5	1.5	3.3	3.6
Norway[a]	3.6	2.6	3.9	4.8	9.5	7.9	8.9	11.1	2.9	1.9	3.5	4.3	1.8	1.1	1.5	1.8
Poland	14.6	9.1	8.6	7.4	33.3	20.0	22.7	20.7	12.1	7.8	7.2	6.2	9.1	7.4	7.1	5.9
Portugal	3.3	7.0	14.2	12.8	6.3	13.8	34.2	29.6	2.7	6.1	12.0	10.8	3.6	7.1	15.2	14.0
Slovak Republic	19.0	9.8	12.9	10.4	39.7	20.3	29.5	25.8	15.2	8.6	11.5	9.1	13.5	7.7	9.7	8.2
Slovenia	6.6	4.1	9.1	8.2	14.6	9.4	19.4	17.7	5.4	3.4	8.3	7.3	6.6	3.0	8.6	8.1
Spain[a]	9.6	6.5	23.7	20.9	19.4	15.2	53.4	48.6	8.0	5.5	21.7	18.9	8.6	5.0	20.4	18.5
Sweden[a]	6.3	6.0	8.4	7.8	12.1	18.6	24.3	21.2	5.3	4.1	6.0	5.8	6.8	4.3	6.2	6.0
Switzerland	2.3	3.0	4.5	4.6	5.6	6.8	8.6	9.2	1.6	2.3	4.1	3.8	3.0	2.6	3.4	4.4
Turkey	6.8	10.2	9.2	9.4	13.7	19.6	16.6	16.5	5.0	8.5	7.8	8.1	2.9	5.4	7.4	7.9
United Kingdom[a]	6.1	5.6	6.6	5.9	13.2	15.8	18.5	17.3	4.8	3.7	4.7	4.1	5.5	4.1	4.6	3.7
United States[a]	3.9	4.8	6.4	5.5	9.7	11.6	14.5	12.8	2.9	3.7	5.2	4.4	2.4	3.2	4.5	3.9
OECD[c]	5.9	5.6	7.5	6.9	12.0	12.2	15.5	14.4	4.8	4.6	6.5	6.0	5.3	4.2	5.6	5.3
Brazil[d]	7.7	6.1	5.5	..	14.7	12.9	13.8	..	5.3	4.2	3.7	..	4.3	3.0	2.0	..
China[e]	3.6	..	2.7	..	9.2	..	6.3	..	2.7	..	2.2	..	0.6	..	1.4	..
Colombia[d]	12.3	8.9	7.1	6.9	22.5	17.8	14.6	13.2	9.2	6.6	5.2	5.2	8.5	6.3	5.6	5.6
Costa Rica	..	..	8.2	8.1	..	..	21.4	20.0	..	..	5.1	5.6	..	..	4.9	5.2
India[e]	..	..	3.5	..	..	..	10.4	..	..	..	2.1	..	..	..	1.3	..
Indonesia[e]	..	8.4	6.3	..	..	23.8	21.2	..	..	4.7	3.3	..	..	1.8	1.3	..
Latvia	15.5	6.7	12.1	11.4	20.9	11.0	19.4	18.0	15.3	6.1	11.2	10.4	10.7	4.9	11.6	11.6
Lithuania	19.1	4.3	12.4	10.3	32.1	7.0	19.6	16.0	17.7	3.9	11.1	9.5	13.7	4.1	13.8	10.6
Russian Fed.	10.9	6.4	5.5	5.9	19.5	14.5	13.3	15.3	9.6	5.4	4.7	5.0	7.5	3.5	4.4	4.3
South Africa[d]	23.1	18.8	23.3	23.4	47.1	41.1	48.0	46.3	18.9	15.1	20.8	20.8	9.3	6.4	8.1	10.1

Table D. **Unemployment rates by selected age groups** *(cont.)*

As a percentage of the female labour force in each age group

	Women (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	6.1	4.8	6.3	6.2	11.2	9.2	12.5	11.9	4.9	3.9	5.1	5.2	3.2	2.6	3.8	3.5
Austria	3.8	5.4	5.5	5.4	5.2	9.6	9.9	10.0	3.5	4.7	5.0	4.9	4.7	3.5	2.8	3.4
Belgium	8.7	8.5	8.0	7.8	20.3	20.9	22.3	20.0	7.6	7.4	7.0	7.1	2.9	5.3	5.1	4.7
Canada	6.7	5.7	6.5	6.4	11.4	10.1	11.9	11.3	5.8	4.8	5.5	5.4	5.5	4.9	5.5	5.4
Chile	10.2	8.8	7.1	7.0	24.8	20.8	19.7	18.2	8.1	7.3	5.8	6.1	3.4	3.6	3.2	2.8
Czech Republic	10.6	6.8	7.5	6.2	17.4	11.0	17.1	14.4	9.9	6.7	7.1	5.8	5.4	4.8	5.4	4.9
Denmark	5.3	4.2	6.9	6.5	6.7	7.4	11.5	10.1	5.0	3.6	6.4	6.1	5.1	4.0	4.5	4.8
Estonia	13.5	3.9	7.0	6.2	23.0	7.2	10.0	12.2	12.9	4.2	7.2	5.8	7.5	0.9	5.1	5.4
Finland	10.6	7.3	8.0	9.0	21.8	16.8	18.0	19.6	8.8	5.8	6.5	7.5	9.4	6.0	6.4	7.1
France	12.2	8.1	10.1	9.9	22.6	19.5	23.1	23.4	11.4	7.2	9.2	9.0	7.4	4.1	6.9	6.8
Germany	8.1	8.9	4.7	4.3	7.5	11.1	7.1	6.5	7.5	8.1	4.4	4.0	13.6	11.2	4.6	4.1
Greece	17.5	13.0	30.4	29.1	38.2	31.7	58.1	55.0	15.1	12.0	29.8	28.7	4.3	4.3	16.4	16.5
Hungary	5.7	7.8	8.0	7.1	11.2	18.9	20.9	16.0	5.0	7.3	7.2	6.6	1.6	3.9	6.0	5.5
Iceland[a]	2.8	2.4	5.0	4.3	3.6	6.3	6.9	6.7	2.4	1.6	5.0	3.8	3.2	0.9	3.2	3.3
Ireland	4.7	4.7	9.8	8.3	8.3	9.8	25.6	20.3	3.8	3.7	8.3	7.3	2.9	2.0	6.7	6.1
Israel[b]	11.2	9.9	6.0	5.5	17.4	17.3	11.1	9.7	9.7	8.4	5.2	4.9	6.0	6.0	3.9	3.4
Italy[a]	14.6	7.9	13.9	12.8	35.4	23.3	44.7	42.6	12.1	7.1	13.2	12.2	4.7	2.1	4.4	4.3
Japan	4.7	3.9	3.5	3.3	7.9	7.1	5.4	5.1	4.4	3.9	3.5	3.3	3.6	2.4	2.5	2.3
Korea	3.8	2.8	3.6	3.7	9.0	7.1	9.2	10.0	3.0	2.4	3.3	3.2	1.6	1.4	1.9	2.0
Luxembourg	3.2	4.7	5.8	7.4	7.3	17.5	18.1	15.7	2.9	4.0	5.1	6.9	0.0	1.7	4.2	3.8
Mexico	3.4	3.7	5.0	4.7	6.2	7.3	10.3	10.3	2.4	3.0	4.1	3.9	0.9	0.6	1.7	1.5
Netherlands	3.9	4.1	6.7	7.3	7.0	7.8	11.3	11.2	3.3	3.3	5.6	6.3	1.5	3.8	6.4	7.6
New Zealand	6.0	4.0	6.8	6.6	12.4	10.2	15.7	14.7	4.8	3.0	5.6	5.2	3.6	1.3	3.1	3.8
Norway[a]	3.2	2.5	3.3	4.2	10.9	6.6	6.6	8.8	2.3	2.0	3.2	3.9	0.7	0.8	1.0	1.6
Poland	18.4	10.4	9.7	7.8	37.3	23.8	25.5	20.9	16.0	9.1	8.7	7.1	9.7	5.7	6.3	4.8
Portugal	5.2	10.1	14.8	13.1	11.6	20.3	35.4	34.5	4.4	9.5	13.4	11.6	2.6	5.8	11.5	10.7
Slovak Republic	18.6	12.6	13.7	12.9	33.8	19.9	30.1	27.5	15.8	11.9	12.7	12.2	8.7	9.1	11.7	10.6
Slovenia	7.2	6.0	10.8	10.2	18.5	11.2	21.3	14.6	5.8	5.6	10.5	10.2	2.5	3.8	6.6	7.2
Spain[a]	20.6	10.7	25.5	23.7	32.9	21.7	52.9	48.0	18.9	9.5	24.1	22.4	11.3	7.7	19.4	18.7
Sweden[a]	5.4	6.5	7.8	7.4	11.3	19.8	21.5	19.4	4.5	4.7	5.9	5.8	5.4	3.5	4.6	4.6
Switzerland	3.2	4.6	4.8	4.7	3.9	7.4	8.5	8.0	3.1	4.1	4.5	4.4	2.3	3.8	3.1	3.4
Turkey	6.5	11.3	12.1	12.9	11.9	20.8	20.4	22.2	4.6	8.8	10.9	11.4	0.5	1.1	2.2	3.4
United Kingdom[a]	4.8	5.0	6.1	5.4	10.1	12.5	14.0	13.3	4.0	3.8	4.9	4.3	2.7	2.2	3.8	3.2
United States[a]	4.1	4.6	6.1	5.3	8.9	9.4	12.2	10.4	3.3	3.8	5.3	4.6	2.5	3.0	4.2	3.6
OECD[c]	7.0	6.0	7.6	7.1	12.3	11.7	14.5	13.5	6.2	5.3	7.1	6.5	4.4	3.7	4.7	4.4
Brazil[d]	12.2	11.0	9.0	..	22.5	21.9	21.2	..	9.1	8.5	6.8	..	3.7	2.7	2.5	..
China[e]	3.8	..	3.3	..	8.4	..	6.5	..	2.9	..	2.9	..	0.2	..	0.9	..
Colombia[d]	19.8	15.1	12.3	12.2	34.8	28.6	24.3	23.8	15.7	12.3	10.0	10.1	6.7	5.0	5.1	5.2
Costa Rica	..	..	12.2	12.4	..	..	31.5	28.0	..	..	9.0	9.9	..	..	2.7	4.3
India[e]	..	..	4.3	..	..	..	11.6	..	..	..	2.9	..	..	..	1.8	..
Indonesia[e]	..	11.2	6.7	..	..	27.3	22.1	..	..	7.2	3.3	..	..	1.9	1.1	..
Latvia	13.4	5.7	10.1	8.8	23.7	10.0	20.0	14.2	12.8	5.3	9.5	8.6	8.0	4.1	8.5	7.3
Lithuania	14.3	4.4	9.4	8.4	27.5	10.4	18.7	16.6	13.5	4.0	8.8	7.8	8.1	3.4	7.9	7.1
Russian Fed.	10.4	5.7	4.8	5.3	22.2	14.4	14.1	16.9	8.8	4.8	4.2	4.6	7.1	2.6	2.7	3.0
South Africa[d]	27.9	26.4	27.2	27.7	52.2	52.8	55.3	54.9	232.8	22.6	24.5	25.2	7.2	4.5	7.1	6.9

a) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
b) There is a break in series between 2011 and 2012 with the introduction of a redesigned monthly labour force survey since January 2012. Therefore, data prior to 2012 are spliced using new-to-old chaining coefficients between monthly and quarterly surveys based on data of fourth quarter of 2011.
c) Weighted average.
d) Data for 2000 refer to 2001.
e) Data for 2014 refer to 2010 for China, 2012 for India and 2013 for Indonesia.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

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Table E. **Employment/population ratios by educational attainment, 2014**

Persons aged 25-64, as a percentage of the population in each gender

	Total			Men			Women		
	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education
Australia	59.7	77.3	82.9	69.2	84.7	88.9	51.5	67.8	78.0
Austria	53.0	75.9	85.3	59.1	79.8	87.2	49.5	71.6	83.3
Belgium	47.5	72.8	84.7	56.1	78.1	87.2	38.1	66.9	82.6
Canada	55.8	73.9	81.6	64.5	79.2	84.9	44.6	67.3	79.0
Chile[a]	61.3	71.6	84.0	84.2	86.3	90.7	41.8	58.7	78.2
Czech Republic	43.0	77.6	84.5	53.5	85.6	92.3	37.1	68.7	77.2
Denmark	61.7	79.4	86.3	69.4	83.0	89.2	52.8	75.1	84.2
Estonia	60.4	74.4	84.0	65.7	80.0	89.5	51.1	67.5	80.8
Finland	53.5	73.2	83.5	58.1	75.0	85.6	46.5	70.9	81.9
France[a]	54.3	73.3	84.4	61.8	76.8	87.3	47.7	69.5	81.9
Germany	58.0	79.7	88.1	67.4	83.5	91.3	50.9	76.0	84.0
Greece	46.9	54.5	68.5	58.6	67.1	72.5	34.4	42.9	64.8
Hungary	45.3	71.8	81.8	54.7	78.2	88.4	38.1	64.6	77.0
Iceland	76.8	86.6	90.8	83.3	89.6	93.5	70.7	82.1	88.8
Ireland	46.6	67.9	81.1	58.1	76.4	85.6	31.9	59.5	77.4
Israel	48.6	72.3	86.1	63.6	76.9	89.5	32.2	66.7	83.4
Italy	49.6	69.8	77.8	64.1	79.1	83.2	34.1	60.6	73.7
Japan[b]	..	..	81.6	..	..	93.0	..	..	70.2
Korea	66.2	72.1	77.4	78.9	84.9	89.7	58.3	59.1	62.6
Luxembourg	60.9	72.1	84.6	70.0	79.8	88.9	53.5	64.2	79.7
Mexico	63.3	73.1	79.1	87.6	90.0	87.3	43.8	54.8	70.8
Netherlands	58.8	77.9	87.7	70.9	83.0	90.3	47.8	72.5	84.9
New Zealand	70.9	80.3	87.2	78.1	89.5	92.9	64.8	70.0	82.8
Norway	61.9	81.5	89.9	66.5	85.3	91.4	56.8	76.7	88.6
Poland	39.2	66.2	86.2	49.5	75.3	90.7	29.0	55.9	83.0
Portugal	63.0	77.6	82.7	69.1	81.1	85.5	56.4	74.4	80.9
Slovak Republic	32.7	71.1	80.0	37.0	78.1	87.4	29.5	63.4	73.9
Slovenia	48.5	69.5	83.2	55.7	73.5	86.5	42.3	64.1	80.7
Spain	49.4	65.9	77.2	57.4	71.6	80.8	40.7	60.1	74.0
Sweden	65.9	84.7	89.0	72.7	87.1	90.2	58.2	81.4	88.1
Switzerland	69.2	82.3	88.9	78.3	87.6	92.3	62.4	77.7	84.4
Turkey	50.8	61.9	76.1	74.6	81.1	84.3	27.0	32.0	64.7
United Kingdom[c]	60.1	80.0	84.6	70.4	85.3	88.6	51.0	74.1	80.9
United States	54.8	67.9	80.1	66.2	73.7	85.0	41.5	61.9	75.9
OECD[d]	55.7	73.8	83.3	65.9	80.8	88.0	45.9	66.0	78.9
Brazil[a]	66.9	76.3	85.1	83.2	88.4	91.4	50.2	65.9	80.7
Colombia	72.2	76.3	84.4	90.0	88.7	90.9	54.9	64.4	79.2
Costa Rica	65.4	73.3	84.6	85.6	86.9	90.8	45.0	60.2	79.1
Latvia	51.3	70.9	84.2	58.3	74.8	86.6	39.1	66.9	83.0
Lithuania	48.1	69.7	89.4	52.1	72.8	91.2	41.3	66.4	88.2
Russian Federation[a]	49.4	72.4	82.6	57.6	79.5	88.6	39.6	63.9	78.5

Note: In most countries data refer to ISCED 2011. The countries with data that refer to ISCED-97 are: Brazil and the Russian Federation. See the description of the levels of education in *www.oecd.org/els/emp/definitions-education.pdf*.

a) Year of reference 2013.

b) Data for total tertiary education include upper secondary and post-secondary non-tertiary programmes (less than 5% of the adults are under this group).

c) Data for upper secondary attainment include completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).

d) Unweighted average.

Source: OECD (2015), *Education at a Glance*, Indicator A5, *www.oecd.org/edu/educationataglance2015indicators.htm*.

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Table F. **Labour force participation rates by educational attainment, 2014**

Persons aged 25-64, as a percentage of the population in each gender

	Total			Men			Women		
	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education
Australia	64.8	81.0	85.7	74.8	87.9	91.7	56.1	72.1	80.7
Austria	59.4	79.5	88.6	68.1	83.8	90.5	54.3	74.7	86.6
Belgium	55.4	78.5	88.4	65.6	84.3	91.1	44.2	72.1	86.1
Canada	62.4	79.0	85.7	71.9	84.8	89.3	50.2	71.7	82.8
Chile[a]	64.7	75.9	88.4	88.1	91.1	94.8	44.7	62.5	82.8
Czech Republic	54.2	82.0	86.8	67.9	89.3	94.3	46.6	74.0	79.6
Denmark	67.2	83.7	90.3	75.6	86.8	93.0	57.6	80.0	88.2
Estonia	68.5	80.6	88.1	74.9	86.3	93.6	57.5	73.7	84.9
Finland	61.2	79.6	87.9	66.1	81.8	90.8	53.6	77.0	85.8
France[a]	63.1	80.1	89.1	71.9	83.7	92.3	55.3	76.2	86.3
Germany	65.9	83.5	90.3	78.4	87.9	93.4	56.5	79.3	86.3
Greece	64.9	75.3	84.7	79.7	86.9	87.1	49.1	64.7	82.4
Hungary	54.3	76.8	84.1	65.4	83.3	90.5	46.0	69.3	79.4
Iceland	80.6	90.2	94.2	87.4	92.9	96.1	74.3	86.1	92.8
Ireland	57.4	77.1	86.3	72.9	88.0	91.6	37.4	66.3	82.0
Israel	52.6	77.0	89.6	69.1	81.9	92.8	34.4	71.3	87.0
Italy	58.4	76.8	84.2	74.7	85.9	88.7	41.1	67.8	80.7
Japan[b]	..	..	84.0	..	..	95.5	..	..	72.4
Korea	68.1	74.6	80.0	81.9	87.9	92.5	59.5	61.0	64.8
Luxembourg	66.0	76.0	87.8	75.5	84.1	92.1	58.2	67.5	82.9
Mexico	65.6	76.5	83.3	90.9	94.0	92.1	45.3	57.5	74.3
Netherlands	65.4	83.9	91.2	78.7	89.0	93.8	53.3	78.5	88.5
New Zealand	74.8	84.1	89.7	82.5	92.2	94.7	68.2	75.0	85.7
Norway	66.4	83.5	91.6	71.7	87.6	92.9	60.4	78.4	90.5
Poland	47.8	72.3	89.9	60.0	81.4	93.9	35.6	62.2	87.1
Portugal	73.9	88.8	90.7	81.2	91.0	92.3	66.0	86.9	89.8
Slovak Republic	53.8	80.1	84.9	65.5	87.2	91.8	45.1	72.4	79.4
Slovenia	57.4	76.9	88.5	66.1	80.6	90.5	49.8	72.1	87.2
Spain	72.0	84.1	89.6	82.1	88.8	92.2	61.0	79.2	87.3
Sweden	75.9	89.0	92.7	82.8	91.6	94.4	68.1	85.5	91.4
Switzerland	75.9	85.5	91.9	85.8	91.1	95.3	68.5	80.8	87.3
Turkey	55.5	68.1	82.9	81.5	87.2	89.7	29.6	38.4	73.5
United Kingdom[c]	65.1	83.2	86.8	76.6	88.7	90.9	55.0	77.2	83.0
United States	61.3	73.1	83.2	73.1	79.5	88.3	47.6	66.6	78.9
OECD[d]	63.6	79.9	87.7	75.4	86.9	92.2	52.4	72.1	83.5
Brazil[a]	70.1	80.8	87.6	86.0	91.9	93.4	53.8	71.2	83.6
Colombia	77.0	83.3	91.1	94.3	94.6	96.4	60.1	72.4	86.9
Costa Rica	70.5	78.5	88.2	90.7	91.7	93.7	49.9	65.7	83.3
Latvia	67.2	79.9	88.8	74.5	84.6	91.1	54.2	74.9	87.6
Lithuania	64.2	80.1	92.8	69.3	84.7	94.5	55.4	75.4	91.7
Russian Federation[a]	56.5	77.2	85.1	65.8	84.6	91.4	45.4	68.2	80.8

Note: In most countries data refer to ISCED 2011. The countries with data that refer to ISCED-97 are: Brazil and the Russian Federation. See the description of the levels of education in *www.oecd.org/els/emp/definitions-education.pdf*.

a) Year of reference 2013.

b) Data for total tertiary education include upper secondary and post-secondary non-tertiary programmes (less than 5% of the adults are under this group).

c) Data for upper secondary attainment include completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).

d) Unweighted average.

Source: OECD (2015), *Education at a Glance*, Indicator A5, *www.oecd.org/edu/educationataglance2015indicators.htm*.

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Table G. **Unemployment rates by educational attainment, 2014**

Persons aged 25-64, as a percentage of the labour force in each gender

	Total			Men			Women		
	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education	Below upper secondary education	Upper secondary or post-secondary non-tertiary education	Tertiary education
Australia	7.8	4.6	3.2	7.5	3.7	3.0	8.2	5.9	3.3
Austria	10.8	4.5	3.7	13.2	4.8	3.7	8.9	4.2	3.8
Belgium	14.3	7.3	4.2	14.6	7.4	4.3	13.8	7.2	4.1
Canada	10.6	6.5	4.8	10.5	6.7	4.9	10.7	6.2	4.6
Chile[a]	5.2	5.6	4.9	4.4	5.3	4.3	6.5	6.1	5.5
Czech Republic	20.7	5.4	2.6	21.1	4.2	2.2	20.3	7.1	3.1
Denmark	8.2	5.1	4.4	8.1	4.4	4.1	8.3	6.1	4.6
Estonia	11.9	7.8	4.7	12.3	7.3	4.4	11.1	8.5	4.8
Finland	12.5	8.1	5.1	12.1	8.2	5.7	13.2	7.9	4.5
France[a]	13.9	8.5	5.3	14.0	8.2	5.4	13.7	8.8	5.1
Germany	12.0	4.6	2.5	14.0	5.0	2.3	10.0	4.2	2.7
Greece	27.7	27.6	19.1	26.5	22.8	16.8	29.8	33.7	21.4
Hungary	16.7	6.5	2.7	16.3	6.2	2.4	17.1	6.9	2.9
Iceland	4.7	4.1	3.6	4.7	3.6	2.7	4.8	4.7	4.4
Ireland	18.7	11.9	6.1	20.3	13.1	6.5	14.8	10.4	5.6
Israel	7.5	6.2	3.9	8.0	6.0	3.6	6.3	6.4	4.1
Italy	15.2	9.1	7.6	14.2	7.9	6.1	17.1	10.6	8.8
Japan[b]	..	..	2.8	..	..	2.7	..	..	3.0
Korea	2.7	3.3	3.1	3.6	3.5	3.0	1.9	3.1	3.4
Luxembourg	7.7	5.1	3.6	7.3	5.2	3.5	8.2	5.0	3.8
Mexico	3.5	4.4	5.0	3.6	4.3	5.2	3.2	4.6	4.7
Netherlands	10.1	7.1	3.9	10.0	6.7	3.7	10.4	7.6	4.1
New Zealand	5.2	4.5	2.7	5.3	2.9	2.0	5.2	6.7	3.3
Norway	6.7	2.4	1.9	7.3	2.6	1.7	5.9	2.2	2.1
Poland	17.5	8.6	4.1	17.4	7.6	3.4	17.8	10.2	4.7
Portugal	14.8	12.6	8.9	14.9	10.9	7.3	14.6	14.3	9.9
Slovak Republic	39.2	11.3	5.8	43.4	10.4	4.7	34.7	12.4	6.9
Slovenia	15.4	9.7	6.1	15.7	8.8	4.3	15.1	11.1	7.4
Spain	31.4	21.6	13.8	30.1	19.4	12.3	33.3	24.1	15.2
Sweden	13.2	4.9	4.0	12.2	4.9	4.5	14.5	4.8	3.7
Switzerland	8.8	3.8	3.2	8.8	3.8	3.1	8.8	3.8	3.4
Turkey	8.5	9.1	8.2	8.4	7.0	5.9	8.7	16.7	12.0
United Kingdom[c]	7.7	3.9	2.5	8.0	3.9	2.5	7.4	4.0	2.6
United States	10.6	7.2	3.7	9.4	7.3	3.8	12.7	7.1	3.7
OECD[d]	12.8	7.7	5.1	12.9	7.1	4.6	12.6	8.6	5.5
Brazil[a]	4.5	5.6	2.9	3.2	3.9	2.1	6.7	7.4	3.4
Colombia	6.2	8.4	7.4	4.6	6.2	5.8	8.7	11.1	8.9
Costa Rica	7.1	6.6	4.1	5.6	5.3	3.1	9.9	8.4	5.1
Latvia	23.6	11.2	5.1	21.8	11.6	4.9	27.9	10.7	5.3
Lithuania	25.0	13.1	3.7	24.8	14.1	..	..	11.9	3.8
Russian Federation[a]	12.5	6.2	2.9	12.4	6.1	3.1	12.7	6.4	2.9

Note: In most countries data refer to ISCED 2011. The countries with data that refer to ISCED-97 are: Brazil and the Russian Federation. See the description of the levels of education in *www.oecd.org/els/emp/definitions-education.pdf*.

a) Year of reference 2013.

b) Data for total tertiary education include upper secondary and post-secondary non-tertiary programmes (less than 5% of the adults are under this group).

c) Data for upper secondary attainment include completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).

d) Unweighted average.

Source: OECD (2015), *Education at a Glance*, Indicator A5, *www.oecd.org/edu/educationataglance2015indicators.htm*.

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Table H. **Incidence and composition of part-time employment**[a]

Persons aged 15 and over, percentages

	Part-time employment as a proportion of total employment												Women's share in part-time employment			
	Total				Men				Women							
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia[b,c]	23.8	23.7	25.2	25.2	11.7	12.3	14.0	14.2	38.8	37.7	38.4	38.0	72.7	71.5	69.9	69.5
Austria	11.7	17.3	20.9	21.0	2.4	5.6	8.5	8.6	23.9	31.4	34.9	35.0	88.6	82.4	78.6	78.4
Belgium	19.3	18.1	18.1	18.2	6.9	6.4	7.2	7.3	35.5	32.2	30.5	30.2	79.5	80.7	79.1	78.9
Canada	18.1	18.3	19.3	18.9	10.4	11.1	12.3	12.1	27.2	26.3	27.0	26.4	69.1	68.0	66.6	66.4
Chile	4.7	8.0	17.0	16.8	3.1	5.2	11.5	11.5	8.7	13.9	25.0	24.5	53.9	56.9	60.2	59.4
Czech Republic	3.2	3.5	4.8	4.7	1.6	1.7	2.5	2.5	5.4	5.9	7.7	7.4	72.5	72.3	70.5	69.5
Denmark	15.3	17.3	19.7	20.0	9.1	11.9	14.6	15.0	22.4	23.4	25.4	25.8	68.1	63.3	61.0	60.3
Estonia	7.2	6.8	7.6	8.6	4.6	3.6	5.0	5.1	10.0	10.1	10.3	12.2	67.9	73.2	66.1	69.8
Finland	10.4	11.7	13.3	13.4	7.1	8.2	10.0	10.6	13.9	15.5	16.8	16.4	63.8	63.7	61.4	59.5
France	14.2	13.3	14.3	14.4	5.3	4.9	6.7	6.9	24.3	22.8	22.5	22.3	80.1	80.5	75.6	75.2
Germany	17.6	22.0	22.3	22.4	4.8	7.8	9.1	9.3	33.9	39.1	37.5	37.4	84.5	80.7	78.1	77.9
Greece	5.3	7.7	11.2	11.1	3.0	4.1	7.5	7.3	9.4	13.3	16.2	16.3	65.0	67.7	60.8	61.9
Hungary	3.2	3.1	4.5	4.4	1.7	1.8	3.2	3.0	4.7	4.5	6.0	6.0	71.2	68.6	62.8	63.6
Iceland[b,d]	20.4	15.9	16.7	17.2	8.8	8.0	10.8	11.3	33.7	25.4	23.2	23.7	77.0	72.7	66.2	65.6
Ireland	18.1	19.9	23.4	23.3	7.3	7.4	12.5	12.3	32.0	35.0	35.4	35.4	77.1	79.8	72.2	72.1
Israel	15.6	16.1	16.0	15.9	7.4	8.1	9.4	9.4	25.4	25.3	23.5	23.3	74.5	73.3	68.6	68.3
Italy[d]	11.7	15.3	18.8	18.7	5.4	5.5	8.6	8.5	22.5	29.8	32.9	32.8	70.9	78.2	73.4	73.5
Japan[e]	15.9	18.9	22.7	22.7	7.1	9.2	12.0	12.0	29.0	32.6	37.2	36.9	73.7	71.5	69.8	69.8
Korea[e]	7.0	8.9	10.5	10.6	5.1	6.3	6.8	6.9	9.8	12.5	15.6	15.9	57.7	58.9	62.2	62.6
Luxembourg	13.0	13.1	15.5	14.9	2.1	1.4	5.6	5.2	28.9	27.6	27.7	26.7	90.4	93.9	80.1	80.8
Mexico	13.5	17.7	18.7	18.2	7.1	11.3	13.0	12.5	25.6	28.2	27.9	27.5	65.1	60.0	56.8	57.3
Netherlands	32.1	35.9	38.3	38.5	13.1	16.1	19.4	19.5	57.3	59.9	60.6	60.7	76.7	75.5	72.6	72.7
New Zealand	22.2	21.9	21.5	21.3	10.9	11.0	11.4	11.2	35.7	34.5	32.7	32.7	73.2	73.2	72.0	72.3
Norway[d]	20.2	20.4	18.8	19.4	8.7	10.5	10.8	12.1	33.4	31.6	27.7	27.6	77.0	72.9	69.8	67.1
Poland	12.8	10.1	7.1	6.4	8.8	6.0	4.2	3.8	17.9	15.0	10.7	9.6	61.7	67.0	67.1	67.0
Portugal	9.3	10.0	11.0	10.5	4.9	6.3	9.1	8.5	14.7	14.4	12.9	12.6	70.9	66.7	57.9	59.3
Slovak Republic	1.9	2.4	4.9	5.7	1.0	1.1	3.7	4.1	2.9	4.0	6.4	7.8	70.6	74.0	58.2	59.9
Slovenia	4.9	7.8	9.6	9.2	3.9	6.3	7.1	6.7	6.1	9.7	12.5	12.1	56.8	56.2	59.5	59.8
Spain[d]	7.5	10.5	14.7	14.5	2.6	3.6	7.1	7.2	16.1	20.1	23.6	23.1	78.3	80.0	74.0	73.3
Sweden[d]	14.0	14.4	14.2	14.1	7.3	9.5	10.5	10.6	21.4	19.7	18.3	18.0	72.9	65.0	61.1	60.7
Switzerland	24.4	25.4	26.9	26.8	8.4	8.7	10.8	10.9	44.7	45.6	45.6	45.0	80.6	81.3	78.5	78.3
Turkey	9.4	8.1	10.6	9.9	5.7	4.4	6.4	5.9	19.3	18.6	20.6	19.0	55.4	59.6	57.7	58.2
United Kingdom[d]	23.3	22.9	24.1	24.0	8.5	9.7	11.7	11.9	40.7	38.2	38.1	37.7	80.2	77.2	74.2	73.7
United States[c,f]	12.6	12.6	13.0	12.7	7.7	7.6	8.5	8.4	18.0	17.9	17.9	17.4	68.1	68.4	66.3	65.9
OECD[g]	13.9	15.4	17.0	16.8	6.7	7.8	9.6	9.5	23.8	25.3	26.3	25.9	72.4	71.5	68.8	68.7
Brazil[c]	16.8	18.3	17.1	..	8.8	10.3	10.6	..	28.4	29.1	25.6	..	69.1	67.6	64.8	..
Colombia[c]	17.9	14.5	16.5	..	11.4	9.2	9.2	..	28.2	22.8	26.6	..	61.1	61.3	67.5	..
Costa Rica	..	..	19.0	18.2	..	..	11.8	11.1	..	..	30.6	29.8	..	..	61.4	62.2
Latvia	8.8	5.4	6.6	6.8	6.3	3.4	4.1	4.2	11.4	7.4	9.0	9.4	64.6	67.5	69.2	69.7
Lithuania	11.8	7.0	8.7	7.9	8.8	4.3	6.0	5.0	14.5	9.5	11.0	10.5	64.5	69.9	67.4	70.0
Russian Fed.	7.4	5.1	4.0	4.2	4.9	3.5	2.7	2.9	10.0	6.6	5.3	5.6	66.0	64.8	65.1	64.9
South Africa	..	..	8.0	8.8	..	..	5.0	5.5	..	..	11.9	13.0	..	..	64.8	64.6

a) Part-time employment refers to persons who usually work less than 30 hours per week in their main job.
b) Part-time employment based on hours worked at all jobs.
c) Data for 2000 refer to 2001.
d) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
e) Data are based on actual hours worked.
f) Data are for wage and salary workers only.
g) Weighted average.

Source and definition: OECD Employment Database, www.oecd.org/employment/database. See van Bastelaer, A., G. Lemaître and P. Marianna (1997), "The Definition of Part-Time Work for the Purpose of International Comparisons", *Labour Market and Social Policy Occasional Paper*, No. 22, OECD Publishing, Paris, *http://dx.doi.org/10.1787/132721856632*.

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Table I. **Incidence and composition of involuntary part-time employment**[a, b]

Persons aged 15 and over, percentages

	Involuntary part-time employment as a proportion of total employment												Involuntary part-time employment as a proportion of part-time employment			
	Total				Men				Women							
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	6.3	6.6	8.6	8.9	4.3	4.5	6.2	6.4	8.8	9.3	11.6	11.8	23.8	23.5	28.2	28.8
Austria	1.8	2.7	3.1	3.3	0.9	1.0	1.6	1.8	3.0	4.6	4.7	5.1	11.1	11.8	11.0	11.9
Belgium	4.6	3.2	2.4	2.4	1.7	1.5	1.3	1.4	8.4	5.5	3.7	3.6	22.1	14.6	9.9	9.8
Canada	4.6	4.0	5.3	4.9	2.8	2.6	3.6	3.4	6.6	5.6	7.1	6.7	25.4	22.0	27.3	26.2
Chile	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	1.4	0.8	1.3	1.1	0.3	0.3	0.6	0.6	2.9	1.4	2.1	1.7	27.1	16.4	20.0	17.2
Denmark	2.9	3.1	4.1	3.8	1.1	1.3	2.1	2.1	5.1	5.0	6.4	5.8	13.8	13.0	16.2	15.1
Estonia	..	1.2	1.4	1.3	..	0.7	0.7	0.9	..	..	2.0	1.8	..	15.3	14.4	12.1
Finland	3.5	2.9	3.7	4.0	1.5	1.3	2.0	2.5	5.7	4.6	5.5	5.6	28.7	20.7	23.9	25.8
France	4.6	5.2	7.2	7.5	2.3	1.8	3.2	3.4	7.3	9.0	11.5	11.9	27.0	29.9	37.9	40.0
Germany	2.3	5.3	3.7	3.6	0.8	2.7	1.9	1.9	4.2	8.4	5.7	5.5	12.0	20.3	13.3	12.8
Greece	1.9	2.4	6.3	6.5	1.2	1.2	4.7	5.1	3.2	4.3	8.6	8.5	42.9	42.7	66.5	68.9
Hungary	0.7	1.1	2.5	2.1	0.4	0.7	1.9	1.7	1.2	1.6	3.2	2.5	19.0	26.3	38.6	34.7
Iceland[c]	2.2	1.1	4.5	3.6	0.8	0.0	1.9	1.2	3.8	2.5	7.3	6.2	8.5	5.0	19.5	15.3
Ireland	2.7	1.8	8.8	7.8	2.2	1.3	7.0	6.2	3.4	2.6	10.9	9.7	16.4	10.3	37.4	34.3
Israel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy[c]	3.2	5.2	11.7	11.8	1.8	2.4	6.2	6.4	5.4	9.5	19.3	19.4	37.1	38.3	63.6	63.9
Japan	..	4.5	4.8	4.7	..	2.6	2.7	2.7	..	7.1	7.6	7.2	..	23.6	21.1	20.6
Korea	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Luxembourg	0.8	0.8	2.4	2.5	0.2	0.4	0.6	0.8	1.7	1.3	4.7	4.7	6.8	4.4	12.8	13.5
Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Netherlands	1.4	2.1	4.7	4.2	0.9	1.1	3.1	3.0	2.2	3.3	6.5	5.7	4.7	6.1	13.0	11.7
New Zealand	6.0	3.9	4.9	4.6	3.5	2.5	2.9	2.7	9.0	5.4	7.2	6.7	26.0	16.6	21.6	20.3
Norway[c]	1.6	1.5	1.4	1.5	0.8	0.7	0.8	0.9	2.6	2.3	2.2	2.2	6.4	5.6	5.8	5.9
Poland	..	2.0	2.3	2.0	..	1.3	1.4	1.3	..	2.8	3.3	3.0	..	21.3	29.0	27.5
Portugal	2.5	3.3	4.8	4.8	1.0	1.5	3.1	2.9	4.3	5.4	6.6	6.7	22.4	26.8	36.9	38.5
Slovak Republic	0.7	0.9	3.3	4.0	0.2	0.3	2.8	3.0	1.3	1.6	3.9	5.1	33.5	33.8	63.4	65.4
Slovenia	..	0.4	0.9	1.2	..	0.3	0.6	0.7	..	0.6	1.4	1.9	..	4.6	8.5	11.5
Spain[c]	1.8	3.9	10.3	10.0	0.6	1.4	5.6	5.5	3.8	7.4	15.9	15.3	22.1	33.6	64.6	63.4
Sweden[c]	3.4	7.7	8.0	7.0	1.7	4.3	5.6	5.1	5.3	11.5	10.6	9.1	16.0	32.4	34.9	30.8
Switzerland	1.3	1.8	2.6	2.8	0.8	0.8	1.4	1.6	1.9	3.1	4.1	4.2	4.4	5.7	7.3	7.7
Turkey	..	0.6	0.9	0.9	..	0.5	0.9	0.9	..	0.7	1.0	1.0	..	7.3	8.7	9.5
United Kingdom[c]	2.4	2.3	4.5	4.3	1.8	1.8	3.7	3.5	3.2	3.0	5.5	5.2	9.7	9.3	16.9	15.9
United States[c]	0.7	0.8	1.7	1.5	0.5	0.6	1.4	1.2	0.9	1.0	2.2	1.9	4.1	4.8	9.3	8.3
OECD[d]	1.8	2.6	3.7	3.5	1.0	1.4	2.2	2.2	2.9	4.1	5.5	5.2	10.8	14.1	17.8	17.4
Colombia	..	..	..	6.9	..	..	..	4.6	..	..	..	10.1	..	..	..	41.8
Latvia	..	1.4	2.6	2.4	..	1.0	1.9	1.5	..	1.8	3.2	3.3	..	22.2	34.9	30.3
Lithuania	..	2.4	2.7	2.5	..	2.0	2.1	1.5	..	2.9	3.3	3.4	..	26.6	29.8	29.6
Russian Fed.	0.3	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.4	0.2	0.4	0.3	3.0	1.9	3.5	3.3

a) Involuntary part-time employment refers to part-time workers who could not find full-time work.
b) Part-time employment is based on national definitions.
c) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
d) Weighted average.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

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Table J. **Incidence and composition of temporary employment**[a]

As a percentage of dependent employment in each age group

	Total (15+)				Youth (15-24)				Prime age (25-54)				Women's share in temporary employment			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia[b]	4.8	6.3	5.6	..	4.6	6.0	5.5	..	5.0	6.4	5.6	..	54.4	52.3	52.7	..
Austria	7.9	8.8	9.1	9.1	33.0	34.8	35.1	35.8	3.8	4.3	5.3	5.2	47.1	47.5	48.5	48.4
Belgium	9.1	8.7	8.7	9.0	30.8	31.6	34.2	36.6	6.9	6.6	7.1	7.3	58.3	57.3	54.3	52.3
Canada	12.5	13.0	13.4	13.4	29.1	28.9	30.8	31.3	8.8	9.2	9.8	9.8	51.0	51.8	51.5	50.9
Chile	..	..	29.2	29.1	..	..	46.5	45.0	..	..	27.5	27.7	..	..	36.4	36.8
Czech Republic	9.3	8.6	10.2	10.5	19.6	17.4	32.4	31.0	5.2	5.6	8.1	8.7	46.6	54.3	53.3	54.6
Denmark	9.7	9.1	8.5	8.6	27.4	22.5	21.4	22.7	6.6	6.9	6.8	6.7	54.8	55.7	51.3	52.8
Estonia	3.0	2.1	3.2	3.5	6.4	6.6	11.2	11.4	2.6	1.6	2.6	2.9	27.4	37.6	48.2	45.1
Finland	16.5	16.0	15.6	15.4	45.6	42.4	42.7	41.9	13.0	13.2	12.9	12.9	60.3	61.8	61.0	60.5
France	15.4	15.1	16.0	16.7	55.1	53.6	57.3	59.6	11.6	11.1	12.6	13.3	49.6	52.5	52.9	52.6
Germany	12.7	14.6	13.0	13.1	52.4	57.4	53.4	53.6	7.5	9.1	9.3	9.6	46.2	46.7	48.4	48.4
Greece	13.5	11.0	11.7	12.0	29.5	26.5	29.4	33.3	11.6	10.0	11.1	11.1	46.5	50.9	48.3	48.4
Hungary	7.1	7.3	10.8	11.4	13.9	18.9	25.1	24.1	5.9	6.5	9.8	10.3	43.8	44.0	45.3	46.3
Iceland[c]	12.2	12.4	13.4	12.8	28.9	32.0	31.3	33.3	7.5	8.9	10.6	9.5	53.3	53.8	49.5	54.4
Ireland	6.0	8.5	9.3	8.7	15.9	21.2	33.9	32.7	3.0	5.6	6.9	6.5	55.1	56.6	51.5	50.7
Israel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Italy[c]	10.1	13.2	13.6	14.0	26.6	42.2	56.0	57.1	8.5	11.4	12.7	13.2	48.1	51.7	47.3	46.7
Japan[d]	14.5	13.9	7.6	7.5	24.9	26.4	14.4	14.1	9.5	10.9	5.4	5.3	61.7	65.1	60.5	60.5
Korea	..	24.7	21.7	22.3	..	30.0	25.7	27.0	..	21.3	16.4	16.7	..	44.4	47.8	48.2
Luxembourg	3.4	6.8	8.2	10.2	14.5	34.1	45.4	47.1	2.3	5.3	6.2	7.7	54.0	49.9	51.1	45.4
Mexico	20.5	..	..	20.3	25.7	..	..	26.4	17.8	..	..	17.9	19.7	..	..	20.6
Netherlands	13.7	18.1	21.5	20.2	35.5	45.1	55.5	53.4	9.1	12.9	16.1	14.9	53.7	51.1	49.5	50.6
New Zealand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway[c]	9.3	9.5	7.8	8.0	28.5	27.3	23.2	24.1	6.9	7.4	6.1	6.3	58.8	59.8	60.0	57.5
Poland	..	28.2	28.4	28.0	..	65.7	71.2	72.7	..	24.0	25.7	25.6	..	45.9	46.3	46.9
Portugal	19.9	22.3	21.5	22.0	41.4	53.1	63.0	67.5	16.4	19.7	19.7	20.1	50.0	49.1	50.8	50.3
Slovak Republic	4.8	5.1	8.9	10.6	10.5	13.7	28.2	29.1	3.4	3.7	7.4	9.4	44.6	48.3	45.9	50.1
Slovenia	13.7	18.5	16.7	18.0	46.3	68.3	72.7	75.5	9.4	12.9	13.5	14.4	51.3	52.4	48.4	49.4
Spain[c]	32.2	31.6	24.0	25.1	68.3	62.7	69.1	70.4	27.7	29.3	23.6	24.8	40.7	45.4	49.2	48.0
Sweden[c]	15.2	17.5	17.5	17.2	49.5	57.3	56.4	55.9	11.9	13.0	12.6	12.3	57.6	56.9	55.3	54.6
Switzerland	11.5	12.9	13.1	13.6	47.0	50.3	52.6	52.3	5.1	6.4	6.9	7.9	50.1	47.1	48.0	47.3
Turkey	20.3	11.9	13.0	13.2	23.7	12.4	21.7	23.4	18.6	11.3	10.7	10.6	12.1	21.6	23.4	23.7
United Kingdom[c]	7.0	5.8	6.4	6.2	14.2	13.4	15.2	15.0	5.4	4.2	4.7	4.6	54.4	53.9	52.7	52.7
United States[b]	4.0	..	..	4.2	8.1	..	..	8.1	3.2	..	..	3.5	49.8	..	..	48.2
OECD[e]	11.4	12.2	11.0	11.4	21.9	25.6	23.6	25.0	8.9	10.0	9.2	9.5	45.7	47.5	46.2	46.0
Colombia[b,f]	18.3	29.1	23.7	33.1	..	..	..	..	..	..	..	..	29.0	26.0	36.7	24.6
Costa Rica	..	..	8.4	8.8	..	..	15.0	14.2	..	..	6.4	7.4	..	..	24.6	26.2
Latvia	6.6	4.1	3.3	3.8	10.9	9.0	8.4	10.9	6.0	3.5	2.7	2.9	33.6	33.8	38.0	41.5
Lithuania	4.4	3.8	2.8	2.1	9.4	10.5	8.5	6.5	4.1	3.1	2.2	1.6	38.1	33.1	37.9	45.0
Russian Fed.	5.5	12.3	8.9	9.0	14.5	23.1	17.4	18.4	4.2	11.2	8.3	8.4	36.5	41.9	37.0	37.0

a) Temporary employees are wage and salary workers whose job has a pre-determined termination date as opposed to permanent employees whose job is of unlimited duration. To be included in these groups are: *i)* persons with a seasonal job; *ii)* persons engaged by an employment agency or business and hired out to a third party for carrying out a "work mission"; and *iii)* persons with specific training contracts (including apprentices, trainees, research assistants, probationary period of a contract, etc.). National definitions broadly conform to this generic definition, but may vary depending on national circumstances. Country-specific details can be found in the PDF reported below.

b) Data for 2000 refer to 2001.

c) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.

d) Japan applies a maximum duration threshold of one year to classify jobs as temporary employment. As a result, a regular employee with a fixed-term contract lasting more than one year is not included in temporary employment.

e) Weighted average.

f) The data cover only salaried employees who reported a written labour contract.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

StatLink http://dx.doi.org/10.1787/888933385136

Table K. **Incidence of job tenure, less than 12 months**

As a percentage of total employment in each age group

	Total (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia[a]	22.8	23.6	19.4	..	47.7	47.7	41.5	..	18..6	20.1	16.8	..	8.8	10.2	8.3	..
Austria	..	15.5	14.6	15.2	..	39.7	38.6	39.3	..	12.3	12.1	12.8	..	5.0	5.1	5.4
Belgium	13.2	13.0	11.4	11.2	50.8	48.8	46.6	47.0	10.1	10.7	9.8	9.7	2.4	2.7	2.6	2.0
Canada	21.4	21.0	18.7	19.5	54.0	53.2	48.9	49.8	16.2	16.1	15.1	15.4	8.0	8.3	7.5	7.5
Chile	..	..	29.3	28.6	..	..	62.5	60.3	..	..	27.2	26.7	..	..	15.6	16.0
Czech Republic	..	10.7	10.0	10.3	..	35.0	37.7	37.8	..	8.8	8.9	9.4	..	7.6	4.8	4.4
Denmark	22.5	26.0	21.9	21.4	53.5	56.4	50.5	50.2	18.9	23.3	19.1	18.3	6.5	10.2	8.3	8.4
Estonia	..	15.1	15.7	15.5	..	42.5	48.8	49.2	..	12.7	14.2	13.9	..	7.9	7.2	7.0
Finland	20.6	20.3	17.8	17.6	65.2	62.6	58.5	58.0	16.1	16.8	14.7	14.6	5.8	6.3	5.8	6.1
France	15.8	15.4	12.5	12.9	56.7	55.0	50.5	52.2	12.6	12.3	10.3	10.7	3.6	4.6	4.3	4.1
Germany	14.9	14.9	13.4	13.6	38.8	40.9	39.0	39.4	13.0	12.7	12.1	12.4	4.7	4.9	4.7	4.8
Greece	9.5	8.4	10.1	10.2	31.0	28.8	38.2	39.0	7.7	7.5	9.7	9.6	2.8	3.1	3.9	5.0
Hungary	11.7	11.7	14.8	14.2	29.7	39.1	46.1	43.3	9.3	10.3	13.3	12.6	4.5	5.3	9.0	9.2
Iceland[b]	25.4	22.5	19.1	19.5	59.1	53.1	46.4	46.0	20.0	18.3	15.4	16.4	6.1	7.2	7.2	6.2
Ireland	19.4	18.0	14.4	15.0	46.8	45.0	47.0	50.6	13.6	14.1	12.8	13.3	5.7	4.6	4.4	4.6
Israel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Italy[b]	10.6	11.6	9.5	10.2	36.8	41.1	39.7	43.0	8.9	10.3	9.1	9.8	3.3	3.7	3.4	3.8
Japan	..	12.5	..	..	..	41.2	..	..	..	10.3	..	..	..	6.3	..	..
Korea[c]	..	38.1	30.8	30.9	..	70.7	70.8	69.3	..	33.8	25.7	25.8	..	44.7	35.1	34.7
Luxembourg	11.6	10.6	13.0	14.2	40.4	44.0	55.1	50.9	9.6	9.0	11.7	12.1	0.5	1.9	3.9	4.3
Mexico	..	24.1	21.4	21.7	..	45.7	43.0	43.8	..	19.3	17.6	18.1	..	10.4	8.3	8.8
Netherlands	..	9.8	14.4	15.7	..	34.3	41.9	44.8	..	8.2	10.8	11.9	..	2.5	3.8	4.3
New Zealand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway[b]	16.9	..	14.9	14.7	46.1	..	42.3	39.8	13.9	..	12.7	12.7	3.3	..	3.0	3.5
Poland	13.7	15.7	12.1	11.5	41.2	47.3	42.8	41.3	11.0	12.8	10.6	10.1	6.0	6.9	5.2	5.0
Portugal	14.1	13.1	13.7	14.7	39.2	40.0	51.9	53.6	11.4	11.7	12.5	13.6	3.2	3.6	4.9	5.3
Slovak Republic	..	11.8	9.9	11.9	..	35.7	35.6	39.0	..	9.5	8.7	10.9	..	6.3	4.6	5.5
Slovenia	..	13.9	9.3	12.9	..	51.1	39.0	50.2	..	10.5	8.1	11.0	..	2.8	3.2	5.0
Spain[b]	21.2	21.9	15.9	16.8	54.5	55.5	56.4	60.8	17.8	19.8	15.5	16.4	6.5	6.1	5.2	5.7
Sweden[b]	15.8	20.4	19.5	20.0	49.4	65.4	60.2	61.0	14.0	17.0	16.3	16.7	4.6	6.5	6.9	7.3
Switzerland	16.5	15.3	16.1	16.9	44.6	41.4	41.0	42.4	13.4	12.7	14.2	15.1	3.9	4.2	4.6	5.4
Turkey	..	19.6	27.5	27.7	..	41.6	56.5	56.9	..	15.7	23.0	23.2	..	6.4	13.0	13.6
United Kingdom[b]	19.8	17.9	16.2	17.0	48.5	46.0	43.1	45.4	16.1	14.5	13.3	14.1	8.1	7.2	7.2	7.1
United States[b,c,d]	27.1	23.4	20.2	..	61.8	56.6	54.6	..	21.7	19.3	16.3	..	11.2	9.4	9.4	..
OECD[e]	20.4	19.4	17.5	17.6	49.5	49.5	48.5	49.1	16.5	16.1	14.7	14.7	8.6	8.3	8.0	8.1
Brazil[a]	20.6	18.8	18.0	..	36.6	37.6	39.9	..	16.4	14.7	14.5	..	8.3	6.5	6.1	..
Colombia	..	50.2	47.0	46.9	..	65.0	63.7	64.3	..	32.6	33.1	33.7	..	19.6	19.9	19.2
Costa Rica	..	..	27.9	28.3	..	..	53.3	52.8	..	..	24.7	25.5	..	..	16.6	16.4
Latvia	..	19.3	15.1	14.9	..	50.1	41.7	46.0	..	15.7	13.3	13.3	..	10.2	10.3	7.6
Lithuania	14.2	15.0	14.9	15.8	37.1	45.3	45.0	48.7	12.7	13.1	13.1	13.9	5.7	6.7	8.1	8.6

Table K. **Incidence of job tenure, less than 12 months** *(cont.)*

As a percentage of male employment in each age group

	Men (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia[a]	21.7	22.2	18.9	..	46.4	45.6	40.3	..	18.1	19.0	16.5	..	8.8	9.9	9.4	..
Austria	..	14.7	14.1	14.7	..	39.8	37.2	37.5	..	11.6	11.8	12.6	..	5.0	5.1	5.4
Belgium	12.8	12.5	11.2	11.3	49.3	46.2	44.0	45.2	9.9	10.4	9.8	10.0	2.5	2.8	2.8	2.1
Canada	20.6	20.8	19.1	19.5	53.9	52.8	49.3	49.6	15.6	16.2	15.7	15.8	8.3	8.7	8.2	8.1
Chile	..	..	30.0	29.2	..	..	62.8	60.0	..	..	28.0	27.2	..	..	15.7	16.3
Czech Republic	..	9.5	8.5	8.7	..	34.3	34.1	34.7	..	7.5	7.2	7.5	..	6.0	4.4	4.0
Denmark	20.7	24.1	21.1	20.9	49.5	51.6	50.7	50.6	17.5	21.7	18.3	17.6	6.1	9.8	8.5	9.0
Estonia	..	14.6	15.2	14.4	..	39.2	49.5	44.6	..	11.9	12.9	12.3	..	7.7	9.2	8.1
Finland	19.5	18.9	16.5	16.3	62.5	60.2	56.8	56.2	15.3	15.2	13.4	13.5	5.8	6.9	5.7	5.6
France	15.7	15.2	12.2	12.7	56.7	53.3	47.3	49.4	12.4	12.1	10.0	10.5	4.1	4.5	4.1	4.2
Germany	13.8	14.4	12.7	12.9	37.9	39.7	37.5	37.3	12.0	12.4	11.4	11.7	4.1	4.9	4.6	4.7
Greece	8.6	7.6	9.3	9.5	29.0	26.5	33.8	35.3	7.1	6.8	8.9	9.1	2.5	3.2	4.2	4.8
Hungary	11.8	11.9	14.5	13.7	29.1	38.2	45.6	43.9	9.6	10.4	12.8	11.9	4.5	6.2	9.3	9.1
Iceland[b]	23.9	21.1	18.5	18.6	58.0	52.1	48.3	46.9	19.4	17.1	14.7	15.3	2.8	6.4	6.3	5.9
Ireland	17.1	16.3	14.2	14.9	44.0	40.8	45.1	49.5	12.2	13.2	12.9	13.5	4.9	4.2	4.8	5.0
Israel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Italy[b]	9.6	10.4	8.7	9.6	36.2	38.7	37.1	40.8	8.0	9.0	8.3	9.0	3.2	3.5	3.4	3.9
Japan	..	9.7	..	..	..	39.6	..	..	..	7.1	..	..	..	6.3	..	..
Korea[c]	..	34.0	27.8	28.0	..	81.1	79.3	77.3	..	30.0	23.1	23.2	..	40.2	32.4	32.8
Luxembourg	10.3	10.0	11.9	14.1	41.2	43.8	53.2	51.1	8.3	8.2	10.5	12.1	0.8	1.3	4.2	4.8
Mexico	..	22.5	20.1	20.5	..	43.1	39.9	41.1	..	17.9	16.3	16.8	..	9.9	8.0	8.0
Netherlands	..	9.3	14.2	15.0	..	31.5	40.5	43.4	..	8.1	11.2	11.7	..	2.6	4.3	4.8
New Zealand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway[b]	15.9	..	14.3	14.3	43.0	..	40.5	39.6	13.3	..	12.3	12.3	3.2	..	3.6	4.2
Poland	14.6	15.8	12.0	11.2	40.3	45.5	40.4	37.9	12.2	13.1	10.3	9.7	6.2	7.6	6.0	5.6
Portugal	14.0	13.0	13.6	14.8	38.6	38.4	48.2	49.3	11.1	11.5	12.7	14.0	3.7	3.5	5.1	5.6
Slovak Republic	..	11.6	9.7	11.4	..	34.8	35.1	38.6	..	9.5	8.4	10.0	..	5.3	4.4	5.6
Slovenia	..	13.5	9.2	12.4	..	49.4	36.5	47.9	..	9.9	8.1	10.6	..	3.1	3.6	5.1
Spain[b]	19.4	20.4	15.8	16.8	52.8	53.2	53.9	59.1	16.3	18.6	15.7	16.6	6.2	5.7	5.4	5.8
Sweden[b]	16.0	20.3	18.4	19.0	46.2	62.7	56.9	58.6	14.7	17.3	15.4	16.0	4.7	7.3	7.4	7.4
Switzerland	15.2	13.8	14.5	15.4	41.8	39.2	37.1	39.3	12.6	11.3	12.9	13.8	4.2	3.6	4.1	5.2
Turkey	..	19.7	27.5	27.8	..	43.3	58.6	59.4	..	15.9	23.0	23.2	..	7.2	13.3	13.9
United Kingdom[b]	18.7	17.3	15.8	16.2	47.1	44.4	42.9	43.8	15.1	14.1	13.0	13.4	8.6	7.8	7.4	7.3
United States[b,c,d]	25.9	22.8	21.6	..	59.4	55.6	53.8	..	20.6	19.0	18.0	..	11.3	8.5	10.0	..
OECD[e]	18.8	18.3	17.3	17.5	47.4	47.9	47.2	47.8	15.0	15.2	14.5	14.8	8.3	8.1	8.2	8.4
Brazil[a]	19.9	18.0	17.5	..	34.1	35.3	38.3	..	16.1	14.1	14.0	..	9.0	6.4	6.2	..
Colombia	..	47.8	44.4	44.7	..	62.1	60.3	61.3	..	30.7	30.2	30.8	..	19.4	18.5	17.7
Costa Rica	..	..	27.5	28.3	..	..	54.0	53.9	..	..	23.5	25.2	..	..	17.2	15.3
Latvia	..	20.8	15.9	16.1	..	47.7	42.5	45.7	..	16.9	13.3	14.2	..	12.3	12.5	8.6
Lithuania	16.4	16.7	17.6	17.7	36.4	45.7	44.8	47.0	14.9	14.4	15.5	15.6	7.8	8.5	10.4	10.9

Table K. **Incidence of job tenure, less than 12 months** *(cont.)*

As a percentage of female employment in each age group

	Women (15-64)				Youth (15-24)				Prime age (25-54)				Older population (55-64)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia[a]	24.1	25.4	20.0	..	49.1	50.1	42.8	..	19.2	21.4	17.2	..	8.9	10.6	7.1	..
Austria	..	16.3	15.2	15.7	..	39.6	40.0	41.2	..	13.1	12.5	13.1	..	5.1	5.0	5.5
Belgium	13.8	13.6	11.6	11.1	52.7	52.0	49.5	49.0	10.4	10.9	9.8	9.5	2.2	2.7	2.3	1.9
Canada	22.3	21.2	18.3	19.4	54.2	53.6	48.6	49.9	16.9	16.1	14.4	15.0	7.7	7.8	6.8	6.8
Chile	..	..	28.2	27.8	..	..	62.0	60.7	..	..	26.0	25.9	..	..	15.5	15.6
Czech Republic	..	12.3	12.1	12.4	..	36.1	43.4	42.2	..	10.5	11.2	11.7	..	10.1	5.4	5.0
Denmark	24.6	28.2	22.8	22.1	58.1	61.7	50.3	49.9	20.4	24.9	20.1	19.1	7.2	10.7	8.1	7.7
Estonia	..	15.7	16.3	16.7	..	46.9	48.1	54.8	..	13.5	15.7	15.8	..	8.1	5.5	6.2
Finland	21.7	21.9	19.2	19.0	67.9	64.9	60.0	59.5	17.0	18.5	16.1	15.8	5.8	5.8	5.9	6.5
France	15.9	15.6	12.8	13.1	56.7	57.2	54.3	55.6	12.8	12.6	10.6	10.9	2.9	4.6	4.4	4.0
Germany	16.4	15.5	14.1	14.3	39.8	42.2	40.7	41.7	14.2	13.0	12.9	13.1	5.8	4.9	4.8	4.8
Greece	11.0	9.6	11.2	11.1	34.0	32.6	44.3	44.0	8.9	8.5	10.7	10.4	3.2	3.1	3.3	5.2
Hungary	11.5	11.5	15.0	14.7	30.4	40.3	46.9	42.6	9.0	10.2	13.8	13.5	4.5	4.2	8.6	9.2
Iceland[b]	27.1	24.2	19.8	20.5	60.1	54.2	44.6	45.1	20.7	19.7	16.0	17.5	10.1	8.2	8.2	6.5
Ireland	22.6	20.3	14.7	15.1	50.2	49.8	49.0	51.7	15.7	15.1	12.7	13.2	7.7	5.4	4.0	4.2
Israel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Italy[b]	12.4	13.5	10.6	11.0	37.7	44.7	43.7	46.4	10.4	12.2	10.3	10.8	3.3	4.0	3.3	3.6
Japan	..	16.2	..	..	..	42.9	..	..	..	14.5	..	..	..	6.4	..	..
Korea[c]	..	43.8	34.7	34.6	..	64.6	64.8	63.8	..	39.4	29.3	29.4	..	52.1	38.7	37.3
Luxembourg	13.6	11.4	14.4	14.3	39.4	44.4	57.4	50.8	11.5	10.1	13.1	12.0	-	2.6	3.3	3.6
Mexico	..	26.8	23.5	23.7	..	50.3	48.8	49.2	..	21.6	19.6	20.0	..	11.4	8.9	10.2
Netherlands	..	10.5	14.6	16.5	..	37.7	43.4	46.2	..	8.3	10.3	12.2	..	2.3	3.2	3.7
New Zealand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway[b]	18.0	..	15.6	15.1	49.4	..	44.0	40.0	14.6	..	13.1	13.2	3.4	..	2.4	2.8
Poland	12.7	15.5	12.2	11.9	42.4	49.9	46.5	46.5	9.7	12.5	10.9	10.6	5.8	5.6	4.0	4.2
Portugal	14.2	13.3	13.8	14.5	39.9	42.1	55.8	58.6	11.8	11.8	12.4	13.2	2.5	3.7	4.7	4.9
Slovak Republic	..	12.1	10.1	12.6	..	37.0	36.4	39.7	..	9.5	9.2	12.0	..	8.6	4.9	5.5
Slovenia	..	14.3	9.5	13.5	..	53.5	42.3	52.9	..	11.1	8.1	11.5	..	2.3	2.6	5.0
Spain[b]	24.3	23.9	15.9	16.8	57.0	58.5	59.1	62.7	20.4	21.5	15.3	16.1	7.3	6.8	5.0	5.5
Sweden[b]	15.7	20.5	20.7	21.1	52.7	68.3	63.5	63.5	13.3	16.6	17.2	17.6	4.4	5.6	6.5	7.2
Switzerland	18.2	17.1	18.0	18.7	47.6	43.8	45.2	45.5	14.5	14.3	15.7	16.5	3.5	5.0	5.2	5.7
Turkey	..	19.5	27.3	27.3	..	38.2	52.2	51.9	..	15.1	23.0	23.1	..	4.3	12.5	12.8
United Kingdom[b]	21.1	18.6	16.6	18.0	49.9	47.6	43.3	47.0	17.3	15.0	13.7	15.0	7.3	6.3	6.9	6.9
United States[b,c,d]	28.4	24.0	18.9	..	64.2	57.7	55.5	..	22.9	19.7	14.8	..	11.2	10.3	8.8	..
OECD[e]	22.7	20.8	17.8	17.6	52.1	51.6	50.0	50.6	18.5	17.3	14.9	14.6	9.1	8.6	7.7	7.8
Brazil[a]	21.5	19.7	18.6	..	40.4	41.0	42.4	..	16.8	15.5	15.2	..	7.3	6.7	6.0	..
Colombia	..	54.6	51.0	50.2	..	69.7	69.0	69.1	..	35.4	37.0	37.3	..	19.9	22.0	21.5
Costa Rica	..	..	28.5	28.4	..	..	51.9	50.9	..	..	26.5	25.9	..	..	15.5	18.3
Latvia	..	17.7	14.2	13.7	..	53.4	40.7	46.4	..	14.4	13.3	12.4	..	8.3	8.5	6.8
Lithuania	12.0	13.1	12.4	13.9	38.0	44.7	45.3	50.9	10.6	11.8	10.8	12.3	3.3	4.9	6.2	6.6

a) Data for 2000 refer to 2001.
b) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.
c) Data cover dependent employment.
d) Data for 2007 refer to 2008.
e) Weighted average.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

StatLink http://dx.doi.org/10.1787/888933385147

Table L. **Average annual hours actually worked per person in employment**[a]

	Total employment								Dependent employment							
	1979	1983	1990	1995	2000	2007	2014	2015	1979	1983	1990	1995	2000	2007	2014	2015
Australia	1 834	1 791	1 780	1 793	1 779	1 713	1 664	1 665	..	..	..	..	..	..	..	..
Austria	..	..	..	1 783	1 807	1 736	1 629	1 625	..	..	..	1 455	1 509	1 526	1 440	1 429
Belgium	1 727	1 675	1 663	1 585	1 595	1 577	1 560	1 541 [b]	..	..	..	1 447	1 459	1 448	1 429	1 427
Canada	1 841	1 779	1 797	1 775	1 779	1 741	1 703	1 706	1 812	1 761	1 782	1 768	1 772	1 740	1 712	1 713
Chile	..	..	..	..	2 263	2 128	1 990	1 988	..	..	..	..	2 318	2 168	2 065	2 059
Czech Republic	..	..	..	1 858	1 896	1 784	1 771	1 779 [b]	..	..	..	1 987	2 018	1 914	1 826	1 811
Denmark	1 575	1 558	1 457	1 440	1 490	1 456	1 458	1 457	1 470	1 469	1 381	1 366	1 407	1 390	1 411 [b]	1 407 [b]
Estonia	..	..	..	..	1 978	1 998	1 859	1 852	..	..	..	..	..	2 055	2 008	1 995
Finland	1 869	1 823	1 769	1 776	1 742	1 691	1 643	1 646	..	..	1 666	1 672	1 638	1 594	1 572	1 574
France	1 832	1 712	1 665	1 605	1 535	1 500	1 473	1 482 [b]	1 666	1 555	1 536	1 489	1 428	1 407	1 387	1 399 [b]
Germany	..	..	..	1 528	1 452	1 424	1 366	1 371	..	..	..	1 442	1 360	1 346	1 298	1 304
Greece	..	2 186	2 084	2 111	2 108	2 111	2 026	2 042	..	1 760	1 761	1 785	1 818	1 780	1 733	1 733
Hungary[c]	..	..	..	2 006	2 033	1 979	1 858	1 749	..	1 829	1 710	1 765	1 795	1 778	1 809	1 769
Iceland	..	..	..	1 975	2 040	1 932	1 864	1 880	..	..	..	1 968	2 017	1 888	1 827	1 852
Ireland	..	..	..	..	1 933	1 865	1 821	1 820	..	1 678	1 689	1 632	1 574	1 530	1 485	1 475
Israel	..	..	..	1 995	2 017	1 931	1 853	1 858	..	..	..	..	..	..	..	..
Italy	..	..	..	1 856	1 851	1 818	1 719	1 725	..	..	..	1 680	1 696	1 652	1 567	1 576
Japan[d]	2 126	2 095	2 031	1 884	1 821	1 785	1 729	1 719	..	..	..	1 910	1 853	1 808	1 741	1 734
Korea	..	2 911	2 677	2 648	2 512	2 306	2 124	2 113	..	..	..	..	..	..	2 057	..
Luxembourg	..	..	..	..	1 603	1 570	1 509	1 507	..	..	..	..	1 605	1 570	1 509	1 507
Mexico	..	..	..	2 294	2 311	2 261	2 228	2 246	..	..	..	2 360	2 360	2 337	2 327	2 346
Netherlands	1 556	1 524	1 451	1 479	1 462	1 430	1 420	1 419	1 512	1 491	1 434	1 424	1 394	1 359	1 349	1 347
New Zealand	..	..	1 809	1 841	1 836	1 774	1 762	1 757	..	..	1 734	1 766	1 777	1 754	1 760	1 754
Norway	1 580	1 553	1 503	1 488	1 455	1 426	1 427	1 424	..	..	..	..	..	..	..	..
Poland	..	..	..	..	1 988	1 976	1 923	1 963	..	..	..	..	1 963	1 953	1 885	1 923
Portugal	2 017	1 971	1 959	1 893	1 917	1 900	1 865	1 868	..	..	1 830	1 778	1 729	1 731	1 719	1 683
Slovak Republic	..	..	..	1 853	1 816	1 791	1 760	1 754	..	..	..	..	1 768	1 774	1 729	1 704
Slovenia	..	..	..	1 755	1 710	1 655	1 676	1 676	..	..	..	..	1 606	1 593	1 627	1 630
Spain	1 954	1 848	1 763	1 755	1 753	1 704	1 698	1 691	1 864	1 769	1 696	1 686	1 705	1 662	1 648	1 643
Sweden	1 530	1 546	1 575	1 640	1 642	1 612	1 611	1 612	..	..	..	..	..	..	..	..
Switzerland[e]	..	..	..	1 686	1 674	1 633	1 568	1 590	..	..	..	..	..	..	..	..
Turkey	1 964	1 935	1 866	1 876	1 937	1 911	1 832 [b]	..	..	..	..	..	..	..	..	..
United Kingdom	1 813	1 711	1 765	1 731	1 700	1 677	1 677	1 674	1 747	1 649	1 700	1 695	1 680	1 658	1 667	1 663
United States	1 829	1 820	1 831	1 844	1 836	1 798	1 789	1 790	1 828	1 827	1 833	1 849	1 836	1 799	1 796	1 795
OECD (weighted)	1 921	1 900	1 883	1 866	1 840	1 799	1 763	1 766	..	..	..	..	..	..	..	..
Costa Rica	..	..	..	..	..	..	2 210	2 230	..	..	..	..	..	..	2 291	2 308
Latvia	..	..	..	..	1 976	1 878	1 938	1 903	..	..	..	..	..	1 869	1 752	1 704
Lithuania	..	..	..	..	..	1 684	1 617	1 646	..	..	..	..	..	1 661	1 598	1 623
Russian Fed.	..	..	..	1 891	1 982	1 999	1 985	1 978	..	..	..	1 886	2 000	2 020	2 003	1 997

Country specific notes can be found at *www.oecd.org/employment/outlook* and data at the *OECD Employment Database*, *www.oecd.org/employment/database*.

a) Total hours worked per year divided by the average number of people in employment. The data are intended for comparisons of trends over time; they are unsuitable for comparisons of the level of average annual hours of work for a given year, because of differences in their sources and method of calculation. Part-time and part-year workers are covered as well as full-time workers.

b) Provisional estimates.

c) Data for dependent employment refer to establishments in manufacturing with five or more employees.

d) Data for dependent employment refer to establishments with five or more regular employees.

e) OECD estimates on hours per worker are obtained by dividing total hours worked from the Federal Statistical Office (FSO) by SPAO-based average employment from the FSO website, both series referring to National Accounts domestic concept.

Source: The series on annual hours actually worked per person in total employment presented in this table for all 34 OECD countries are consistent with the series retained for the calculation of productivity measures in the *OECD Productivity Database* (*www.oecd.org/std/productivity-stats*). However, there may be differences for some countries given that the main purpose of the latter database is to report data series on labour input (i.e. total hours worked) and also because the updating of databases occurs at different moments of the year. Hours actually worked per person in employment are according to National Accounts concepts for 23 countries: Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Korea, the Netherlands, Norway, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland and Turkey. OECD estimates for Luxembourg and Lithuania for annual hours worked are based on the European Labour Force Survey, as are estimates for dependent employment for Austria, Estonia, Greece, Ireland, Latvia, Portugal and the Slovak Republic. The table includes labour-force-survey-based estimates for the Russian Federation.

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Table M. **Incidence of long-term unemployment,[a] 12 months and over**

As a percentage of total unemployment in each age group

	Total (15+)				Youth (15-24)				Prime age (25-54)				Older population (55+)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	25.9	15.4	21.7	23.5	14.9	9.9	17.5	18.0	30.7	17.2	22.5	24.9	45.6	30.5	31.8	35.1
Austria	25.8	27.2	27.2	29.2	12.7	13.4	13.5	15.8	25.5	30.2	29.3	30.5	49.7	58.1	50.6	52.8
Belgium	54.2	50.4	49.9	51.7	29.1	29.7	34.4	35.7	61.9	54.8	52.3	53.4	79.4	80.3	71.7	76.2
Canada	11.3	7.5	12.9	11.6	4.0	2.2	5.8	5.1	12.2	7.7	13.1	10.5	18.7	12.5	18.8	18.0
Chile	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	48.8	53.4	44.5	48.3	37.8	33.6	28.6	30.9	53.3	58.3	47.8	50.8	45.6	51.7	48.4	56.6
Denmark	21.7	16.1	25.2	26.9	2.1	4.2	8.9	8.0	24.7	16.6	29.9	32.4	41.2	38.3	41.8	41.6
Estonia	45.1	49.8	45.3	38.3	26.3	30.5	29.7	15.5	49.4	52.7	46.2	43.9	52.5	73.5	60.0	40.9
Finland	29.0	23.0	23.1	25.1	8.8	5.5	5.7	8.0	34.0	25.9	26.3	27.8	56.5	47.6	44.1	47.2
France	39.7	39.7	44.2	44.3	21.1	24.3	30.5	28.8	42.8	42.8	45.7	46.3	67.7	66.8	62.6	63.7
Germany	51.5	56.6	44.3	44.0	23.5	32.2	23.0	22.5	51.0	57.5	44.2	44.3	69.1	76.9	62.5	60.1
Greece	54.7	49.7	73.5	73.1	50.2	41.4	60.1	56.1	56.9	51.5	74.8	74.3	56.2	59.5	81.6	84.8
Hungary	48.9	47.5	48.9	46.7	37.8	36.6	34.4	27.2	52.6	49.6	50.6	48.8	57.9	54.3	63.0	64.8
Iceland[b]	(11.8)	(8.0)	(13.6)	(16.1)	-	-	(5.9)	(1.6)	(17.0)	(8.6)	(17.8)	(16.9)	(33.0)	(56.8)	(19.3)	(48.7)
Ireland	37.3	30.0	59.2	57.6	19.9	21.0	39.4	38.5	44.9	33.5	62.2	60.0	47.6	42.4	74.2	74.0
Israel	12.0	24.9	10.6	11.5	6.1	13.2	5.0	4.8	13.5	27.3	10.9	11.4	21.8	41.6	22.4	25.3
Italy[b]	61.8	47.5	61.4	58.9	57.5	41.1	59.7	55.7	63.8	49.4	61.3	59.2	63.7	53.4	67.8	65.1
Japan	25.5	32.0	37.6	35.5	21.5	20.0	25.8	25.0	22.5	33.1	39.9	38.4	36.0	39.6	38.0	33.3
Korea	2.3	0.6	-	-	1.0	0.4	-	-	2.8	0.7	-	-	3.0	-	-	-
Luxembourg	(22.4)	(28.7)	(27.4)	(28.4)	(14.3)	(23.0)	(14.0)	('8.5)	(24.9)	(29.9)	(28.4)	(33.1)	(26.4)	(43.7)	(57.9)	(42.9)
Mexico	1.2	2.3	1.2	1.2	0.9	1.0	0.4	0.8	1.2	3.0	1.5	1.1	4.3	4.6	3.5	3.9
Netherlands	..	39.4	39.9	43.6	..	12.6	19.2	18.7	..	44.1	42.7	45.5	..	74.4	60.4	68.4
New Zealand	19.9	6.0	13.6	13.2	9.8	2.4	7.5	6.9	23.1	8.6	15.5	15.5	44.8	15.8	29.5	26.3
Norway[b]	(5.3)	(8.8)	(11.8)	(11.7)	(1.3)	(2.6)	(4.0)	(3.1)	(7.3)	(11.8)	(14.0)	(14.7)	(14.1)	(19.5)	(24.9)	(23.8)
Poland	37.9	45.9	36.2	39.3	28.0	30.0	24.0	29.2	41.5	50.6	38.7	40.8	44.2	57.0	46.0	50.3
Portugal	42.2	47.2	59.6	57.4	21.2	27.4	36.3	30.9	47.9	49.6	61.8	60.2	68.5	67.8	78.8	76.4
Slovak Republic	54.6	70.8	66.8	62.3	43.1	53.9	53.9	51.2	59.9	74.5	68.8	64.3	60.1	82.6	74.1	66.4
Slovenia	61.4	45.7	54.5	52.3	42.4	29.2	37.5	35.8	67.9	49.8	56.0	53.7	86.2	57.4	68.7	63.0
Spain[b]	41.7	20.4	52.8	51.6	29.3	10.1	40.5	35.0	45.0	21.2	52.8	51.9	58.0	46.8	70.5	70.9
Sweden[b]	26.4	12.8	16.8	17.6	8.9	3.5	4.6	4.4	26.6	16.4	22.3	21.8	49.3	27.8	30.1	34.0
Switzerland	29.0	40.8	37.7	38.6	..	..	..	..	..	..	..	..	..	..	..	..
Turkey	21.1	30.3	20.6	21.2	19.8	26.6	14.4	13.8	21.8	32.2	22.5	22.9	31.4	41.0	34.7	40.6
United Kingdom[b]	26.7	23.8	35.7	30.7	12.3	15.7	27.9	21.9	32.9	28.4	39.3	35.0	43.4	35.5	47.2	40.9
United States[b]	6.0	10.0	23.0	18.7	3.9	6.5	13.9	11.4	6.6	11.1	25.2	20.5	11.9	14.3	32.9	25.9
OECD[c]	30.7	28.4	35.3	33.8	19.7	16.3	21.9	19.8	34.2	32.0	38.7	37.3	41.2	39.1	44.3	42.6
Colombia[d]	26.5	12.0	9.1	7.7	23.0	8.4	6.1	5.0	28.8	14.2	10.4	8.8	31.5	16.3	15.8	12.5
Costa Rica	..	..	15.9	15.9	..	..	12.8	11.3	..	..	17.6	18.2	..	..	26.0	25.6
Latvia	58.6	27.1	43.1	45.5	43.4	11.1	24.1	27.1	61.3	30.6	46.7	47.8	67.5	38.4	46.1	51.1
Lithuania	49.8	32.4	44.7	42.9	43.1	21.1	22.6	16.4	51.4	33.0	46.9	45.7	52.0	45.6	57.4	55.4
Russian Fed.	46.2	40.6	28.1	27.3	32.6	28.6	17.3	17.2	50.2	45.9	31.2	30.0	62.8	44.2	34.5	34.5
South Africa[d]	68.4	57.7	57.8	57.0	46.8	36.2	34.3	35.7	72.0	61.8	60.9	59.4	85.3	80.5	66.8	70.6

Table M. **Incidence of long-term unemployment,[a] 12 months and over** *(cont.)*

As a percentage of male unemployment in each age group

	Men (15+)				Youth (15-24)				Prime age (25-54)				Older population (55+)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	28.8	16.4	22.6	25.1	15.6	10.0	19.5	19.9	33.9	18.9	22.4	25.9	49.5	30.7	32.6	37.5
Austria	28.1	26.9	28.2	31.8	10.0	14.0	12.7	16.3	27.2	29.2	29.9	32.4	56.4	57.1	53.4	58.6
Belgium	54.1	49.3	51.9	52.5	27.2	30.1	38.6	38.9	62.8	53.0	53.6	53.4	75.1	80.2	72.1	76.5
Canada	12.3	8.4	13.1	12.0	4.4	2.3	5.4	5.7	13.7	9.4	13.7	10.5	20.0	13.4	19.1	18.6
Chile	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	47.5	51.7	45.0	48.8	37.2	35.4	33.2	31.0	53.3	56.5	49.0	51.5	45.2	54.9	44.6	58.5
Denmark	21.0	15.6	25.9	27.6	0.9	3.3	8.4	8.7	25.2	17.6	32.5	33.5	38.8	35.4	39.8	44.7
Estonia	47.1	53.3	50.2	40.8	31.3	33.8	32.4	18.9	51.2	55.2	53.6	45.0	51.3	80.4	62.3	50.6
Finland	32.2	26.5	25.1	28.5	8.8	5.9	8.0	10.4	39.1	30.2	28.8	31.9	58.3	52.4	43.7	50.2
France	38.4	39.9	45.3	45.0	19.8	28.3	33.0	30.8	41.8	41.8	46.9	47.0	66.3	66.1	61.7	63.0
Germany	50.1	56.7	46.2	45.7	23.7	33.5	26.1	24.4	49.1	57.9	46.2	46.2	69.0	76.2	63.0	60.9
Greece	48.0	41.5	72.8	72.7	42.9	32.8	61.2	56.0	49.9	42.5	73.5	73.3	55.8	58.0	81.1	84.9
Hungary	51.1	47.2	49.8	48.1	40.7	38.0	35.3	29.3	54.4	48.9	51.8	50.2	62.9	54.7	62.6	68.4
Iceland[b]	(8.7)	(9.5)	(13.5)	(13.1)	-	-	(4.7)	(1.0)	(17.1)	(14.3)	(15.7)	(18.8)	..	(59.3)	(34.8)	(33.6)
Ireland	46.7	35.4	65.2	63.4	21.5	24.8	44.5	41.3	56.1	39.6	68.2	66.5	58.5	44.8	78.6	77.9
Israel	13.5	28.9	11.9	12.8	8.1	15.7	5.7	6.0	13.7	31.0	11.4	11.8	25.5	44.4	25.8	27.8
Italy[b]	61.8	45.6	60.3	59.0	56.7	41.0	60.5	57.8	64.0	46.7	59.1	58.5	67.0	54.2	69.6	66.0
Japan	30.7	40.3	47.1	45.4	26.3	24.0	29.4	31.3	29.4	43.0	51.8	50.6	35.6	44.7	44.4	40.0
Korea	3.1	0.7	-	-	1.4	0.3	-	-	3.5	0.9	-	-	3.6	-	-	-
Luxembourg	(26.4)	(35.4)	(26.7)	(31.0)	(20.4)	(30.5)	(15.4)	(3.9)	(28.7)	(36.5)	(27.5)	(38.5)	(26.4)	(46.5)	(57.2)	(51.1)
Mexico	0.6	2.4	1.3	1.1	-	0.7	0.3	0.9	0.5	3.4	1.8	0.8	5.3	5.0	2.9	3.5
Netherlands	..	41.8	40.5	46.1	..	12.2	19.0	20.3	..	45.9	41.8	46.7	..	75.3	60.5	70.4
New Zealand	23.7	6.6	14.8	14.0	12.1	2.3	8.5	7.9	27.4	10.0	17.5	17.0	47.6	18.2	29.6	26.3
Norway[b]	(6.9)	(10.2)	(11.8)	(12.9)	(1.3)	(3.1)	(3.7)	(4.1)	(9.3)	(14.4)	(14.8)	(15.8)	(16.6)	(18.5)	(19.9)	(27.0)
Poland	34.1	45.8	36.3	39.7	25.5	31.0	24.9	29.8	37.3	49.9	38.8	41.4	43.3	57.2	44.8	49.9
Portugal	43.9	47.6	60.7	58.7	20.3	26.2	36.5	32.4	47.5	50.1	62.7	60.3	73.9	66.6	78.8	77.9
Slovak Republic	54.1	72.3	69.8	63.9	43.9	57.8	56.5	54.5	59.2	75.6	72.8	66.3	59.3	86.5	76.0	67.4
Slovenia	62.8	45.3	55.0	50.7	41.7	27.8	37.2	34.1	68.9	51.1	56.3	52.9	86.8	57.9	70.9	59.4
Spain[b]	35.3	17.4	52.0	50.4	25.5	8.6	42.2	36.5	35.9	17.4	51.1	49.8	58.9	42.3	70.0	70.2
Sweden[b]	29.3	14.2	17.9	19.3	11.0	3.3	5.2	4.4	30.1	18.9	23.1	24.0	48.6	28.1	32.5	36.0
Switzerland	28.2	37.9	35.5	36.7	..	..	..	..	..	..	..	..	..	..	..	..
Turkey	18.1	27.0	17.2	17.7	16.0	23.3	12.2	11.4	19.0	28.3	17.4	17.6	31.4	40.4	35.2	40.8
United Kingdom[b]	32.6	28.5	40.2	34.3	14.6	18.9	32.1	25.3	40.2	34.7	44.8	39.7	49.0	39.6	48.9	42.5
United States[b]	6.7	10.7	23.7	19.8	4.5	7.6	15.4	12.5	6.7	11.4	25.3	21.9	15.6	16.8	34.7	27.4
OECD[c]	29.6	28.4	35.4	34.1	18.8	16.9	22.9	20.9	32.5	31.6	38.2	37.1	41.8	40.1	45.1	43.5
Colombia[d]	24.1	10.8	6.7	6.2	21.8	8.3	4.2	3.5	24.9	12.0	6.9	6.7	31.3	16.0	14.4	12.6
Costa Rica	..	..	12.3	10.8	..	..	10.2	9.3	..	..	11.0	9.0	..	..	28.1	25.2
Latvia	58.8	30.1	45.0	48.6	46.7	11.6	29.5	32.3	61.1	37.2	48.8	52.1	64.8	29.3	44.1	49.0
Lithuania	51.4	34.9	44.3	43.5	50.2	22.9	27.7	16.8	52.0	34.6	45.6	46.1	49.2	53.3	55.6	56.8
Russian Fed.	42.7	39.1	27.8	26.7	31.2	28.4	17.8	16.7	45.7	43.7	30.4	29.3	59.2	44.4	35.5	33.9
South Africa[d]	66.3	52.6	53.9	52.1	41.7	34.2	31.6	32.4	69.9	55.5	56.7	54.5	84.7	80.7	65.5	65.9

Table M. **Incidence of long-term unemployment,[a] 12 months and over** *(cont.)*

As a percentage of female unemployment in each age group

	Women (15+)				Youth (15-24)				Prime age (25-54)				Older population (55+)			
	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015	2000	2007	2014	2015
Australia	21.9	14.4	20.6	21.7	14.1	9.9	15.1	15.7	26.4	15.6	22.6	24.0	33.9	30.2	30.6	30.9
Austria	22.8	27.6	25.9	25.9	16.5	12.8	14.5	15.2	23.5	31.1	28.5	28.1	31.7	59.6	44.0	40.0
Belgium	54.3	51.4	47.4	50.7	30.8	29.3	29.2	30.9	61.3	56.6	50.5	53.3	89.1	80.3	71.3	75.6
Canada	10.0	6.3	12.6	11.0	3.4	2.2	6.4	4.2	10.5	5.6	12.3	10.5	17.0	11.4	18.4	17.3
Chile	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	49.8	54.7	44.2	47.9	38.5	31.1	22.6	30.8	53.3	59.4	46.9	50.2	46.3	46.6	52.9	54.4
Denmark	22.4	16.6	24.4	26.2	3.5	5.3	9.5	7.3	24.4	15.8	27.4	31.4	43.9	41.0	44.4	38.6
Estonia	42.6	44.4	39.4	35.7	19.4	22.8	23.8	10.7	47.3	49.9	37.8	42.8	54.9	29.6	57.8	32.0
Finland	26.2	19.5	20.6	21.0	8.8	5.0	3.0	5.0	29.6	21.8	23.2	22.9	54.5	42.2	44.6	43.5
France	40.8	39.5	43.1	43.5	22.4	19.7	27.1	26.2	43.6	43.8	44.5	45.5	69.2	67.7	63.7	64.4
Germany	53.1	56.5	41.9	41.6	23.2	30.4	18.8	19.8	52.9	57.0	41.7	41.7	69.1	77.8	61.9	59.0
Greece	59.2	54.4	74.2	73.5	55.1	46.7	59.1	56.2	61.2	56.3	76.0	75.2	57.0	61.6	82.5	84.7
Hungary	45.7	47.9	47.9	45.1	33.1	34.7	33.1	24.0	50.1	50.3	49.4	47.5	37.5	53.6	63.6	59.9
Iceland[b]	(14.1)	(5.7)	(13.7)	(19.4)	-	-	(7.5)	(2.6)	(16.9)	(2.7)	(21.6)	(15.4)	(27.4)	(53.1)	(14.0)	(64.4)
Ireland	23.0	21.7	49.1	47.5	18.1	15.5	31.9	34.0	26.2	23.9	52.2	49.1	19.9	37.2	64.4	64.7
Israel	10.4	20.9	9.2	10.0	4.2	11.2	4.2	3.7	13.2	23.8	10.3	11.0	12.4	36.3	17.4	21.3
Italy[b]	61.8	49.2	62.7	58.8	58.3	41.1	58.6	53.0	63.6	51.5	63.7	60.0	56.1	51.6	63.9	63.0
Japan	17.1	19.4	23.7	20.2	14.8	15.0	21.4	16.7	13.8	20.6	24.6	22.0	37.5	20.0	21.4	15.4
Korea	0.8	0.3	-	-	0.5	0.5	-	-	0.9	0.2	-	-	1.1	-	-	-
Luxembourg	(18.8)	(22.3)	(28.2)	(25.9)	(8.4)	(14.8)	(11.4)	(14.8)	(21.9)	(24.0)	(29.4)	(28.4)	-	(39.1)	(59.0)	(27.7)
Mexico	2.0	2.0	1.1	1.3	2.1	1.4	0.7	0.5	1.9	2.5	1.0	1.6	-	1.9	6.0	5.5
Netherlands	..	37.1	39.3	41.0	..	13.0	19.4	17.0	..	42.7	43.5	44.4	..	72.8	60.3	65.2
New Zealand	14.9	5.4	12.6	12.5	7.0	2.4	6.6	5.7	18.1	7.5	14.2	14.4	37.5	12.5	29.5	26.3
Norway[b]	(3.3)	(7.1)	(11.7)	(10.1)	(1.4)	(2.0)	(4.3)	(1.9)	(4.4)	(9.2)	(13.0)	(13.3)	(9.3)	(21.4)	(33.4)	(19.3)
Poland	41.3	46.0	36.2	38.8	30.7	29.0	22.8	28.3	45.1	51.3	38.5	40.1	45.7	56.7	48.0	51.0
Portugal	41.0	46.9	58.5	56.0	21.8	28.3	36.1	29.5	48.2	49.3	61.0	60.1	58.6	69.6	78.8	74.0
Slovak Republic	55.1	69.4	63.2	60.7	42.0	48.5	49.7	46.1	60.5	73.5	64.4	62.6	63.3	75.8	72.0	65.6
Slovenia	59.8	46.1	54.0	53.8	43.0	31.1	37.9	38.4	66.9	48.9	55.8	54.3	82.9	56.7	64.7	68.8
Spain[b]	46.3	22.8	53.7	52.8	32.4	11.3	38.4	33.1	50.8	24.0	54.5	53.8	56.3	52.2	71.3	71.8
Sweden[b]	22.8	11.3	15.5	15.5	6.4	3.7	3.8	4.4	22.1	14.0	21.3	19.3	50.3	27.3	26.8	31.1
Switzerland	29.7	43.0	40.2	40.8	..	..	..	..	..	..	..	..	..	..	..	..
Turkey	29.8	38.9	26.7	26.8	28.5	32.9	17.8	17.2	31.3	43.8	30.9	31.4	..	50.0	31.3	39.1
United Kingdom[b]	18.1	17.6	30.1	26.2	9.4	11.2	22.0	17.3	22.6	21.4	33.1	30.0	28.3	25.7	44.5	38.6
United States[b]	5.3	9.0	22.2	17.2	3.1	5.1	11.9	10.0	6.4	10.7	25.1	18.9	7.4	11.2	30.7	24.2
OECD[c]	32.0	28.3	35.3	33.5	20.8	15.5	20.6	18.4	35.8	32.5	39.2	37.5	40.2	37.4	43.1	41.1
Colombia[d]	28.7	13.1	11.1	8.8	24.1	8.6	7.8	6.1	32.3	16.1	12.8	10.3	32.1	17.4	18.8	12.4
Costa Rica	..	..	19.7	21.1	..	..	15.9	13.6	..	..	23.0	25.8	..	..	17.0	26.5
Latvia	58.3	23.4	40.8	41.5	39.3	10.4	17.2	18.4	61.5	22.8	44.2	42.4	72.0	47.2	48.4	53.7
Lithuania	47.7	29.9	45.2	42.1	31.4	19.3	15.3	15.9	50.7	31.5	48.5	45.2	58.0	36.3	60.1	53.6
Russian Fed.	50.0	42.4	28.4	28.0	34.2	28.7	16.7	17.7	55.1	48.3	32.0	30.8	67.4	43.9	32.9	35.3
South Africa[d]	70.5	62.3	62.3	62.5	51.8	38.3	37.5	40.1	74.1	66.9	65.8	64.8	86.7	79.8	68.8	79.4

Note: For country details related to data on unemployment by duration of job search, see PDF in source below. Data in brackets are based on small sample sizes.

a) Persons for whom no duration of unemployment was specified are excluded from the total used in the calculation.

b) The lower age limit is 16 instead of 15: for Iceland up to 2008, Italy after 2007, Norway up to 2005 and Sweden up to 2006.

c) Weighted average.

d) Data for 2000 refer to 2001.

Source and definition: OECD Employment Database, www.oecd.org/employment/database and *www.oecd.org/els/emp/lfsnotes_sources.pdf.*

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Table N. **Real average annual wages and real unit labour costs in the total economy**

Annualised growth rates, percentages

	Average wages in 2015 in USD PPPs[a]	Average wages[b]					Unit labour costs[b]				
		2000-07	2007-15	2007	2014	2015	2000-07	2007-15	2007	2014	2015
Australia	50 167	1.2	0.7	2.8	0.3	-1.1	0.9	-0.2	2.1	-1.6	-1.6
Austria	46 084	0.8	0.4	0.5	0.2	0.7	-1.1	0.6	-1.0	0.1	0.9
Belgium	47 702	0.2	0.4	-0.5	0.4	-0.1	-0.5	0.4	-1.0	-0.7	-0.7
Canada	47 843	1.6	1.3	2.4	0.9	0.3	0.9	0.5	2.4	-0.6	0.2
Chile[c, d]	23 247	..	4.7	..	1.0	..	..	1.9	..	0.0	..
Czech Republic	21 689	4.7	0.6	3.0	0.7	2.0	0.7	-0.2	-0.1	-0.2	-0.2
Denmark	50 024	1.8	1.0	1.2	1.7	2.0	1.1	0.4	3.6	0.6	1.6
Estonia	21 564	7.7	1.0	15.6	6.3	5.5	1.8	0.7	7.6	2.8	5.8
Finland	40 731	1.9	0.5	1.5	0.2	1.2	-0.1	0.6	-1.5	-0.7	0.3
France	41 252	1.2	1.0	0.4	1.1	1.4	0.1	0.6	-0.5	1.0	0.2
Germany	44 925	0.2	1.1	-0.2	1.4	2.2	-1.9	1.1	-2.2	1.2	1.7
Greece	25 211	2.6	-2.4	0.0	0.7	0.9	1.6	-0.4	0.4	0.2	3.1
Hungary	19 999	4.3	-0.6	-1.3	-1.0	3.0	0.7	-0.8	-0.6	1.3	3.1
Iceland[c, d]	49 953	2.8	-1.4	3.3	0.5	..	1.1	-0.9	0.0	2.0	4.1
Ireland	46 074	2.5	0.4	2.7	-0.9	0.4	0.8	-1.9	0.7	-3.3	-4.2
Israel[d]	29 794	..	0.1	1.9	0.4	2.9	-0.9	-0.5	-0.6	0.7	..
Italy	34 140	0.5	-0.2	-0.1	0.5	0.7	0.6	0.4	0.0	0.4	1.0
Japan	35 780	-0.3	0.2	-0.9	-1.4	0.4	-1.3	0.4	-1.7	-0.3	0.8
Korea	33 110	2.7	0.4	2.4	0.1	1.2	0.5	-0.1	-0.1	0.6	1.2
Luxembourg	60 369	1.3	0.7	2.7	2.0	0.3	0.8	1.6	-1.7	0.7	-1.6
Mexico[c, d]	14 867	2.3	-1.0	0.9	-1.5	-1.6	1.4	-0.6	-0.7	..	..
Netherlands	50 670	0.8	0.7	1.1	-0.8	1.9	-0.7	0.2	0.0	-0.8	-1.1
New Zealand[c, d]	38 331	2.7	0.4	5.9	..	..	1.3	1.5	2.3	1.4	1.2
Norway	50 908	3.1	1.8	4.3	0.7	0.6	2.3	2.2	6.6	0.2	-0.4
Poland	23 998	1.0	1.9	2.3	1.9	3.6	-1.5	0.0	1.4	0.7	-0.4
Portugal	24 105	-0.3	-0.5	0.7	-2.0	-1.0	-0.7	-0.9	-1.7	-1.1	-0.9
Slovak Republic	22 031	3.5	1.6	6.1	1.9	3.2	-2.6	-0.1	-3.0	1.6	1.4
Slovenia	33 085	2.9	0.7	2.2	1.4	2.0	-0.3	-0.1	-1.3	-1.3	0.5
Spain	36 325	0.1	0.6	1.3	-1.0	0.8	0.5	-1.1	1.3	-0.7	1.2
Sweden	40 909	1.9	1.3	3.2	1.3	1.8	0.2	1.0	2.6	0.5	0.5
Switzerland	58 389	1.1	0.9	1.4	0.9	0.3	0.1	1.5	-0.2	0.7	2.4
Turkey	..	..	..	..	..	..	..	..	..	..	..
United Kingdom	41 384	2.1	-1.0	2.4	-0.8	1.8	0.8	-1.3	0.9	-2.6	1.1
United States	58 714	1.2	0.6	2.0	1.6	1.9	-0.4	-0.2	0.9	0.7	1.6
OECD[e]	41 253	1.1	0.5	1.2	0.4	1.2	-0.2	0.0	0.1	0.2	0.9
Latvia	20 518	9.2	1.1	23.4	7.8	7.6	2.3	-0.6	14.4	4.4	4.2

Note: Average annual wages per full-time equivalent dependent employee are obtained by dividing the national-accounts-based total wage bill by the average number of employees in the total economy, which is then multiplied by the ratio of average usual weekly hours per full-time employee to average usually weekly hours for all employees. For more details, see *www.oecd.org/employment/outlook*.

a) Average wages are converted in USD PPPs using 2015 USD PPPs for private consumption.

b) Average annual wages and unit labour costs are deflated by a price deflator for private final consumption expenditures in 2015 prices.

c) Real compensation per employee (instead of real wages) are considered for Chile, Iceland, Mexico and New Zealand.

d) Annualised real wage growth between 2007 and 2015 refers to 2008-14 for Chile, 2007-14 for Iceland and 2007-12 for New Zealand. Annualised changes of real unit labour costs for 2007-15 refers to 2008-14 for Chile, 2007-14 for Israel, and 2007-13 for Mexico.

e) Aggregates are weighted averages computed based on dependent employment weights in 2015 for the countries shown.

Source: OECD estimates based on OECD (*Annual and Quarterly*) *National Accounts Database* (2016) and *OECD Economic Outlook*, Vol. 2016, No. 1, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_outlook-v2016-1-en*.

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Table O. **Earnings dispersion and incidence of high and low pay**

	Earnings dispersion[a]						Incidence of			
	9th to 1st earnings deciles		9th to 5th earnings deciles		5th to 1st earnings deciles		Low pay[b] (%)		High pay[c] (%)	
	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
Australia	3.12	3.47	1.88	2.06	1.66	1.68	14.5	16.6	..	..
Austria	3.23	3.33	1.90	1.94	1.70	1.72	15.2	15.9	19.7	20.8
Belgium	2.46	2.46	1.76	1.77	1.40	1.39	6.3	4.6	12.7	13.8
Canada	3.69	3.71	1.84	1.90	2.00	1.95	22.4	22.5	10.8	9.8
Chile	5.33	4.72	3.00	2.83	1.78	1.67	19.9	12.2	28.6	26.5
Czech Republic[d]	3.36	3.52	1.79	1.85	1.88	1.91	19.7	20.3	..	..
Denmark	..	2.56	..	1.77	..	1.45	..	7.9	..	3.0
Estonia	4.55	4.40	2.18	2.11	2.08	2.08	24.5	24.0	25.4	23.4
Finland	2.42	2.57	1.69	1.76	1.43	1.46	7.0	8.4	15.3	16.6
France	2.99	2.98	2.00	2.00	1.49	1.49	..	..	..	..
Germany	3.14	3.41	1.75	1.82	1.79	1.87	17.9	18.4	16.9	19.0
Greece	3.44	3.27	2.00	1.90	1.72	1.72	20.0	17.9	22.1	19.6
Hungary	4.61	3.67	2.35	2.29	1.97	1.61	23.0	18.7	..	..
Iceland	3.15	2.94	1.72	1.78	1.83	1.65	18.7	15.7	15.8	18.5
Ireland	3.61	3.96	2.07	2.00	1.75	1.98	17.6	25.1	..	..
Israel	5.18	4.91	2.64	2.65	1.96	1.85	23.2	22.1	28.8	27.9
Italy	2.40	2.17	1.60	1.44	1.50	1.50	9.4	7.6	11.4	8.0
Japan	2.94	2.94	1.82	1.84	1.61	1.60	14.3	13.9	..	..
Korea	5.12	4.79	2.42	2.42	2.12	1.98	24.9	23.7	..	..
Luxembourg	3.29	3.41	1.99	2.05	1.65	1.66	15.4	14.8	21.8	22.7
Mexico	3.75	3.88	2.14	2.21	1.75	1.75	17.9	14.8	20.1	22.0
Netherlands	2.91	2.94	1.79	1.77	1.62	1.66	14.1	14.9	17.4	16.8
New Zealand	2.79	2.95	1.76	1.88	1.59	1.57	13.2	13.9	..	..
Norway	2.10	2.42	1.45	1.50	1.45	1.62	..	..	..	..
Poland	4.11	4.03	2.07	2.10	1.98	1.92	22.2	22.6	..	..
Portugal	4.65	3.89	2.84	2.49	1.64	1.56	14.1	20.3	27.5	27.8
Slovak Republic	3.49	3.66	2.00	2.02	1.74	1.82	18.0	20.0	..	..
Slovenia	..	3.26	..	2.05	..	1.59	..	..	..	..
Spain	3.55	3.08	2.10	1.88	1.69	1.64	16.3	14.6	23.3	20.6
Sweden	2.24	2.28	1.63	1.67	1.38	1.36	..	..	..	..
Switzerland	2.59	2.48	1.77	1.71	1.46	1.45	8.9	10.1	..	..
Turkey	..	4.85	..	2.90	..	1.67	..	..	..	..
United Kingdom[d]	3.52	3.56	1.94	1.98	1.81	1.80	20.5	20.4	..	..
United States	4.79	5.01	2.29	2.40	2.09	2.09	23.9	24.9	..	..
OECD[e]	3.50	3.46	2.01	2.02	1.73	1.70	17.2	16.8	19.8	18.6

Note: Estimates of earnings used in the calculations refer to gross earnings of full-time wage and salary workers. However, this definition may slightly vary from one country to another. Further information on the national data sources and earnings concepts used in the caculations can be found at *www.oecd.org/employment/outlook*.

a) Earnings dispersion is measured by the ratio of 9th to 1st deciles limits of earnings, 9th to 5th deciles and 5th to 1st deciles. Data refer to 2006 for Chile, Estonia, Korea, Luxembourg and the Netherlands; and to 2005 for Mexico. They refer to 2013 for Belgium, Chile and Denmark and Sweden; to 2012 for France and Spain; to 2011 for Israel; and to 2010 for Estonia, Luxembourg, the Netherlands, Slovenia and Turkey.

b) The incidence of low pay refers to the share of workers earning less than two-thirds of median earnings. See note *a)* for countries with different time periods.

c) The incidence of high pay refers to the share of workers earning more than one-and-a-half times median earnings. See note *a)* for countries with different time periods.

d) For the Czech Republic, there are breaks in series in 2010 and 2012. For the United Kingdom, there are breaks in series in 1997, 2004, 2006 and 2011. In each case, data were spliced from new-to-old series to remove the breaks in series.

e) Unweighted average for above countries.

Source: OECD Earnings Distribution Database, www.oecd.org/employment/emp/employmentdatabase-earningsandwages.htm.

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Table P. **Relative earnings: Gender, age and education gaps**

Percentages

	Gender[a]		Age[b]				Education/Skills[c]			
	Women / Men		15-24 / 25-54		55-64 / 25-54		Low / Medium		High / Medium	
	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
Australia	14	15	39	41	-1	-1	12	12	-36	-36
Austria	22	18	33	36	-58	-35	..	22	..	-50
Belgium	12	6	34	35	-28	-27	10	10	-32	-36
Canada	23	19	44	41	-4	0	23	18	-34	-32
Chile	4	17	45	42	-7	-5	..	32	..	-161
Czech Republic	16	16	36	36	-7	0	..	24	..	-92
Denmark	..	7	36	40	-1	-2	..	11	..	-26
Estonia	28	27	..	..	..	..	..	..	..	..
Finland	20	20	32	37	-8	-4	4	1	-43	-35
France	15	14	..	..	..	..	..	8	..	-47
Germany	23	17	43	40	-10	-11	..	..	..	..
Greece	14	9	42	44	-23	-38	..	20	..	-40
Hungary	3	4	37	30	-20	-1	..	24	..	-97
Iceland	19	14	43	42	5	-2	..	..	..	..
Ireland	18	15	42	54	-3	-17	17	8	-72	-65
Israel	25	22	54	54	-24	-19	..	14	..	-61
Italy	7	6	..	35	..	-16	..	17	..	-40
Japan	31	26	43	41	-3	0	..	..	..	..
Korea	40	37	44	43	57	55	8	12	-34	-37
Luxembourg	8	5	..	41	..	-31	..	33	..	-54
Mexico	17	18	29	31	-6	-2	..	42	..	-102
Netherlands	16	19	..	..	..	..	13	14	-46	-49
New Zealand	8	6	37	41	4	4	..	..	..	..
Norway	10	6	31	36	-4	-7	12	12	-26	-26
Poland	11	11	41	35	-23	-2	..	15	..	-72
Portugal	13	19	44	39	-16	-27	35	29	-77	-69
Slovak Republic	21	14	..	33	..	6	27	27	-42	-73
Slovenia	..	20	..	..	..	..	..	21	..	-75
Spain	13	9	40	37	-24	37	17	18	-35	-41
Sweden	15	13	27	31	-7	-8	..	7	..	-22
Switzerland	20	15	37	37	-11	-15	..	21	..	-47
Turkey	..	20	..	..	..	..	..	27	..	-74
United Kingdom	23	17	43	43	7	1	..	24	..	-47
United States	20	17	47	47	-8	-10	..	27	..	-69
OECD[d]	17	15	39	39	-9	-6	..	19	..	-58

a) See note to Table O. The gender wage gap is unadjusted and is calculated as the difference between median earnings of men and women relative to median earnings of men. Data refer to 2006 for Chile, Estonia, Korea, Luxembourg and the Netherlands; and to 2005 for Mexico. They refer to 2013 for Belgium, Chile, Denmark and Sweden; to 2012 for France and Spain; to 2011 for Israel; and to 2010 for Estonia, Luxembourg, the Netherlands, Slovenia and Turkey.

b) Age wage gaps are calculated as the difference between mean earnings of 25-54 year-olds and that of 15-24 year-olds (respectively 55-64 year-olds) relative to mean earnings of 25-54 year-olds. Data refer to 15-29 year-olds and 30-59 year-olds for Austria. Data refer to 55 year-olds and over for Hungary, Korea and Norway; and to 60 year-olds for Austria. Data refer to 2006 for Chile and Korea; and to 2005 for Mexico and Poland. They refer to 2013 for Belgium, Denmark and Korea; to 2012 for Spain and Sweden; and to 2011 for Israel.

c) Earnings by skill (or education levels) refer to mean annual earnings of full-time full-year for 25-64 year-old employees. Earnings gaps by skill levels are calculated as the difference between mean earnings of medium-skilled employees and low- (respectively high-) skilled employees relative to mean earnings of medium-skilled employees. The skill levels are based on the International Standard Classification of Education (ISCED, 2011). *Low* (skills) corresponds to less than upper secondary ISCED Levels 0, 1, 2 (Less than primary, primary and lower secondary education). *Medium* (skills) corresponds to upper secondary and post-secondary non-tertiary ISCED Levels 3 (including partial level completion), and ISCED 4 (Upper secondary and post-secondary non-tertiary education). *High* (skills) corresponds to tertiary ISCED Levels 5, 6, 7 and 8 (short-cycle tertiary education, bachelors or equivalent level, masters or equivalent level, doctoral or equivalent level). Data refer to 2006 (instead of 2005) for Korea. They refer to 2010 (instead of 2013) for the Netherlands and Sweden; to 2011 for Chile and France; and to 2012 for Australia, Belgium, Canada, Mexico and Poland. For Korea, data are provided by national authorities.

d) Unweighted average for above countries.

Source: OECD Earnings Distribution Database, *www.oecd.org/employment/emp/onlineoecdemploymentdatabase.htm#earndisp* for earnings gaps by gender and age; and OECD (2015), *Education at a Glance 2015: OECD Indicators*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eag-2015-en* for earnings gaps by skills or education levels.

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Table Q. **Public expenditure and participant stocks in labour market programmes in OECD countries, 2013 and 2014**

	Public expenditure (% of GDP)								Participant stocks (% of labour force)			
	Total		Active programmes		*of which:* Active measures not including PES and administration		Passive programmes		Active measures not including PES and administration		Passive programmes	
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
Australia	0.88	0.94	0.24	0.26	0.08	0.09	0.64	0.68	1.99	1.93	6.72	6.96
Austria	2.16	2.20	0.75	0.80	0.59	0.62	1.40	1.41	3.88	3.76	6.88	7.21
Belgium	2.77	2.65	0.72	0.74	0.52	0.52	2.05	1.91	6.27	6.66	18.76	15.74
Canada	0.80	0.79	0.24	0.22	0.14	0.12	0.57	0.57	0.51	0.49	2.69	2.64
Chile	0.36	0.42	0.10	0.11	0.07	0.08	0.26	0.31	..	..	1.85	2.07
Czech Republic	0.54	0.59	0.30	0.37	0.19	0.24	0.25	0.23	1.05	1.56	2.22	2.19
Denmark	3.45	3.33	1.81	1.91	1.49	1.60	1.65	1.42	6.08	6.17	6.14	5.52
Estonia	0.67	0.58	0.23	0.19	0.13	0.10	0.43	0.39	0.70	0.57	2.45	2.18
Finland	2.63	2.89	1.02	1.07	0.86	0.91	1.61	1.82	4.41	4.77	10.37	11.27
France	2.39	2.47	0.93	0.99	0.67	0.73	1.46	1.48	5.74	6.24	10.26	10.60
Germany	1.64	1.59	0.64	0.66	0.30	0.29	1.00	0.94	3.14	3.06	6.95	6.67
Greece	..	..	..	..	..	..	..	..	..	..	..	..
Hungary	1.12	1.12	0.78	0.86	0.70	0.77	0.34	0.26	7.02	5.31	5.67	4.25
Ireland	3.01	..	0.86	..	0.71	..	2.15	..	4.72	..	18.07	..
Israel	0.73	0.73	0.16	0.16	0.14	0.14	0.57	0.56	3.40	3.98	4.84	4.91
Italy	1.99	1.97	0.41	0.36	0.32	0.28	1.58	1.61	4.71	4.44	7.03	6.46
Japan	0.41	0.36	0.18	0.17	0.11	0.10	0.22	0.20	..	..	..	..
Korea	0.73	0.75	0.44	0.45	0.41	0.42	0.29	0.30	..	..	..	..
Luxembourg	1.47	1.41	0.62	0.65	0.58	0.60	0.85	0.76	9.49	9.86	6.25	3.86
Mexico	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	..	..	..	..
Netherlands	2.79	3.03	0.84	0.83	0.58	0.55	1.95	2.20	4.08	3.99	9.59	9.85
New Zealand	0.70	0.72	0.27	0.33	0.18	0.16	0.43	0.39	2.47	2.18	2.84	2.68
Norway	0.83	0.88	0.50	0.50	0.37	0.37	0.33	0.38	2.06	1.92	1.99	2.15
Poland	0.84	..	0.49	..	0.41	..	0.35	..	3.14	..	2.79	..
Portugal	2.15	1.89	0.50	0.57	0.46	0.53	1.65	1.32	3.91	5.30	8.07	6.94
Slovak Republic	0.62	0.55	0.22	0.20	0.17	0.16	0.40	0.35	2.45	2.42	2.30	2.09
Slovenia	1.18	0.98	0.38	0.37	0.28	0.28	0.80	0.61	1.84	1.85	2.98	2.37
Spain	3.37	..	0.50	..	0.42	..	2.87	..	7.90	..	12.36	..
Sweden	2.03	1.95	1.35	1.34	1.07	1.08	0.68	0.62	5.34	5.35	5.44	5.09
Switzerland	1.19	1.19	0.56	0.57	0.46	0.46	0.63	0.61	1.20	1.21	2.57	2.40
United Kingdom	..	..	..	..	..	..	..	..	..	..	..	..
United States	0.36	0.29	0.12	0.11	0.09	0.08	0.24	0.18	..	..	..	..
OECD	1.46	1.34	0.54	0.55	0.42	0.42	0.92	0.80	3.90	3.77	6.46	5.48
Latvia	0.54	0.53	0.23	0.17	0.19	0.14	0.31	0.36	1.50	1.22	3.00	3.47
Lithuania	0.46	0.43	0.24	0.24	0.19	0.18	0.22	0.19	1.31	1.51	2.32	2.19

Note: The data shown should not be treated as strictly comparable across countries or through time, since data at the level of individual countries in some cases deviate from standard definitions and methods and certain programmes or programme categories are not always included in the data for participants stocks. OECD average has variable country coverage. See *www.oecd.org/els/emp/employment-outlook-statistical-annex.htm* which provides a general introductory note about scope and comparability, tables for expenditure and participants in the main programme categories and subcategories, country-specific notes, and access to the online database. Fiscal years for Australia, Canada, Japan, New Zealand, the United Kingdom and the United States.

Source: For European Union countries and Norway, European Commission (2016), *Labour Market Policy*, *http://ec.europa.eu/eurostat/web/labour-market/labour-market-policy/database* and detailed underlying data supplied to OECD by the European Commission with certain Secretariat adjustments. For other countries: *OECD Database on Labour Market Programmes*, *http://dx.doi.org/10.1787/data-00312-en*.

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