OECD Employment Outlook 2012

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OECD Employment Outlook 2012

The *OECD Employment Outlook*

Provides an annual assessment of key labour market developments and prospects in member countries. In addition, each issue 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. Reference statistics are also included.

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Table of Contents

Editorial: Achieving a Sustainable Recovery – What Can Labour Market Policy Contribute? . . . 9

Chapter 1. **Waiting for the Recovery: OECD Labour Markets in the Wake of the Crisis** . . . 13

Key findings . . . 14
Introduction . . . 16
1. Recent labour market developments and future prospects . . . 16
2. A growing marginalisation among the jobless? . . . 24
3. Has structural unemployment started to increase? . . . 31
Conclusions . . . 42
Notes . . . 43
References . . . 45
Annex 1.A1. OECD Labour Market Projections from May 2012 . . . 47
Annex 1.A2. Job-vacancy Statistics . . . 50

Chapter 2. **What Makes Labour Markets Resilient During Recessions?** . . . 53

Key findings . . . 54
Introduction . . . 56
1. The impact of the global financial crisis on labour markets and the role of policies: A first look . . . 57
2. Macroeconomic analysis of the role of structural policies and institutions for labour market resilience . . . 71
3. Microeconomic analysis of the role of structural policies and institutions for labour market resilience . . . 83
Conclusions . . . 98
Notes . . . 99
References . . . 105

Chapter 3. **Labour Losing to Capital: What Explains the Declining Labour Share?** . . . 109

Key findings . . . 110
Introduction . . . 112
1. Trends in the labour share . . . 113
2. What explains the within-industry decline of the labour share? . . . 126
3. Collective bargaining, workers' bargaining power and the labour share . . . 134
4. Minimum wages, employment protection and the labour share . . . 145
Conclusions . . . 147

Notes . . . 148
References . . . 152
Annex 3.A1. Data Construction and Sources . . . 158

Chapter 4. **What Green Growth Means for Workers and Labour Market Policies: An Initial Assessment** . . . 163

Key findings . . . 164
Introduction . . . 165
1. The labour market implications of a transition to green growth: Insights from general-equilibrium modelling . . . 167
2. Direct impacts on employment and skill requirements in key winning and losing sectors: Lessons from partial-equilibrium analysis . . . 178
3. An active role for labour market and skill policies: Establishing good general framework conditions . . . 193
4. An active role for labour market and skill policies: What role or green-specific measures? . . . 201
Conclusions . . . 209
Notes . . . 210
References . . . 213
Annex 4.A1. List of Industries Used in the Analysis of Worker Mobility in Section 2 . . . 218

Statistical Annex . . . 219

Tables

1.A1.1. Recent and projected developments in OECD countries . . . 48
3.1. Structure of collective bargaining systems: Bargaining levels and co-ordination . . . 140
4.1. Selected evaluations of the economic impact of mitigation policies . . . 169
4.2. Economic impact of mitigation policies for various recycling options . . . 172
4.3. Towards a taxonomy of factors shaping cross-country differences in the green growth challenge for labour market and skill policies . . . 207
4.A1.1. List of industries and industry codes used in Section 2 . . . 218
A. Harmonised unemployment rates in OECD countries . . . 222
B. Employment/population ratios, activity and unemployment rates . . . 223
C. Employment/population ratios, activity and unemployment rates by selected age groups . . . 226
D. Employment/population ratios, activity and unemployment rates by educational attainment, 2010 . . . 235
E. Incidence and composition of part-time employment . . . 238
F. Incidence of temporary employment . . . 240
G. Average annual hours actually worked per person in employment . . . 242
H. Incidence of long-term unemployment . . . 244
I. Earnings dispersion, gender wage gap and incidence of low pay . . . 247
J. Average annual wages in the total economy . . . 248
K. Public expenditure and participant stocks in labour market programmes in OECD countries . . . 249

Figures

1.1. A weak and uneven economic recovery 17
1.2. Unemployment is projected to remain high in OECD countries 19
1.3. The recovery is not strong enough to reduce the jobs gap 20
1.4. The recovery differs across socio-economic groups 21
1.5. Evolution of unemployment-exit probabilities 25
1.6. Evolution of unemployment by duration, 2007 Q1-2011 Q4 27
1.7. Unemployment is becoming more persistent 28
1.8. Youth and low skilled workers are at greater risk of long-term unemployment 30
1.9. The number of persons marginally attached to the labour force has increased 31
1.10. Structural unemployment has increased in most countries, but so far the increase remains small 32
1.11. Beveridge curves in selected OECD countries 34
1.12. Comparing actual and predicted job-finding and job-filling rates 36
1.13. The evolution of hires by worker group and sector since the start of the crisis 42
2.1. The change in unemployment and labour income by country during the crisis and initial recovery 60
2.2. The response of unemployment and labour income to the change in GDP by country during the crisis and initial recovery 62
2.3. Decomposing the change in the unemployment rate by country during the crisis and initial recovery 63
2.4. The change in employment and average hours worked by age, education and type of contract 66
2.5. Change in selected labour market institutions in OECD countries, 1995-2007 . . 68
2.6. Harmonised unemployment rates in OECD countries, 1995 Q1-2007 Q4 70
2.7. The role of policies and institutions for the rate of structural unemployment 72
2.8. The role of policies and institutions for trend total earnings, employment and earnings per worker 74
2.9. The role of reforms for structural labour market outcomes 75
2.10. Aspects of labour market resilience by country 78
2.11. The role of policies and institutions for labour market resilience 79
2.12. Comparing the actual and predicted evolution in unemployment and earnings across countries 81
2.13. Achieving good labour market performance over the course of the business cycle 82
2.14. Cross-country differences in economic structure (“structure heterogeneity”) . . . 85
2.15. Differences in output shocks across countries, industries and firm size groups (“shock heterogeneity”) 86
2.16. Differences in the sensitivity of labour inputs to output shocks across countries, industries and firm size groups (“response heterogeneity”) 87
2.17. Decomposition of cross-country variation in labour market adjustment during the crisis, 2008-09 89

2.18. The effect of employment protection on the responsiveness of employment and earnings per worker to output shocks . . . 93
2.19. The effect of collective wage bargaining coverage on the responsiveness of employment and earnings per worker to output shocks . . . 94
2.20. The simulated impact of economic downturns on household income . . . 95
2.21. The simulated impact of economic downturns on household income inequality . . . 97
3.1. The decline of the labour share in OECD countries, 1990-2009 . . . 113
3.2. Changes in the labour share and in income inequality, 1990s to mid-2000s . . . 114
3.3. The decline of the business-sector labour share in OECD countries, 1990-2007 . . . 117
3.4. Within- and between-industry changes in the business-sector labour share, 1990-2007 . . . 120
3.5. Average within-industry changes in the labour share, by industry, 1990-2007 . . . 121
3.6. The role of real wage, productivity and prices in explaining trends in the business-sector labour share, 1990-2007 . . . 122
3.7. Changes in the shares of different occupational groups in total hours worked, 1993-2006 . . . 123
3.8. Decomposition of changes in the shares of different education groups in total compensation, 1997-2004 . . . 125
3.9. TFP growth, capital accumulation and within-industry decline of the labour share . . . 128
3.10. Intra-industry offshoring and within-industry decline of the labour share . . . 132
3.11. Privatisation, reduction in entry barriers and within-industry decline of the labour share . . . 134
3.12. Trade union density and collective bargaining coverage, 1990 and latest year . . . 136
3.13. Change in trade union density and in collective bargaining coverage, 1990 and latest year . . . 137
3.14. Evolution of labour shares and bargaining coverage . . . 138
3.15. Minimum wages, employment protection and the labour share . . . 146
4.1. An illustrative mitigation policy scenario for GHG emissions and its impact on GDP growth in OECD countries . . . 171
4.2. Simulated changes in sectoral composition of employment, OECD . . . 173
4.3. Sectoral impact of mitigation policies on employment compared with historical benchmarks, OECD . . . 174
4.4. GDP and employment impacts for different degrees of labour market rigidity when ETS revenues are recycled in the form of lump-sum transfers, OECD . . . 176
4.5. GDP and employment impacts for different recycling options of ETS revenues and an intermediate degree of labour market rigidity, OECD . . . 177
4.6. Projected global employment in the renewable energy sector by 2030 . . . 181
4.7. CO_2-emissions and employment by industry in 25 EU countries, 2005 . . . 187
4.8. Employment share of the most polluting industries in selected EU countries, 2000-07 . . . 188

4.9. Employment share of the most polluting industries in selected EU countries by skill, age and contract type, 2000-07 190
4.10. Worker mobility and CO_2 intensity in 15 European countries 192
4.11. Employment protection and product market regulation, 2008 199
4.12. Green-specific national labour market programmes implemented by OECD countries, 2010. 203

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Editorial

Achieving a Sustainable Recovery – What Can Labour Market Policy Contribute?

Unemployment remains high, bearing heavily on youth and the long-term unemployed, and the pace of labour market recovery is flagging.

The OECD-wide unemployment rate was 7.9% in May 2012, equivalent to around 48 million people out of work – almost 15 million more than when the financial crisis began at the end of 2007. OECD economic projections from May 2012 indicate that job creation will continue to be weak in many OECD countries and that unemployment may remain around 8% in the OECD area at the end of 2013. The outlook is even more discouraging in the euro area, where unemployment is rising again and is projected to rise further before stabilising in 2013.

Persistently high levels of youth unemployment are of particular concern. The youth unemployment rate for the OECD area was just over 16% in May 2012, unchanged from one year previously. This rate varies from a low of around 8% in Germany to more than 50% in Greece and Spain. The slow pace of job growth has also been reflected in a rise in long-term unemployment. By the last quarter of 2011, more than 35% of all those unemployed in the OECD area had spent a year or more out of work and looking for a job. In EU countries, around 44% of all unemployed were long-term unemployed, on average, and the United States has recorded an unprecedented increase in the share of long-term unemployment, going from around 10% of all unemployment in 2007 to around 30% in the first quarter of 2012.

Labour market recovery is largely dependent upon a quick resolution to the euro crisis and appropriate macroeconomic policies…

In the short term, an improvement in labour market conditions is largely dependent upon a broader economic recovery and is thus shaped by factors that labour market authorities cannot control directly. For example, the recent divergence between declining unemployment in the United States and rising unemployment in many countries in the euro

area reflects the impact of the banking and sovereign debt crisis in a number of European countries. The resulting stress in European financial markets, coupled with a sharp shift toward fiscal consolidation, is depressing aggregate demand and job creation in Europe.

Countries must respond to these developments with appropriate macroeconomic policy measures, including taking immediate steps to stabilise the European banking system. There is also a case for some further fiscal policy easing in those countries that still have some flexibility in this area, although this must be grounded in a credible medium-term strategy of fiscal consolidation. In addition, further monetary policy easing can play a crucial role in Europe to support growth in the short term.

… but labour market policies still have a vital role to play to boost job creation and support long-term labour supply.

Despite the macroeconomic headwinds, a well-designed package of labour market policies can play an important supportive role in helping to boost job creation. They can minimise the long-term costs of high unemployment and help to lay the foundation for a sustainable return to high employment rates and rising earnings. In particular, policy makers must ensure that the sustained period of high labour market slack does not undermine the recovery by raising the level of structural unemployment or permanently depressing labour supply. This report shows that the unemployed have become increasingly marginalised over the past few years, with a rising share of them having drifted into long-term unemployment or dropped out of the labour force due to discouragement about their job prospects. Many individuals encountering similar difficulties during earlier recessions left the workforce permanently. This was in part because public authorities sometimes viewed labour supply losses due to early retirement or to a switch to long-term sickness and disability benefits as a way to lower high unemployment figures. It is essential to avoid repeating that mistake by helping jobless workers to maintain contact with the labour market and to get back into employment as soon as possible. It is also important to ensure that the skills and motivation of jobless workers, especially those who are young and not in education, are not degraded through prolonged spells of unemployment, as this would be detrimental to their future earnings and employment prospects.

Active labour market programmes that work must play a key role…

Firstly, a comprehensive package of effective re-employment services must be available for the unemployed through private and public employment services. Considerable hiring continues despite high labour market slack, and job-search assistance should remain the first line of support for many unemployed, especially those who are job-ready. However, employers are at present very selective in their hiring strategies, making it very difficult to place some job seekers into jobs quickly. Training programmes and even publically subsidised work-experience programmes can help prevent this latter group from becoming demoralised, while preparing them to take advantage of new job opportunities when labour market conditions improve. Targeted job subsidies for new hires by employers which are tied to a *net* increase in jobs should also be considered rather than across-the-board reductions in payroll taxes, which are likely to be less cost effective. For youth, there

is a need to expand or create "study and work" programmes, such as apprenticeships and other dual vocational education and training programmes. Since the number of job seekers requiring these intensive services has risen in the wake of the crisis, it is important to target programmes carefully on the most disadvantaged groups in the labour market and, when feasible, temporarily expand funding levels for the most cost-effective active labour market programmes (ALMPs).

... and should be adequately funded, even in countries where fiscal consolidation requires overall cuts in public spending.

New analysis in this report shows that OECD governments scaled up ALMP spending more strongly following the onset of the financial crisis than in earlier recessions, probably due to their fuller appreciation of the need to retain an activation stance even during a deep recession. However, these spending increases were modest in scale and the resources available per unemployed job seeker have declined by 21% on average (in real terms) across the OECD between 2007 and 2010. This suggests that ALMP spending should generally be spared when implementing broad spending cuts as part of current, short-term fiscal consolidation packages.

Automatic expansions of active and passive labour market programmes during recessions should be given serious consideration…

More generally, serious consideration should be given to redesigning both active and passive labour market programmes so that they automatically expand and contract in response to cyclical variations in the number of job seekers. For example, the *OECD Employment Outlook 2011* analysed how Canada adjusts the maximum benefit duration in its unemployment benefit system (Employment Insurance) with the state of the business cycle, allowing those who become unemployed during a recession to receive more months of benefits at times when it is more difficult to find a new job. Similarly, in Denmark and Switzerland, ALMP expenditures adjust automatically to changes in the level of unemployment. Once the current recovery is better established, the usefulness of a wider adoption of such business-cycle-contingent measures should be investigated urgently.

... but this would require tackling capacity constraints to expanding ALMPs during recessions.

Increasing ALMP spending during a recession is only useful if it is possible to scale up quickly cost-effective re-employment services. Unfortunately, very little is known about how feasible it is to expand these services while maintaining quality standards. It will thus be useful to carefully evaluate how effective the recent expansions have been, including the use of partnerships with private employment agencies to more rapidly expand the capacity to deliver employment services under performance-oriented contracts.

Policy makers should also consider undertaking structural reforms to improve labour market resilience to future adverse shocks.

Even though the current recovery is far from complete, it is not too early to consider how labour market policies and institutions can be reformed in order to increase labour market resilience to negative economic shocks. Indeed, the labour market has proved to be more resilient in some countries than in others during the recent economic and financial crisis. While the unemployment rate rose substantially in most OECD countries, it declined significantly in Germany and remained in the range of 3.5-5.5% in a number of other countries (Australia, Austria, Japan, Korea, Luxembourg, Netherlands, Norway and Switzerland). This report identifies structural reforms that could increase resilience, allowing higher employment and earnings levels to be sustained during future recessions. The findings are encouraging in that they suggest that some of the policies known to foster strong labour market performance in the long run, such as those highlighted in the Reassessed OECD Jobs Strategy of 2006, also contribute to greater labour market resilience to adverse shocks.

Labour market reforms will be more effective if combined with other structural reforms.

A broader package of labour and product market reforms is more likely to deliver larger overall gains in job creation and labour market performance than individual reforms. For instance, several countries have recently announced or implemented reforms to tackle labour market duality by reducing the gap in employment protection between permanent and temporary workers (Greece, Italy, Portugal and Spain). The impact of these reforms both on employment growth and on the efficiency in the allocation of labour to the most productive uses could be boosted by competition-enhancing product market reforms in sectors in which there is a strong potential for job creation, such as retail trade and professional services.

More than ever, these reforms must be pursed vigorously to reduce long-term unemployment and promote better employment prospects for youth.

This is clearly a demanding time for labour market authorities. They are confronted with a slow and uneven recovery, a growing risk of increased structural unemployment in some countries and tighter constraints on public expenditures. While the constellation of challenges sketched out above is unprecedented in some respects, policy makers need to push ahead with implementing bold structural reforms, along the lines spelled out above, together with investing in those active labour market policies that work. In this way, they can best tackle long-term unemployment, boost job creation and improve employment prospects for youth.

John P. Martin
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and Social Affairs, OECD

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Chapter 1

Waiting for the Recovery: OECD Labour Markets in the Wake of the Crisis

The economic recovery has been weak or uneven and some countries have fallen back into recession. This chapter examines the implications of the lack of a vigorous recovery for OECD labour markets. Its main findings are threefold. First, almost three years since the start of the economic recovery, economic growth has not been strong enough to make more than a small dent in the cyclical hike in OECD-wide unemployment. Second, there has been an increasing marginalisation of the jobless through an increase in the number of long-term unemployed and of discouraged workers leaving the labour force. Third, there is a growing risk that at least part of the cyclical increase in unemployment may become structural even if this has only materialised to a limited extent so far. From a policy perspective, the key priority is to underpin aggregate demand. This requires appropriate macroeconomic policies coupled with structural reforms that promote a prompt and solid recovery in output and job creation. Labour market policies also have a key role to play in helping unemployed job seekers get back into work and addressing structural obstacles that prevent them from finding jobs.

Key findings

The economic recovery has been weak or uneven across the OECD countries, and some countries have fallen back into recession. While the recovery in OECD-wide economic growth was initially similar in strength to those following the recessions of the early 1990s and early 2000s, it has since slowed down and become by far the weakest recovery of the past four decades. This chapter examines the implications of the lack of a vigorous recovery for OECD labour markets. Its main findings are:

- The fragile economic recovery that occurred in 2010 and 2011 has not been strong enough to make more than a small dent in the cyclical hike in labour market slack that took place as a result of the global financial crisis:
  - Almost three years into the economic recovery, the OECD-wide unemployment rate declined by just 0.6 of a percentage point from a post-war high of 8.5% in October 2009 to 7.9% in May 2012. This leaves more than 48 million people unemployed throughout the OECD, almost 15 million more than at the start of the jobs crisis in December 2007. According to the OECD's latest projections of May 2012, the unemployment rate is expected to remain persistently high, with only a small fall to 7.7% by end 2013.
  - The employment gap, *i.e.* the percentage increase in employment required to restore the employment-to-population ratio to its pre-crisis level, remains substantial. The OECD-wide employment gap increased from 2% at the start of the economic recovery in the second quarter of 2009 to 2.5% in the last quarter of 2011. This implies that the OECD area needs to create about 14 million jobs to restore pre-crisis employment rates. OECD projections suggest that this measure of labour market slack is expected to stay constant in 2012 and decline to 1.8% by end 2013.
  - The employment situation of youth and the low-skilled remains particularly depressed. Low-skilled employment has decreased since the start of the crisis by almost 5 percentage points relative to overall employment, while youth employment has declined by almost 7 percentage points. The situation may now be stabilising for youth though not yet for the low-skilled. Temporary employment has picked up strongly and now accounts for a higher share of overall employment than before the crisis. This reflects the reluctance of firms to rehire workers on open-ended contracts in an uncertain economic environment.
  - Since the beginning of the crisis, there has been a striking diversity across OECD countries in labour market performance. The unemployment rate has remained within the 3.5-5.5% range in nine countries (Australia, Austria, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway and Switzerland) and has declined considerably since the start of the crisis in Germany from 8.2% in December 2007 to 5.6% in May 2012. At the other end of the scale, nine countries had double-digit unemployment rates in May 2012 (Estonia, France, Greece, Hungary, Ireland, Italy, Portugal, the Slovak Republic, and Spain). For the European Union as a whole, the unemployment rate has been rising since the end of 2011, whereas there has been a renewed decline in the United States over the same period.

- The absence of a strong recovery in aggregate demand has led, in most countries, to an increasing marginalisation of the jobless through an increase in the number of long-term unemployed and the number of discouraged job seekers leaving the labour force:
  - Long-term unemployment of more than one year has continued to rise in the OECD area. As a ratio of the labour force, it has increased from 1.6% at the start of the crisis to 2.9% in the fourth quarter of 2011. As a share of total unemployment, the OECD average has increased from 27% to 35% over the same period. The rate of very long-term unemployment, those unemployed for two years or more, has also increased from 0.9% at the start of the crisis to 1.5% in the fourth quarter of 2011.
  - The working-age population share of marginally attached workers, defined as persons out of the labour force who are willing to work and available for work, but are not actively seeking work, has increased by 0.3 of a percentage point since the crisis began. While this seems small, it represents an increase of more than 30% in its level since the start of the crisis. The rise in the number of marginally attached workers reflects an increasing number of job seekers who have become discouraged from actively looking for work because of the difficulty of finding a job. Inactivity for other reasons has been largely constant and has fallen somewhat for women.
- In addition to raising concerns about the well-being of those concerned and their families, the increasing marginalisation of the jobless also raises the spectre of the cyclical increase in unemployment becoming a structural increase:
  - A commonly-used measure of structural unemployment is the non-accelerating inflation rate of unemployment, or NAIRU. OECD estimates of the NAIRU suggest that it has risen in the majority of countries since the crisis began. In Estonia, Greece, Ireland, Portugal and Spain, the NAIRU has increased by more than 2 percentage points. Nevertheless, the estimated increase in the NAIRU tends to be small relative to the *actual* increase in the unemployment rate.
  - A complementary approach to documenting recent developments in structural unemployment is based on the Beveridge curve, which charts the negative relationship between job vacancies and unemployed job seekers over the business cycle. During the recession of 2008 and 2009, labour market slack has increased resulting in a shift down along the Beveridge curve. However, since the middle of 2010 the Beveridge curve has started to move outwards in many countries. This may simply reflect the normal cyclical pattern where a recovery in vacancies is not immediately reflected in declines in unemployment. However, it may also reflect an increase in matching frictions, related to the build-up of long-term unemployment or the need for structural change in the labour market. In comparison with the period following the bursting of the dotcom bubble, the outward shift of the Beveridge curve in Sweden, the United Kingdom and the United States has been particularly notable.
  - A more detailed analysis of matching frictions based on the actual and predicted evolution in job-finding and job-filling rates suggests that matching frictions have evolved very differently across countries during the current economic recovery. Matching frictions appear to have increased in countries such as Norway, the Slovak epublic, Spain, Sweden and the United States. However, in countries such as Estonia and the Netherlands matching frictions may have decreased.

Given the current extent of cyclical labour market slack, the main policy priority from a labour market perspective should be to underpin aggregate demand. Given that monetary policy is already fairly accommodative and that the space for supportive fiscal policy is very limited in most OECD countries, placing more emphasis on structural reforms in product and labour markets will be key for the recovery. But labour market policies have also a crucial role to play in containing the risk of rising unemployment by: *i*) making sure that job losers, and particularly those at risk of long-term unemployment, do not see their skills depreciate as a result of prolonged joblessness and will be readily employable once the labour market recovers; and *ii*) addressing structural bottlenecks that prevent specific groups of workers from regaining employment and specific firms from filling vacant jobs.

Introduction

The economic recovery has been weak or uneven and some countries have fallen back into recession. For the OECD as a whole, its strength was initially on a par with the two most recent previous recoveries in the early 1990s and early 2000s. However, in the wake of a sharp slowdown in the pace of the recovery in the second-half of 2011, it has become by far the slowest recovery of the post-war period. This has important implications for reducing labour market slack and for the job prospects of the unemployed. In particular, there is a growing risk that a rising share of the unemployed will become disconnected from the labour market and, subsequently, more difficult to re-integrate into work once the labour market recovers. In other words, there is an increasing risk that the cyclical increase in unemployment will become structural.

This chapter examines how OECD labour markets have fared during the recovery in 2010 and 2011, with a focus on those groups that are at high risk of marginalisation. It also assesses the risk that the rise in cyclical unemployment will translate into a rise in structural unemployment. The chapter is organised as follows. Section 1 reviews recent labour market developments and discusses future prospects for 2012 and 2013. Section 2 documents the potential implications of the economic crisis and weak recovery for the marginalisation of the unemployed. It describes recent trends in long-term unemployment, very long-term unemployment and the number of persons marginally attached to the labour force. Section 3 discusses the possible implications of the weak recovery and the growing marginalisation of the workforce for the risk that the cyclical increase in labour market slack becomes structural. The last section briefly sums up the chapter's analysis and offers some policy recommendations and suggestions for future research.

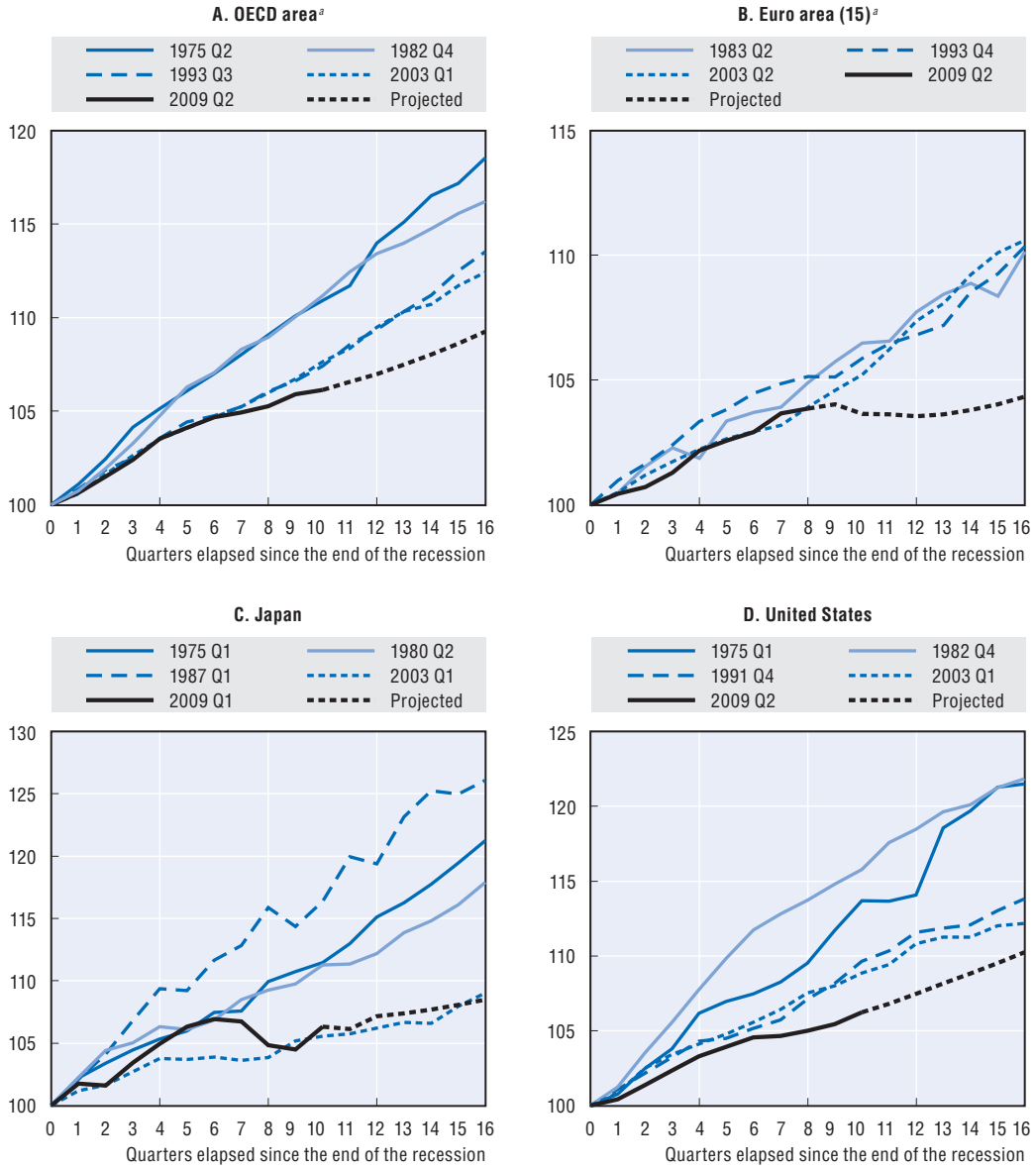
1. Recent labour market developments and future prospects

The economic recovery has been particularly weak and uneven

The recovery from the financial and economic crisis that hit global markets in 2008 and 2009 has been feeble in most OECD countries and even went into reverse in a few of them (Figure 1.1 and Table 1.A1.1 at the end of this chapter). After a fall in GDP of about 4% during the economic downturn, OECD-wide economic growth rebounded in 2010 to 3.2%, but has slowed since. It decreased to 1.8% in 2011 and is projected to slow to 1.6% in 2012 before it will strengthen to 2.2% in 2013. Figure 1.1 compares the evolution of GDP since the start of the recovery with the pattern observed during previous economic recoveries. Panel A shows that during the first and much of the second year of the recovery, OECD-wide economic growth was similar to the experience of the recoveries that followed

Figure 1.1. **A weak and uneven economic recovery**

Index base 100 = real GDP at the business-cycle trough of the output gap, quarterly data



a) Aggregated real GDP (excluding Cyprus and Malta for euro area [15]).

Source: OECD calculations based on *OECD Economic Outlook*, No. 91.

StatLink http://dx.doi.org/10.1787/888932650819

the recessions of the early 1990s and early 2000s, but considerably weaker than that observed during the recoveries following the oil shocks in the 1970s. However, it also shows that the recovery has lost steam relative to previous recovery episodes from its second year onward, making it by far the slowest economic recovery of the post-war period. The pattern is broadly similar for the euro zone, Japan and the United States, although there are some differences in the strength of the initial recovery and the recent slowdown. Emerging OECD economies have tended to do substantially better, with growth rates generally averaging well over 3% during the recovery period. By contrast, in a number of European countries, including Greece, Hungary, Italy and Portugal, the economic recovery went into reverse in

the second half of 2011 or has not yet started. The slow recovery in output in the majority of countries is consistent with historical evidence provided by Reinhart and Rogoff (2009) that output takes longer to recover in the aftermath of a financial crisis.

Unemployment remains persistently high

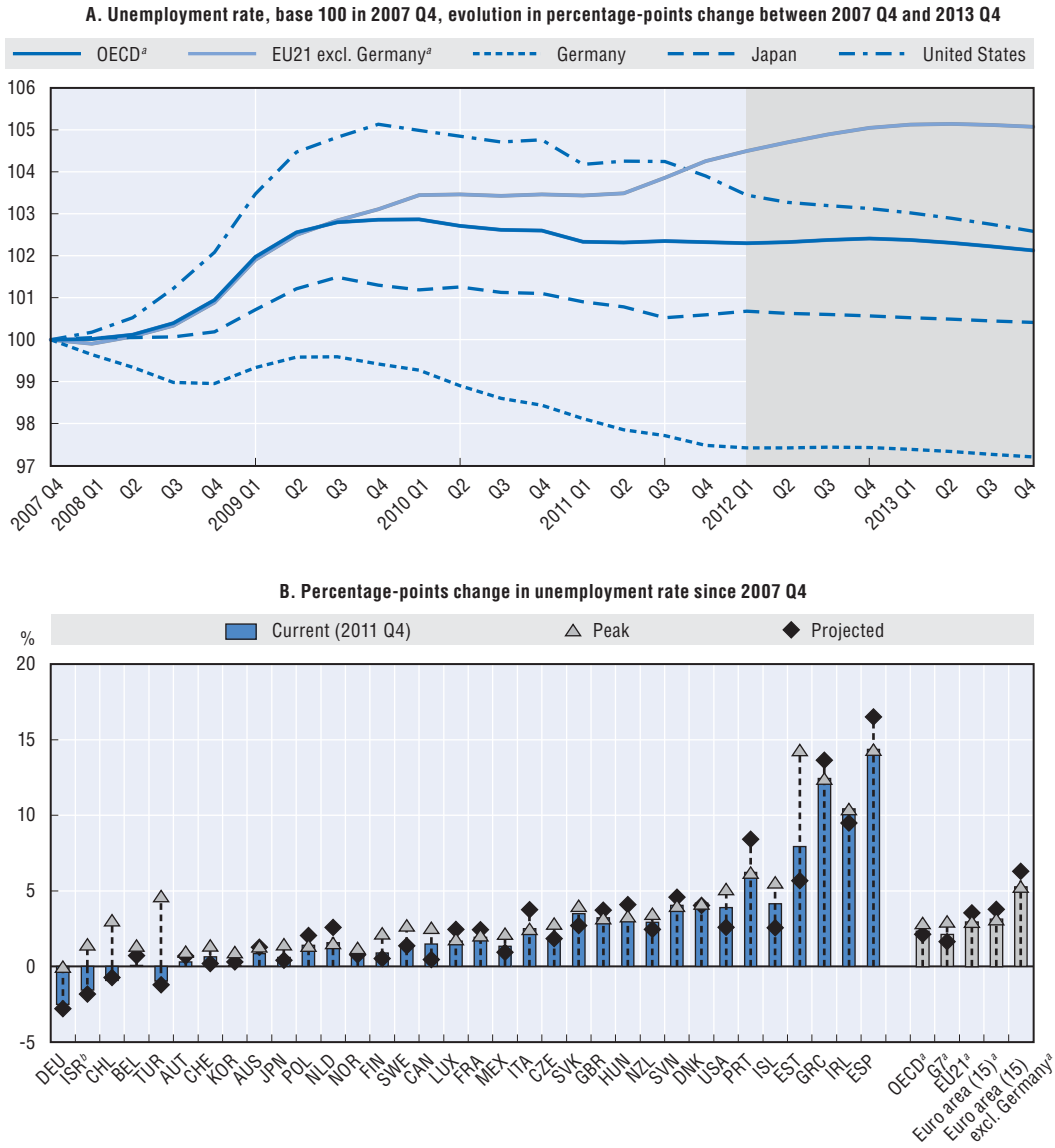
As a result of the weak economic recovery, the unemployment rate has declined only modestly in the two years since reaching its cyclical peak in late 2009. The OECD-wide unemployment rate decreased from a post-war high of 8.5% in October 2009 by just 0.6 of a percentage point to 7.9% in May 2012, leaving more than 48 million people unemployed throughout the OECD, almost 15 million more than at the start of the jobs crisis in December 2007. According to the OECD's latest short-term economic projections of May 2012, the unemployment rate is expected to remain persistently high for an extended period of time. This is illustrated clearly in Panel A of Figure 1.2, which represents the evolution of the unemployment rate since the start of the crisis. It shows for the OECD area as a whole that, by the middle of 2009, the unemployment rate had increased rapidly by over 3 percentage points as a result of the crisis. It has since come down very slightly and is expected to remain broadly stable until the end of 2013. This corresponds to an OECD-wide unemployment rate at the end of 2013 of 7.7%. The persistence of high unemployment raises important concerns about the ability of the unemployed to find jobs quickly if and when the economic recovery gathers pace.

The OECD-wide evolution of the unemployment rate hides important differences across countries, both in terms of the initial impact of the crisis and prospects for the recovery. The initial impact was particularly strong in Estonia, Iceland, Ireland, Spain, and the United States (Panel B of Figure 1.2). Of these countries, only in Estonia, where the proportional increase was most pronounced, has unemployment fallen significantly from its peak. In the United States, the unemployment rate has declined from 10% in October 2009 to 8.2% in May 2012. In Japan, the initial increase in the unemployment rate was muted and unemployment has declined rather quickly since reaching its cyclical peak. In Germany, where the unemployment rate increased only slightly during the first quarter of 2009, unemployment is now about 30% lower than at the start of the crisis, continuing its declining trend since the mid-2000s. In a number of other EU countries such as Austria, Belgium, France, Italy and the Netherlands, the initial impact of the crisis on the unemployment rate was also small, but there has been little sign of a recovery. Indeed, as a result of the euro zone sovereign debt crisis, unemployment rates are expected to increase further until the end of 2013 in the majority of EU countries, particularly those in the euro zone. Possible factors driving these country differences in the impact of the crisis on unemployment are explored further in Chapter 2 on labour market resilience.[1]

The employment gap remains substantial

The economic recovery has been insufficiently strong to prevent a further increase in the employment gap, *i.e.* the number of jobs that need to be created to restore the pre-crisis ratio of employment to the working-age population. Figure 1.3 presents the employment gap at the start of the recovery, at the latest time for which data are available (2011 Q4) and at 2013 Q4 using the OECD's projections from May 2012. Employment gaps in the OECD area have continued to widen through the early recovery period in most countries. The OECD-wide employment gap increased from 2% at the start of the economic recovery in 2009 Q2 to 2.5% in the last quarter of 2011. Given the current level of employment, this

Figure 1.2. **Unemployment is projected to remain high in OECD countries**



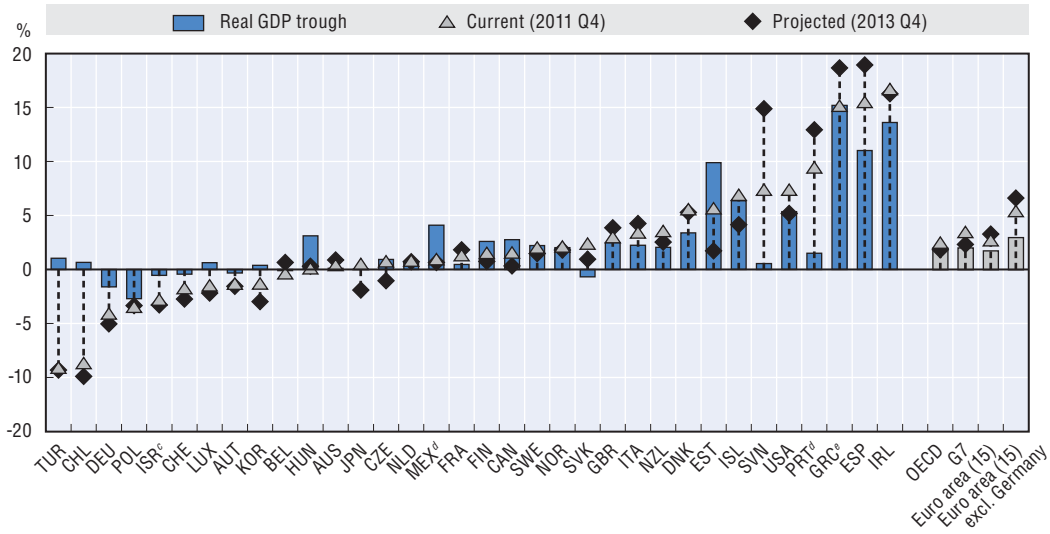
Note: Grey shading area refers to the OECD projections.
a) Aggregates are weighted averages.
b) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.
Source: OECD calculations based on *OECD Economic Outlook*, No. 91.

StatLink http://dx.doi.org/10.1787/888932650838

implies that the OECD area needs to create 14 million jobs to restore employment rates to pre-crisis levels. The projections suggest that the extent of labour market slack is expected to stay constant in 2012 before declining to 1.8% by the end of 2013, its level at the start of the economic recovery.[2] Thus, job creation is expected to remain insufficient to absorb the considerable labour market slack that has arisen as a result of the crisis.

Figure 1.3. **The recovery is not strong enough to reduce the jobs gap**

Jobs gap as percentage of actual employment[a, b]



Note: Countries are shown in ascending order of jobs gap in 2011 Q4.

a) The jobs gap at a particular date is defined as the increase in employment required to restore the ratio of employment to the working-age population to its value in 2007 Q4. GDP trough dates are defined as the start of the longest spell of consecutive increases in GDP since 2007 Q4. Further details are shown in Annex Table 1.A3.1 of OECD (2012a).

b) OECD, G7, euro area (15) and euro area (15) excluding Germany are weighted averages of countries shown.

c) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.

d) Adjusted series taking into account the break in series following the introduction of the 2010 Census for Mexico and the change in the LFS questionnaire for Portugal in 2011, respectively.

e) Real GDP trough refers to 2011 Q4 for Greece.

Source: OECD calculations based on *OECD Economic Outlook*, No. 91.

StatLink http://dx.doi.org/10.1787/888932650857

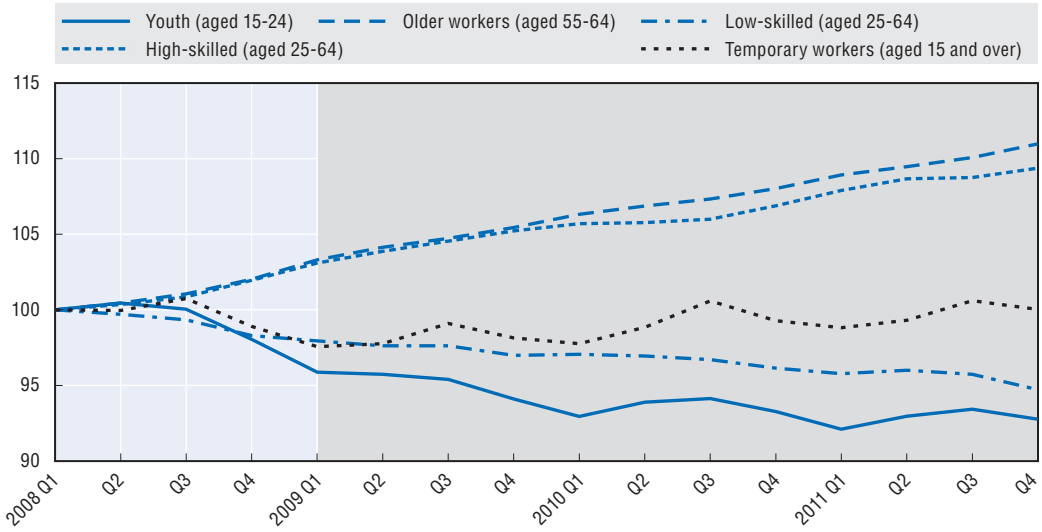
There are large differences in the estimated size of the employment gap across countries. The pattern is similar to the one for unemployment in Panel B of Figure 1.2, but there are some slight differences due to the role of labour force participation and the present focus on proportional rather than percentage-point changes. The employment gaps are largest in Greece, Ireland and Spain, where they exceed 15%. Employment gaps in Denmark, Estonia, Iceland, Portugal, Slovenia and the United States are also substantial (between 5% and 10%). In Estonia and Iceland, the employment gap is expected to fall below 5% by the end of 2013, while it is expected to increase significantly further in Greece, Portugal, Slovenia and Spain. The employment gap has fully closed in ten OECD countries and is expected to do so in two other countries by the end of 2013.

Employment outcomes continue to diverge across workforce groups

Previous editions of the *OECD Employment Outlook* have shown that the *initial* employment impact of the crisis differed importantly across socio-economic groups (OECD, 2009, 2010 and 2011a). In particular, it was shown that the decline in overall labour demand has been greatest for youth, low-skilled and temporary workers. This is confirmed in Figure 1.4, which shows the evolution of OECD-wide employment for selected groups *relative* to overall employment.[3] This figure also shows that employment growth has differed greatly across groups during the *economic recovery*.[4] On the one hand, temporary employment has increased relative to overall employment since the start of the recovery.

Figure 1.4. **The recovery differs across socio-economic groups**

Ratio of each group's employment relative to overall employment,[a] OECD average,[b] 2008 Q1-2011 Q4, index = 100 at the start of the crisis



Note: Grey shading area refers to the recovery period starting from the trough in OECD-wide GDP.

a) Series are smoothed using three-quarter centred moving averages.

b) OECD is the weighted average of 33 countries for data by age (excluding Chile), 30 countries for data by education (excluding Australia, Chile, Japan and New Zealand) and 28 countries for data on temporary workers (excluding the countries listed previously, Israel and the United States).

Source: OECD calculations based on *OECD Main Economic Indicators*, *OECD Labour Force Statistics Databases* and national labour force surveys.

StatLink http://dx.doi.org/10.1787/888932650876

According to the latest available data, the incidence of temporary employment is now higher on average across the OECD area (for those countries with comparable data available) than at the start of the crisis. The apparent reluctance of employers to re-hire workers on open-ended contracts may reflect the role of weak growth prospects and economic uncertainty. On the other hand, the employment situation of youth and low-skilled workers has continued to deteriorate during the recovery. Since the start of the crisis, low-skilled employment has declined by over 5 percentage points relative to overall employment in the fourth quarter of 2011. Moreover, there is no sign yet of any pick-up in employment of low-skilled workers, which may, in part, reflect the secular decline in the demand for low-skilled workers. Youth employment has declined even more than low-skilled employment, by over 7 percentage points relative to overall employment, but with some improvement in the two most recent quarters for which data are available.[5] The decline in youth employment is mirrored by a rise in the youth unemployment rate and, in those countries particularly hard hit by the crisis, an increase in youth enrolment rates in education and training activities (see Box 1.1 for details).

Box 1.1. **The share of youth at high risk of labour market marginalisation has increased**

The collapse in employment opportunities experienced by youth during the crisis is of particular concern because unemployment and other labour market difficulties encountered early in their working lives can jeopardise their long-term career paths and future earnings prospects (the so-called "scarring effect"). Youth not in employment, education or training (the so-called "NEETs") are most at risk of these scarring effects. The share of this group in the total youth population increased in the OECD area by 1 percentage point since the start of the crisis to 16.4% in the first quarter of 2011 (see Panel A in the figure below). Youth in this group may be either unemployed or inactive. The NEET rate for unemployed and inactive youth is represented separately in Panels B and C.

The NEET rate increased in all OECD countries except Austria, the Czech Republic, Portugal, Sweden and Turkey. Notable rises of more than 4 percentage points occurred in countries that were both hard hit by the crisis and where pre-crisis rates were already high (*e.g.* Ireland and Spain).

The increase in the NEET rate mainly reflects rising unemployment rate among youth outside of the education system. For the OECD area as a whole, the NEET rate of unemployed youth increased by 1.3 percentage points since the start of the crisis (corresponding to an increase of about 5 percentage points when expressed in terms of the youth labour force). There are striking differences across countries. Over the four year-period to the first quarter of 2011, the share of all youth who were unemployed and not in school rose sharply by 6.9 percentage points in Spain, to 12.6% in the first quarter of 2011. It increased by 5.4 percentage points in Ireland, by 3.5 percentage points in Greece and Slovenia and by 2 percentage points or more in four other countries (Estonia, New Zealand, the Slovak Republic and the United States). In contrast, this share dropped by more than 1 percentage point in Germany to 3.9% in the first quarter of 2011.

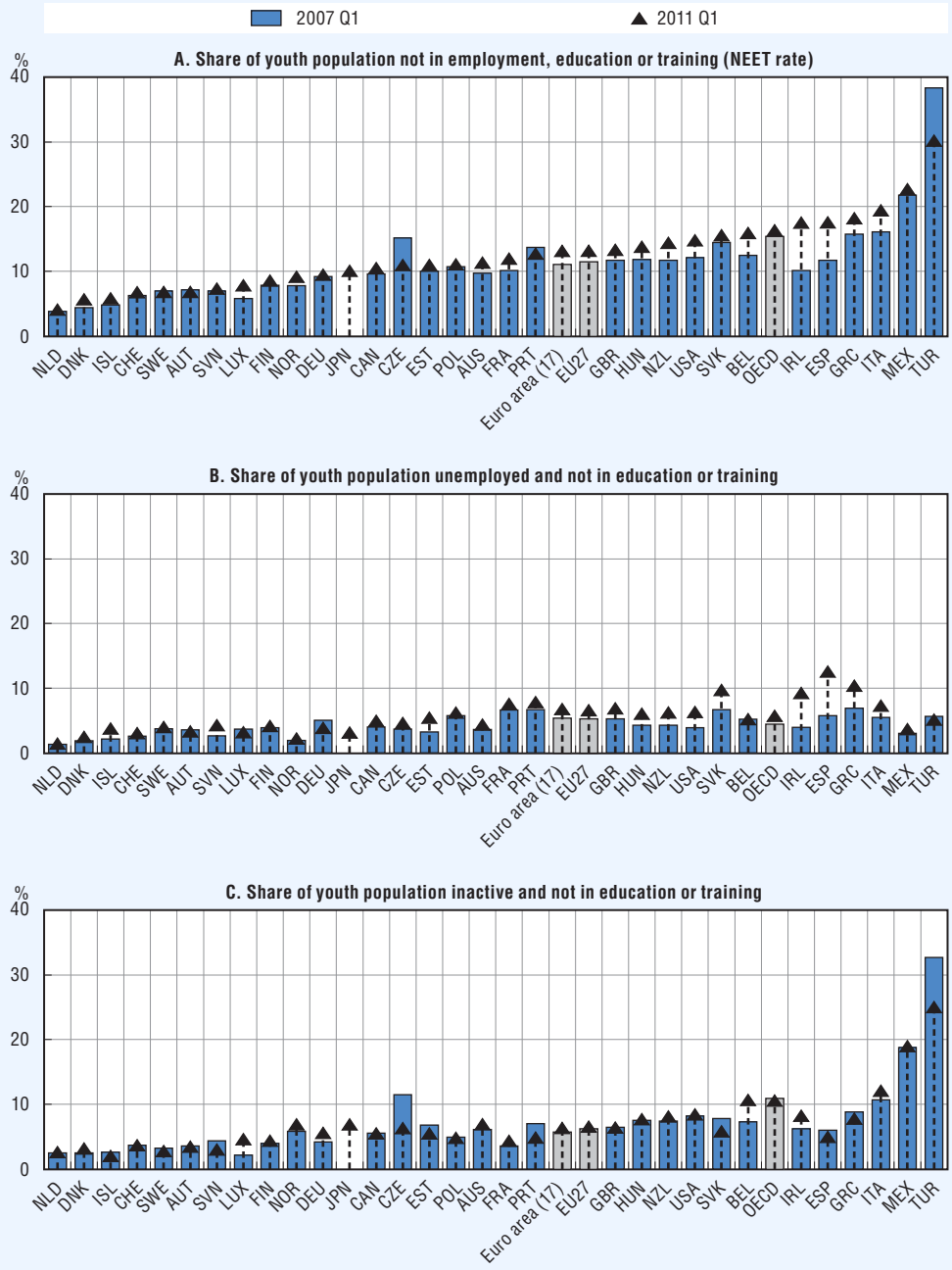
The share of all youth who were inactive and not in school declined slightly for the OECD as a whole, reflecting opposing patterns across countries. This means that in general the main concern is youth unemployment and not rising inactivity among youth (beyond education and training). However, in a few countries, such as Belgium, Ireland, Italy and Luxembourg, the share of inactive youth not in education or training has increased substantially.

In a number of the countries where NEET rates rose sharply in the aftermath of the crisis, there has also been a marked increase in the share of youth who are not working but studying. This share rose by more than 10 percentage points in Ireland, Iceland and Spain and 6 percentage points or more in the Czech Republic, Denmark, Iceland, Ireland, Norway, Portugal and Turkey.

Box 1.1. **The share of youth at risk of labour market marginalisation has increased** *(cont.)*

NEET rates among youth in OECD countries

Percentage of population aged 15-24,[a] 2007 Q1-2011 Q1[b]



Note: Countries are shown in ascending order of the NEET rate in 2011 Q1.

a) OECD, EU27 and euro area (17) are weighted averages. OECD includes 30 countries (excluding Chile, Israel, Japan and Korea).

b) 2007 Q2-2011 Q2 for Australia, 2007 Q2-2011 Q1 for Switzerland, and 2011 Q1 for Japan.

Source: OECD estimates based on national labour force surveys.

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2. A growing marginalisation among the jobless?

The weak economic recovery in many OECD countries has also increased the risk that a growing number of the unemployed will become disconnected from the labour market. This can be assessed by examining changes in: exit rates from unemployment; the duration of unemployment; and the extent of movements in and out of the labour force.

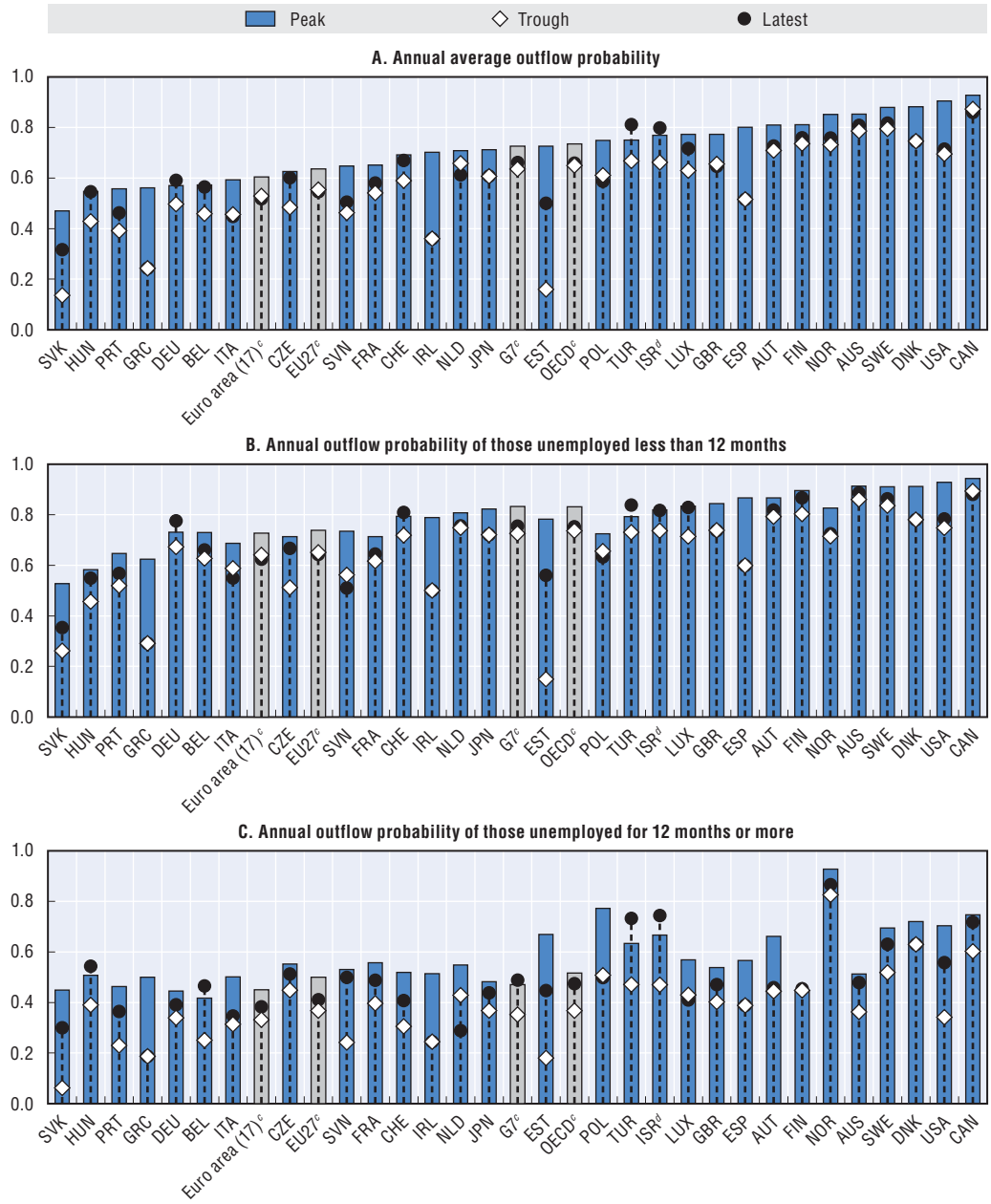
The decline in aggregate demand has reduced the job-finding prospects of job seekers…

The decline in aggregate demand during the crisis and the absence of a vigorous recovery have led to a reduction in hiring by employers, reducing the probability of exit from unemployment and increasing the expected duration of unemployment spells. Figure 1.5 documents how the unemployment-exit probability has evolved during the crisis and early recovery for different groups of unemployed. The unemployment-exit probability is measured as the probability of job seekers leaving unemployment during a 12-month period.[6] It is calculated separately for all unemployed, those unemployed for less than 12 months and those unemployed for 12 months or more:

- The probability of exiting from unemployment declines with the time spent in unemployment. This is indicated in the figure by the smaller annual unemployment-exit probability for job seekers unemployed for more than 12 months than that of job seekers unemployed for less than 12 months. This phenomenon is typically referred to as *negative duration dependence*. In part, this reflects composition effects that arise because unemployed job seekers with high levels of employability tend to find jobs more quickly. However, it may also reflect the impact of longer spells of unemployment on the employability of workers, *i.e.* the unemployed may lose valuable labour market skills and become discouraged and disconnected from the labour market the longer they are unemployed. To the extent that worker employability declines with the duration of unemployment, this raises major concerns about the implications of the increase in long-term unemployment in the context of a weak labour market recovery.
- The annual unemployment-exit probability has declined both for job seekers unemployed for less than 12 months and those unemployed for 12 months or more, but the dynamics are rather different:
  - The OECD-wide unemployment-exit probability for those unemployed *less* than 12 months has declined from about 0.8 to just above 0.7. This implies that the average probability of someone unemployed for less than 12 months exiting unemployment during the subsequent 12 months has declined from 80% to 70%. Consequently, the risk of long-term unemployment for this group, that is, the risk of becoming unemployed for more than 12 months, has increased. Most of this decline in the exit rate took place between 2008 and 2009 and has been largely stable since.
  - The OECD-wide unemployment-exit probability of those unemployed for 12 months or more declined somewhat more sharply during the economic downturn than that of those unemployed for less than 12 months. It initially declined from about 0.5 to about 0.35. However, it has since reversed close to its pre-crisis level. The more pronounced decline in the outflow probabilities of the long-term unemployed seems consistent with stock-flow matching models of the labour market in which the newly unemployed crowd out the employment prospects of the incumbent unemployed (Coles and Smith, 1998). The recovery of the unemployment-outflow probability to its

Figure 1.5. **Evolution of unemployment-exit probabilities**

Annual unemployment-exit probabilities for different unemployment durations[a, b]



Note: Countries are shown in ascending order of the average annual unemployment exit probability at its peak.

a) The outflow probability for those unemployed less than 12 months (for those unemployed for 12 months or more) is calculated as one minus the ratio of the number of unemployed with a duration of 12-24 months (number of unemployed with a duration of 24 months or more) over the number of persons unemployed for less than 12 months (number of persons unemployed for 12 months or more) one year earlier.

b) The exit rates are calculated for three periods, corresponding to the trough and peak in unemployment in each country and for the latest period available. Trough (peak) dates are defined as the start of the longest spell of consecutive increase (decrease) of the average annual outflow probability since 2007 Q1.

c) OECD, G7, EU27 and euro area (17) are weighted averages. OECD includes 29 countries (excluding Chile, Iceland, Korea, Mexico and New Zealand).

d) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD estimates based on *OECD Main Economic Indicators*, *OECD Labour Force Statistics Databases*, and national labour force surveys.

StatLink http://dx.doi.org/10.1787/888932650895

pre-crisis level most likely reflects the role of composition effects that arise because of the inflow of the newly unemployed with relatively solid work histories into long-term unemployment and the outflow of mostly disadvantaged workers from long-term unemployment into inactivity.

... resulting in increasing long-term and very long-term unemployment

The decline in unemployment-exit probabilities, even temporarily, explains the rise in the incidence of long-term unemployment (those unemployed for 12 months and more) in many OECD countries. Figure 1.6 documents the evolution of the unemployment rate for those unemployed for less than 12 months, those unemployed for 12 to 24 months, and those unemployed for 24 months or more:

- For the OECD as a whole, the unemployment rate for those unemployed less than one year rose rapidly during the crisis but largely recovered during the economic recovery. The initial rise reflects the importance of job losses at the start of the crisis, while its subsequent decline since the middle of 2009 reflects the fall in job losses and the transition of job losers towards long-term unemployment. The rate of persons unemployed for one to two years increased from 0.7% at the start of the crisis to a peak of 1.6% in 2010 Q4 but has since declined to about 1.4% in 2011 Q4. In contrast to the other categories of unemployment, the rate of very long-term unemployment (unemployed for 24 months or more) is still increasing. The rate of persons unemployed for two years or more increased from 0.9% at the start of the crisis to 1.5% in 2011 Q4.
- The pattern described above for the OECD area applies also to the three main economic areas: the euro zone, Japan and the United States. The proportional rise in long-term unemployment was particularly important in the US where it increased from less than half a percentage point to over 2.7 percentage points in the last quarter of 2011.[7] Recent data suggest that, consistent with the general improvement in the labour market, long-term and very long-term unemployment may have peaked. In the euro zone and Japan, the rate of persons unemployed for one to two years has stabilised, but very long-term unemployment is still increasing. Long-term unemployment reached 4.8 percentage points in the euro zone in 2011 Q4, of which 2.7 percentage points are accounted for by the unemployed who have been unemployed for two or more years. It reached 2% in Japan, with the very long-term unemployed accounting for 1.1 percentage point.[8]

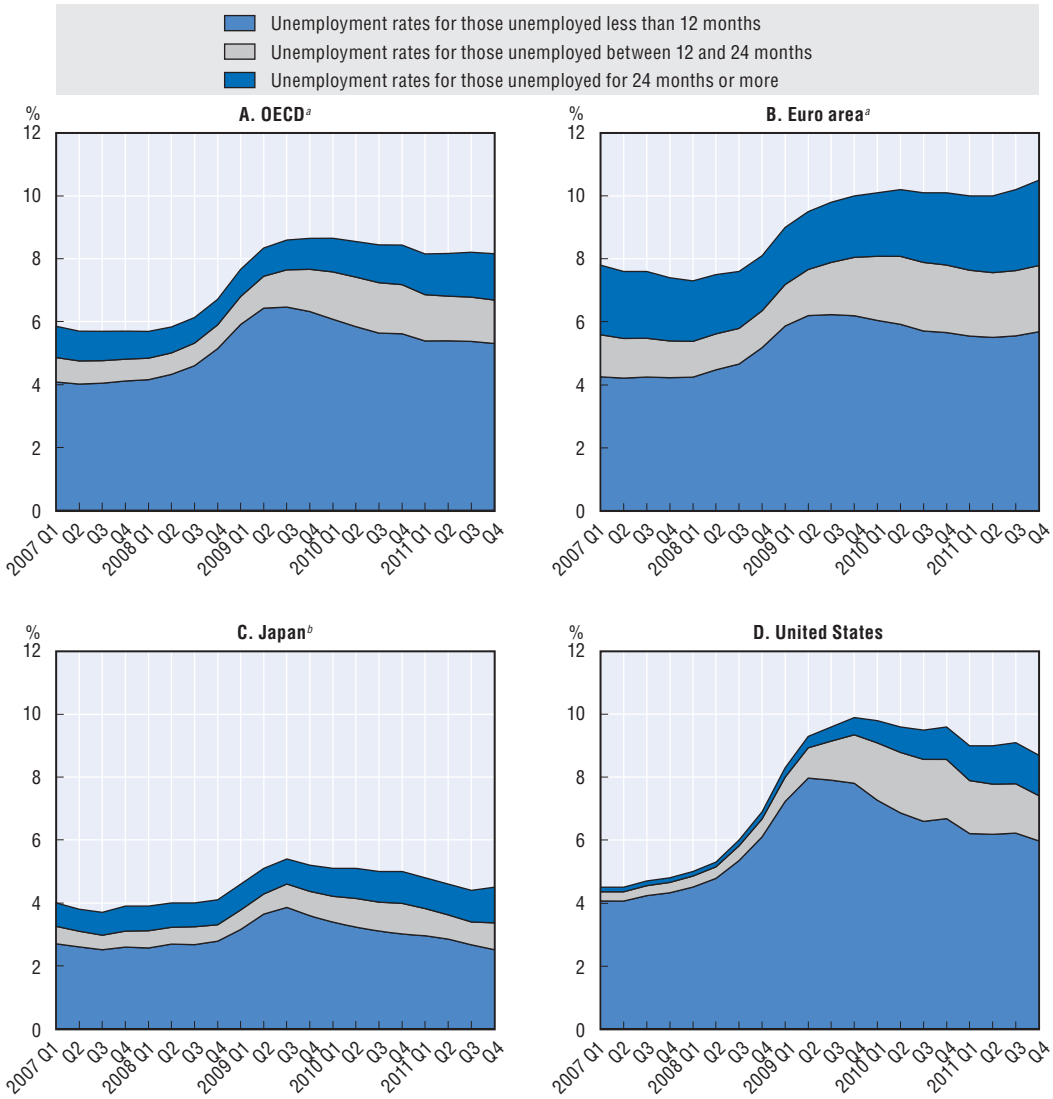
These large increases in long-term unemployment, and particularly in the incidence of very long spells of unemployment, have increased the risk of a structural rise in unemployment, as was the case in the wake of past recessions when several countries experienced persistently high unemployment. Moreover, the long-term unemployed face substantial declines in well-being as a result of a greater risk of poverty, health problems and school failure of their children.

The increase in long-term unemployment could have important implications for the persistence of aggregate unemployment going forward

To the extent that the employability of workers falls with time spent in unemployment, the build-up of long-term unemployment may increase the persistence of unemployment in the future, even if aggregate demand recovers. Conversely, one would expect long-term unemployment to dissipate relatively quickly once aggregate demand recovers if the employability of workers is not much affected by the duration of unemployment. In order to assess these issues in some more detail, Figure 1.7 shows how

Figure 1.6. **Evolution of unemployment by duration, 2007 Q1-2011 Q4**

Percentage of labour force



a) OECD is the weighted average of 32 countries (excluding Chile and Korea). Euro area is the weighted average of 17 European countries. Results for a wider range of countries are shown in Annex Figure 1.A3.1 of OECD (2012a).

b) From 2011 Q1 to 2011 Q3 (March to August 2011 inclusive), the results for Japan exclude three prefectures (Iwate, Miyagi and Fukushima) struck by the Great East Japan Earthquake, where the survey operation was suspended.

Source: OECD estimates based on *OECD Main Economic Indicators*, *OECD Labour Force Statistics Databases* and national labour force surveys.

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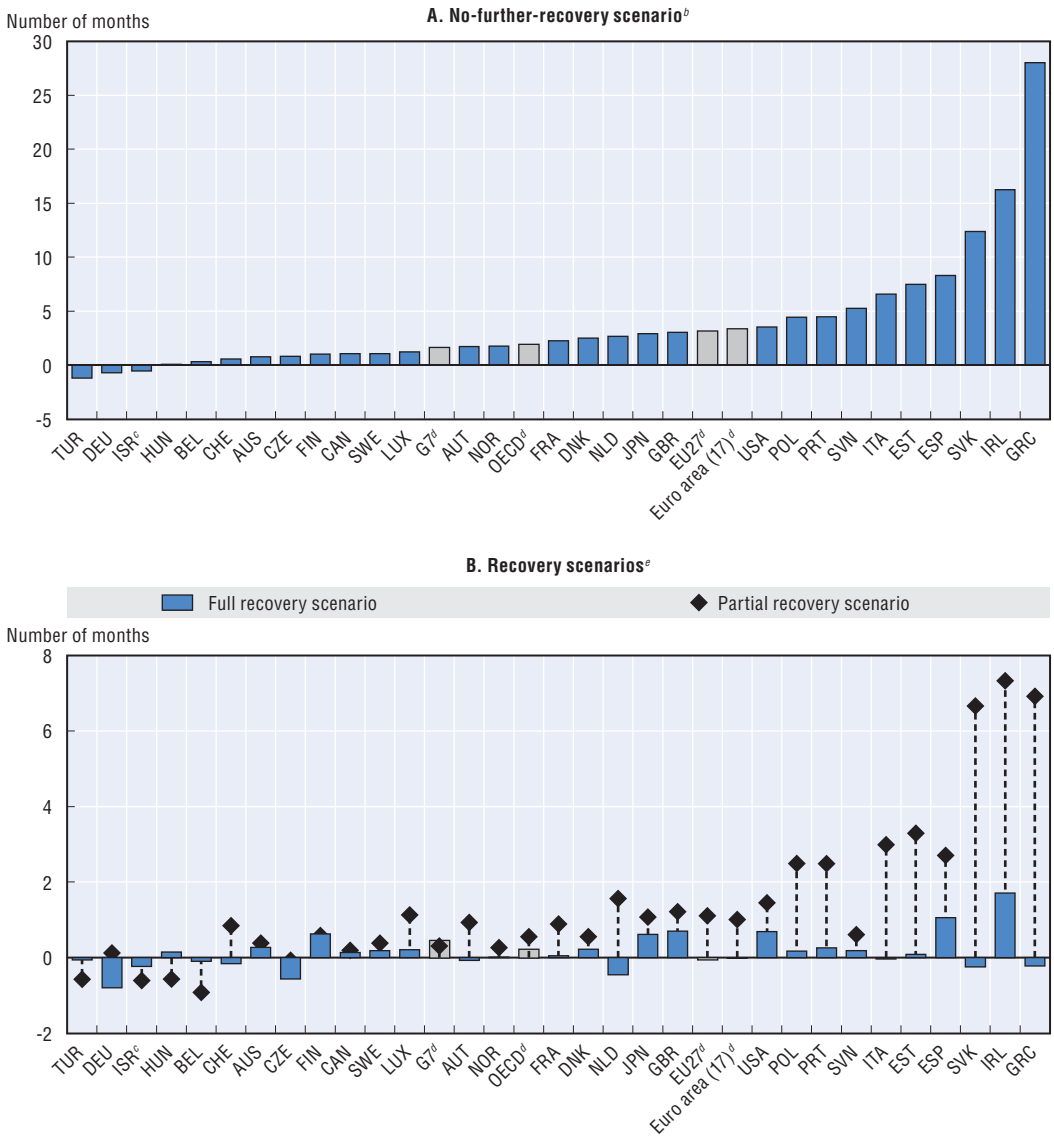
many more months the unemployed in 2011 Q4 may be expected to remain unemployed relative to their counterparts at the start of the crisis under a number of different scenarios.[9] Panel A simulates how many more months the unemployed in 2011 Q4 may be expected to remain unemployed under a no-recovery scenario which assumes that unemployment-exit probabilities remain unchanged at their most recently observed values. This captures both differences in the duration structure of the unemployed and changes in the corresponding unemployment-exit probabilities. Panel B simulates how many more months the currently unemployed may be expected to remain unemployed

Figure 1.7. **Unemployment is becoming more persistent**

Simulated expected additional time spent in unemployment of current stock of unemployed relative to their counterparts at the onset of the crisis[a]



Note: Countries are shown in ascending order of the expected average duration of unemployment.

a) The average durations are calculated as the inverse of the outflow probabilities. See Figure 1.5 for further details on the calculations.

b) The no-further-recovery scenario assumes that unemployment-outflow probabilities remain at their current levels.

c) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.

d) OECD, G7, EU27 and euro area (17) are weighted averages. OECD includes 29 countries (excluding Chile, Iceland, Korea, Mexico and New Zealand).

e) The full recovery scenario assumes that outflow probabilities for all unemployed persons (*i.e.* those unemployed for less or more than 12 months) instantaneously return to their pre-crisis levels, while the duration structure of unemployment is assumed to remain unchanged. The partial recovery scenario assumes that the outflow probability for those unemployed for less than 12 months instantaneously returns to its pre-crisis level, while outflow probability of the long-term unemployed and the duration structure of unemployment are assumed to remain constant.

Source: OECD estimates based on *OECD Main Economic Indicators*, *OECD Labour Force Statistics Databases*, and national labour force surveys.

StatLink http://dx.doi.org/10.1787/888932650933

under two alternative scenarios for the recovery. The first assumes that all unemployment-exit probabilities return instantaneously to their pre-crisis levels. In this case, any changes in the expected duration of unemployment are exclusively due to changes in the duration-composition of unemployment. The second recovery scenario assumes that the unemployment-exit probability returns to its pre-crisis level for those unemployed for less than 12 months, but remains constant for those unemployed for 12 months or more. This corresponds to the situation where long-term unemployment is assumed to be structural and does not dissipate once the macroeconomic situation returns to normal:

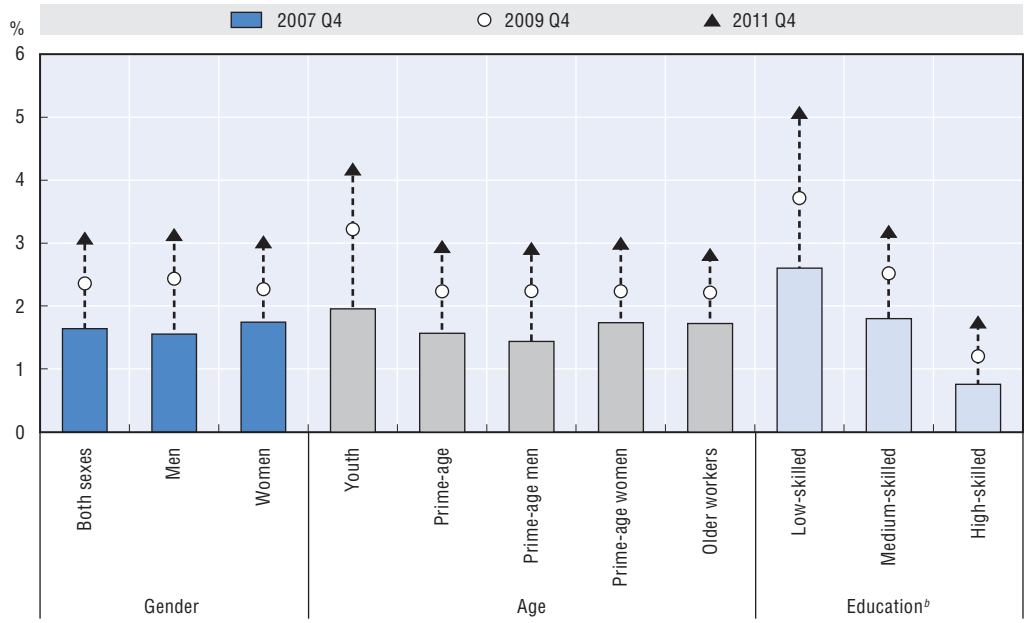
- *No-recovery scenario (Panel A)*. It shows that for the OECD as a whole the unemployed in 2011 Q4 may be expected to remain about two months longer unemployed relative to their counterparts at the start of the crisis. The rise in the expected duration of unemployment is largest in Greece, Ireland and Slovak Republic where the currently unemployed may be expected to remain unemployed for about one to two and a half years longer than their counterparts at the start of the crisis. The no-recovery scenario is most relevant for countries where aggregate demand is expected to remain depressed in the near future.
- *Recovery scenarios (Panel B)*. Both recovery scenarios suggest that the increase in the expected additional duration of unemployment relative to the situation before the crisis is small. This suggests that the expected duration of unemployment will come down almost entirely to its pre-crisis level once aggregate demand recovers. In the full recovery scenario, the increased persistence in unemployment tends to be largest in countries that experienced large increases in long-term unemployment such as Ireland, Spain, the United Kingdom and the United States. In the partial recovery scenario, where the unemployment-exit probability of the long-term unemployed is assumed to remain constant, the increased persistence of unemployment is largest in Estonia, Greece, Ireland and Slovak Republic. The set of countries differs because the outflow probability of the long-term unemployed is still depressed in the latter group. However, this does not mean that these countries face necessarily greater risks of increased structural unemployment. It may also reflect the different state of the business cycle. Indeed, most of these countries are still in recession. It is yet to be seen to what extent the long-term unemployment-exit probability will recover once aggregate demand starts picking up.

The risk of long-term unemployment has risen more for some workforce groups than for others

There has been a general increase in the risk of long-term unemployment across the workforce as a result of the crisis, but youth and low-skilled workers have suffered the largest increases (Figure 1.8 and Figure 1.A2.1 of OECD, 2012a, for individual countries). On average across the OECD, long-term unemployment for youth and the low-skilled increased by over 2 percentage points since the start of the crisis. As of the fourth quarter of 2011, youth long-term unemployment was particularly high in countries such as Greece, Italy, the Slovak Republic and Spain, where it ranged from 15 to 22 percentage points. The increase in Spain is particularly noteworthy since long-term unemployment was relatively rare before the crisis (less than 2%). In the United States, where there has been a substantial increase in the incidence of long-term unemployment, this is due to a disproportionate increase among low-skilled workers.[10]

Figure 1.8. **Youth and low skilled workers are at greater risk of long-term unemployment**

Long-term unemployment rates as a percentage of labour force by demographic group, OECD average,[a] 2007 Q4-2011 Q4



a) OECD is the weighted average of 30 countries (all OECD countries except Australia, Chile, Korea and New Zealand) for data by age and gender and of 29 countries (the same countries except Japan) for data by education. Results for individual countries are shown in Annex Figure 1.A3.2 of OECD (2012a).

b) Statistics by education refer to persons aged 25-64.

Source: OECD estimates based on *OECD Main Economic Indicators*, *OECD Labour Force Statistics Databases* and national labour force surveys.

StatLink http://dx.doi.org/10.1787/888932650952

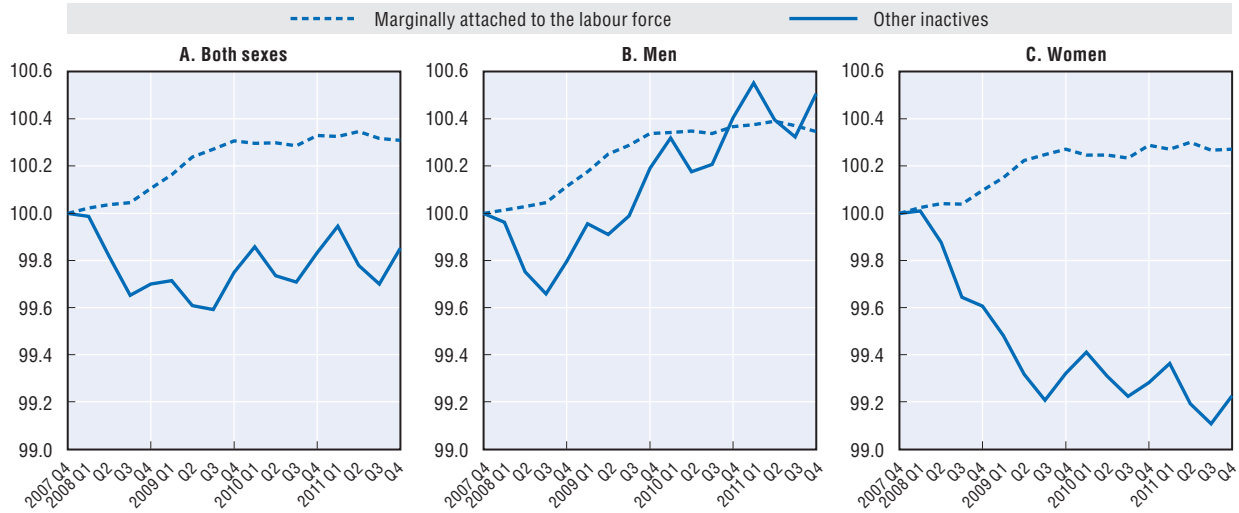
Some job losers have become discouraged in their job search and left the labour force

An increased risk of marginalisation among the unemployed may not only show up in the form of increased long-term unemployment, but also in the rate at which the unemployed are dropping out of the labour force altogether. In order to analyse this issue, Figure 1.9 shows the evolution since the start of the crisis of the number of persons who are marginally attached to the labour force or inactive for other reasons as a share of the working-age population. Persons who are marginally attached to the labour force are persons who are willing to work and available for work, but who do not search actively for a job:

- The number of marginally attached workers to the labour force as a share of the working-age population has increased by 0.3 of a percentage point since the start of the crisis in the OECD. While this seems small, it represents an increase of more than 30% in its level since the start of the crisis. The rise in the number of marginally attached persons is likely to reflect an increasing number of job seekers who have become discouraged from looking actively for work because of the difficulty of finding a job in a depressed labour market. The rise in the marginally attached was particularly pronounced in countries such as Denmark, Estonia, Greece, Ireland, New Zealand and the United States, and was somewhat more pronounced for men than for women.

Figure 1.9. **The number of persons marginally attached to the labour force[a] has increased**

Percentage of working-age population, base 100 in 2007 Q4,
series smoothed using three-quarter moving averages, OECD average[b]



a) Persons not in the labour force who did not actively look for work during the past four weeks, but wish to work and are available for work.

b) OECD is the weighted average of 24 countries (Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Japan, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, the United Kingdom, and the United States). Annex Figure 1.A3.4 of OECD (2012a) provides similar information for individual countries, while Annex Table 1.A3.2 of OECD (2012a) reports information on broader measures of labour market slack for 29 OECD countries.

Source: OECD estimates based on the European Union Labour Force Survey (EULFS) for European countries and national labour force surveys for Japan and the United States.

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- The rate of inactivity for other reasons has been largely constant since the start of the crisis. To some extent this reflects opposing trends among men and women. For men, inactivity for other reasons has tended to increase by over half a percentage point, while for women it has declined by slightly more. The increase in inactivity, particularly among men, probably reflects the tendency of youth to postpone their labour-market entry by prolonging their studies or the retirement of older men who have lost their job. A potential concern in this regard is the rise in the number of youth who are inactive and not enrolled in education or training. However, Box 1.1 on NEET rates suggests that, except for a number of specific countries, NEET rates of inactive youth have been stable or declined. The decline in inactivity for other reasons among women may reflect a second-earner effect (also known as the "added-worker effect") in which women return to work to compensate for the loss of household income caused by job losses among men. The second-earner effect is most visible in Spain.[11]

3. Has structural unemployment started to increase?

The growing importance of marginalised jobless in a number of OECD countries raises important questions about its implications for structural unemployment and potential output going forward. The analysis on the evolution of unemployment-exit probabilities by time spent in unemployment in Section 2 provided already a first indication of the potential impact of the build-up of long-term unemployment on the persistence of aggregate unemployment. This section looks at the prospects of higher levels of structural unemployment based on the OECD's estimates of the NAIRU, as well as by looking at changes in the relationship between unemployed job seekers, vacancies and hires.[12]

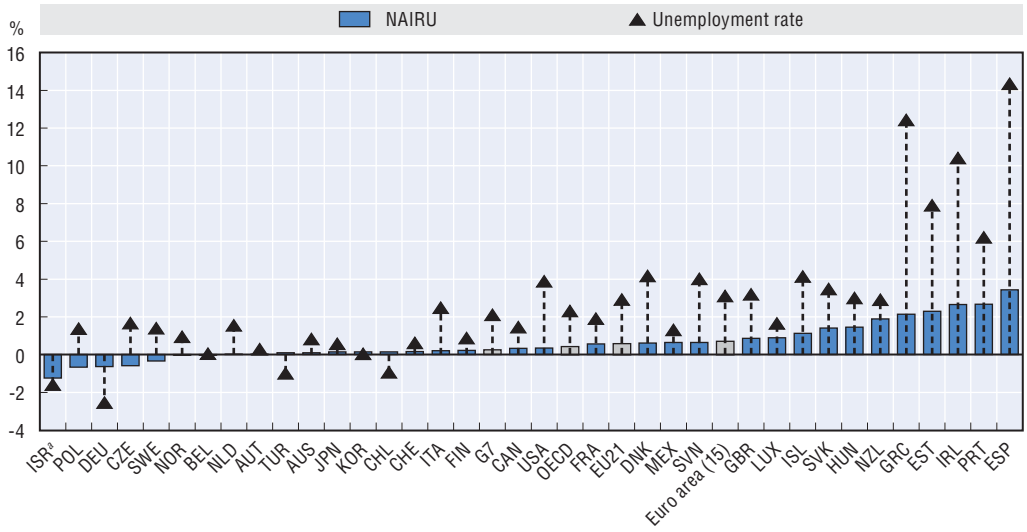
The NAIRU has increased in most countries but by a small amount relative to the total cyclical change in unemployment

A commonly-used measure of structural unemployment is the non-accelerating inflation rate of unemployment (NAIRU). The idea of the NAIRU is based on the notion that in the long-run, inflation has only nominal effects and unemployment depends solely on structural factors, while in the short-run, the relationship between unemployment and inflation is described by a so-called "Phillips curve". When the unemployment rate falls below the NAIRU, and labour-market conditions are tight, inflation pressures increase until the unemployment rate returns to the NAIRU, while inflation pressures fall when unemployment rises above the NAIRU.[13] In the aftermath of a recession, this suggests that prices and wages adjust so that the existing labour market slack will be re-absorbed. While, in principle, wages could adjust in line with productivity, this may not always happen in practice. Employers may be unwilling or unable to lower wages below a certain threshold (for example, there may be a binding wage floor imposed by a national minimum wage), while workers may be not willing to work for wages below their reservation wage. This is most likely to be the case for long-term unemployed and marginally attached workers whose employability has fallen substantially because they lack recent work experience. As a result, it is possible that the unemployment rate does not return to its pre-crisis level and the NAIRU increases.

Figure 1.10 relates the change in actual unemployment rates since the start of the crisis and the last quarter of 2011 to the corresponding change in the NAIRU, as estimated by the Economics Department of the OECD.[14] It shows that in the majority of countries, and particularly those hardest hit by the 2008-09 global crisis, the NAIRU has tended to

Figure 1.10. **Structural unemployment has increased in most countries, but so far the increase remains small**

Percentage-points change, 2007 Q4-2011 Q4



Note: Countries are shown in ascending order of the estimated change in the NAIRU.

a) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD calculations based on *OECD Economic Outlook*, No. 91.

StatLink http://dx.doi.org/10.1787/888932650990

increase. However, it also shows that the estimated increase in the NAIRU is rather small relative to the *actual* increase in the unemployment rate, which indicates that there is considerable labour market slack. For example, in the OECD, the actual unemployment rate increased by 2.3 percentage points, while the NAIRU is estimated to have increased by only 0.4 percentage points. Similarly, in the United States, the actual unemployment rate increased by 3.9 percentage points, while the NAIRU has increased by just 0.4 of a percentage point. From a policy perspective, this suggests that the priority should be to promote economic growth and hence aggregate demand. Nevertheless, in a number of European countries, the increase in the NAIRU appears to be more significant. In Estonia, Greece, Ireland, Portugal and Spain, the estimated NAIRU has increased by more than 2 percentage points. These are all countries that were hit hard by the crisis and where the build up of long-term unemployment has been particularly pronounced. This means that in those countries an expansion of aggregate demand will not be sufficient to bring unemployment back to pre-crisis levels. Specific measures with respect to training and job-search assistance will also be required.

While these NAIRU estimates provide a timely indication of the level of unemployment that is consistent with constant levels of inflation, they have important limitations from a labour market policy perspective. Not only is there considerable uncertainty and controversy concerning their measurement and their policy use, reduced-form estimates of this kind provide little information about the determinants of structural unemployment and the role of policies and institutions (Richardson *et al.*, 2000).

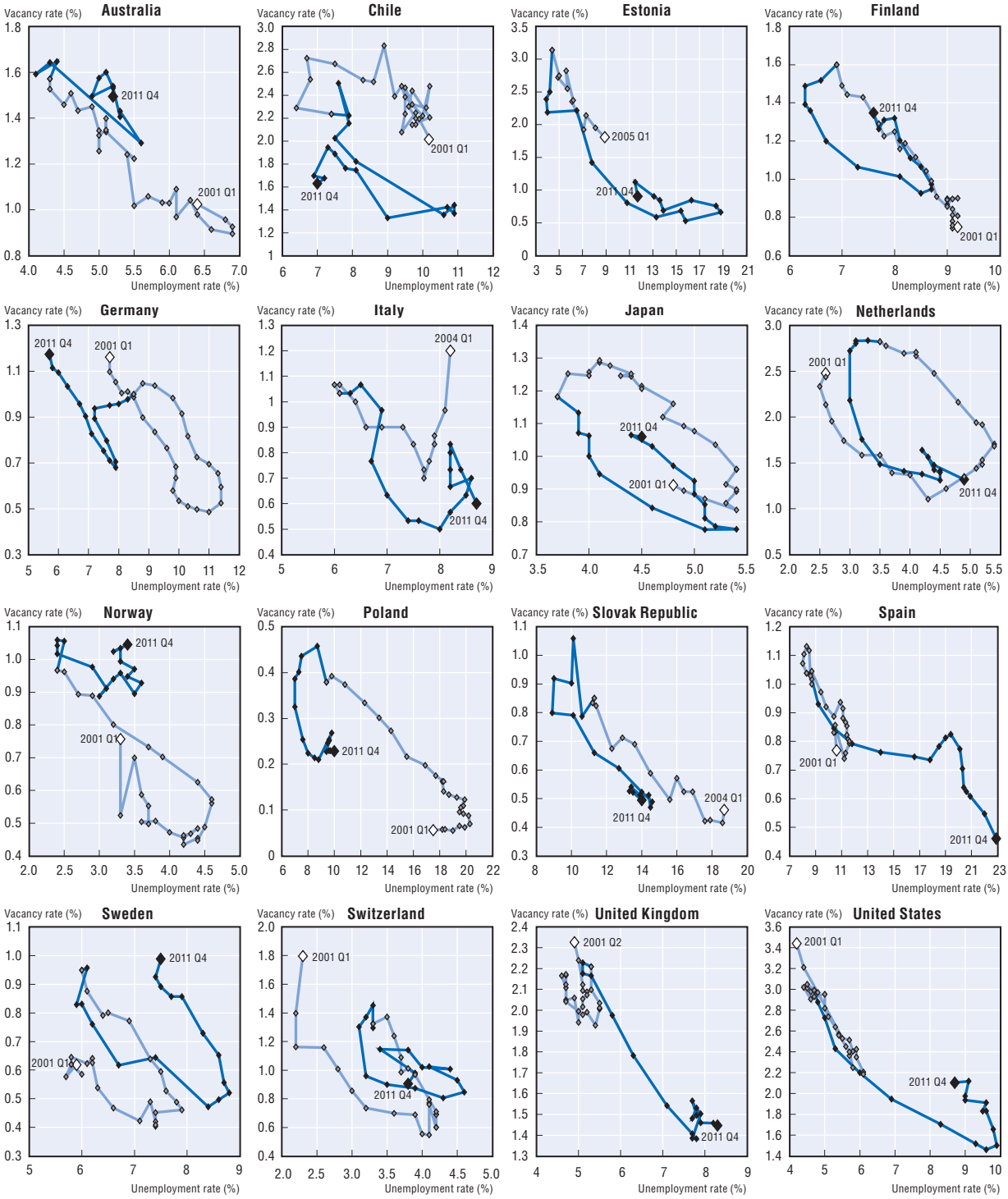
Matching frictions tended to increase in countries where the unemployment impact of the crisis was relatively large…

A complementary approach to assessing developments in structural unemployment is based on the Beveridge curve, which traces out combinations of job vacancies and job seekers over the business cycle, for a given level of matching frictions. Recessions are characterised by a fall in vacancies and an increase in unemployment, and *vice versa* during recoveries. For a given level of matching frictions, the Beveridge curve should thus trace out a negatively sloped curve. An increase in structural unemployment would show up in this framework as an outward shift in the Beveridge curve, indicating that a higher level of unemployment now prevails for any given level of vacancies, because it has become more difficult to locate job seekers who are qualified to fill the existing vacancies (*i.e.* "matching frictions" have increased).

Figure 1.11 charts the empirical relationship between vacancy and unemployment rates from 2001 until the end of 2011 for selected OECD countries, allowing developments to be followed in the aftermath of both the dotcom bubble and the more recent recession.[15] As is typical, these charts exhibit a lot of seemingly erratic movement, making it rather difficult to detect where the theoretical Beveridge curve is located at any given time, as well as any significant inwards or outwards shifts of the curve. One complication is that vacancies often respond more quickly to changing business-cycle conditions than the unemployment rate, so that the data charted trace out counter-clockwise loops around the underlying Beveridge curve. However, this pattern is less present in countries with high levels of worker flows, including Australia, Estonia, Spain, the United Kingdom and the United States, where the unemployment rate responds more quickly to changes in

Figure 1.11. **Beveridge curves in selected OECD countries**[a]

Rates are expressed as a percentage of the labour force, 2001 Q1-2011 Q4



Note: Dark blue line corresponds to the period up to 2007 Q4, while the light blue line corresponds to the period since 2007 Q4.

a) Results for other countries can be found in Annex Figure 1.A3.5 of OECD (2012a).

Source: OECD calculations based on *OECD Main Economic Indicators Database*, and various national sources (see Annex Table 1.A3.3 available online at *www.oecd.org/employment/outlook* and Annex 1.A2 for details on the data sources used for job vacancies).

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vacancies. Bearing in mind the number of measurement issues associated with the vacancy data in particular (see Annex 1.A2 at the end of this chapter), the following key points emerge from this analysis:[16]

- Counter-clockwise loops were evident in the aftermath of the *dotcom bubble* in a number of countries, with Japan and the Netherlands being good examples of this pattern. However, there are quite a few countries that initially exhibit a similar pattern, but where the relationship between vacancies and job seekers does not return to its starting point. Examples are Sweden and Switzerland, where matching frictions appear to have increased in the aftermath of the dotcom bubble. In other countries, including Australia, Spain, the United Kingdom and the United States, there is little evidence of an outward shift of the Beveridge curve.[17]
- During the *2008-09 recession*, countries initially moved down along their Beveridge curves, consistent with the increase in cyclical labour market slack. However, these curves appear to have started to shift outwards in the middle of 2010 in many countries. At this point, it is difficult to ascertain whether these movements simply reflect the usual lag in the response of the unemployment rate to the recovery in vacancies or, instead, are the first sign of an increase in matching frictions related to the build-up of long-term unemployment. While it is too soon to draw strong conclusions from these Beveridge curves about whether structural unemployment has risen, it is worth noting that the apparent outward shift is relatively large in Sweden, the United Kingdom and the United States.[18]

... but declined in others where the unemployment impact tended to be smaller

The potential increase in matching frictions during the recent recovery can be analysed in more detail by using so-called "matching functions", which describe the ease with which unemployed job seekers can find jobs and job openings can be filled. Figure 1.12 compares the evolution of actual job-filling and job-finding rates before and during the crisis with their predicted evolution based on the estimates of aggregate matching functions using data from before the crisis.[19] Under the assumption that the responsiveness of job-filling and job-finding rates has remained unchanged from its historical pattern before the crisis, any differences between the actual and fitted series can be interpreted as changes in matching frictions relative to the pre-crisis period:

- *Matching and labour market tightness*. Job-finding rates have tended to increase in the run-up to the crisis, consistent with increasing labour market tightness; they have fallen sharply during the economic crisis, reflecting the sudden decline in aggregate demand and the subsequent hiring freeze; and they have recovered partially during the two years to 2011 Q4. The job-finding rates remain largely depressed in Italy, Norway, the Slovak Republic, Spain and the United States. The opposite pattern is observed for the job-filling rate. In the run-up to the crisis, the growing importance of labour shortages is reflected by a decline in the job-filling rate. During the crisis, the job-filling rate rose as more and more job seekers were competing for a declining number of vacancies. In countries where unemployment started to decline and labour demand picked up, the job-filling rate has started to decline again (*e.g.* Finland, Japan, the Slovak Republic, Sweden and the United States).
- *Matching frictions*. Matching frictions have evolved very differently across countries. In a number of countries, actual job-finding and job-filling rates have fallen significantly below the respective rates that would have been observed had matching efficiency

Figure 1.12. **Comparing actual and predicted job-finding and job-filling rates**

Rates are expressed as a percentage of the labour force, 2001 Q1-2011 Q4

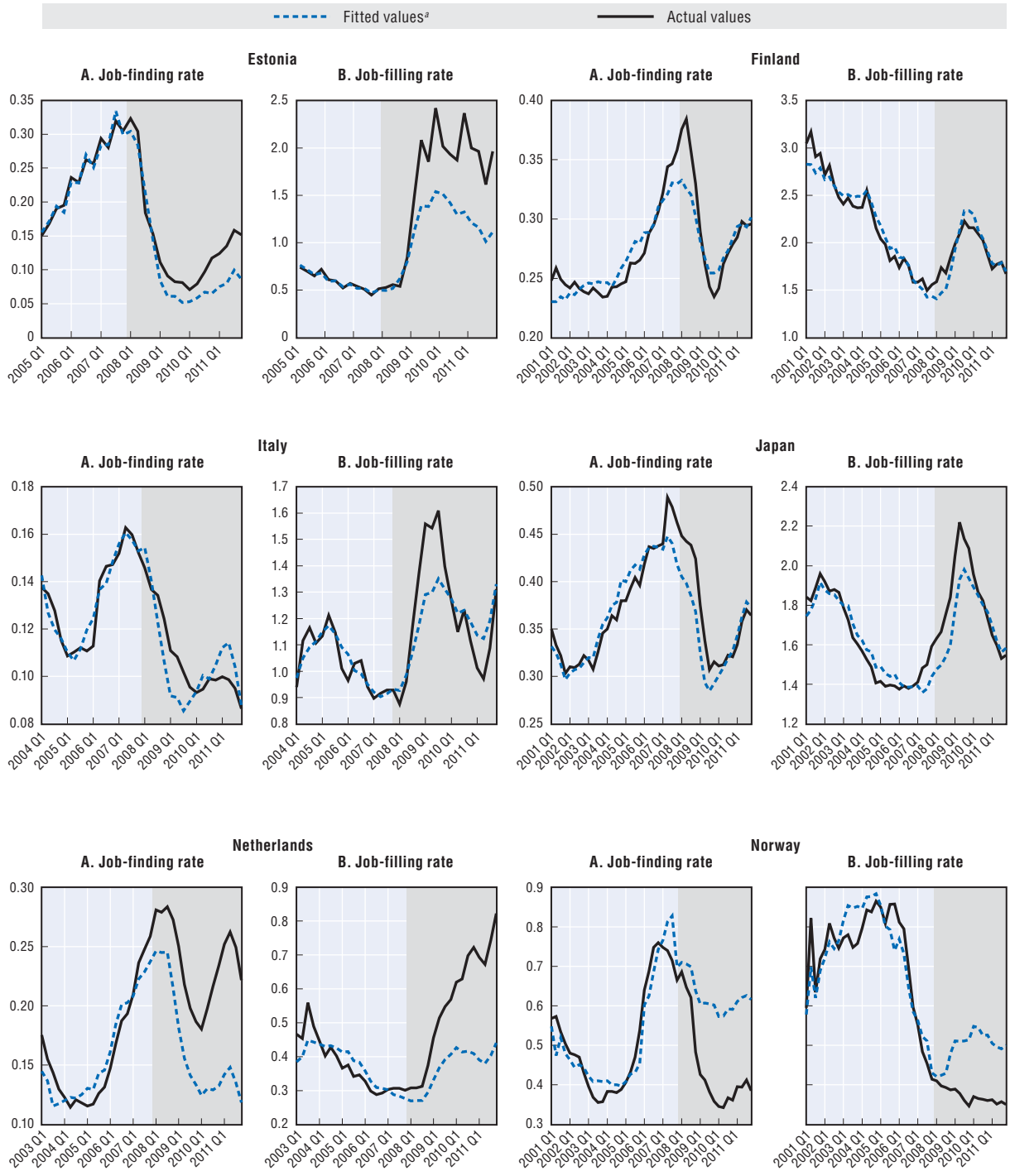
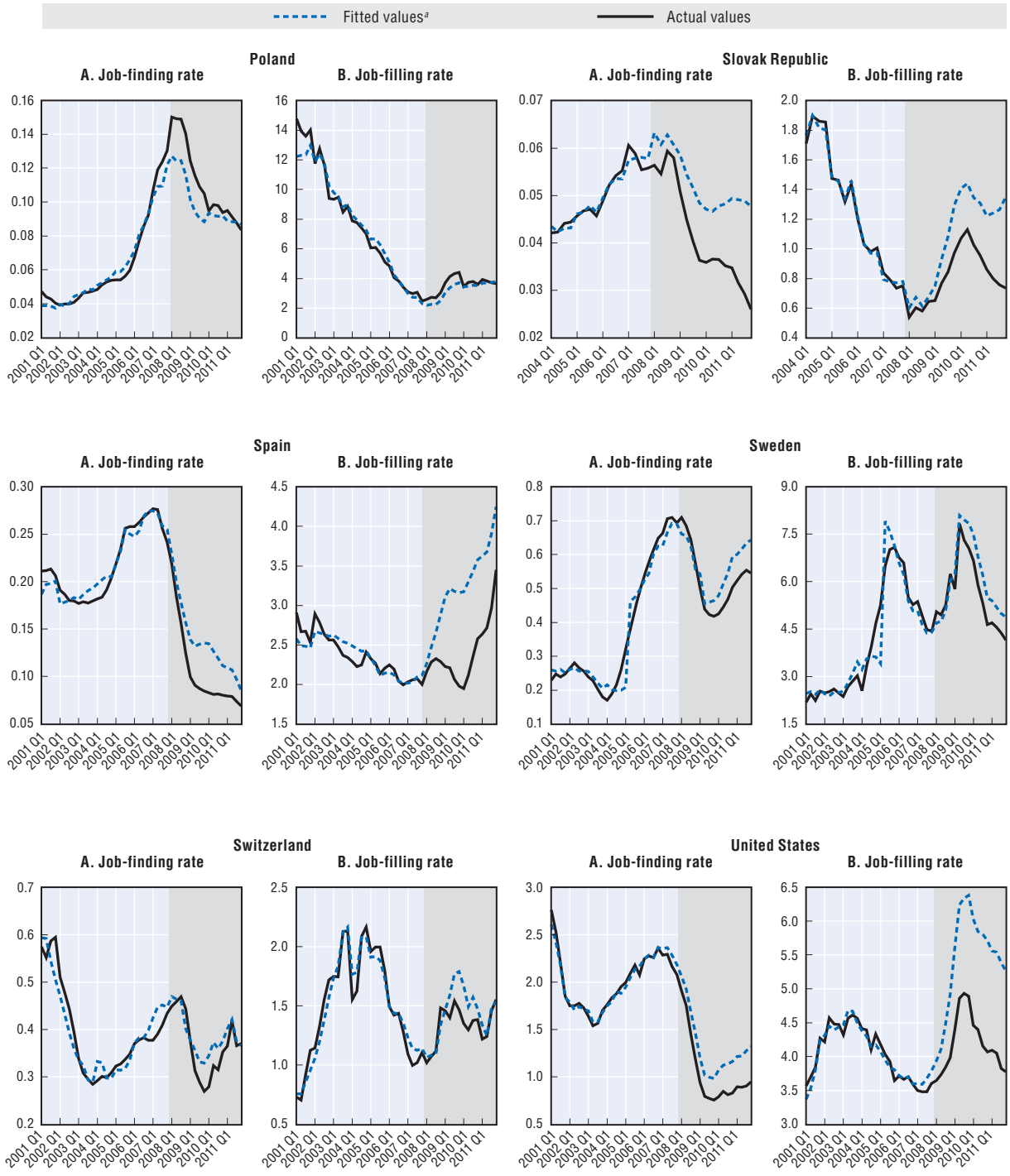


Figure 1.12. **Comparing actual and predicted job-finding and job-filling rates** *(cont.)*

Rates are expressed as a percentage of the labour force, 2001 Q1-2011 Q4



Note: Shaded area refers to the forecast period.

a) Fitted values are obtained from estimating matching functions for the job-finding (defined as the ratio of hires over unemployment) and job-filling (defined as the ratio of hires over vacancies) rates for each country using data up to 2007 Q4. See footnote 19 for further details. Hires are defined as workers working for the same employer for less than one month.

Source: Data on hires are obtained from the European Union Labour Force Survey (EULFS) for European countries and Job Openings and Labour Turnover Survey (JOLTS) for the United States. See Annex Table 1.A3.3 available online at *www.oecd.org/employment/outlook* for data sources on job vacancies.

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remained at its pre-crisis level. This suggests that matching frictions have increased. This pattern is observed in, for example, Norway, the Slovak Republic, Spain, Sweden and the United States, some of which also displayed large outward shifts in their Beveridge curves. In other countries, however, the predicted job-finding and job-filling rates fall short of their actual levels during the recovery. This suggests that labour-market frictions have decreased. Countries where this appears to be the case include Estonia and the Netherlands.

Why may matching frictions have increased in some countries?

There are a number of factors that could contribute to an increase in matching frictions in the aftermath of a recession:[20]

- *Mismatch*. Mismatch represents imbalances between labour demand and supply across geographic regions, sectors, occupations and skills.[21] An increase in the degree of mismatch complicates the task for unemployed job seekers to find a job and for employers to fill a vacancy. Since it tends to be time-consuming to train or relocate workers, an increase in mismatch is likely to engender a prolonged increase in the structural rate of unemployment. To the extent that the recent crisis was not just the result of an aggregate demand shock, but was also associated with re-allocative shocks that have permanently depressed the size of certain activities, such as banking and construction, it may have increased sectoral and occupational mismatch. The collapse in housing prices may also have increased mismatch by reducing the geographical mobility of unemployed job seekers who are unable to sell their house and move because the value of their house has fallen below that of their mortgage.[22] It is noteworthy that a number of countries that are likely to have experienced increases in matching frictions did indeed have important construction and housing-bubble collapses. The crisis may also accelerate ongoing structural changes. One example of this may be the gradual up-skilling of the economy. To the extent that there is a tendency to try to replace low-skilled layoffs by more skilled workers in the recovery, this will increase skill mismatch. This could also explain why the employment situation of low-skilled workers has continued to deteriorate into the recovery. [23]
- *Search intensity*. The intensity of workers to search for a new job ("job-search intensity") or the intensity of firms to search for new recruits ("recruitment intensity") may have declined:
  - *Job-search intensity*. Average job-search intensity may fall due to changes in the institutional environment or due to changes in the composition of the jobless. In the United States, there has been an intensive debate on the potential adverse effects of the temporary extension of the maximum duration of unemployment benefits from 26 to 99 weeks on job-search intensity and the willingness of unemployment-benefit recipients to accept job offers. While the majority of empirical studies suggest that the impact of the extension of the maximum duration of unemployment benefits has been limited, the substantial increase in their generosity in the absence of an effective activation strategy does raise concerns about its potential implications for the labour market recovery (OECD, 2011a).[24] Perhaps, more importantly in the context of this chapter is the potentially adverse impact of long-term unemployment on job-search intensity. Job seekers who have been unemployed for longer are more likely to become discouraged from intensive job search due to the lack of suitable job opportunities.[25]

- *Recruitment intensity*. While little is known about the variation in recruitment intensity across countries, firms and time, recent work by Davis *et al*. (2012) for the United States suggests that changes in recruitment intensity account for a substantial proportion of the evolution of the job-filling rate during the recent recession and the subsequent recovery. Moreover, they show that aggregate movements in the job-filling rate and recruitment intensity are disproportionately driven by the construction sector: they estimate that construction accounts for more than 40% of the time variation in aggregate job-filling rates during the period 2007-11.[26]

Hiring remains depressed for youth, low-skilled workers and in the construction sector

The analysis so far suggests that most of the increase in the unemployment rate since the start of the crisis is cyclical, but that structural unemployment may also have increased, particularly in countries where unemployment and long-term unemployment have risen most strongly. From a policy perspective, this means that the key priority is to support aggregate demand. This can be done through the use of accommodative macroeconomic policies but also, given the already accommodative monetary policy stance and the limited fiscal space, by promoting growth and employment-friendly structural reforms, However, active labour market policies also have a key role to play in containing the risk of rising structural unemployment. They can help minimise the risk that the cyclical rise in unemployment becomes structural by helping unemployed job seekers back into work as quickly as possible, while they can also contribute to bringing structural unemployment down by addressing any emerging obstacles that prevent unemployed job seekers from finding jobs and employers from filling job openings (see Box 1.2 for a more detailed discussion of the role of active labour market policies in containing the risk of rising structural unemployment).[27]

Box 1.2. **Active labour market policies have a crucial role to play in containing the risk of rising structural unemployment***

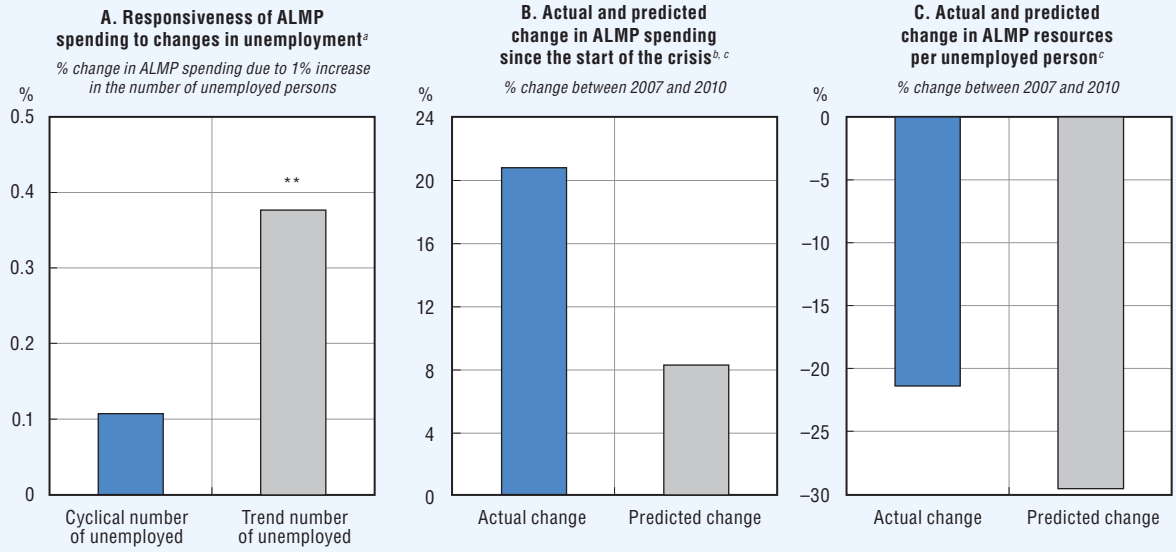
In the context of a weak economic recovery following a severe economic downturn, active labour market policies have a key twofold role to play in containing the risk of rising structural unemployment. First, they can play a *preventive* role by helping job losers find their way back into work as quickly as possible and helping those at risk of long-term unemployment by maintaining their skills through the provision of (temporary) work opportunities that make use of their existing skills. This can prevent skills depreciation among the unemployed and reduce the risk that they become discouraged and drop permanently out of the labour force. From this perspective, active measures that are likely to be most effective include job-search assistance (*e.g.* face-to-face interviews, individual action plans, job clubs) and employment subsidies (*e.g.* gross hiring subsidies, reductions in employer social-security contributions, marginal employment subsidies). Second, the role of ALMPs can be *remedial* by addressing structural bottlenecks that prevent unemployed job seekers from getting back into work. This may be because their skills have become obsolete or depreciated as a result of prolonged joblessness. Active measures that can help to remedy structural labour market difficulties faced by the unemployed include training and work-experience programmes.

In order to effectively contain the risk of rising structural unemployment, it is crucial that sufficient resources for ALMPs are available. However, since the start of the crisis, resources for ALMPs increased relatively little in most OECD countries compared with the increase in the number of unemployed job seekers. Between 2007 and 2010, the latest year for which data on ALMP spending are available, it increased 21% on average in the OECD area, while the number of unemployed increased by 54%. This implies that the value of ALMP spending per unemployed job seeker declined by 21%. While the increase in

Box 1.2. **Active labour market policies have a crucial role to play in containing the risk of rising structural unemployment*** *(cont.)*

ALMP spending was insufficient to keep the value of resources available per job seeker constant, it was considerably larger than what might have been expected on the basis of historical patterns. As shown in the figure below on the responsiveness of ALMP spending to changes in unemployment before the crisis, an increase in trend unemployment of 1% was associated with an increase in ALMP spending of 0.4%, while a similar increase in cyclical unemployment was associated with an increase in ALMP spending of 0.1% (not statistically different from zero). This suggests that ALMP spending traditionally responded fairly strongly to changes in structural unemployment, but tended to be relatively insensitive to changes in the business cycle. These findings are consistent with previous results reported in OECD (2009). The actual change in ALMP spending between 2007 and 2010 is also compared with the predicted change in spending based on the traditional relationship between ALMP spending and unemployment. It shows that the increase in actual ALMP spending was almost three times as large as might have been expected based on historical patterns. ALMP spending actually increased by about 21% compared with a predicted increase of just 8%. This implies that if historical patterns had continued into the recession, the value of ALMP spending per unemployed person would have declined by almost 30% instead of 21%.

The responsiveness of ALMPs spending to cyclical changes in unemployment tends to be very low



**: Statistically significant at the 5% level.

a) The elasticity of ALMP spending to the number of persons unemployed is obtained from a panel regression of the log of ALMP spending on the cyclical and trend components of log unemployment, log real GDP, log labour force and the two decadal dummies for the 1990s and the 2000s. The model is estimated using data for 28 OECD countries (*i.e.* excluding Chile, Estonia, Iceland, Israel, Slovenia and Turkey) for the period 1985-2007.

b) The predicted change in ALMP spending is obtained by taking the difference between the out-of-sample prediction for 2010 from the model described in footnote a) and the prediction for 2007.

c) For Panels B and C, the data refer to weighted averages of the countries included in Panel A but excluding Korea and the United Kingdom because of missing data on ALMP spending for 2010.

Source: OECD estimates based on the *OECD Labour Market Programmes* and *OECD Main Economic Indicators Databases*.

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Box 1.2. **Active labour market policies have a crucial role to play in containing the risk of rising structural unemployment*** *(cont.)*

There may be several reasons why active spending does not increase more strongly to changes in cyclical unemployment. First, governments may not be convinced that additional investments in ALMPs will translate into correspondingly better labour market outcomes. On the one hand, the marginal costs of helping job seekers back into work may increase during an economic downturn due to the decline in available job opportunities. On the other hand, the marginal benefit from helping a job seeker back into work may also increase in recessions, given the greater expected duration of unemployment. As a result, it is difficult to determine *a priori* how recessions affect the returns to ALMPs. Unfortunately, the available empirical evidence is limited. Providing evidence on the role of ALMPs in the context of a depressed labour market, therefore, represents an important priority for future research. Second, the low responsiveness of ALMPs to cyclical changes in unemployment may also reflect capacity constraints related to the difficulty of quickly recruiting and training skilled case managers or expanding the number of training slots while maintaining quality levels. One possibility that may help to overcome capacity constraints is to rely on private-sector employment service providers to scale up the provision of activation services in response to a cyclical downturn.

Nevertheless, the sharp decline in resources per unemployed person for ALMPs between 2007 and 2010 represents a major concern. Moreover, there is a risk that the ongoing process of fiscal consolidation will squeeze the resources available for ALMPs. Given the limited progress that has been made in reducing the cyclical rise in unemployment; the build-up of long-term and very long-term unemployment; and the growing risk of rising structural unemployment, reducing the value of resources devoted to ALMPs may be inappropriate. This is likely to aggravate the already difficult labour market situation and, in addition, might jeopardize the long-term potential for economic growth.

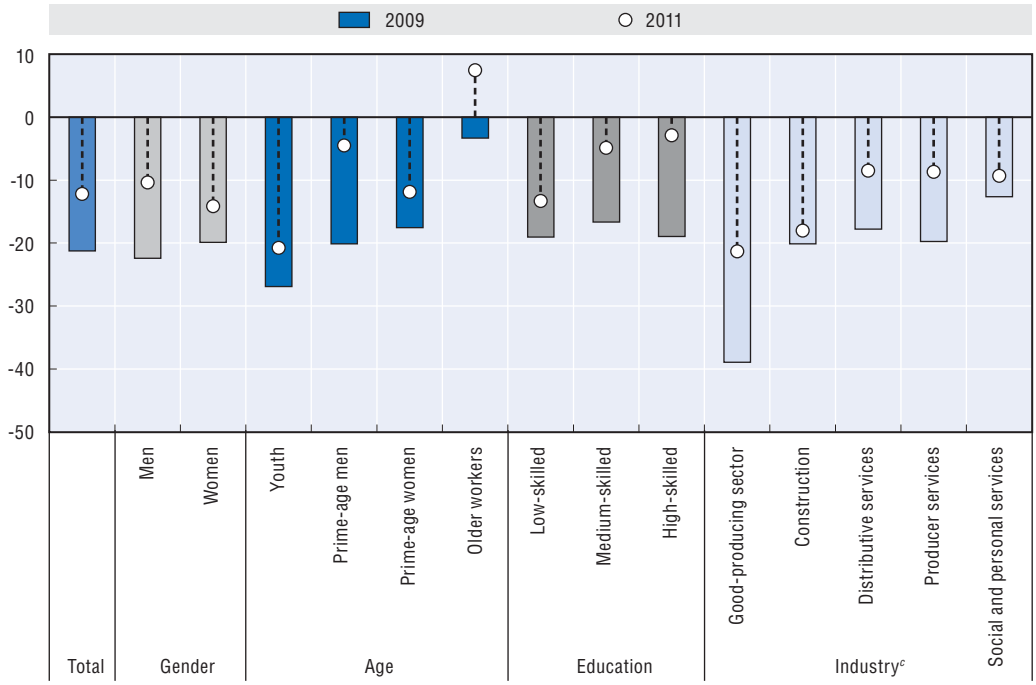
* All references to changes in ALMP spending in this box are expressed in real terms.

In order to implement active labour market policies effectively, it is essential to have a good understanding of which job seekers have most difficulty in finding work and which firms find most difficulty in recruiting new workers. As a first indication, Figure 1.13 documents the proportional *change* in the number of hires across different groups of job-seekers and firms in different industries since the start of the crisis in 2007 Q4 and 2009 Q4 (the start of the recovery) as well as 2011 Q4 (the latest date for which data are available):

- *Workers*. The initial decline in hires has been most pronounced for youth, amounting to over 25%. Hires have tended to recover for all groups since the fourth quarter of 2009, but the extent of the hiring recovery has been uneven. Whereas the hires of high-skilled workers have almost returned to pre-crisis levels, hires of low-skilled workers have only recovered marginally. The hiring of youth remains the most depressed, at more than 20% lower in the fourth quarter of 2011 than at the start of the crisis.
- *Industries*. The initial decline in hires has been most pronounced in manufacturing, where it declined by almost 40%, consistent with the large negative output shock in this sector. The initial decline in hires was similar in construction, distribution services and producer services, amounting to around 20%, while it was relatively limited in social personal services. In the two years since the fourth quarter of 2009, there has been a recovery in hires in all sectors except construction, where it has remained almost constant. The lack of an apparent hiring recovery in the construction sector reflects the structural problems of this industry in many OECD countries.

Figure 1.13. **The evolution of hires by worker group and sector since the start of the crisis**

Percentage change in number of hires since 2007 in EU countries[a, b]



a) Weighted average across the 27 EU member countries. See Annex Figure 1.A3.6 of OECD (2012a) for individual country results.

b) Data by gender, age and industry refer to the working age population (aged 15-64), while data by education refer to persons aged 25-64.

c) "Good-producing sector" corresponds to mining, manufacturing and electricity, gas and water supply; "Distributive services" to wholesale and retail trades, hotels and restaurants, transport, storage and communication; "Producer services" to financial intermediation and real estate and business services; and "Social and personal services" to service sectors other than those defined previously.

Source: OECD calculations based on the European Union Labour Force Survey (EULFS).

StatLink http://dx.doi.org/10.1787/888932651047

Conclusions

The weak and uneven economic recovery in many OECD countries has major implications for the labour market. First, it has been insufficiently strong to make a large dent in the cyclical hike in OECD-area unemployment. Second, it has led to an increasing marginalisation of the jobless through an increase in the number of long-term unemployed and of discouraged job seekers. Third, there remains a risk that the cyclical increase in unemployment becomes structural even if this has not yet materialised to any significant degree. This risk remains highest for those countries where the increase in labour market slack has been most pronounced.

Given the extent of cyclical labour market slack, the main policy priority from a labour market perspective should be to underpin aggregate demand. However, as the scope for supportive macroeconomic policies has narrowed in most OECD countries, placing more emphasis on the potential role of structural reforms in product and labour markets may help to provide the right conditions for a vigorous recovery in output and labour markets. Indeed, the crisis and the subsequent need for fiscal consolidation already appear to have acted as important catalysts for structural reforms, particularly in countries where reforms

were most needed (OECD, 2012e). Labour market policies also have a key role to play in containing the risk of rising unemployment by: *i)* making sure that job losers, and particularly those at risk of long-term unemployment, do not see their skills depreciate as a result of prolonged joblessness and will be readily employable once the labour market recovers; and *ii)* addressing any emerging structural obstacles that prevent unemployed seekers from finding jobs and employers from filling job openings. This requires identifying as early as possible any emerging skill shortages; specific groups of workers with inappropriate or obsolete skills; and providing training opportunities to help them get back into work.

A key issue going forward relates to improving our understanding of the mechanisms that render cyclical increases in labour market slack more persistent or even structural. While this chapter has adopted a number of different approaches to analyse these issues, it remains difficult to draw definitive conclusions about the increased persistence of labour market slack, let alone about any increase in the level of structural unemployment. However, the intense debate on the possible increase in structural unemployment, particularly in the United States, has led to a flurry of new research in this area that has yet to make its way into mainstream labour market policy analysis.[28]

Notes

1. Among other things, Chapter 2 examines the role of aggregate demand and different margins of adjustment (*e.g.* wages, working time, labour productivity) for the evolution of unemployment during the crisis and the recovery.
2. The OECD-wide employment gap peaks substantially later than the OECD-wide unemployment rate. This is due to the significant decline in labour force participation during the initial phase of the economic recovery in a number of countries, including in the United States.
3. Differences in the evolution of employment between men and women are very small. Employment fell slightly more for men than that for women during the crisis, but has since recovered slightly more for men than for women. While suitable data to analyse the employment position of immigrants are lacking, OECD (2012c) suggests that immigrants have been hard hit by the economic downturn in most OECD countries. This is mainly explained by the greater presence of immigrants in sectors that have been affected most by the crisis in comparison with natives and the over-representation of immigrants in non-standard jobs.
4. Differences in the evolution of relative employment across socio-economic groups may, in part, reflect differences in trend labour force participation and/or population growth. One way to abstract from the influence of secular labour market developments is to express the evolution of employment in terms of its deviation from the pre-crisis trend. While the qualitative results by age and type of contract are similar to those presented in Figure 1.4, the results by skill are qualitatively different. The relatively weak employment performance of low-skilled workers during the crisis largely reflects the trend decline in the demand for low-skilled workers, whereas the cyclical impact of the crisis on the relative demand for low-skilled workers appears to be fairly minor.
5. This may to some extent be linked to the uptick in temporary jobs.
6. For the further details on the calculation of unemployment-exit probabilities by time spent in unemployment, see note a) of Figure 1.5.
7. It is worth noting that nearly half of all long-term unemployment in the United States takes the form of very long-term unemployment (two years of more). This suggests that it is unlikely to be related in an *important* way to the *temporary* extension of unemployment insurance benefits from 26 to 99 weeks.
8. Unlike long-term unemployment, the increase in very long-term unemployment occurred only in a few countries hardest-hit by the deep and protracted recessionary shock such as Ireland, Greece, Portugal, Spain and the United States. See Figure 1.A3.1 of OECD (2012a).

9. This represents a simplified version of the unemployment simulations in Elsby *et al.* (2010, 2012) for the United States.

10. While job seekers without previous work experience have traditionally been more likely to be unemployed, the increase in long-term unemployment during the crisis is largely accounted for by job losers with recent work experience. See Annex Figure 1.A3.3 of OECD (2012a) for details.

11. In addition to a second-earner effect, it may also reflect the secular increase in labour force participation.

12. Structural unemployment refers to the equilibrium level of unemployment that remains after accounting for cyclical fluctuations in aggregate demand.

13. This view of the economy may be contrasted to that of full hysteresis in which unemployment reflects the cumulative effect of all past shocks to the economy, including those to aggregate demand. This implies that unemployment can be maintained indefinitely at any level with stable inflation. While there exists considerable evidence against the hysteresis model in this extreme form, unemployment persistence associated with a relatively weak and slow-acting relationship between unemployment and inflation can have important implications for the relationship between actual unemployment and the NAIRU (see Richardson *et al.*, 2000, for further details).

14. These estimates are based on a reduced-form Phillips-curve equation smoothed by means of a Kalman filter (see Guichard and Rusticelli, 2011, for details).

15. While for some countries data are available for earlier years, this time period was chosen as it allows comparing the most recent experience of recession and recovery with the corresponding period following the bursting of the dotcom bubble in 2001, without obscuring the visual representation of the empirical Beveridge curves.

16. Two recent European Commission reports suggest a risk of increased skill mismatch and higher structural unemployment at the EU level, with both vacancy and unemployment rates increasing since early 2010 (European Commission, 2011 and 2012).

17. It is also noteworthy that in a number of countries the Beveridge curve appears to have shifted inwards in the period before the recent crisis since 2001, signalling increased matching efficiency. These are Chile, Germany, Italy and Japan. In Germany, this is widely attributed to the Hartz IV reforms that took place in the mid-2000s.

18. Using more comprehensive data on job vacancies, Barnichon *et al.* (2011) also find that the Beveridge curve drifted rightwards in the United States since the Great Recession. They argue that the drift is transitory.

19. Practically, this involves estimating for each country the following empirical model using pre-crisis data: $\ln y_t = \alpha_0 + \alpha_1 \ln\left(\frac{v}{u}_t\right) + \varepsilon_t$ where y refers to either the job-filling or the job-finding rate, u and v refer to the number of vacancies and unemployed job seekers and ε an independent error term. α_1 captures the sensitivity of matching measured in terms of either the job-filling or the job-finding rate with respect to labour market tightness and α_0 measures the degree of matching frictions conditional on labour market tightness. The evolution of the job-filling and job-finding rates since the start of the crisis can be predicted by combining the estimated parameters with the actual evolution of labour market tightness since the start of the crisis. The results are qualitatively similar when the lagged value of labour market tightness is used or a linear trend is included. See Petrongolo and Pissarides (2001) for a survey of the matching function.

20. See also Daly *et al.* (2011).

21. Sahin *et al.* (2011) analyse the relative importance of different forms of mismatch in the United States for the recent rise in unemployment. They show that sectoral and occupational mismatch increased during the crisis, but that regional mismatch increased little. They suggest that increased mismatch may account for 0.8 to 1.4 percentage points of the recent rise in the unemployment rate. However, some of the increase in mismatch is likely to be temporary.

22. See Fereira *et al.* (2010, 2011) and Farber (2012) for evidence on the potential negative effects of the housing bust on housing mobility in the United States.

23. Jaimovich and Shiu (2012) suggest that the secular process of job polarisation may be related to the emergence of jobless recoveries in the United States. They argue that most of the semi-skilled jobs tend to disappear during the recessions, while jobless recoveries arise because these semi-skilled jobs do not return in the recovery.

24. See Aaronson *et al.* (2010), Rothstein (2011) and Fujita (2011).

25. This may account to some extent for the pattern of negative duration dependence that was documented in Section 2.

26. Daly *et al.* (2011) note that economic uncertainty may make employers more selective with respect to applicants which is consistent with a decline in observed recruiting intensity.

27. See also OECD (2011a, Chapter 4) for a broader discussion of policies to tackle skills mismatch.

28. Another issue is to improve the quality and comparability of job vacancy data. In line with the search-and-matching literature, this chapter has emphasised the importance of vacancy information as a way of bringing labour demand into the analysis and for distinguishing between the relative contributions of changes in aggregate demand and labour market mismatch to changes in unemployment. However, the importance of vacancy information goes well beyond the issues raised in this chapter. Job vacancy information also plays a crucial role in the more day-to-day work of identifying skills shortages and obsolete skills.

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ANNEX 1.A1

OECD Labour Market Projections from May 2012

Table 1.A1.1. **Recent and projected developments in OECD countries**[a]

		Real GDP growth (percentage change from previous period)							Employment growth (percentage change from previous period)								Unemployment rates (percentage of labour force)						
	Share in total OECD GDP 2008	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013	Level 2011 (000s)	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013
America																							
Chile	0.6	4.9	3.7	–0.9	6.1	5.9	4.4	5.1	7 487	2.7	3.0	0.0	7.4	5.0	1.1	2.0	8.0	7.8	10.8	8.1	7.1	7.2	7.2
Canada	3.2	2.7	0.7	–2.8	3.2	2.5	2.2	2.6	17 309	1.8	1.7	–1.6	1.4	1.5	1.1	1.1	6.4	6.1	8.3	8.0	7.5	6.9	6.6
Mexico	3.8	3.9	1.2	–6.3	5.5	4.0	3.6	3.8	46 306	1.7	1.1	0.5	4.4	2.2	2.1	2.4	3.6	4.0	5.5	5.3	5.2	5.1	4.9
United States	35.1	2.5	–0.3	–3.5	3.0	1.7	2.4	2.6	139 873	1.6	–0.5	–3.8	–0.6	0.6	1.8	1.6	4.8	5.8	9.3	9.6	8.9	8.1	7.6
Asia																							
Japan	10.7	1.7	–1.1	–5.5	4.5	–0.7	2.0	1.5	62 443	0.4	–0.4	–1.6	–0.4	–0.2	0.1	–0.2	4.1	4.0	5.1	5.1	4.6	4.5	4.4
Korea	3.3	4.7	2.3	0.3	6.3	3.6	3.3	4.0	24 244	1.3	0.6	–0.3	1.4	1.7	1.4	1.2	3.5	3.2	3.6	3.7	3.4	3.5	3.5
Israel[b]	0.5	5.3	4.0	0.8	4.8	4.8	3.2	3.6	3 253	3.8	3.4	2.0	3.5	3.0	1.8	2.3	10.2	7.6	9.4	8.2	7.0	6.9	6.7
Europe																							
Austria	0.8	3.4	1.1	–3.6	2.5	3.0	0.8	1.6	4 146	2.5	1.5	–0.3	0.5	1.2	0.5	0.3	4.8	3.8	4.8	4.4	4.1	4.6	4.8
Belgium	1.0	2.5	0.9	–2.7	2.2	2.0	0.4	1.3	4 633	1.4	1.8	–0.1	0.8	1.4	0.1	0.2	8.1	7.0	7.9	8.3	7.2	7.5	7.8
Czech Republic	0.7	6.6	2.9	–4.5	2.6	1.7	–0.5	1.7	4 888	1.6	1.6	–1.3	–1.0	0.4	–0.6	0.5	6.8	4.4	6.7	7.3	6.7	7.0	6.9
Denmark	0.5	2.5	–0.8	–5.8	1.3	1.0	0.8	1.4	2 780	2.0	1.7	–3.3	–2.2	–0.5	–0.1	0.2	4.1	3.3	5.9	7.3	7.4	7.6	7.5
Estonia	0.1	8.8	–3.7	–14.3	2.3	7.6	2.2	3.6	609	3.2	0.2	–9.2	–4.2	6.7	1.1	0.9	6.2	5.6	13.9	16.8	12.5	11.4	10.4
Finland	0.5	4.2	0.3	–8.4	3.7	2.9	0.9	2.0	2 464	1.8	1.6	–2.9	–0.5	1.1	–0.1	0.2	7.7	6.4	8.3	8.4	7.8	7.9	7.8
France	5.2	2.3	–0.2	–3.0	1.6	1.7	0.6	1.2	25 769	1.0	1.4	–0.9	0.2	0.3	–0.1	0.2	8.6	7.4	9.1	9.4	9.3	9.8	10.0
Germany	7.4	2.7	0.8	–5.1	3.6	3.1	1.2	2.0	41 099	0.7	1.2	0.0	0.5	1.3	0.9	0.2	9.6	7.2	7.4	6.8	5.7	5.4	5.2
Greece	0.8	3.6	–0.2	–3.2	–3.5	–6.9	–5.3	–1.3	4 094	1.5	1.1	–1.1	–2.7	–6.7	–5.0	–1.1	9.0	7.7	9.5	12.5	17.6	21.2	21.6
Hungary	0.5	2.7	0.7	–6.7	1.2	1.7	–1.5	1.1	3 793	0.3	–1.2	–2.3	0.0	1.0	–0.1	0.1	7.4	7.9	10.1	11.2	11.0	12.0	12.2
Iceland	0.0	6.0	1.3	–6.8	–4.0	3.1	3.1	2.7	167	4.3	0.7	–6.0	–0.3	0.0	1.0	1.2	2.6	3.0	7.2	7.5	7.0	5.8	5.1
Ireland	0.5	5.3	–3.0	–7.0	–0.4	0.7	0.6	2.1	1 808	4.3	–0.7	–8.2	–4.2	–2.1	–0.1	0.3	4.4	6.0	11.8	13.6	14.5	14.5	14.4
Italy	4.5	1.6	–1.2	–5.5	1.8	0.5	–1.7	–0.4	22 968	1.2	0.7	–1.5	–0.7	0.4	–0.3	–0.3	6.9	6.8	7.8	8.4	8.4	9.4	9.9
Luxembourg	0.1	5.7	0.8	–5.3	2.7	1.6	0.6	2.2	225	1.8	3.0	1.2	1.7	2.3	1.4	1.3	4.2	4.2	5.5	5.8	5.7	6.3	6.6
Netherlands	1.7	3.2	1.8	–3.5	1.6	1.3	–0.6	0.7	8 533	1.4	1.2	–0.6	–0.3	0.2	–0.3	0.1	4.3	3.0	3.7	4.4	4.4	5.3	5.7
Norway	0.6	2.6	0.0	–1.7	0.7	1.6	2.3	2.6	2 543	2.4	3.3	–0.6	0.0	1.4	1.5	1.4	3.5	2.6	3.2	3.6	3.3	3.3	3.2

Table 1.A1.1. **Recent and projected developments in OECD countries**[a] *(cont.)*

		Real GDP growth (percentage change from previous period)							Employment growth (percentage change from previous period)								Unemployment rates (percentage of labour force)						
	Share in total OECD GDP 2008	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013	Level 2011 (000s)	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013	Average 2005-07	2008	2009	2010	2011	Projections 2012	Projections 2013
Poland	1.7	5.5	5.0	1.7	3.9	4.4	2.9	2.9	16 131	3.4	3.7	0.4	0.6	1.1	0.1	–0.1	13.7	7.1	8.2	9.6	9.6	10.3	10.6
Portugal	0.6	1.5	0.0	–2.9	1.4	–1.6	–3.2	–0.9	4 807	0.3	0.6	–2.7	–1.4	–2.9	–3.9	–1.2	7.8	7.6	9.5	10.8	12.8	15.4	16.2
Slovak Republic	0.3	8.5	5.8	–4.9	4.2	3.3	2.6	3.0	2 352	2.8	3.2	–2.7	–2.1	1.5	–0.1	0.7	13.6	9.5	12.0	14.4	13.5	14.0	13.5
Slovenia	0.1	5.6	3.6	–8.0	1.4	–0.2	–2.0	–0.4	936	1.5	1.1	–1.5	–1.5	–3.1	–3.3	–2.7	5.8	4.4	5.9	7.2	8.2	8.8	9.2
Spain	3.4	3.7	0.9	–3.7	–0.1	0.7	–1.6	–0.8	18 105	4.0	–0.5	–6.8	–2.3	–1.9	–4.1	–1.1	8.6	11.3	18.0	20.1	21.6	24.5	25.3
Sweden	0.8	3.7	–0.8	–5.0	5.8	4.0	0.6	2.8	4 642	1.6	1.1	–2.1	1.0	2.1	0.4	0.9	6.9	6.2	8.3	8.4	7.5	7.6	7.6
Switzerland	0.8	3.3	2.1	–1.9	2.7	1.9	0.9	1.9	4 468	1.6	2.3	0.4	0.5	2.2	1.3	1.0	3.9	3.3	4.3	4.4	4.0	3.9	3.7
Turkey	2.3	6.6	0.7	–4.8	9.2	8.5	3.3	4.6	24 610	1.8	2.1	0.4	6.0	6.6	1.7	2.2	10.2	10.7	13.7	11.7	9.6	9.5	9.1
United Kingdom	5.5	2.7	–1.1	–4.4	2.1	0.7	0.5	1.9	29 176	0.9	0.7	–1.6	0.3	0.5	–0.2	0.1	5.2	5.7	7.6	7.9	8.1	8.6	9.0
Oceania																							
Australia	2.0	3.6	2.3	1.5	2.4	2.2	3.1	3.7	11 493	3.0	2.8	0.7	2.7	1.7	0.2	0.9	4.7	4.2	5.6	5.2	5.1	5.4	5.7
New Zealand	0.3	2.9	–0.7	–0.1	2.4	1.3	1.9	2.8	2 215	2.4	0.6	–1.1	0.7	1.6	1.2	1.8	3.8	4.2	6.1	6.5	6.5	6.5	6.1
OECD Europe[c]	**40.5**	**3.2**	**0.4**	**–4.1**	**2.5**	**2.0**	**0.3**	**1.4**	**235 744**	**1.6**	**1.2**	**–1.4**	**0.3**	**0.9**	**–0.2**	**0.2**	**8.2**	**7.3**	**9.3**	**9.6**	**9.4**	**10.0**	**10.2**
Euro area (15)[c]	**27.0**	**2.7**	**0.2**	**–4.4**	**1.9**	**1.5**	**–0.1**	**0.9**	**142 546**	**1.5**	**0.9**	**–1.8**	**–0.5**	**0.1**	**–0.6**	**–0.1**	**8.2**	**7.4**	**9.4**	**9.9**	**10.0**	**10.8**	**11.1**
EU15[c]	**33.3**	**2.7**	**0.0**	**–4.4**	**2.0**	**1.4**	**–0.1**	**1.0**	**175 247**	**1.4**	**0.9**	**–1.8**	**–0.3**	**0.1**	**–0.5**	**–0.1**	**7.6**	**7.1**	**9.0**	**9.4**	**9.5**	**10.3**	**10.6**
EU21[c]	**36.7**	**3.0**	**0.3**	**–4.2**	**2.1**	**1.5**	**0.0**	**1.2**	**203 956**	**1.5**	**1.1**	**–1.6**	**–0.3**	**0.3**	**–0.5**	**–0.1**	**8.1**	**7.0**	**8.9**	**9.5**	**9.5**	**10.3**	**10.5**
Total OECD[c]	**100.0**	**2.9**	**0.1**	**–3.8**	**3.2**	**1.8**	**1.6**	**2.2**	**550 369**	**1.5**	**0.6**	**–1.8**	**0.6**	**1.0**	**0.7**	**0.9**	**6.1**	**6.0**	**8.2**	**8.3**	**8.0**	**8.0**	**7.9**

a) The OECD Secretariat's projection methods and underlying statistical concepts and sources are described in detail in "Sources and Methods" in *OECD Economic Outlook* which can be downloaded from the OECD Internet site (*www.oecd.org/dataoecd/47/9/36462096.pdf*).

b) Information on data for Israel can be found at: *http://dx.doi.org/10.1787/888932315602*.

c) Aggregates are computed on the basis of 2008 GDP weights expressed in 2008 purchasing power parities for real GDP growth, employment weights for employment growth and labour force weights for unemployment rates.

Source: OECD (2012), *OECD Economic Outlook*, No. 91, Paris.

StatLink http://dx.doi.org/10.1787/888932652054

ANNEX 1.A2

Job-vacancy Statistics

Job-vacancy data play a key role for understanding recent labour market dynamics. Job vacancies are the number of job openings posted by employers at a given point in time for recruiting employees outside their establishments to fill vacant job positions. The process of recruitment may take more or less time depending on: prevailing labour market conditions; the job-search intensity of prospective employees and the recruitment intensity of employers; and the availability of workers with required qualifications for the jobs offered. Job applicants can either be in employment, unemployment or out of the labour force. Unfilled job openings are jobs remaining vacant for some time after the job announcement has been posted, either because employers or the job-broking agency cannot find suitable matches to fill vacant jobs or because employers do not wish or need to fill those job positions immediately. In the former case, it is a measure of unmet labour demand for different reasons including labour shortages.

Unlike harmonised unemployment rates, job vacancies are derived from a variety of data sources and concepts that are often not internationally comparable. Ideally, analogous to unemployment statistics, job-vacancy data should provide a point-in-time estimate of a job currently vacant or an unoccupied post for which the employer places an announcement and undertook, in the recent past, active search of a suitable candidate to fill the vacant job, at current wages, that is immediately available or within a specified period (Layard *et al.*, 2001; Farm, 2003). However, there are few national survey instruments conducted on a regular basis that capture the extent of job openings at a point in time; contain questions on the ensuing recruitment process; and provide information on unfilled job vacancies. This is the case, for example, of the quarterly job vacancy surveys in Australia, Finland and Sweden. Moreover, a job position may not be actually vacant at the time of recruitment and the methods of active job search or specific recruiting action are specified only in a few cases, such as the *Job Openings and Labour Turnover Survey* (JOLTS) conducted in the United States since December 2000. Clark and Phillips (2002) compare JOLTS with job vacancy surveys developed in Europe and Eurostat's recommendations for defining job vacancies and find that generally the concepts are comparable as well as the results. However, further work needs to be undertaken to assess the comparability of employer-based job-vacancy survey information.

In practice, there are three main sources from which information on vacancies can be obtained: general job-announcement counts; employer surveys on job openings; and job announcements managed by public employment services. Job vacancies may be advertised through a wide range of channels such as newspaper advertisements, public employment

services, private recruitment agencies (*e.g.* private job placement agencies, head hunters, temporary work agencies) as well as dedicated web platforms on the Internet. In some countries, job-announcement counts are estimated and subsequently expressed as indexes, such as the Help Wanted Index in Canada, Chile, New Zealand and the United States. Nowadays, this count takes into account job announcements placed online on the Internet, such as New Zealand's Department of Labour Jobs Online Index and the Help Wanted Index of the US Conference Board. In some countries, job-vacancy statistics are collected through a dedicated job-vacancy survey addressed to employers, such as in Australia, Germany, Finland, Japan, the Netherlands, Sweden and the United Kingdom, while in other countries, job-openings data are collected through questions in regular employment surveys, such as the quarterly *Activité et conditions d'emploi de la main-d'œuvre* (Acemo) in France and similar surveys in Greece, Italy, Slovenia, Spain and Switzerland. In a few other countries, job-vacancy statistics rely only on job announcements managed by public employment services (*e.g.* Austria, Japan and Switzerland) and thus understate total vacancies, because this is only one of a wide range of recruitment channels.

The available information on vacancies, generally, does not fully account for all job openings, as some survey instruments are limited to job openings issued by establishments with ten or more employees in non-farm business sectors (Acemo) or establishments in non-farm private and public sectors (JOLTS). Zanda and Fondeur (2009) report that the French Acemo-based job vacancies, after accounting for missing sectors including the public sector, represent only one third of job openings placed with the public employment service (*Pôle Emploi*). Moreover, job openings do not capture all available jobs. Many job positions are filled by employers without posting formal job offers. Job openings that are filled very quickly may also not be captured well in available vacancy statistics (Diamond, 2011). Workers can get hired through direct job applications, employers can re-hire laid-off workers or hire workers at work fairs or at the end of training programmes, for instance, for apprentices and public servants (Farm, 2003).

The job vacancy statistics reported in Figure 1.11 have been compiled for 27 OECD countries. Data from job vacancy surveys and the count of job advertisements, apart from some known limitations, appear to be the most extensive measures of the number of job openings and thereby of labour demand at a given point in time to be matched with labour supply measures of unemployed job seekers. However, due to unavailability in many countries of survey-based quarterly data for the period under consideration, the data in Figure 1.11 refer to job announcements managed by public employment services for 16 of the 27 countries considered (see sources and notes in Annex Table 1.A3.3 in OECD, 2012a).

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Chapter 2

What Makes Labour Markets Resilient During Recessions?

This chapter analyses the impact of selected labour market policies and institutions for labour market resilience, defined as the extent to which labour markets weather economic downturns with limited social costs. One of the main insights that emerges from this chapter is that policies and institutions that are conducive to good structural labour market outcomes also tend to be good for labour market resilience. In particular, co-ordinated bargaining institutions can contribute to both good structural performance and labour market resilience, while the intensive use of temporary contracts tends to be associated with both weaker structural outcomes and less resilience.

Key findings

All OECD countries have been severely affected by the global economic and financial crisis that began in 2008. But the social costs associated with the economic downturn have differed substantially across countries. To a large extent, this is due to the different degrees to which the decline in aggregate demand for goods and services translated into a reduced demand for labour and to differences in how the burden of adjustment has been shared across the workforce. However, income-support policies have also played an important role in shaping the social costs of the crisis. The main aim of this chapter is to analyse the role of *structural* policies for labour market resilience, defined as the extent to which labour markets weather economic downturns with limited social costs. While the main focus of this chapter is on labour market resilience, this should not be an isolated objective but be part of an overall policy framework that takes account of the role of labour market policies and institutions in both the short and longer term.

A first insight provided by this chapter is that structural policies and institutions matter for labour market resilience. Not only do they moderate the labour market impact of economic shocks, they also mitigate the impact of changes in labour earnings on household disposable income.

- *Differences in policies and institutions can give rise to large cross-country differences in the overall impact of economic downturns on unemployment, labour income and earnings inequality.* Experience from previous economic downturns suggests that a 1% decline in GDP increases the unemployment rate during the first four years by on average 0.15 of a percentage point in Japan but almost 0.6 of a percentage point in Spain. This difference results exclusively from differences in the policies and institutions that are considered in the analysis. Similarly, a 1% decline in GDP reduces total labour income by less than 0.5% in Belgium but by over 1% in Portugal. Simulation evidence further suggests that an adverse economic shock tends to increase overall earnings inequality in countries such as Canada and Spain where most of the adjustment takes the form of job losses, whereas in countries such as Portugal and the Netherlands, it tends to reduce earnings inequality, since most adjustment takes the form of reductions in working time or wages.
- *Evidence from firm-level data suggests that policies and institutions accounted for a substantial part of the differences in the aggregate labour market impact of the recent economic downturn across countries.* Accounting for cross-country differences in economic structures and the distribution of shocks across different types of firms substantially increases our ability to explain differences in aggregate labour market dynamics. Nevertheless, it is the variation in the adjustment behaviour of *similar* firms in different countries that accounts for the bulk of the cross-country variation in outcomes. This provides a first indication that differences in the policies and institutions that affect firm behaviour play an important role in explaining the aggregate labour market response to shocks. Further analysis shows that strict employment protection provisions for workers on permanent contracts reduces the importance of employment adjustments relative to that of

working time and wages, while a higher incidence of temporary work tends to be associated with more employment adjustment relative to working time and wages.

- *The tax-benefit system plays a major role in mitigating the social costs of the labour market response to economic downturns for workers and their families.* Micro-simulation evidence suggests that, in the absence of taxes and benefits, a 5% reduction in aggregate demand reduces average household income by 1% to 2% and increases income inequality. However, once taxes and benefits are taken into account, the proportional reduction in household income is 20 to 40% smaller and most of the increase in income inequality is unwound. To fully appreciate the role of the tax-benefit system for labour market resilience, a more comprehensive analysis is required that takes account not only of its social consequences, but also of how it affects the labour market response to economic downturns in the first place. To the extent that unemployment benefits increase the adverse labour market impact of economic downturns by increasing the persistence of the decrease in employment, as suggested by the macroeconomic analysis, this reduces the positive impact of unemployment benefits for labour market resilience.

A second insight is that policies and institutions that are conducive to good structural labour market outcomes are also good for labour market resilience. In general, countries with low levels of structural unemployment also tended to experience less of an increase in joblessness as a result of previous economic downturns. This implies that many of the recommendations in the *Reassessed OECD Jobs Strategy* (2006) for achieving good structural labour market outcomes are also likely to contribute to labour market resilience. In particular, two specific sets of policies tend to have similar implications for structural labour market performance and labour market resilience:

- *Co-ordinated wage-bargaining institutions can contribute to both good structural performance and labour market resilience.* More specifically, co-ordination appears to be important in achieving low structural unemployment rates and in mitigating the direct impact of shocks on employment by facilitating adjustments to wages and/or working-time. By increasing the responsiveness of real wages to changes in macroeconomic conditions, co-ordinated collective-bargaining institutions may reduce the need to adjust employment in response to negative output shocks. Moreover, such institutions may also be more likely to take account of any negative employment externalities that may be associated with collective wage bargaining.
- *Institutional settings that favour the use of temporary contracts, such as stringent employment protection provisions for regular workers, are associated with both weaker structural outcomes and less labour market resilience.* The adverse impact of temporary work on structural outcomes may reflect its positive impact on frictional unemployment and its negative impact on job quality. It adversely affects labour market resilience by increasing the unemployment response to output shocks and reinforcing the cyclical increase in earnings inequality. Apart from increasing the incidence of temporary work, strict employment protection for regular workers does not appear to have much of a direct impact on most measures of structural labour market performance or labour market resilience considered in this chapter. If anything, it may mitigate the impact of economic shocks on unemployment and earnings inequality by inducing firms to adjust more on the wage and working-time margins than on the employment margin.

Introduction[1]

The global economic and financial crisis that erupted in 2008 severely affected all OECD countries. But the social costs associated with the economic downturn have differed significantly across the OECD. To an important extent, this reflects the different degree to which the decline in aggregate demand for goods and services translated into lower labour demand. It also reflects the way the burden of adjustment was shared across the workforce, *i.e.* differences in the extent of labour hoarding and the relative importance of alternative margins of adjustment (*i.e.* employment, working time and wages). For example, in countries such as Ireland, Spain and the United States, labour market adjustment has overwhelmingly taken the form of labour shedding. In other countries, where firms have tended to hoard labour such as Germany and Japan, much of the decline in employment has been avoided. In addition to differences in the way labour markets have adjusted in response to the decline in aggregate demand, income-support policies also played an important role in shaping the social costs of the crisis.

The substantial cross-country differences in the social consequences of the crisis raise important questions about the role of policies and institutions. This chapter analyses the link between *structural* policies and labour market resilience, with the latter defined as the extent to which labour markets weather economic downturns with limited social costs. This is done both from a macroeconomic perspective, by analysing the role of policies and institutions for aggregate labour market dynamics, and also from a microeconomic perspective, by focusing on the role of institutions for the adjustment behaviour of individual firms. To the extent that individual firms differ in terms of their adjustment technologies, cross-country differences in labour market adjustment may not just stem from differences in institutional settings, but also from differences in the distribution of shocks across firms and the composition of firms across countries. In addition to providing new empirical evidence, this chapter also draws out a number of lessons on how policies and institutions can be designed to achieve good labour market outcomes over the course of the business cycle.

The chapter is organised as follows. Section 1 defines labour market resilience and provides an overview of the way labour market outcomes have evolved during the crisis and economic recovery up to the last quarter of 2011. It also discusses the main policy and institutional reforms that OECD countries have undertaken in the 15 years preceding the global crisis. Using historical data from before the crisis, Section 2 analyses the role of policies and institutions for structural labour market outcomes and different aspects of labour market resilience from a macroeconomic perspective. An important question here is to what extent policies and institutions that are conducive to good structural labour market outcomes are also good for labour market resilience. Section 3 takes a microeconomic approach to labour market resilience by focusing on the adjustment behaviour of individual firms in response to shocks and its implications for the incomes of workers and their families. The final section sums up the chapter's main insights and offers suggestions for further work.

1. The impact of the global financial crisis on labour markets and the role of policies: A first look

Defining labour market resilience

For the purpose of this chapter, resilient labour markets are defined as labour markets that weather economic downturns with limited social costs or, more formally, limited losses in worker welfare. Three features of this definition are worth highlighting:[2]

- Labour market resilience is defined in terms of *worker welfare* rather than productive efficiency. This implies that it takes a worker perspective rather than the perspective of firms. The two perspectives differ when firms and workers differ in their preferences to risk and their ability to smoothen income fluctuations. Workers are typically considered to be risk-averse since stable consumption paths are associated with higher welfare than more volatile consumption paths that follow the same long-term trend. Firms may be more likely to be risk-neutral since they are primarily concerned with long-term profits and productive efficiency. In addition to differing in their risk preferences, workers and firms also differ in their ability to smooth income fluctuations. This may be the case when they differ in their access to credit and/or insurance on private capital markets. Indeed, the difficulty of insuring individual labour market risks in private insurance markets provides an important economic rationale for the public provision of unemployment insurance and social assistance.
- In order to avoid taking a normative stance on how worker welfare is defined, this chapter focuses on a number of labour market outcomes that are likely to capture the main channels through which economic downturns affect worker welfare instead of adopting an explicit welfare function. These are: *i)* the change in the unemployment rate; *ii)* the change in total earnings; and *iii)* the way the earnings impact is distributed over the labour force.[3] While unemployment and labour income changes both incorporate the effects of job losses, their welfare implications are likely be quite different. Unemployment often entails social costs that go beyond the loss of income by adversely affecting other outcomes such as health, crime and happiness. Labour income changes, for their part, not only capture the loss of earnings associated with job loss, but also those associated with reduced working hours and hourly wages. Earnings volatility is a concern when workers are risk-averse and insurance against earnings losses is incomplete.[4] Moreover, earnings volatility may be considered to be more of a concern for workers with relatively low incomes as they typically have a more limited capacity to absorb the impact of income shocks on consumption.[5]
- Labour market resilience is defined with respect to shocks in *output* rather than its underlying source. The main justification for this is that output fluctuations, such as those experienced during the global financial crisis, largely reflect fluctuations in aggregate demand which may be considered the prime responsibility of macroeconomic policies (*e.g.* fiscal and monetary policy), while the main responsibility of labour market institutions and policies is to promote good labour market performance throughout the economic cycle. The main advantage of taking the level of aggregate demand as given is that the source of output fluctuations does not have to be modelled and the analysis can instead focus on the specific role of labour market policies and institutions. Conditioning on output fluctuations does, however, involve assuming that output fluctuations are driven by changes in aggregate demand rather than by changes in aggregate supply. While this seems reasonable in the context of the global financial crisis, this was not

always the case during previous downturns. Importantly, conditioning on output fluctuations rules out the possibility of *hysteresis* effects, *i.e.* the possibility that the cyclical increases in labour market slack become structural and hence reduce potential output.[6]

There are different economic and social models that can be consistent with good labour market resilience. Labour markets may be more resilient because the average impact of shocks on workers is limited or because their distributional and unemployment implications are more limited. Moreover, labour market resilience is, in principle, consistent with very different labour-market dynamics: it may reflect a relatively strong initial response of labour market outcomes to shocks followed by a speedy recovery or a weaker initial response followed by relatively more persistence. The measures of labour market resilience used in this chapter generally take account of both *direct* and *persistence* effects.[7]

It is important to emphasise that labour market resilience should not be an isolated objective but be part of an overall policy framework that takes account of the role of labour market policies and institutions in both the short and the longer term. Indeed, the objective of labour market resilience, *i.e.* the minimisation of temporary fluctuations in individual labour market outcomes, needs to be balanced against the maximisation of economic growth and good labour market performance in the longer term. However, little is known about the relationship between labour market resilience and good economic and labour market performance in the longer term.

Box 2.1. **The welfare costs of business cycles**

The welfare approach to labour market resilience in this chapter draws on a number of insights from the literature on the welfare costs of business cycles. In a provocative publication, Lucas (1987) analysed the welfare costs of business cycles by asking how much individuals would be willing to give up of their life-time consumption not to experience any macroeconomic volatility. Based on the existing estimates of risk-aversion in the literature and the actual pattern of consumption volatility in the United States, he calculated that individuals would be willing to sacrifice at most 0.1% of lifetime consumption, implying that the benefits of macroeconomic stabilisation are limited.

The publication of Lucas's findings has sparked an intense debate on the welfare costs of stabilisation and a number of studies have revisited his findings (see Barlevy, 2005, for an overview). One important issue in assessing the robustness of Lucas's findings is related to the appropriateness of the representative-agent assumption and the reliance on aggregate data. Studies that have maintained the representative-agent assumption but have made different assumptions with respect to: the degree of risk preferences; the functional form of utility; and the persistence of consumption, tend to confirm Lucas's earlier findings. The representative-agent framework, however, is problematic when the effects of business cycles on consumption are not equally distributed over the population. The welfare costs of business cycles are likely to be larger when: the consumption losses of downturns are unpredictable and concentrated on some individuals; earnings losses are highly persistent at the individual level; and those most affected have limited savings or access to credit. Krebs (2007) and De Santis (2007) provide two recent applications that depart from the

Box 2.1. **The welfare costs of business cycles** *(cont.)*

representative-agent framework by assuming that individual shocks are highly persistent or even permanent, while insurance markets are incomplete. They both find that, under these assumptions, the welfare costs of business cycles are sizeable.

The concept of labour market resilience used in this chapter draws on this recent literature by taking account of both the average earnings losses associated with recessions, as in the representative-agent framework, as well as the distribution of earnings losses across the population as in studies with heterogeneous agents. As in previous studies that take a heterogeneous-agent approach to measuring the cost of business cycles, the analysis focuses on earnings rather than consumption. In order to make the link to consumption or welfare, it is either implicitly assumed that the public safety net or the market for insurance do not allow absorbing the impact of earnings losses on disposable household income (Section 2) or it takes account of the extent of public insurance that is available to individuals through the tax-benefit system (Section 3). Given the difficulty of defining aggregate welfare in an objective way, this chapter does not make any explicit statements on the role of business-cycle shocks for aggregate welfare.

The impact of the global financial crisis and early recovery on OECD labour markets

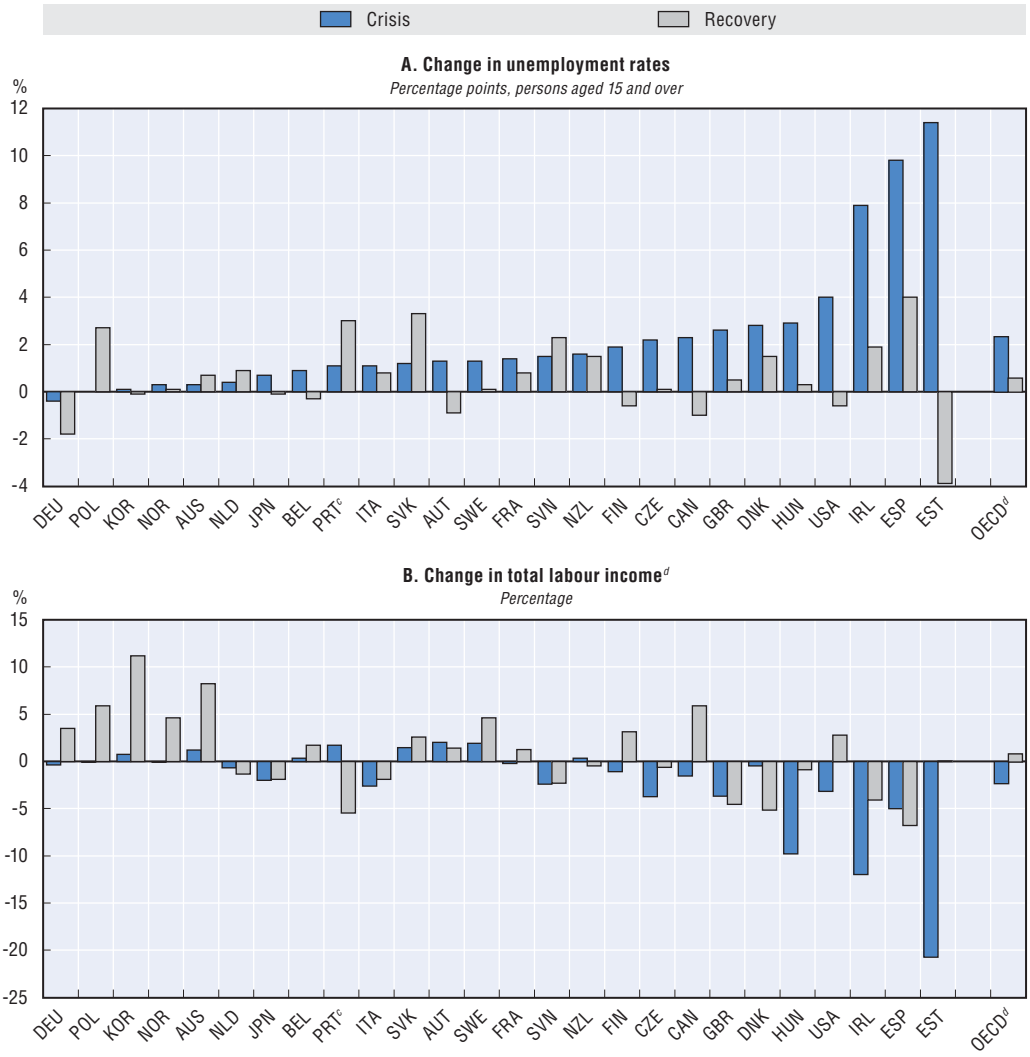
This sub-section provides an overview of the social costs of the recent downturn and subsequent slow recovery up to 2011 Q4 by focusing on its impact on unemployment and total labour income.[8, 9] It also describes the impact of the global financial crisis on different socio-economic groups in terms of employment and average hours worked. The latter is of interest in its own right, but also gives an indication of how the adjustment behaviour of firms affects the overall distribution of earnings across labour force participants.[10, 11]

Cross-country differences in the social impact of the global financial crisis are substantial…

As a result of the global financial crisis, unemployment initially increased in all OECD countries, although the extent and duration of the increases differed greatly across countries. The OECD-wide unemployment rate increased from a post-war low of 5.6% in the first quarter of 2008 to a peak of 8.5% in the fourth quarter of 2009. While economic growth resumed in most countries towards the end of 2009, the recovery has not been sufficiently strong to cut unemployment to pre-crisis levels.[12] Indeed, by the end of 2011, two years into the economic recovery, the OECD unemployment rate stood at 7.9%. Figure 2.1 documents the changes in the unemployment rate and total earnings that took place during the crisis, defined from the country-specific peak to the country-specific trough in GDP, and during the initial recovery, defined from the trough in GDP to the end of 2011 Q4.[13]

- *Unemployment (Panel A)*. In all OECD countries, with the exceptions of Germany and Poland, the unemployment rate increased during the crisis period, with the largest increases observed in Estonia, Ireland and Spain. During the economic recovery, the unemployment rate continued to rise for some time in most OECD countries before reaching its peak, reflecting the usual lag between unemployment and output as well as the unusually weak economic recovery (*cf.* Chapter 1). In Germany, the unemployment rate declined slightly during the crisis, since its initial rise was more than offset by a

Figure 2.1. **The change in unemployment and labour income by country during the crisis and initial recovery**[a, b]



a) Countries are shown in ascending order by the percentage point change of the unemployment rate from the peak in real GDP to its trough.

b) The crisis is defined from the peak in real GDP to its trough whereas the recovery is defined from the trough in real GDP to the latest values available (2011 Q4 for the majority of the countries). Peak (trough) dates are defined as the start of the longest spell of consecutive decreases (increases) in real GDP since 2006 Q1. For details on the country-specific peak and trough dates, see Annex Table 2.A1.1 of OECD (2012b).

c) Total compensation of employees for Portugal.

d) OECD is the unweighted average of countries shown.

Source: OECD calculations based on *OECD Main Economic Indicators Database* and quarterly national accounts.

StatLink http://dx.doi.org/10.1787/888932651104

subsequent decline. Poland also experienced a slight decline, reflecting the minor impact of the global crisis on aggregate demand.

- *Labour income (Panel B)*. The cross-country pattern of changes in labour income during the crisis largely mirrors that of changes in unemployment, with larger income decreases occurring in countries with larger increases in unemployment.[14] In countries with small increases in the unemployment rate during the crisis (less than one percentage point), labour income tended to increase, while in other countries with larger increases in

unemployment, labour income tended to decline by about 1% for each additional percentage point increase in the unemployment rate. In Italy, Japan and most central European countries, the impact of the crisis on labour income was substantially larger than may be expected on the basis of the average relationship between unemployment and total labour income across the OECD, while in Portugal and Spain, the impact on labour income was significantly smaller.[15] During the recovery period, the negative relationship between income and unemployment changes is much weaker. This suggests that the dynamics of labour income and unemployment are rather different, possibly reflecting the greater persistence of adjustments in employment compared with those in working hours and wages.

… reflecting differences in the decline of aggregate output demand…

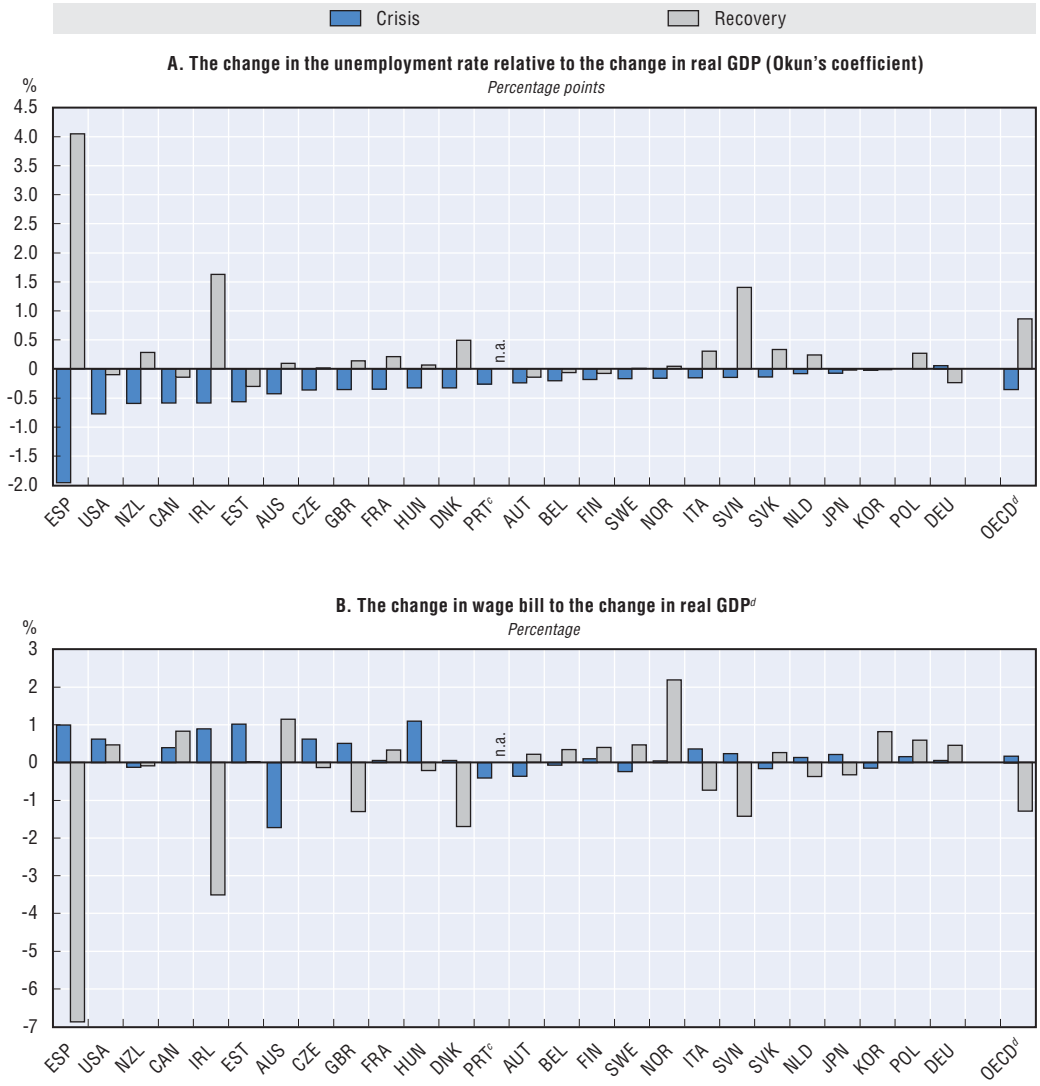
Figure 2.2 relates the cross-country variation in unemployment and labour-income changes during the crisis and initial recovery to the corresponding changes in GDP.

- *Unemployment (Panel A)*. During the crisis, the unemployment rate increased on average across the OECD by one third of a percentage point for each additional percentage reduction in real GDP. This is somewhat less than implied by Okun's law, which posits that a negative output shock of a given size increases unemployment by about half as much. However, when account is taken of the lagged response of unemployment to the decline in GDP, as is done in Section 2, the unemployment elasticity approaches 0.5. The lagged response of unemployment to the decline in GDP also explains why the net change in OECD-area unemployment was positive during the initial recovery. There are large differences in the unemployment response across countries. The main outlier was Spain where Okun's coefficient approached two (in absolute value). In Canada, Estonia, Ireland, New Zealand and the United States, countries which experienced above-average unemployment increases, Okun's coefficient was slightly above one half. In other OECD countries, it was less than one half and many of those countries experienced below-average increases in unemployment.
- *Labour income (Panel B)*. During the crisis, total labour income declined on average across the OECD by 0.16% for each percentage reduction in GDP during the crisis. The proportional response of labour income to the decline in GDP during the crisis was largest in Estonia, Hungary, and Spain, where the change in labour income was approximately the same size as the decline in aggregate demand. This suggests that the ratio of output over the wage bill was broadly constant in those countries during the crisis. In all other countries, the responsiveness of labour income to GDP was less than one, reflecting declining labour productivity. During the recovery, the relationship between labour income and GDP becomes negative on average. This is largely driven by relatively large negative responses in a few countries (*e.g.* Denmark, Ireland, Slovenia, Spain and the United Kingdom). This most likely reflects the lagged impact of the crisis on employment and wages.

… as well as in the importance of different margins of adjustment

Figure 2.3 examines the differences in the evolution of unemployment since the start of the crisis in more detail by decomposing the change in unemployment during the crisis and the early recovery into five components: *i)* the change in the quality-adjusted labour productivity (simply measured as the ratio of output to the wage bill);[16] *ii)* the change in average hourly wages; *iii)* the change in average hours worked; *iv)* the change in labour

Figure 2.2. **The response of unemployment and labour income to the change in GDP by country during the crisis and initial recovery**[a, b]



n.a.: Not available.

a) Countries are shown in ascending order of Okun's coefficient during the crisis.

b) The crisis is defined from the peak in real GDP to its trough whereas the recovery is defined from the trough in real GDP to the latest values available (2011 Q4 for the majority of the countries). Peak (trough) dates are defined as the start of the longest spell of consecutive decreases (increases) in real GDP since 2006 Q1. For details on the country-specific peak and trough dates, see Annex Table 2.A1.1 of OECD (2012b).

c) Total compensation of employees for Portugal.

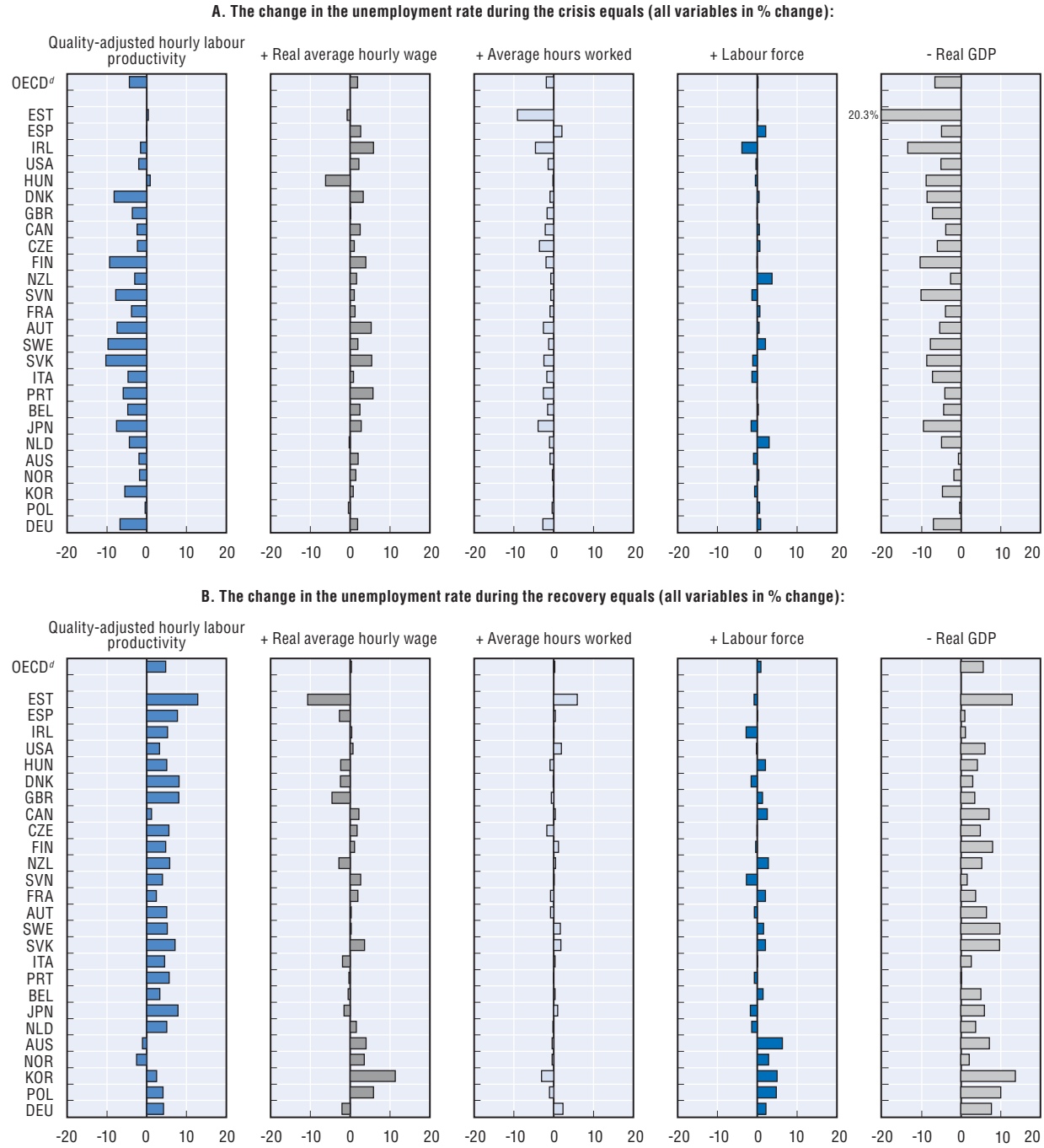
d) OECD is the unweighted average of countries shown.

Source: OECD calculations based on *OECD Main Economic Indicators Database* and quarterly national accounts.

StatLink http://dx.doi.org/10.1787/888932651123

force participation; and *v)* the change in output.[17] A similar decomposition for total labour income can be found in Annex Figure 2.A1.1 of OECD (2012b). Furthermore, variance-decomposition methods are used to provide an indication of the share of the cross-country variation in the change in the unemployment rate that can be attributed to the change in GDP and the different margins of adjustment as well as the share of the cross-country

Figure 2.3. **Decomposing the change in the unemployment rate by country during the crisis and initial recovery**[a, b, c]



a) See note 17 for details on the methodology.

b) Countries are shown in ascending order by the percentage change of the unemployment rate during the crisis.

c) The crisis is defined from the peak in real GDP to its trough, whereas the recovery is defined from the trough in real GDP to the latest values available. Peak (trough) dates are defined as the start of the longest spell of consecutive decreases (increases) in real GDP since 2006 Q1. For details on the country-specific peak and trough dates, see Annex Table 2.A1.2 of OECD (2012b).

d) OECD is the unweighted average of countries shown.

Source: OECD calculations based on *OECD Main Economic Indicators Database* and quarterly national accounts.

StatLink http://dx.doi.org/10.1787/888932651142

variation in Okun's coefficient that can be attributed to each margin of adjustment.[18] The results of the variance decompositions are reported in Annex Table 2.A1.3 of OECD (2012b).

- *The role of changes in aggregate demand*. During the crisis, the decline in GDP accounted for about three quarters of the rise in unemployment. The average decline in GDP across the OECD was 6.7%, accounting for about 1.7 of the 2.3 percentage-point increase in the unemployment rate. The largest decline in GDP was observed in Estonia, where it declined by over 20%, while Australia and Poland experienced declines in GDP of less than one percent. During the initial recovery, average GDP in the OECD regained 5.7%, making up most of the decline observed during the crisis, although its strength differs considerably across countries.
- *The role of changes in quality-adjusted labour productivity ("labour hoarding")*. Labour hoarding, in the form of declining labour productivity, accounts for over half of the cross-country variation in Okun's coefficient during the crisis. Labour hoarding, thus, played a key role in limiting the unemployment response to the decline in GDP. This reflects the tendency of employers to postpone or forego labour-input adjustments in order to avoid losing firm-specific human capital or incurring firing costs and subsequent hiring costs in the recovery. During the recession, labour hoarding was particularly important in Denmark, Finland, Slovak Republic and Sweden where quality-adjusted labour productivity declined by over 8%. By contrast, quality-adjusted labour productivity remained largely unchanged in Estonia, Hungary, Poland and Spain. The flipside of intensive labour hoarding during the crisis was that during the initial recovery labour productivity tended to recover quickly, reducing the job content of the recovery.
- *The role of changes in earnings per worker*. Adjustments in earnings per worker, which captures the combined role of average hourly wages and working-time adjustments, account for about a half of the cross-country variation in Okun's coefficient, with the role of working-time and wage adjustments being approximately equally important:
  - *Average hours worked* tended to decline substantially during the crisis, almost 2% on average, thereby limiting the rise in unemployment. The biggest reductions were observed in Estonia, Ireland and Japan. The only country where average hours increased during the crisis was Spain. During the recovery, working hours only recovered to a limited extent. In the majority of countries, average hours were stable, while in two countries they returned to pre-crisis levels (*e.g.* Sweden, United States).
  - *Average hourly wages* tended to increase in all OECD countries during the crisis except Hungary, Poland and Estonia, reflecting a combination of pure wage-growth effects for those who stayed employed, and composition effects, due to the concentration of total hours reductions at the bottom end of the wage distribution (see Figure 2.4 below).[19] During the initial recovery, average hourly wages continued to increase in about half the countries, while it declined in the other half and, in some cases, by a very large amount (*e.g.* over 10% Estonia, almost 5% in the United Kingdom). This phenomenon may reflect the possibility that wage adjustments follow changes in aggregate demand with a lag or that composition effects associated with labour-input adjustments during the crisis were partially reversed as labour markets started to recover.[20]
- *The role of changes in labour force participation*. Changes in labour force participation do not account for much of the cross-country variation in Okun's coefficient during the crisis (about 5%). The average change in labour force participation across the OECD was small. Changes in labour force participation tended to be more positive in countries with small

increases in unemployment and more negative in countries with large increases in unemployment. This is consistent with a discouraged-worker effect, which arises when unemployed workers leave the labour market due to a lack of suitable jobs (*cf.* Chapter 1 in this volume). During the crisis, the largest reduction in labour force participation was observed in Ireland which continued also during the recovery.[21] In the recovery, a strong decline in labour force participation was also observed in Slovenia.

The rise in unemployment during the crisis varied considerably across countries due to differences in the size of the output shocks and the role of the different margins of adjustment. While differences in the size of the shock account for the bulk of the cross-country variation in unemployment during the crisis, differences in the role of quality-adjusted labour productivity and earnings per worker also played an important role. Labour hoarding in the form of reduced labour productivity and earnings per worker adjustments helped to limit the *initial response* of unemployment to the decline in GDP, but also reduced the job content of the recovery as firms tended to restore labour productivity and earnings per worker before hiring new workers. In countries, where much of the slack in demand has now been absorbed, one would expect employment to track changes in GDP more closely in the near future, strengthening the job content of the recovery.

The importance of cross-country differences in the evolution of unemployment relative to that of aggregate demand and in the role of different margins of adjustment during the crisis and the recovery raises important questions about the role of policies and institutions. However, it may also reflect the role of cross-country differences in the nature of the crisis, and in particular the distribution of shocks across different types of firms, as well as the role of cross-country differences in economic structure in terms of, for example, the industrial make-up of a country or the size distribution of its firms.

Job losses are more likely to increase overall earnings inequality, while the role of working-hours reductions is likely to be limited

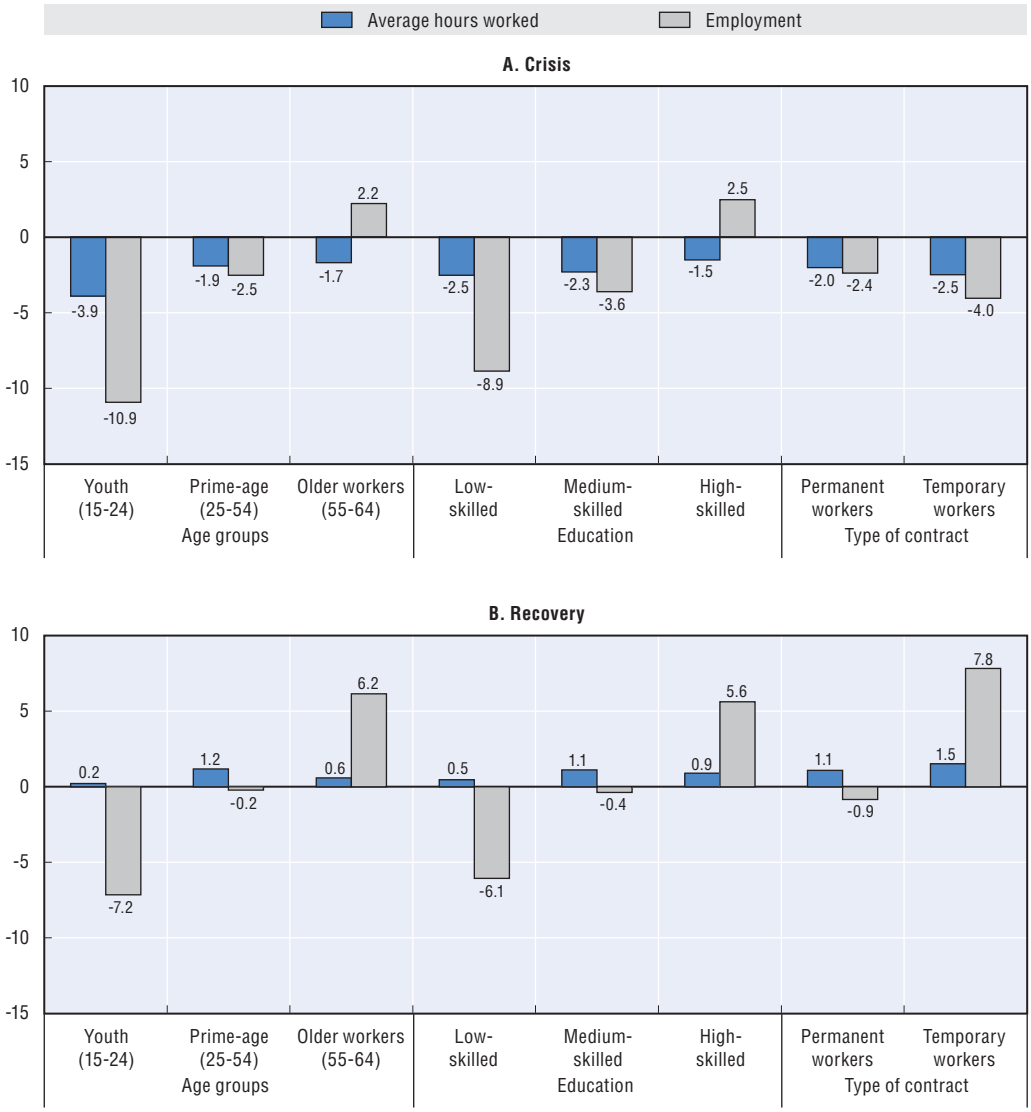
In addition to affecting unemployment and total labour income, the labour-input adjustment behaviour of firms in response to economic shocks can also have important implications for the inequality of earnings across labour force participants since the relative importance of adjustments on employment, average hours and hourly wages is likely to affect how the burden of adjustment is being shared across the workforce. There are two main reasons for this. First, because employment reductions are necessarily limited to a segment of the workforce, thus increasing the share of the workforce that has no labour earnings, employment reductions have a tendency to increase the inequality of earnings across all labour force participants, while working-time and wage adjustments could, at least in principle, be evenly distributed over the workforce. Second, employment, hours and wage adjustments may differ in terms of their selectivity with respect to the *ex-ante* distribution of earnings. For example, differences in turnover costs, that is, the costs that employers incur when they replace existing workers with new recruits, may increase with earnings, since both turnover costs and earnings tend to increase with labour-market experience and skills.[22] This implies that firms may find it more attractive to adjust labour inputs by reducing working hours or wages for workers with relatively high levels of prior earnings, while they may be more inclined to suppress jobs of workers with relatively low levels of earnings. Thus, the way firms adjust their labour inputs in response to economic shocks can have important implications for the distribution of earnings. This is of interest *per se*, but particularly because individuals with different earnings are likely to differ in

their ability to absorb earnings shocks. As a result, changes in the distribution of earnings can have important implications for the distribution of consumption and welfare and this raises important questions about the adequacy of the social safety net to absorb income shocks.

In order to shed some light on the implications of the global financial crisis for the distribution of earnings, Figure 2.4 decomposes the average change in total hours worked

Figure 2.4. **The change in employment and average hours worked by age, education and type of contract**

Percentage change[a, b]



a) Unweighted average of the following countries: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. For further details by country, see Annex Figure 2.A1.2 of OECD (2012b).

b) The crisis is defined from the peak in real GDP to its trough, whereas the recovery is defined from the trough in real GDP to 2011 Q2. Peak (trough) dates are defined as the start of the longest spell of consecutive decreases (increases) in real GDP since 2006 Q1. For details on the country-specific peak and trough dates, see Annex Table 2.A1.1 of OECD (2012b).

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

StatLink http://dx.doi.org/10.1787/888932651161

across OECD countries into the corresponding changes in employment and working hours for a number of socio-economic groups, which differ substantially in terms of their average earnings.[23] It shows, consistent with previous editions of the *OECD Employment Outlook,* that the decline in employment during the global financial crisis was heavily concentrated on youth and low-skilled workers, and to a lesser extent, on workers with temporary contracts.[24] This suggests that employment reductions during economic downturns are likely to have important adverse consequences for earnings inequality. Not only do they increase the share of the workforce with zero labour income, but they are also concentrated on specific groups of workers who tend to have below-average earnings. Compared with the high degree of concentration of employment losses among specific socio-economic groups, working-hours adjustments appear to be much more evenly distributed. Thus, it does not appear to be the case, as was suggested above, that working-hours adjustments are concentrated among workers with more labour-market experience and higher levels of skills. If anything, working-hours reductions tend to be concentrated on youth, the low-skilled and temporary workers, similarly to employment losses, although, in the case of hours, differences across groups are very small. Given the fairly even distribution of working-time reductions across groups with different levels of average earnings, working-time reductions are most likely to reduce overall earnings inequality by narrowing the earnings gap between those out-of-work and those on reduced working hours.[25, 26]

The role of reforms prior to the crisis for structural outcomes and labour market resilience

This section provides a brief overview of the nature of structural reforms that have been undertaken during the past 15 years in OECD countries and discusses their implications for structural labour market outcomes and labour market resilience.

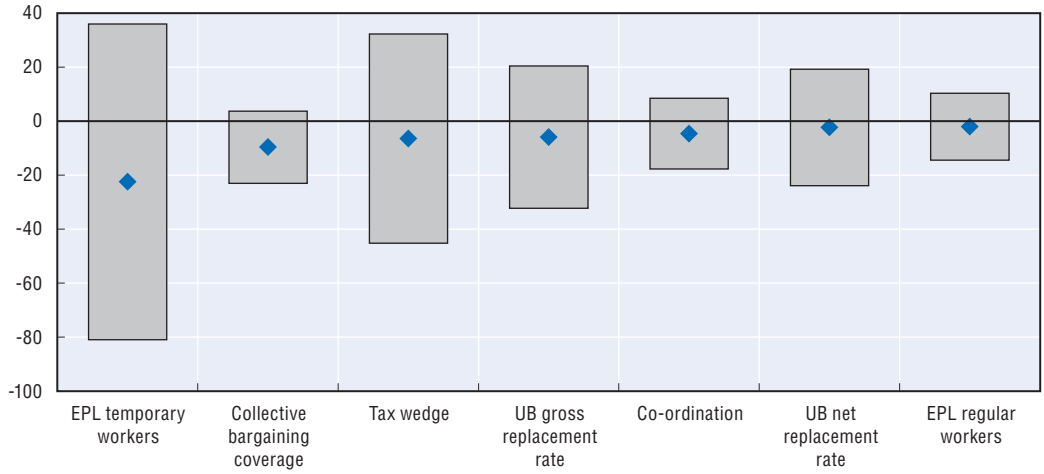
Many OECD countries have engaged in important structural reforms during the 15 past years…

During the 15 years that preceded the global financial crisis, many OECD countries introduced important structural policy reforms to promote economic growth and job creation. Labour market reforms largely consisted of measures that sought to strike a better balance between providing an effective social safety net and reducing benefit dependency, as well as measures to reinforce labour market flexibility. While these measures were primarily intended to deal with structural labour market problems, they may also have an important impact on the transmission of economic shocks to labour markets.

Figure 2.5 provides an indication of the average direction of reforms using a selected set of policy indicators, as well as their dispersion across countries. The selected indicators relate to: the generosity of unemployment benefits (net and gross);[27] the stringency of regulation of permanent and temporary contracts; the importance and nature of collective bargaining (coverage and the degree of co-ordination); and the tax wedge. The set of policies considered reflects the key variables that are used in the macro-analysis in Section 2.[28] The figure provides two main insights. First, there appears to be a tendency towards less government involvement in labour markets and an easing of labour market institutions along the dimensions considered here. This is reflected by the negative average change along the indicators included in the figure. Second, there is a lot of

Figure 2.5. **Change in selected labour market institutions in OECD countries, 1995-2007**

Unweighted average percentage change across OECD countries with 90% confidence interval



Note: Diamonds refer to simple average changes across countries, while the shaded areas give the range of the average plus and minus one standard deviation. Institutions are shown in ascending order of the average change. For the underlying country-specific information, see Annex Table 2.A1.4 of OECD (2012b).

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932651180

heterogeneity in the nature and direction of reforms across OECD countries. This may reflect: the possibility that the optimal stance of policies and institutions for achieving high employment rates differs across countries; the presence of uncertainty about the role of policies and institutions; or the role of fiscal and political-economy considerations in motivating structural reforms. While the selected indicators provide a useful indication of the overall direction and heterogeneity of structural reforms in the OECD, they do not provide a fully comprehensive picture, as comparable time-series data are not available for all relevant policy areas. Among the most important omitted policy areas are activation measures and the regulation of working time. In Box 2.2, a more detailed qualitative discussion is given of the nature of structural labour market reforms from 1995 to the crisis.

Box 2.2. **Structural reforms prior to the crisis**

Most countries have sought to strike a better balance between social safety nets and benefit dependency by implementing effective activation measures. The essence of activation measures is the principle of "mutual obligations" where, in return for receiving benefits, benefit recipients are required to actively engage in job search and participate in active labour market programmes (ALMPs), enforced with the threat of benefit sanctions. Activation strategies represent a key component of the *Reassessed OECD Jobs Strategy* and have been shown to contribute to better labour market outcomes in countries which applied them effectively (OECD, 2006). The progressive implementation of activation strategies in a number of OECD countries might have had important implications for the unemployment impact of the crisis by speeding up the reintegration of job losers into the labour market.* In addition to implementing activation strategies, a number of countries with previously generous unemployment benefits have sought to reduce benefit dependency by reducing replacement rates or limiting their maximum duration (*e.g.* Denmark

Box 2.2. **Structural reforms prior to the crisis** *(cont.)*

and the Netherlands). However, several other countries have sought to strengthen the effectiveness of UI by increasing their generosity. Figure 2.5 shows that average gross benefit generosity, as measured by the average replacement rate during the first five years of unemployment, declined slightly on average during the period 1995-2007, but also that the relative stability of UB generosity hides considerable heterogeneity across countries.

Regulatory rules affecting job protection and working time have important implications for effective labour demand by increasing the cost of adjusting to changing economic conditions and are, therefore, of particular interest in the present context. With respect to employment-protection provisions for permanent contracts, there has been essentially no change in the average degree of protection, but there has been a slight reduction in its dispersion, as a number of countries with relatively high levels of protection reduced it (*e.g.* Austria and Spain), while it was increased in a number of countries with relatively low levels of protection (*e.g.* Australia and the United Kingdom). With respect to provisions regulating the use of temporary contracts, there has been a tendency to liberalise rules. As these measures have generally not been accompanied by similar reforms with respect to permanent contracts, this has often been associated with an increase in labour market segmentation. In the context of the global financial crisis, these reforms raise important questions about their implications for the strength of the unemployment response to the decline in aggregate demand and the way the burden of adjustment is being shared across the workforce. Since 1995, many OECD governments have enacted reforms that seek to expand the flexibility of employers in terms of working hours and to respond to demands of workers for more flexible working-time arrangements to enhance work-life balances (OECD, 2006). Measures that increase the flexibility of employers to adjust working hours relate to hours averaging, the use of overtime, and time-saving accounts. These regulatory changes may account for the relatively large adjustment of working time during the recession and the relatively weak response of unemployment to the decline in aggregate demand.

Similar to employment and working-time regulations, wage-setting institutions play an important role in determining the ability of firms to adjust their labour inputs in response to economic shocks. The importance and nature of collective bargaining is particularly relevant in this respect. In the large majority of OECD countries, the importane of collective bargaining, as measured by collective bargaining coverage, has declined since 1995 (*cf.* Chapter 3). This was driven by different factors in different countries, including: declining union density; the reduced role of automatic extensions of collective agreements to firms not represented by trade unions; and the greater use of opt-out clauses from collective agreements. An important indicator of the nature of collective bargaining is the degree of centralisation of wage bargaining (*i.e.* at level of firm, industry or country) and the degree of co-ordination. While major changes in the nature of collective bargaining have been fairly rare, there has been a tendency towards more decentralisation and less co-ordination, particularly in countries with high levels of centralisation and co-ordination. To the extent that changes in the importance and nature of collective bargaining have increased wage flexibility for firms, this may have contributed to limiting the rise in unemployment during the crisis. However, it is important to emphasize that collective bargaining arrangements do not just affect wage-setting, but also can have important implications for employment and hours flexibility. This may be particularly relevant in the context of an economic crisis during which trade unions may be more concerned with maintaining employment levels than usual.

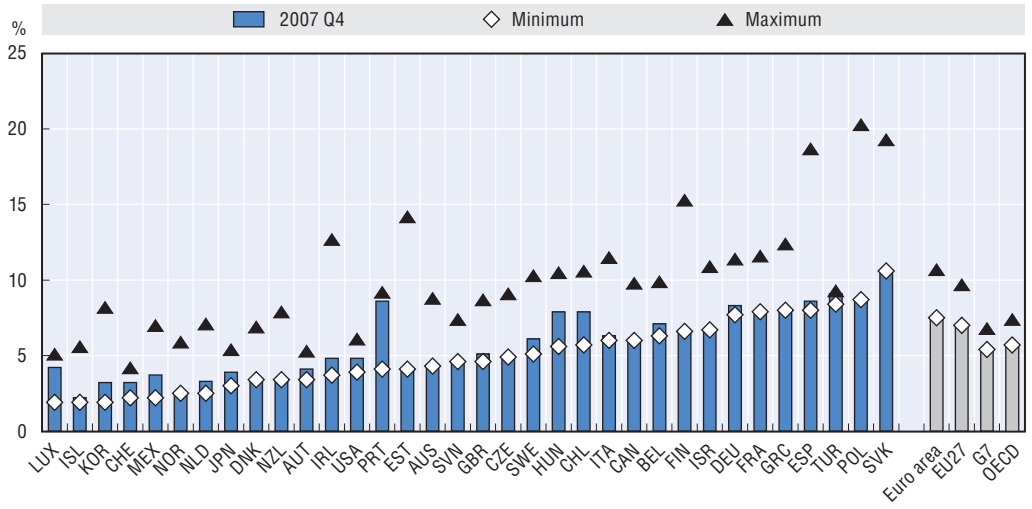
* However, the recent economic downturn and sluggish recovery presents a major challenge to the activation strategies of many OECD countries as the sharp decline in the number of job vacancies and the rise in the number of job seekers threatens to undermine their effectiveness.

… with potentially important implications for structural labour market outcomes…

To the extent that the reforms in policies and institutions discussed above have strengthened work incentives and increased the adaptability of firms, these reforms are likely to have resulted in better employment outcomes. In order to get a first idea of the potential role of these reforms for structural labour market outcomes, Figure 2.6 presents the unemployment rate in 2007, at the onset of the crisis, as well as its minimum and maximum values during the period 1995-2007. It shows that in the large majority of countries, the unemployment rate was at its lowest level in 2007. The main exceptions are Luxembourg and Portugal where unemployment was at its maximum level during the period or close to it.[29] The strong labour market situation at the onset of the crisis is likely to reflect not just favourable macroeconomic conditions, but also the influence of structural reforms enacted during the previous 15 years. Indeed, recent empirical evidence from aggregate cross-country panel data suggest that a sizeable part of the decline in the structural rate of unemployment can be attributed to the reforms of policies and institutions (OECD, 2006; Bassanini and Duval, 2009; Murtin *et al.*, 2011). This will be discussed in more detail in Section 2.

Figure 2.6. **Harmonised unemployment rates in OECD countries, 1995 Q1-2007 Q4**

Percentage of total labour force



Note: Countries are ordered in ascending order of the minimum of their respective harmonised unemployment rates over the period.

Source: OECD calculations based on *OECD Main Economic Indicators Database*.

StatLink http://dx.doi.org/10.1787/888932651199

… as well as labour market resilience

An important question in the context of this chapter is to what extent the structural reforms discussed above also have made OECD labour markets better able to withstand the downturn or to recover more quickly. While it is not easy to draw strong conclusions based on the existing evidence about the role of structural reforms during the past 15 years for labour market resilience, previous work by Bassanini and Duval (2006); Bassanini (2011); and De Serres and Murtin (2011) suggests that the implementation of activation strategies and reduced generosity of unemployment benefits are most likely to have reduced the overall impact of aggregate demand shocks on unemployment. Moreover, past reforms,

particularly those reducing the stringency of employment protection for temporary contracts, are likely to have changed cyclical dynamics by reinforcing the initial unemployment response to negative shocks but also strengthening the subsequent drop in unemployment during the recovery. There is less evidence with respect to the role of policies and institutions that affect the flexibility of working time and wages.[30]

2. Macroeconomic analysis of the role of structural policies and institutions for labour market resilience

Good labour market performance entails having high structural levels of employment and good-quality jobs, while limiting excessive labour market volatility over the business cycle. This section provides a detailed analysis of the role of policies and institutions for both structural labour market outcomes and labour market resilience. The empirical analysis in this section makes use of an unbalanced panel of quarterly data for the period 1982 Q1 to 2007 Q4 for 18 OECD countries.[31] In order to analyse the role of policies and institutions, the following variables are considered: employment protection for regular workers, the share of temporary workers in employment, the average replacement rate of unemployment benefits, the coverage rate of collective bargaining agreements and a measure for the degree of co-ordination in collective bargaining.[32] This set of variables closely resembles those included in the baseline specification of the empirical work by Bassanini and Duval (2006, 2009) that was conducted in the context of the *Reassessed OECD Jobs Strategy* of 2006. For details on the composition of the sample and the definition of variables, see Annex Table 2.A2.1 of OECD (2012b).

The role of policies and institutions for structural labour market outcomes

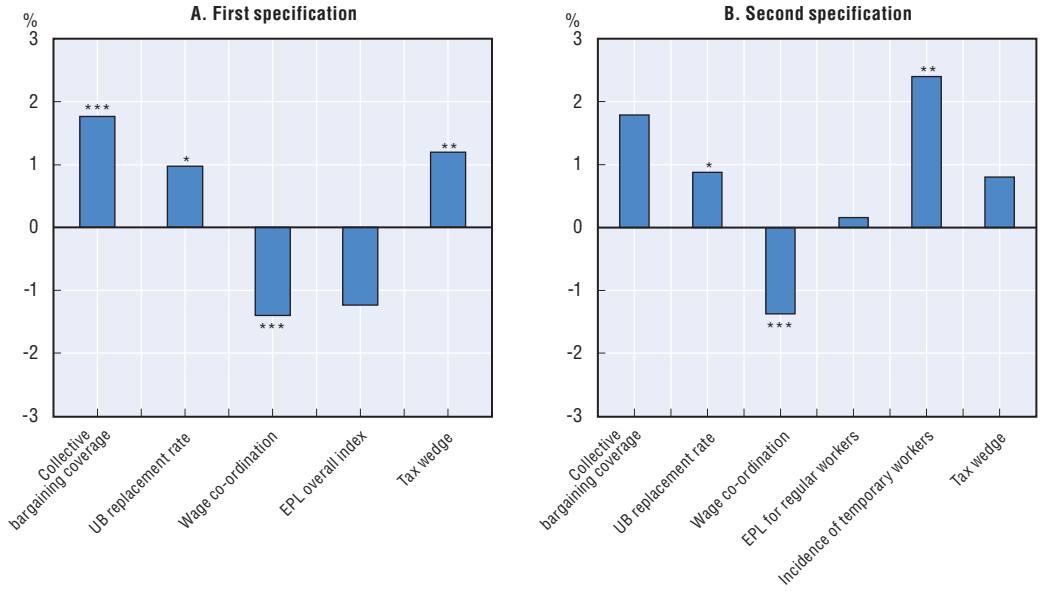
The *Reassessed OECD Jobs Strategy* of 2006 provided a comprehensive analysis of the role of policies and institutions for achieving high structural employment rates and low structural unemployment rates. This section provides some new evidence by means of regressions that model the labour market outcomes of interest as a function of a set of policy and institutional variables as well as the cyclical change in output to control for business-cycle conditions.[33] The analysis contributes to the existing evidence in two different ways. First, it updates the analysis of structural employment and unemployment in OECD (2006) and Bassanini and Duval (2006, 2009) using more recent data in order to assess to what extent structural reforms in the fifteen-year period prior to the crisis had contributed to the favourable employment situation in many OECD countries at the onset of the global financial crisis (see Figure 2.6). This also serves as a useful reminder of the role of structural policies and institutions in the longer term when assessing the role of policies and institutions for the sensitivity of labour market outcomes to aggregate demand shocks in the next sub-section. Second, in addition to looking at structural unemployment and employment rates, the analysis also considers the role of policies and institutions for total earnings and earnings per worker. In doing so, the analysis goes beyond the role of policies and institutions for the number of jobs by touching on issues related to job quality. This is also consistent with the analysis of labour market resilience in this chapter which places particular emphasis on earnings and earnings inequality in addition to unemployment.

The incidence of temporary work is associated with weaker structural outcomes, while wage co-ordination tends to be associated with stronger ones

Figure 2.7 summarises the main results on the role of policies and institutions for structural unemployment based on two slightly different specifications. The first specification, reported in Panel A, makes use of approximately the same policy and institutional variables as were included in the baseline specification reported in OECD (2006) and Bassanini and Duval (2006, 2009).[34] This specification, therefore, allows one to compare the present results with the earlier evidence. As extending the sample from 2002, the end of the sample used by Bassanini and Duval (2006, 2009), to 2007 only has a limited impact on the overall composition of the sample, it is not surprising that the results are qualitatively similar. The tax wedge, the average replacement rate and the coverage rate of collective bargaining agreements are found to increase the structural rate of unemployment, while the degree of wage co-ordination in collective bargaining is found to reduce it.[35] Employment protection does not have a statistically significant impact. In the specification reported in Panel B, the overall index of employment protection is replaced by an index of employment protection for workers with permanent contracts as well as a separate variable for the incidence of temporary work.[36] Differentiating between workers with permanent and temporary contracts in this way is useful for shedding additional light on job-quality issues and the implications of the rising incidence of temporary work for labour market resilience. The results suggest that employment protection for regular workers does not have a statistically significant impact on unemployment, while a standard-deviation increase in the incidence of temporary work increases the structural unemployment rate by over two percentage points.[37] The results for the other variables are

Figure 2.7. **The role of policies and institutions for the rate of structural unemployment**

Effect of a one standard-deviation change of the indicated institution on the rate of structural unemployment, percentage-point change



***, **, *: Statistically significant at the 1%, 5% and 10% level, respectively.

Source: OECD estimates. For full details on the results, see Annex Table 2.A2.2 of this chapter available online only at *www.oecd.org/employment/outlook*.

StatLink http://dx.doi.org/10.1787/888932651218

qualitatively similar to the results in Panel A, although the role of collective bargaining coverage and the tax wedge are no longer statistically significant.

The results presented above on the role of policies and institutions for structural unemployment need to be interpreted with caution. First, some of the results are sensitive to the specification used. For example, the statistically significant effect of the tax wedge and collective bargaining coverage in Panel A disappears when moving to a slightly different empirical specification in Panel B. Second, the simple linear specification used here does not take account of the possibility that the impact of a change in a given policy or institution for structural unemployment depends on its current stance. Indeed, the linear specification used above suggests, in principle, that the optimal stance of a given policy or institution with a statistically significant estimated coefficient is either zero or infinite, depending on its sign. The results are, therefore, best seen as indicative only of the impact of relatively small changes in policy settings. Third, the specifications used do not allow for the possibility that the role of a given policy or institution depends on the settings of *other* policies and institutions, including some outside the labour market such as the degree of product market competition or investment in human capital. Indeed, OECD (2006) emphasises the potential importance of policy complementarities. For example, generous unemployment benefits tend to increase aggregate unemployment in the average OECD country, but not in countries with extensive ALMPs (Bassanini and Duval, 2009). This suggests that requiring unemployed job seekers to actively search for a job or participate in ALMPs can offset the negative effects of unemployment benefits on the incentives to search for a job or accept a job offer. Another example is the potential of co-ordination to offset the negative effects of bargaining coverage on employment (OECD, 1997; Layard and Nickell, 1999).[38] These examples clearly illustrate that the importance of building coherent policy packages that are consistent with low levels of structural unemployment rather than focusing on individual policies and institutions.[39]

Figure 2.8 provides further insights on the role of policies and institutions for structural labour market outcomes by focusing on the proportional impact of a one standard-deviation change in policies or institutions on trend labour income, employment and earnings per worker.[40] As the sum of the implied percentage change in employment and earnings per worker equals the percentage change in total labour income, the discussion concentrates largely on the results for employment and earnings per worker.[41] Collective-bargaining coverage and the average UB replacement rate reduce employment, but increase earnings per worker, although the latter effect is only statistically significant for collective-bargaining coverage. This may reflect the possibility that workers use their bargaining power to negotiate higher wages. The negative effect of the replacement rate on employment could reflect the role of unemployment benefits in reducing work incentives or alleviating liquidity constraints, which prevent workers from having to accept the first job offer they receive.[42] However, the absence of a significant positive effect on earnings per worker may indicate that unemployment benefits do not have a major impact on raising the reservation wage (*i.e.* the wage for which benefit recipients are willing to work). The degree of co-ordination of collective bargaining is found to increase employment, without reducing earnings per worker, suggesting that co-ordination may help to internalise the potentially adverse effects of collective bargaining on employment. The incidence of temporary work is negatively correlated with employment, presumably because it increases frictional unemployment by increasing worker turnover, as well as

Figure 2.8. **The role of policies and institutions for trend total earnings, employment and earnings per worker**

Effect of a one standard-deviation change in the policy or institution of interest, percentage change

***, **, *: Statistically significant at the 1%, 5% and 10% level, respectively.

Source: OECD estimates. For full details on the results, see Annex Table 2.A2.2 of this chapter available online only at *www.oecd.org/employment/outlook*.

StatLink http://dx.doi.org/10.1787/888932651237

earnings per worker, reflecting its negative impact on job quality. These findings also imply that the incidence of temporary work has a negative impact on total labour income.

Structural reforms account for a significant part of the change in structural labour market performance since the mid-1990s

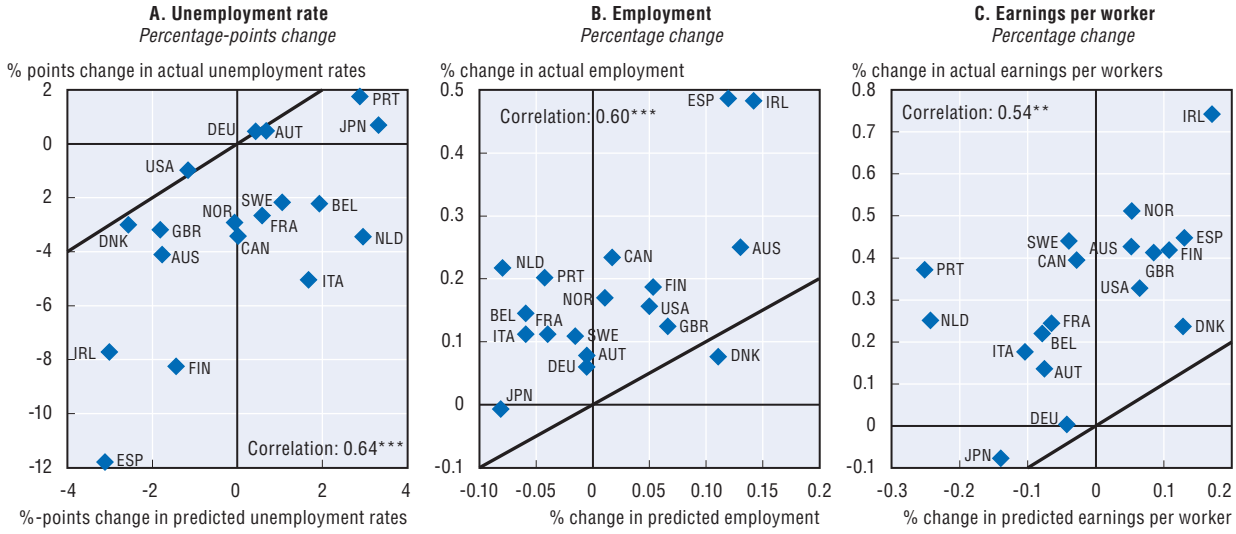
As discussed in Section 1, many OECD countries have engaged in important structural reforms during the past 15 years. Previous work by Bassanini and Duval (2009) and Murtin *et al.* (2011) has shown that structural reforms have the potential to lower unemployment rates. Figure 2.9 relates *actual* changes in unemployment rates, employment and earnings per worker between 1995 and 2007 to the changes in those variables that may be attributed to changes in policies and institutions over the same period, based on the regression results reported in Figure 2.7, Panel B and Figure 2.8. The results indicate a significant positive relationship between actual and predicted changes for all three labour market outcome variables.[43] This indicates that the changes in policies and institutions that took place in different countries during the past 15 years had a significant effect on labour market outcomes. The role of changes in policies and institutions, however, is not overwhelmingly positive. In about half of the countries in the sample, changes in policies and institutions are predicted to have had a favourable impact on labour market outcomes, while in the other half such changes may have made matters worse. Given the heterogeneity in the structural reforms documented in Figure 2.5, this finding is hardly surprising. Countries characterised by structural reforms that contributed to better labour market outcomes along all three dimensions are Australia, Denmark, Finland, Ireland, Norway, Spain, the United Kingdom and the United States.

The role of policies and institutions for labour market resilience

Using the same dataset as was used for the analysis of structural labour market performance, this sub-section analyses the role of policies and institutions for labour market resilience by focusing on the sensitivity of the unemployment rate, total earnings

Figure 2.9. **The role of reforms for structural labour market outcomes**

Change between 1995 and 2007



***, **, *: Statistically significant at the 1%, 5% and 10% level, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932651256

and earnings inequality with respect to output changes. To this end, a series of dynamic panel data models are estimated which specify the change in a given labour market outcome as a function of its first lag, the change in output, a set of policies and institutions and a set of interaction terms of the lagged dependent variables and the change in output with each policy or institution.[44] The analysis focuses on three different aspects of labour market resilience, namely the medium-term impact of a 1% decline in aggregate demand on *i)* the unemployment rate; *ii)* total labour income; and *iii)* the inequality of earnings across labour force participants.[45] Since the analysis takes output as given, it does not consider the role of policies and institutions for hysteresis. Box 2.3 provides details on the methodology, whilst Figure 2.10 presents the main results. It provides the following insights:

Box 2.3. **Analysing labour market resilience at the macrolevel**

In order to assess the degree of labour market resilience in OECD countries before the crisis, a series of dynamic panel data specifications are estimated using quarterly data for the pre-crisis period. The results are used to assess the impact of output shocks on the unemployment rate, log total earnings and earnings inequality. In each case, the focus is on the *medium-term* impact, defined as the average impact during the first four years after the shock in output, to capture the impact of output shocks on labour market outcomes over the course of a typical business cycle (usually considered to be three to five years).

Empirical model

In order to analyse the cross-country variation in the responsiveness of the labour market outcome of interest (y) with respect to changes in aggregate demand (x) that can be attributed to differences in labour market institutions and policies (z), the following dynamic panel data model is estimated:

$$\Delta y_{it} = \alpha_0 + \gamma_0 \Delta y_{it-1} + \sum_{Z=1}^{Z} \gamma_Z \Delta y_{it-1}(z_{it} - z) + \beta_0 \Delta x_{it} + \sum_{Z=1}^{Z} \beta_Z \Delta x_{it}(z_{it} - z) + \sum_{Z=1}^{Z} \delta_Z (z_{it} - z) + \eta_i + \varepsilon_{it}$$

Box 2.3. **Analysing labour market resilience at the macrolevel** *(cont.)*

where institutions and policies are expressed as a deviation from the sample mean, η represents a full set of country dummies to control for country-specific trends and ε refers to an independent error term. The coefficient β_0 gives the average marginal effect of an output shock on the outcome variable of interest when policies and institutions are at their sample mean, while γ_0 gives the average level of persistence for the outcome variable of interest.

Measuring the impact of aggregate demand shocks on unemployment and total earnings

The medium-term impact of aggregate demand shocks on the unemployment rate and total earnings can be measured in net or in gross terms. The net impact, NB_{16}, is defined as the cumulative impact of a 1% change in output on the variable of interest in terms of its difference during the first sixteen quarters since the shock:

$$NB_{16}=\sum_{s=1}^{S=16}\beta_0\gamma_0^{s-1}+\sum_{s=1}^{S=16}\sum_{z=1}^{Z}\beta_z\gamma_z^{s-1}(z_i-z)$$

where s refers to the number of quarters since the shock in output and z the set of policies and institutions. The cumulative impact of the difference gives the net effect in levels between t = t and t = t + 16. This measure, therefore, does not take account of dynamics over the interval. The gross impact, GB_{16}, is defined as the average impact of a 1% change in output on the variable of interest in terms its level over the first sixteen quarters since the shock:

$$GB_{16}=\sum_{s=1}^{S=16}\frac{(S-s)}{S}\beta_0\gamma_0^{s-1}+\sum_{s=1}^{S=16}\sum_{z=1}^{Z}\frac{(S-s)}{S}\beta_z\gamma_z^{s-1}(z_i-z)$$

The gross elasticity captures not just the impact on the level of the variable of interest, but its impact during the entire interval. This measure, therefore, takes account of differences in dynamics and, as such, provides a useful metric for analysing the social cost associated with output shocks.

The medium-term impact is evaluated at: *i)* the average level of policies and institutions within each country to obtain the country-specific impact (Figure 2.10); *ii)* the average level of policies and institutions in the sample to get the average impact and the change in the average impact after increasing one policy or institution at a time by one standard-deviation (Figure 2.11).

Measuring the sensitivity of earnings inequality to aggregate demand shocks

Comparable time-series data that measure overall earnings inequality across labour force participants are not readily available. It is, therefore, not possible to estimate the same empirical model for earnings inequality as was done for the unemployment rate and log total earnings. The implications of output shocks for the distribution of earnings are, therefore, simulated using output elasticities of unemployment, employment and earnings per worker along with specific assumptions on the adjustment process. This is discussed in detail below.

A benchmark measure of overall earnings inequality was constructed first. This can be done either using micro or macrodata. While microeconomic data yield more precise inequality estimates, these are only available for a subset of the countries considered here. As the interest here is not to report inequality measures, but merely to illustrate how differences in the adjustment process can affect the overall distribution of earnings, inequality measures were constructed based on aggregate data. More specifically, data on earnings by decile for employed workers were used to calculate approximate Gini indices of earnings inequality among those in work. Using data on unemployment rates, these Gini indices were then converted into overall indices that measure the degree of earnings inequality across *all* labour force participants, following Atkinson and Brandolini (2006).

Box 2.3. **Analysing labour market resilience at the macrolevel** *(cont.)*

In order to simulate the impact of shocks on the inequality of earnings across all labour force participants, using the benchmark measure of overall earnings inequality and estimates of the medium-term impacts of output shocks on unemployment, employment and earnings per worker, one needs to make a number of specific assumptions on the adjustment process. Following Bargain *et al.* (2011), it was assumed that earnings per worker changes, as a result of adjustments in average hours and/or hourly wages, are evenly distributed over the earnings distribution of employed workers, whereas (un)employment changes are assumed to be randomly distributed over the earnings distribution of employed workers. Moreover, it is assumed that unemployed persons receive unemployment benefits equal to the gross UB replacement rate for workers with median earnings. The income of non-employed workers is assumed to be independent of output shocks.

Policies and institutions account for substantial cross-country differences in labour market resilience

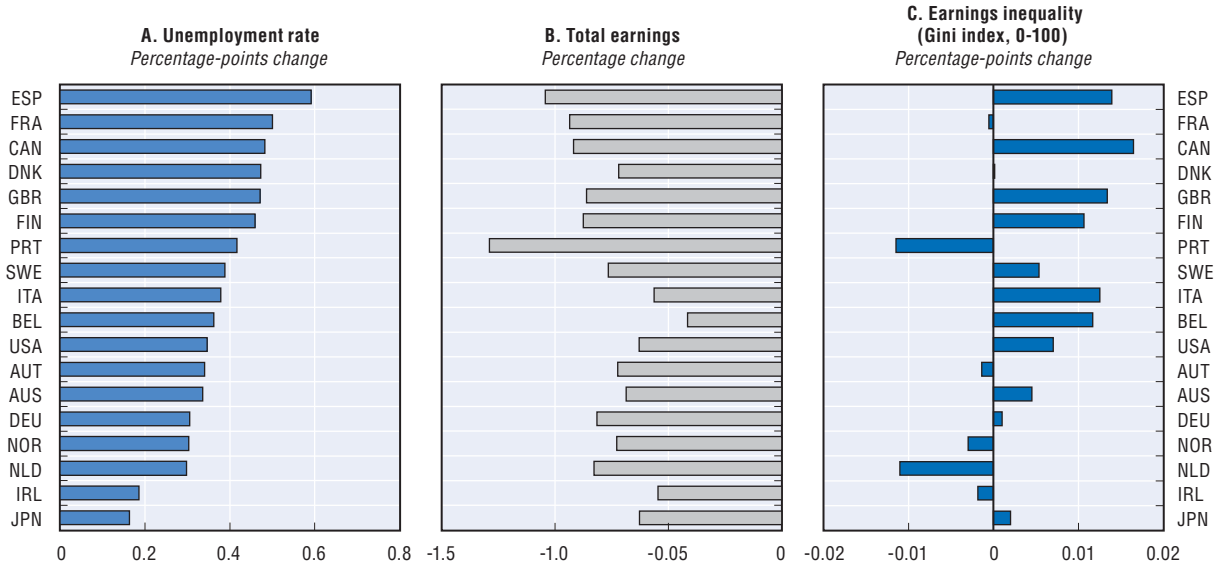
- The implied medium-term impact of a 1% decline in GDP on the *unemployment rate* gives an indication of the duration-adjusted impact of output shocks on the unemployment rate by taking account of both amplification/mitigation effects, *i.e.* the contemporaneous response of unemployment to output shocks, and persistence effects, *i.e.* the speed of adjustment towards its long-term trend (Panel A). The estimated average medium-term impact of a 1% decline in GDP on unemployment is somewhat below 0.5.[46] However, there is considerable variation across countries, with the unemployment impact being almost four times as large in the country where it has traditionally been the largest (*e.g.* Spain) as in the country where it has been the smallest (*e.g.* Japan).
- The average medium-term impact of a 1% decline in GDP on *total earnings* to output shocks (Panel B) captures the combined impact of shocks on employment and earnings per worker. The results indicate that the medium-term impact is generally between –1 and –0.5, except in Portugal, where it is about –1.3, reflecting the traditionally high degree of wage flexibility in that country and in Belgium where it is about –0.4, implying that both employment and earnings per worker are relatively insensitive to changes in the business cycle. Differences in the cross-country ranking compared with Panel A, reflect cross-country differences in the importance of the sensitivity of earnings per worker to output shocks (*e.g.* average hours and hourly wages) and labour force participation.
- The implications of a 1% decline in GDP on *earnings inequality* are simulated by making a number of specific assumptions on the adjustment process in relation to the earnings distribution and assuming that unemployed workers receive unemployment benefits (see Box 2.3). The results indicate that a decline in output increases earnings inequality in countries where the employment impact dominates, but that it decreases it in countries where the earnings per worker effect dominates. Given the estimated output elasticities, the employment effect is stronger, the lower the generosity of unemployment benefits.[47]

Pervasive temporary work and generous UB benefits have a tendency to reduce labour market resilience, while co-ordination in collective bargaining may improve it

The cross-country variation in the different aspects of labour market resilience in Figure 2.10 is entirely driven by differences in institutional settings. Figure 2.11 provides an

Figure 2.10. **Aspects of labour market resilience by country**

Implied average impact over first sixteen quarters of a 1% decline in real GDP



Note: Countries ordered by ascending order of the implied percentage change in the unemployment rates.

Source: OECD estimates. See Box 2.3 and Annex Table 2.A2.3 of this chapter available online only at *www.oecd.org/employment/outlook*.

StatLink http://dx.doi.org/10.1787/888932651275

indication of the role of specific policies and institutions for each aspect of labour market resilience.[48]

- *Employment protection for regular workers* does not appear to have major implications for market resilience. If anything, it mitigates the adverse medium-term impact of a 1% decline in GDP on unemployment and earnings inequality and reinforces that on total earnings. While it may have a weak tendency to reduce the sensitivity of unemployment and employment to output shocks (not statistically significant), it does increase the sensitivity of earnings per worker to output shocks, which may indicate that firms adjust more on hours and wages if the cost of making employment adjustments increases. However, the direct effect of employment protection on the sensitivity of different labour market outcomes may not reveal the whole story since it could also have indirect effects by promoting the use of temporary contracts (see below).
- The *share of temporary workers* may reflect the role of regulations with respect to the use of temporary contracts, but also the stringency of employment protection with respect to regular workers as this affects incentives for the use of temporary contracts (Blanchard and Landier, 2002; Boeri, 2011; Cahuc *et al.*, 2012).[49] An increase in the share of temporary workers reinforces the adverse impact of a 1% decline in GDP on unemployment and earnings inequality in the medium-term (the latter effect is due to the positive role of temporary work for the output elasticity of employment). It does not affect the sensitivity of total labour income since its tendency to increase the sensitivity of employment is partially offset by a reduction in the sensitivity of earnings per worker.
- The *tax wedge* has no impact on any of the aspects of labour market resilience considered here. However, it does have important implications for the time profile of the labour-market response to shocks by reducing the contemporaneous sensitivity of earnings and employment to output shocks, while increasing their persistence (not reported).

Figure 2.11. **The role of policies and institutions for labour market resilience**

Implied impact of a one standard-deviation change in a specific policy or institution on the average impact over the first sixteen quarters of a 1% reduction in GDP on the labour market outcome of interest

Source: OECD estimates. See Box 2.3 and Annex Table 2.A2.3 of this chapter available online only at *www.oecd.org/employment/outlook*.

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- The *average unemployment benefit replacement rate* reduces labour market resilience in terms of total earnings (*i.e.* all else equal, a higher rate is associated with a larger decline in earnings in response to a negative output shock) and earnings inequality (but this effect is small). This is due to the positive impact of the average replacement rate on employment persistence (and therefore total earnings persistence). This probably reflects the role of unemployment benefits for job-search intensity or reservation wages. However, these effects are small.
- *Collective-bargaining coverage* does not have an impact on any of the three measures of labour market resilience. However, there is some evidence that it affects the time profile of the inequality response by increasing the sensitivity of employment to contemporaneous shocks and by reducing employment persistence.
- The degree of wage *co-ordination* in collective bargaining plays a positive role for all three aspects of labour market resilience.[50] In all three cases, this reflects the role of wage co-ordination for employment. It reduces the direct impact of output shocks on employment, but increases persistence somewhat. As the direct effect dominates the persistence effect, its effect is positive for all three measures of labour market resilience considered here. This suggests that wage co-ordination can help to preserve jobs in the context of negative output shocks either by increasing the ability of firms to hoard workers or by enhancing the flexibility of wages. As the estimates do not suggest an impact of co-ordination on the sensitivity of earnings per worker, it is most likely to reflect an increased ability to hoard.[51]

To what extent can the dynamic panel data model be used to predict the evolution of the unemployment rate and earnings across countries beyond 2007 Q4? A first indication can be obtained by comparing the actual average impact for each labour market outcome between 2007 Q4 and 2011 Q4 with the out-of-sample predicted average impact from the empirical model based on data up to 2007 Q4 (Figure 2.12). The correlations between the actual and predicted impacts are positive and statistically significant for both the

unemployment rate and total earnings.[52] For most OECD countries that experienced an average increase in the unemployment rate in the four years since 2007 Q4, the model has a tendency to over-predict the actual average increase in the unemployment rate, suggesting that the actual increase in unemployment relative to the evolution of output was smaller than might have been expected on the basis of historical patterns (for countries located above the 45 degree line). However, the empirical model substantially under-predicts the unemployment impact in Spain and Ireland and to a lesser extent also in the United States. In terms of earnings, the pattern is broadly similar. The actual earnings impact during the four years since 2007 Q4 tended to be more positive/less negative in most OECD countries, providing further evidence that the social costs of the global financial crisis may have been smaller than what might have been expected on the basis of historical patterns. Australia, Belgium, Ireland, the Netherlands and the United States are the main exceptions, with the actual change in earnings being less positive than predicted for Australia and the Netherlands and more negative for Ireland and the United States.[53]

While the dynamic panel data models allow one to explain a considerable part of the cross-country variation in labour market adjustment patterns, the presence of substantial forecast errors for some countries raises the question of what, apart from the evolution of output during the crisis and structural policy settings before the crisis, accounts for the break from historical experience. Three key factors are discussed below:

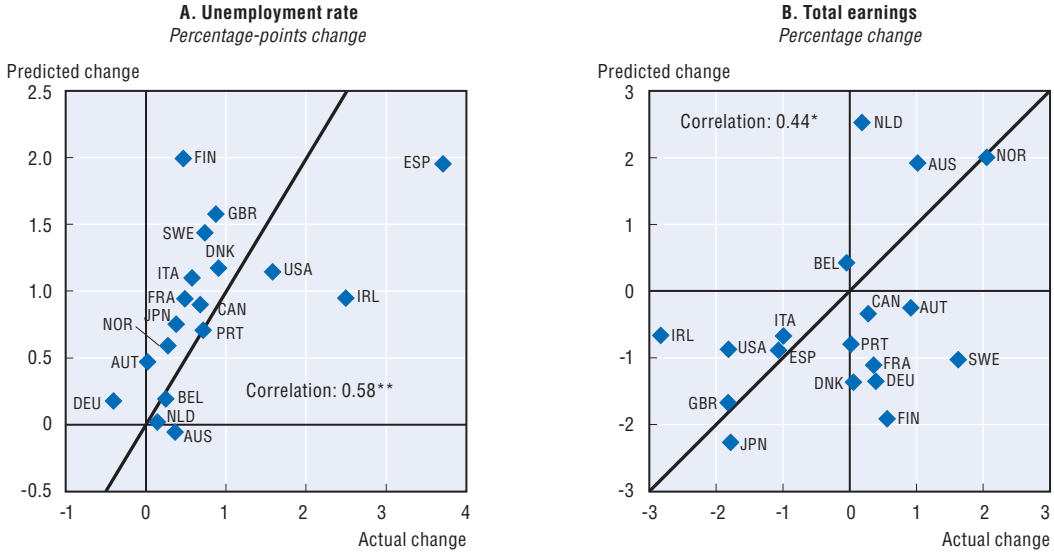
- The analysis does not take account of *all* the policy and institutional changes that have taken place during the period before the global financial crisis, even though these changes may have had important implications for labour market resilience (see Section 1). One important development that is not captured by the analysis relates to the progressive implementation of activation strategies in many OECD countries. This is not only likely to have contributed to achieving record-low unemployment rates at the onset of the crisis, but is also likely to have helped job losers get back into work more quickly during the crisis than otherwise would have been the case. This may be particularly relevant in explaining forecast errors for countries such as Germany, Sweden and the United Kingdom. The reason for not directly accounting for ALMPs in the analysis is that measures of the intensity of ALMPs tend to be very sensitive to the business cycle. Other important policy and institutional developments that are not accounted for in the present analysis, but may be important for labour market resilience, relate to reforms that have increased the flexibility of working hours and wages.
- The analysis also does not take account of policy developments since the start of the global financial crisis. The crisis and the subsequent need for fiscal consolidation have acted as important catalysts for structural reforms, particularly in countries where reforms were most needed. Major structural reforms have been undertaken with respect to most areas of labour market policy. For example, employment protection for workers on open-ended contracts has been reduced in Greece, Portugal and Spain. Collective bargaining has been decentralised in countries such as Italy, Finland and Spain, by giving more room to firms opt out of collective agreements or enter into firm-level agreements. Moreover, the large majority of OECD countries has implemented one or several temporary measures in response to the crisis in an effort to mitigate its social cost (OECD, 2009, 2010, 2011). Policy measures that were widely shared across countries and are likely to have contributed to labour market resilience include the allocation of

additional resources for job-search assistance and expanding short-time work schemes or establishing new ones. The role of short-time work in preserving jobs has been particularly important in countries such as Germany, Italy and Japan (Hijzen and Venn, 2010; OECD, 2012a).

- The macroeconomic analysis does not take account of differences in the distribution of shocks across firms or differences in the composition of firms. To the extent that firms differ in the way they adjust to shocks, cross-country differences in labour market adjustment may not just stem from differences in institutional settings, but also from differences in the distribution of shocks across firms and the composition of firms across countries. For example, in Germany and Japan, the bulk of the decline in output demand during the crisis was concentrated in manufacturing, whereas the construction sector was hit particularly hard in countries such as the Ireland, Spain and the US. Since firm-specific human capital tends to be less important in construction than in manufacturing, construction firms tend to adjust their labour inputs more quickly in response to falling output demand. As a result, cross-country differences in the distribution of demand shocks may account for some of the observed differences in aggregate labour-market adjustment patterns across counties.[54] Given the specific nature of the crisis in the three countries for which large forecast errors were observed, this may indeed be an important part of the story. This is analysed in detail in Section 3.

Figure 2.12. **Comparing the actual and predicted evolution in unemployment and earnings across countries**

Predicted and actual average change of the variable of interest between 2007 Q4 and 2011 Q4



**, *: Statistically significant at the 5% and 10% level, respectively.

Source: OECD estimates.

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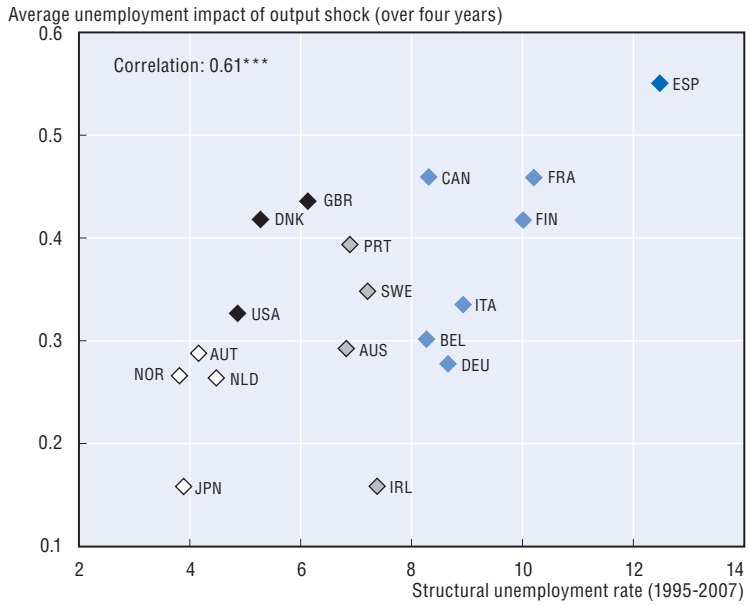
The role of policies and institutions for good overall labour market performance

Countries with lower unemployment rates before the crisis also tended to experience smaller increases in unemployment during economic downturns

A key question is to what extent policies and institutions that are conducive to good structural labour market outcomes are also good for labour market resilience. While this is a complex question, a natural starting point to address it is to relate structural labour market outcomes before the crisis to the evolution of labour market outcomes during the crisis and the recovery. This is done in Figure 2.13, which relates the average unemployment rate between 1995 and 2007, *i.e.* a simple measure of the structural unemployment rate, to the sensitivity (elasticity) of the unemployment rate to output shocks, *i.e.* the implied medium-term impact on unemployment following a 1% decline in GDP. These medium-term elasticities are used rather than the actual evolution of unemployment since they control for differences in the size of the decline in aggregate demand. The main insight from Figure 2.13 is that countries that had low structural unemployment rates during the period 1995-2007 also appear to have had relatively resilient labour markets measured in terms of unemployment. This is reflected by the large and significant positive correlation between the two measures in Figure 2.13.[55] This may indicate that policies and institutions that are conducive for good structural labour market outcomes are also good for labour market resilience.

Figure 2.13. **Achieving good labour market performance over the course of the business cycle**

A comparison of structural unemployment outcomes and labour market resilience (measured in terms of unemployment)



***: Statistically significant at the 1% level.

Note: Structural unemployment rates are calculated by adjusting the unemployment rate for the state of the business cycle. The average unemployment impact of an output shock is calculated as in Figure 2.10. See Box 2.3 for details.

Source: OECD estimates.

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Apart from looking at the correlation between structural and cyclical unemployment outcomes, one may also use Figure 2.13 to identify different country groupings.[56] With the help of cluster analysis, five different groups were identified. A first group of countries, consisting of Austria, Japan, the Netherlands and Norway, performs well in terms of both structural outcomes and labour market resilience. A second group of countries combines low structural unemployment levels with moderate levels of volatility. This group of countries consists of Denmark, the United Kingdom and the United States, all economies with high level of labour market flexibility. The third group of countries combines labour market resilience with moderate levels of structural labour market outcomes. This group consists of a rather diverse set of countries, including Australia, Ireland, Portugal and Sweden. The fourth group of countries tends to have similar levels of resilience as groups two and three, but higher structural levels of unemployment. This group includes Belgium, Canada, France, Italy, Germany and Finland. Spain stands out from the other groups with both relatively high levels of structural unemployment and low levels of labour market resilience. While the precise definition of the country groupings should only be considered as suggestive as the classification is sensitive to the definition of structural and cyclical labour-market performance, as well as the statistical implementation of cluster analysis, the contrast between groups two and three suggests there may be potentially interesting policy trade-offs between structural performance and labour market resilience.

3. Microeconomic analysis of the role of structural policies and institutions for labour market resilience

This section provides a more detailed analysis of the role of policies and institutions for labour market resilience by making use of comparable *firm-level data* for 19 OECD countries for the period 1993 to 2009.[57] The main objective of the analysis is to assess the role of institutions and policies in moderating the impact of the crisis on labour market outcomes, while allowing for differences in the distribution of shocks and economic structure across countries. The analysis proceeds in three steps. First, a detailed account is given of: cross-country differences in economic structure (labelled "structure heterogeneity" and measured by labour-shares); the distribution of output shocks across different types of firms (labelled "shock heterogeneity" and measured by the output growth rate of each firm type); and the responsiveness of labour inputs to output shocks (labelled "response heterogeneity" and measured by the output elasticity of each firm type). Variance-decomposition methods are used to assess the relative contribution of each source of heterogeneity in explaining the cross-country variation in aggregate labour-market outcomes between 2008 and 2009. The share of the cross-country variation that may be attributed to response heterogeneity is interpreted as an upper bound on the potential role of policies and institutions.[58] Second, the role of specific policies and institutions for response heterogeneity is analysed by relating cross-country differences in the responsiveness of labour inputs to output shocks to differences in institutional settings, while controlling for shock and structure heterogeneity. The analysis considers employment protection, the incidence of temporary work and collective wage bargaining. Third, using micro-simulation methods, the implications of the way firms adjust in response to shocks for different dimensions of worker welfare are assessed, consistent with the welfare perspective on labour market resilience adopted in this chapter. The analysis considers two dimensions of worker welfare: average household income and

income inequality. Income effects are calculated both in market and net terms, *i.e.* before and after taking after taking account of taxes and benefits.

The relative importance of structure, shock and response heterogeneity for labour input adjustment

Within-country heterogeneity is captured by stratifying the dataset along two key dimensions: *firm size* (small, medium-sized, and large) and *industry* (construction, manufacturing and services).[59] While the use of these groups may ignore some differences in labour adjustment across firms within cells, the use of a coarse cell structure makes it easier to highlight the main messages of the descriptive analysis. For the econometric analysis of policies and institutions, which is presented in the next sub-section, more detailed size and industry classes will be used. Before discussing the results from the decomposition, the degree of cross-country heterogeneity along each of the three dimensions is documented.

Differences in labour-input adjustment reflect a combination of structure, shock and response heterogeneity

Figure 2.14 provides a brief account of the importance of differences in economic structure across countries in terms of the size and industry of firms in 2008.

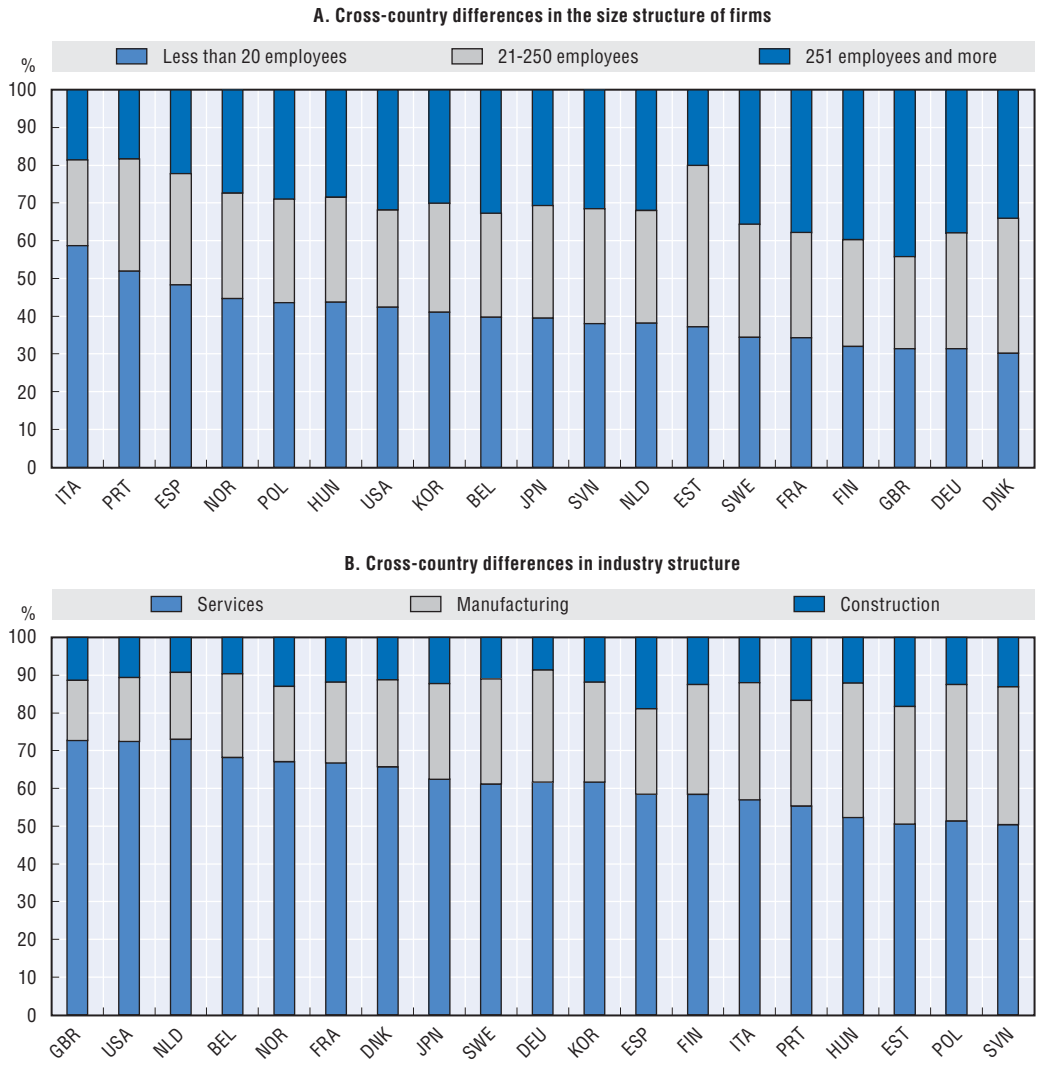
- *Firm size* (Panel A). Small firms with less than 20 employees accounted for over half of the overall level of employment in countries such as Italy and Portugal, whereas small firms accounted for less than one third of employment in Denmark, Finland, Germany and the United Kingdom. By contrast, large firms, defined as firms with more than 250 employees, accounted for less than 20% of employment in Italy and Portugal, while they accounted for about 40% of employment in Finland, France, Germany and the United Kingdom.
- *Industries* (Panel B). In 2008, construction accounted for more than 15% of employment in Estonia, Portugal and Spain, countries where the unemployment impact of the crisis tended to be relatively strong, while it accounted for less than 10% in countries such as Belgium, Germany and the Netherlands, countries in which the unemployment impact was relatively small. Manufacturing accounted for over one-third of employment in Central and Eastern European countries (CEECs), about 30% in Finland, Germany and Italy, and less than 20% in the Netherlands, Norway, the United Kingdom and the United States. Services accounted for over 70% of employment in the Netherlands, the United Kingdom and the United States, while it accounted for just over one-half of employment in CEECs.

Figure 2.15 documents the degree of shock heterogeneity by focusing on the decline in output demand between 2008 and 2009 across size groups, industries and countries. Since cross-country differences in the decline of GDP during the global financial crisis were already discussed in Section 1, the discussion here concentrates on differences in the distribution of shocks between different types of firms within countries.[60]

- *Firm size* (Panel A). In the majority of countries, medium-sized firms were disproportionately affected by the decline in output. In a few countries, including in Germany, Hungary and Sweden, the decline in output was concentrated among large firms. This is consistent with other evidence for Germany that negative output shocks were concentrated on large exporting firms (Möller, 2010). Small firms were the least affected in the large majority of countries.

Figure 2.14. **Cross-country differences in economic structure ("structure heterogeneity")**

Percentage of employees, 2008



Source: OECD calculations based on SDBS, STAN and LFS. See P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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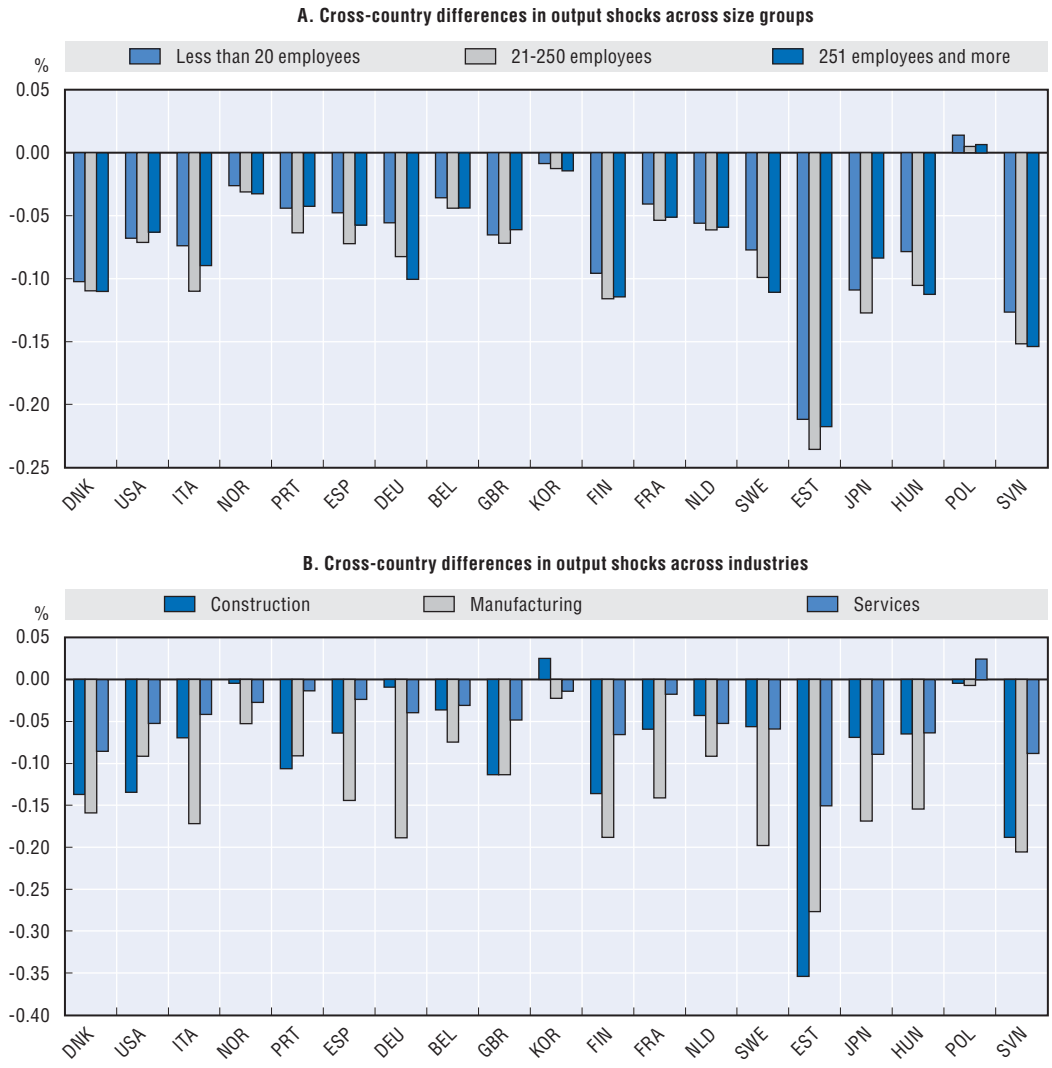
- *Industry* (Panel B). In the large majority of countries, manufacturing was most affected by the crisis. The bias towards manufacturing is particularly striking in Germany, where output declined by almost 20% in manufacturing, but less than 5% in any of the other sectors. Other countries in which the output decline in manufacturing was at least twice as important as in any of the other sectors include France, Hungary, Italy, Spain and Sweden. In a few countries, the output decline was concentrated in construction, including in Estonia, Portugal and the United States, all countries with an above-average unemployment response to the crisis.

Figure 2.15. **Differences in output shocks across countries, industries and firm size groups ("shock heterogeneity")**

Percentage change in real output, 2008-09



Source: OECD calculations based on LFS, ORBIS, SDBS and STAN. See P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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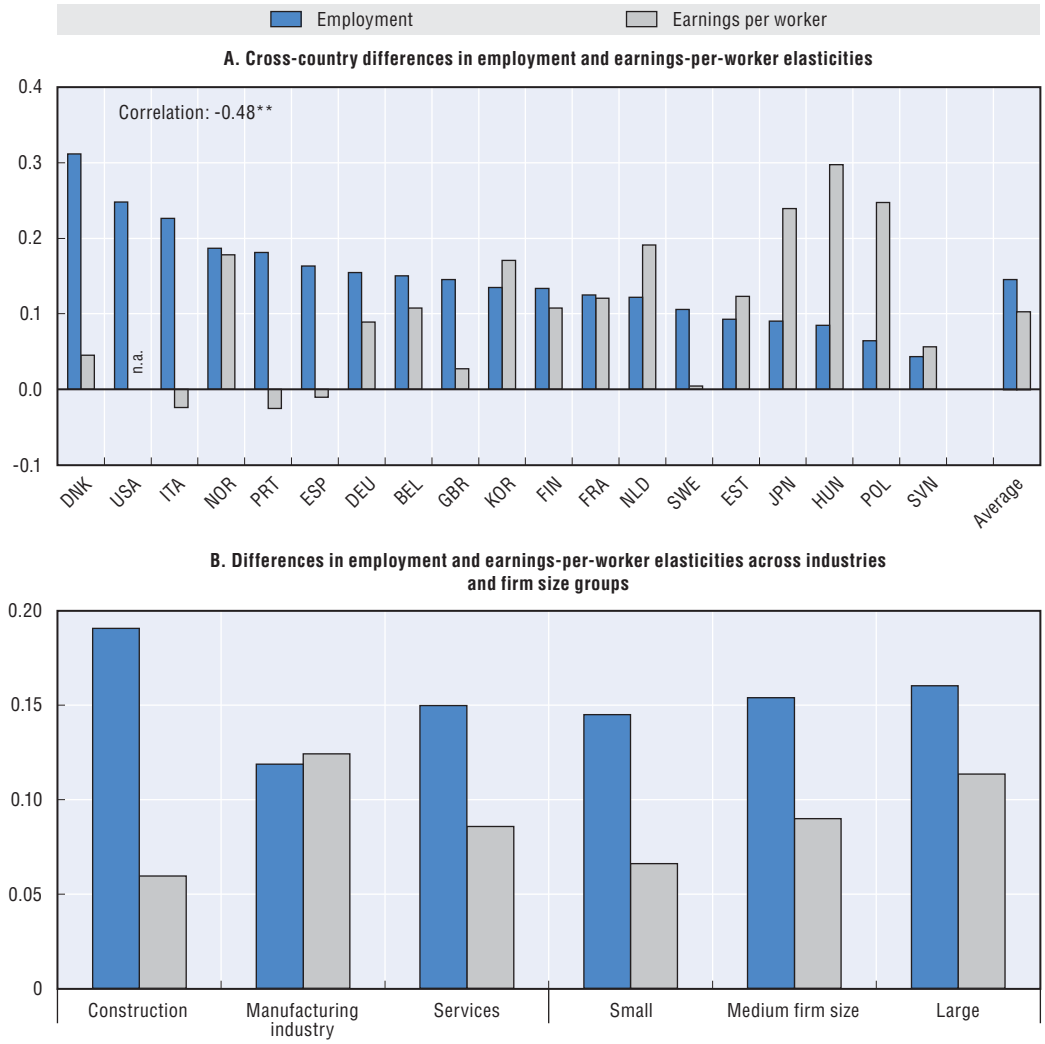
Figure 2.16 documents the responsiveness of labour input to output shocks in terms of the elasticities of employment and earnings per worker to output across countries, industries and firm-size groups.[61]

- *Countries* (Panel A). On average across countries, the elasticities of employment and earnings per worker are fairly similar, with the sensitivity of employment to output shocks being slightly larger than that of earnings per worker (first column on the right). This implies that, at least in terms of cross-country averages, contemporaneous adjustments on the *extensive* (*e.g.* employment) and *intensive* margin (*e.g.* average hours worked and wages) to output shocks account for an approximately equal share of total labour-cost adjustment. However, there is considerable heterogeneity in the

Figure 2.16. **Differences in the sensitivity of labour inputs to output shocks across countries, industries and firm size groups ("response heterogeneity")**



n.a.: Not available.

**: Statistically significant at the 5% level.

Source: OECD estimates based on ORBIS. See P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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responsiveness of labour inputs across countries, with a significant negative correlation between the output elasticities of employment and earnings per worker. This implies that firms that adjust jobs more readily tend to adjust less on the intensive margin. The contemporaneous output elasticity of employment is highest in countries such as Denmark and the United States, while it is lowest in CEECs and Japan. The earnings per worker elasticity is highest in Hungary, Japan and Poland, while it is lowest in Italy, Portugal and Spain.

- *Industries* (Panel B). The responsiveness of employment to output is highest in construction and lowest in manufacturing, while the responsiveness of earnings per worker is highest in manufacturing and lowest in construction. The differences in

estimated elasticities are quantitatively large, with the employment (earnings per worker) elasticity in construction being about twice as large (small) as that in manufacturing. These differences are likely to reflect the different nature of production technologies in terms of the importance of firm-specific human capital (*e.g.* manufacturing) and seasonal flexibility (construction), resulting in potentially large differences in the skill composition of the workforce and the incidence of non-standard contracts.

- *Firm-size groups* (Panel B). Differences in the responsiveness of labour inputs across size groups are less pronounced than those across industries. According to the figure, the output sensitivity of both employment and earnings per worker increases with firm size. This is at odds with the traditional view that employment in small firms is more sensitive to output shocks than employment in large firms, because the former find it more difficult to hoard labour during periods of weak product demand due to financial constraints (Sharpe, 1994).[62] This argument predicts that the sensitivity of both employment and earnings per worker to output should decline with size.[63] However, the traditional view that small firms hoard less during a downturn has recently been challenged by Moscarini and Postel-Vinay (2011). They argue that large firms have weaker incentives to retain workers during a downturn since they tend to be more productive and offer higher wages and, as a result, find it easier to recruit new workers during a recovery.[64] This argument is, in principle, consistent with the positive relationship between the sensitivity of employment and firm size, but does not explain the positive relationship between earnings per worker and firm size.[65]

The above analysis documents important differences across countries in the composition of firms, the distribution of shocks and the responsiveness of labour inputs across firms. This suggests that accounting for structure and shock heterogeneity may be important for understanding the aggregate labour market impact of the global financial crisis.

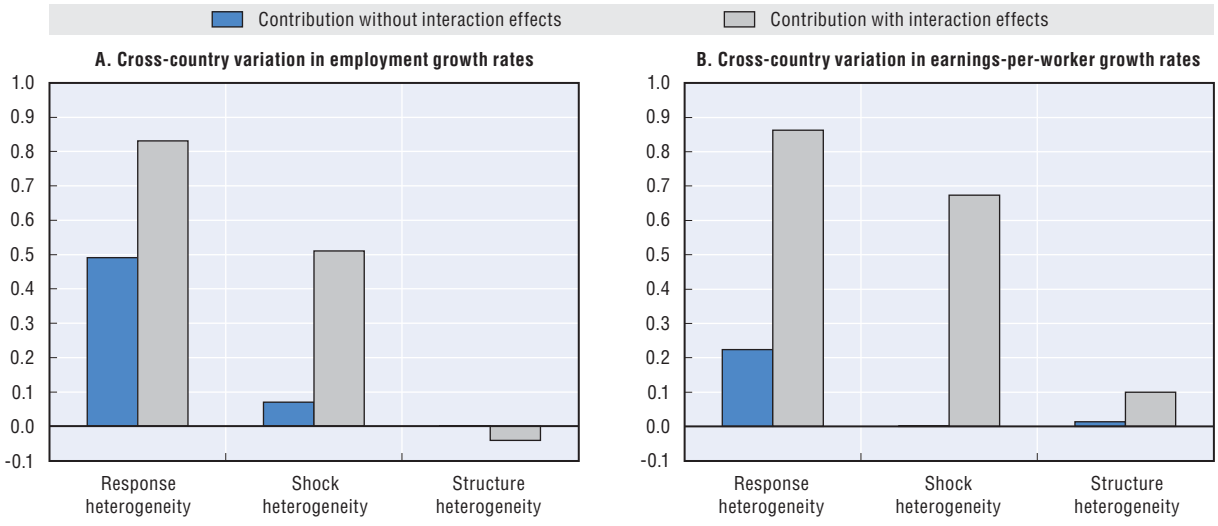
The role of policies and institutions in explaining cross-country differences in the impact of the crisis on labour markets is potentially large

In order to examine the role of structure, shock and response heterogeneity for the way in which labour markets have been impacted by the global financial crisis, the cross-country variation in aggregate labour-market dynamics between 2008 and 2009 is decomposed into components that can be attributed to the different sources of heterogeneity. For each source of heterogeneity, its contribution to the overall variance is calculated both without and with interaction effects. The contribution of one source of heterogeneity *without* interaction effects is assessed by focusing on the variance that remains after "switching" off the two other sources of heterogeneity. For example, in the case of response heterogeneity, this involves calculating how much of the cross-country variance is explained once shocks and employment shares are set to their average values across countries. The advantage of measuring the contribution of a specific source of heterogeneity in this particular way is that it can be attributed exclusively to a single source. However, the drawback of not taking account of the role of interaction effects is that a potentially important share of the cross-country variation is left unexplained. The contribution of one source of heterogeneity *with* interaction effects is obtained by assessing its contribution to the overall variance without switching off the two other sources of heterogeneity. For example, in the case of response heterogeneity, its

contribution for the overall variance is calculated using actual values for shocks and employment shares. The drawback of this measure is that the interaction effects cannot be attributed to a single source of heterogeneity.[66] The importance of the interaction terms gives an indication of the value-added of using disaggregate information for explaining aggregate labour market dynamics.[67]

The results from the decompositions are presented in Figure 2.17. Response heterogeneity appears to be the most important factor in explaining the cross-country variation in the change of employment and earnings per worker during the crisis. It explains about 50% of the cross-country variation in employment and 20% of the variation in earnings per worker when the role of interaction effects is ignored. After allowing for interaction effects, its contribution goes up to over 80% of the cross-country variation in both employment and earnings per worker changes. Shock heterogeneity without interaction effects explains less than 10% of the cross-country variation in employment and hardly anything of the variation in earnings per worker. When taking account of interaction effects, shock heterogeneity accounts for 50% of the cross-country variation in employment and almost 70% of that in earnings per worker. The role of structure heterogeneity is negligible irrespective of whether interaction effects are accounted for or not. The results provide two key insights. First, the relative importance of response heterogeneity suggests that differences in policies and institutions across countries account for a potentially large part of the cross-country variation in aggregate labour dynamics during the crisis. Second, using disaggregate information can greatly enhance one's ability to explain differences in aggregate labour market dynamics. This is neatly illustrated by the share of the cross-country variance that can be attributed to the role of interaction effects across different dimensions of heterogeneity.

Figure 2.17. **Decomposition of cross-country variation in labour market adjustment during the crisis, 2008-09**



Source: OECD estimates based on ORBIS, STAN, LFS and SDBS. See P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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The role of policies and institutions for the labour-input adjustment behaviour of firms

This sub-section analyses how employment protection, the incidence of temporary work and collective wage bargaining (CWB) impact on the way firms adjust their labour inputs in response to output shocks. A major challenge when trying to identify the role of policies and institutions for the labour-input adjustment behaviour of firms is that institutions are typically defined at the country level and that the cross-country variation in one institution is often correlated with that of other institutions. This makes it difficult to isolate the role of a single institution using the *cross-country* variation in the data.[68] The present analysis focuses, therefore, instead on the *within-country* variation in the data. In the case of employment protection, this is achieved by focusing on the role of exemptions from national settings for small firms. In the case of temporary work and collective wage bargaining, this is achieved by comparing its incidence/coverage rate across different groups of firms. A two-stage approach is adopted to assess the role of policies and institutions for the labour-input adjustment behaviour of firms. In the first stage, the elasticities of employment and earnings per worker with respect to output are estimated using firm-level information for each country and cell. The cell structure is defined separately for each set of institutional variables in order to maximise the within-country variation in the data on institutions. The purpose of the second stage is to quantify the role of selected policies and institutions for the output elasticity of employment and earnings per worker. See Box 2.4 for further details.[69]

Box 2.4. **Assessing the role of policies and institutions for the way firms adjust their labour inputs in response to shocks**

First-stage estimates of the elasticity of employment and earnings per worker with respect to output

To estimate the elasticity of labour input with respect to output, the following dynamic equation was estimated:

$$l_{it} = \gamma l_{it-1} + \beta y_{it} + \eta_i + \varepsilon_{it}$$

where I_{it} denotes the log-level of labour input (employment or earnings per worker) in firm *i* in year *t*, y_{it} denotes the log-level of output in firm *i* in year *t*, η_i denotes firm-fixed effects and ε_{it} denotes an error term. Both labour inputs and output are expressed in logs. The empirical model is consistent with a model with quadratic adjustment costs for employment. The elasticities β are estimated separately for each industry and firm size combination within a country. The industry and firm size classification is determined by the variation in the institution of interest. This implicitly involves assuming that elasticities are homogeneous within cells. Estimations are conducted using Difference GMM to account for the endogeneity of output and lagged labour inputs (Arellano and Bond, 1991).

Second-stage estimates of the role of employment protection (EP) for labour input adjustment

To estimate the effect of EP on the responsiveness of employment and earnings per worker to output shocks, the following regression was run:

$$\hat{\beta}_{kjs} = \alpha_1 EPR_{ks} + \alpha_2 EPC_{ks} + \mu_k + \eta_j + \omega_s + \varepsilon_{kjs}$$

where $\hat{\beta}_{kjs}$ denotes the first-stage estimates of the employment and earnings per worker elasticities by country (k), industry (j) and firm size (s). EPR_{ks} denotes the stringency of employment protection provisions with respect to individual dismissals of regular workers and EPC_{ks} denotes the stringency of provisions with respect to collective dismissals. The variables μ_k, η_j and ω_s control for country- industry- and firm-size

Box 2.4. **Assessing the role of policies and institutions for the way firms adjust their labour inputs in response to shocks** *(cont.)*

specific fixed effects. The impacts of EPR_{ks} and EPC_{ks} are identified by making use of the within-country variation that results from firm-size exemptions. The identification assumption is that differences in the adjustment behaviour between firms above and below the size thresholds are systematically related to the stringency of EP above and below those thresholds. In order to control for independent firm-size effects unrelated to employment protection, countries without firm-size exemptions are included as controls. Furthermore, only firms whose employment level is either always above or always below the threshold are taken into account. Data on employment protection and size exemptions are obtained from Venn (2009). The analysis covers 18 countries, 9 of which have firm-size exemptions. Standard errors are clustered at the industry level.

Second-stage estimates of the role of the incidence of temporary work for labour input adjustment

The effect of temporary work on the responsiveness of employment and earnings per worker to output shocks is identified using the following model:

$$\hat{\beta}_{kc} = \alpha_1 TEMP_{kc} + \mu_k + \eta_c + \varepsilon_{kc}$$

where $\hat{\beta}_{kc}$ denotes the first-stage estimates of the employment and earnings per worker elasticities by country (k) and industry-firm size cell (c). $TEMP_{kc}$ denotes the incidence of temporary work within a cell. Identification is based on within-country variation through the inclusion of country fixed effects, μ_k. Moreover, cell fixed effects η_c are included to control for common elasticity patterns across cells between countries. It is assumed that the remaining variation can entirely be attributed to differences in the cell-level incidence of temporary work. Data on the incidence of temporary work by industry and firm-size cell are obtained from the EULFS.

Second-stage estimates of the role of collective wage bargaining (CWB) for labour input adjustment

The analysis of CWB differentiates between CWB agreements negotiated at the firm level and those negotiated at higher levels (*i.e.* industry or country). The effect of CWB coverage rate by type of negotiation on the responsiveness of employment and earnings per worker to output shocks is identified using the following model:

$$\hat{\beta}_{kc} = (\alpha_1 + \alpha_2 D_{Group\ 1}) CWB_{kc}^{firm} + (\alpha_3 + \alpha_4 D_{Group\ 1}) CWB_{kc}^{higher} + \mu_k + \eta_c + \varepsilon_{kc}$$

where $\hat{\beta}_{kc}$ denotes the first-stage estimates of the employment and earnings per worker elasticities by country (k), industry-firm size-cell (c). CWB_{kc} denotes the incidence of CWB agreements in each country and cell across firms. Superscripts indicate whether collective wage bargaining agreements are, respectively, negotiated at the firm level or at a higher level (*i.e.* industry, firm). To allow for differences in the role of bargaining across countries characterised by flexible labour markets, low levels of CWB coverage and a predominance of firm-level bargaining (Group 1: Estonia, Poland and the United Kingdom) and countries with less flexible labour markets, higher levels of CWB coverage and a predominance of bargaining at the industry or country levels (Group 2: Belgium, France, Italy and Spain), the CWB variables are interacted with a dummy for Group 1. The main justification for distinguishing between these two groups of countries is that the role of CWB coverage is likely to depend on its broader institutional context. As in the case of temporary work, the model includes full sets of country and cell dummies. Semi-aggregated data on CWB coverage are obtained from the Structure of Earnings Survey (SES).

Employment protection reduces the sensitivity of employment to output shocks, but increases that of earnings per worker

The majority of OECD countries exempt small firms from some or all country-wide employment protection requirements.[70] The analysis here exploits the resulting

within-country variation to examine the role of employment-protection provisions with respect to individual and collective dismissals for the responsiveness of labour inputs to output shocks.[71] In order to ensure that the results only relate to exemptions with respect to employment-protection provisions and not other differences in adjustment behaviour that may be related to firm size, the analysis incorporates countries without firm-size exemptions to capture the independent effect of firm size.[72] The results are reported in Figure 2.18. They indicate that provisions with respect to individual dismissals have a tendency to reduce the output elasticity of employment, while they appear to increase the sensitivity of earnings per worker to output shocks. Collective dismissal provisions have no detectable effect on the labour input adjustment behaviour of firms. A one standard-deviation increase in the stringency of individual dismissal provisions, which roughly corresponds to an increase in the level of employment protection from Japan to France, would result in a 3 percentage-point reduction in the responsiveness of employment to output shocks and an 11 percentage-point increase in the responsiveness of earnings per worker to output shocks. These results suggest that more stringent employment-protection provisions for regular employees induce firms to adjust less on the extensive and more on the intensive margin.

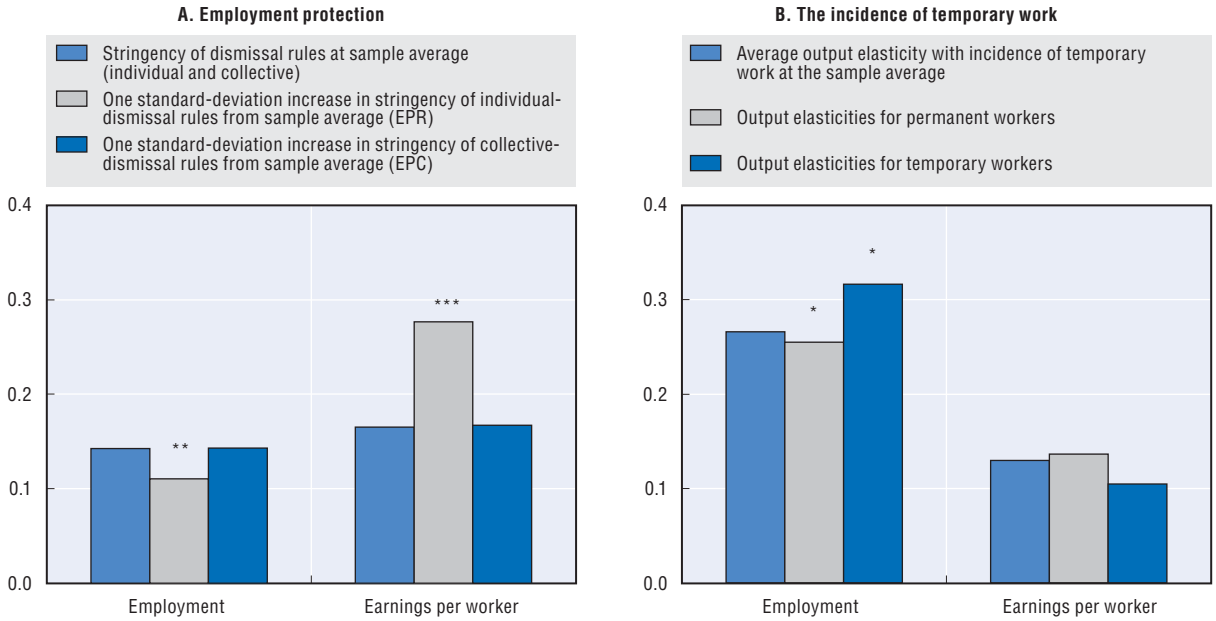
Employment protection rules are also likely to have an important impact on the use of temporary contracts (Blanchard and Landier, 2002; Boeri, 2011; Cahuc *et al.*, 2012). Employment protection provisions with respect to regular contracts increase incentives to make use of temporary contracts, while employment protection provisions with respect to temporary contracts regulate their use. In order to capture the impact of employment protection on the adjustment behaviour of firms that comes about through its impact on the incidence of temporary work, Panel B analyses the role of the incidence of temporary work for the adjustment behaviour of firms. It shows that, as one would expect, the employment sensitivity of temporary workers with respect to output shocks is substantially higher than that of regular workers. There is some indication that the increased sensitivity of employment reduces the sensitivity of earnings per worker in response to shocks. However, the difference in the sensitivity of earnings per worker to shocks between permanent and temporary workers is not statistically significant.

The impact of collective wage agreements on the labour-input adjustment behaviour of firms may depend on the broader institutional environment

The analysis of the role of collective wage bargaining agreements for the labour-input adjustment behaviour of firms takes account of both their pervasiveness by looking at the coverage rate of CWB agreements across firms within detailed cells (defined in terms of firm size and industry) as well as an important aspect of their nature by taking account of the predominant level of centralisation/decentralisation at which they are negotiated. More specifically, the analysis focuses on the role of CWB agreements that are negotiated at, respectively, the firm-level or higher levels of negotiation (*i.e.* industry or country). A key feature of the analysis is that it allows for differences in the role of bargaining across different groups of countries: a group of countries characterised by flexible labour markets, low levels of CWB coverage and a predominance of firm-level bargaining (Group 1: Estonia, Poland and the United Kingdom) and a group of countries that have less flexible labour markets, high levels of CWB coverage and a predominance of bargaining at the industry or country levels (Group 2: Belgium, France, Italy and Spain). The main justification for distinguishing between these two groups of countries is that the role of CWB coverage is

Figure 2.18. **The effect of employment protection on the responsiveness of employment and earnings per worker to output shocks**

Output elasticities of employment and earnings per worker



*, **, ***: statistically significant at the 10%, 5% and 1% level, respectively.

Source: OECD estimates based on ORBIS and D. Venn (2009), "Legislation, Collective Bargaining and Enforcement: Updating the OECD Employment Protection Indicators", *OECD Social, Employment and Migration Working Papers* No. 89, OECD Publishing, Paris. See also P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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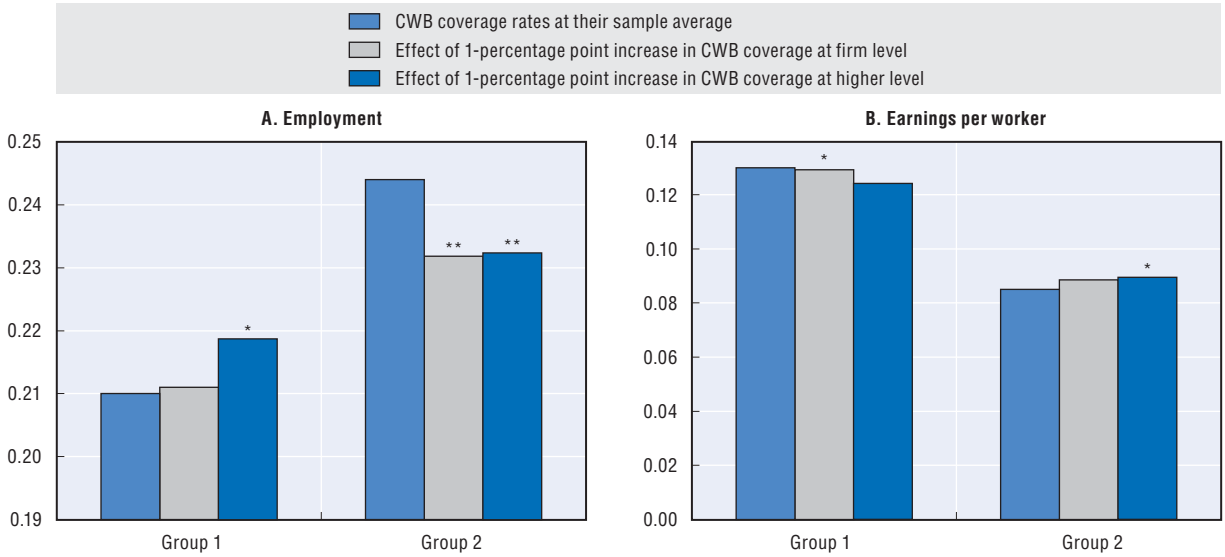
likely to depend on its broader institutional context (Aidt and Tzannatos, 2008).[73] For details on the methodology, see Box 2.4.

Figure 2.19 compares the average employment and earnings-per-worker elasticities that result when the coverage rates of firm and higher-level CWB agreements are set at their sample means with those that result when the coverage rates are increased, one-by-one, by one percentage point from their sample means. In general, the results suggest that more pervasive collective bargaining mitigates the effect of output shocks on employment in Group 2, but has either no effect or reinforces the impact of output shocks on employment in Group 1. The results with respect to earnings per worker are very weak. If anything, the results suggest that CWB coverage increases the responsiveness of earnings per worker to shocks in Group 2, while it reduces it in Group 1. However, the effects are small and generally statistically insignificant. The differences in the estimated impact of CWB coverage on the labour input adjustment behaviour of firms across the two groups of countries may indicate that its role depends on the broader institutional environment in which collective bargaining takes place. However, it may also reflect the role of specific features of the bargaining process that are not taken into account in the present analysis.[74] Whether collective bargaining agreements are negotiated at the firm-level or at higher levels does not appear to matter in any of the two groups of countries.[75]

Figure 2.19. **The effect of collective wage bargaining coverage on the responsiveness of employment and earnings per worker to output shocks**

Output elasticities by country group[a]



CWB: Collective wage bargaining.
*, **: statistically significant at the 10% and 5% level, respectively.
a) Group1: Estonia, Poland and the United Kingdom; Group 2: Belgium, France, Italy and Spain.

Source: OECD estimates based on ORBIS and SES. See P. Gal, A. Hijzen and Z. Wolf (2012), "The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-country Firm-level Evidence", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, forthcoming, for details.

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The implications of the adjustment behaviour of firms for household income and its distribution[76]

This sub-section uses detailed micro-level data on individual workers and households from EU-SILC to simulate the implications of the adjustment behaviour of firms in response to output shocks for different dimensions of worker welfare, consistent with the welfare perspective on labour market resilience adopted in the remainder of the chapter.[77] The adjustment behaviour of firms in response to shocks is characterised by means of estimated output elasticities for employment and earnings per worker that vary by region, industry, firm size and type of contract.[78] The implications of the adjustment behaviour of firms for workers are examined by computing the implied earnings change of a given output shock for each worker in EU-SILC, whilst making specific assumptions on the way employment and earnings per worker changes are distributed within cells. Following Bargain *et al.* (2011) and similar to the analysis in Section 2, it is assumed that employment changes are randomly distributed within cells and that earnings per worker changes are uniformly distributed across workers who remain employed within cells. After computing the implications of the adjustment responses by firms for individual earnings, one can also compute the implications for market household incomes (before taking account of taxes and benefits) and *net* household incomes (after taking account of taxes and benefits), which is more appropriate from a welfare perspective.[79, 80] The analysis focuses on two dimensions of worker welfare: average changes in household income and changes in income inequality. For simplicity, the analysis abstracts from differences in output demand

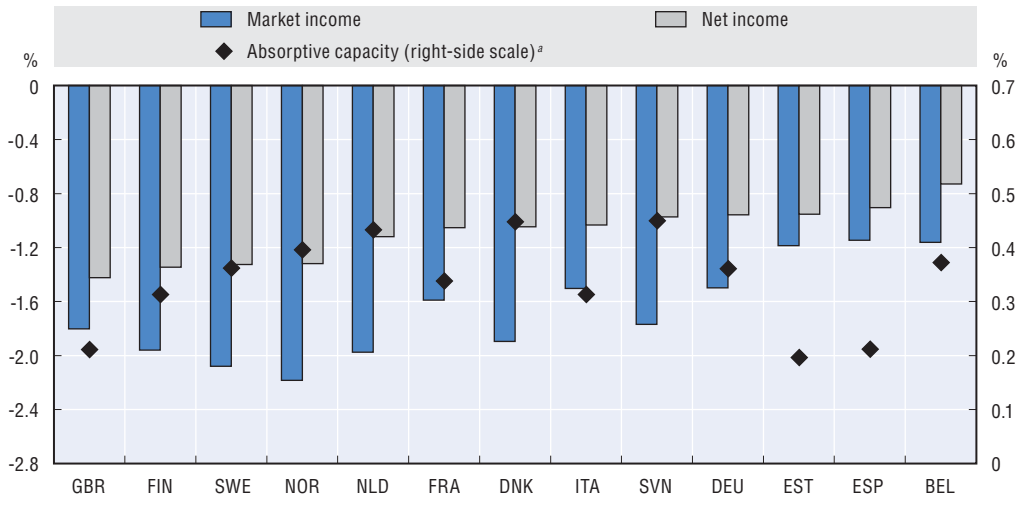
shocks across countries and firms by assuming a uniform reduction in output demand for the market sector of 5%.[81]

The tax-benefit system plays a major role in mitigating the adverse impact of economic downturns on disposable income…

Figure 2.20 represents the simulated changes in *average household income* before and after taxes due to a uniform 5% reduction in aggregate demand. Cross-country differences in simulated market income changes are not easy to interpret as they reflect a multitude of factors including: the adjustment behaviour of firms in response to shocks; the employment rate (since it increases the fraction of households that is exposed to labour income shocks); the size of the public sector (this reduces the fraction of households exposed to labour income shocks because public-sector workers are assumed not to be affected by changes in aggregate demand); and household composition. In addition to the factors that affect market income changes, cross-country differences in net income changes also reflect differences in the role of the tax-benefit system across countries. The results indicate that market income declines following a 5% reduction in aggregate demand range from just over 1% in Belgium, Estonia and Spain to around 2% in the Nordic countries, the Netherlands and the United Kingdom, possibly reflecting the role of high employment rates. Similarly, simulated declines in net income range from 0.7% in Belgium to 1.4% in the United Kingdom. The tax-benefit system reduces the average impact of aggregate demand shocks on household income in all countries considered, reflecting their role as automatic stabilisers. The absorptive capacity of the tax-benefit system is smallest in Estonia, Spain and the United Kingdom (about 20%) and largest in Denmark, the Netherlands, Norway and Slovenia (40% or more).[82]

Figure 2.20. **The simulated impact of economic downturns on household income**

Implied impact of a 5% reduction in aggregate demand



Note: Countries shown in ascending order of the absolute change in net household income.

a) Absorptive capacity is defined as the change in market income minus the change in net income as a share of the change in market income.

Source: IZA/OECD estimates based on the third wave of the European Union Statistics on Income and Living Conditions (EU-SILC).

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… and income inequality

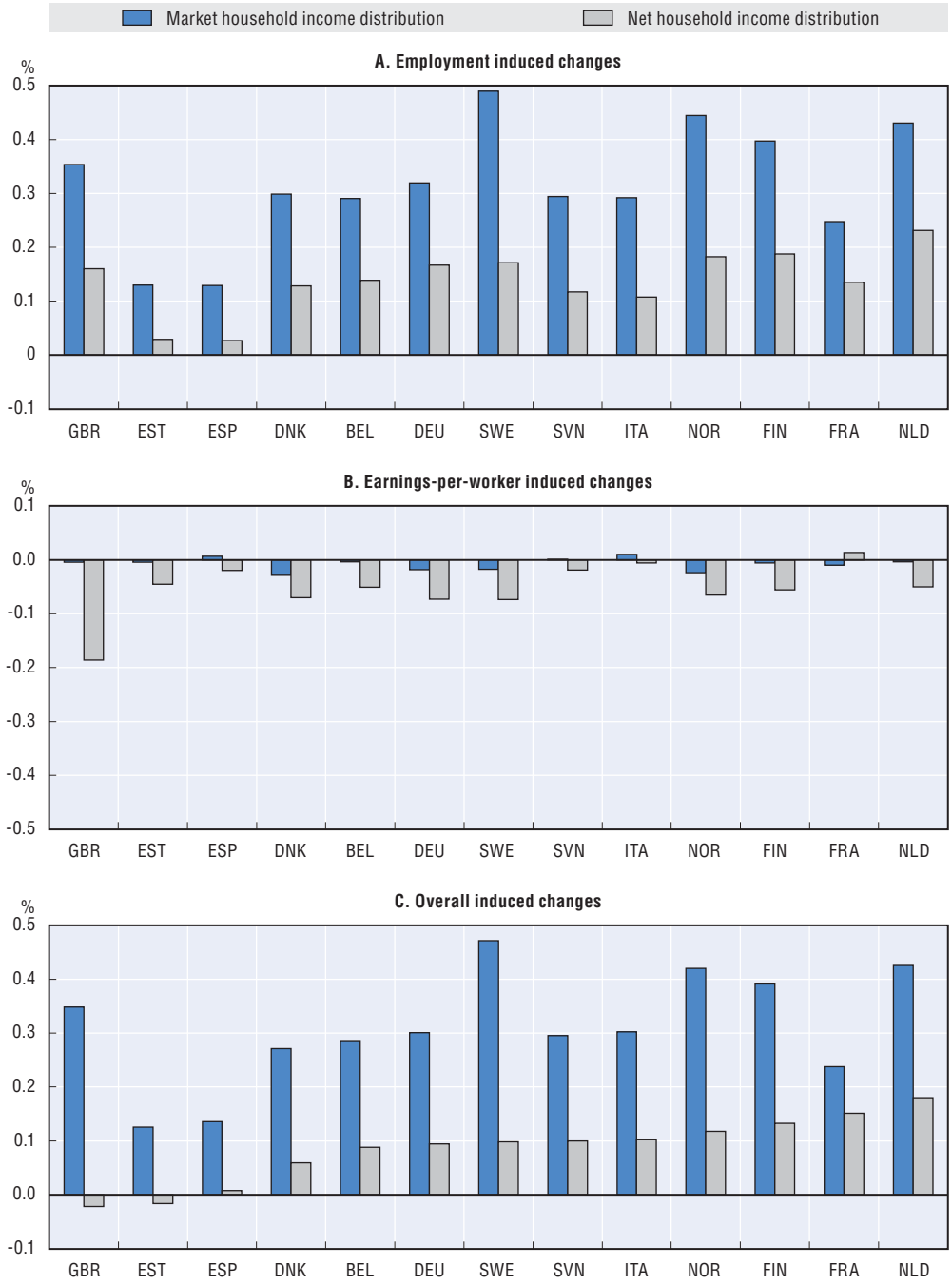
Figure 2.21 shows the simulated changes in *household income inequality* due to a 5% reduction in aggregate demand measured in terms of the Gini coefficient. The results are reported separately for changes in income inequality that derive from, respectively, changes in employment status of one or more of the household members (Panel A), changes in average earnings for those who remain employed in a household (Panel B), and changes in total labour earnings within a household (Panel C). Panel A shows that employment reductions in response to a decline in aggregate demand have a tendency to increase market income inequality, but that the tax-benefit system tends to mitigate the increase in income inequality. Panel B shows that the impact of average earnings adjustments for market income inequality tends to be relatively small and may be positive or negative. However, once the role of the tax-benefit system is taken into account, income inequality decreases as a result of earnings per worker adjustments. This most likely reflects the progressivity of the tax system in many OECD countries.[83] Panel C shows that the joint impact of employment and average-earnings adjustments for income inequality tends to be positive due to the dominant role of employment changes for inequality. These results illustrate that the way firms adjust in response to shocks can have potentially important implications for the change in income inequality and, consequently, social welfare, particularly in countries where the role of the tax-benefit system in offsetting increases in income inequality is relatively limited. However, in most countries, a significant part of the rise in inequality is offset by the tax-benefit system.

The above analysis provides two main insights. First, the way firms adjust in response to output shocks can have important implications for average incomes and income inequality and, hence, aggregate worker welfare.[84] Second, it underlines the importance of taking account of the tax-benefit system when assessing the role of economic downturns for worker welfare. In the countries considered here, the tax-benefit system absorbs 20 to 40% of the proportional reduction in household income and also tends to offset more than half of the increase in income inequality. Hence, the tax-benefit system substantially mitigates the social impact of recessions and acts as an important automatic stabiliser of aggregate demand.[85]

An important issue is to what extent the present conclusions, and, particularly, the inequality impact of the way firms adjust in response to shocks, are genuine or driven by the specific modeling assumptions used. The analysis shows that when job losses are random within cells, this will have a tendency to increase income inequality, while earnings-per-worker reductions tend to have the opposite effect when these are distributed evenly within cells. This raises the questions whether the assumed patterns of employment and earnings-per-worker adjustments are realistic and whether with more realistic assumptions the same patterns would result. The descriptive statistics in Section 1 provide suggestive evidence that employment losses tend to be highly selective in practice, even in the context of a severe economic downturn, whereas working-time adjustments tend to be more evenly distributed. The ideal way to address this would be to estimate the labour adjustment responses of firms for more detailed groups of workers and firms. Unfortunately, this is not possible with the available data. Another possibility would be to assess the sensitivity of the results to alternative assumptions on the way the costs of adjustment are distributed *within* cells. For example, one might assume that job losses are purely selective in the sense that the lowest-earning workers are the first to lose their jobs in a recession. However, this is likely to reinforce the inequality impact of employment changes and, thus, would not change the qualitative results presented here.

Figure 2.21. **The simulated impact of economic downturns on household income inequality**

Implied impact of a 5% reduction in aggregate demand on income inequality
(percentage-points of Gini index 0-100)



Note: Countries shown in ascending order of the overall induced change in net income inequality.

Source: IZA/OECD estimates based on the European Union Statistics on Income and Living Conditions (EU-SILC).

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Conclusions

One of the main insights that emerges from this chapter is that policies and institutions that are conducive to good structural labour market outcomes also tend to be good for labour market resilience. In general, it appears that countries with low levels of structural unemployment also tended to experience less of a cyclical increase as a result of the crisis. This finding implies that many of the recommendations in the *Reassessed OECD Jobs Strategy* of 2006 for achieving good structural labour market outcomes are also likely to contribute to labour market resilience.

Beyond suggesting that policy packages that are consistent with good structural labour market performance are also broadly consistent with labour market resilience, this chapter also sheds new light on the role of a number of specific structural policies and institutions. On the positive side, co-ordinated collective bargaining arrangements may be an important factor in achieving low structural unemployment rates, while mitigating the direct impact of shocks on employment and facilitating wage and/or working time adjustments. Improving our understanding of the way industrial relations can contribute to good labour market performance is an important avenue for further research. On the negative side, institutional settings that implicitly promote the use of temporary contracts, such as stringent employment protection provisions with respect to regular workers, are associated with weaker structural outcomes, possibly reflecting their impact on frictional unemployment and their negative impact on overall job quality. They also result in less labour market resilience by increasing both the unemployment response to output shocks and reinforcing cyclical increases in overall earnings inequality. Apart from affecting the incidence of temporary work, employment protection for regular workers does not appear to have much of a direct impact on most measures of structural labour market performance or labour market resilience that are considered in this chapter. If anything, it mitigates the impact of economic shocks on unemployment and earnings inequality by inducing firms to adjust more on the wage and working-time margins than on the employment margin.

The chapter also leaves a number of important issues for future work. First, the analysis does not take account of policy developments since the start of the global financial crisis. However, the large majority of OECD countries have implemented one or several temporary measures in response to the crisis in an effort to mitigate its social cost. Moreover, the crisis and the subsequent need for fiscal consolidation have acted as important catalysts for structural reforms, particularly in countries where reforms were most needed. It will be important to assess the role of these temporary measures for labour market resilience and monitor the role of structural labour market reforms for labour market performance in the longer term. Second, the chapter does not consider the potential impact of the crisis on labour market hysteresis, that is, the possibility that part of the cyclical increase in unemployment becomes structural. While this is unlikely to change the main conclusions of this chapter, this represents a highly important issue in the present context in which the recovery in aggregate demand remains rather weak in many OECD countries, raising the risk of hysteresis. As more recent data become available, the scope for analysing the risk of hysteresis as a result of the global financial crisis will increase.

Notes

1. This chapter is based on a EC-funded project on "The role of policies for labour market resilience" (VS2010/0617 – SI576449). In addition to considering the role of structural policies and institutions, this project also examines the role of active and passive policies, including short-time work schemes, over the business cycle. See OECD (2012a) for further details.
2. Given the welfare focus of the definition of labour market resilience adopted in this chapter, it is possible to draw several parallels with the more established literature on the welfare costs of business cycles. This literature is discussed in Box 2.1.
3. To the extent that social welfare may be related to the earnings/incomes of individuals, the present analysis may be consistent with various perspectives on social welfare. The implications of aggregate shocks for social welfare in the purely utilitarian tradition, where social welfare is defined as the simple sum of individual utilities, proxied by income, may be assessed by focusing on the implications of aggregate shocks for total earnings. The implications of shocks for social welfare *à la* Sen (defined as the product of average income and one minus the Gini coefficient), may be gauged by focusing on their consequences for average earnings and earnings inequality. The way inequality is measured in this chapter does not allow for a Rawlsian interpretation of social welfare (based on the poorest person in society), since this would require focusing specifically on the implications of shocks for the incomes of the poorest segment of the population, which is not done here.
4. Since the tax-benefit system helps to insure workers against negative earnings losses in many OECD countries, it would arguably be more appropriate to focus on *net* incomes, after taxes and benefits, rather than earnings. As suitable up-to-date data on net incomes are not available, the emphasis in this chapter will be on earnings. However, Section 3 assesses the implications of the adjustment behaviour of firms in response to shocks for the incomes of households before and after taking account of taxes and benefits. See also Venn (2011) for an analysis of the role of the tax-benefit system for moderating the impact of individual earnings changes on household disposable income in different OECD countries.
5. This represents a form of counter-cyclical inequality averseness, since greater earnings volatility among individuals at the bottom-end of the distribution gives rise to counter-cyclical earnings inequality, whereas greater volatility at the top-end gives rise to pro-cyclical earnings volatility.
6. The main difficulty is that one would have to allow for differences in the trend before and after economic shocks as well as the way policies and institutions affect the impact of shocks on the trend.
7. The microeconomic analysis in Section 3 only takes account of direct effects.
8. Country coverage in this sub-section was limited to countries with quarterly data on GDP, labour income and unemployment.
9. It does not take account of differences in the trend across countries. This is done in the econometric analysis of Section 2.
10. Appropriate up-to-date data on earnings or income inequality are not yet available.
11. Since earnings are closely related to wealth and, therefore, the ability of individuals to cope with economic shocks, the concentration of earnings losses in the bottom end of the earnings distribution can have important implications for consumption and worker welfare and raises potentially important questions about the effectiveness of the social safety net.
12. In countries where historically low unemployment rates at the onset of the crisis partly reflected bubbles in financial and housing markets, it may not be realistic to expect unemployment rates to return their pre-crisis levels. Nevertheless, the economic recovery to date has not been sufficiently strong to make more than a dent in the cyclical rise in unemployment in the majority of countries.
13. For country-specific details on the data used in this section and the definition of peaks and troughs, see Annex Table 2.A1.2 of OECD (2012b).
14. The correlation coefficient during the crisis is –0.8 and –0.4 during the recovery.
15. Deviations from the average relationship are likely to reflect cross-country differences in the evolution of labour force participation and earnings per worker.
16. The term quality-adjusted labour productivity is used as shorthand for hourly labour productivity divided by the wage bill. The ratio of hourly labour productivity to the wage bill represents a form of quality-adjusted labour productivity since it takes account of changes in the composition of the

workforce that affect hourly labour productivity. The ratio of hourly labour productivity to the wage bill also represents the inverse of the wage share in national income. Chapter 3 analyses the long-term evolution of the wage share before the crisis as well as its main determinants.

17. The change in the unemployment rate can be decomposed as follows: $\Delta\frac{U}{LF} \approx \Delta\log\frac{Y}{EHW} + \Delta\log\frac{EHW}{EH} + \Delta\log\frac{EH}{E} + \Delta\log LF - \Delta\log Y$ where U refers to the number of persons unemployed, LF to the number of participants in the labour force, E to the number of persons employed, H to average hours worked and W to the hourly wage. This decomposition can be derived by noting that $\Delta\frac{U}{\mathrm{LF}} \approx -\Delta\log\left(1-\frac{U}{\mathrm{LF}}\right) = -\Delta\log\left(\frac{\mathrm{E}}{\mathrm{LF}}\right) = -\Delta\log\left(\frac{Y}{1}\frac{EHW}{Y}\frac{EH}{EHW}\frac{E}{EH}\frac{1}{LF}\right) = \Delta\log\left(\frac{1}{Y}\frac{Y}{EHW}\frac{EHW}{EH}\frac{EH}{E}\frac{LF}{1}\right)$. It is straightforward to extend the decomposition to account for population changes, but for expositional purposes this was not done here.

18. The variance decomposition makes use of the fact that the variance of the change in unemployment rate across countries equals the sum of the covariance terms of each component with the change in unemployment rates. The contribution of each component is calculated as the covariance of this component over the variance of the unemployment rate. As the decomposition is based on a log approximation, but particularly, because the data for different indicators come from different sources (*e.g.* national-accounts and labour-force survey data), the sum of the components does not perfectly correspond to the variance of the change in the unemployment rate. The shares are normalised to net out the role of the residual.

19. See Daly *et al.* (2011) for an analysis of the relative importance of pure wage growth and composition effects for the evolution of median earnings in the United States over the business cycle.

20. This is also likely to capture hours reductions which do not translate into earnings reductions.

21. Part of this reflects the role of return migration following the steep jump in unemployment.

22. Turnover costs not only depend on firm-specific skills but also on the type of contract. More specifically, turnover costs for workers on temporary contracts tend to be much lower than those for workers on open-ended contracts. This is important in the present context since there is a high incidence of temporary contracts among low-paid workers.

23. Since appropriate data on wages by socio-economic group are not available, the decomposition focuses on total hours rather than total earnings.

24. The extent to which employment adjustments are concentrated on workers with temporary contracts is very sensitive to the choice of start and end points over which changes are calculated. This is due to the tendency of firms to lay off temporary workers first in a downturn but also to rehire them disproportionately early in the recovery. See Chapter 1 for further details on the evolution of employment by socio-economic groups.

25. Moreover, working hours appear to have stabilised or even started to recover, suggesting that the distributional implications of employment adjustment may not only be more negative, but also more persistent than those associated with average hours reductions.

26. For further details on the impact of the global financial crisis on income inequality, see Jenkins *et al.* (2010).

27. Gross replacement rates compare the level of benefits with the level of a person's earnings before becoming unemployed, while net placement rates take into account taxes paid and other benefits received by the unemployed. Gross replacement rates are most relevant when documenting the key parameters of UB programmes, whereas net replacement rates are most relevant from a behavioural perspective. The econometric analysis uses net replacement rates to the extent possible. The evolution of gross replacement rates is used to extend the sample of net replacement rates backwards from 2001.

28. As discussed in Section 2, this set of variables closely resembles those included in the baseline specification of the empirical work by Bassanini and Duval (2006, 2009) that was conducted in the context of the *Reassessed OECD Jobs Strategy* of 2006.

29. In the case of Portugal, this is likely to reflect the gradual decline in international competitiveness since joining the euro.

30. Note, however that empirical studies of labour market resilience typically focus on the *temporary* labour market effects of cyclical shocks. They focus either directly on the cyclical component of the labour market outcome of interest or implicitly assume that labour market outcomes eventually

return to their long-term trend. As a result, these studies do not account for the possibility that cyclical shocks have permanent effects on the labour market, so-called "hysteresis" effects. While there are good reasons for limiting the scope of labour market resilience in these studies to the temporary effects of output shocks, the possibility of hysteresis also deserves attention, particularly in the context of a severe recession. Chapter 1 of this publication provides a tentative assessment of the extent to which the cyclical rise in unemployment has become structural.

31. "Unbalanced panel" in this case means that the time-series for each country do not span the same period. However, the data cover for each country at least the period 1995 Q4 to 2007 Q4.

32. The main reason for limiting the analysis to the pre-crisis period is that information beyond 2007 is not yet available for most of the institutional variables used in the analysis. Out-of-sample predictions are used to assess how labour market outcomes would have evolved had institutional settings remained at the 2007 values.

33. In addition, all regressions control for unobserved characteristics that are either constant over time or common across countries by means of country and time fixed effects.

34. Different from Bassanini and Duval (2006, 2009), the present analysis uses adjusted bargaining coverage instead of union density, the net replacement rate instead of the gross replacement rate and a categorical measure of wage co-ordination that allows for five different levels instead of a dichotomous indicator.

35. In principle, it would make sense to allow for a hump-shaped relationship between co-ordination and unemployment as suggested by Calmfors and Driffill (1988). They posit that both co-ordinated/centralised wage bargaining systems and unco-ordinated/decentralised wage bargaining systems can be consistent with good labour market outcomes, while intermediate systems are likely to perform less well. More co-ordinated/centralised systems may lead to better outcomes because such systems can facilitate internalising negative bargaining externalities with respect to employment. On the other hand, in the case of unco-ordinated bargaining at the firm level, competitive pressures from other firms in the same industry can provide strong incentives for wage moderation. The specific role of low co-ordination for labour market outcomes could not be assessed here due to the absence of sufficient variation in the low co-ordination variable over time. See Aidt and Tzannatos (2008) for an overview of the empirical evidence on the Calmfors-Driffill hypothesis.

36. The incidence of temporary work is used instead of the stringency of employment protection provisions with respect to temporary contracts because of concerns over the importance of their enforcement in practice. The main reason why enforcement issues are of particular concern in the context of temporary contracts is that incentives for enforcement are likely to be weak as workers and firms often share a mutual interest in their non-enforcement. As a result of these enforcement problems, it has sometimes been difficult to establish a negative relationship between the incidence of temporary work and the stringency of employment protection provisions with respect to temporary contracts. Bassanini *et al.* (2010) provide empirical evidence that shows this is, indeed, related to the problem of enforcement.

37. While it is possible that the positive relationship between temporary work and unemployment reflects to some extent the impact of unemployment on the incidence of temporary work, it does not reflect the possibility that countries with high levels of unemployment introduced reforms to facilitate the use of temporary contracts in effort to reduce unemployment. The inclusion of country-fixed effects ensures that identification is achieved solely on the basis of the variation over time. The standard deviation of the incidence of temporary work in the sample is about 7 percentage points.

38. Fiori *et al.* (2012) and Murtin *et al.* (2011) provide evidence of a number of other examples where policy complementarities are important. Fiori *et al.* (2012) show that product market deregulation is more effective at the margin when labour market regulation is high, while Murtin *et al.* (2011) find that the adverse effect of the tax wedge on unemployment tends to larger in countries where wage bargaining takes place at the sectoral level.

39. Relaxing the assumption that the role of a given policy or institution is non-linear or depends on the nature of policies and institutions is likely to render the results rather sensitive to their precise specification and is considered to be beyond the scope of this chapter.

40. As a robustness test, the same regressions were also estimated for log earnings per capita and the employment rate. The results are qualitatively very similar.

41. Another reason for focusing directly on employment and earnings per worker is that the expected impact of policies and institutions in many cases goes in opposite directions (except in the case of the incidence of temporary work), which reduces the likelihood of obtaining statistically significant results when focusing on earnings.

42. More generous UI benefits may also create moral-hazard effects by reducing incentives for workers and firms to preserve job matches.

43. The correlation between actual and predicted changes in unemployment is 64% and statistically significant (Figure 2.9, Panel A), slightly lower than the correlation of 69% reported in Bassanini and Duval (2009). Controlling for changes in actual unemployment rates due to the changes in the business cycle does not make a major difference.

44. Country-fixed effects are included to capture country-specific trends.

45. The medium-term impact is defined here as the average impact over the first sixteen quarters since the shock in order to capture the impact of output shocks on labour market outcomes over the course of a "typical" business cycle (usually considered to be three to five years). The sixteen-quarter period also corresponds to the period from the start of the crisis to the end of 2011 that is used to compare the out-of-sample forecasts with actual labour market developments.

46. The long-term semi-elasticity of the unemployment rate with respect to GDP is also about 0.5, consistent with Okun's law.

47. One may simulate the impact of output shocks on overall earnings inequality using different assumptions on the degree of selectivity with respect to employment and earnings per worker adjustments. For example, one might assume that employment losses are entirely concentrated at the bottom end of the earnings distribution. This would reinforce the differences across countries in Figure 2.10, but would not add any major new insights.

48. Further analysis on the role of structural reforms during the period 1995-2007 suggests that they had not much of an impact on the unemployment response to the global financial crisis. About two-thirds of the countries in the sample experienced a slightly larger unemployment response as a result of structural reforms, while in the remainder past reforms mitigated the response. In all countries, the quantitative difference between the predicted change in unemployment based on 1995 settings and that based on 2007 settings is small compared with the overall predicted increase in unemployment. In terms of earnings, there is little indication that total earnings losses in response to economic downturns have increased as a result of past reforms.

49. A scatter plot that relates the incidence of temporary work to the stringency of employment protection provision with respect to open-ended contracts suggests a strong positive and statistically significant relationship (OECD, 2004; Boeri, 2011). For more robust empirical evidence on this relationship, see Autor (2003), Kahn (2007) and Centeno and Novo (2011).

50. The analysis implicitly assumes that there is a monotonic relationship between co-ordination and the elasticity of interest. Complementary regressions that include dummies for low and high levels of co-ordination instead of the current co-ordination variable suggest that this assumption is appropriate.

51. Aidt and Tzannatos (2008) argue that co-ordination is consistent with labour market resilience because in more co-ordinated regimes real wages tend to be more responsive to economic shocks. As a result, it is possible that employment is less sensitive to negative output shocks, while persistence may also be less since wages adjust more readily to changes in labour market conditions. Empirical studies by Blanchard and Wolfers (2000) and Bassanini and Duval (2006) confirm that co-ordination has a tendency to reduce the direct effect of macroeconomic shocks in line with the evidence presented here. The latter also show that co-ordination is associated with more unemployment persistence. One possible explanation for increased unemployment persistence despite more real wage flexibility may be that co-ordination also induces more adjustment on labour productivity and working time and that these margins recover before employment in the initial phase of a recovery (see discussion in Section 1). Aidt and Tzannatos (2008) further provide some discussion of the role of specific features of co-ordination for labour market performance. They suggest that informal and formal co-ordination can lead to similar outcomes, but also that informal co-ordination is more likely to break down in turbulent economic times. Moreover, employer co-ordination may be more relevant than employee co-ordination for labour market performance, possibly because more centralised employers' organisations may be more effective in controlling wage drift than their employee counterparts.

52. The correlation coefficients are, respectively, 0.6 and 0.4. The correlation between actual and predicted earnings is considerably lower than that for unemployment. In part, this is because of the relatively poor performance of the model to predict the evolution of earnings per worker.

53. Spain is not an exception in terms of total earnings as the model not only under-predicts employment changes but also over-predicts earnings per worker adjustment for Spain.

54. Similarly, the credit crunch that was associated with the economic downturn may have affected some firms more than others. For example, the credit crunch may have particularly affected firms that rely to an important extent on external financing or firms that differ in their access to credit (which tends to be related to firm size).

55. The correlation coefficient is 0.61 and statistically significant at the 1% level. The correlation coefficient is not very sensitive to the concept of structural unemployment (NAIRU, unemployment rates adjusted for the business cycle) and the time period over which unemployment rates are averaged.

56. The cluster analysis is implemented using hierarchical clustering with complete linkage.

57. The main data source for the analysis is ORBIS, a dataset collected by Bureau van Dijk, which provides comparable information from balance sheets and income statements for firms across many OECD and non-OECD countries. The Statistics Department of the OECD has carried out extensive consistency checks and cleaning of the data (see Ragoussis and Gonnard, 2012, for details). For the purposes of this project, the OECD/ORBIS dataset was complemented with previous vintages of ORBIS and Amadeus (the "European edition" of ORBIS) to increase the time-horizon of the data. The cleaning procedure developed by the Statistics Department was applied to these earlier datasets and extended to take account of specific issues in relation to the present analysis. The data do not allow one to consider entry and exit. The firm-level data are (almost) exclusively used for the estimation of output elasticities of labour demand for different groups of firms. For aggregation purposes, the data were combined with a number of nationally representative datasets with information on the value of output, output deflators, employment and the number of firms from SDBD, STAN, and LFS. For further details, see Gal *et al.* (2012).

58. Amongst others, this involves assuming that policies and institutions do not affect the volatility of output and the size and industry structure of the economy.

59. This involves implicitly assuming that adjustment technologies are homogeneous within each of these size-industry cells.

60. The annual changes in output demand between 2008 and 2009 may not always give an accurate picture of the impact of the crisis across countries and industries. This is particularly important for countries in which the crisis started in late 2007. In general, these also tended to be the countries with significant housing bubbles.

61. These elasticities are estimated separately for each firm size, industry and country cell using dynamic panel data models that take account of the potential endogeneity of output and employment shocks. The elasticities in Figure 2.16 refer to simple average across cells. Coefficients on the lagged dependent variable are also of interest, but not discussed here, as the main purpose is to explain the short-term impact of the crisis on labour markets. For further details on the econometric model, see Box 2.3.

62. Small firms tend to have shorter credit histories; tend to be subject to higher levels of idiosyncratic risk; and are less likely to have adequate collateral (Gertler and Gilchrist, 1994).

63. While the focus in the literature appears to have been limited to adjustments on the extensive margin, the same argument should also apply for earnings per worker.

64. Descriptive statistics based on firm-level data for a large number of European countries in OECD (2010) are consistent with the results presented here.

65. The analysis only takes account of continuing firms and, thus, does not consider the role of output shocks for entry and exit. As entry and exit may be particularly important for small firms, the current estimates may underestimate the total impact of shocks on employment.

66. As a result, the three components attributed to each source of heterogeneity can exceed one.

67. For further details on the methodology, see Gal *et al.* (2012).

68. For instance, in countries with a stronger tradition of protecting worker rights, employment protection may be stringent and the role of trade unions more important.

69. Firm policies on hours may also have an impact on the way they adjust their labour inputs in response to output shocks. However, regressions that relate the variation in the incidence of overtime and long-term working time accounts across countries, industries, firm-size groups to the variation in labour input elasticities suggest that these variables do not have a detectable impact on the labour-input adjustment behaviour of firms.

70. Most commonly, small firms are exempt from additional notification or procedural requirements when undertaking collective dismissals. In addition, several countries reduce or remove severance payments, notice periods or the risk of being accused of unfair dismissal for small firms. Some other countries also apply blanket exemptions (Venn, 2009).

71. A number of previous country studies have exploited the firm-size exemptions to study the economic implications of employment protection provisions (see Venn, 2010, and references therein). However, this appears to be the first study to do this on a cross-country basis.

72. A potential criticism to identifying the effect of employment protection from firm-size exemptions is that high-volatility firms with a high responsiveness of labour inputs to output shocks have an incentive to stay below the firm-size threshold, thus potentially leading to an upward bias in the estimated effect of employment protection. However, this is unlikely to be a major issue in practice. Firm-size distributions reported in Gal *et al.* (2012) do not reveal strong evidence of selection around the firm-size thresholds. Moreover, as a robustness check, the empirical model was re-estimated while including a proxy for the average employment volatility within a cell to control for any changes in composition that may result from self-selection (average employment volatility is measured by the standard deviation of employment over time for each firm averaged across firms within a cell). The results are very similar, suggesting that selection effects are unlikely to drive the results reported here.

73. In an alternative specification, the role of CWB coverage and how this depends on the mode of collective bargaining was analysed in more detail. This specification explicitly differentiates between the role of coverage and the nature of bargaining. The results of this specification do not suggest much of an independent effect of coverage on average, but provide a weak indication that CWB coverage reduces the sensitivity of employment to output and increases that of earnings per worker when bargaining is done predominantly at the central level.

74. Theoretical models of wage bargaining focus on the efficiency properties of equilibrium employment and real wage levels. Right-to-manage models postulate that workers bargain over wages, while the decision about the level of employment is at the firm's discretion. The equilibrium is Pareto-inefficient and employment is lower than in the absence of collective wage bargaining (Nickell and Andrews, 1983). In efficient-bargaining models, unions and firms bargain *simultaneously* over wages and employment levels, yielding an efficient outcome in which underemployment disappears (McDonald-Solow, 1981). The results for Group 2 are inconsistent with the predictions from so-called "right-to-manage" models, which suggest that trade unions only care about wages and not about employment, but may be consistent with efficient bargaining models in which trade unions take account of the potentially adverse employment implications of wage bargaining and exercise restraint on wage claims in order to save jobs.

75. Re-estimating the model on a larger set of countries, which includes Germany and Portugal, yields similar qualitative results. However, these results are not presented here as including Germany and Portugal also required making a number of data imputations, which raises legitimate concerns about the reliability of the data used for those two countries.

76. The analysis in this sub-section was conducted by the OECD Secretariat in collaboration with Andreas Peichl and Sebastian Siegloch (IZA).

77. More specifically, the analysis makes uses of the 2009 wave of the *European Union Statistics on Income and Living Conditions* (EU-SILC). The aim of EU-SILC is to collect harmonised and comparable multidimensional survey data on income poverty and social exclusion for EU member countries as well as Norway and Iceland. The survey is representative for the whole population in each country due to the construction of population weights at the household and individual level.

78. This involves first estimating the output elasticities using the estimation procedure in Box 2.4 by region, industry and firm size. In a second step, the output elasticities by region, industry and firm size are related to the incidence of temporary work using data from the EULFS. The estimated correlations are used to construct output elasticities that vary region, industry, firm size and type of contract.

79. Equivalent household incomes are calculated based on the modified OECD equivalence scale.

80. Net household incomes are calculated using country-specific tax regressions. Using detailed individual budget curves for each household in each country, this involves running regressions of observed net income on a polynomial of market income, a vector of non-income factors (*e.g.* marital status, number and age of children) as well as interactions between both. The non-income factors and their interactions with the market income variables capture the country-specific non-linearities in the tax system. The fit of the tax regression is extremely good with R-squared values ranging from 0.89 to 0.96 across countries.

81. This corresponds roughly to the peak-to-trough average decline in real OECD GDP during the crisis.

82. This is defined as the difference between the change in market and net income as a share of the change in market income. In the literature, this is also referred to as the "normalised tax change" (Auerbach and Feenberg, 2000) or the "income stabilisation coefficient" (Dolls *et al.,* 2012).

83. This is consistent with previous findings by Bargain *et al.* (2011) who conduct similar micro-simulations for Germany as well as the macroeconomic analysis in Section 2 of this chapter. Job losses increase inequality by increasing the fraction of the labour force without labour income. earnings per worker reductions tend to reduce inequality because they only affect those with positive labour incomes.

84. Note that the present findings may understate the implications of output shocks for inequality when the adverse impact of job loss goes beyond that of the loss of income by adversely affecting future employability, health and happiness.

85. The implications of the simulations are unambiguously positive as the analysis does not take into account the effects of the tax-benefit systems for the way firms adjust to shocks (labour demand) and the incentives for work (labour supply). The macroeconomic analysis in Section 2 suggests, however, that while the implications of the tax wedge on labour market resilience are likely to be limited, the generosity of unemployment benefits may reduce it by increasing the persistence of employment. Thus, to fully appreciate the role of the tax-benefit system for labour market resilience, a more comprehensive analysis is required that would take account not only of its social consequences, but also its labour market effects.

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Chapter 3

Labour Losing to Capital: What Explains the Declining Labour Share?

During the past three decades, the share of national income represented by wages, salaries and benefits – the labour share – has declined in nearly all OECD countries. The chapter examines the drivers of this decline, stressing the role played by factors such as increased productivity and capital-deepening, increased domestic and international competition, the reduction of workers' bargaining power and the evolution of collective bargaining institutions. The decline of the labour share went hand-in-hand with greater inequality in the distribution of market income, which might endanger social cohesion and slow down the current recovery. Enhanced investment in education and use of the tax and transfer system can effectively reduce these risks.

Key findings

In recent decades, the labour share, or the share of labour compensation (wage, salaries and benefits) in the total national income, has been declining in almost all OECD countries. The median labour share dropped to 61.7% in the late 2000s, from 66.1% in the early 1990s and in some countries this decline began over 30 years ago.

A declining labour share does not necessarily imply declining living standards for workers, however. Even if average real labour incomes have grown less rapidly than incomes from capital, workers may still be better off to the extent the decline in the labour share was accompanied by faster economic growth. Nevertheless, the decline in the overall labour share hides significant differences across earning groups. On average, the wage income share of the top 1% of income earners increased by 20% in the countries for which data are available over the past two decades. By contrast, despite rising employment at the bottom end of the skill ladder, the wage share of the lowest educated slumped. This suggests that the position of certain workers, notably the least educated, in the income distribution worsened over the period. To the extent that less wealthy people tend to have a higher consumption propensity, the worsening of their labour income share might have an adverse effect on the level of aggregate demand and on how quickly economies can recover from the recent crisis. More generally, the unequal distribution of both labour and capital income growth that went hand-in-hand with the decline of the labour share suggests that these trends might endanger social cohesion.

What explains the decline of the labour share? *Total factor productivity (TFP) growth and capital deepening* – the key drivers of economic growth – are estimated to jointly account for as much as 80% of the average within-industry decline of the labour share in OECD countries between 1990 and 2007. This is consistent with the idea advanced by many studies that the spread of information and communication technologies (ICTs) has created opportunities not only for unprecedented advances in innovation and invention of new capital goods and production processes, thereby boosting productivity, but also for replacing workers with machines for certain types of jobs, notably those involving routine tasks.

There is also evidence that another driver of economic growth, the *rise in domestic and international competition*, had an impact on the labour share. In advanced economies, at least 10% of the decline of the labour share is accounted for by increasing globalisation – and in particular by the pressures from the delocalisation of some parts of the production chain as well as from import competition from firms producing in countries with low labour cost. The significant trend towards reducing public ownership of companies operating in the business sector also appears to have played an important part in shrinking the labour share, probably through the impact of privatisation on incentives for profit maximisation. This has been particularly the case in network industries, such as energy, transport and communications, where this process was of paramount importance. In fact, large-scale privatisation of network industries since the early 1990, while leading to strong

productivity enhancements, can also explain about 33% of the decline of the labour share in these industries. By contrast, there is no evidence that deregulation of inward foreign direct investment (FDI) had any negative impact on the labour share.

The reduction in the labour share associated with increased domestic and international competition and reduction in public ownership could be partly explained by their effect on *workers bargaining power*. There is evidence in the literature that increased competitive pressures not only reduce the size of the rent that employers and workers share, but also decrease the bargaining power of workers, particularly those who are low-skilled, and thus their ability to appropriate their share. Increased import flows raise the substitution between domestic and foreign workers, while the possibility of offshoring improves the position of employers in bargaining. Lifting entry barriers brings new workers into the industry, who tend to be less unionised and have less bargaining power than workers with long job tenures in incumbent firms.

By raising the pressures on employers to reduce costs and reducing the bargaining power of workers, increased domestic and international competition also appears to have shaped the *evolution of the coverage and structure of collective bargaining institutions*. Trade union membership has been falling in most countries and collective bargaining coverage declined significantly in many countries, implying that an increasing share of workers have their wage set individually. In countries with multi-employer bargaining systems, when co-ordination between social partners was not sufficient, centralised agreements have often been used to obtain the wage moderation required to preserve competitiveness. At the same time, significant decentralisation has taken place in most countries, as employers felt simultaneously the need to adjust more speedily to wage competition from domestic or international competitors and less need for collective protection from trade union pressure in bargaining. Compared with more centralised collective bargaining system, local wage bargaining tends to increase wage dispersion, so that decentralisation together with lower collective bargaining coverage probably explains part of the deterioration of low-skilled workers' position.

The role played by those *labour market policies* that typically have a strong impact on productivity growth, *such as statutory minimum wages and employment protection*, is also examined in the chapter. While the impact of the latter on the labour share is found to be negligible, minimum wages are estimated to depress the labour share in the long-run. A higher minimum wage is likely to induce greater investment in labour-saving innovations and firm-sponsored training, whose benefits, in imperfect labour markets, are not fully reaped by workers in terms of higher wages. However, the contribution of changes in minimum wages to the observed decline of the labour share appears minor.

Should policy respond to the declining labour share and if so how? Slowing down some of the key driving forces – technological progress and globalisation – is not a viable option insofar as these are the key drivers of economic growth that determines the size of the pie to be split between labour and capital. Governments can sometimes modify the direction of technical change towards labour-augmenting technologies through tax incentives and subsidies. But these interventions run risks insofar as they might distort the pace and efficiency of the allocation of resources and thus depress growth in the long-run. Alternatively and more promising, governments can equip workers to win the "race against the machine". Further investment in human capital, in particular by curbing the number of school dropouts and ensuring a better match between skills taught in school

and those in demand in the market, can go a long way to tackling the decline in the labour share. Finally, the tax and transfer system can be used to minimise the impact of growing inequality in market incomes on inequality in household disposable income.

Introduction

In recent decades, the aggregate labour share – the ratio of labour compensation to domestic output – has been declining in almost all OECD countries. In times of economic recession, this decline has typically paused, but then subsequently resumed with a recovery. The recent economic and financial crisis and subsequent sluggish recovery have not deviated from this general pattern. This suggests that workers are receiving an increasingly smaller share of national income.[1]

Should policy makers be concerned about these developments? In essentially all OECD countries, while the fraction of national income going to labour decreased, economic growth was still sufficiently rapid so that real labour compensation increased and, it has been argued,[2] the average worker is now better off. However, there is evidence that not all workers have fared the same. Recent work has shown that labour compensation of top income earners, both in private companies and government-controlled enterprises and organisations, has increased dramatically (*e.g.* Saez and Veall, 2005; Atkinson *et al.*, 2011), while the position of people at the bottom end of the distribution has been worsening. This has meant that the pre-tax distribution of income has become more unequal in most OECD countries (see, for example, OECD, 2008a, 2011a). There is a risk that this tendency, coupled with diverging trends between the average labour share and the average capital share, becomes a threat to social cohesion. Moreover, the shift of income away from labour (and, in particular, away from low-wage workers) towards capital (and top earners) might also have a negative impact on aggregate demand, to the extent that workers with below-average pay tend to have a higher consumption propensity than do top earners and capitalists (see, for example, Dynan *et al.*, 2004), which might result in a particularly adverse effect on the speed of the recovery.

The chapter examines the recent evolution of the labour share at the aggregate and industry level and links its observed decline with a number of possible determinants. In particular, several explanations for the decline in the labour share have been put forward by the literature. These include: structural transformations in the OECD economies involving the reallocation of resources away from high-labour-share industries, globalisation and outsourcing, increasingly faster labour-saving capital accumulation, skill-biased technical change, privatisation of state-owned enterprises, changes in collective bargaining systems, and the fall in workers' bargaining power. This chapter examines all of these explanations, identifies the key factors behind the decline in the labour share and discusses their policy implications. In order to do so, the analysis relies on comparable cross-country time-series of industry-level data, so that the impact of different factors on the labour share can be identified while taking care of potential endogeneity.

The chapter is organised as follows. Section 1 reviews the evolution of the aggregate and industry-level labour shares and assesses the different roles of within-industry changes and sectoral reallocation. It also considers the evolution of shares for different workers, in particular by looking at levels of education. Section 2 focuses on the determinants of within-industry changes in the labour share that are only indirectly

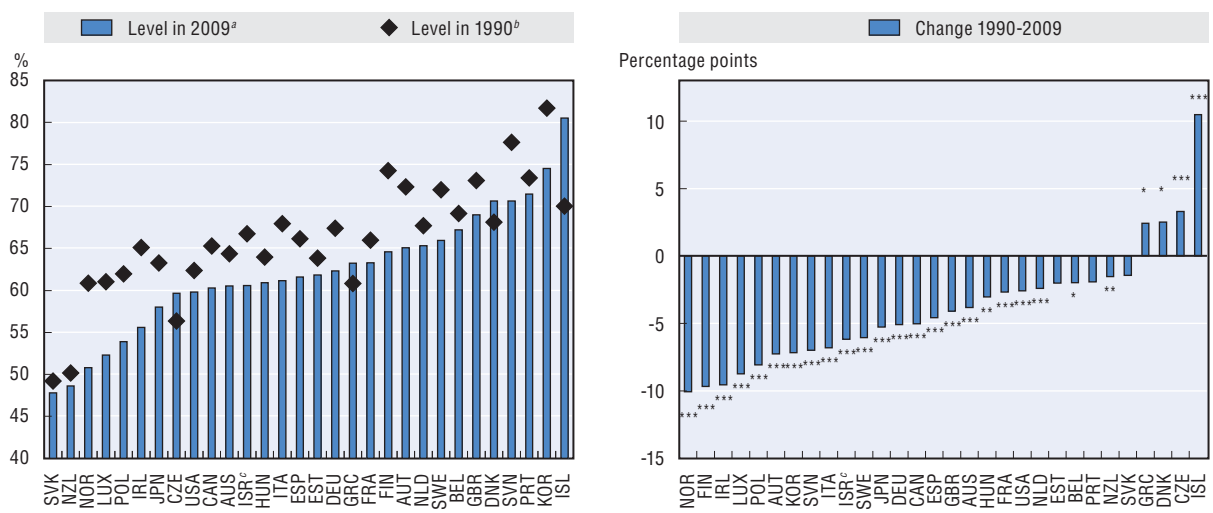
related to labour market institutions, namely capital accumulation and technology, globalisation, privatisation and product market liberalisation. The role of collective bargaining and changes in workers' bargaining power is examined in detail in Section 3, while Section 4 investigates the role of employment protection and the minimum wage. The key results of the chapter and their implications for policy are summarised in the concluding section.

1. Trends in the labour share

The evolution of the labour share in the past two decades

In most OECD countries the aggregate labour share has been declining.[3] Indeed, the median labour share went down from 66.1% to 61.7% between the early 1990s and the late 2000s (Figure 3.1).[4] Differences across countries are nonetheless large: the labour share went down by about 10 percentage points in Finland, Ireland and Norway, while it increased significantly in the Czech Republic and Iceland. Moreover these figures would be even more marked in the absence of the recent crisis in which the response of employment to GDP contraction in several countries was particularly moderate and labour hoarding substantial (see *e.g.* OECD, 2010, 2011b; and Chapters 1 and 2 in this volume), thereby temporarily raising the labour share.[5] Interestingly, in many countries, the trend decline of the labour share started well before the early 1990s: in half of the countries for which long time-series are available, the labour share declined by 10 percentage points or more since the mid-1970s, although it increased or fluctuated without a clear trend in the 1970s and 1980s in others (Bassanini and Manfredi, 2012).

Figure 3.1. **The decline of the labour share in OECD countries, 1990[a]-2009[b]**



Note: Three-year averages, starting and ending with indicated years. ***, **, * significant at the 1%, 5% and 10% level respectively. Statistical significance refers to the coefficient of the time trend in a bivariate regression on annual data with the labour share as dependent variable. The wage of the self-employed is imputed assuming that their annual wage is the same as for the average employee of the whole economy.

a) Germany and Iceland: 1991; Estonia: 1993; Poland: 1994; Czech Republic, Greece, Hungary, Slovak Republic and Slovenia: 1995; Israel: 2000.

b) Portugal: 2005; Canada and New Zealand: 2006; Australia, Belgium, Ireland, Norway and Sweden: 2007; France, Iceland, Israel, Poland and the United Kingdom: 2008.

c) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD calculations based on OECD STAN and EUKLEMS.

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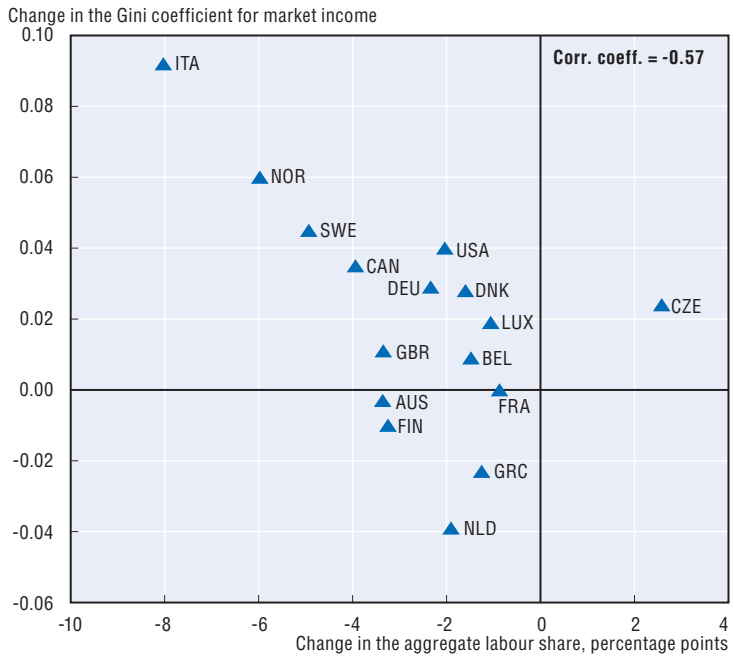
As discussed in OECD (2008a, 2011a), the distribution of pre-tax-and-transfer income (market income hereafter) has widened dramatically in many OECD countries in recent years. Has the decline of the labour share played an important role in this process of increasing inequality? It is difficult to establish with certainty a causal link between the evolution of the labour share and the evolution of the dispersion of market income, due to the lack of continuous time series for the latter. Nevertheless, in many countries, the income of the *average capital owner* tends to be higher than the income of the *average worker*. As a consequence, the decline of the labour share tended to evolve hand-in-hands with the widening of market-income inequalities (see Figure 3.2).

Figure 3.2. **Changes in the labour share and in income inequality, 1990s to mid-2000s**[a]



Note: Labour share: three-year moving averages centred around start and end dates. The wage of the self-employed is imputed assuming that their annual wage is the same as for the average employee of the whole economy. The Gini coefficient is based on pre-tax and transfer income of the population aged 18 to 65 years.

a) 1990-2004 for Canada; 1990-2005 for Denmark, the Netherlands and the United States; 1991-2004 for Italy, Sweden and the United Kingdom; 1995-2004 for Australia, Belgium, Germany and Norway; 1995-2005 for Finland; 1996-2004 for the Czech Republic, France and Luxembourg; 1999-2004 for Greece.

Source: OECD calculations based on the *OECD Income Distribution Database*, OECD STAN and EUKLEMS.

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Standard labour share statistics, moreover, tend to underestimate the contraction of the share of national income that is received by the *typical worker*. Recent work (*e.g.* OECD, 2011a; Atkinson *et al.*, 2011) shows that top income earners have seen their share of national income increase. Moreover, the wage income of top income earners has increased dramatically in a number of countries, particularly in North America, mostly driven by CEO and top executive's compensation (see Fernandes *et al.*, 2009; Frydman and Jenker, 2010; and Frydman and Saks, 2010). The labour compensation of the top 1% of income earners, measured as a fraction of national income, has increased substantially in almost all countries for which data are available. By contrast, the labour share of the other earners has declined by much more than what Figure 3.1 suggests (see Box 3.1). In particular, in

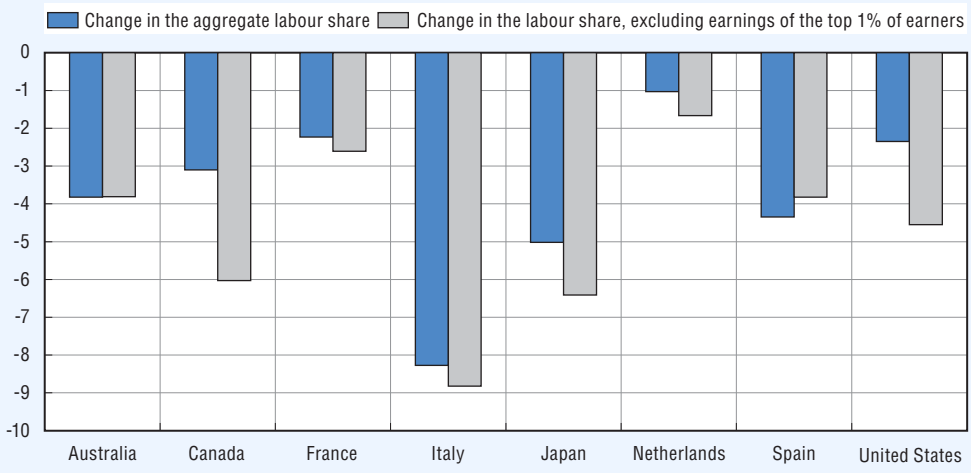
Box 3.1. **Trends in the labour share excluding top-income earners**

In recent years, long time series on income of top earners have become available for many countries (see *e.g.* Atkinson *et al.*, 2011). This evidence shows a general upward trend for the share of top income earners on total income. For example, in OECD countries for which data are available, the share of the top 1% of earners has increased on average from 6.7% to 10.3% between the mid-1970s and the mid-2000s. This stylised fact has fuelled much of the recent debate on inequality (see OECD, 2011a).

While, in general, the debate on income inequality focuses on trends in the overall share of income commanded by top-income earners, it is important to examine the evolution of their labour and capital income separately to understand better how national income is split between capital, top earners and other workers. Ideally, in order to have meaningful statistics on the fraction of national income that is appropriated by the average worker, it would be useful to adjust the evolution of the aggregate labour share by removing the top earners' contribution. However, long time series of comparable, detailed data on the share of top-income earners in total *labour income* are not available for many countries. For a few countries, these data can be retrieved from the *World Top Incomes Database* (Atkinson *et al.*, 2011). This database reports, for a number of countries including many OECD members, information on the share of the top 1% of income earners in total income and the share of labour income in total income of the top 1% of earners. The product of these two shares gives the labour share of the top 1% of income earners (except for discrepancies between national income and GDP). Therefore, subtracting it from the aggregate labour share yields an estimate of the labour share of the bottom 99% of earners (see OECD, 2012, for more details). The results from this exercise are summarised in the chart below.

Labour share declines, excluding the top 1% of income earners in selected OECD countries, 1990 to mid-2000s

Percentage point changes



Note: Three-year averages, starting and ending with indicated initial and end years. Initial year is 1990 for all countries, except for Japan (1991); mid-2000s data refer to 2007 for Australia, 2000 for Canada, 2005 for France and Japan, 2004 for Italy, 1999 for the Netherlands, 2008 for Spain and the United States.

Source: OECD (2012), "Labour Losing to Capital", supporting material for Chapter 3 of the 2012 *OECD Employment Outlook*, OECD Publishing, Paris, available online at *www.oecd.org/employment/outlook*.

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Once top earners' income is excluded from the computation of the wage bill, the drop of the labour share appears somewhat greater, especially in Canada and the United States. In 1990s and 2000s, the decline in the adjusted labour share in these two countries (6 and 4.5 percentage points, respectively) was substantially greater than that of the unadjusted labour share, due to an increase in the share of wage income in total income of top earners (2.9 and 2.2 percentage points in Canada and the United States,

Box 3.1. **Trends in the labour share excluding top-income earners** *(cont.)*

respectively; see OECD, 2012). In most other countries, the difference is smaller: on average, the cumulated labour income of the bottom 99% of earners expressed as a fraction of national income decreased by 0.9 percentage points more than the unadjusted aggregate labour share. Conversely, the top 1% of earners saw their labour share increasing by the same amount.* The only exception is Spain, where the adjusted labour share fell less than the unadjusted one, mostly due to a minor decrease in the share of labour income in top earners' income.

* Note that, as the labour share of the top 1% of earners is about 5% on average, this implies that the labour income of the top 1% of earners as a percentage of national income has increased by about 20% on average.

Canada and the United States, the decline of the labour share of the bottom 99% of income earners in the past two decades was about 2.9 and 2.2 percentage points larger, respectively, than that of the aggregate labour share.

These trends in the aggregate labour share also need to be interpreted with caution because of a number of measurement issues (see Box 3.2). Moreover, the evolution of the labour share in the *business sector* is likely to be shaped by different forces than the corresponding aggregate for the *public sector*, where measurement of output and factor shares raises more complex issues.[6] Therefore, the focus in the rest of this chapter is on the evolution of the labour share in the business sector, which represents a more consistent aggregate and where measurement issues are less problematic. Nevertheless the picture

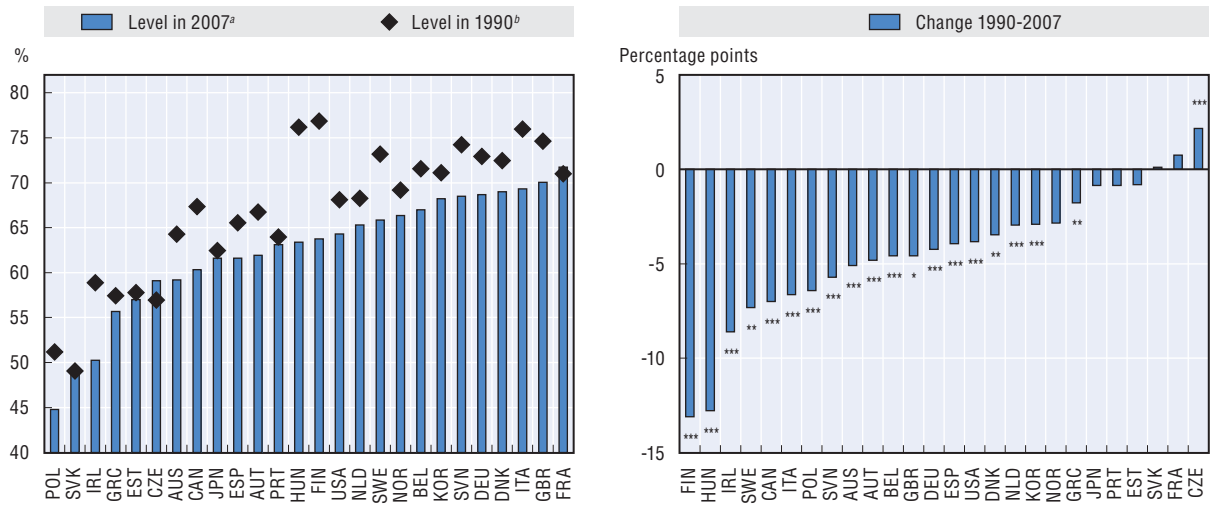
Box 3.2. **The aggregate labour share: Measurement issues**

The labour share is typically computed by dividing gross labour compensation by gross value added at current basic prices. In many industries outside the business sector, however, the measurement of value added is problematic. For example, the value added of the public administration, as measured in the national accounts is often equal to the sum of labour costs. As a consequence, the labour share is often dramatically inflated in the public sector. Conversely, in industries such as mining and fuel production, value added fluctuates quite a lot subject to changes in world demand for raw materials, while wages do not, thereby inducing large fluctuations in the labour share. Another source of measurement error is the imputation of owner-occupied housing in the national accounts, which is a significant proportion of value added in the real estate industry but is only reported as capital income (see *e.g.* OECD, 2009). Finally, the revenue of the self-employed is a mix of capital and labour income, which are typically not identified separately in the national accounts. There is a wide consensus that the remuneration of proprietors' labour should be assumed to be equal to the average compensation of wage earners (Gollin, 2002; Arpaia *et al.*, 2009). Typically, due to data availability, average annual wages of the whole economy are used for this calculation. However, the share of self-employed varies significantly across industries as does average compensation of employees, therefore imputation rules based on average compensation in the whole economy can be misleading both in terms of levels and trends.

In order to address these issues, in the remainder of this chapter the analysis focuses mainly on the labour share in the non-agricultural/non-mining/non-fuel/non-real-estate business sector – accounting for about two-thirds of the whole economy – where most of these problems are less important. In addition, the income of the self-employed is imputed on the basis of the average hourly wage of each industry. In other words, the labour share in the business sector is calculated in two steps: first, labour compensation for each industry is computed assuming that hourly compensation of proprietors' labour is the same as for employees in the same industry; then, industry labour compensation is aggregated at the level of the business sector and the labour share is computed by dividing this aggregate by business-sector's value added.

that emerges is rather similar to the results for the whole economy (Figure 3.3). The cross-country median labour share in the business sector, excluding agriculture, mining, fuel and real estate, was 68.2% in the OECD in 1990 and 63.6% in 2007. Among countries for which data are available, a significant trend increase is observed only in the Czech Republic (with a growth of 1.3 percentage points). By contrast, the labour share contracted significantly in almost three-quarters of the countries. Very large falls in the labour share were observed in some Scandinavian countries (Finland, and Sweden), a number of eastern European countries (Hungary, Poland and Slovenia), many English-speaking countries (Australia, Canada and Ireland) and Italy.[7] In all these countries the decline in the business sector's labour share exceeded 5 percentage points. The implication is that, in these countries, labour is obtaining an increasingly smaller share of the business-sector's pre-tax revenue.

Figure 3.3. **The decline of the business-sector labour share in OECD countries, 1990[a]-2007[b]**



Note: Three-year averages, starting and ending with indicated years. ***, **, * significant at the 1%, 5% and 10% level, respectively. Statistical significance refers to the coefficient of the time trend in a bivariate regression on annual data with the labour share as dependent variable. The wage of the self-employed is imputed assuming that in each industry their hourly wage is the same as for the average employee of the industry. Estimates for Norway exclude the chemical industry and are based on average hours per employed person rather than average hours per employee.

a) Germany and Hungary: 1992; Czech Republic, Estonia, Greece, Poland, Slovak Republic and Slovenia: 1995.

b) Canada: 2004; Korea and Portugal: 2005; Japan, Poland and Slovenia: 2006.

Source: OECD calculations based on OECD STAN and EUKLEMS.

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A number of previous studies have suggested that trends in the aggregate labour share typically hide important compositional factors (*e.g.* de Serres *et al.*, 2002). Indeed, since the 1960s, a number of low-labour-share service industries, such as financial intermediation, have gained importance in most countries[8] while other labour-intensive industries, such as textiles, have shrunk, thereby depressing the aggregate labour share. Thus, a key question is whether the decline of the aggregate labour share has been the result of a structural shift away from labour-intensive activities or whether instead it has been the result of a decline in the labour share within each industry. This question can be answered using a standard shift-share analysis (see Box 3.3). Based on comparable data for 20 industries in the business sector, changes in the business-sector labour share can be decomposed into the contribution of *within-industry* changes in the labour share and the contribution of changes in the *value-added share* of industries with high labour shares *versus* those with low labour shares.

Box 3.3. **Shift-share analyses**

The shift-share methodology allows decomposing aggregate changes of an economic variable into the contribution due to changes of that variable within industries and structural changes in industry composition. Formally, in the case of the labour share, a shift-share decomposition can be written as:

$$F_t - F_{t-1} = \sum_i \bar{s}_i \left(f_{it} - f_{it-1} \right) + \sum_i \left(s_{it} - s_{it-1} \right) \bar{f}_i \qquad [1]$$

where F and f represent the aggregate and industry labour shares, respectively, s is the share of industry i in nominal value added and a bar represents averages between the start and end dates. The first term on the right-hand side is a weighted average of *within-industry* changes in the labour share while the last term represents the contribution of sectoral reallocation across industries with different labour shares (the so-called *between-industry* component).

The evolution of the labour share in each industry can also be linked to the different evolution of real wages, labour productivity and relative prices (see *e.g.* De Serres *et al.*, 2002; Torrini, 2005). In particular, using logarithmic approximations:

$$\log \frac{F_t}{F_{t-1}} = \log \frac{W_t}{W_{t-1}} - \log \frac{Y_t}{Y_{t-1}} + \log \frac{(P_t / D_t)}{(P_{t-1} / D_{t-1})}$$

that is, the percentage change in the aggregate labour share F can be decomposed into the percentage growth of the aggregate real gross hourly wage W (deflated with the consumption deflator P) minus the percentage growth in hourly productivity Y (in volumes, that is deflated with the aggregate value-added deflator D) and the percentage change in the relative price of consumption with respect to domestic output. As suggested by Böckerman and Maliranta (2012) one can make use of the above formula to extend the standard shift-share decomposition in order to shed light on the relative contributions of wages, productivity and prices to within-industry and between-industry variations of the labour share. As shown in OECD (2012), the percentage change in the aggregate labour share can be approximated by:

$$\begin{aligned} \log \frac{F_t}{F_{t-1}} \cong & \left[\sum_i \bar{h}_i \left(\log \frac{w_{it}}{w_{it-1}} - \log \frac{y_{it}}{y_{it-1}} \right) \right] + \\ & \left[\sum_i \bar{h}_i \log \frac{w_{it}}{w_{it-1}} \left(\frac{\bar{w}_i - \bar{W}}{\bar{W}} \right) - \sum_i \bar{h}_i \log \frac{y_{it}}{y_{it-1}} \left(\frac{\bar{v}_i - \bar{V}}{\bar{V}} \right) \right] + \\ & \left[\sum_i \bar{h}_i \log \frac{(P_t / d_{it})}{(P_{t-1} / d_{it-1})} + \sum_i \bar{h}_i \log \frac{(P_t / d_{it})}{(P_{t-1} / d_{it-1})} \left(\frac{\bar{v}_i - \bar{V}}{\bar{V}} \right) + o \right] + \\ & \left[\sum_i \left(h_{it} - h_{it-1} \right) \left(\frac{\bar{w}_i}{\bar{W}} - \frac{\bar{v}_i}{\bar{V}} \right) \right] \end{aligned} \qquad [2]$$

where V is nominal (aggregate) value added per hour worked, h stands for the share of industry i in total hours worked, lowercase letters indicate industry-level variables, a bar represents averages between the start and end period, and o is a residual, which is typically very small. The term in the first bracket represents the contribution to the evolution of the

Box 3.3. **Shift-share analyses** *(cont.)*

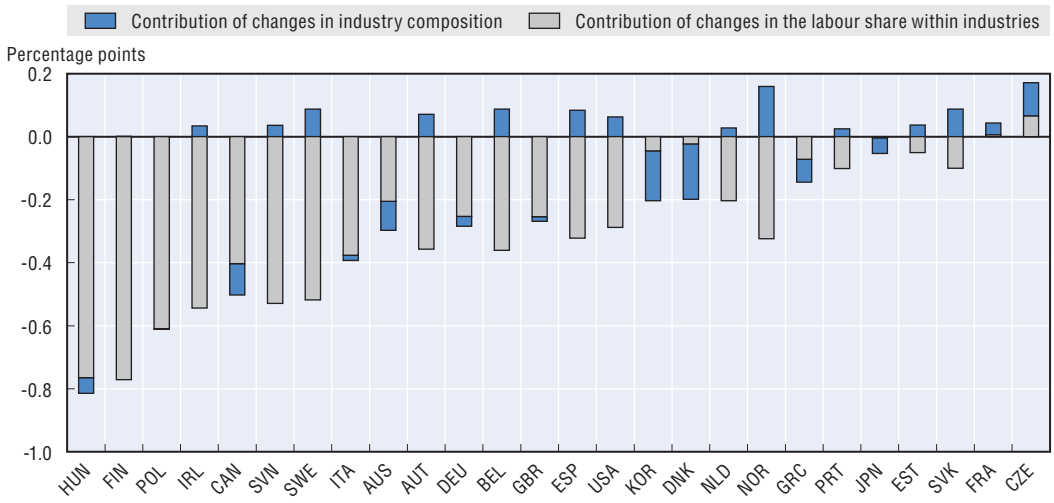
aggregate labour share of the average relative within-industry growth of real wages with respect to productivity. The terms in the second bracket capture the contribution of convergence/divergence patterns in real wages and productivity: real wages provide a greater contribution to the percentage change of the labour share when they grow faster in high-wage industries; conversely, when productivity grows faster in high-productivity industries, this compresses the labour share. The terms in the third bracket represent a relative price effect, which is positive if, on average, the consumption deflator grows faster than the output deflators. This relative price effect can be further decomposed into a within effect, a convergence effect and a small residual. However, in practice, most of the action occurs within industries and therefore, for simplicity, the three terms will be presented together in this chapter. Finally, the term in the fourth bracket (that approximately corresponds to the between component in [1]) captures the reallocation of labour from/to industries that are relatively more high-wage or high-productivity: it is positive if the difference between expanding industries and the average industry as regards wages is larger than their difference as regards productivity – or, in other words, expanding industries tend to be more high-wage than they are high-productivity industries.

In practice, the terms in the first, second and third brackets of [2] decompose within-industry changes in the labour share – as computed in [1], except that they are expressed in percentages instead of percentage points – into average within-industry growth of the ratio of real wages to productivity, convergence/divergence patterns and relative price growth. This approximation is precise – that is the sum of the terms in [2], except those in the fourth bracket, closely corresponds to the within component of [1] – if h and s are sufficiently close, which turns out to be the case in the data considered in this chapter. The interesting feature of this decomposition is that it allows to single out simultaneously three factors that, to a different extent in different countries, appear to be key in determining the within-industry evolution of the labour share in the business sector: the fact that, on average, within-industry real wage growth did not keep pace with productivity growth, the role of relative price effects, and the correlation between growth and levels of wages and productivity. The latter factor represents another, more dynamic, type of structural shift within an economy: if the growth rate of real wages is relatively homogeneous across industries while productivity grows faster in high-productivity industries, this inevitably depresses the labour share.

Within-industry falls in the labour share explain an overwhelming proportion of its aggregate decrease between 1990 and 2007 (Figure 3.4). Within industries, the labour share declined by as much as 0.7 percentage points per year in Finland, Hungary and Poland. Moreover, in most countries where a significant contraction of the aggregate labour share was observed, within-industry changes accounted for close to 100% of that decline, with the partial exception of Australia, where this proportion is only two-thirds. Large between-industry components, implying noteworthy reallocation away from high-labour-share industries, were observed only in Denmark and Korea.[9] In these two countries, structural reallocation across industries accounted for a decrease of the business-sector labour share greater than 0.1 percentage points per year. By contrast, in a few other countries, and notably Austria, Belgium, Norway, Spain, Sweden and the United States, reallocation *to* high-wage share industries limited somewhat the aggregate consequences of sizeable within-industry falls in the labour share. Finally, in the Czech Republic, a similar shift in

Figure 3.4. **Within- and between-industry changes in the business-sector labour share, 1990[a]-2007[b]**

Average annual contributions in percentage points



Note: Shift-share decomposition of the percentage-point change of the labour share in the business sector, partitioned in 20 industries, excluding agriculture, mining, fuel manufacturing and real estate. The wage of the self-employed is imputed assuming that in each industry their hourly wage is the same as for the average employee of the industry. Estimates for Norway exclude the chemical industry and are based on average hours per employed person rather than average hours per employee.

a) Germany and Hungary: 1992; Czech Republic, Estonia, Greece, Slovak Republic, Poland and Slovenia: 1995.

b) Canada: 2004; Korea and Portugal: 2005; Japan, Poland and Slovenia: 2006.

Source: OECD calculations based on OECD STAN and EUKLEMS.

StatLink http://dx.doi.org/10.1787/888932651560

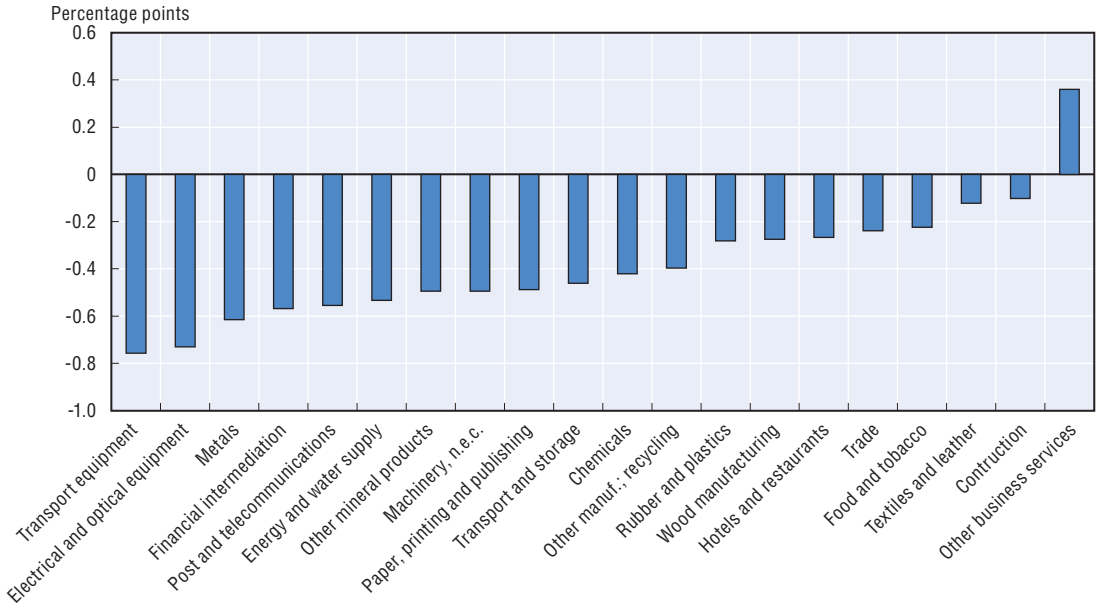
industry composition is responsible for most of the significant increase in the labour share in that country. In all other countries that experienced a significant reduction in the labour share, reallocation across industries played a minor role.[10]

Another key question is whether the fall in the labour share has been homogeneous across industries or whether this phenomenon has been more important in specific industries. On average across the countries for which data are available, within-industry changes in the labour share declined in all business-sector industries except business services, where the labour share rose substantially by almost 0.4 percentage points per year (Figure 3.5). Business services is, however, a composite industry, which includes medium-skill sub-industries that are highly intensive in physical capital (such as renting of machinery and equipment) and sub-industries that are extremely intensive in high-skill labour, such as research and development, computer and related activities, as well as legal, technical and advertising services, which expanded dramatically in the past two decades.[11] The expansion of the labour share in this industry is therefore likely to reflect to a large extent within-industry changes in the composition of this industry.[12] By contrast, large contractions in the labour share (above 0.4 percentage points per year on average) occurred in financial intermediation, network industries as well as high- and medium-technology manufacturing, while declines were typically small in other service industries, construction and low-tech manufacturing.[13]

Changes in the labour share are the result of the differential evolution of real wages, productivity and relative, quality-adjusted prices of output and consumption. More precisely, the growth rate of the labour share can be written as the sum of the relative

Figure 3.5. **Average within-industry changes in the labour share, by industry, 1990-2007**

Cross-country average of within-industry annual changes



Note: Average of within-industry annual percentage-point changes. The wage of self-employed is imputed assuming that in each industry their hourly wage is the same as for the average employee of the industry. Based on the countries reported in Figure 3.4, except Norway.

Source: OECD calculations based on EUKLEMS.

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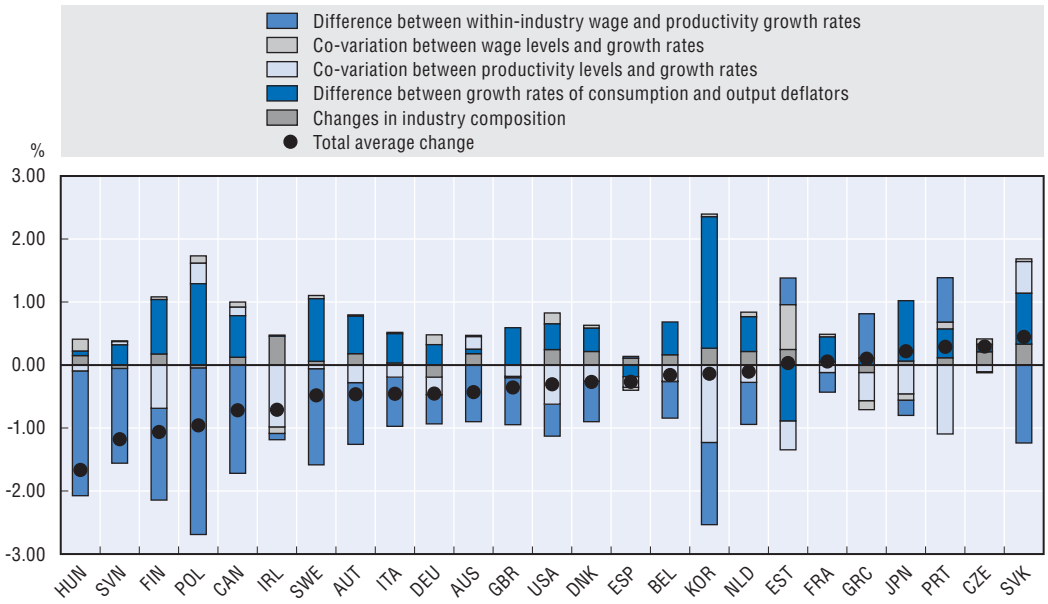
growth of real hourly wages with respect to hourly productivity and their respective deflators (see Box 3.3). In Figure 3.6, percentage changes in the labour share are decomposed into the contributions of: *i)* within-industry average growth differences between real wages and productivity; *ii)* the differential growth of the consumption and value-added deflators; *iii)* the reallocation across industries (towards or away from high-labour-share industries);[14] and *iv)* the correlations between *growth rates* and *levels* of real wages and productivity. The latter terms capture cross-industry convergence or divergence patterns of wages and productivity. In fact, if wages diverge – that is, larger growth rates occur in high-wage industries – aggregate wage growth will be faster and, ceteris paribus, the labour share will increase. By contrast, the converse holds for productivity.

In almost all countries, within-industries, hourly productivity grew faster than hourly wages between 1990 and 2007. Yet, in most of them, the price of domestic output – after deduction of the cost of inputs – increased less than the price of consumption goods and services, reflecting the fact that the quality of goods and services produced by the domestic business sector increased more, on average, than that of non-market services, fuel and imported goods.[15] Nevertheless, in almost all countries for which sizeable within-industry falls in the labour share were observed during the period, the growth of real wages was significantly slower than that of productivity even taking into account the dynamics of relative prices (see Figure 3.4 above).

In a few of the many countries where the labour share declined (for example Germany, the United Kingdom and, especially, the United States), the slower growth of real wages was accompanied by greater growth of the consumption deflator than that of the value-added deflators. In other words, if measured using the same deflator, wages and

Figure 3.6. **The role of real wage, productivity and prices in explaining trends in the business-sector labour share, 1990[a]-2007[b]**

Average annual contributions



Note: Extended shift-share decomposition of the percentage change of the labour share in the business sector, partitioned in 20 industries, excluding agriculture, mining, fuel manufacturing and real estate. The wage of the self-employed is imputed assuming that in each industry their hourly wage is the same as for the average employee of the industry.

a) Germany and Hungary: 1992; Czech Republic, Estonia, Greece, Poland, Slovak Republic and Slovenia: 1995.

b) Canada: 2004; Korea and Portugal: 2005; Japan, Poland and Slovenia: 2006.

Source: OECD calculations based on EUKLEMS.

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productivity grew at the same rate, on average, in these countries. Yet, the labour share contracted in these countries because labour productivity grew faster in high-productivity industries while real wage growth was approximately homogeneous across industries (see Box 3.3). For example, in the case of the United States, productivity grew faster in financial intermediation and electrical and optical equipment, which have high nominal output per hour worked, while productivity growth was particularly small in construction. But wage growth differences were, on average, less striking. Even more impressive, this pattern of divergence of industry-level productivities explains the entire drop of the aggregate labour share in Ireland, where the average difference between within-industry growth rates of productivity and wages was small, on average, but the distribution of productivity growth was highly skewed towards industries with above-average productivity levels.

The deteriorating position of the low-educated

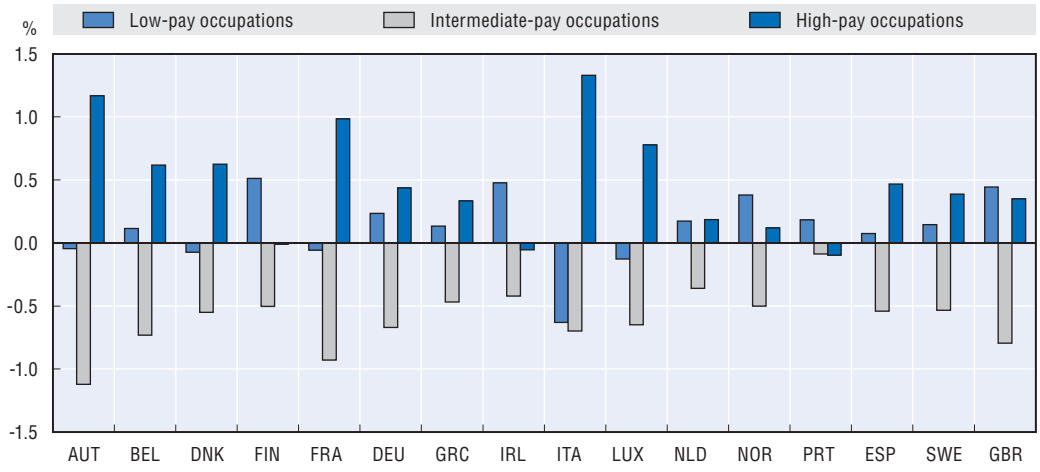
There is a substantial literature (starting with Berman *et al.*, 1994) which suggests that skill-biased technological change has been exerting a downwards pressure on the the share of the low-skilled in labour compensation during the past three to four decades. Recent contributions to this literature, however, qualify this statement and suggest that in some countries there has been a long-term polarisation of labour demand in terms of the skill content of jobs (see Autor *et al.*, 2003; Spitz-Oener, 2006; Goos and Manning, 2007, for

extensive evidence concerning the United States, Germany and the United Kingdom, respectively). True, the share of the high-skilled in labour compensation, and notably that of managers and administrators as well as IT engineers, has increased enormously. But at the bottom of the wage distribution, employment has increased significantly in a number of elementary occupations, typically in low-paid jobs with precarious contracts in many countries. As a consequence, the share of those in low-skilled jobs has increased as well, while labour demand for medium-skilled occupations has fallen almost everywhere.

This tendency to job polarisation appears to have become the rule in most OECD countries at least since 1990. Figure 3.7 shows, on the basis of cross-country comparable data, that in most European countries employment in occupations that are typically characterised by an intermediate level of pay declined sharply between the early 1990s and the mid-2000s while, in other occupations, the number of jobs increased or decreased only mildly.[16] A plausible explanation for job polarisation that is advanced in this literature is that technical change has essentially been biased towards non-routine tasks, while machines have increasingly replaced humans in routine tasks, whether manual or cognitive. Yet, another explanation for increasing job opportunities in low-skill jobs has to do with increasing labour market participation of women and the consequent substitution of low-skill market services for home production (Mazzolari and Ragusa, 2012).

Figure 3.7. **Changes in the shares of different occupational groups in total hours worked, 1993-2006**

Annual percentage rates



Note: Annual growth of total hours worked in different occupations. Occupational groups are defined on the basis of their ranking in terms of average wages in each country over the period.

Source: Goos, M., A. Manning and A. Salomons (2009), "Job Polarization in Europe", *American Economic Review: Papers and Proceedings*, Vol. 99, No. 2, pp. 58-63.

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One striking fact that emerges from Figure 3.7 is that the growth rate of low-paying occupations was positive in most countries and even greater than that of high-paying occupations in almost one-third of the countries (Finland, Ireland, Norway, Portugal and the United Kingdom). Does this imply that the relative labour market position of the low-educated improved, at least in these countries? This conclusion would be hasty. As shown by Goos and Manning (2007), educational requirements in expanding low-pay occupations have increased substantially more than in any other occupation. Therefore, workers in

these jobs tend to be increasingly over-qualified, so that, more frequently, workers with intermediate level of educational attainment end up displacing workers with lower skills.

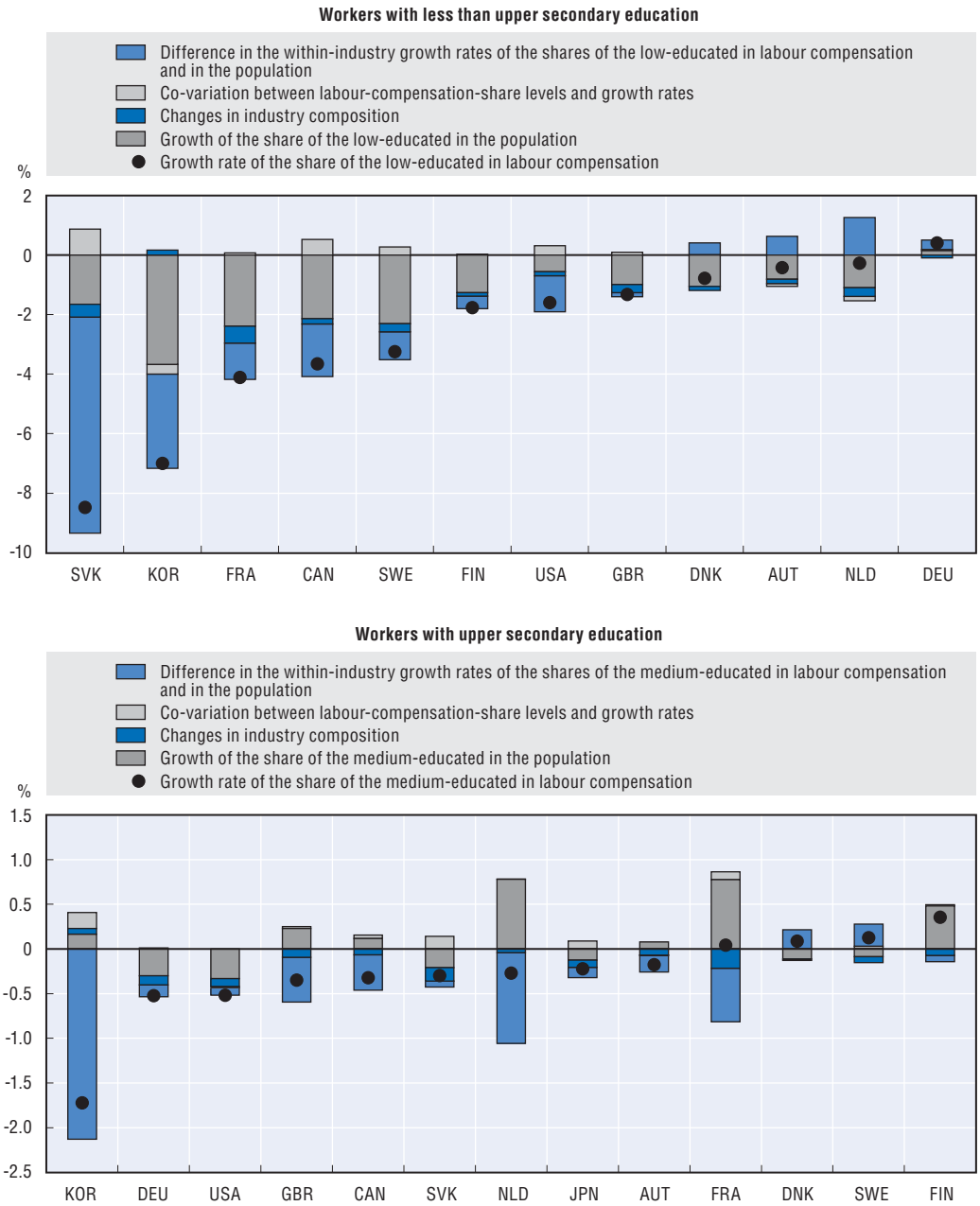
For the 13 countries for which comparable data are available, the share of those with low education[17] in total labour compensation slumped between mid-1990s and mid-2000s (Figure 3.8). In that period, the share of the low-educated fell by 2.7% per year, while that of those with upper secondary education was approximately stable (decreasing on average by 0.3% per year).[18] These changes are only partially matched by changes in the educational attainment of the working-age population.[19] On average, the share of the low-educated in the working-age population fell by 1.5% per year while that of those with an intermediate level of education remained about stable. Particularly large declines in the share of the low-educated in labour compensation occurred in the Slovak Republic and Korea, with a fall greater than the decrease of the fraction of the low-educated in the population by 6.5% and 3% per year, respectively. By contrast, in countries with a dual-track vocational education system (Austria, Denmark, Germany and the Netherlands in Figure 3.8, see Mühlemann *et al.*, 2009), the share of those with less than upper secondary education in labour compensation declined by less than the share of the same group in the working-age population. This confirms that at a level below upper secondary education, in these countries the vocational system delivers outcomes in terms of skill acquisition that appear to better equip workers to take advantage of changes in labour demand.

A shift-share analysis similar to that discussed in Box 3.3 (see OECD, 2012, for details on the methodology) reveals that the worsening position of the low-educated is due to the within-industry dynamics of their share in labour compensation (Figure 3.8).[20] This is true even if account is taken for the evolution of the share of each group in the population, except for countries with a dual track system and the United Kingdom. Reallocation across industries also contributes to explain the worsening position of the low-educated, but its role is modest except in France where reallocation away from industries with a high share of low-educated workers explains about 30% of the contraction that is not accounted for by changes in the population. Taken together, these pieces of evidence suggest that the labour market position of those with little or no education worsened significantly in OECD countries in the past two decades. This occurred in spite of job polarisation, because of greater competition for expanding low-skilled jobs from those with middle levels of educational attainment.

Overall, the evidence presented in this section suggests that reallocation across industries in recent decades has played only a minor role in explaining both the evolution of the labour share and its distribution. By contrast, the within-industry dynamics of the labour share appear to have been the main driver of aggregate trends in the past two decades. It is therefore essential to identify the determinants of within-industry variations in order to understand the evolution of the aggregate labour share. This is the objective of the next sections.

Figure 3.8. **Decomposition of changes in the shares of different education groups in total compensation, 1997[a]-2004[b]**

Average annual contributions



Note: Extended shift-share decomposition of the percentage change of the share of different education groups in total compensation in the business sector, partitioned in 20 industries, excluding agriculture, mining, fuel manufacturing and real estate.

a) Slovak Republic: 1999.

b) Japan: 2001; France and Netherlands: 2002; Austria, Denmark and United Kingdom: 2003; Korea: 2005.

Source: OECD calculations based on EUKLEMS.

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2. What explains the within-industry decline of the labour share?

Many different explanations have been suggested in the academic literature to account for the decline in the labour share in OECD countries. These explanations include an increase in capital intensity, enhancement of skill-biased capital-augmenting technical change, deregulation and privatisation, particularly in network industries, increased globalisation, and the decline of workers' bargaining power, whether related or not to the evolution of collective bargaining institutions and labour market policies and regulations. These different factors are analysed in this chapter within a unified framework adopting an industry-level approach (see Box 3.4).[21] More precisely, this section quantifies the role of a number of factors that have been considered by the literature but are only indirectly related to labour market institutions. It discusses the main economic and quantitative implications of the econometric estimates concerning these factors, while the detailed estimates, sample definition and robustness checks are presented in Bassanini and Manfredi (2012). By contrast, the next sections focus more directly on the role of institutions and policies, and in particular on the role of the evolution of collective bargaining systems and workers' bargaining power.

The role of capital intensity and technical change

Recent academic work on the decline of the labour share has pointed to the role of capital accumulation and capital-augmenting technical change (see *e.g.* Bentolila and Saint-Paul, 2003; Arpaia *et al.*, 2009; Driver and Muñoz-Bugarin, 2010; Raurich *et al.*, 2012; Hutchinson and Persyn, 2012). Under standard assumptions, an increase in capital intensity – that is in the ratio of the volume of capital services to value added – is accompanied by an increase in both the capital-to-labour ratio and marginal productivity of labour, which results in greater wages. If capital and labour are complementary,[22] the more than proportional rise in wages will compensate the decline in the ratio of labour to value added and the wage share will increase. However if capital and labour tend to be substitutable, the relative decline of labour with respect to value added will not be compensated by a sufficient increase in the wage rate. While, under standard assumptions and conditional on capital intensity, labour-augmenting technical change has no impact on the labour share,[23] capital-augmenting technical change would have the same effect as increasing capital accumulation, thereby reinforcing the effect of capital intensity (see Box 3.4). As a consequence, if capital and labour are gross substitutes and technical change is, at least partially, capital-augmenting, both growth in capital intensity and technical change will depress the labour share. Bentolila and Saint-Paul (2003) confirm this theoretical conjecture by estimating a specification derived from a standard production function, where a residual measure of efficiency – total factor productivity (TFP) – is included as a (noisy) proxy of technical change.[24] They find that the growth in capital intensity and TFP have both a negative impact on the labour share[25] and jointly over-predict its aggregate fall in OECD countries between 1972 and 1993.

The estimation of a similar model undertaken for this chapter (see Box 3.4) for a different period (1980-2007) yields qualitatively similar results, except for the somewhat smaller estimated effects (Figure 3.9). The estimates suggests that an increase of capital intensity by 1% would induce a within-industry reduction in the labour share by about 0.05 percentage points, while an increase in TFP by 1% would result in a contraction of the labour share of 0.14 percentage points. Taken at face value, they imply that between 1990

Box 3.4. **Explaining within-industry changes in the labour share: Econometric methodology**

In a standard aggregative model of the economy – that is a model with an aggregate production function with labour and capital as factors of production, where technical change can be decomposed into neutral, labour-augmenting and capital-augmenting technical change, if labour and product markets are competitive, the labour share depends uniquely on capital intensity, the evolution of capital-augmenting technical change and the elasticity of substitution between capital and labour (*e.g.* Acemoglu, 2003; Bentolila and Saint-Paul, 2003). For instance, in the case of a CES production function, we have, in a closed economy, that the aggregate labour share *F* can be expressed as:

$$F_t = 1 - \alpha(B_t k_t)^{\theta}$$

where *B* represents capital-augmenting technical change, *k* the capital intensity – that is in the ratio of the volume of capital services to value added – and θ a function of the elasticity of substitution ρ (ρ = 1 – 1/θ), which is negative when capital and labour are gross substitutes. It can be easily shown, by using a first-order Taylor approximation of log(1 – *x*), that this leads to:

$$F_t \cong Const + \theta \log B_t + \theta \log k_t \qquad [1]$$

that can be used as a baseline to estimate the determinants of the labour share at the aggregate or industry-level.* Interestingly, [1] implies that the more capital is a gross substitute for labour, the more the increase in capital intensity and capital-augmenting technical change will depress the labour share. If labour and product markets are not competitive, then international and domestic product market competition and labour market institutions (including workers' bargaining power) will act as shifters of this relationship. In addition, cyclical fluctuations in union bargaining power, due for example to unemployment fluctuations, can cause additional departures from this relationship. This implies that the role of these factors can in principle be studied by including additional covariates.

The analysis of this chapter is based on [1], augmented by other explanatory and confounding factors and estimated using industry-level data. However, while *k* is observable in [1], although with some error, *B* is not. Nonetheless, as suggested by Bentolila and Saint-Paul (2003), one can approximate *B* with a measure of total or multi-factor productivity (TFP), which is supposed to capture both capital and labour-augmenting technical change. Indeed, insofar as the latter has no theoretical impact on *F* conditional on *k*, the estimated coefficient of TFP should give an indication of the direction and intensity of the impact of *B*. Obviously, the larger the proportion of neutral or labour-augmenting technical change, the less adequate is TFP as a proxy of capital augmenting technical change, and therefore the smaller its coefficient in estimated versions of [1]. The key difficulty with this approach, however, is that *k* and *B* are endogenous. For example, in the model of directed technical change by Acemoglu (2003), the incentives to innovate depend on the share of income paid to each factor, so that a decrease in the labour share encourages capital-augmenting technological change. Since, as in a standard growth model, there is no obvious instrument for *k* and *B*, a natural solution, adopted in this chapter when possible, is using GMM estimators (or lagged long differences when GMMs are not feasible). However, insofar as dynamic GMM estimators can be highly inefficient (and therefore strongly biased in small and medium samples), comparisons with standard fixed effects models are key, and fixed-effect estimates are preferred for inference when endogeneity biases appears negligible. Indeed, the consistency between different estimates is reassuring on their reliability. Finally, in order to keep the model tractable with GMM estimators, in order to control for all aggregate variables, country-by-time effects are systematically taken into account by de-meaning all variables, thereby avoiding the inclusion of a large number of co-variates in the specification. This implies that the estimated specifications would take the form (see Bassanini and Manfredi, 2012, for more details):

$$F_{ijt} = \beta \log TFP_{ijt} + \gamma \log k_{ijt} + X_{ijt}\delta + \eta_{ij} + \eta_{it} + \varepsilon \qquad [2]$$

where TFP stands for a measure of level TFP whose changes can act as a noisy proxy for capital-augmenting technical change, *X* is a vector of other labour-share determinants and controls that vary by country *i*, industry *j* and time *t*, η are country-by-industry and country-by-time effects, ε is an error term and other

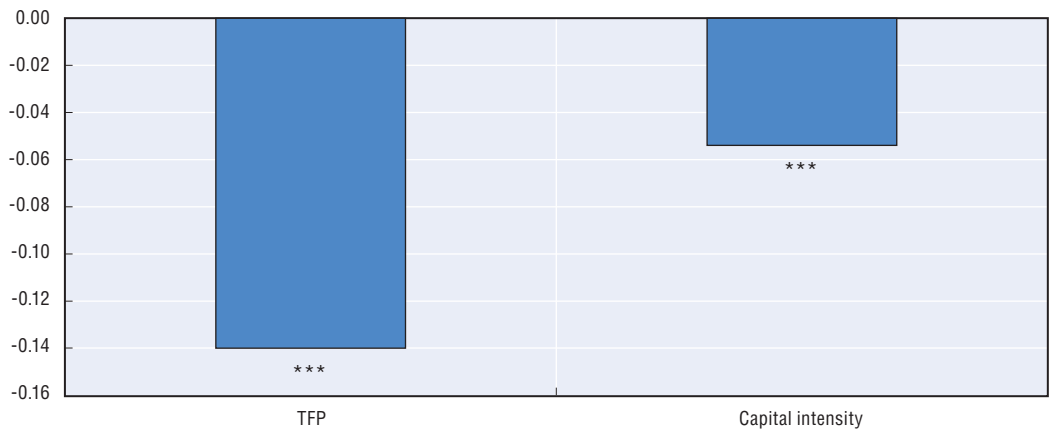
Box 3.4. **Explaining within-industry changes in the labour share: Econometric methodology** *(cont.)*

Greek letters are parameters to be estimated. The disadvantage of this approach is that it does not allow identifying the effect of aggregate variables such as collective bargaining institutions, which in Section 3 are therefore explored in a more qualitative way. By contrast, following the approach pioneered by OECD (2007), the impact of certain labour market policies and institutions, such as dismissal regulations and the level of the minimum wage, can be analysed by looking at differences in their effects between industries in which they are more likely to be binding and other industries. For example, the industries where employment protection legislation concerning permanent contracts is more likely to be binding will be those where firms typically need to lay off workers to restructure their operations in response to changes in technologies or product demand and where, therefore, high firing costs are likely to slow the pace of reallocation of resources. In these industries, one can expect that dismissal regulations have the greatest impact on productivity and wages and, therefore, the wage share. By contrast, in industries where firms can restructure through internal adjustments or by relying on natural attrition of staff, changes in employment protection for open-ended contracts can be expected to have little impact. Similarly, the effect of the minimum wage can be identified by assuming that changes in minimum wages have a greater impact on wages and productivity in industries that are more heavily reliant on low-wage labour.

* [1] can be considered a reduced-form approximation if the aggregate production function is not CES.

Figure 3.9. **TFP growth, capital accumulation and within-industry decline of the labour share**

Estimated percentage-point impact on the labour share of one-per cent increases in selected variables



Note: Estimated within-industry impact of a one-percent increase in total factor productivity (TFP) and the ratio of capital services to value added (capital intensity). ***: significant at the 1% level.

Source: Bassanini, A. and T. Manfredi (2012), "Capital's Grabbing Hand? A Cross-country/Cross-industry Analysis of the Decline of the Labour Share", OECD Social, Employment and Migration Working Paper, OECD Publishing, Paris, forthcoming.

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and 2007 the increase in capital intensity and TFP in OECD countries accounted, on average, for as much as 80% of the within-industry change of the labour share.[26]

What explains this strong negative effect of technical change and capital accumulation on the labour share? One possible explanation has to do with the diffusion of information and communication technologies (ICTs) as a new general-purpose technology, which has created opportunities for unprecedented advances in innovation and invention of new (increasingly cheaper) capital goods and production processes. This

has boosted productivity but also allowed extensive automation of production and high substitution between capital and labour (see *e.g.* Greenwood and Jovanovic, 1999; Brynjolfsson and McAfee, 2011). This conclusion is confirmed by Arpaia *et al.* (2009) who, using a structural model, suggest that in the past twenty years, technical change was in fact *capital-augmenting*.[27] By contrast, they argue that the high degree of substitution between capital and labour was in fact due to high substitution between capital and low-skilled labour and complementarity between capital and high-skilled labour. Other scholars have advanced the possibility that, within this context, technical change could be *labour-replacing*, in the sense that technological progress takes the form of machines replacing tasks previously performed by labour. In turn, this would especially reduce job opportunities for low-educated workers and, in practice, dampen the aggregate productivity of low-skilled labour (see Zeira, 1998; Arthur, 2011; and the survey on machine-replacing-labour technical change in Acemoglu, 2011).

Both interpretations appear consistent with two additional pieces of empirical evidence. First, labour productivity growth has been associated with increases in the share of those with tertiary education in labour compensation and contractions of the shares of those with lower levels of education, and particularly those with less than upper secondary education. Second, decomposing further this association, ICT capital accumulation appears to have had an especially negative effect on the lowest educated, while TFP growth has affected particularly the share of those with intermediate education (see Bassanini and Manfredi, 2012). These two results taken together suggest that, in the period under analysis, technical change embodied in ICT capital was strongly biased *against* the low-educated, while disembodied technical change was strongly biased *towards* high-skilled labour. While the first result is fully consistent with the literature on skill-biased technical change, one possible explanation of the latter is that disembodied technical progress reflects embodiment in intangible capital (entrepreneurship, output from R&D departments, better management, high-performing human resource practices) – that is improvements that are essentially incorporated in highly-qualified personnel.

From a policy perspective, however, it is not possible with the available data to assess whether the negative relationship between technical progress and changes in the labour share is a long-lasting relationship or is specific to the past decades and will progressively disappear when the process of diffusion of ICT-based technologies slows down. On the one hand, the standard view in the theory of economic growth is that, in the long-run, capital and labour are complements and technical change augments the factor that cannot be accumulated (that is labour, see *e.g.* Acemoglu, 2002). Hence, capital-augmenting technical change and substitutability between capital and labour are likely to be only a temporary phenomenon due to the rapid diffusion of ICT-based technologies and related innovations. By contrast, within this view, to the extent that the skilled labour supply increases faster, thereby increasing incentives to create capital goods complementary to skilled labour, technical change would remain biased against the unskilled. On the other hand, a more pessimistic view considers that ICT has changed the nature of technological advances, making them more rapid but incorporated in machines whose main purpose is to replace jobs previously held by certain categories of workers (Brynjolfsson and McAfee, 2011; Acemoglu, 2011). If this were the case, most workers, and in particular the least educated, would find themselves in a "race against the machine", thereby increasingly worsening their relative position.

The impact of international competition, offshoring and foreign direct investment

Another key factor shaping the OECD economies over the past decades has been the closer integration of labour and product markets. Technological changes and the progressive removal of cross-border restrictions to trade and capital flows have made it possible to locate production sites for both goods and services further away from the markets for final demand, while international migration has globalised labour supply. By allowing a fuller exploitation of economies of scale and comparative advantage through greater exports, this process of trade expansion has provided a boost to economic growth in OECD countries (see *e.g.* Felbermayr *et al.*, 2011). Nevertheless, increased international competition has also raised competitive pressure on businesses located in the richest countries and reinforced the need for them to contain labour costs. Firms and activities unable to remain competitive either downsize and, eventually, disappear or delocalise to countries where relative labour costs appear more favourable. In the face of these pressures, workers might accept to contain their wage claims to save their jobs, while companies might increase the automation of the production process to remain competitive. There is indeed much evidence that increased import penetration from, and offshoring of production to, developing countries is associated with greater sensitivity of domestic labour demand to labour costs (see *e.g.* OECD, 2007; Hijzen and Swaim; 2010; Bloom *et al.*, 2011).[28]

The available but scant aggregate evidence suggests that declines in import prices have contributed to dampen the labour share in high-income countries, due to the fact that imports come increasingly from developing countries, and goods imported from these countries are typically labour intensive (*e.g.* Harrison, 2002; IMF, 2007).[29] To the extent that barriers to outward capital movements are limited and have decreased over time, greater import penetration is also likely to reflect delocalisation of production abroad while still serving domestic demand. For example ILO (2011) finds that the ratio of foreign assets and liabilities to GDP is negatively associated with the labour share in aggregate cross-country regressions. Aggregate analyses, however, do not allow taking into account potential endogeneity and controlling for a full list of confounding factors.[30] In this context, industry-level estimations performed for this chapter do not suggest any association between rising competition in domestic markets due to an increase in the penetration of goods produced abroad and the within-industry decline of the labour share. In fact, this decline is not found to be correlated with either changes in the relative price of imports with respect to domestic products or with measures of import penetration and trade exposure – defined as the sum of import penetration and export orientation[31] – even when the possible endogeneity of the latter is taken into account (see Bassanini and Manfredi, 2012, for detailed estimates).[32]

One needs to remain cautious, nevertheless, about drawing conclusions from these findings. Indeed, these estimates are likely to represent a lower bound on the true effect of fiercer import competition, if that effect is negative. In fact, competition for rich-country markets from firms producing in countries with low labour cost is likely to be particularly strong for domestic businesses whose production activity is intensive in low-skilled labour. If competition from low-cost foreign producers drives these businesses out of the market or forces them to relocate abroad, the industry will become relatively more skill-intensive. Conditional on capital intensity, this will probably push up the labour share in these industries, insofar as skilled labour's bargaining power is larger – as suggested by the empirical evidence (*e.g.* Cahuc *et al.*, 2006).[33] By contrast, unskilled workers will be partially

re-employed in other industries – less affected by import competition – thereby driving down the labour share of these industries. As a consequence, to the extent that estimated effects are identified through cross-industry comparisons of within-industry differences, the estimated effects will tend to be upward-biased. Unfortunately, reliable data by skills or educational attainment are not available at a sufficiently disaggregated level to test for this hypothesis. Nonetheless, estimations performed for this chapter show that, in advanced economies, greater import penetration prompts reallocation of resources away from affected industries and towards either other domestic industries or countries with lower labour costs (see Bassanini and Manfredi, 2012). The finding that industry downsizing is more important in industries with the largest increase in import penetration is consistent with the above argument and, therefore, provides some confirmation of the likely upward-bias of within-industry estimates of the impact of import competition on the labour share.

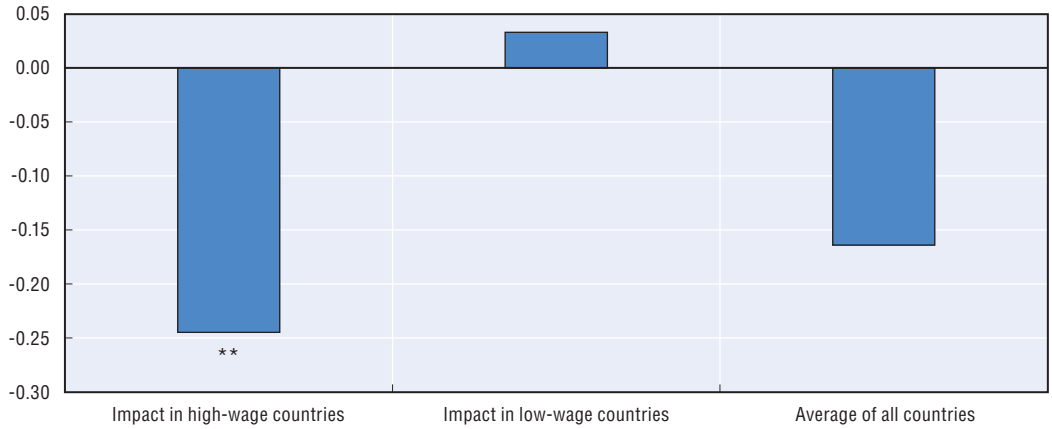
In addition, the growth of import penetration appears more important in industries that are typically characterised by a high labour share (see Bassanini and Manfredi, 2012). This implies that larger trade-induced reallocation away from these industries resulted in a fall in the share of these industries in aggregate value added, thereby contributing to a decline in the aggregate labour share. For example, between 1990 and 2007 the rise in the penetration of manufacturing imports and the induced pattern of cross-industry reallocation are estimated to explain a decline in the labour share in manufacturing of 0.1 percentage points, on average, in countries with real wages above one half of the US level (high-wage countries hereafter). This corresponds to about 3% of the whole contraction of the manufacturing labour share in high-wage countries. The effect is statistically significant although small.

Competition from abroad for the market of finished goods is not the only channel through which globalisation can exert influences on the labour share, however. For example, domestic companies can outsource abroad part of the production chain or threaten to do so – particularly the production of unskilled-labour-intensive intermediate inputs – as a strategy to cope with labour-cost pressures. Aggregate evidence suggests that offshoring of intermediate stages of production is negatively related to the labour share (Jaumotte and Tytell, 2007). At the industry-level, OECD (2007) and Hijzen and Swaim (2010) find that intra-industry offshoring (defined as the ratio of imported same-industry inputs to domestic output) is negatively associated with labour demand and positively associated with its wage elasticity. Industry-level estimates performed for this chapter suggests that delocalisation of intermediate stages of the production process, as measured by intra-industry offshoring (defined as in OECD, 2007), exerts a small but significant downward pressure on the wage bill relative to value added (Figure 3.10). Between 1995 and 2005, intra-industry offshoring in manufacturing increased by 0.8 percentage points on average in the high-wage countries for which data are available. This change is estimated to have induced the labour share to decline by about 0.2 percentage points. As the average decline in the labour share in these industries was about 3 percentage points during this period, this implies that the rise in intra-industry offshoring can account for about 7% of the within-industry reduction in the labour share.[34]

If delocalisation of production activities abroad exerts a downward pressure on wages and labour demand, one could expect that inward foreign direct investment (FDI) would have a more positive impact on workers. Indeed, foreign takeovers are usually estimated to raise wage growth in the acquired firm. Moreover, there is evidence in the literature of wage spillovers from FDI to other domestic firms, even if less so for unskilled workers in

Figure 3.10. **Intra-industry offshoring and within-industry decline of the labour share**

Estimated percentage-point impact on the labour share of a 1-percentage-point increase in intra-industry offshoring



Note: Estimated within-industry impact of a 1-percentage-point increase in the ratio of imported same-industry inputs to domestic output. High-wage countries are those where the average gross hourly wage in purchasing power parity was equal or above 50% of the US wage rate in 1997. ** significant at the 5% level.

Source: Bassanini, A. and T. Manfredi (2012), "Capital's Grabbing Hand? A Cross-country/Cross-industry Analysis of the Decline of the Labour Share", *OECD Social, Employment and Migration Working Paper*, OECD Publishing, Paris, forthcoming.

StatLink http://dx.doi.org/10.1787/888932651674

rich countries. However, in these countries, the impact of takeovers on employment levels in the acquired firm tends to be negative and there is evidence that job destruction is greater in subsidiaries that are geographically far from headquarters (see *e.g.* Driffield and Girma, 2003; OECD, 2008b; Landier *et al.*, 2009; Hijzen *et al.*, 2010). The estimations performed for this chapter suggest that regulations making inward FDI more difficult tend to depress the labour share, even though the statistical significance of the effect depends on the countries included in the sample (see Bassanini and Manfredi, 2012, for detailed results).[35] This implies that deregulation of inward FDI might have helped to contain the decline in the labour share, although more research is needed on this issue.[36]

Overall, globalisation plays a role in driving the contraction of the labour share. There is some evidence that within-industry increases in offshoring tend to reduce the labour share, while competition from foreign firms in domestic markets tends to induce structural changes that have an adverse effect on the aggregate labour share.[37] The sum of these two effects accounts for at least 10% of the observed decline of the fraction of national income appropriated by workers.

The influence of rising product market competition and privatisations

Pro-competition regulatory reform, involving privatisation of state-owned enterprises (SOEs) and reduction in barriers to entry was one of the most extensive policy-induced institutional changes that OECD countries experienced in the past decades. As these reforms have been shown to have a clear positive impact on growth and negative impact on prices (*e.g.* Nicoletti and Scarpetta, 2003), workers benefited from these reforms in the form of higher real wages.

Economic theory suggests, however, that the wage share is larger in government-controlled companies. There is indeed evidence that entrenched managers with low profit

stakes (and weak budget constraints) care about their company's level of employment either to minimise conflicts or to increase their influence on the society (see *e.g.* Bertrand and Mullainathan, 2003; Atanassov and Kim, 2009). Moreover, one can expect managers of SOEs to be influenced by political pressures to maintain inefficiently high employment levels (*e.g.* Bertrand *et al.*, 2005). In both cases this leads to a larger wage share in SOEs, so that their privatisation is likely to result in a decline of the labour share (Azmat *et al.*, 2012).[38]

By contrast, in a standard theoretical model with homogenous firms and workers, deregulation of barriers to firm entry is expected to increase the labour share (see for example Blanchard and Giavazzi, 2003). This is because greater competition in the product markets decreases the rents accruing to the firm and, thus, the surplus that is shared with the workers. However, price mark-ups are typically estimated to be greater than wage mark-ups – that is the wedge between the bargained wage and the reservation wage, so that the nominal wage bill should decrease less than nominal value added and the wage share should increase.

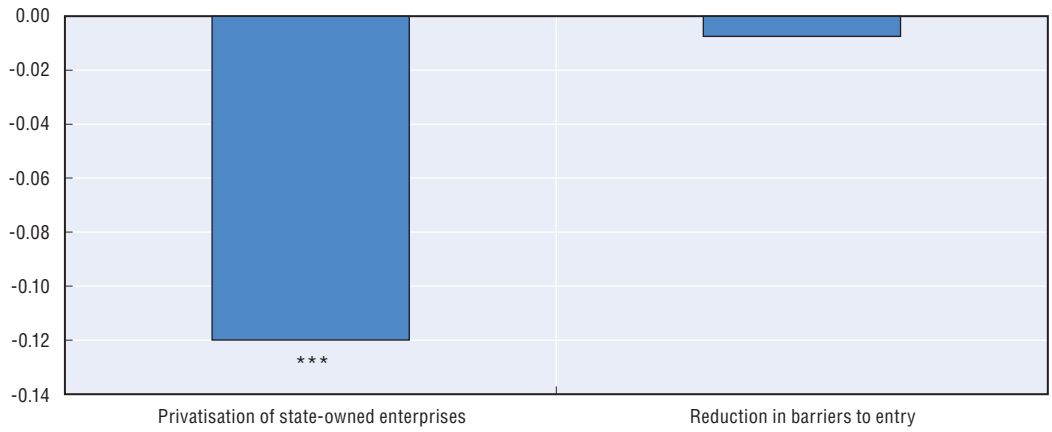
The impact of barriers to entry and public ownership on the labour share is analysed empirically in this chapter, by looking at the relationship among these three variables on a sample of network industries (such as energy, transport and communications) in 25 OECD countries between 1980 and 2007 (see Bassanini and Manfredi, 2012, for detailed estimation results). The restriction of the analysis to these industries is due to data availability, since long time series of OECD indicators on industry-specific regulations and public ownership are available only for these industries. Nevertheless, they are industries that were characterised by strict regulations and much government control in the 1980s and early 1990s, but underwent massive pro-competitive liberalisation thereafter (see Wölfl *et al.*, 2009). They also are among the industries that experienced the greatest fall in the labour share (see Figure 3.5). Therefore, these industries provide an interesting "testing ground" to study the effect of deregulation and privatisation on the labour share.

The empirical analysis that has been carried out for the chapter confirms the theoretical prediction that public ownership is positively associated with the labour share (Figure 3.11).[39] Taking the most reliable estimates at face value, the results suggest that the average reduction in public ownership observed in network industries between 1990 and 2007 in OECD countries (about 0.1 points per year of the corresponding OECD indicator) yielded a within-industry decline in the labour share by about 0.12 percentage points per year.[40] Put it another way, these findings suggest that the large-scale privatisation of network industries can explain about 33% of the decline of the labour share in these industries.

How relevant is the impact of privatisations on the evolution of the labour share for the whole business sector? Network industries accounted on average for 15% of the business sector's value added in this period. Therefore, assuming that privatisations did not contribute to the decline of the labour share outside network industries, the measured reduction of public ownership in these industries already accounts for about 5% of the contraction of the labour share in the whole business sector. What is more, in many countries, sales of government shares in SOEs was not confined to network industries.[41] Therefore, even if one needs to be cautious about extending the findings for network industries to other industries, the true impact of privatisations on the decline in the business sector's labour share may well have been larger than what the figures above

Figure 3.11. **Privatisation, reduction in entry barriers and within-industry decline of the labour share**

Estimated percentage-point impact on the labour share of a 0.1-point reduction of selected regulation indicators



Note: Estimated within-industry impact of privatisations and reductions in entry barriers in network industries on the labour share, based on estimated coefficients for the period 1990-2007. Changes in OECD indicators of public ownership and anti-competitive regulations are used to measure regulatory reform. These indicators vary between 0 (no public ownership or anti-competitive regulations) and 6 (maximum stringency of regulations). The average annual reduction in public ownership and barriers to entry were 0.10 and 0.22 points per year, respectively, in 1990-2007. ***: significant at the 1% level.

Source: Bassanini, A. and T. Manfredi (2012), "Capital's Grabbing Hand? A Cross-country/Cross-industry Analysis of the Decline of the Labour Share", *OECD Social, Employment and Migration Working Paper*, OECD Publishing, Paris, forthcoming.

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imply. However, to the extent that the scope of further shrinking of government control is now limited, as a result of earlier privatisations, one would expect some slowdown in the pace of the decline in the aggregate labour share through this channel.

By contrast, the empirical estimates do not suggest any impact of lessening barriers to entry on the labour share (see Figure 3.11). This might suggest that increased product market competition was accompanied by offsetting reductions in the bargaining power of the average worker. The evidence on the decline of workers' bargaining power will be discussed in the next section.

3. Collective bargaining, workers' bargaining power and the labour share

Due to the lack of appropriate data describing collective bargaining arrangements at the industry level, the type of quantitative analysis carried out in the previous sections cannot be undertaken on the role of collective bargaining institutions for the decline of the labour share. This section will thus provide a more qualitative assessment on this issue. First, have collective bargaining institutions evolved in a way that reduces the bargaining power of workers and thus their stake in rent-sharing with employers? The rationale for the formation of unions arises from the asymmetry in contracting between individual workers and employers regarding both access to information and bargaining power. Labour laws provide framework conditions for collective bargaining to emerge so as to rebalance the bargaining power between employers and workers. Hence, all else equal, compared with a situation in which only individual contracts prevail, the more developed collective bargaining is, the higher the bargaining power of workers is likely to be.[42] Second, are there other factors, not directly related to collective bargaining institutions, which have

weakened the bargaining power of workers and thus affected the outcomes in terms of rent-sharing?

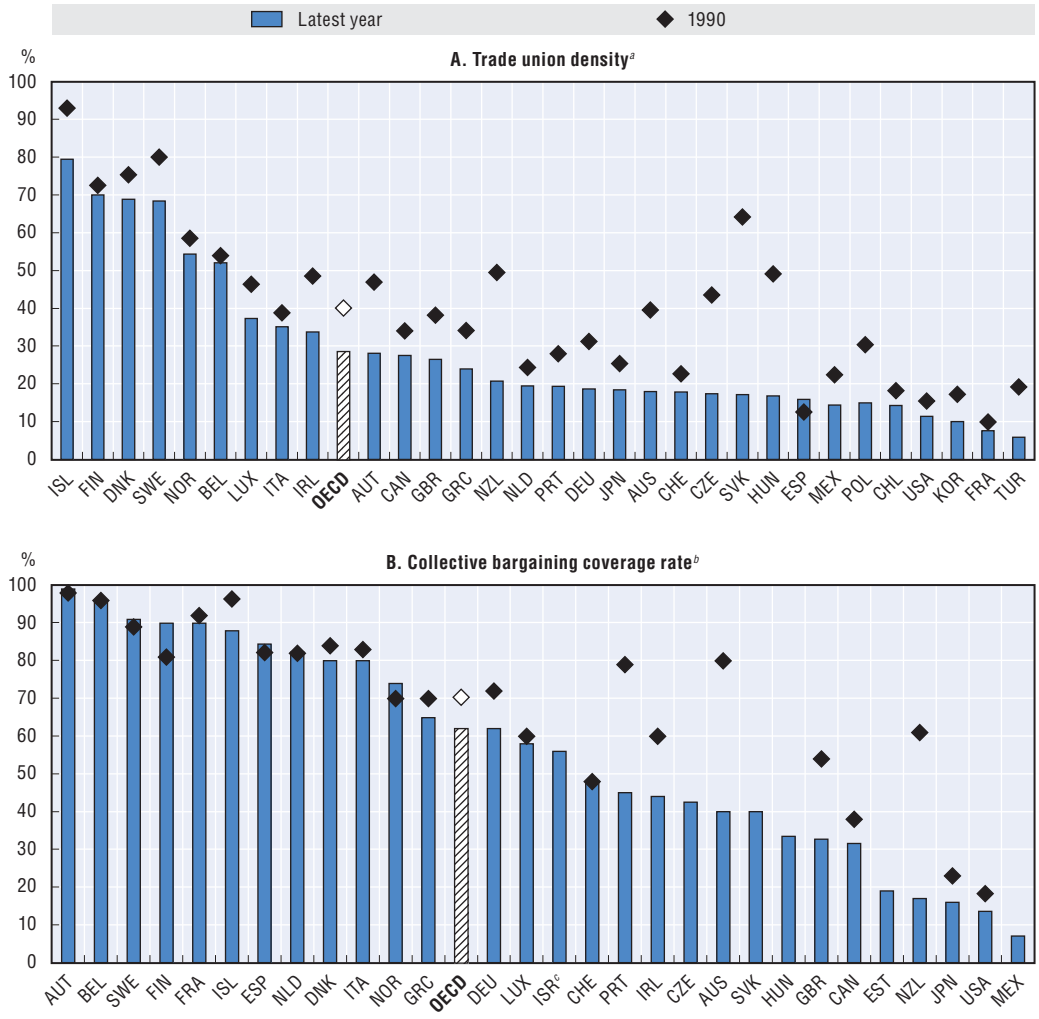
Trends in trade union density and bargaining coverage

Trade union density and collective bargaining coverage rates are two standard indicators used to assess the bargaining power of workers and the extent of collective bargaining. Trends in trade union density in OECD countries since 1990 are rather clear cut, as declines are observed in all OECD countries but Spain (Figure 3.12, Panel A). However, the size of the decline varies significantly across countries. The decline was relatively limited in Belgium, Finland, France, Italy, the Netherlands, and Norway. Overall, though, a majority of countries experienced significant declines. The largest reductions occurred in Central and Eastern European countries, which have had to build up new structures of industrial relations in a short period of time after the transition to a market economy, but also in Australia and New Zealand, which experienced significant deregulation of collective labour relations on which governments partially reversed course more recently (Hayter *et al.*, 2011). Only in the Nordic countries and Belgium did more than half of all employees belong to a trade union at the end of the 2000s.

Apart from possible institutional reforms, a number of structural factors may also have contributed to the decline of trade union density to various extents across countries. High unemployment, relatively persistent in some countries, makes it more difficult for unions both to recruit members and to successfully conduct collective actions. Structural changes involving a reduction in the share of manufacturing and an increase in the share of services in total employment eroded the traditional membership base of trade unions in many countries (Hayter *et al.*, 2011). Privatisation of public utilities/infrastructure and services tended to have the same effect, as trade union membership is generally significantly higher in the public than in the private sector.[43] The increase in the use of part-time, temporary and contract workers in most countries also changed the nature of employment relations in a way that makes it more difficult for trade unions to recruit members. Temporary workers are much less likely to be union members than those on open-ended contracts, and their organisation and representation in collective bargaining remain very difficult. Sub-contracted workers have no possibility to negotiate with those with the real power over the contracting process, and thus have no interest to join the establishment's trade unions (Wills, 2009).

In the case of collective bargaining coverage, the evolution since 1990 is more contrasted across countries (Figure 3.12, Panel B), and in many cases does not reflect the relatively strong decline observed in trade union membership (Figure 3.13). This is because the percentage of workers covered by collective agreements itself depends on the interaction between various institutions: the level of trade-union membership; the bargaining structure – in particular the importance of multi-employer bargaining and the density of employers' associations when multi-employer bargaining prevails; and the role the state plays in promoting collective bargaining and extending collective agreements to employers and employees not affiliated with the bargaining parties. Countries with widespread multi-employer bargaining and/or legal extension mechanisms, such as Austria, Belgium, France, Finland, Germany, Italy and Spain, all have relatively high collective bargaining coverage rates which are significantly higher than their union density rates. Changes in these various institutional features also explain the evolution of collective bargaining coverage rates.

Figure 3.12. **Trade union density and collective bargaining coverage, 1990 and latest year**



Note: Trade union density refers to the number of trade union members as a percentage of wage and salary earners; the collective bargaining coverage rate refers to the number of workers covered by wage bargaining agreements as a proportion of all wage and salary earners (employees excluded from bargaining rights have been removed from both the numerator and denominator).

a) Data for the latest year refer to 2010 for: Australia, Austria, Canada, Estonia, Finland, Germany, Italy, Japan, Mexico, New Zealand, Poland, Portugal, Sweden, United Kingdom and United States; 2009 for Belgium, Chile, Czech Republic, Denmark, Ireland, Norway, Spain, Switzerland and Turkey; and 2008 for France, Greece, Hungary Luxembourg and Slovak Republic. Data refer to 1995 instead of 1990 for Czech Republic and Hungary; 1992 for Mexico; and 1994 for Slovak Republic.

b) Data for the latest year refer to 2009 for Austria, Canada, Czech Republic, Estonia, Germany, Italy, Portugal, Slovak Republic, United Kingdom and United States; 2008 for Belgium, France, Greece, Iceland, Ireland, Japan, Luxembourg, Mexico, Netherland, Norway, Spain, Sweden and Switzerland; and 2007 for Australia, Denmark, Finland and New Zealand. Data refer to 1991 instead of 1990 for Sweden and Switzerland; 1989 for Iceland. As data for Czech Republic, Hungary, Israel, Mexico and Slovak Republic are available for the latest year only, these countries are not included in the OECD average.

c) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Database on Trade Unions; Visser, J. (2011), "Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts", 1960-2010(ICTWSS), Version 3.0, May, *www.uva-aias.net/208*.

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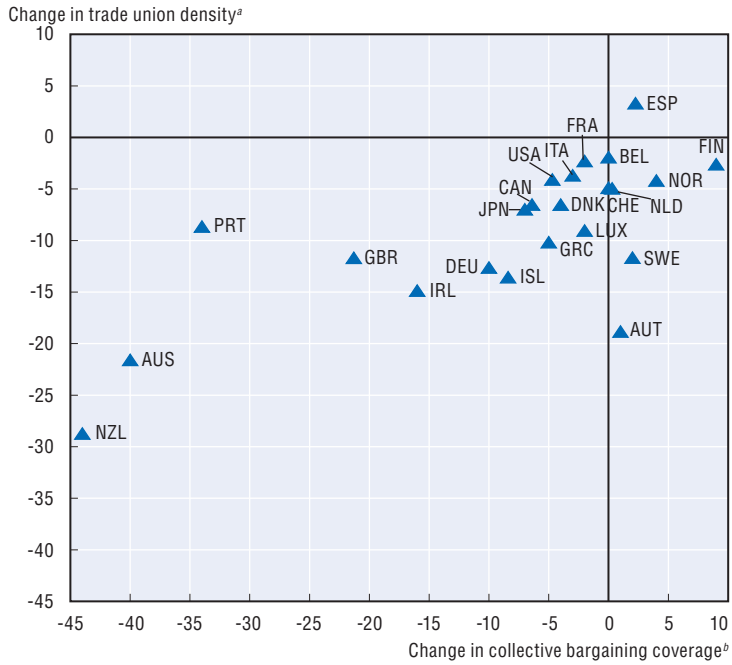
Figure 3.13. **Change in trade union density and in collective bargaining coverage, 1990 and latest year**[a]

Percentage points



a) See Figure 3.12 for precise information on years.

Source: OECD Database on Trade Unions; Visser, J. (2011), "Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts", 1960-2010(ICTWSS), Version 3.0, May, *www.uva-aias.net/208*.

StatLink http://dx.doi.org/10.1787/888932651731

Since 1990, collective bargaining coverage has increased in two Nordic countries, Finland and Norway, and has been relatively stable in Sweden and in a majority of continental European countries (Figure 3.12, Panel B). In Austria and Sweden, these developments are in striking contrast with the strong decline in trade union density experienced over the same period (Figure 3.13). In all of these countries, multi-employer bargaining arrangements prevail and union and/or employees' rights to bargain are firmly established, and these institutional features experienced no significant change in that period.

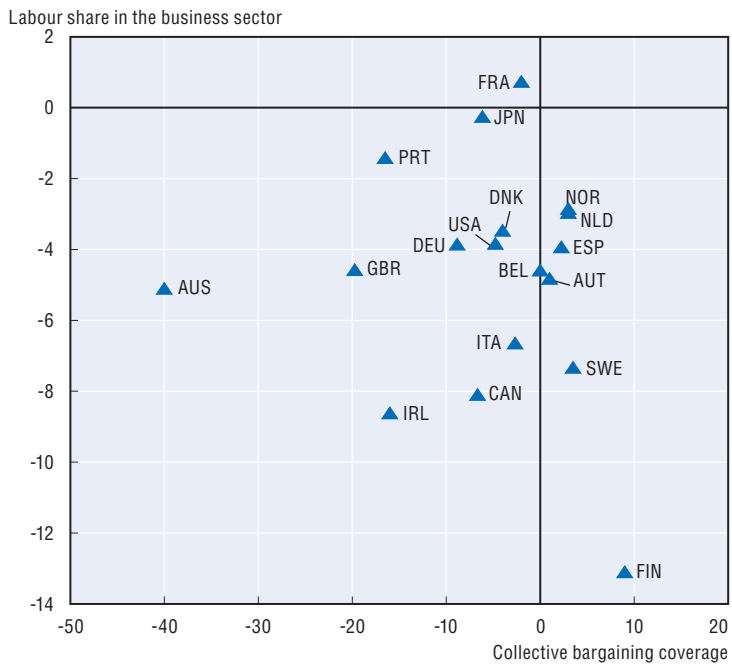
On the other hand, many countries experienced significant declines in collective bargaining coverage over that same period. The strongest declines were observed in countries which implemented radical reforms of their collective bargaining framework, such as New Zealand and Australia, where the systems switched from being dominated by sectoral agreements or awards – in the case of Australia – with common extension to one dominated by firm-level bargaining. The strong decline in collective bargaining coverage in the United Kingdom also results from a series of reforms which started in the 1980s and continued in the early 1990s.[44] In Portugal, the huge drop in collective bargaining coverage is due to the coming into force of a new labour code in 2009, which significantly increased the bargaining power of employers and facilitated their withdrawal from existing collective agreements (EIRO, 2011). Second, declines were also observed in countries in which collective bargaining at the firm level prevails and is applicable only to sites where unions have established their representativeness. Logically, these declines were in line with those

observed in trade union density, relatively small in the United States, Canada and Japan, and larger in Ireland.[45] Finally, collective bargaining coverage also decreased significantly in Germany, where multi-employer bargaining prevails and no reform of collective bargaining institutions was passed. This is due to the combination of an increasing share of employees under non-standard employment contracts such as mini-jobs, a reduction in the participation of employers to employers' associations, and a continuous decline in the extension of sectoral collective agreements.[46]

To sum up, although collective bargaining coverage remains high in Nordic countries as well as in some continental European countries, there is a trend towards a decreasing number of workers covered by collective agreements in the OECD, and thus an increasing share of employees whose wage is fixed at the individual level. Nevertheless, a straightforward comparison of the trends in labour share in the business sector and those in collective bargaining coverage shows no clear correlation (Figure 3.14). Notably, some of the largest decreases in the business-sector labour share occurred in countries where collective bargaining coverage increased or decreased only slightly, such as Finland, Sweden and Italy.

Figure 3.14. **Evolution of labour shares and bargaining coverage**

Change between 1990-92 and 2005-07 in percentage points



Source: OECD calculations based on OECD STAN, EUKLEMS and Visser, J. (2011), "Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts", 1960-2010(ICTWSS), Version 3.0, May, *www.uva-aias.net/208*.

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The evolution of bargaining structures

One reason for the absence of correlation between the labour share and the collective bargaining coverage, which can be taken as measuring the "quantity" of bargaining, may lie in the "quality" of bargaining and its evolution. Has the structure of collective bargaining

institutions evolved in a way that contributed to diminish the share of value-added accruing to workers between 1990 and the years preceding the global financial crisis?

As noted above, Australia and New Zealand are the only countries which experienced radical change in their type of collective bargaining systems since 1990. As a result, Australia and New Zealand now form part of the group of countries in which collective bargaining is very *decentralised*, taking place mostly at the firm/establishment level, and where there is no or little attempt or possibility to co-ordinate wage negotiations among the various actors. This group also includes Canada, Japan, Korea, Poland, the United Kingdom and the United States (Table 3.1). Sectoral agreements still exist in these countries, but mostly in the public sector or in a few specific business sectors. In the other OECD countries, changes in collective bargaining systems have taken place mostly within the existing institutions, through incremental reforms or changes, with various degrees of government involvement.

Central agreements to overcome co-ordination failures

In a number of European countries where sectoral bargaining was playing a major role, governments pushed in the 1990s for the (re-)emergence of agreements at the national level. The implementation of such agreements is very much linked to the European economic integration process. Although economic internationalisation and financial liberalisation was taking place in many countries and regions, market integration was particularly deep within the European Union, bringing workers in the various countries into competition with each other. In addition, monetary integration ruled out external adjustment via the exchange rate to compensate for losses in national competitiveness, and, starting from 1999 for EMU countries, the use of monetary policy instruments to adjust to asymmetric shocks. As a result, the burden of adjustment to economic imbalances and shocks shifted increasingly onto the labour market.[47] Some European countries had centralised and/or co-ordinated collective bargaining systems allowing for high responsiveness of wages to shocks. For example, in Austria, Denmark and Germany, wage negotiations in the exporting sectors set the rule for the rest of the economy, a form of co-ordination called pattern bargaining. In other European countries, however, the co-ordination of collective bargaining was not developed enough for wages to adjust in face of high inflation or external deficits, or high unemployment, thus prompting government intervention to reach agreements at the central level (Hassel, 2006; Traxler and Brandl, 2010).

Overall, since 1990, nine European countries implemented central-level collective agreements with wage provisions.[48] Wage restraints were sometimes obtained in these pacts in exchange for tax cuts (Finland and Ireland) and/or improved benefits to the workers (Finland). In Belgium, the Netherlands and Sweden, agreements were reached under the threat of government intervention to freeze wages in case of failure to agree. Compared with previous agreements at the central level, these agreements took less and less the form of formal contracts enforceable by law and relied more on guidelines and targets. By and large, they achieved their aim of shifting workers' wage expectations and delivering wage moderation.[49]

Increased decentralisation to provide more flexibility

At the same time, in most OECD countries, the role played by collective negotiations at the firm/establishment level has increased, leading to a significant decentralisation of collective bargaining systems since 1990. While the process often started in the 1980s for

Table 3.1. **Structure of collective bargaining systems: Bargaining levels and co-ordination**

Second half of the 2000s, before the crisis

Dominant level*		Central (1)	Sectoral (2)	Extension	Derogations	Local (3)	Change in dominant level since 1990	Co-ordination type	
Central	BEL	xxx	xx	xxx	x	x		xxx	State-imposed
	IRL[b]	xxx	x	x	xx	xx		xxx	Tripartite
Sectoral	AUT		xxx	x		x		xxx	Pattern bargaining
	DEU		xxx	x	xxx	xx		xxx	Pattern bargaining
	ESP	x	xxx	xx	x	x		xxx	Inter-associational
	FIN		xxx	xx	x	x	2 → 1, 1 → 2, 3	xx	Intra-associational
	GRC[b]	x**	xxx	xx		x		xx	Inter-associational
	ITA[b]		xxx		x	x		xxx	Inter-associational
	NLD		xxx	xx	xx	x		xxx	Pattern bargaining
	NOR	x	xxx	x	x	x		xxx	Pattern bargaining
	PRT		xxx	xx		x		xx	Intra-associational
Company/establishement	AUS[a]		x			xxx	2 → 3		
	CAN		x			xxx			
	CZE		xx	xx		xxx		x	Intra-associational
	DNK		xx			xxx	2 → 3	xx	Pattern bargaining
	FRA	x	xx	xxx	x	xxx	2 → 3	x	Intra-associational
	GBR		x			xxx			
	HUN	x	x	x	x	xxx		x	Tripartite
	JPN					xxx		x	Intra-associational
	KOR		x			xxx			
	POL	x**	x		x	xxx			
	SVK		xx	x		xxx	1, 2 → 3	x	Intra-associational
	SWE		xx			xxx	2 → 3	xx	Pattern bargaining
	USA		x			xxx			

Note: x = low ; xx = medium ; xxx = high, qualifying the relative importance for bargaining levels and the importance of co-ordination. The table should be read by line, as it describes the relative importance of the various bargaining levels and of the extension of, and derogation from, sectoral agreements within each countries. It is not meant to provide an assessment of the relative importance of a given bargaining level across countries.

* 1 refers to central level of bargaining, 2 to sectoral and 3 to local.

** In Greece and Poland, the central level of bargaining serves only to fix the minimum wage.

a) Collective bargaining systems incurred significant changes in Greece, Ireland and Italy after the start of the global financial crisis; they are not included here as they are not relevant for the period under study in this chapter.

b) In Australia, "awards" passed by Fair Work Australia prevail at the sectoral level, which are not real collective "agreement", as trade union and employer organisations are simply consulted. They apply to the whole sector. Company level agreements cannot be overall less favourable than sectoral ones, but the various elements can be traded against one another (*e.g.* wage for working time).

Source: OECD Secretariat based on various sources detailed in Annex 3.A1.

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bargaining over working-time reduction, it has since extended to matters of pay. Three main factors can explain this tendency towards decentralisation (Visser, 2004). First, due to increased international competition, the ability of sectoral agreements to promote the creation of a level-playing field and the prevention of low-wage competition – traditionally considered as one of their main advantage for both social partners – has vanished. Second, changes in the nature of firms' activities such as the growing importance of non-price developments favours company-specific human resource management, while the diversification of business activities leads to a growing mismatch between sectoral agreements and the activities of the firm. Finally, stronger international competition increases the importance for firms to be able to react speedily to wage competition from foreign firms, a flexibility that firm-level agreements allow (see Section 2 above).

Decentralisation has taken place at different degrees across countries and in different ways. The various institutions have mutated to increase flexibility and autonomy in the determination of pay and conditions at the firm level, but this has not necessarily meant institutional convergence (Howell and Colins Givan, 2011). The depth of decentralisation depends on the coverage of firm-level agreements as well as on the extent to which they matter in the determination of wages compared with higher level collective agreements. In Denmark, France and Sweden, firm-level agreements can now be considered to be the dominant level in wage determination (Table 3.1).[50] The decentralisation process has been organised by social partners in Denmark and Sweden, while it was initiated by the state in France.[51] In the other European countries, while it did not imply a change in the dominant level of bargaining, firm-level bargaining also gained in importance in wage-setting.

Decentralisation has taken place in three main ways: *i)* sectoral agreements increasingly include derogation clauses, allowing firm-level agreements to depart from sectoral agreements in specified cases; *ii)* instead of setting standard wage increases, sectoral agreements increasingly provide a framework for firm-level agreements; and *iii)* the share of variable pay, by definition negotiated at the firm level, has been growing.

In general, firms covered by a multi-employer agreement should observe what is called the favourability principle, meaning that firm level agreements should be more favourable to employees than higher-level agreements. While this principle still held in 2009 in the Czech Republic, Finland, Greece, Portugal and the Slovak Republic, in the other European countries, the inclusion of derogation clauses in sectoral/central level collective agreements had become increasingly frequent, especially in Germany, Ireland and Spain. Derogation clauses are of two types: "hardship" or "inability-to-pay" clauses allow temporary deviations from these agreements for firms facing economic difficulties; more general "opening" or "opt-out" clauses can be invoked either by firms that cannot afford to meet the general standard, especially small and medium-sized enterprises, or by firms facing threats to future competitiveness and possible relocations of investment and production sites (Visser, 2004). Actual use of these clauses has increased significantly in Germany.[52] Although to a lesser extent, the "inability-to-pay" clause included in the central agreements since 2003 has also been regularly used in Ireland (van Klaveren, 2011). In other countries, the use of derogation clauses remains more limited (Table 3.1).

Besides derogation clauses, the substance of sectoral agreements has also been changed in many cases, leaving much more room for firm-level bargaining on wages. In some cases, the determination of average wage increases still takes place at the sectoral level, but the decision on how to distribute wage increases among employees is left to firm-level bargaining. This is a very common practice in Denmark and Sweden, and exists in Austria, Belgium, Germany and Italy. In the Netherlands, a large share of employees is covered by sectoral agreements which leave the possibility to make choices at the firm level between pay and working time. In the Czech Republic, Denmark, and the Slovak Republic, industry-level agreements increasingly tend to set minima while actual wage increases for the rest of the pay scale are negotiated at the firm level. This is also occasionally the case in Spain.

What is the evidence concerning the possible effects of decentralisation on the labour share? A few empirical studies have looked at the effects of different bargaining regimes on wages, wage dispersion and rent-sharing, using matched employer-employee datasets. Exploiting transitions from one regime to another, wages negotiated at the firm level are

found to be higher in Denmark than those negotiated under sectoral agreements, but also significantly more dispersed, and returns to education significantly higher (Dahl *et al.*, 2011). Decentralisation of wage bargaining would thus be one factor explaining the deterioration of low-skilled workers position noted above. Gürtzgen (2010) and Rusinek and Rycx (2008) looking respectively at Germany and Belgium, find that wages are much more responsive to firm-level profits under firm-level bargaining than under sectoral bargaining, and that rent-sharing is thus higher.

Overall, centralisation and co-ordination of wage bargaining appear to have contributed to contain wage increases when needed on the one hand, while decentralisation seems to have increased the link between wages and local performance on the other. However, the links between wage-bargaining regimes and their evolution and changes in labour share across countries are not straightforward. Countries where the labour share has dropped significantly, for example, had different bargaining regimes (centralised in Finland and Ireland; already fully decentralised in Canada, increasingly decentralised in Sweden; centralised and intermediate but co-ordinated in Italy).

A shift of bargaining power away from workers

One reason explaining why trends in the labour share cannot be strictly related to the type of collective bargaining structure nor to its evolution may be that other factors, in particular the increased domestic and international competitive pressures (see Section 2) and domestic and international financial liberalisation and the associated change in corporate management – often referred to as financialisation, in addition to having driven the changes in collective bargaining institutions described above, also reduced the bargaining power of workers across the board (*i.e.* whatever the collective bargaining regime). From a theoretical point of view, all other things equal, this reduction in workers' bargaining power implies a reduction in the labour share (see *e.g.* Bentolila and Saint-Paul, 2003).

While they tend to reduce the size of the rent that employers and workers share, by increasing the substitutability of employees, globalisation and increased international competition also affect bargaining in the workplace and thus the rent-sharing between employers and workers (see *e.g.* Rodrik, 1997): imports increase the substitution between domestic and foreign workers and hence reduce workers' bargaining power, while the increasingly credible threat to relocate activities abroad improves the position of employers in bargaining. In other words, the increasing mobility of goods and capital shifts the threat points in the bargaining game over the dwindling economic rents. A number of empirical studies using firm-level data confirm that imports and offshoring have tended to deteriorate the bargaining power of workers over the past two decades (Box 3.5).

The deregulation of product or service markets, often combined in practice with privatisation, is also affecting the bargaining power of workers. Privatisation shifts the objective function of the managers from one that includes the employment level to one that concentrates exclusively on profits. When combined with increased product market competition, privatisation reduces the size of the rent as well as the bargaining power of workers in the sector. It usually leads to a two-tier system with a relatively stable bargaining structure at the level of the incumbent firm and a rather decentralised and fragmented bargaining structure with low bargaining coverage at the level of the new competitors (Schulten *et al.*, 2008; see Box 3.5 for some empirical evidence).

Box 3.5. **Empirical evidence on globalisation and increased competition and workers' bargaining power**

Globalisation

Looking at Belgium, France, Germany, Italy and the United-Kingdom over the 1990s, Dumont *et al.* (2005) find that increased globalisation with both low-wage and high-wage countries, as measured by imports and the importance of foreign affiliates, has reduced the bargaining power of workers. Boulhol *et al.* (2011) find that imports from developed countries have significantly contributed to their estimated decrease in both mark-ups and workers' bargaining power in the United Kingdom. Abraham *et al.* (2009) also find that import competition put significant pressure on mark ups and bargaining power in Belgium, but especially when coming from low-wage countries. However, considering workers as a homogeneous group might be misleading, because, as consistent with the findings of Section 1 above, low-skilled workers can be expected to be most affected by globalisation. Dumont *et al.* (2012) indeed find that the bargaining power of low-skilled workers in Belgium declined in the 2000s, while that of high-skilled workers increased. They establish a significant negative effect of import competition from low wage countries as well as from offshoring on the bargaining power of low-skilled workers.

Increased competition and privatisation

Brown *et al.* (2008) find that both trade union density and collective bargaining coverage declined more rapidly in UK privatised industries than in the rest of the private sector in the two decades following privatisation. There is also evidence that, when firm-entry increases due to lifting entry barriers, workers in entrant firms are typically less unionised and have less bargaining power than workers with long job tenure in incumbent firms (*e.g.* Hirsch, 1988; Bamber *et al.*, 2009). Therefore, labour reallocation from the former to the latter might lead to a reduction of average bargaining power. This is confirmed empirically by Böckerman and Maliranta (2012). This mechanism may explain why no correlation is observed between reduction in entry barriers and the labour share in network industries (see Section 2 above): the reduction in bargaining power offsets the positive effect of the decline in mark-ups.

Although less studied, the role that financialisation played in lowering workers bargaining power should not be understated either. In addition to boosting the financial sector, the deregulation of formerly highly regulated financial markets has also had important consequences for the non-financial economy, mainly through the spread of the doctrine of shareholder value maximisation as a principle of corporate governance. Grounded in agency theory, the spread of the shareholder value thesis in the 1970s and 1980s in the United States and United Kingdom and the 1990s in most other OECD countries was fostered in practice by the rise of institutional investors[53] that benefited from the lifting of legal restrictions that previously limited the extent to which corporate equity could be added to their portfolios (Duenhaupt, 2011). The threat of takeover together with the development of stock options has aligned the interests of managers to that of shareholders. The time horizon of investors is generally short,[54] and that of managers has consequently shortened. Combined with the fact that acquisitions, such as for example leverage buyouts (LBOs),[55] are often financed with a significant amount of borrowed money, this forces cost reduction and divestments or outsourcing to be able to reduce debt while at the same time generating high short-term profits. Firms thus switch from the principle of "retain and invest" – retain earned income and employees and re-invest in

physical and human capital – to a "downsize and distribute" strategy which is significantly weakening workers' bargaining power (Lazonick and O'Sullivan, 2000).[56]

Social and labour market reforms, sometimes passed without the consent of or discussion with social partners, might also have contributed to a weakening of workers' bargaining power. Increased competitiveness constraints have led a number of countries to facilitate the use of temporary-agency work or fixed-term contracts, and allow the development of atypical contracts, such as for example mini-jobs in Germany. In those cases where it contributes to increased labour market dualism, the development of such non-standard contract is likely to reduce workers' bargaining power. At the same time, reforms in the welfare state to reduce access and levels of welfare benefits for those out of work (unemployment benefits, disability, social assistance, etc.), are likely to have lowered the reservation wage of workers.

All these pressures on workers bargaining power are likely to have contributed to the decline in trade union membership and collective bargaining coverage, and appear to have induced trade unions to change their objective function. Instead of negotiating wage increases reflecting productivity trends or the preservation of real pay or pay equality, trade unions may increasingly be internalising the competitive constraints and the likely effects of their wage claims on employment.[57] This is likely to be true in sectoral/national negotiations, and perhaps even more so at the local level, where concession bargaining has become frequent.[58]

Increased competitive pressures and the associated decline in workers bargaining power may also help explain the trend towards decentralisation. As a result of the changing economic and political context, many of the benefits which employers traditionally perceived multi-employer bargaining to have offered may no longer appear as valuable. Employers are likely to feel less need of the protection from trade union pressure to shape the wage-effort bargain within the workplace. Besides, lower levels of unionisation and of bargaining coverage reduce the capacity of centralised agreements to deliver benefits in terms of the internalisation of external wage costs, thus probably reducing their interest for social partners (Visser, 2005). In turn, increased decentralisation may weaken the bargaining power of trade unions if it makes it more difficult for trade unions to hold centralised union structures together.[59] The fact that low-skilled workers have lost bargaining power while high-skilled workers may have improved theirs also increases the difficulty for trade unions to hold a united group of workers together and keep promoting wage compression (Acemoglu *et al.*, 2001).

As the importance of collective bargaining institutions and their protective power for workers has eroded, legal protections for workers have become increasingly important. In many countries, such as Ireland, the UK, Denmark and Sweden, the dominant source of regulation has shifted away from voluntary self-regulation at the collective level to formal individual rights enforced through the courts (Visser, 2005). The combination of increased competitive pressures – especially on the low-skilled – and the decreasing role of collective bargaining institutions can also explain the introduction or increase of a legislated minimum wage in some OECD countries, such as Australia, Ireland, New Zealand and the United Kingdom. However, although statutory rights may be helpful for trade unions as they establish a floor on which collective bargaining can build, there are probably limits to what they can achieve in terms of protecting workers while preserving efficiency (see below).

4. Minimum wages, employment protection and the labour share

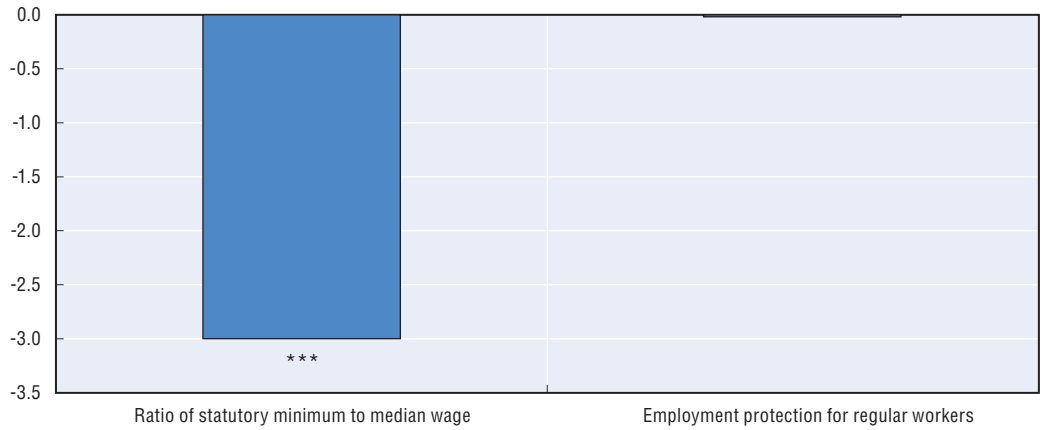
Evidence presented in the previous sections suggests that in the two decades preceding the crisis, rapid TFP growth and capital-deepening, reflecting capital-augmenting technical change, were among the most important factors explaining the within-industry decline of the labour share. Beyond collective bargaining institutions, discussed in the previous section, other labour market policies have affected the relative price of capital and labour, and are therefore also likely to have played a role in this process. For example, in the past ten years, the ratio of statutory minimum to median wages has increased by about 2 percentage points, in countries where statutory minima exist. In addition, in a number of countries where collective bargaining coverage declined significantly, statutory minimum wages were implemented or significantly raised as a means to fight in-work poverty (*e.g.* Australia, Ireland, New Zealand and the United Kingdom; see the previous section). In turn, however, this might have induced firms to overinvest in labour-saving innovation (see *e.g.* Boone, 2000), thereby lowering the labour share.

Exploiting the likely cross-industry differences in the impact of the minimum wage on productivity and wages, it is possible to identify the impact of statutory minimum wages on the labour share, using the same methodological framework adopted in Section 2 (see Box 3.4). Estimations performed for this chapter suggest that, in the short-run, an increase in the statutory minimum wage relative to median wages is reflected in a substantive increase of prices, wages and nominal value added, so that no significant short-run effect on the labour share is estimated. However, in the long-run, the evidence suggests that firms react by increasing efficiency levels and productivity beyond the wage increase, leading to a decline in the labour share (Figure 3.15; and OECD, 2012, for detailed methodology and estimates). These patterns are likely to result from the fact that higher minimum wages tend to induce greater investment in capital-augmenting innovations – prompted by the need to offset the increase in labour costs, as suggested by Boone (2000) – and firm-sponsored training – whose benefits, in imperfect labour markets, cannot be easily reaped by trained workers. In fact, by compressing the lower tail of the wage distribution without necessarily affecting individual productivity prior to training, minimum wages could increase employers' incentive to pay for training as they can reap the difference between productivity and wage growth after training (see *e.g.* Acemoglu and Pischke, 1999 and 2003; Arulampalam *et al.*, 2004). Once the infrastructure for training is in place – that is, the fixed cost has been paid, it is likely to be used also for workers paid above the minimum, in particular if the quality of training can only be imperfectly signalled and valued on the external labour market, so that most of the productivity gains from training accrue to the firm.

The overall quantitative impact of minimum-wage increases on the wage share is, however, small. Taking estimates at face value, raising the ratio of the statutory minimum to median wages by 10 percentage points – roughly corresponding to one standard deviation of the cross-country distribution, would result in a 3% contraction of the labour share in the average industry in the subsequent ten years (Figure 3.15). But a 10-percentage point increase of this ratio is very large in historical perspective. Between 2000 and 2010, the ratio of minimum to median wages increased by barely 2 percentage points, on average, in the countries where statutory minima exist. The estimates would therefore imply that the cumulated impact of these increases has been responsible for an average contraction of the labour share by 0.2 percentage points.[60] Nevertheless, these results

Figure 3.15. **Minimum wages, employment protection and the labour share**

Estimated percentage impact on the labour share of the average industry of an increase of selected policy indicators by one standard deviation, cumulated effect over the subsequent ten years



Note: Estimated effect of an increase in the ratio of the statutory minimum to median wage by 10 percentage points and an increase in the indicator of stringency of employment protection for regular workers by 1 point. Both effects are cumulated over a ten-year period following the policy change. Effects are derived from difference-in-difference estimates and are computed, in the case of the minimum wage,with reference to an industry with an average incidence of low-educated labour (in the United Kingdom before the introduction of the statutory minimum wage) and, in the case of employment protection, with reference to an industry with an average rate of dismissals (in the United States) for the minimum wage and employment protection, respectively. *** significant at the 1% level.

Source: OECD (2012), "Labour Losing to Capital" – supporting material for Chapter 3 of the 2012 *OECD Employment Outlook*, OECD Publishing, Paris, available online at *www.oecd.org/employment/outlook*.

StatLink http://dx.doi.org/10.1787/888932651769

suggest that large increases in the minimum wage might have the unexpected effect of reducing the fraction of national income that is appropriated by the *average worker*, even though the position of the lowest paid might improve.

Employment protection regulations can also affect the labour share. Indeed, stringent dismissal regulations might worsen the employer's bargaining position, thereby improving bargaining outcomes for incumbent workers. There is clear evidence in the literature that employment protection for regular workers negatively affects productivity growth (see *e.g.* Autor *et al.*, 2007; Bassanini *et al.*, 2009). By contrast, evidence concerning the impact on wages is more mixed.[61] The possible difference between the effects of dismissal regulations on productivity and wages suggests that their reform might have a negative impact on the labour share. However, there is little research on this issue. The main exception is Checchi and Garcia-Peñalosa (2008), who estimate a standard aggregate cross-country/time-series model for OECD countries, and find no impact of employment protection on the labour share controlling for other institutions.

Following standard approaches in the literature, likely differences in the impact of firing restrictions across industries with different propensities to adjust on the external labour market can be used for identification of the effects of dismissal restrictions within the same industry-level approach used throughout this chapter (see Box 3.4). Estimations suggest that reforms relaxing employment protection do boost TFP growth and productivity (see OECD, 2012, for detailed results). It is also found that the impact on real wages is limited. However, the productivity effect of relaxing dismissal regulations is by and large reflected in lower growth of output prices, once adjustments for quality are made. This pattern is probably due to the fact that those industries in which dismissal regulations are more likely to be binding are downsizing manufacturing industries where

product market competition is typically high and dissipates rents arising from efficiency increases. By contrast, the impact on nominal value added growth is limited so that the overall effect on the labour share is close to zero (Figure 3.15).

Conclusions

This chapter has investigated the evolution of the labour share at the aggregate and industry level, with a special attention to the past twenty years. In most OECD countries, the labour share declined throughout this period, even though the recent economic crisis marked a temporary pause in this trend. The contraction of the labour share is common to most industries of the business sector and does not appear to be driven by structural shifts in the industry composition of the economy. However, not all workers experienced the same decline of labour compensation, measured as a fraction of national income. The wage share of top income earners increased in many countries for which data are available. At the same time, the position of the lowest educated worsened, in spite of rising employment at the bottom end of the skill ladder. In addition, those at the bottom of the earnings distribution are very unlikely to have much capital income, which reinforces the impact of this trend on the increasing dispersion of the income distribution (see OECD, 2008a, 2011a).

What explains these divergent patterns and, more generally, the decline of the labour share? The chapter shows that the pressure arising from delocalisations and increasing competition from firms producing in countries with low labour cost can account for at least 10% of the overall decline of the labour share. Privatisation of state-owned enterprises, albeit associated with significant productivity improvements, also led to a decline of the labour share. These developments are also likely to be linked to the weakening of collective bargaining institutions and of workers' bargaining power.

Labour-saving – or even labour-replacing – technical change, induced by continuous innovation in ICT-based technologies, was one of the most important forces behind the decline of the labour share. Even though the decline in the labour share was often associated with capital accumulation and stronger productivity growth, the average worker benefited from the faster economic growth induced by this process, which made average labour incomes grow in real terms, although at a less rapid pace than capital income. However, the unequal distribution of both labour and capital income growth that went hand-in-hand with the decline of the labour share suggests that these trends might jeopardise social cohesion. Moreover, to the extent that less wealthy people tend to have a higher consumption propensity, the shift of income away from low earners might also have a negative impact on aggregate demand, which might undermine the strength of the recovery.

Slowing down technical change and globalisation to achieve a more equal distribution of factor shares would not be a wise choice, however. Governments can sometimes intervene with effective industrial policies in order to modify the direction of technical change through tax incentives and subsidies. For example, Criscuolo *et al.* (2012) evaluate the UK Regional Selective Assistance programme, which was designed to co-finance labour-intensive investment projects of firms in depressed areas. According to their estimates, which take into account potential endogeneity, the programme has created many unskilled jobs in a cost-effective way with small deadweight losses. However, the scope of these interventions on a broader scale is limited insofar as they might distort

reallocation of resources and depress growth in the long-run. As a much more promising strategy on a large scale, governments can intervene by helping workers acquiring more skills in order to enable them to win the "race against the machine". For example, countries could consider policies to increase their investment in education, particularly if targeted at the rate of school drop-out and better matching skill acquisition to firm demands.

In addition, the tax and transfer system can play an important redistributive role so as to contain the reflection into household disposable income of observed increases in market income inequality without necessarily interfering with economic growth (OECD, 2011a and 2011b). The growing share of income going to top earners suggests that this group now has a greater capacity to pay taxes than before. In this context governments may wish to reassess the redistributive role of taxation to ensure that wealthier individuals contribute their fair share of the tax burden. As suggested by OECD (2011a), this re-examination should not necessarily be confined to raising marginal tax rates on income, which might not be the most effective measure to raise tax revenues but should include efforts for better tax compliance; rationalising those tax exemptions that disproportionally benefit higher income groups; and reassessing the role of taxes on all forms of property and wealth, including their transfer.

Notes

1. As prominent news media put it, "the economic pie is growing, but [...] the share of income produced in the country that is flowing to workers' bank accounts has been steadily shrinking" (*New York Times*, online edition, 2 February 2012): "pay for ordinary workers has not kept up with economic growth and rising company profits" (BBC4, Analysis, 20 February 2012), so that the general perception is that "capitalists are grabbing a rising share of national income at the expense of workers" (*The Economist*, 10 February 2005).
2. For example, *The Economist* contended just before the onset of the crisis: "Are workers getting smaller shares but larger slices? Yes" (Economic Focus, 4 April 2007).
3. The labour share is defined as the share of national income that is received by workers, be they employees or self-employed, in the form of labour compensation.
4. Three-year moving averages at the beginning and the end of the period are used to filter out short-term fluctuations.
5. See Bassanini and Manfredi (2012). This halt of the labour share's decline during 2008-09 is likely to be temporary, however. In fact, there is evidence that, at least in European countries, the labour share in the non-financial business sector resumed its trend decline in 2010 (Eurostat, 2011). A decline was also observed in the United States in 2010 (Bureau of Economic Analysis, 2011).
6. Factor shares in the public sector are difficult to measure due to the often imprecise estimates of the value added of the public administration in national accounts.
7. Norway experienced a large decline in the labour share of the whole economy (see Figure 3.1), which is however largely due to the offshore expansion of the oil industry. In fact when mining and fuel are excluded, no significant variation appears (Figure 3.3).
8. The most striking example of expansion of low-wage-share industry is that of the real estate industry, which is however excluded from the analysis of the business-sector labour share presented in this chapter.
9. However, in these two countries, the magnitude of the between component is sensitive to the choice of weights (see Box 3.3 and Figure 3.6).
10. Results similar to those presented in this section are obtained if the analysis is repeated for a time window spanning from the early 1970s to the late 2000s for countries for which long time series are available.
11. This resulted in large growth of the share of this industry in business-sector output, which grew at about one quarter of a percentage point per year during that period.

12. Nevertheless, one needs to be cautious in interpreting these figures since value added is particularly difficult to measure in this industry.

13. The relative stability of the labour share in low-tech manufacturing appears to be essentially due to the large contraction of their value added and, therefore, should not be interpreted as evidence of stability of labour demand. In fact, being in addition typically labour-intensive, these industries appear to have contributed significantly to the between component of the shift-share decomposition (see also Section 2).

14. Discrepancies between Figure 3.6 and Figure 3.3 essentially come from the fact that hours worked rather than value-added shares are used in the decomposition of Figure 3.6. As a result, the large between components in Korea and Denmark disappear.

15. Nevertheless, quality-adjusted deflators for many non-market services (such as those of the public administration) are often of poor quality, and therefore the actual gap between the growth of price deflators might be smaller in many countries.

16. These statistics are based on an average ranking of occupations according to their average wage level in the countries reported in Figure 3.7. See Goos *et al.* (2009) for more details.

17. In this chapter low, medium and high education refer to less than upper secondary, upper secondary and more than upper secondary education, respectively.

18. These figures are likely to represent an underestimate of the true reductions, because compensation shares by educational level in EUKLEMS – the source of these data – are not computed on the basis of national accounts but rely on surveys, such as labour force surveys, in which wage data are typically top-coded. To the extent that the incidence of top-coding is likely to be greater for those with tertiary education, the shares of those with less than tertiary education end up being overestimated.

19. The greater the degree of substitutability of different types of workers, the greater is the effect of their relative supply in determining their shares in labour compensation. For example, if the elasticity of substitution across workers with different educational attainment is close to 1, the evolution of education shares is independent from the supply of different types of labour. However, if workers with different skills were perfectly substitutable and relative productivity were constant (with high-educated workers being more productive than low-educated workers by a constant factor), the evolution of the shares by educational attainment will simply match the trends in the relative size of each subpopulation. Adjusting labour shares by level of education for the relative supply of workers of different types represents therefore an interesting benchmark: if the share of one group falls by more than its reduction in the population, this suggests that the position of that group worsened, no matter what assumption is made on the substitutability across groups.

20. Due to data limitations, the analysis is based on a coarser partition of the business-sector.

21. The evolution of the demographic structure of the population can also affect the labour share to the extent that workers tend to be paid below their productivity when they are young. Due to lack of suitable data, this factor is left aside in the analysis. However, to the extent that the ageing of the workforce is widespread in OECD economies, this channel should rather serve to slow the decline of the labour share.

22. In terms of the aggregate production function discussed in Box 3.4, capital and labour are gross complements if their elasticity of substitution is smaller than 1 and gross substitutes if their elasticity of substitution is greater than 1.

23. For example, if returns to scale are constant and factors are remunerated at their marginal productivity, the labour share can be written as the product of the marginal productivity of labour and the amount of labour divided by output. This relationship holds also if labour is expressed in efficient units (that is employment multiplied by the parameter expressing labour-augmenting technical change). But if labour is expressed in efficiency units, the ratio of labour to output and the marginal product of labour can be written as a sole function of capital intensity. In other words, labour-augmenting technical change cannot shift the relationship between capital intensity and the labour share. It can be shown that departures from perfect competition in the labour market do not alter this conclusion (see Bentolila and Saint-Paul, 2003).

24. Their specification is close to that presented in Box 3.4, except that they do not control for any time or country-by-time effects.

25. This is consistent with capital and labour being gross substitutes as found in a number of studies based on aggregate data (see for example Masanjala and Papageorgiou, 2004). The seminal paper of Berndt (1976) also finds elasticities of substitution greater than 1, although insignificantly so.

More generally, however, estimated elasticities of substitution reported in the literature can vary from significantly smaller to significantly larger than 1 (see *e.g.* Antràs, 2004).

26. On average, the growth rates of TFP and capital intensity were 1.3% and 0.8% per year, respectively, between 1990 and 2007 in the countries for which data are available.

27. Similar conclusions are also drawn by Guscina (2006) and Hutchinson and Persyn (2012) on the basis of cross-country/time-series estimates.

28. By contrast, the impact on structural unemployment is more ambiguous (see *e.g.* Trefler, 2004; Felbermayr *et al.*, 2011).

29. Inflows of immigrants and adverse shocks on export prices are also found to have a similar effect on the labour share in the literature (*e.g.* IMF, 2007; and Jaumotte and Tytell, 2007). Due to the identification strategy adopted here, however, the contribution of these two channels cannot be estimated.

30. IMF (2007) and Jaumotte and Tytell (2007) use lagged levels of endogenous covariates as instruments. However, to the extent that the effect of covariates might occur with some lags, there are reasons to suspect that the orthogonality condition required for instrument validity might not hold with lagged levels.

31. More precisely, import penetration is defined as the ratio of imports to apparent demand and export orientation as the ratio of exports to domestic output.

32. This result is consistent with findings of OECD (2011a), which using aggregate data finds that neither rising trade integration nor financial openness had a significant impact on either wage inequality or employment trends in OECD countries. Yet, problems of potential endogeneity are not addressed in that study.

33. There is also some evidence that the bargaining power of high-skilled workers might increase with import penetration while that of the low-skilled declines (see Section 3).

34. What is more, in contrast with the previous literature, these estimates take into account the possibility of reverse causality and are robust to a number of robustness checks (see Bassanini and Manfredi, 2012, for details). Again, however, as companies are more likely to offshore unskilled segments of the production chain (see Jaumotte and Tytell, 2007; and Antonietti and Antonioli, 2011, for some evidence), these estimates should be considered a lower bound to the true effect.

35. The effect of regulation of inward FDI is insignificant in the full sample of countries, but becomes significant at the 1% level upon the exclusion of France.

36. By contrast, as the literature suggests that benefits from FDI in advanced economies tend to be captured by skilled workers (see Driffield and Girma, 2003; OECD, 2008b), deregulation of inward FDI might contribute to explain the rising share of high-educated workers in total compensation. However, given the lack of available data, this issue cannot be further investigated here.

37. Although the effect of trade and, more generally, globalisation could be indirect (occurring through the effect of globalisation on productivity), the estimated effects of trade variables, offshoring or inward FDI are not sensitive to the inclusion of TFP, capital intensity or labour productivity in the regressions, which suggests that indirect effects are minor.

38. The fact that the company's value function is positively related to both profits and employment makes the labour demand curve shift outward: for any given level of the wage, employment is larger. At the firm level this implies a larger wage share and, in equilibrium, lower wages and greater employment than the combination that would maximise profits.

39. The estimated impact of privatisation is not affected by the inclusion of TFP, capital intensity or labour productivity in the regressions, which suggests that indirect effects (occurring through the effect of privatisation on technical change and capital accumulation) are small.

40. This estimated effect of public ownership appears almost twice as large in the 1980s. But in order to derive the implications for trends in the labour share in that period, one needs to take into account that the pace of privatisations was three times less rapid. The difference in estimated effects across the two periods is probably due to the evolution of governance rules for SOEs. In particular, while it is likely that in the 1980s different objectives from profit-maximisation were pursued by SOEs managers, this is probably much less the case for firms that were still under government control in the 2000s, when SOEs were often asked to behave more like private-for-profit firms.

41. For example, in the 1990s, the privatisation of Iri – the largest Italian holding – and its subsidiaries involved a reduction of public ownership in several industries including, financial intermediation, construction, real estate and food manufacturing.

42. In the standard theoretical literature, bargaining between employer and employees is typically represented as the maximisation of a surplus function, which is defined by the firm value added, the outside options or threat points of the two parties, and a parameter of division of the rent. The latter defines the share of the rent that will accrue to the worker. If employees negotiate individually with the employer, competition among workers will drive the division parameter to zero so that the employer becomes the residual claimant and workers are simply paid their reservation wage (Farber, 1986).

43. Cross-country data on trade union density in both the private and public sector are not available. Blanchflower (2006) finds that in Canada, the United Kingdom and the United States, union membership rates were three to four times higher for public sector workers than for private sector workers in the mid-2000s. In France, the same ratio amounted to three in the first half of the 2000s (DARES, 2008).

44. The reforms greatly restricted and controlled trade union activity and thus union's ability to conduct effective collective negotiations (Davies and Freedland, 2005).

45. Collective agreements at the central level have also played an important role in wage setting in Ireland, but collective bargaining coverage relates to the firm level. The decline of trade union density and bargaining coverage is partly associated with union avoidance practices of multinationals at new sites, in a country where attracting FDI has been a priority over the period studied (Lamare *et al.,* 2009).

46. Unlike in other countries, extensions have to be approved by a committee where trade unions and employers are equally represented (Bispinck *et al.*, 2010).

47. This was reinforced by the adoption by the European Central Bank of the German model of restrictive monetary policy, targeting low inflation. See Hassel (2006) and Keune (2008).

48. This is the case of Belgium, Finland, and Ireland over the past two decades, Italy, Portugal, the Netherlands, Norway and Sweden in the 1990s mainly, and Spain in the 2000s only.

49. This was accomplished through various modalities across countries: the elimination of automatic indexation mechanisms (Finland and Italy); wage freezes (Finland and Sweden); the introduction of ceilings on wage increases explicitly linked to cost competitiveness *vis-à-vis* the main trading partners (Belgium and Norway), sometimes under the form of a legislated formula based on pay developments in the main trading partner (Belgium); wage increases based on expected inflation (Italy and Spain); and/or recommendations to keep wage increases negotiated at lower levels in line with productivity developments (Ireland, Italy, the Netherlands and Spain).

50. Overall, in the private sector, wages were fully determined at the firm level for 16% of Swedish employees in 2010;for 55% of the employees, the distribution of the nationally-agreed wage increase among employees was bargained at the firm level; and 18% of the employees had their wage fixed at both levels, leaving only 11% of employees with their wage fully determined at the sectoral level (*Annual Report 2010* of the National Mediation Office). In Denmark, 22% of private sector employees had their wages fully determined at the firm level and 62% had a minimum defined at the sectoral level and individual wages negotiated at the firm level in 2004 (Dahl *et al.*, 2011). In France, 64% of the employees in firms with more than ten employees were covered by wage negotiation at the firm-level in 2008 (DARES quoted in *www.worker-participation.eu/National-Industrial-Relations/Countries/France/Collective-Bargaining)*.

51. In Denmark and Sweden, where trade union membership is high, sectoral agreements established the rules governing bargaining at the firm level, so as to create a transparent wage bargaining system based on objectives criteria (Ahlberg and Bruun, 2005; Andersen and Navrjberg, 2008). By contrast, in France, where trade union membership is low, the process of decentralisation of collective bargaining was launched by the government in the early 1980s by obliging employers and trade unions to negotiate on working time and wages at the firm level; a 2004 law further extended the possibilities for firm level agreements to deviate from sectoral agreements or labour laws. The co-ordination between the two levels of bargaining is very limited, but sectoral agreements remain influential, as they still often provide the job classification used for wage negotiation at the firm level; this is, however, less and less the case (Barrat *et al.*, 2007). Besides, the statutory minimum wage, determined by the government, defines a wage floor for the entire labour market, thus limiting the effective margins for negotiations at both levels.

52. Increased use of derogation clauses resulted in cuts in basic pay, reductions in agreed wage increases, lower wage rates for job starters or reduction/suspension of bonuses (Keune, 2010; Haipeter and Lehndorff, 2009).

53. Leading institutional investors include mutual funds, pension funds, hedge funds, life insurance, and investment companies such as private equity funds.

54. Fund managers typically aim to sell-on acquisitions within a five year time frame (Clark, 2009).

55. LBOs have undergone an explosive growth since the early 2000s (ILO, 2009).

56. Amess and Wright (2007) find that LBOs have negatively affected wages in the United Kingdom over the 1999-2004 period. In the United Kingdom also, collective agreements have often been revised downwards after acquisitions, while straight de-recognition of trade unions and collective agreements occurred more rarely (Clark, 2009). Chambost *et al.* (2008) note that, in France, pay individualisation and increased work pressure tend to fragment staff in LBO firms and that the role of trade unions thus becomes more limited.

57. Dumont *et al.* (2005) find evidence that the objective functions of trade unions increasingly include employment in the five European countries they study.

58. See Freyssinet and Seifert (2001), Raess and Burgoon (2006), Haipeter and Lehndorff (2009).

59. In more decentralised bargaining systems the bargaining coverage depends much more on the unions' organisational power (Bispinck *et al.*, 2010).

60. These estimates take into account that minimum-wage increases were distributed over time. An estimation of the effect in the 1990s is more difficult since arbitrary assumptions would have to be made to allow for the change in wage floors induced by the introduction of the minimum wage in Ireland and the United Kingdom. Excluding these two countries, changes in the ratio of minimum to median wages were negative, on average, in that decade.

61. Leonardi and Pica (2010) analyse the effect of monetary compensation for unfair dismissal on male wages by exploiting an Italian reform that introduced this type of compensation for establishments with less than 15 employees. They find that the reform had no impact on entry wages, although returns to tenure decreased, as suggested by Lazear (1990). OECD (2010) shows that the wage premium to voluntary job changes is smaller where dismissal legislation is more stringent. However, that report also finds evidence that involuntary job loss is less frequent in that case, so that the overall impact of these regulations on wage premia to job changes is ambiguous. By contrast, van der Wiel (2010) identifies intra-firm effects of employment protection by exploiting a 1999 Dutch reform, which eliminated age-based terms-of-notice rules but implied the coexistence within the same firm of workers under different rules for a transitory period. She finds that those covered by more stringent rules received higher wages.

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ANNEX 3.A1

Data Construction and Sources

Industry-level data

Earnings and hourly wage data refer to total gross annual earnings and average hourly wages, respectively of wage and salary employees. Employment and hours worked refer to annual averages for wage and salary employees. Real value added is obtained by deflating nominal value added in each industry with the industry-specific double deflator. Data are from the *EUKLEMS Database* except for Norway, where they come from the *OECD STAN Database* and refer to total employment. Capital services and TFP data are also from the *EUKLEMS Database* and are constructed using double-deflated value added. EUKLEMS data obtained through interpolation and/or estimated on the basis of conjectures were removed from the sample, following the criteria detailed in the *2011 OECD Employment Outlook*. For the computation of the labour share in each industry, average hourly compensation of self-employed is assumed to be equal to the average hourly wage of the industry.

The distributions by educational attainment of earnings, wage and hours also come from the *EUKLEMS Database*. Education is divided into three categories: low-education (less than upper secondary); medium education (upper secondary); and high education (more than upper secondary). The business sector, in this case, is partitioned in 9 industries for reasons of data reliability (as in the *2011 OECD Employment Outlook*).

The industry-specific US dismissal rate is from Bassanini and Garnero (2012). The data are available at *https://sites.google.com/site/bassaxsite/home/files/BGdata.zip*. It is derived from various waves of the CPS Displaced Workers Supplement (2000-06, even years). An individual is considered to have been dismissed if he/she lost his/her job in the most recent year covered by each survey, because of plant closing or moved, insufficient work, or position or shift abolished. Only wage and salary employees in the private-for-profit sector are considered.

The share of workers in the United Kingdom with less than secondary education prior to the introduction of the minimum wage in 1999 is the average share in each industry over all available quarters between 1994 and 1998. The source is the UK Labour Force Survey.

The indexes of anti-competitive product market regulation, including public ownership and barriers to entry, come from the *OECD Regulatory Database* (*www.oecd.org/document/1/0,3746,en_2649_%2037421_2367297_1_1_1_37421,00.html*). They vary from 0 to 6 from the least to the most restrictive. Time-varying aggregate data are available for three industries (Energy, Transport and Communications) from 1975 to 2008.

Import-weighted real exchange rates are defined as follows:

$$x_{ikt} = \sum_{i=1}^{I} \sum_{l=1}^{L} m_{iklt_0} e_{klt} p_{lt} / p_{kt}$$

where x stands for the import-weighted real exchange rate, m is to the import share from country l in industry i of country k at a fixed time period t_0 (early 1980s in these data) – the import weights thus vary across industries and countries but are constant over time – e is the nominal bilateral exchange rate between countries k and l at time t – which varies across partner countries and time, but not across industries – the p variables refer to price levels, as approximated by the GDP deflator, in countries l and k respectively. An increase in the industry-specific exchange rate represents a real depreciation in the price of output produced in industry i of country k relative to its trading partners (weighted by import shares). Put differently, an increase in the industry-specific exchange rate represents an improvement in the terms of trade in industry i for country k. The source is the *2007 OECD Employment Outlook*.

Import penetration is defined as the ratio of imports to apparent demand (imports plus output minus exports). Trade exposure is the sum of import penetration and export propensity, the latter defined as the ratio of exports to domestic output. The source of both variables is the *OECD STAN Database*. For industry i in country k, intra-industry offshoring is defined as the ratio of imported intermediate purchases from the same industry to that industry's domestic output:

$$o_{ikt} = \frac{M_{ikt}}{Y_{ikt}}$$

where M refers to the imports of intermediates from industry i by industry i and Y refers to domestic output in industry i. This indicator is computed using *OECD Input-Output tables*, available for 1995, 2000 and 2005.

OECD industry-specific indicators on regulatory barriers to inward FDI concern foreign equity limits, screening and approval, restrictions on top foreign personnel, and other restrictions concerning notably reciprocity rules and profit/capital repatriation. For each of these components the indicator vary between 0 and 1 from the least to the most restrictive. They are available between 1997 and 2006 at approximately five year intervals. Missing data were interpolated. In the regressions, missing 2007 data are replaced with 2006 data. All components, except restrictions on top foreign personnel, were lumped together by simple addition. The source is Kalinova *et al.* (2010).

Aggregate data

Earnings data are deflated using the private consumption deflator, drawn from the *OECD Economic Outlook* (EO) *Database*. When comparisons of deflators are made, the difference between aggregate value added deflators in the *EO* and *EUKLEMS Databases* is netted out, in order to purge the comparison from different degrees of quality-adjustment across deflators. For the computation of the aggregate labour share, average annual compensation of self-employed is assumed to be equal to the average annual wage of the industry. 1997 USD purchasing power parities data, used for the definition of high-wage countries, are from EUKLEMS. Data on earnings inequality are from the *OECD Income Distribution Database* (*www.oecd.org/els/social/inequality*).

EP indicators come from the *OECD Indicators of Employment Protection* (*www.oecd.org/employment/protection*). All indicators vary from 0 to 6 from the least to the most stringent.

Minimum wages are measured as the ratio of the statutory minimum wage to median earnings of full-time workers. The deviation of the logarithm of the real minimum wage in 2000 USD purchasing power parities from the OECD average of each year is used as instrument. The source of all these variables is the *OECD Employment Database* (*www.oecd.org/els/employment/database*).

Collective bargaining coverage is the share of workers covered by a collective agreement, in percentage. The source is the *ICTWSS Database* (*www.uva-aias.net/207*). Data were averaged or interpolated when information is not available at the annual level.

The degree of corporatism is proxied with the ICTWSS index of bargaining co-ordination, which takes values from 1 to 5 from the least to the most co-ordinated. The source of this variable is the ICTWSS Database (*www.uva-aias.net/207*).

Unemployment benefit generosity is measured on the basis of gross average replacement rates (in percentage of pre-displacement wage), defined as average unemployment benefit replacement rate across two income situations (100% and 67% of average worker earnings), three family situations (single, with dependent spouse, with spouse in work) and three different unemployment durations (first year, second and third years, and fourth and fifth years of unemployment). The source is the *OECD Benefits and Wages Database* (*www.oecd.org/els/social/workincentives*).

The tax wedge considered in this chapter is the wedge between the labour cost for the employer and the corresponding net take-home pay of the employee for single-earner couples with two children earning 100% of average worker earnings. It is expressed as the sum of personal income tax and all social security contributions as a percentage of total labour cost. The source of all these variables is the *OECD Taxing Wages Database* (*www.oecd.org/ctp/taxingwages*).

Sources for Table 3.1

The table was constructed by compiling various sources.

Importance of the various levels of bargaining

Eurofound (2005); European Commission (2011); country notes on national industrial relations from the website "Worker participation" from ETUI, *www.worker-participation.eu/National-Industrial-Relations*; EIRO's industrial relations country profiles, *www.eurofound.europa.eu/eiro/country_index.htm*; various country readings: Dølvik (2008), for Denmark, Finland, Norway and Sweden; Howell (2009) and Barrat *et al.* (2007) for France; Romo (2008); Ahlberg and Bruun (2005) for Sweden.

Extension of sectoral agreements

Eurofound (2011); ETUI's Worker participation country notes on industrial relations for Ireland and the Netherlands (*www.worker-participation.eu/National-Industrial-Relations*); Bispinck *et al.* (2010) for Spain.

Use of derogation clauses

Eurofound (2010) for Austria, Belgium, France, Germany, Ireland, Italy and Spain; Haipeter and Lehndorf (2009) for Denmark and Hungary; Eurofound (2005) for Sweden.

Change in the dominant bargaining level since 1990

For Denmark: Andersen, and Navrbjerg (2008) and Dølvik (2008); for Finland and Sweden, Dølvik (2008); for France, ETUI's workers participation country note on national industrial relations (*www.worker-participation.eu/National-Industrial-Relations*) and Barrat *et al.* (2007); for Slovak Republic, ETUI's workers participation country note on national industrial relations (*www.worker-participation.eu/National-Industrial-Relations*).

Type and intensity of co-ordination between the various bargaining actors and levels

Du Caju *et al.* (2008); ETUI's worker participation country notes on national industrial relations (*www.worker-participation.eu/National-Industrial-Relations*); Traxler and Brandl (2010); EIRO's industrial relations country profiles; Calmfors and Larsson (2011); Barrat *et al.* (2007).

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Chapter 4

What Green Growth Means for Workers and Labour Market Policies: An Initial Assessment*

A successful transition towards a low-carbon and resource-efficient economy will reshape the labour market in ways that create new opportunities for workers, but also new risks. The challenge for labour market and skill policies is to maximise the benefits from this transition for workers and help assure a fair sharing of unavoidable adjustment costs, while also supporting broader green growth policies. This chapter sheds light on these policy challenges and provides guidance for how they can best be met.

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Key findings[1]

It is now widely recognised that it is essential to decouple economic growth from unsustainable environmental pressures, such as those leading to global climate change, and that a successful transition towards a low-carbon economy will necessarily reshape the labour market. This chapter aims to provide guidance for how labour market and skill development policies can best contribute to a fast, efficient and fair transition to a low-carbon and resource-efficient economy, particularly in developed countries. It first analyses the main impacts on the labour market of green growth policies, particularly climate-change mitigation policy. Next it turns to how labour market and education/training policies can best facilitate the transition to green growth.

The chapter finds that:

- *The transition to green growth is best conceived of as a driver of structural economic change.* New simulations using the OECD ENV-Linkages computable general equilibrium (CGE) model demonstrate how ambitious climate-change mitigation policies may affect labour market outcomes, as well as how labour market rigidities could raise the overall cost of reducing green house gas (GHG) emissions. These simulations suggest that one of the main labour market impacts would be to alter the sectoral composition of employment, with fossil-fuel industries experiencing the steepest employment declines and renewable energy industries the sharpest increases. However, such a policy-induced increase in the reallocation of employment is likely to be modest by comparison with the underlying rates of labour reallocation generally observed in OECD countries during recent decades and have little impact on the overall level of job skill demand. The functioning of the labour market will have a significant impact on aggregate outcomes of mitigation policies: while the impact of these policies on GDP growth is small when the labour market is fully flexible, it becomes larger and employment falls when the labour market is characterised by rigidities that hinder the necessary structural adjustments. In the presence of partial labour market rigidity, introducing an emissions trading scheme and recycling the carbon revenues so as to reduce the tax wedge on labour income can generate a "double-dividend" by delivering both lower GHG emissions and higher employment.
- *Labour market policy choices should also be informed by detailed case studies of the most strongly-impacted sectors, notably "green" sectors that are likely to grow rapidly and the most CO_2-intensive sectors that will need to radically change their technologies or shed jobs in the transition towards green growth.* While certain green sectors, such as renewable energy, will grow at a rapid pace, the overall labour market impact will likely be modest because these sectors account for only a small share of total employment. The most polluting industries account for 14% of employment on average in the OECD, but this share varies significantly from country to country (ranging from 11% in Denmark to 27% in Poland). Should many workers in these industries lose their jobs in the transition towards green growth, they are likely to face above-average adjustment costs since many of these

industries are characterised by relatively low educated workers with a low level of labour mobility, while several are also highly localised.

- *The shift towards greener production practices also implies some changes in skill requirements, but there appear to be few uniquely green skills.* Adding some green content to existing vocational and training programmes and offering top-up training to the existing workforce probably can meet most of the emerging skill demands. The strong trend increase in environmental patenting during the past several decades underlies the importance of preparing the workforce for a period of rapid eco-innovation, including by raising science, technology, engineering and mathematics (STEM) skills.
- *Labour market and skill policies should play an active role in helping workers and employers to make the transition to green growth.* Existing policies, such as those identified in the *OECD Reassessed Jobs Strategy*, provide the essential framework for successfully managing the structural changes required to decouple production from harmful environmental effects. In adapting these general policies for the transition towards green growth, priority should be given to:
  - Supporting a smooth reallocation of workers from declining to growing firms, while reducing the adjustment costs borne by displaced workers.
  - Supporting eco-innovation and the diffusion of green technologies by strengthening initial education and vocational training, and assuring that overly-strict employment protection and product market regulations are not blunting the incentive to innovate.
  - Reform of the tax-benefit system for workers in order to ensure that cost pressures generated by environmental policies do not become a barrier to employment.
- *Green-specific labour market and skill policies also have a role to play, especially in meeting new job skill needs.* An OECD questionnaire sent to labour and employment ministries reveals that about 60% of the responding countries have implemented at least one labour market measure targeted on green growth, with training being the most common type of measure. However, most of these measures are of small scale and were only recently introduced. The limited experience with implementing these policies suggests that they confront two particularly difficult challenges; detecting how green growth is changing labour demand and jobs skill requirements, and co-ordinating labour market and skill policies with environmental policy. This suggests that the role for green-specific measures is likely to emerge only incrementally, as the environmental policy framework needed to support green growth develops and experience with managing the labour market dimension of the transition to green growth accumulates.

Introduction

The need to decouple economic growth and social progress from unsustainable environmental pressures, such as those leading to global climate change, is now widely recognised and the OECD has proposed a broad policy strategy for achieving green growth (OECD, 2011a). A successful transition towards a low-carbon and resource-efficient economy will reshape the labour market in ways that create both new opportunities and new risks for workers. The challenge for labour market and skill policies is to maximise the benefits for workers and help assure a fair sharing of unavoidable adjustment costs, while also supporting broader green growth policies (*e.g.* by minimising skill bottlenecks). This chapter examines this policy challenge and offers guidance for best meeting it. The chapter begins with an analysis of how the transition to green growth will reshape labour markets,

which helps to define the policy challenge. The latter part of the chapter then discusses the appropriate policy responses.

Analysing the employment impact of green growth policies is not an easy task and much remains to be done is this area. One complication is that a general-equilibrium approach is required to capture all of the direct and indirect channels through which green growth policies will reshape labour markets and create structural adjustment pressures. Section 1 takes this approach which is shown to offer a number of key insights into the ways that labour markets must restructure in order to decouple production and consumption from unsustainable environmental pressures. This section also illustrates the limitations of this approach and, hence, the need to supplement general-equilibrium modelling with detailed analyses of specific sectors and occupations that will be strongly affected by the transition towards low-carbon growth. Section 2 adopts this partial-equilibrium approach. After summarising key findings from the many recent studies of green jobs and skills, new empirical findings are presented for a topic that has received much less attention from researchers, namely, structural adjustment pressures in industries with a large environmental footprint.

The second part of the chapter analyses how labour market and skill policies can best contribute to an efficient and fair transition towards a low-carbon and resource-efficient economy. Section 3 discusses general employment and skill policies, arguing that the policy orientations presented in the *OECD Reassessed Jobs Strategy* (OECD, 2006a) and the *OECD Innovation Strategy* (OECD, 2010a) provide an essential framework for managing the transition towards green growth. In particular, labour market and skill policies are identified that can:

- Ensure that displaced workers receive adequate re-employment assistance and income support.
- Help to speed the development and diffusion of environmentally friendly technologies.
- Recycle revenues from environmental taxes or emissions trading schemes so as to ensure that the cost pressures generated by environmental policies do not become a barrier to employment.

Section 4 then analyses the role of green-specific employment and skill policies. Since little is known about this type of policy, this section makes use of the responses to a new OECD questionnaire that was sent to employment and labour ministries in late 2010. The information collected provides a unique overview of the extent to which OECD countries have implemented green-specific measures and which types of targeted initiatives are most widely used. To the extent possible at this early stage, the effectiveness of different types of measures is assessed as well as cross-country differences in policy priorities.

Several important limitations of the scope of this study should be noted. A first limitation is that labour market *adaptation* to environmental degradation, such as that associated with climate change, is not analysed. Instead, the focus is almost exclusively on the implications of environmental *mitigation* policies – principally, policies aimed at curbing GHG emissions – for the functioning of labour markets. A second limitation is that the analysis is largely confined to OECD member countries. Labour market issues of particular salience for managing the transition towards green growth in emerging and developing economies, such as high rates of informal employment and large-scale migration of rural workers to urban areas, are not analysed.[2]

1. The labour market implications of a transition to green growth: Insights from general-equilibrium modelling

This section first provides a brief (and highly selective) literature review of past studies that use general-equilibrium methods to study the labour market implications of climate-change mitigation policy. New simulation exercises which have been conducted with the OECD ENV-Linkages model are then presented in order to clarify further some of the general-equilibrium effects associated with the implementation of mitigation policies, such as emission trading schemes.

Structural adjustment pressures brought about by a policy-driven transition to green growth: Lessons from earlier studies adopting a general-equilibrium approach

A growing number of economic modelling teams have developed and applied computable general-equilibrium (CGE) models or hybrid models to analyse the economic impacts of climate change policies, including the impacts on labour markets. The estimated impact of mitigation policies on economic growth and employment varies somewhat across studies and countries (see Table 4.1). In considerable part, this variation reflects differences across studies with respect to the mitigation policies considered and, for a given mitigation scenario, differences across countries with respect to the initial level of GHG emissions and hence the mitigation effort required. The assumption about how the revenues from carbon taxes (or emissions permits) are distributed also affects the estimated labour market impact. For example, Boeters and van Leeuwen (2010) estimate that a 20% reduction in energy use in selected European countries would slightly increase unemployment when energy tax revenue is distributed as lump-sum transfers to households, but slightly reduce unemployment in several countries when this revenue is used to reduce labour taxes – an illustration of the "double-dividend" hypothesis that it is sometimes possible to "recycle" revenues from a newly instituted environmental tax so as to achieve both environmental gains and higher employment or output (see Bovenberg, 1999, and other studies cited in OECD, 2012a).

Despite these differences, the estimated impacts on GDP and labour market outcomes tend to be relatively small. For example, an evaluation conducted by the European Commission concludes that the pace of employment growth in Europe would slow only slightly, should participating countries meet the EU's objectives on climate change and renewable energy for 2020 (EC, 2008). Montgomery *et al.* (2009) obtain the same qualitative result for the United States, while also demonstrating that labour market imperfections would increase mitigation costs.

Modelling assumptions also influence the estimated impacts. CBO (2010) compares the estimated economic impacts produced by three leading CGE models for the United States when used to analyse a *standardised* climate-change mitigation scenario and show that the results differ significantly across the three models. Nonetheless, many of the qualitative conclusions were consistent across the models. This includes the findings that net employment effects are small whereas there is a considerable reallocation of workers between contracting and expanding sectors.[3] The CBO analysis also provides robust evidence that real wages tend to fall compared with the business-as-usual (*i.e.* no-reform) scenario, due to the impact of higher energy prices in raising the cost of living. The findings that the transition towards low-carbon growth requires both the sectoral reallocation of labour and downward wage flexibility suggest that a substantial degree of labour market flexibility is a precondition for a smooth transition to green growth. Paroussos and

Capros (2009) illustrate this point using the GEM-3 model for EU countries. Of particular interest, they analyse the same scenario for the expansion of renewable energy sectors under three alternative assumptions concerning the degree of labour market flexibility. Their results confirm that the impact on total employment and its sectoral composition is significantly affected by the degree of labour market flexibility.

Several methodological limitations of the CGE models used in these simulation studies mean that they probably are too pessimistic about the long-run impact of mitigation policies on economic growth.[4] Whereas these models capture well the short and medium-run adjustment costs associated with reducing GHG emissions, they generally miss some or all of the economic benefits due to new green technologies, whose development would be stimulated by the mitigation policy.[5] As a result, these models also shed little light on which countries are likely to become the export and technology leaders in fast-growing green sectors (*e.g.* by developing a green Silicon Valley). These models also typically omit how mitigation policy avoids environmental damage that otherwise would have occurred. This is an important omission because the potential damages from climate change can be large, including the destruction of physical capital through more intense and frequent storms, droughts and floods. For example, a rise in the sea level means that storm surges may cause extensive flooding in heavily populated coastal areas (Nicholls *et al.*, 2008; OECD, 2012c). The estimated costs of these impacts vary widely by location and region, but may be as much as the equivalent of 14.4% of per capita consumption when all market and non-market impacts are taken into account (Stern, 2006).[6]

Further insights from new simulation exercises[7]

In order to investigate further some of the implications of a transition towards low-carbon growth for labour markets, new simulation exercises have been conducted with the OECD ENV-Linkages model. This is a global CGE that has been extensively used to assess the impact of environmental policies on GHG emissions and economic growth (see Box 4.1). In the baseline version of the ENV-Linkages model, the labour market is assumed to be fully flexible, as is common in long-run growth models. This implies that the job reallocation across economic sectors, which results when GHG mitigation policies are introduced, is costless and occurs instantaneously. It also implies that aggregate employment is not affected by mitigation policy, because the labour supply is assumed to be exogenous and real wages always adjust so that the labour market clears. While the assumption of full flexibility is at odds with extensive evidence of rigidities in OECD labour markets, this baseline version of the model provides a useful indication of the magnitude of the labour market adjustment pressures generated by mitigation policies. The first simulations discussed below use the baseline model for this purpose. An augmented version of the ENV-Linkages model, which incorporates partial real wage rigidity, is then used to explore how the adjustment challenge created by mitigation policy varies in the presence of different degrees of labour market imperfection.[8]

Economic impacts of an illustrative mitigation scenario combined with different recycling options for carbon revenues

The illustrative policy scenario applied in the modelling is an emission trading scheme (ETS) which progressively reduces GHG emissions over the period 2013-50, bringing emissions for the OECD area as a whole to 50% below their 1990 level in 2050 (Figure 4.1, Panel A).[9] The target is less stringent for non-OECD countries, where emissions

Table 4.1. **Selected evaluations of the economic impact of mitigation policies**

Scenario/Country			Estimated impact (deviation from the business-as-usual scenario)						Labour market modelling
			Unemployment (% points)		**Participation** (%)		**Real wage** (%)		
			Worker skill:						
			High	Low	High	Low	High	Low	
			Recycling: lump-sum transfers						
		France	0.15	0.27	–0.58	–0.81	–3.5	–3.5	
		Germany	0.10	0.22	–0.33	–0.47	–3.5	–3.7	
		United Kingdom	0.04	0.15	–0.35	–0.40	–2.7	–2.8	
		Italy	0.09	0.27	–0.54	–0.49	–3.4	–3.5	
		Spain	0.05	0.17	–0.42	–0.47	–3.4	–3.9	
			Recycling: lower labour taxes						
		France	0.00	0.13	–0.31	–0.65	–3.7	–3.7	
		Germany	–0.12	–0.05	0.03	–0.23	–3.5	–3.9	
		United Kingdom	0.00	0.07	–0.19	–0.32	–2.7	–2.8	
		Italy	–0.14	–0.16	–0.02	–0.14	–3.8	–4.0	
		Spain	–0.26	–0.23	0.11	–0.12	–3.8	–4.2	
Boeters and van Leeuwen (2010) WorldScan Model	**Target:** 20% reduction in energy use. **Policy:** uniform tax on energy use. Tax rate (as an *ad valorem* tax to the energy price exclusive of other taxes): around 50%. **Implementation period:** 2001 (static model simulation).								Collective wage bargaining, endogenous labour supply. Empirical weakness of the model: no scope for calibrating the wage bargaining equation to empirical estimations of wage curve elasticities, because the only remaining free parameter, the relative bargaining power of trade unions, is needed to calibrate the model so that empirical unemployment rates are met.
Montgomery *et al.* (2009) MNR-NEEM and MS-MRT models	**Target:** reduction of GHG emissions by 83% below 2005 levels by 2050. **Policy:** national cap-and-trade programme plus a minimum 20% renewables share for electricity generation by 2020. Recycling: lump-sum transfers to consumers. **Implementation period:** 2010-50.	**United States**	**GDP** (%)		**Employment** (thousands of jobs)		**Real wage** (USD per year)		Wages adjust by one-half the amount required for full employment
			–1.0 in 2030		–2 200 in 2030		–510 in 2030		
			–1.5 in 2050		–3 600 in 2050		–1,250 in 2050		
International Council for Capital Formation (2005a-d) DRI-WEFA model	**Target:** 60% below 2000 emissions by 2050. **Policy:** international carbon dioxide trading mechanism. Recycling: lump-sum transfers to consumers. **Implementation period:** 2005-25.		**GDP** (%)				**Employment** (%)		Real gross wages are sticky and adjust to expected inflation and unemployment rate. Labour supply is exogenous.
		United States	–2.0 in 2020				–0.1 in 2020		
		Italy	–1.6 in 2025				–1.25 in 2025		
		Spain	–4.1 in 2025				–2.9 in 2025		
		Germany	–1.4 in 2025				–1.6 in 2025		
		United Kingdom	–1.1 in 2025				–1.25 in 2025		
EC (2008) GEM-E3 model	**Target:** at least a 20% reduction of GHG emissions by 2020 relative to 1990 levels, and target of 20% renewable energy by 2020. **Policy:** EU trading mechanism. Recycling: lump-sum transfers. **Implementation period:** 2005-20.	**Europe**	**GDP** (%)				**Employment** (%)		Labour supply not fully elastic. Wage bargaining with an intermediate value for trade-union bargaining power.
			–0.35 in 2020				–0.04 in 2020		

Box 4.1. **Main characteristics of the OECD ENV-Linkages model**

The OECD ENV-Linkages model is a recursive dynamic neo-classical general-equilibrium model, documented in detail in Burniaux *et al.* (2010). It has been used extensively for several OECD publications, notably the *Environmental Outlook to 2030* (OECD, 2008a) and *The Economics of Climate Change Mitigation* (OECD, 2009a). The model represents the world economy in 15 countries/regions, each with 26 economic sectors, allowing structural changes across and within countries and regions to be studied in detail. The economic sectors include five electric generation sectors, five that are linked to agriculture (including fishing and forestry), five energy-intensive industries, three sectors linked to oil and gas extraction, refineries and distribution of petroleum products. The remaining sectors are transport services, other services, construction and four other manufacturing sectors. Technological progress is exogenous, but alternative existing production technologies are modelled in great detail in the energy sector and the mix of technologies used evolves in response to changes in relative prices. A labour market clearing equation equalises aggregate labour demand to an exogenous employment level, and therefore determines wages.

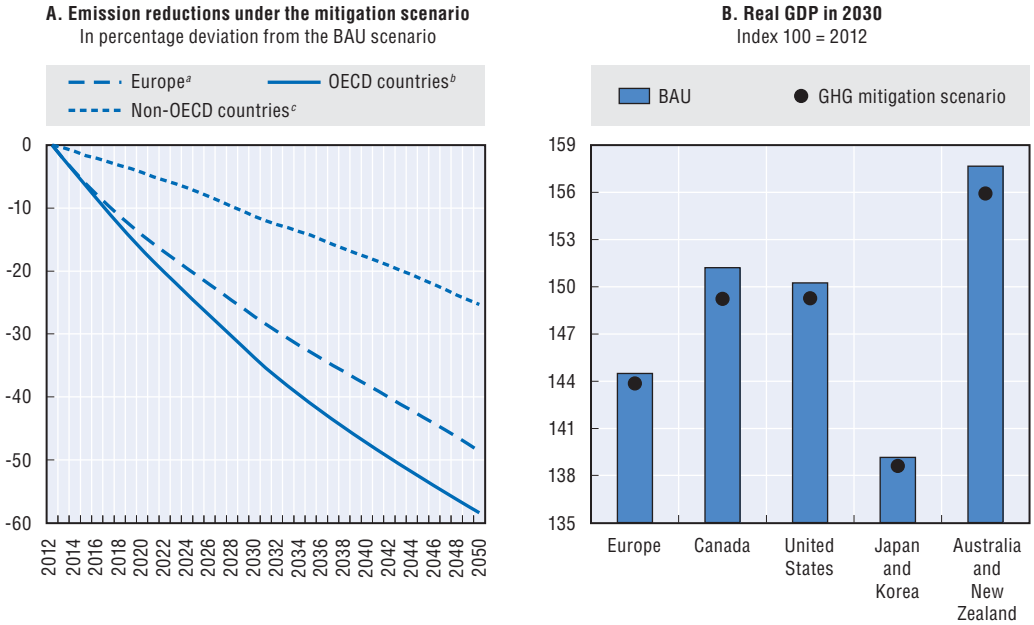
The exogenous employment levels are derived from labour force projections to 2050 and from estimates of national unemployment rates provided by the OECD Economics Department (see Duval and De la Maisonneuve, 2010). The model is built primarily on a database of national economies. The core of the static equilibrium is formed by the set of Social Account Matrices (SAMs) that describe how economic sectors are linked; these are based on the *GTAP Database*. Many key parameters are set on the basis of information drawn from various empirical studies and data sources (see Burniaux *et al.*, 2010). The "business-as-usual" (BAU) projection used as a support for economic policy scenarios is described in detail in OECD (2011b). It should be stressed that the BAU scenario is not intended to represent a prediction of how the global economy is likely to evolve, but rather to provide a baseline representing key economic developments that could be expected to occur if no further mitigation policies were introduced. It is important to emphasise that the BAU baseline does not represent a viable policy option, since such a scenario would imply a marked deterioration in global environmental conditions that would have serious consequences for living standards (OECD, 2012c).

As is the case for most available CGE models developed for the economic analysis of mitigation costs, the ENV-Linkages model has two limitations which tend to overstate the long-run cost of mitigation policies: *i)* technological progress is assumed to be exogenous, so that the model does not fully capture the potential effects of environmental policies in stimulating the innovation of new green technologies; and *ii)* the ENV-Linkages model does not account for the potential economic damages from climate change and, hence, omits the economic benefits from mitigation policies that operate through reduced environmental disruption. Both characteristics imply that in the long run, potential output and employment gains induced by the mitigation policy are not fully captured in the modeling framework. These limitations are, however, less important when attention is focused on the next several decades, as innovation and climate changes are slow processes. This medium-run time horizon is emphasized here because it is arguably most relevant for understanding the challenges green growth poses for labour market and skill policies.

are reduced by 25% in 2050 as compared to what would be observed in these countries in the absence of mitigation efforts, under the so-called business-as-usual (BAU) scenario. It is assumed that there is OECD-wide trading in ETS permits, but that each non-OECD country operates its separate ETS.[10]

The first set of policy simulation exercises was conducted using the baseline version of the OECD ENV-Linkages model with full flexibility in the labour market. In this set-up, the structural adjustment pressures triggered by mitigation policy can be observed through the policy impacts on real GDP, the real net wage (disposable income of working households) and a welfare measure (the so-called "equivalent variation" in real income of

Figure 4.1. **An illustrative mitigation policy scenario for GHG emissions and its impact on GDP growth in OECD countries**



Note: Simulated impacts of GHG mitigation policy are shown as deviations from a business-as-usual (BAU) baseline scenario that assumes no new mitigation policy measures are implemented and takes no account of how the resulting environmental damages would affect economic activity and well-being.

a) **European average** includes: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

b) **OECD average** includes: the European countries identified above together with Australia, Canada, Japan, Korea, New Zealand and the United States.

c) **Non-OECD** average includes: Brazil, China, India, Indonesia, and the Russian Federation.

Source: OECD ENV-Linkages model.

StatLink http://dx.doi.org/10.1787/888932651807

all households[11]). As the harm from climate change and hence the benefits from mitigation action are *not* included in the analysis, these welfare losses represent only the cost of policy action and not the benefit.

Mitigation policy tends to slow the pace of economic growth relative to the BAU scenario, albeit not by very much. Focusing first on the standard assumption, namely, that the revenue from the ETS system is distributed to households as equal lump-sum transfers, the simulations indicate that real GDP for the OECD area in 2030 declines by less than 0.6% compared with the BAU (Table 4.2). The corresponding reduction is somewhat smaller in Europe, where a smaller reduction in GHG emissions is required. The simulated costs are small compared with the substantial GDP growth that is projected during the 2012-30 period (Figure 4.1, Panel B). Under the BAU scenario, the cumulative growth for this period ranges from 39% in Japan and Korea to 57% in Australia and New Zealand.

In fully flexible labour markets, the illustrative mitigation policy scenario would also lead to a reduction in real wages relative to the BAU scenario (Table 4.2).[12] This is because the ETS leads to an increase in the marginal costs of production and this puts a downward pressure on labour demand and thus on wages. This cost rises over time, reflecting the gradual introduction of larger emission reductions with respect to the baseline scenario. The real wage in the OECD area would decline by around 1.4% from baseline levels in 2030

Table 4.2. **Economic impact of mitigation policies for various recycling options**

Percentage deviation from the BAU scenario for an OECD-wide ETS

		Revenues from ETS[a]	Lump-sum transfers			Taxes on labour			Household income tax			Capital and labour taxes		
			Real GDP	Real net wage[b]	Welfare measure[c]	Real GDP	Real net wage[b]	Welfare measure[c]	Real GDP	Real net wage[b]	Welfare measure[c]	Real GDP	Real net wage[b]	Welfare measure[c]
Europe	2015	0.12	–0.02	–0.13	–0.02	–0.02	0.18	–0.02	–0.02	0.01	–0.02	–0.02	0.16	–0.02
	2020	0.51	–0.12	–0.59	–0.08	–0.12	0.68	–0.08	–0.12	–0.02	–0.08	–0.12	0.56	–0.08
	2030	0.92	–0.43	–1.27	–0.36	–0.43	0.74	–0.36	–0.43	–0.34	–0.36	–0.43	0.54	–0.36
OECD	2015	0.15	–0.02	–0.13	–0.02	–0.02	0.16	–0.02	–0.02	0.03	–0.02	–0.02	0.12	–0.02
	2020	0.60	–0.13	–0.61	–0.12	–0.13	0.54	–0.12	–0.13	0.02	–0.12	–0.13	0.38	–0.11
	2030	1.04	–0.55	–1.41	–0.51	–0.55	0.36	–0.51	–0.55	–0.41	–0.51	–0.55	0.11	–0.50

Note: For the country coverage of Europe and OECD, see Figure 4.1, notes *a)* and *b)*.

a) Revenues from ETS are expressed as a percentage of GDP and correspond to the policy scenario with lump-sum recycling.

b) The real net wage is defined as the net-of-taxes wage received by households divided by the consumer price index. Therefore, it is directly affected by changes in carbon prices.

c) The welfare measure is defined as the difference between the simulated level of real income when mitigation policies are introduced and the level of real income that would ensure the same utility level to consumers as would occur in the absence of such policies, *i.e.* in the baseline (or BAU) scenario. It takes no account of environmental benefits from mitigation policy.

Source: OECD ENV-Linkages model.

StatLink http://dx.doi.org/10.1787/888932652092

and by a little less in Europe. The depressive effect of mitigation policies is always more pronounced on real net wages than it is on GDP or aggregate welfare. These policies may thus generate distributional concerns and off-setting the resulting income losses for workers could thus be one of the considerations involved in deciding how to distribute the revenues from ETS.

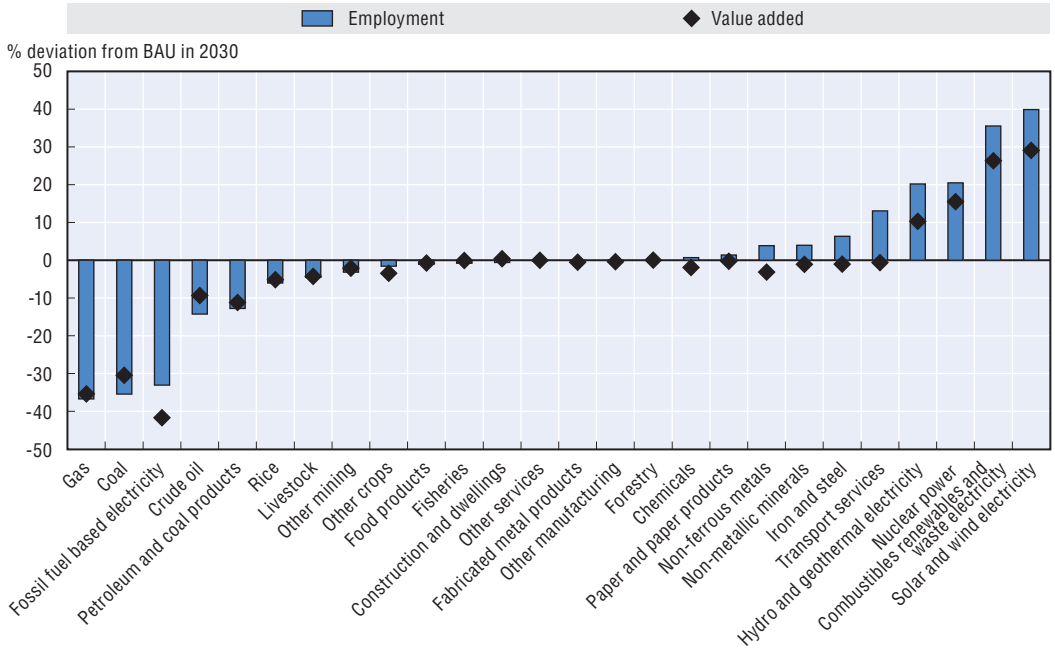
In addition to simulations where ETS revenues were redistributed to households in the form of *uniform lump-sum transfers*, Table 4.2 also shows the simulation results for three alternative recycling policies, namely, with ETS revenues being recycled so as to: *i)* lower household wage income taxation; *ii)* lower household global income taxation; and *iii)* reduce both capital and labour taxes paid by firms.[13] The results show that the mitigation policy generates net additional public revenues that are potentially large enough to offset its depressive effect on workers' disposable income. When all of the permit revenues are used to reduce taxes on wage income, real net wages increase indicating that working households could actually benefit from this mitigation policy (see the "taxes on labour" scenario). With fully flexible labour markets, this alternative recycling option has only distributional consequences, shifting part of the adjustment burden away from working households.[14] Because capital incomes are earned by households, similar redistributive patterns are found when ETS revenues are used to reduce taxes on both labour and capital incomes. However, the recycling of ETS revenues in the form of lower income taxes is much less favourable to workers, because income taxes are more equally distributed across working and non-working households than are taxes on labour and capital.

How do mitigation policies affect the sectoral mix of employment and job-skill requirements?

The transition to green growth will also require labour reallocation across sectors, which could be a source of adjustment costs and insecurity for workers. Figure 4.2 shows how employment is affected by mitigation efforts in each of the economic sectors

Figure 4.2. **Simulated changes in sectoral composition of employment, OECD**[a]

Policy-induced labour reallocation in 2030



Note: Simulated impacts of GHG mitigation policy are shown as deviations from the BAU baseline scenario that assumes no new mitigation policy measures are implemented and takes no account of how the resulting environmental damages would affect economic activity and well-being.

a) For the country coverage of OECD, see Figure 4.1, note *b)*.

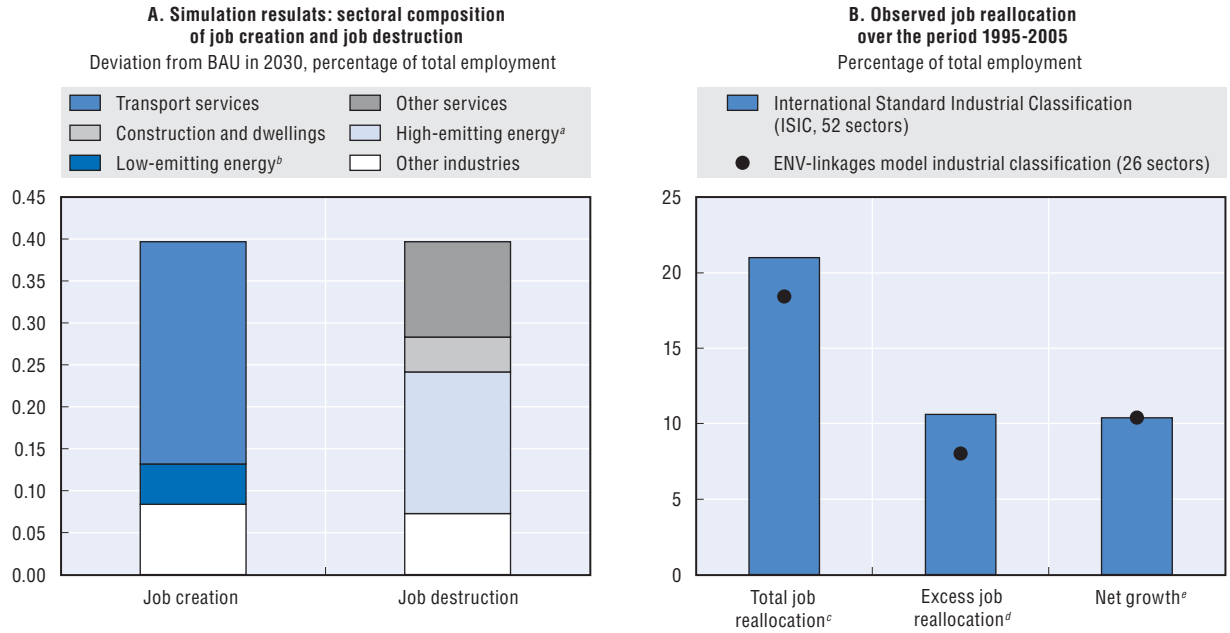
Source: OECD ENV-Linkages model.

StatLink http://dx.doi.org/10.1787/888932651826

considered in the ENV-Linkages model. These results are based on the baseline mitigation scenario with ETS revenues being redistributed to households in the form of equal lump-sum transfers. The simulation indicates that by 2030 employment in the solar and wind electricity sector in the OECD area as a whole could be 40% higher than it would have been in the absence of the climate mitigation policy. By contrast, the fossil fuel and coal mining sectors could lose more than 35% of their jobs in the OECD area.

Although these expansions and contractions are very large at the individual sectoral level, they do not translate into a large *overall* reallocation of jobs, because the heavily impacted industries represent only a small share of total employment. Indeed, summing up all sectoral job creation, it appears that the new jobs created by expanding sectors represent only 0.4% of total employment in the OECD area (Figure 4.3, Panel A).[15] As labour markets are assumed to be fully flexible and total employment is not affected by the mitigation policy, the aggregate job destruction induced by mitigation policy equals total job creation. It follows that the change in the sectoral composition of employment that is induced by the mitigation policy in 2030, as measured by the sum of job creation and job destruction, would affect less than 1% of total employment in the OECD. Figure 4.3, Panel B shows that this is a small number compared with the magnitude of cross-sectoral employment shifts that has recently characterised OECD labour markets. On average in the OECD area, total job reallocation between economic sectors (*i.e.* the sum of sectoral job creation and destruction) accounted for 20% of total employment during 1995-2005.[16]

Figure 4.3. **Sectoral impact of mitigation policies on employment compared with historical benchmarks, OECD**



Note: Simulated impacts of GHG mitigation policy are shown as deviations from the BAU baseline scenario that assumes no new mitigation policy measures are implemented and takes no account of how the resulting environmental damages would affect economic activity and well-being.

a) Coal, crude oil, gas, petroleum and coal products, fossil fuel based electricity.

b) Hydro and geothermal electricity, nuclear power, solar and wind electricity, combustible renewables and waste electricity.

c) Sum of job creation and job destruction.

d) Difference between total job reallocation and absolute net growth.

e) Absolute value of net employment growth (defined as the difference between job creation and job destruction).

Source: OECD ENV-Linkages model (Panel A) and *EUKLEMS Database* (Panel B).

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This analysis suggests that GHG mitigation policy is unlikely to create structural adjustment pressures that are quantitatively large compared with historical experience, but this conclusion is subject to two caveats. First, the measurement of job reallocation between sectors is sensitive to the industry classification retained for the analysis and the use of a consolidated services sector in the classification used in the ENV-Linkages model misses employment shifts within the broad services sector. However, Figure 4.3 (Panel B) shows that the historical estimates obtained vary only slightly when the calculation is based on the industry classification in 26 economic sectors used in the ENV-Linkages model, instead of being based on the International Standard Industrial Classification in 52 sectors (three-digit level). A second caveat is that past research has shown that gross job flows *between* firms in the same sector or sub-sector are an order of magnitude larger than gross job flows *across* sectors (OECD, 2009b and 2010b). Unfortunately, the OECD ENV-Linkages model does not take account of job reallocation within sectors and how this form of labour market churn would be affected by mitigation policy.[17]

Although the magnitude of the policy-induced job reallocation between sectors is projected to be quite limited, the sectoral composition of job creation and job destruction reveals interesting patterns (Figure 4.3, Panel A). Indeed, general-equilibrium effects appear to be at least as important as the partial-equilibrium effects in that much of job reallocation is projected to take place outside the strongly impacted sectors with large

percentage employment gains and losses in Figure 4.2. Two-thirds of job creation takes place in the transport services, even though this sector figures among the more polluting industries. This reflects several general-equilibrium effects. First, the demand for transport services is complementary to many other economic activities and, thus, does not fall much when transportation prices increase due to rising energy prices. Second, transport services become significantly more labour-intensive as the price of energy rises relative to wages. By comparison, job creation in the so-called "clean energy sector" represents a far smaller fraction of total job creation (12%). The high-emitting energy sector accounts for the largest proportion of sectoral job destruction (43%), but services other than transportation also contribute a significant share (29%) despite the percentage decline in this sector's employment being very small. This can be explained by the fact that the services sector is by far the largest employer, representing around two-thirds of total employment.

OECD (2012a) analyses how these mitigation policy-induced changes in the industry composition of employment would affect overall skill demand. In light of the relatively small impact of the mitigation policy on industry mix, it is not surprising that the estimated impact on economy-wide skill demand is minimal.[18]

In sum, these simulations confirm previous studies by suggesting that ambitious mitigation policies would create only relatively modest economic costs, be they measured in terms of GDP, welfare or wage loss. However, they also highlight how wage earners could bear a disproportionate share of these costs unless offsetting policies are implemented, such as recycling carbon tax revenues so as to lower the taxation of labour income. These simulations also suggest that the structural adjustment pressures in the labour market that will be created by mitigation policy will not be too difficult to manage because the estimated impacts on the industrial mix of employment and overall skill demand are small. Do these results hold up when the model is made more realistic by allowing for labour market rigidities? In order to provide a tentative answer to this question, labour market imperfections have been introduced in the ENV-Linkages model through a wage equation implying that real wages do not adjust immediately to the new economic situation when mitigation policies are implemented.

How much do labour market rigidities reshape the economic impact of mitigation policies?

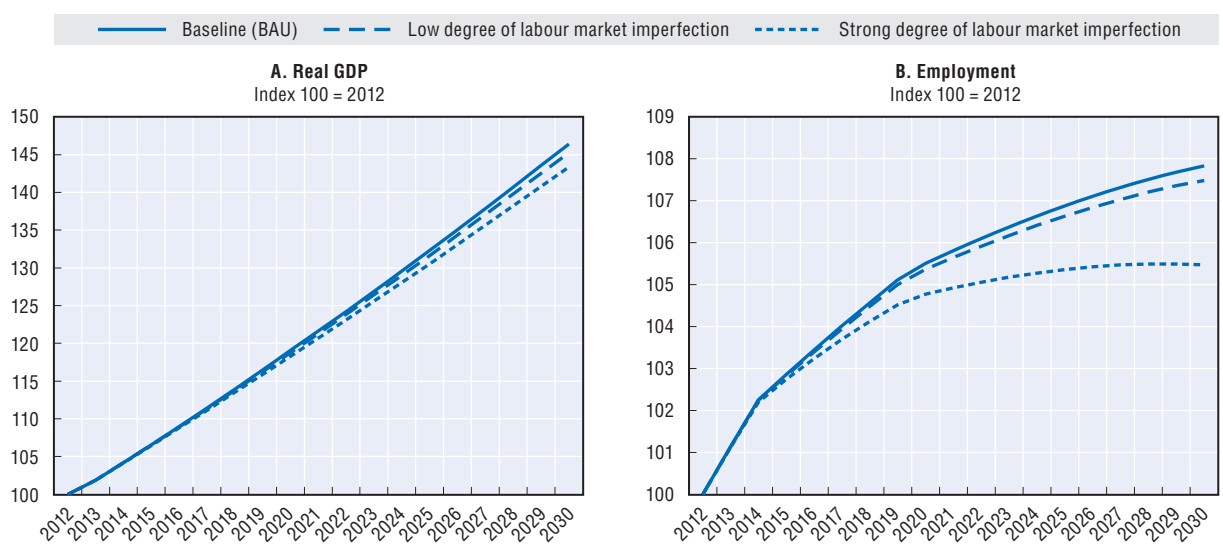
The modelling of labour market imperfections in the augmented version of the ENV-Linkages model follows the approach adopted by Montgomery *et al.* (2009) for evaluating the economic and employment impact of the American Clean Energy and Security Act of 2009. Extensive empirical evidence suggests that in most OECD countries wages do not adjust immediately to economic changes, be they cyclical or structural. To reflect this, simulations were carried out where the real net wage in each period was set at an intermediate value between the real net wage that would be observed in the absence of mitigation policies (*i.e.* the wage corresponding to the BAU scenario) and the real wage that would be reached if wages adjusted instantaneously so that the employment level is not affected by mitigation policies (*i.e.* the market-clearing wage). This provides a stylised representation of an economy in which workers temporarily resist the reduction in real wages associated with mitigation policy. This partial rigidity in wage setting implies that part of the labour market adjustment to mitigation policy takes the form of temporary job losses. While this simple representation captures wage rigidities in a qualitative manner and keeps the simulation model tractable, the numerical results need to be interpreted

with caution since labour market imperfections that may impede adjustment to mitigation policy are much more complex than the simple representation used in these simulation exercises.[19]

Figure 4.4 shows how the introduction of labour market imperfections into the OECD ENV-Linkages modifies the projected mitigation costs when permit revenues are redistributed in the form of uniform lump-sum transfers. As it is difficult to parameterise the model to the degree of wage rigidity in different countries, lower- and upper bound projections are provided: a low degree of labour market imperfection refers to a situation where 80% of the decline in the market-clearing wage rate is absorbed by workers immediately, while this proportion is set at only 20% when strong labour market imperfection is assumed. As would be expected, the economic cost of mitigation policy increases as the degree of wage rigidity increases. Nonetheless, economic growth slows only moderately when a strong degree of wage rigidity is assumed. Whereas real GDP for the OECD area as a whole increases by around 46% over the period 2012-30 in the BAU scenario, cumulative growth declines to 43% when mitigation actions are implemented in the context of strong rigidity (Figure 4.4, Panel A). A weaker degree of wage rigidity generates an intermediate growth path.

Introducing wage rigidity has a more pronounced effect on employment (Figure 4.4, Panel B). Whereas mitigation policy has no effect on employment when the labour market is fully flexible, the additional production costs associated with reducing GHG emissions depress employment levels when wages do not adjust fully to falling labour demand. For the OECD area as a whole, employment declines by 0.3% from baseline levels in 2030 in the scenario with a low degree of wage rigidity, and by 2.4% in the presence of strong wage rigidities. Indeed, the mitigation policy in the presence of strong rigidity substantially reduces the pace of

Figure 4.4. **GDP and employment impacts for different degrees of labour market rigidity when ETS revenues are recycled in the form of lump-sum transfers, OECD**[a]



Note: Simulated impacts of GHG mitigation policy are shown as deviations from the BAU baseline scenario that assumes no new mitigation policy measures are implemented and takes no account of how the resulting environmental damages would affect economic activity and well-being.

a) For the country converage of OECD, see Figure 4.1, note *b)*.

Source: OECD ENV-Linkages model.

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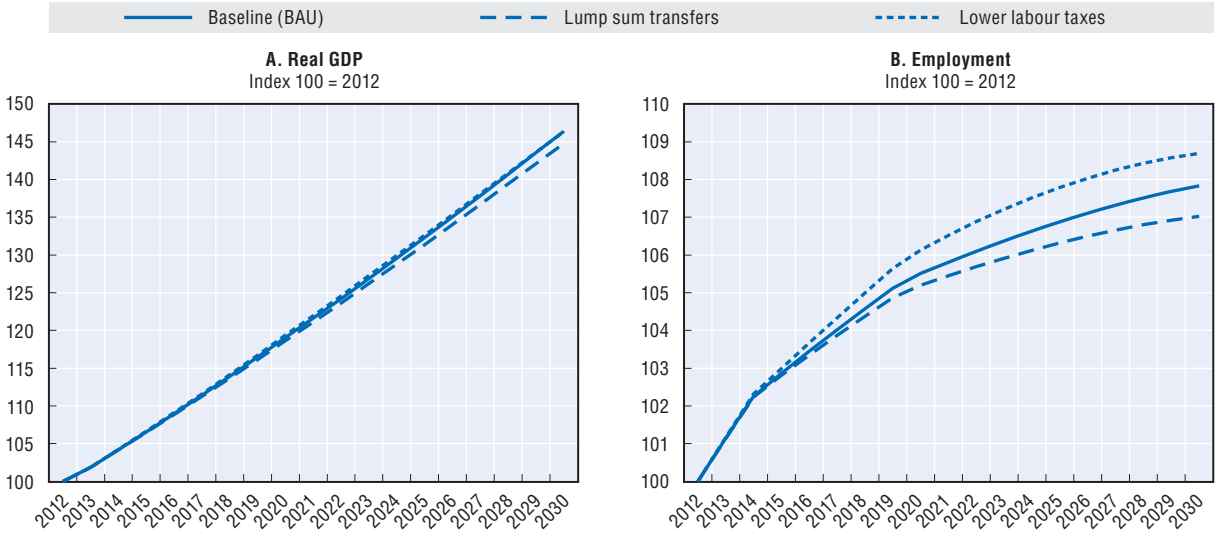
employment growth over the period 2012-30, namely, from 7.8% to 5.5%. However, this scenario is likely overly pessimistic as it assumes stronger wage rigidities than are likely to persist over an 18-year period.[20]

In the presence of labour market imperfections, the employment impact of mitigation policies depends crucially on how ETS revenues are distributed. This is illustrated in Figure 4.5, which compares two recycling options when the degree of labour market imperfection is set at an intermediate level (40% of the decline in the market-clearing wage rate is absorbed by workers immediately). As in Figure 4.4, mitigation policy depresses employment below the BAU path when revenues are distributed as lump-sum transfers to households. By contrast, recycling permit revenues so as to reduce taxation on labour income accelerates the pace of employment growth slightly relative to the BAU scenario. With this policy package in place, OECD employment increases by 8.7% over the period 2012-30, as compared with a 7.8% increase in the absence of mitigation actions. Combining mitigation policy with this recycling scheme boosts job creation more strongly in Europe, where the tax wedge on labour income is relatively high and hence acts as a larger drag on employment: European employment grows by 5.9% in the BAU scenario, but by 7.3% when the ETS is introduced and the resulting revenue is used to lower the labour tax wedge (Chateau *et al.*, 2011).

These simulation exercises illustrate the *double-dividend* principle that certain policy mixes can improve both environmental and labour market performance, while also illustrating the importance of taking account of the quality of labour market institutions when making choices about how permit revenues will be recycled. While these conclusions are in line with several earlier studies analysing the employment impact of mitigation actions within the framework of a CGE or hybrid models (see discussion of earlier studies

Figure 4.5. **GDP and employment impacts for different recycling options of ETS revenues and an intermediate degree of labour market rigidity, OECD**[a]



Note: Simulated impacts of GHG mitigation policy are shown as deviations from the BAU baseline scenario that assumes no new mitigation policy measures are implemented and takes no account of how the resulting environmental damages would affect economic activity and well-being.

a) For the country coverage of OECD, see Figure 4.1, note *b)*.

Source: OECD ENV-Linkages model.

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above), they are subject to several caveats. In particular, policy combinations that could not be modelled with the current version of the ENV-Linkages model might be superior to the policy scenarios simulated here. For example, mitigation policy could be combined with labour market reforms that reduce rigidities that would otherwise impede structural adjustment, freeing up the carbon permit revenues for other uses, such as reducing public deficits or subsidising eco-innovation.[21]

2. Direct impacts on employment and skill requirements in key winning and losing sectors: Lessons from partial-equilibrium analysis

The general-equilibrium approach in the previous section emphasises how the transition to green growth will be an important driver of structural changes across the labour market. It also provides a number of insights into economy-wide policy issues. However, these general-equilibrium models also have important limitations as a guide for making labour market and skill development policy choices, at least in their current form. One of their biggest limitations is that they provide little information about how the transition to low-carbon growth will affect job-skill demands, because it is difficult to incorporate much detail about job-skill requirements into these complex models and, in any case, very little is known about how the switch to greener technologies will alter job-skill requirements across the economy. These models also provide little guidance concerning how easily labour can be shifted from declining to growing sectors, even though that represents a potential "choke-point" that could slow the necessary structural change.

Partial-equilibrium analysis and case studies focussing on key sectors or workforce groups can help to overcome these limitations. They thus represent an essential complement to general-equilibrium modelling when analysing how labour market and skill development policy can best support an efficient and fair transition to green growth. This section focuses on those segments of the labour market that will be most intensely affected by a transition to green growth, including both green sectors which are likely to experience rapid growth and high-polluting sectors which are likely to shrink or profoundly re-engineer their production processes.

Green jobs: Emerging employment opportunities and emerging skills requirements

How many green jobs will be created?

Despite all of the uncertainty about the form that green growth will take, it can confidently be predicted that the transition to a low-carbon and resource-efficient economy will entail a significant expansion of employment in a number of "green" economic activities that either replace polluting activities with cleaner alternatives (*e.g.* renewable energy displacing fossil fuels) or provide environmental services (*e.g.* waste management and reforestation).

It has become common to refer to some or all of the employment in these activities as "green jobs". A number of different approaches have been proposed for defining green jobs, but no consensus has yet emerged (see Box 4.2). Indeed, the most widely cited definitions imply widely different estimates of the share of green jobs in total employment. For example, a major study for European Union countries presents three definitions which imply EU-wide green jobs shares that range from 2% to 21% (GHK Consulting *et al.*, 2007). This huge variation reflects different judgments about the appropriate criterion for

Box 4.2. **Defining and counting green jobs: A work in progress**

A number of definitions of green jobs have been proposed, but no consensus has emerged and the OECD has not endorsed a specific definition. Most statistical definitions take an *industry approach*, identifying green jobs with employment in industries that are judged to produce green goods and services. However, judgments differ concerning which industries should be classified as green, leading to disparate estimates of the number of green jobs. Two definitions have been proposed at the international level:

- Building on the 1999 OECD/Eurostat definition of eco-industries (*i.e.* industries producing environmental goods and services, such as pollution and resource management industries), Eurostat has developed a relatively narrow definition which implies that green jobs account for 2% of total employment in the EU area (EC, 2009). The US Department of Commerce (2010) has implemented a similar approach and concludes that green jobs accounted for between 1.5% and 2% of total employment in the United States in 2008.
- The United Nations Environmental Programme and the ILO developed a broader industry-based definition of green jobs (UNEP *et al.*, 2008). This definition also encompasses employment in industries that are heavily dependent on environmental resources (*e.g.* agriculture and forestry) and environmental quality (*e.g.* environment-related tourism). One drawback with this expanded definition of green sectors is that many firms in these environmentally-dependent sectors may not operate in an environmentally-friendly manner. However, the broader definition has the advantage of drawing attention to sectors that are likely to be adversely impacted by climate change or other forms of environmental degradation and thus are likely to be especially relevant for adaptation policies. When applied to the EU area, this broader definition classifies approximately one job in five as "green".

A growing number of national governments are developing their own definitions of green jobs to serve as a basis for collecting statistics and making policy choices (see OECD, 2012b, for more details). Of the 27 countries responding to an OECD questionnaire on green jobs, ten have adopted a definition of green jobs, five are in the process of developing a definition and 12 have yet to take a decision to define and count green jobs (see OECD, 2012b, for more complete information). Nine countries have produced estimates of the number of green jobs using either a recently adopted definition or an experimental definition. These national initiatives have often been guided, at least in part, by the international standards mentioned above, but have also incorporated novel aspects, as is illustrated by on-going work in the United States to develop statistics on green jobs:

- The US Bureau of Labor Statistics (BLS, 2010) is using two different approaches to measuring green jobs: *i)* an *output approach,* which identifies business establishments that produce green goods and services (GGS), estimates the GGS share of their total sales and then counts that same proportion of all jobs in these establishments as green jobs; and *ii)* a *process approach* which identifies business establishments that use environmentally friendly production process and practices, regardless of the nature of the good or service they produce, and counts the jobs associated with these processes as green jobs. The first approach is a variation on the already common approach that relies on the nature of the good or service produced and begins by identifying industries that produce GGS. Rather than treating all output and employment in these industries as green, the BLS method estimates the share of green output in each establishment and counts the same share of its employment as green. First estimates implementing this approach indicate that 2.4% of total employment was green in 2010 (BLS, 2012). The second approach is even more of a departure because it allows for the fact that some workers in firms that do not produce GGS may, nonetheless have green jobs (*e.g.* pollution control workers in a steel mill). The BLS will publish its first estimates using the process approach later in 2012.

considering a job to be green when the degree of "greenness" is difficult to assess precisely and varies more or less continuously across jobs. A related complication is that the most appropriate "green" threshold will evolve as technological progress makes it increasingly economical to reduce adverse environmental impacts. By the same logic, this threshold could also vary between more and less developed countries, if the latter lack either access to the most sophisticated green technologies or the capacity to apply them effectively.[22]

Even if convergence on a widely accepted definition of green jobs remains elusive, efforts to identify types of employment that are particularly critical to achieving green growth are valuable for guiding labour market and training policy. Demand for certain types of green workers will have to grow rapidly if the transition to green growth is to succeed and policy makers should attempt to anticipate recruitment and skill bottlenecks that would impede the transition. This pragmatic approach requires only that key types of green jobs be identified and that future hiring needs and job-skill requirements be assessed with a certain degree of accuracy. There are a growing number of successful applications of this pragmatic approach which has also proven to be useful for assessing skill development needs in the emerging green economy (see ILO, 2011a, for an excellent survey of many studies taking this approach).

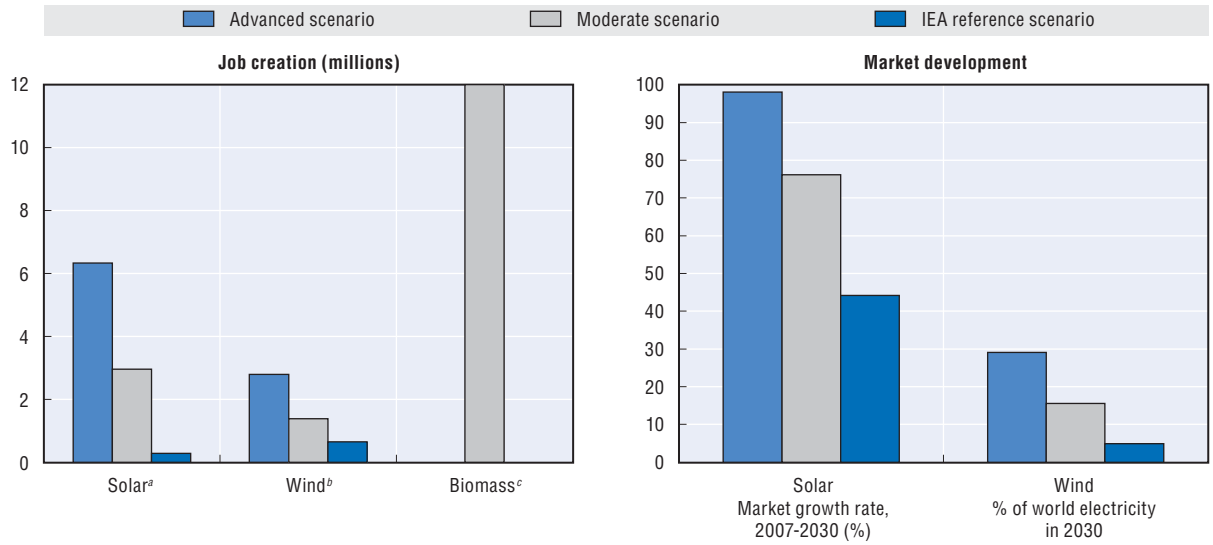
An increasing number of studies put forward the potential for job creation associated with the expansion of renewable energy generation and distribution. After an extensive review of available studies, the recent report by UNEP, ILO, IOE and ITUC estimates that in 2006, about 2.3 million people were employed worldwide in the renewable energy sector (UNEP *et al.*, 2008). While the majority of these jobs are in developed countries, the development of renewable energy and other environment-related jobs extends well beyond advanced economies. UNEP (2011b) updated its estimate of worldwide employment in durable energy to more than 3 million workers in 2009. While this number is growing rapidly, it is still a tiny share of total employment. China has the largest absolute number of workers in renewable energy (1.1 million), but that represents only about 0.1% of total employment. The employment share of renewable energy is somewhat higher in a few EU countries (*e.g.* 0.7% in Germany and 0.8% in Denmark).

Employment growth in the renewable energy sector is projected to be rapid in the coming decades. UNEP (2011b) suggests that by 2030, given the increasing interest in energy alternatives, up to 20 million jobs could be created worldwide: 2.1 million jobs in wind energy production, 6.3 million in solar photovoltaic and 12 million in biofuels-related agriculture and industry. Similarly, Fraunhofer ISI *et al.*, (2009) estimate that achieving the EU target for the share of renewables in total energy consumption to attain 20% in 2020 could create more than 2 million jobs in the European Union, while Wei *et al.* (2010) estimate that implementing a 30% renewable portfolio standard together with aggressive energy efficiency measures would expand US employment in the energy sector by 4 million jobs in 2030.

As Figure 4.6 shows, these various employment estimates are quite sensitive to the assumption made regarding the expansion of renewable energy markets.[23] They are also in constant need of updating as economic conditions and policy stances change. For example, the European Commission (EC, 2010) estimated the employment impact of implementing the "high pledge" from the climate change conference in Copenhagen in 2009 and concluded that shifting from a 20% to a 30% share for renewable energy in 2020 would create an additional 65 000 jobs in the renewable sector. All such estimates also rely on a number of modelling assumptions regarding the employment content of the whole

Figure 4.6. **Projected global employment in the renewable energy sector by 2030**

Estimates taken from the UNEP/ILO/IOE/ITUC report



a) Underlying assumptions (EPIA and Greenpeace International, 2007, p. 48): ten jobs are created per megawatt (MW) during production; about 33 jobs per MW during the process of installation; wholesaling of the systems and indirect supply (for example in the production process) each create 3-4 jobs per MW; and research adds another 1-2 jobs per MW. Over the coming decades, it can be assumed that these numbers will decrease as the use of automated machines will increase (especially for jobs involved in the production process).

b) Underlying assumptions (GWEC and Greenpeace International, 2006, p. 46): 16 jobs are created for every MW of new capacity through manufacture and component supply; a further 5 jobs by wind farm development, installation and indirect employment; and 0.33 jobs for regular operations and maintenance work at wind farms. As production processes are optimised, the number of manufacturing jobs falls to 11 jobs for every MW of cumulative capacity by 2030.

c) Estimates based on various studies, for different countries and areas.

Source: UNEP, ILO, IOE and ITUC (2008), *Green Jobs: Towards Decent Work in a Sustainable, Low-carbon World*, Geneva.

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production, transformation and commercialisation process of renewable energy sources. Most importantly, however, these estimates represent only the potential for *gross* job creation within the renewable energy sector.

A somewhat more comprehensive picture is provided by a number of detailed studies of the restructuring of the energy sector towards a cleaner energy-mix (*e.g.* Kammen *et al.*, 2004; Pearce and Stilwel, 2008; and IEA, 2009). These studies have typically concluded that *net* employment gains will result for energy-related activities, even after taking account of the jobs lost in the more polluting energy sector; because the renewable energy sector is more labour intensive and thus requires more jobs per megawatt of energy produced than the fossil fuel-based energy sector. Based on an in-depth analysis of 13 independent reports and studies on the direct economic and employment impacts of the clean energy industry in Europe and the United States, Kammen *et al.* (2004) argue that increasing the share of renewable energy in the United States to 20% of consumption levels by 2020 could create more than 200 000 jobs (against less than 90 000 jobs in a scenario without renewables). Similarly, a study supported by the European Commission concludes that net employment gains of nearly 1.4 million jobs could be generated in Europe by meeting the current policy goal of raising the renewable energy share to 20% in 2020 (MITRE, 2004). It needs to be emphasised, however, that these are still partial-equilibrium studies that do not capture the full macroeconomic impact of environmental policies on employment. While a general-equilibrium approach is required to assess the overall

employment impact of green initiatives, such as shifting the energy sector towards greater reliance on renewable sources, these sectoral studies provide a much more finely grained picture of the types of new jobs being created in the sectors that will grow most rapidly and where job-skill requirements are least likely to be met by the existing vocational training system.[24]

What skills will green workers need?

The transition towards low-carbon and resource-efficient growth clearly will affect job-skill demands due to both rapid employment growth in emerging green sectors, such as renewable energy, and the diffusion of environmentally-friendly production technologies and practices more broadly across the economy. It would be difficult to predict *a priori* how skill demand will be affected. Accordingly, it is a very welcome development that detailed empirical information has recently become available about how skill demands are changing. This section briefly reviews the key lessons about emerging demands for green skills and how well they match with the vocational education and training (VET) systems in place. It relies particularly on two important sources of detailed information:

- *International studies conducted by the ILO.* Working together with the European Union and other partners, the ILO has recently completed a series of international studies of the impact of the transition to green growth on job-skill requirements (ILO, 2011a, b, c, d; and Cedefop, 2010). Twenty-one national case studies, along with detailed international case studies of the renewable energy and construction sectors, form the core of this work.
- *Labour market information systems.* Another valuable source of information about the emerging skill requirements of green jobs is provided by public labour market information (LMI) systems, which are intended to support job brokering by public employment services, guidance counselling services and labour market actors generally. For example, the US Department of Labor (DOL) is making a major investment in the collection and dissemination of better information about emerging green occupations, including projected recruitment needs, pay, working conditions, the skills required by those jobs and sources of training to acquire those skills.[25]

A first finding is that green jobs – understood to encompass new green specialties, such as energy auditors, familiar but rapidly growing green occupations, such as waste-recycling operators, and existing occupations, such as the construction trades, that have not been associated with environmental benefits in the past but which are evolving so as to become greener – are very diverse in their skill requirements. This is true in terms of the overall levels of skills required by these jobs, the specific content of the skills required and in how novel those skills are as compared to familiar occupational requirements for which training pathways are already in place.

Perhaps the most important finding from the point of view of skill policy is that there appear to be relatively few unique "green skills". Instead, most green jobs resemble familiar occupations, requiring a mix of generic skills, which are in wide demand throughout the economy (*e.g.* problem-solving, management and mathematical skills), and specific occupational skills. Furthermore, most of the specific occupational skills required by these jobs are familiar, although some are novel and directly related to the green character of the production activity (ILO, 2011b).

Since technological innovation will be essential to lower the cost of meeting environmental objectives (OECD, 2011a), it is sometime argued that green sectors will be characterised by intense innovation, implying that the generic skill requirements will tend to be higher overall than for similar occupations in other parts of the economy, where workers are less frequently called upon to develop or adapt to new technologies. It has also been argued that many of the jobs in these sectors will require at least a solid grounding in science, technology, engineering and mathematics (STEM) skills (ILO, 2011b). However, much remains to be learned about how eco-innovation will alter job-skill requirements, including how intense these pressures will be in different countries and industries (see Box 4.3).

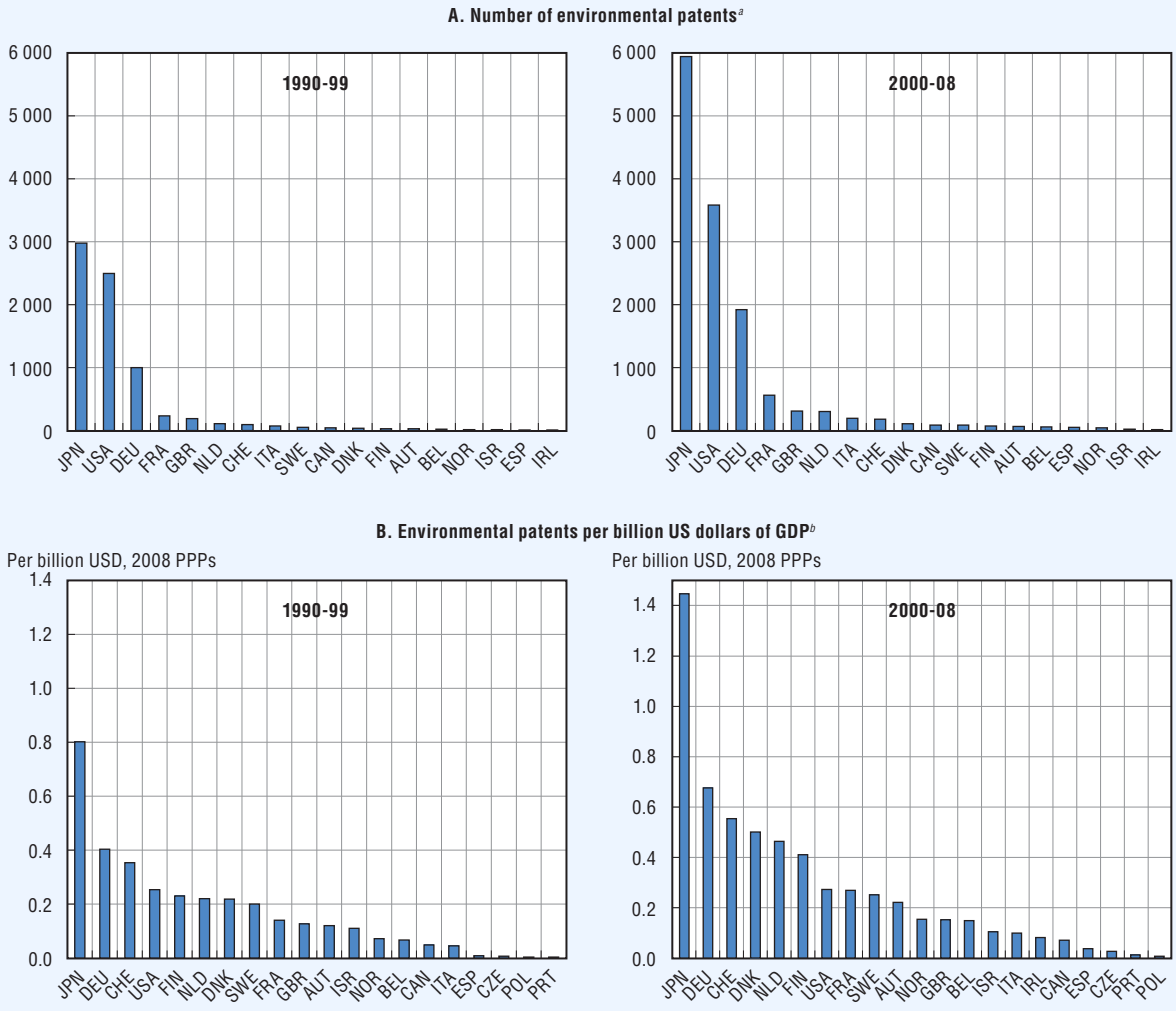
Box 4.3. **Eco-innovation: Which countries and industries are in the lead and how are new green technologies changing job-skill requirements?**

OECD (2012a) presents new evidence about how the intensity of eco-innovation varies across countries and industries, as well as some tentative evidence concerning how jobs skill requirements and other employment conditions are affected. Among the key findings:

- Environmental patenting data for 21 OECD countries show a strong upward trend between the 1990s and the 2000s, confirming that eco-innovation has intensified (see Panel A of the figure below). Three high-income countries (Japan, the United States and Germany) accounted for 84% of total patents during 2000-08, suggesting that only relatively few countries are presently well positioned to become market leaders in environmental technologies. However, several smaller European countries, such as Switzerland, Denmark and the Netherlands, have a high intensity of environmental patenting per unit of GDP (see Panel B of the figure below) and may also be able to gain technological leadership in certain green technology niches that could serve as the basis for developing new export markets.
- Relatively few industries account for a large share of environmental R&D. The two sectors accounting for the most environmental patents are non-financial business services – which includes research and development, and computer services – and the manufacture of electrical machinery and optical equipment – which includes ICT hardware. Interestingly, the industries typically singled out as green are not among the main inventors of new environmental technologies, but several of the most-polluting industries are quite active in environmental patenting, most notably the chemicals industry. The motor vehicle manufacturing sector (including automobiles) is also an important developer of new green technologies in Japan, Germany and France, but not in the United States where environmental regulation has provided less incentive to innovate in this industry in recent decades.
- The concentration of environmental patenting in a few industries suggests that relatively few workers and firms are involved in developing novel environmental technologies, even in the countries conducting most of the environmental R&D. However, new green technologies developed in one industry are often intended for use by other sectors, potentially affecting employment levels and job-skill requirements more broadly. For example, a large majority of the environmental patents registered by the electrical machinery and optical equipment industry were for the following five types of technologies: *i)* climate-change mitigation; *ii)* renewable energy; *iii)* abatement of air and water pollution, and waste; *iv)* energy efficiency; and *v)* transportation.
- Firm-level data for Germany confirms that eco-innovation – defined broadly to include the adaptation of green technologies developed by other firms – is much more widespread than green patenting. Environmental regulation is an important motivation for adopting new green technologies, as is customer demand for environmentally responsible products. Eco-innovation is associated with higher skill requirements, training and pay, as well as a stronger export orientation. However, the links between innovation and these employment conditions may be somewhat weaker for environmental than for non-environmental innovations.

Box 4.3. **Eco-innovation: Which countries and industries are in the lead and how are new green technologies changing job-skill requirements?** *(cont.)*

Intensity of environmental patenting by country, 1990-2008



a) Data not shown for countries with fewer than 100 total patents. This exclusion applied to Czech Republic, Poland and Portugal.
b) Billions of USD in purchasing power parities.

Source: OECD calculations based on OCDE PATSTAT and ORBIS databases.

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Occupations requiring specifically green vocational skills also typically require many skills that overlap with those required by similar non-green occupations. This pattern suggests that the special training associated with green jobs often can take the form of "top-up" training that adapts workers, who are already qualified in an occupation, to using greener technologies or greener ways of working.[26] For example, designing and constructing energy-efficient buildings requires primarily familiar skills from the construction sector, but it also requires incremental training to understand how those skills can be applied in the construction of energy-efficient structures (ILO, 2011d).

There is also a need to update initial VET to prepare future labour market entrants to meet emerging green skill demands. In many cases, this is best done by enriching the curriculum of existing training and apprenticeship programmes to incorporate green elements, rather than by developing new green training pathways. Indeed, experience in Germany has shown that many secondary students are reluctant to take up specialised environmental apprenticeships due to the perceived risk of being trained too narrowly, which may be a disadvantage for them in the future.In response, basic knowledge in environmental protection has been incorporated into the vocational curricula across sectors in Germany (Cedefop, 2010). However, some emerging green occupations do appear to justify the creation of new educational or training pathways, especially at the highest skill levels. Since these occupations often take the form of new sub-specialties within long-standing disciplines, such as research and engineering positions in the renewable energies sector or systems analysts who develop ICT supports for "smart power grids", it may be relatively easily to add the new courses of study to existing programmes.

Even if the evolution of job-skill needs proves to be as incremental as is suggested by the evidence summarised above, it will still be a challenge to anticipate the new skill needs generated by the transition towards green growth and to adapt initial and continuing VET quickly enough to avoid significant skill mismatches from developing. Indeed, evidence from a number of countries suggests that skill shortages have already developed in certain sectors or occupations, where green growth policies have created a need for new skills or new combinations of familiar skills. Energy-efficient construction and retrofitting, renewable energy, energy and resource efficiency and environmental services appear to be among the most affected sectors. For example, a report to the French government recently identified a number of emerging occupational specialties in the construction sector (*e.g.* energy auditors and solar panel installers), which are not well served by traditional training institutions and hence face potential recruitment bottlenecks (COE, 2010; OECD 2012a). Other examples of skill shortages identified by Cedefop (2010) include difficulties reported by employers in recruiting skilled photovoltaic workers (Germany), design engineers for smart grids (the United Kingdom), installation and maintenance of solar electrical systems (Spain), and project managers with competencies in renewable energy (Denmark). Recent OECD work has shown that small and medium-sized enterprises (SMEs) face particular challenges in upgrading their workers' skills to meet new skill requirements created by the transition towards green growth (OECD, 2012e and 2012f).

While these examples of skill shortages confirm the importance of co-ordinating environmental policy initiatives with an assessment of their implications for the VET system, it is difficult to assess how general and severe green skill shortages are based on evidence from highly diverse case studies.[27] Consequently, it is unclear whether skill shortages are presently a significant brake on the transition towards green growth. At a minimum, it can be concluded that skill shortages could become more of a problem as labour markets recover from the 2008-09 recession and more ambitious green growth policies are put in place.

Brown jobs: Structural adjustment pressures in the most polluting industries

Even as a transition towards green growth stimulates job creation in environmentally beneficial activities, employment losses can be expected in other sectors, particularly those with the largest adverse environmental impacts. This pattern is illustrated by the simulations of climate-change mitigation policy in Section 1, which show that a tax on

CO_2 emissions leads to expanded employment in the renewable energy sector, but employment losses in the extraction of fossil fuels and their use in generating electricity. Potential employment losses in highly polluting industries may be reduced or even avoided, if changes in production technology can be introduced that reduce harmful environmental impacts (*e.g.* carbon capture and storage). Even in such cases, the industry's workforce would still face structural adjustment pressures, as new technologies and work practices change the composition of employment and the skills required to do the work. This section analyses potential adjustment costs in the most polluting industries, as proxied by high CO_2 emissions intensity. It identifies the most polluting industries, documents how many workers they employ and analyses how the characteristics of workers in these industries and their turnover patterns are likely to influence their ability to adapt successfully, should they lose their job or need to retrain in order to retain it.

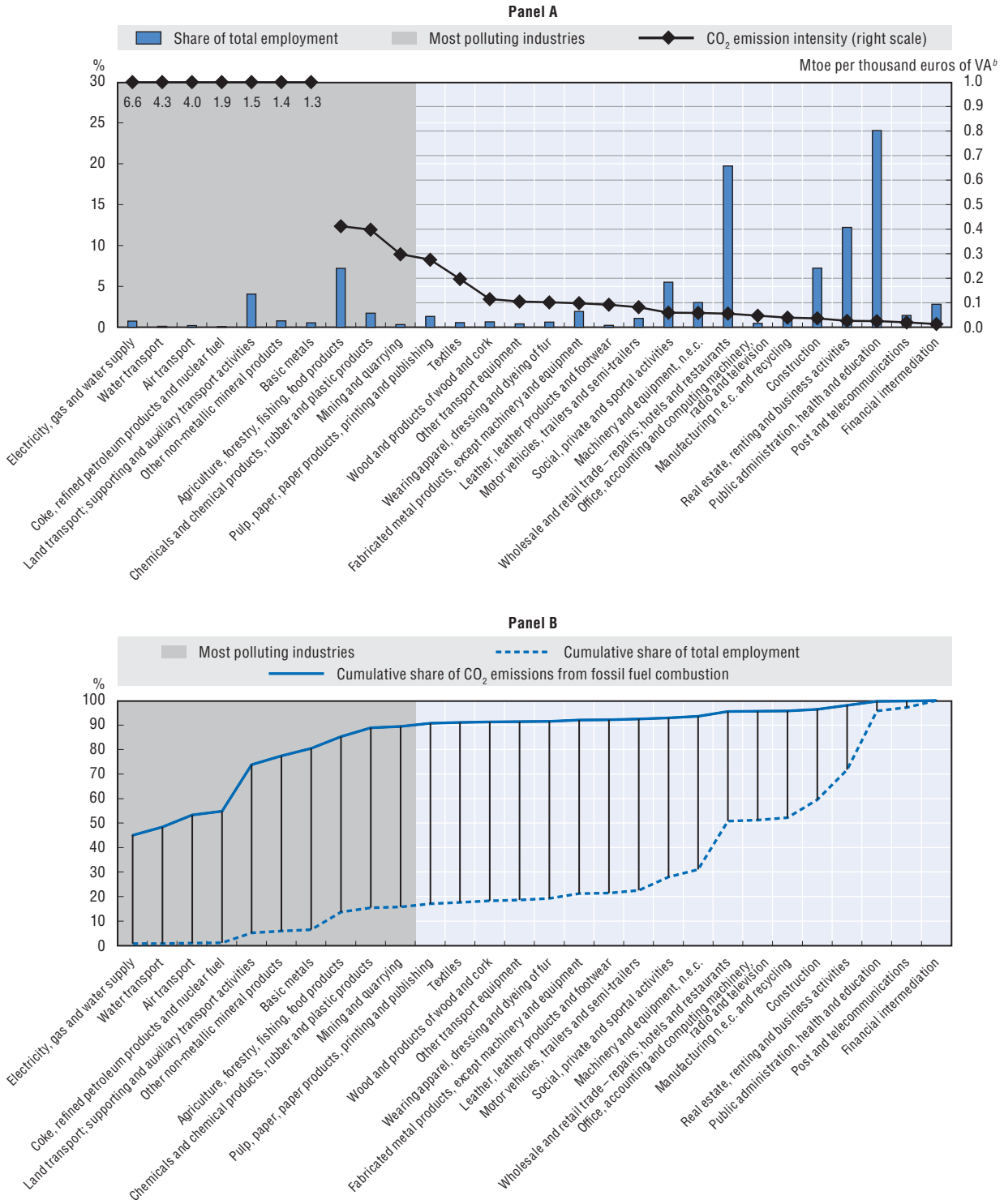
Which are the most polluting industries?

Carbon taxes and similar policies are more likely to result in job losses in industries characterised by a relatively high ratio of CO_2 emissions to value added than in industries with a relatively low intensity of CO_2 emissions, even though this measure is an imperfect proxy for structural adjustment pressures.[28] As shown in Panel A of Figure 4.7, the average CO_2 emissions intensity in 25 EU countries varies widely across industries, ranging from 6.6 Mtoe of CO_2 emissions per thousand euros of value added in the electricity sector to almost no emissions in financial intermediation services. Ten sectors can be identified as being the most polluting: two energy producing sectors (electricity and fossil/nuclear fuels), three transport sectors (including water; air; and land and supporting and auxiliary transport activities), three manufacturing sectors (basic metals; other non-metallic mineral products; and chemicals), as well as agriculture and mining.[29] It is notable that agriculture and land transportation are the only industries in this group accounting for substantial shares of total employment (a combined 11.3% of total employment in the EU25 region). By contrast, CO_2 emission intensity is low in the three biggest sectors in terms of employment – namely, public administration, health and education (24.1% of total employment), wholesale and retail trade, repairs, hotels and restaurants (19.7% of total employment), and real estate, renting and business services (12.2% of total employment) that together account for more than half of total employment.

Figure 4.7, Panel B shows that the ten most intensely-polluting sectors account for a large share of total CO_2 emissions (nearly 90%), while they account for less than 16% of total employment. This suggests that the structural adjustment pressures in the labour market that would be created by a significant increase in the price of carbon may be concentrated on a relatively small portion of the total workforce.[30] It is also notable that some of these industries (agriculture, mining, coke and basic metals) have been characterised by a secular decline in employment for some time, especially in the most advanced OECD economies. This suggests that any additional job losses in these sectors, as a result of green growth policies, are likely to generate structural adjustment pressures of a type that has already been present and may be adequately managed by existing labour market programmes.

While the most polluting industries account for only a relatively small share of total employment (14% of total workforce) in the 15 major EU countries included in Figure 4.8, there are significant cross-country variations, with the proportion ranging from a low of 11% in Denmark and Germany to a high of 27% in Poland. Among the countries with the

Figure 4.7. **CO_2-emissions and employment by industry in 25 EU countries, 2005**[a]



a) Averages for the EU25 region.
b) Mtoe: Million tonnes of oil equivalent.

Source: Employment and value added data from EUKLEMS, CO_2 emissions data from GTAP.

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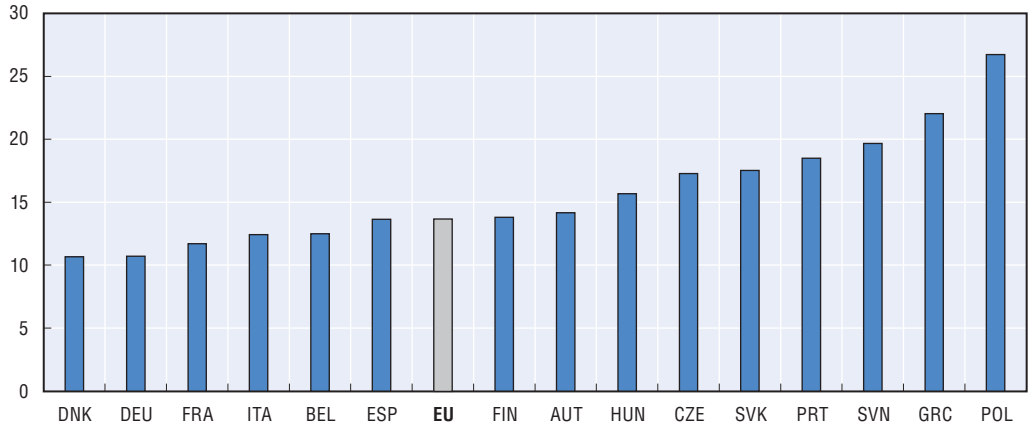
greatest concentration of employment in highly polluting industries are the five central and Eastern European members, where high emissions intensity in manufacturing is, in part, a heritage of economic development policies during the period of central planning and where agriculture still accounts for a high share of total production. Most western European countries have below-average employment shares in the most polluting industries, although Greece and Portugal are exceptions. The concentration of employment in the most polluting industries in countries with relatively low GDP per capita presents a risk that the adjustment costs associated with the transition towards a low-carbon economy could be greater in countries where living standards are lower.[31]

Figure 4.8. **Employment share of the most polluting industries in selected EU countries, 2000-07**[a]

Percentage of total employment



a) Most polluting industries: agriculture, hunting and forestry; fishing, mining and quarrying; electricity and gas; air transport; water transport; land transport and other supporting and auxiliary transport activities, including activities of travel agencies; coke, refined petroleum and nuclear fuel; chemicals and chemical products; other non-metallic mineral products; basic metals.

Source: EU Labour Force Survey.

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The adjustment costs associated with green structural change are also likely to be unevenly distributed across regions within countries, due to the high localisation of some of the most polluting industries. OECD (2012a) analyses which of the most polluting industries are the most geographically concentrated and hence a potential source of locally concentrated restructuring pressures. The least localised of the highly polluting sectors are electricity generation and supply, the two manufacturing sectors, land transportation, supporting and auxiliary transportation, and agriculture, forestry and fishing. By contrast, several of the most polluting industries are strongly localised in the Czech Republic, Poland and the Slovak Republic: coke and fuel production, and basic metals in the Slovak Republic; mining and water transportation in Poland; and basic metals in the Czech Republic. Air transportation services are also highly localised in these and most other European countries, a reflection of the concentration of air transport activity in major business centres.

If the job losses associated with the transition towards green growth should prove to be spatially concentrated, that would represent a difficult policy challenge. Plant closures and mass lay-offs can have large and long-lasting effects on the region where they occur, especially if the region is relatively isolated and there is a paucity of growing firms and

sectors to absorb displaced workers. This suggests that regional and local government may be important actors in managing the structural adjustment costs associated with the transition towards green growth. Identifying skill needs and organising the provision of training related to green jobs is likely to be one of the necessary components of successful initiatives for regional economic rejuvenation (OECD, 2012e).

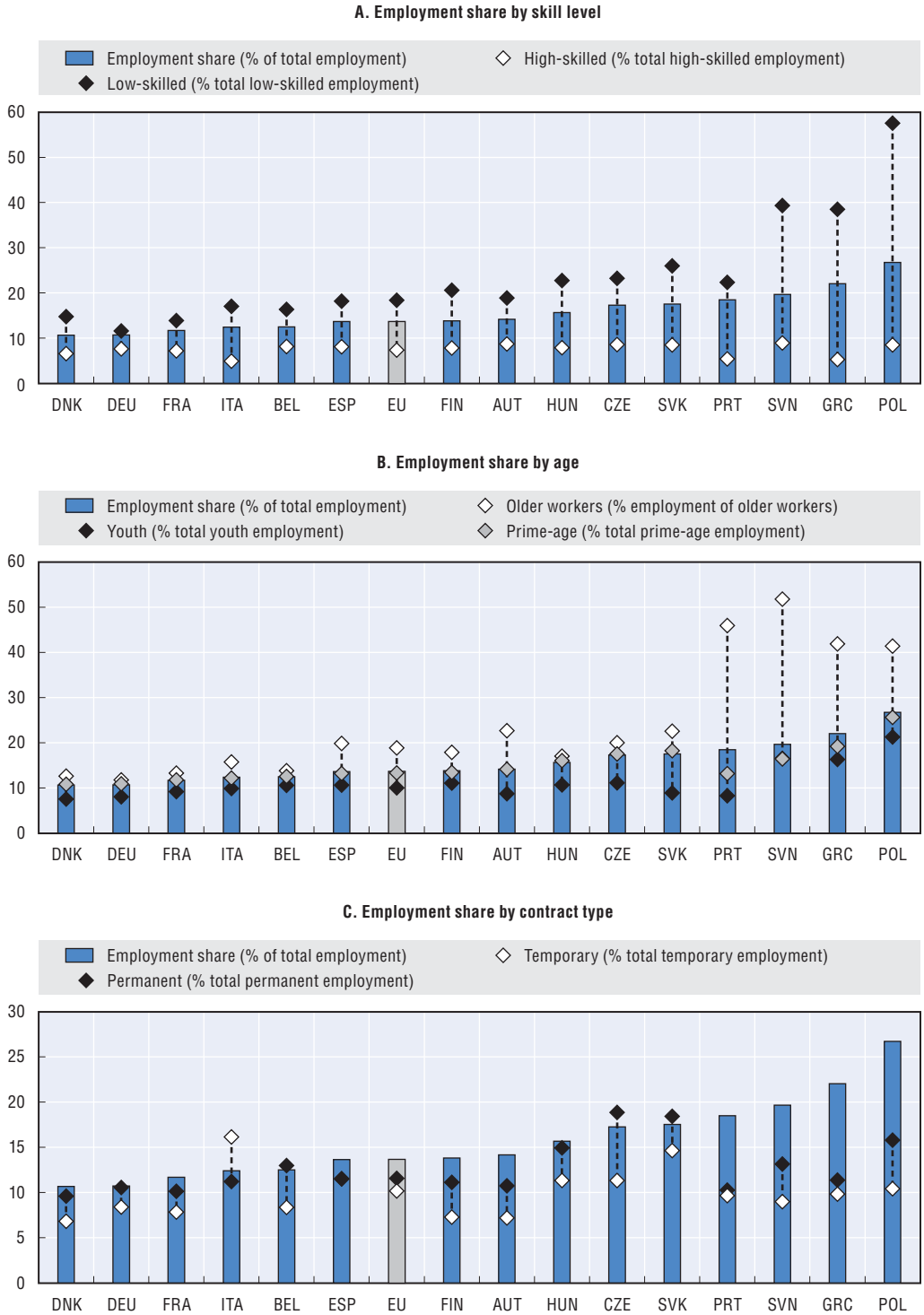
Are workers in the most polluting industries different from the rest of the workforce?

It is important to ascertain which types of workers tend to work in the most polluting industries and whether their characteristics are such as to help or hinder them should they need to move into new jobs in other sectors. An accurate profile of the workers most at risk of being displaced by green growth policies can also help to identify which re-employment and training services would minimise the resulting adjustment costs, thereby contributing to a fair and efficient transition toward green growth while reducing political resistance to the more ambitious environmental policies required to green the economy. This sub-section examines the age and skill profile of the current workforce in the most polluting industries, as well as the types of employment contracts they hold, while the next sub-section compares mobility outcomes for workers in these and other industries. This empirical analysis makes use of German CO_2 output-intensity data, because doing so allows a more disaggregated sectoral analysis (see Annex Table 4.A1.1 for a list of the sectors analysed and their numerical codes). Due to the need to obtain adequate sample sizes for a finer disaggregation of industries, the analysis focuses on the 15 larger EU countries presented in Figure 4.8.

Figure 4.9 provides a portrait of employment in the most polluting industries. The following patterns emerge:[32]

- The share of low-skilled workers employed in the most polluting industries exceeds that for high-skilled workers in all of the countries analysed. On average across the 15 EU countries, the most polluting industries accounted for 18% of low-skilled employment in 2000-07, as compared with 14% of all workers and just 7% of high-skilled workers. In other words, workers who have not finished upper secondary schooling are more than twice as likely as workers with a university-level degree to work in the most polluting industries. There is also a tendency for older workers to be over-represented in these industries (19%). The over-representation of low-skilled and older workers is particularly pronounced in the countries with the highest concentration of employment in the most polluting industries, that is in Poland, Greece, Slovenia and (as regards older workers) Portugal. By contrast, fewer than 10% of employed youth work in the most polluting industries in all of the countries considered. The low representation of youth in the workforce of the most polluting industry probably helps explain why employees in these industries are more likely to have permanent contracts than are employees in the overall economy (Italy is an exception).
- The concentration of the job-displacement risk associated with an increase in carbon taxes on low-skilled and older workers has important implications for the expected size of the adjustment costs associated with green growth, as well as for the design of labour market and training policies intended to minimise adjustment costs. A large body of empirical research has shown that low-skilled and older workers face above-average displacement costs – due to both longer durations of unemployment and greater wage losses once re-employed (see OECD, 2005a and 2005b, and the sources cited there) – and also tend to have relatively limited access to skill upgrade training (OECD, 2003).

Figure 4.9. **Employment share of the most polluting industries in selected EU countries by skill, age and contract type, 2000-07**



Note: Most polluting industries: agriculture, hunting and forestry; fishing, mining and quarrying; electricity and gas; air transport; water transport; land transport and other supporting and auxiliary transport activities; activities of travel agencies; coke, refined petroleum and nuclear fuel; chemicals and chemical products; other non-metallic mineral products; basic metals.

Source: EU Labour Force Survey.

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Labour mobility differences across industries and countries

This sub-section deepens the analysis of potential barriers to achieving the labour market structural change that will be required to make the transition towards green growth, by analysing labour mobility patterns directly. Of particular concern is whether workers currently employed in the most polluting industries, or some part of this group, exhibit low levels of mobility and hence might encounter difficulties should green-driven economic restructuring require them to change employers and possibly also industry and occupation. One reason to anticipate higher adjustment costs following displacement for relative immobile workforce groups is that they tend to have accumulated greater tenure on the lost job. Research has consistently shown that higher tenure workers tend to experience greater adjustment costs following job displacement than do lower tenure workers. Cross-country comparisons also suggest an association between high adjustment costs and low mobility. Year-to-year earnings volatility for individual workers also tends to be relatively low in countries characterised by above-average worker mobility rates: workers change jobs more often in these countries, but when they do so they generally find a new job relatively quickly that offers a similar wage (OECD, 2011c).

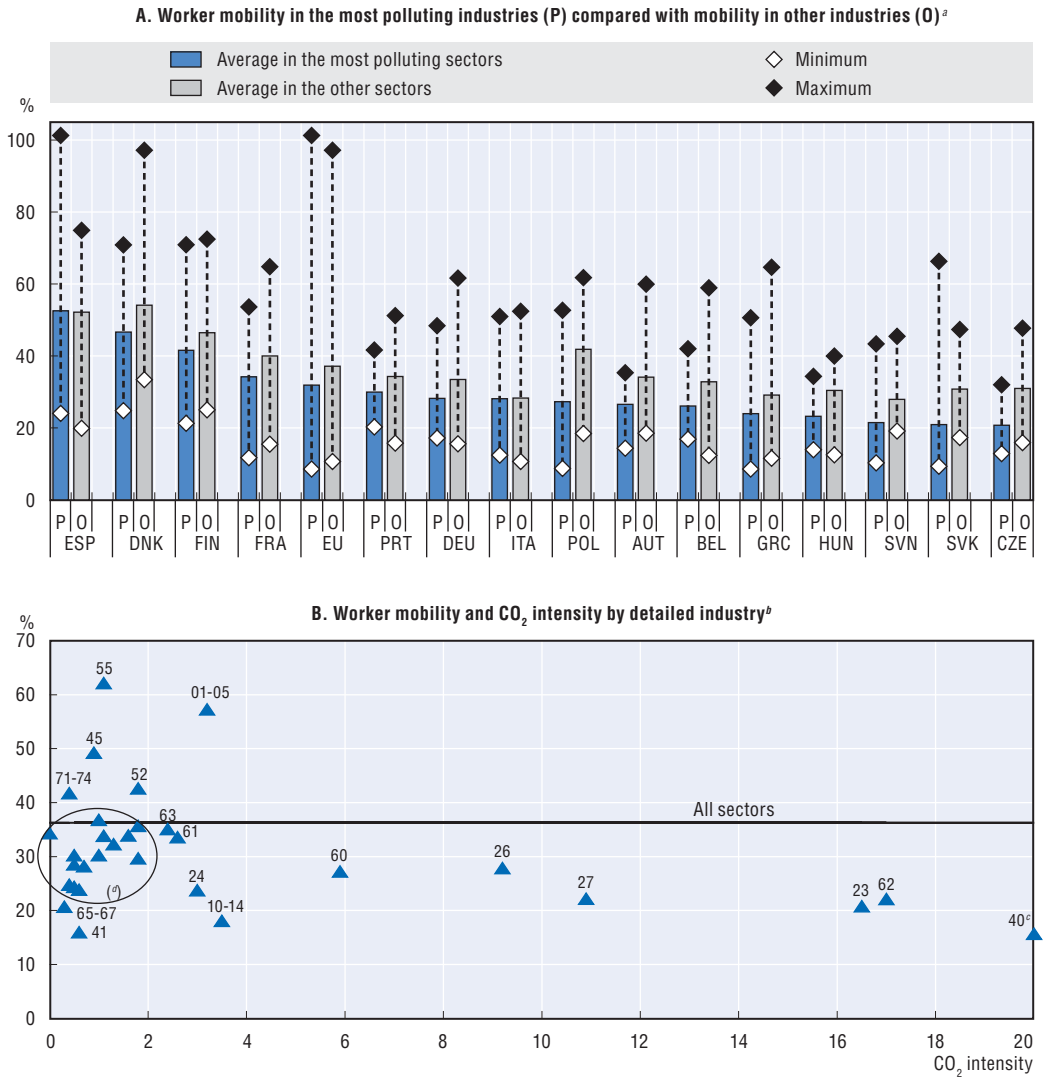
Gross worker flows data, including the total annual movements of workers into jobs (hirings) and out of jobs (separations), have been assembled at the industry level using micro-data from the EU Labour Force Survey. This was done for the same 15 large EU countries analysed in the previous section.[33] Total worker reallocation, defined as the sum of hirings and separations as a proportion of total employment, is used here to make comparisons between workers employed in the most polluting industries and those employed in cleaner sectors, as well as across EU countries.[34]

Panel A of Figure 4.10 compares worker reallocation rates in the most polluting industries and other, less polluting industries (denoted by P and O respectively) separately for 15 large EU countries. On average across these countries, annual gross worker reallocation was 32% of dependent employment in the most polluting sectors, somewhat lower than the 37% rate in less polluting sectors. The relatively low share of temporary workers in the most polluting industries (except agriculture) is probably one of the factors explaining below-average mobility rates. However, the differences in worker mobility between more and less polluting industries within countries tend to be relatively small compared with the mobility differences across countries. This pattern is consistent with an earlier OECD study finding that gross worker flows are strongly influenced by country-specific factors, such as differences in labour market regulations and the prevalence of temporary employment contracts or informal employment relationships (OECD, 2010b).[35]

Figure 4.10 also indicates that mobility rates differ dramatically across industries within both the most polluting group and the less polluting group (see minimum and maximum values in Panel A). Panel B explores this heterogeneity further by plotting mobility rates of 31 separate industries against the carbon intensity of each industry.[36] Doing so confirms that the workers employed in the majority of the most polluting industries have relatively low levels of labour mobility. The one striking exception to the association between high CO_2 emissions and low labour mobility is agriculture (01-05). This is one of industries with the highest rates of labour turnover, reflecting the seasonal nature of much of this employment and the high share of workers with temporary employment contracts. While the high rate of labour turnover in this sector is a factor likely to reduce the adjustment costs borne by agricultural workers losing jobs due to mitigation policy or

Figure 4.10. **Worker mobility and CO_2 intensity in 15 European countries**

Total worker reallocation rates, 2000-07 average values



a) See Figure 4.7 for the definitions of most polluting and other industries.

b) Mobility rates are averages for the 15 countries included in Panel A. See Annex Table 4.A1.1 for definitions of the numerical industry codes.

c) The CO_2 intensity of industry 40 (electricity and gas) is 110.8.

d) Sectors 15-16, 17-19, 20, 21-22, 25, 28, 29, 30-33, 34-35, 36-37 50, 51, 64 and 70.

Source: EU Labour Force Sruvey and IILS-ILO (2009) for the CO_2 intensity values.

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environmental degradation, that advantage could be offset by the over-representation of low educated and older workers in the sector, as well as the fact that many of them live in remote rural locations with few alternative employment opportunities. By contrast, mining is among the high-polluting industries with the lowest mobility and further analysis suggests that workers displaced from mining under a green growth scenario would be likely to bear high adjustment costs: very few job separators in mining find new jobs in other sectors quickly and most of those that do are re-employed in either agriculture or high-polluting manufacturing industries (*e.g.* basic metals and other non-metallic mineral products), which are also likely to shrink.

The evidence on mobility patterns broadly concords with that on workforce composition in the most polluting industries in suggesting that significant downsizing in these industries likely would result in above-average adjustment costs. Just as older and less educated workers tend to fare worse following redundancies than their younger and more educated counterparts, redundancies in industries where labour turnover is relatively low and job tenures relatively high are also likely to result in above-average adjustment costs. The workforce in some but certainly not all of the most polluting industries combines multiple risk factors for high adjustment costs. For example, low labour mobility is combined with high localisation of employment in air transport in most countries; and this combination is also present in fuels, basic metals and mining in several countries. Similarly, low mobility rates are combined with low skill levels for land transport and other non-metallic mineral products. While these new empirical results suggest that policies to promote green growth could add to the risk of job displacement and adjustment difficulties, it is also important to put this finding in context. The numbers of workers affected is likely to be relatively small, since the most polluting industries account for only a modest share of employment in most developed economies. Furthermore, some of these industries have already been characterised by a downward trend in employment for some time and labour market actors have considerable experience managing the structural adjustment difficulties that result from job loss in these economic sectors.

3. An active role for labour market and skill policies: Establishing good general framework conditions

The evidence presented in Sections 1 and 2 highlights how a well-functioning labour market is a prerequisite for a successful transition to green growth. Since new jobs will be created even as other jobs are destroyed or transformed, a key challenge for policy makers will be to cope with the resulting job and worker flows along with the retraining needs of incumbent workers, even as they assure that labour markets support the rapid emergence of new green firms and widespread diffusion of green technologies. Sections 3 and 4 discuss how this can best be done.

Most discussions of labour market and skill policies in the growing literature on green growth have emphasised the role of green-specific measures targeted on promoting the creation of green jobs or the expansion of training for green skills (*e.g.* beginning with UNEP *et al.*, 2008; and continuing with Cedefop, 2010; and ILO, 2011b). However, it is argued here that general policies will play at least as important of a role as targeted programmes, because general policies shape the institutional framework within which labour markets adapt to structural economic change and changing job skill demands (OECD, 2005b). Drawing on the most salient elements of the comprehensive policy framework provided by the *OECD Reassessed Jobs Strategy* (OECD, 2006a), this section analyses the types of general policies required to establish good framework conditions for fostering the structural adjustment that will be required to make a transition towards green growth. This discussion is organised around three key challenges associated with the transition towards green growth: *i)* to assist workers displaced by green structural change; *ii)* to foster eco-innovation; and *iii)* to make the tax-benefit system more supportive of high employment rates. Section 4 then discusses the role of green-specific policies.

Overcoming political resistance to the greening of the economy by assisting displaced workers

Green-growth driven shifts in the composition of employment will cause some workers to lose their jobs and some of these displaced workers are likely to experience difficulties in finding a job with comparable pay and working conditions.[37] The most visible costs borne by displaced workers are the earnings losses attributable to unemployment immediately following layoffs, but total displacement costs are often much higher due to re-employment earnings that are lower than pre-displacement earnings and the typically long period then required for earnings to recover fully (OECD, 2009b and 2010b). Minimising the costs that result from the job displacement associated with the transition towards green growth is thus an important policy challenge associated with managing the transition towards green growth. In this context, it is reassuring that the evidence presented in Sections 1 and 2 suggests that the structural adjustment pressures resulting from green growth policies will be neither more intense nor qualitatively different from those experienced in the recent past. Whether or not that proves to be the case, it should be a help that one of the guiding principles of labour market reforms conducted by OECD governments over the past two decades has been to better reconcile flexibility and security by focussing on securing workers' employability and income, rather than their jobs.

The *OECD Reassessed Jobs Strategy* provides a general policy framework to assure that the labour market is both dynamic – continuously redeploying labour from declining to growing industries and firms – and inclusive. In particular, it emphasises that the public employment service (PES) – interpreted broadly to encompass both job-placement services and the administration of unemployment benefits – should lower displacement costs by providing income support during the unemployment spell and effective re-employment services that facilitate a quick re-integration of jobseekers into employment.[38] Indeed, a growing number of evaluation studies show that an effective PES lowers structural unemployment, notably by shortening unemployment duration (OECD, 2004 and 2006b), while also reducing income volatility (OECD, 2011c). It follows that an effective PES can help reconcile efficiency and equity objectives in a way that would be particularly valuable in the context of a transition towards green growth. First, an effective PES can generate an important efficiency dividend by reducing the adjustment costs due to green growth policies, including by preventing a rise in structural unemployment. An effective PES can also reduce equity concerns about how these costs are distributed, thereby helping to reduce political resistance to environmental policies and regulations that are likely to put some jobs at risk in the most polluting industries and services.

As is emphasised in the *Reassessed Jobs Strategy*, passive and active labour market programmes need to be well co-ordinated for the PES to be effective in reducing structural unemployment. This is typically referred to as "activation". The essence of activation is the principle of "mutual obligations" where, in return for paying benefits and offering a range of re-employment services, public employment agencies monitor benefit recipients' compliance with behavioural eligibility requirements. Such requirements may relate to active job search or participation in training or employment programmes. The increased role of activation/mutual obligation strategies represents one of the main labour policy reforms in the OECD over the past decade. Evidence suggests that, if well-designed, such

strategies have contributed to better labour market outcomes, by ensuring that benefit recipients have a better chance of obtaining employment and minimising the risks that high and/or long-lasting benefits reduce work incentives.

In countries where displacement costs remain high, the question arises as to whether *targeted programmes* should be implemented to provide additional support for the workers who are most adversely affected by environmental protection measures intended to promote the transition to green growth. Beyond the political economy argument already mentioned, an equity argument can also be advanced for providing this subgroup of displaced workers with additional help. The argument is that it would be unjust for the broad majority of the population to benefit from the improved environment quality resulting from these policies, while high adjustment costs are borne by a minority of workers. These types of political economy and equity arguments have motivated the implementation of special programmes targeted at assisting trade-displaced workers (*i.e.* workers who lose their jobs due to competition from imports) in a small number of OECD countries, as well as the European Globalisation Adjustment Fund operated by the European Union. Several lessons can be drawn from these experiences, which can be also relevant for the transition towards a green economy (OECD, 2005a and 2005b):

- This kind of targeted programmes may entail relatively high administration costs. Within the vigorous process of "creative destruction" that characterises OECD labour markets, it can be difficult to identify what caused a particular worker to lose his or her job (Rosen, 2002). Defining entitlement criteria according to displacement reasons may result in a cumbersome, time-consuming and costly screening process that result in low take-up rates while preventing the timely provision of adjustment services to workers who do manage to qualify.
- Equity arguments may be difficult to sustain if the adjustment assistance needs of workers displaced by environmental policies are similar to those of persons displaced for other reasons. If this should be the case, then setting up a targeted programme that favours one type of displaced worker, while excluding others facing similar labour market difficulties, could be considered unfair. It is not yet known whether the adjustment costs of workers displaced by structural changes driven by the greening of the economy will differ in a systematic way from those for other job losers. The analysis in Section 2 suggests that their adjustment costs may be somewhat higher on average, but it also highlights the great diversity of workers in the most polluting industries.
- Political economy arguments also need to be considered with caution, because a programme aimed at strengthening political support for environmental reforms could actually reinforce the association in the public's mind between environmental protection, job losses and economic hardship (LaLonde, 2007). Indeed, the linking of displacement assistance to the greening of the economy might foster the false impression that displacement largely results from the introduction of new environmental policies or regulations, whereas intense labour reallocation is a pervasive characteristic of OECD economies.

All in all, past experience with special programmes targeted at trade-displaced workers suggests that general income transfer and active labour market programmes should be relied upon as much as possible to assist workers displaced by the transition towards green growth.[39] At the same time, experience with managing trade-driven structural change suggests that targeted approaches are a valuable supplement to general

programmes in some instances. OECD (2005b) identifies a number of targeted programmes that offered significant advantages over exclusive reliance upon general employment programmes because they were able to provide assistance that was better tailored to overcoming specific adjustment barriers or they provided a necessary "safety valve" for diffusing political opposition to an open trading system. These examples typically involved abrupt shifts in trading patterns that displaced large numbers of workers facing particularly great barriers to re-employment, in part because they were concentrated in one or a few localities. Similar cases are likely to arise in the transition to green growth since some activities with a large environmental footprint, such as coal mining, are characterised by a relatively strong degree of geographic concentration and displaced mining workers typically are not well prepared to compete for jobs in growing sectors of the economy. When the economic dislocations associated with green growth are spatially concentrated, a targeted programme providing intensive adjustment assistance for the affected workers may be appropriate, perhaps in combination with complementary measures to revitalise the local economy (OECD, 2012e). For example, there have been public-private initiatives to refocus certain Danish shipbuilding and related marine engineering firms, which had lost market share in their traditional markets and announced large layoffs, on developing new competitive niches in the renewable energy sector, including the construction, supply and maintenance of wind turbines and wave and tidal installations (ILO, 2011b).[40]

Fostering eco-innovation

Eco-innovation is expected to be one of the key drivers of the shift toward a low-carbon and resource-efficient growth (OECD, 2011a). The *OECD Innovation Strategy* provides comprehensive policy guidance about how national governments can foster economically valuable innovation (OECD, 2010a). In general, these policies also apply to the more specific challenge to support eco-innovation (OECD, 2011d). Innovation policies in a narrow sense need to play a leading role in supporting and fostering the creation, adoption and diffusion of new green technologies and products, but will not be analysed here. Instead, the emphasis is on the role that labour market and skill policies can play in promoting eco-innovation. Most obviously, education and training systems need to assure that the workforce has the right skills to develop and apply new green technologies. Thus, a well functioning education and training system is an essential element of a general policy framework to foster green innovation. A second need is that labour and product market regulations enable, rather than hinder, the development and diffusion of new green technologies. Since business start-ups account for many new technologies, especially those that constitute important breakthroughs, it is especially important to create a supportive environment for the creation of new firms. More generally, the regulatory environment needs to allow firms that are leaders in developing and applying new green technologies to grow and gain market share, in part by recruiting workers shed by firms using inferior technologies.

Education and training are fundamental both for the conception and the implementation of innovation

The ability to adapt to new technology begins with a well-performing compulsory school system that provides students with strong skills in core fields, including mathematics and science. Cross-country indicators of student achievement in math and

science reveal that the skill levels of students in these subjects vary considerably across OECD countries. According to the latest PISA results, 15-year-olds in the Asian OECD countries attain particularly high scores in mathematical and science literacy tests, while their counterparts in southern European countries and Mexico record low scores (OECD, 2009c).

A well-performing and broadly accessible tertiary education system is also important to facilitate the adoption and widespread diffusion of innovation. The main challenges for tertiary education are: *i)* to train quality graduates who can contribute directly or indirectly to innovation in their workplace; *ii)* to foster research excellence; *iii)* to build links between tertiary institutions and other research organisations and industry; and iv) to improve the ability of tertiary education to disseminate the knowledge it creates (OECD, 2006c). In this respect, evidence suggests that countries with high-quality tertiary education tend to derive more benefits from domestic R&D and from R&D spillovers from abroad (OECD, 2008b). Tertiary attainment levels have increased considerably over the past 30 years, but cross-country differences in the share of the population with tertiary-education qualifications remain substantial, even for the young cohort that has been most strongly influenced by recent education policies.[41]

Effective vocational education and training (VET) is also a vital support for the innovation process, as it is the primary source of skills that are central to incremental innovation activities, including in the environmental area. Many firms do not develop new and radically different products and processes, but they nonetheless contribute to overall innovation by making incremental improvements to existing products or processes. This requires activities such as tooling up, design work, developing prototypes and testing, which rely heavily on skills acquired through vocational training. Studies have shown that firms in countries where a relatively large proportion of the workforce possess postsecondary VET qualifications benefit from a more rapid introduction of new products, even as they also have lower defect rates, less need for quality checkers and fewer plant breakdowns (Toner, 2009).

Based on a careful review and in-depth analysis of several national VET systems, the OECD has recently published a comprehensive report, *Learning for Jobs*, which highlights a number of policy recommendations to help countries increase the responsiveness of VET systems to labour market requirements (OECD, 2010c). One of the key challenges identified – which is particularly salient to assuring that the VET system supports innovation in newly emerging areas, such as renewable energy – is to assure that VET providers connect effectively to the world of work and are constantly updating their curricula and guiding students into the subject areas that respond to employers' changing skill needs.

Learning that takes place on the job – including continuing training for the experienced workforce – is also a crucial component of skilled workers' competences and helps shape innovation outcomes. Recent work using firm-level data found for example that firm expenditures on training were strongly associated with "process modernising" modes of innovation in a number of countries (OECD, 2007 and 2009d). The importance of work-based learning highlights the fact that skills acquisition is a lifelong process. Among the strategies for promoting continuing vocational training is the creation of qualifications systems which recognise important acquired competencies and make them visible to employers and other economic actors. Research on adult education shows the importance

of improving the visibility of mid-career training rewards to learning as a way to motivate people to learn (OECD, 2005c), but it can also support green innovation. For example, one of the barriers to the expansion of the energy-efficient construction sector has been the inability of employers and customers to verify which workers (and firms) have the requisite skills (ILO, 2011d; Zabin *et al.*, 2011).

Well-designed labour and product market regulations also have a role to play

The *OECD Reassessed Jobs Strategy* highlights how overly strict or poorly designed regulation in the areas of employment protection (EP) and product market regulation (PMR) can be impediments to strong labour market performance, and provides guidelines for reforming both types of regulation (OECD, 2006a, b). These concerns are heightened in the context of the transition towards green growth, because both EP and PMR can be a barrier to the smooth reallocation of labour from more polluting firms to environmentally progressive firms.[42] A closely related concern is the possibility that overly restrictive EP and PMR will impede eco-innovation.

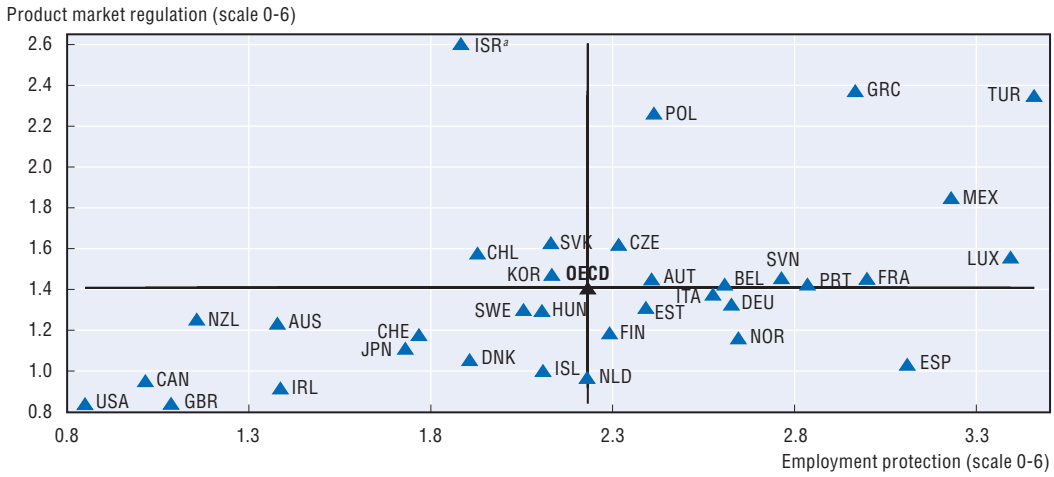
A growing body of research provides evidence that well-designed regulatory systems strengthen the incentives for innovation (de Serres *et al.*, 2010). One reason is that a large share of more radical innovations are introduced by *new* firms. The strategic role played by business start-ups underlies the importance of reducing PMR barriers to the creation of new firms. Another recurrent finding is that vigorous product market competition generally stimulates technology adoption and innovation. Several empirical studies confirm that pro-competitive regulations tend to foster innovative activity when intellectual property rights are adequately protected (*e.g.* Jaumotte and Pain, 2005; Bassanini and Ernst, 2002; Nicoletti *et al.*, 2001).

There is also growing evidence that EP regulation affects innovation patterns. Restrictive hiring and firing rules are likely to constitute an impediment to the adoption of new technologies and innovation where innovation-driven labour adjustments have to be accommodated via worker turnover (*e.g.* when greener firms expand at the expense of more polluting firms).[43] For example, Bartelsman *et al.* (2010) and Samaniego (2006) provide evidence that ICT diffusion was slower in countries with stricter EP. However, the relationship between EP strictness and innovation is complex, because greater job security and low labour turnover may encourage the accumulation of firm-specific competencies and increase worker investment in innovative activity. Consequently, the relationship between EP and innovation appears to depend on the nature of the innovations in question. For example, Bassanini and Ernst (2002) find that EP significantly deters R&D in industries where the innovation process is driven by product differentiation, since these innovations often operate through entry and exit of firms and extensive worker turnover. Strict EP also depresses R&D in industries characterised by product lines at the end of their life-cycle, where innovation often leads to downsizing. By contrast, EP does not appear to constrain R&D in high-technology industries characterised by a cumulative innovation process, because this type of innovation relies heavily upon worker skills that are highly specific to individual firms. In a similar vein, Griffith and Macartney (2009) investigate the relationship between EP and the innovation activities of multinational firms operating across 12 European countries and find that these firms do more incremental patenting in high EP countries and more radical patenting in low EP countries. In sum, EP regulation appears to have a greater effect on the focus of innovative activities than on its overall level.

It seems plausible that the findings summarised above about how EP and PMR affect innovation performance, also hold for eco-innovation. However, there does not appear to be any direct evidence about whether that is indeed the case. What is clear is that these forms of regulation are likely to have important impacts on the development and diffusion of new environmental technologies and that these regulatory policy stances differed substantially across OECD countries in 2008 (Figure 4.11).[44] Further reform efforts in one or both of these policy areas, especially relaxation of PMR barriers to firm entry where they are still high, might significantly improve the incentives for eco-innovation in some countries.

A simple juxtaposition of the 2008 EP and PMR regulatory stringency indicators reported in Figure 4.11 with the country-level measures of environmental patenting presented in Section 2 underlies the importance of assuring that these types of regulations are not impeding the transition towards green growth. When countries are ranked according to the number of environmental patents per billion USD (in purchasing power parities) of GDP (see Panel B of the figure in Box 4.3), all of the top performing countries are seen to have relatively pro-competitive PMR stance. However, top performers vary considerably in terms of the strictness of EP regulation, consistent with this type of regulation affecting the mix of innovation activity more than its overall level.[45] A potential source of concern is that EP regulation has been relatively strict in Poland, Greece, Slovenia and Portugal, the four EU countries with the highest share of employment in the most polluting industries (see Figure 4.8), although Greece and Portugal have enacted reforms in this area since 2008 (OECD, 2012g). Since strict EP is associated with low labour market mobility and long unemployment spells, policies to reduce CO_2 emissions in these countries could become an important source of structural unemployment if EP remains too strict, particularly in the first two countries which are also characterised by relatively strict PMR regulation that is likely to impede the emergence of new green firms.[46]

Figure 4.11. **Employment protection and product market regulation, 2008**



a) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.
Note: Employment protection data refer to 2009 for France and Portugal.
Source: *OECD Employment Protection Database* and *OECD Product Market Regulation Database*.
StatLink http://dx.doi.org/10.1787/888932651997

An opportunity to improve the effectiveness of the tax and benefit system

The simulation analysis of the labour market impact of GHG mitigation policies in Section 1 illustrates how environmental policies can create cost pressures on firms that become a barrier to employment. That analysis also shows how environmental tax reform, such as shifting taxation away from labour income and towards GHG emissions, sometimes can generate a "double-dividend", achieving both environmental gains and higher employment. However, the research literature on the double-dividend hypothesis has shown that the initial labour tax distortion needs to be relatively strong for such an employment dividend to materialise (see discussion in OECD, 2012a). Recycling environmental tax revenues so as to lower labour taxation will thus be more advantageous in some countries than in others. It also cannot be assumed that reducing labour taxes is necessarily the best way to recycle carbon revenues, since they could be used instead to correct other market distortions, such as by lowering capital taxes or subsidising environmental R&D, to address distributional concerns or to reduce the public deficit. Which form of recycling is most desirable is likely to depend on national conditions in a complex way and will not be analysed here. The rest of this section addresses a narrower question, namely, in the event that carbon tax revenues are made available to lower the taxation of labour income, how should the reduction in labour taxation be structured so as to maximise the improvement in labour market performance.[47]

Since the overall tax and benefit system tends to be particularly distortive at the bottom end of the wage ladder, in large part due to the interaction of taxes and means-tested benefits, recycling carbon revenues is likely to have a larger effect in raising employment rates when targeted on low-wage earners. In a number of OECD countries, relatively high statutory minimum wages and/or high benefit replacement rates for unemployed low-wage workers translate into relatively strong downward wage rigidities (Immervoll, 2007). In such cases, tax and benefit systems could particularly discourage employment among workers with low educational attainment or limited employment experiences. Furthermore, climate-change mitigation policies are likely to amplify this distortion, as they will result in higher energy prices (at least in the short to medium run) that could require some downward real wage flexibility in order to preserve employment levels (see the simulation analysis in Section 1). This flexibility may be lacking at the bottom of the wage scale in some countries, creating the risk that unemployment will rise for more disadvantaged workers.

There may also be an equity case for targeting recycled carbon revenues to low-income working households. Since the share of energy bills in total consumption expenditure is highest for low-income households, the likely rise in the price of energy will weigh more heavily on the purchasing power of low-income households. Another possible rational for redistributing carbon revenues towards low-income households is that environmental quality is a public good which high-income households tend to value more than their lower-income counterparts. Household surveys indicate that the so-called "willingness to pay" for environmental protection tends to increase with household incomes.

OECD tax-benefit calculations show that the net returns to working tend to be low at the bottom-end of the wage ladder in many OECD countries. Workers taking up low-paid employment often see more than half of their gross earnings consumed by income taxes, employee social contributions or reduced social benefits. Financial rewards from work tend

to be especially low when only one person in the household is working and this worker has a low-paid job. This is especially true when children are present, largely due to higher out-of-work benefits that are clawed back when a job is accepted, resulting in average effective tax rates of 80% or more in half of OECD countries (OECD, 2012a). This suggests that the policy priority in many countries should be to reform the benefit system rather than to reshape the tax structure for employees. In-work benefits have proved to be effective in raising the labour market participation of low-wage workers while also assuring adequate income (Immervoll and Pearson, 2009). These schemes appear particularly relevant in a context of green growth, as the likely rise in energy prices in the short and medium run raises distributional concerns that can be addressed in a more target-efficient manner using in-work benefits than using reductions in labour taxes.

4. An active role for labour market and skill policies: What role for green-specific measures?

While general policies should be relied upon to a large degree, programmes that are specifically targeted to promoting green jobs or skills will also have a role to play. A greening economy has its own specificities that policies in a wide range of economic areas, including the labour market area, will have to accommodate. One complication in implementing green-specific labour market and skill policies is that they need to be effectively co-ordinated with the key environmental and eco-innovation policies driving the transition towards green growth. Since the development of these core green growth policies is still at an early stage, it would be premature to draw strong conclusions about how employment and skill policies should be tailored to those policies and the structural adjustment pressures and opportunities they will create. The rather mixed performance of the labour market components of the green fiscal stimulus measures implemented by a number of countries in response to the 2008-09 economic crisis also suggests taking a cautious incremental approach in policy development in this area (Box 4.4). Despite these caveats, it may be possible to identify promising first steps in a pragmatic approach to developing green-specific policies. This section attempts to do so by summarising what is known about the limited experience to date with green-specific labour market and training programmes and draws some tentative conclusions concerning promising next steps.

What kinds of green-specific measures have been implemented at the national level?

Internationally comparative information has been lacking about specific labour market measures that countries have implemented in order to realise the full job potential of a shift towards a green economy. Accordingly, the OECD sent a questionnaire on this topic to OECD member countries in November 2010. This section summarises information from the responses received from 27 countries (more detailed information about country responses is provided in OECD, 2012b).

A gradual process, still at an early stage of implementation

Among the 27 OECD countries which responded to the questionnaire, 15 indicated that they had implemented one or more green-specific labour market measures, including at least one education and training measure (Figure 4.12). Consistent with the discussion in Section 2, these countries appear to believe that preventing skill gaps from developing, which could put a brake on the expansion of green activities is a policy priority. By contrast, job subsidies in the private sector and direct job creation in the public sector were less

Box 4.4. **Green fiscal stimulus: a mixed experience**

The potential synergies between policies to promote a transition to green growth and policies to promote employment became clear during the global financial and economic crisis that erupted in 2008. Public investments in green activities played a significant role in the stimulus packages introduced to boost demand and the economic recovery. These investments were seen to offer a potential double dividend at a time of high unemployment: both jumpstarting job creation and accelerating the transition towards green growth. Moreover, the economic return to such investments is potentially higher during a recession, when the opportunity cost of green investment is lower. Thus, de Serres *et al.* (2010) argued that the global economic slowdown provided good opportunities for investment in infrastructure that would facilitate the development of green technologies and industries by anchoring beliefs in governments' commitment to green growth. Even though the space for additional fiscal stimulus is now much diminished or totally exhausted in most countries, it is still interesting to identify the lessons learned about the use of green public spending as a spur to rapid job creation.

A number of governments projected that sizeable employment gains would result from their green stimulus measures (ILO, 2011b; OECD, 2010d). For example, the United States Council of Economic Advisers estimated that the approximately USD 90 billion of Recovery Act investments would save or create about 720 000 job-years by the end of 2012. Projects in the renewable energy generation and transmission, energy efficiency, and transit categories were projected to create the most job-years. Likewise, Korea has been implementing its "Green New Deal" policy since January 2009. The policy's aim is both to overcome the economic crisis in the short-term and to strengthen the growth potential over the long term. The KRW 50 trillion being invested were projected to create 960 000 jobs from 2009 to 2012, including jobs in an environmentally-friendly transportation network, water management and river rehabilitation, clean energy, green information technologies (IT), and waste-to-energy. France is another country that responded to the crisis by increasing its investments in the transition to a greener economy. Its stimulus package totaled USD 33.1 billion, 21% of which was designated for green measures, with an estimated net job creation of about 80 000-110 000 in the 2009-10 period.

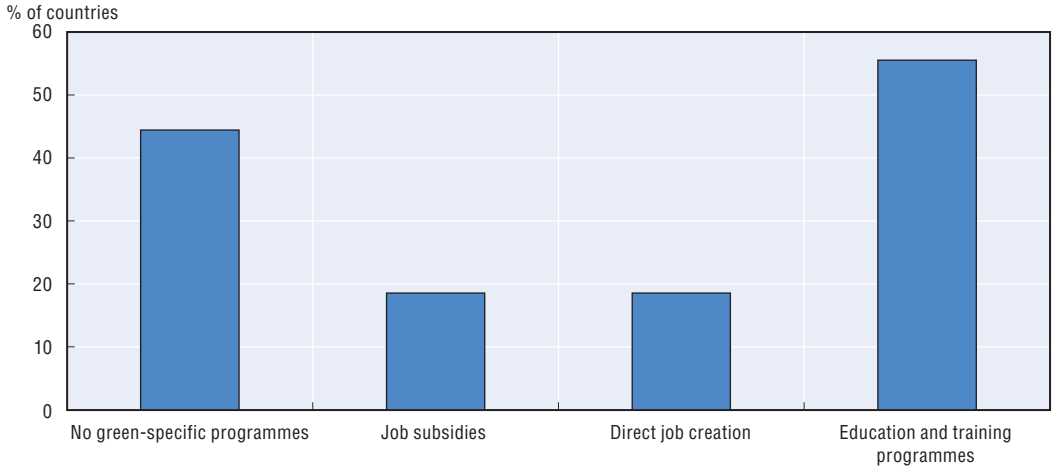
Although these green stimulus measures have not been subject to rigorous evaluation, it has become clear that they need to be carefully designed if they are to foster both macro-stabilisation in the short-run and the transition to green growth over a longer time horizon. While the potential for green stimulus measures should be exploited fully when the macroeconomic conditions justify fiscal stimulus, governments should bear in mind that there are limits to the contribution that temporary macro-stabilisation measures can make to fostering the long-run transition to green growth. A priori, some of the green fiscal measures appear well suited to play this dual role. In particular, programmes to retrofit existing public and private buildings for greater energy efficiency appeared to have a considerable potential to achieve long-run environmental gains while also satisfying the "three Ts" desirable in counter-cyclical fiscal stimulus measures, by providing a timely, temporary and targeted stimulus to labour demand by generating new jobs quickly (timely) of the kind many unemployed workers could fill directly or with limited training (targeted) and the fiscal stimulus related to these measures was designed to be phased out as the economic recovery strengthened (temporary). However, the experience with the Australian Home Insulation Program demonstrates how difficult it can be to assure the quality of the work performed when a public subsidy leads to a rapid expansion in the retrofitting

Box 4.4. **Green fiscal stimulus: a mixed experience** *(cont.)*

(see OECD, 2012a). It is also the case that many of the green policy initiatives required to bring about a transition to green growth do not satisfy the "three Ts". For example, public subsidies to stimulate eco-innovation are likely to involve a long time lag before many new jobs are created. Furthermore, few currently unemployed workers will be qualified for the R&D jobs eventually created.

More generally, the very different time horizons involved in the short-run stimulus measures and the long-run environmental policy means that it is not always possible for policies to serve both objectives well (Strand and Toman, 2010). While synergies with short-run macro-stabilisation policy are welcome when they can be achieved, it should be borne in mind that the fundamental rationale for developing green activities and jobs is to contribute to environmentally sustainable growth in the long-run. It follows that policy packages that are intended to further both environmental and employment objectives need to be considered over a longer time horizon.

Figure 4.12. **Green-specific national labour market programmes implemented by OECD countries, 2010**[a]



a) The OECD questionnaire on green jobs and policies covers 27 OECD countries. The columns sum to more than 100% because many countries operating green-specific measures reported making use of multiple types of measures.

Source: OECD questionnaire on green jobs and policies. For further detail of country responses, see Table 4.A3.1 in OECD (2012b).

StatLink http://dx.doi.org/10.1787/888932652016

widely used, being reported by only five countries each and most often these green employment programmes were temporary measures that were introduced as part of the policy responses to the global economic crisis during 2008-09. Indeed, most of the green-specific measures reported, including training programmes, were quite recently introduced and relatively small, highlighting how limited experience in this policy area remains.

More than two out of five OECD countries have not implemented any specific programmes at the national level (Figure 4.12). In some cases, this appears to reflect the fact that core green growth policies are themselves at a very early stage of implementation (*e.g.* Israel and Poland). But that is not always the case. Indeed, some OECD leaders in

environmental protection and the development of the green economy, such as Germany, Denmark, the Netherlands, Norway and Sweden, are also to be found in the group of countries that have not implemented any green-specific labour market measures. A possible explanation for this apparent paradox is that these countries have long operated relatively extensive systems of general labour market and skill development programmes. It may be that these general programmes have thus far been able to meet the challenges posed by green growth-driven structural change.

In fact, the situation is even more complicated because it appears that green components have been progressively integrated into general labour market programmes in a number of the countries reporting no green-specific programmes. For example, Danish authorities report that while there may be a significant number of programmes that are already supporting green sectors in the generally understood sense, there is no official definition to classify these as being green initiatives.[48] This example suggests that the criterion for distinguishing green-specific programmes from general measures varies across countries. It follows that great caution is required when comparing green-specific initiatives in the field of labour market and skill development policies in different countries.

With these caveats in mind, it is noteworthy that several similarities emerge in the way countries are implementing green-specific measures. Along with the substantive emphasis on providing VET for growing green occupations, a second commonality is the emphasis being placed on addressing two difficulties encountered in this relatively new policy area. The first difficulty is the high degree of uncertainty about how green growth will reshape labour markets and hence also about what sort of policy measures are required. The second difficulty is the need to co-ordinate green-specific labour market and skill policies with other policies that are shaping how and how rapidly economies make the transitions towards green growth, particularly environmental policy. Among the different approaches to addressing these two difficulties are the following:[49]

- *Collection of systematic labour market data on the impact of green growth.* A number of countries are investing in the systematic collection of labour market data on the number of green jobs and their growth prospects, the skill requirements of these jobs, etc. For example, France established a National Observatory of Green Employment Occupations in 2009. Along with incorporating green occupations into national labour market information systems, efforts have also been made to make this information available to students and workers so as to provide them with guidance in developing their careers.
- *Co-ordination of employment and skill policy-making with broader green growth policy.* Many countries are making efforts to co-ordinate employment and skill policy with other policies that are also shaping green growth, especially environmental policy. In some cases, there is a formal process to integrate all relevant ministries into a national green growth policy plan, as is illustrated by the Presidential Committee on Green Growth in Korea, which is charged with co-ordinating green growth policy across the government. In other cases, the process takes the form of a cross-ministry consultative process which may also involve other stakeholders, such as lower levels of government and trade union and employer representatives (Eurofound, 2009). In other cases, an effective co-ordination system has yet to be developed.[50]

A pragmatic approach

At this early stage in setting up and operating green-specific labour market and skill policies, it is not possible to evaluate, even informally, how effective different types of measures have been, nor to judge how large the role of these targeted programmes ultimately should be. The pervasive uncertainty about what type of green-specific labour market and skill policies would be useful calls for a cautious and incremental approach to introducing new policy measures. It may also be useful to focus policy development at a sectoral level where it is typically easier to identify ways to make a targeted labour market intervention most useful, such as by avoiding or overcoming a specific skill gap. Along this line, the Belgian authorities in charge of labour market policies argue that there is no need to define what a green job is in order to design and implement effective labour market programmes in support of environmental measures. Instead, a "policy-oriented" approach has been adopted in Belgium, which consists in assessing the overall workforce and skill needs within closely targeted market segments, whether or not these jobs and skills can be classified as being green and implementing programmes when opportunities for a useful intervention are identified.

This pervasive uncertainty also suggests that green-specific labour market policies are likely to require successive fine-tunings, or even more drastic revisions, in order to correct design mistakes and remain closely aligned to continuously evolving green markets and environmental objectives. A continuous monitoring of emerging needs, a careful evaluation of new measures put into place and a progressive fine-tuning of these measure are thus likely to be critical elements in designing and implementing effective green-specific labour market programmes. While these recommendations apply to any employment and skill development programmes, they are likely to be even more important for green-specific policies. The Australian Green Skill Agreement of 2009 contains a number of provisions aimed at building a flexible and carefully-designed implementation framework, including an emphasis on monitoring and evaluation at various stages of the implementation process (COAG, 2009). The agreement calls for the development of an evaluation framework to monitor achievements against agreed goals and actions. One of the stated goals is to ensure that the actions arising from this agreement complement existing labour market, training and industry development programmes and initiatives, and other initiatives to reduce carbon pollution and promote industry and workforce adjustment to a sustainable, low-carbon economy.

The Austrian Klima:aktiv initiative, launched in 2004 as part of the National Climate Strategy, appears to be one of the best examples of a more comprehensive policy approach. Notably, it ties labour market measures to a broader "market transformation" strategy that aims to produce permanent increases in the share of energy-efficient products and services in targeted markets. This approach means that green training initiatives are closely co-ordinated with measures to develop the associated green product markets. Klima:aktiv makes use of a wide range of policy levers, including workforce training, quality standards for new products and services, information and communication campaigns, advice and support to businesses, and activating and networking partners. As regards training measures, Klima:aktiv focuses primarily on advanced vocational training, and co-ordinates training and education in the various thematic programmes (Fickl and Schmidt, 2009). Pilot training and seminars are initiated and introduced in the training market, in co-operation with universities, technical colleges, educational service of the

chamber of commerce, etc. Klima:aktiv is therefore not in competition with the education market. Rather, this programme introduces new green components into the education market, in close collaboration with all relevant actors on this market.

Cross-country differences in the green jobs challenge and the relative importance of general and green-specific policy measures

This chapter has attempted to characterise the main green growth challenges confronting labour market and skill development policies and to assess how best those challenges can be met. It has done so in a manner that is intended to be sufficiently general to apply to all developed economies. Despite this generality, some of the material presented above sheds light on cross-country differences in the intensity and nature of these challenges, as well as on policy priorities in responding to these challenges. This section briefly discusses these cross-country differences.

Table 4.3 summarises key green growth challenges for labour market and skill policy (Column 1) while also highlighting factors likely to imply significant cross-country differences in the intensity of these challenges (Column 2). Columns 3 and 4 then summarise some of the types of labour market and skill development policy responses that are likely to be most important. How different countries go about implementing these responses, and how effectively they do so, will be influenced by the nature of their national systems of labour market policies and institutions, and skill development policies and institutions, as well as how well these two systems co-ordinate with each other and with environmental policy.

Table 4.3 sheds some light on the relative importance that should be placed on general and green-specific policy measures, and how the appropriate balance will vary from country to country. All of the types of policy responses that are included in Columns 3 and 4 could be implemented either as a general measure or a green growth measure. In countries where there is already a well-functioning general measure in place, there is likely little or no reason to introduce a green-specific policy measure. However, in countries where there is no such general measure or the general measure is of limited effectiveness, a specific green measure may be called for, particularly if some of the intensity factors in Column 2 suggest that there is or soon will be a strong need for such measures.

How might differences in national labour market and skill development systems affect countries' ability to successfully manage the transition towards green growth? Because our understanding of the green revolution is still so incomplete, it would be premature to draw any firm conclusions about the strengths and weaknesses characterising countries conforming more closely to one or another of the stylised models of national labour market and skill development systems that have been proposed in the research literature (*e.g.* Esping-Andersen, 1990; Ashton *et al.*, 2000; OECD, 2006a). Nonetheless, it is useful to begin reflecting upon the ways that the green growth challenge may differ across countries depending on the nature of their labour markets and national education and training systems. In that spirit, the following initial reflections are put forward:

- The two successful labour market models put forth in the *OECD Reassessed Jobs Strategy* (OECD, 2006a) appear to be well aligned overall with the requirements for managing a successful transition towards green growth.[51] In particular, both models suggest the importance of achieving an effective form of flexicurity, while illustrating that there is no

Table 4.3. **Towards a taxonomy of factors shaping cross-country differences in the green growth challenge for labour market and skill policies**

Key policy challenges	Intensity factors	Main role for labour market policy	Main role for skill development policy
1. Labour reallocation. Workers will need to shift from declining firms, particularly in sectors with a heavy environmental footprint, to growing green firms: ● One challenge is to make sure workers displaced from declining "brown" jobs can move quickly into new green jobs that make good use of their skills. ● Growing green firms will also need to be able to recruit the staff they need.	*i)* Displacement costs are likely to be higher in countries and regions where a greater share of total employment is found in high GHG-emissions industries (these shares range from 11% in Denmark to 27% in Poland). *ii)* Post-displacement adjustment costs tend to be higher where worker reallocation is lower. Also where more of the affected workers are older or low educated. (Annual reallocation rates range from 0.28 in the Czech Republic to 0.52 in Spain.) *iii)* Spatial and skill mismatches exacerbate dislocation (localisation of high emissions industries is generally greater in EU periphery countries than in the core).	An effective "flexicurity" package that reconciles high worker mobility with income security and high rates of employment: ● A balanced and not too-strict employment protection system. ● Adequate unemployment benefits. ● Effective activation of job losers via high-quality ALMPs and effective conditioning of unemployment benefit receipt on active job search or participation in measures to raise employability.	*i)* Retraining as needed as a component of the income and reemployment support offered to job losers. *ii)* When green-growth-related job displacement takes the form of mass layoffs or is associated with steep economic decline in an economically specialised locality, integrate job training services effectively into a local redevelopment strategy and/or provide outmigration assistance. *iii)* Local PES adapts its offer of training services to create pathways from declining sectors, firms and occupations to growing sectors of the economy.
2. Green-skilling the labour force. Demand for green skills will be driven by: ● Rapid employment growth is occurring for some existing green occupations (*e.g.* construction workers trained to retro-fit existing homes for energy efficiency). ● The emergence of new green occupations (mostly high skilled?). ● Incremental greening of many existing occupations necessitating top-up training.	*i)* Flexible and well-resourced system of continuing vocational training (CVT) should be an asset (average annual hours of CVT range from 3.5 in Greece to 16.2 in Luxembourg according to Sala and Silva, 2011). *ii)* Good business-tertiary education partnerships useful to develop curricula and certification for new high-skilled green occupations as they emerge (*e.g.* smart grid designer). *iii)* Strong initial vocational training combined with good basic academic skills enhances subsequent ability to profit from CVT and retraining. (mean PISA scores for mathematical and scientific literacy of 15-year-old vary from 460 in Turkey to 550 in Finland).	A high-quality labour market information system that tracks emerging skill needs and shares that information with labour market actors. Forecasting of skill needs or skill mismatches would be useful if sufficiently reliable.	*i)* Ability to expand and contract existing training and vocational education tracks as demand changes. *ii)* Ability to co-ordinate with social partners to create new tertiary-level curricula as new high-skill occupations emerge. *iii)* Employers, trade unions and vocational training providers co-ordinate to continually update workforce skills as job requirements evolve.
3. Creating synergies between environmental and employment policy. Finding ways to promote both environmental goals and employment goals at the same time by addressing multiple market failures (Hallegatte *et al.*, 2011): ● Economic co-benefits of environmental mitigation/restoration. ● Recycling carbon tax revenue to stimulate higher employment. ● Incubating green growth export champions. ● Green fiscal stimulus during an economic downturn.	*i)* High levels of localised adverse impacts from environmental degradation. *ii)* A higher labour tax wedge, especially when combined with a high minimum wage makes it more likely that using carbon tax revues to lower labour taxes would generate a double dividend (labour costs for a full-time minimum-wage worker range from 0.25 of the mean wage in Korea to 0.52 of the mean in Ireland). *iii)* An effective national innovation strategy can improve the chances of nurturing a "green Silicon Valley" (environmental patenting rates per worker are more than 30 times the OECD average in Germany and less than 1% of that average in Greece). *iv)* While labour market slack is still high in many EU and OECD countries, few have unused fiscal space for enacting more fiscal stimulus.	*i)* Structural labour market reforms can provide a substitute for using carbon tax revenues as a way to counteract a high level of equilibrium unemployment. *ii)* If synergies emerge, so that green growth becomes a significant source of net job creation, employment policy should take maximum advantage of that opportunity by taking measures to mobilise under-utilised labour supply (*e.g.* by working against excess benefit dependency or promoting family-friendly employment practices).	*i)* Strong STEM in compulsory and especially tertiary schooling provides an essential support for eco-innovation. *ii)* Strong research universities and effective university-business partnerships can play an important role in fostering a vital innovation ecosystem.

one rigid model for how to reconcile high labour mobility with security. The analysis of the green growth challenge for labour market policy in this chapter and other recent studies tends to provide further support for these broad policy orientations, while identifying some of the specific ways these normative policy frameworks should be applied to manage the transition towards a low-carbon and resource-efficient labour market.

- Green and Green (2011) put forth a descriptive taxonomy of four types of national skill development systems that are suggestive of some distinctive strengths and weaknesses in managing green growth:
  - *The market-oriented skills formation system* (often associated with the United States, the United Kingdom and other English-speaking countries) is characterised by institutional diversity and a market-led approach to the co-ordination of skills supply and demand. One weakness of this system is that low levels of achievement are common among less academically-inclined youth who can later find themselves at a disadvantage in the labour market. If green structural change should turn out to require large parts of the adult workforce to receive significant green training during the course of their working lives, less skilled workers in these counties could struggle to access and profit from this training. On the plus side, these systems offer ample "second-chance" education possibilities for adults and tend to excel at creating research universities that collaborate effectively with the business sector and are likely to be a big asset in promoting eco-innovation.
  - *The social partner co-ordinated skills formation system* (often associated with German-speaking countries) is characterised by the active role that the social partners play in managing skills supply and demand, and the prominent role of the dual system of combining upper secondary schooling with apprenticeships. While these apprenticeships are quite specialised, the students are required to continue their more academic courses as well. This system has done well at developing skilled manual and technical workers, a workforce that should cope well with the incremental greening of jobs. The system can, however, show less flexibility than the market-oriented system which might be a disadvantage for managing more discontinuous changes in labour demand, should green growth evolve in unexpected directions.
  - *The state-led social partnership skills formation system* (often associated with Nordic countries) is also characterised by the active role that the social partners play in co-ordinating skills supply and demand. However, the state plays a greater role in adult education than in the social partner co-ordinated system and the school system differs in important respects. In particular, pre-school is universally provided at a subsidised price and compulsory schooling follows a non-selective, mixed-ability, comprehensive school model that delays subject specialisation as long as possible. Adult education and ALMPs are extensive. Along with its egalitarian orientation, the breadth of initial education and training is intended to maximise the acquisition of transferable skills and to support high labour market mobility. The high mobility of the workforce should be an asset in managing incremental green structural change.
  - *The developmental skills formation system* (often associated with Japan and the former Asian Tigers) is characterised by more interventionist forms of state-led economic and social development. These systems have achieved spectacular increases in educational attainment and also very high levels of student achievement. In countries

like Japan and Korea, adult education has largely been left to be organised by large employers. The governments in these countries have often sought to actively shape future employer skill demand through industrial and trade policy. Korea is now applying that model to green growth, but it remains to be seen whether it can function as effectively at the global technological frontier, as it did when the focus was on catching-up with the most advanced countries.

Conclusions

The evidence presented in this chapter confirms that labour market and skill policies have an important supporting role to play in a comprehensive green growth strategy, as was argued in the *OECD Green Growth Strategy* (OECD, 2011a). These results also suggest that green growth represents a manageable policy challenge that primarily calls for familiar types of policy measures. However, the chapter also highlights the limits of our present understanding of how the transition towards green growth will reshape labour markets and hence of the required policy response. This is true despite the large volume of recent research on this topic and an increasing number of policy initiatives to encourage the creation of green jobs or skills. The limited understanding to date reflects the complexity of decoupling economic growth from harmful environmental impacts. Furthermore, the transition to green growth is still at an early stage and the form it will take will be shaped by future policy choices and technological developments that are inherently difficult to predict.

This chapter argues that the transition towards green growth is best understood as an important driver of structural labour market change. General-equilibrium modelling provides important insights about green restructuring. It suggests for example that there is no automatic link between greening of the labour market and changes in the overall level of employment and that the structural adjustment pressures that will result from the transition towards green growth probably will not exceed those managed in the recent past, in large part because the industries that are most affected only account for a modest share of total employment. However, general-equilibrium models are not yet able to predict how the overall labour market will be reshaped with sufficient precision to provide detailed guidance for labour market and skill policies. Partial-equilibrium analysis is filling some of these knowledge gaps. In particular, considerable progress has been made in assessing future changes in labour demand and job-skill requirements in several economic sectors that are of strategic importance for climate-change mitigation, notably the energy and construction sectors, and these findings provide useful guidance for policy makers.

Policy cannot wait for researchers to resolve all of these uncertainties. Indeed, a growing number of green-specific policy measures recently have been put into place that are intended to assure that growing green firms are able to meet their recruitment needs and retrain their incumbent workforces. Many of these measures appear promising, even if their implementation is relatively recent and they tend to be small in scale. However, there is very little experience in operating this type of policy and it will be important to carefully evaluate how well these measures work. Doing so should also gradually clarify the optimal balance between green-specific policy measures and more general labour market and skill policies. Whatever the optimal balance turns out to be, green growth almost certainly reinforces the importance of assuring that well-recognised policies to promote better labour market outcomes (*e.g.* as described in the *OECD Reassessed Jobs Strategy*) are in place and functioning well, since these policies provide the necessary

framework for reconciling a high degree of labour market flexibility with economic security for workers and their families. Similarly, green growth almost certainly reinforces the returns to raising the STEM skills of the workforce and the importance of assuring that employment protection and product market regulations are not impeding eco-innovation.

Notes

1. This chapter presents material drawn from the longer OECD report, "The Jobs Potential of a Shift towards a Low-carbon Economy" which was produced for the European Commission, DG Employment (OECD, 2012a). Additional information about country responses to the OECD questionnaire on green jobs is provided in OECD (2012b).
2. World Bank (2012) and UNEP (2011a) provide detailed analyses of green growth policies in developing economies.
3. Among the declining sectors are producers or heavy users of fossil fuels, with coal mining being the biggest job loser. Labour flows into industries producing clean energy and also goods and services whose products result in the least GHG emissions when produced and consumed.
4. These limitations also apply to the new OECD simulations reported below.
5. Despite innovation being intrinsically difficult to predict, the potential effects of environmental policies in stimulating the innovation of new green technologies has been incorporated into several CGE models in the form of endogenous R&D sectors (ICCS/NTUA, 2010), as well as into an econometric model (Cambridge Econometrics *et al*., 2011).
6. Several recent empirical studies show that the adverse health impacts of pollution can be quite large (de Serres and Murtin, 2011; Hanna and Olivia, 2011).
7. See Chateau *et al*. (2011) for a more detailed presentation of this simulation analysis.
8. Because labour market policies and institutions vary widely across countries and interact in complex ways with policies in other markets, it remains a huge challenge to introduce a realistic representation of labour market functioning in general-equilibrium environmental models which are already complex and not easily-tractable tools. Nonetheless, these simulations exercises shed light on the magnitude of labour market adjustment pressures at stake when mitigation policies are implemented, as well as the qualitative impact of labour market rigidities in amplifying adjustment costs.
9. For Mexico, it is assumed that emissions are reduced by 50% in 2050 as compared with the 2005 level, rather than the 1990 level. Reaching these policy targets generally requires less sharp emissions reductions in Europe than in non-European OECD countries, since post-1990 emissions growth has been stronger outside of Europe.
10. Chateau *et al*. (2011) consider two alternative policy scenarios: one where each OECD country operates its separate national ETS and a second where there is a globally integrated ETS. While the overall cost of mitigation is higher the more fragmented the ETS system, all of the qualitative patterns discussed here hold also for the alternative assumptions about how widely ETS permits can be traded.
11. The equivalent variation is defined as the difference between the simulated level of real income when mitigation policies are in operation and the level of real income that would be required to provide consumers with the utility level they would have experienced in the absence of these policies (*i.e.* in the BAU scenario). This variable can be interpreted as representing the variation in aggregate welfare caused by the introduction of mitigation policies.
12. The negative impacts of mitigation policy on GDP and real wage growth contrasts with the positive impacts generally associated with the ICT revolution and globalisation, two prominent recent drivers of structural change in OECD labour markets. OECD (2012a) identifies a number of similarities and differences between these two historic drivers of structural change and green growth policies as regards their impacts in reshaping labour markets.
13. The last of these policy options is partly sector-specific in the sense that tax relief is assumed to be proportional to initial taxation.
14. The model assumes that household savings are not influenced by the rate of return on savings, and therefore, capital accumulation depends upon aggregate income only.

15. Using a different methodology, Cambridge Econometrics *et al.* (2011) also conclude that the additional labour market "churn" caused by an ambitious climate-change mitigation policy is small.

16. Only 10% of this 20% corresponded to changes in the sectoral composition of employment for a constant level of total employment, the so-called "excess job reallocation". Comparing this estimate of the historical rate of excess job reallocation with that estimated to be induced by an ambitious mitigation policy, confirms that the latter affect is small: less than a 1% change over an 18-year period as compared with a 10% change over a 10-year period.

17. Research on displaced workers has shown that the adjustment costs associated with moving between employers in the same sector are generally lower than those associated with changing sectors, suggesting that the ENV-Linkages simulations capture the aspect of job reallocation that is most likely to be disruptive.

18. This calculation is likely to underestimate the total impact of green growth policies on job-skill requirements, since it takes no account of how the adoption of new green technologies and working practices will change skill demands *within* industries.

19. Several other multi-country CGEs recently have been extended to include labour market imperfections so as to study how they affect the transition costs created by climate-change mitigation policy, including the GEM-E3 model (Capros and Parousos, 2007; and EC, 2008) and the WorldScan model (Boeters and van Leeuwen, 2010). While the detailed implementation differs, both of these models incorporate labour market rigidities in the form of a variable wage mark-up above the market-clearing wage. This mark-up – which is intended to capture the effect of workers' bargaining power, efficiency wage considerations or matching frictions – results in variable amounts of unemployment and may also influence labour supply. Whereas the approach adopted in this chapter focuses on potential "stickiness" in the adjustment of the labour market to the structural shocks caused by mitigation policy, these studies analyse how the equilibrium level of unemployment and participation can be affected. In practice, both types of imperfection are probably present, but they are difficult to differentiate within these very complicated CGE models.

20. The full adjustment of wages to the cost pressures created by placing a particular limit on GHG emissions is only temporary, so that the reduction in employment would be reversed relatively rapidly. However, the policy scenario analysed here envisions a progressive tightening of the allowable emissions level during the period until 2050, effectively generating a new policy shock every year.

21. Recent modelling studies that endogenise R&D activities and technological change suggest that using the permit revenues to subsidise eco-innovation (*e.g.* R&D in renewable energy) could have a larger, if more indirect, effect in raising GDP and employment in the long-run than would using these revenues to lower labour taxes (Cambridge Econometrics *et al.*, 2011; ICCS/NTUA, 2010).

22. It is sometimes argued that employment needs to exceed minimum job-quality thresholds in order to be classified as representing green jobs. For example, UNEP *et al.* (2008) argues that *green* jobs should be *decent* jobs, but it is unclear whether this is part of their preferred definition or a policy goal. Incorporating minimal job quality into the definition is consistent with definitions of sustainable development which encompass social sustainability, along with economic and environmental sustainability. This approach does not appear to have been used to estimate the number of green jobs and it is clear that green jobs defined only in terms of the environmental impact of the associated production activity may be low-quality jobs by conventional standards (*e.g.* low-paid, insecure and dangerous work such as much disassembly of obsolete ships and ICT equipment in South Asia).

23. These estimates are largely based on engineering estimates of the amount of labour input required to produce exogenously specified targets for domestic production of renewable energy and they abstract from many of the factors likely to influence the growth of employment in this sector in any specific country.

24. Similar, but generally less detailed analyses, have been conducted for a number of other green sectors – for example, green ICT as analysed in OECD (2012d) – or recent green policy initiatives – for example, green fiscal stimulus packages enacted in response to the 2008-09 recession (*e.g.* Pollin *et al.*, 2009 for the United States) or longer-run green jobs initiatives such as the "Grenelle de l'Environment" goals in France (BCG, 2009).

25. Information about green jobs and their skill requirements, and how green technologies and production practices are changing existing occupations, is being incorporated into the Occupational Information Network (O*NET) sponsored by the DOL and web-based career exploration tools that make these data available to students, workers and occupational guidance

counsellors. The O*NET system currently tracks 215 detailed occupations in 12 sectors that have been identified as either new green occupations or existing occupations that have become significantly greener or were already green and are rapidly increasing in size (Dierdorff *et al.*, 2009).

26. Cedefop (2010) argues that an effective revision and upgrade of the skills of existing workers can fill most skills gaps, even in specialised subsectors like renewable energy and energy management.

27. For example, Zabin *et al.* (2011) provide a detailed analysis of the skill demands resulting from the state of California's ambitious energy efficiency and GHG abatement policy goals and conclude that almost all of the workers required could be recruited from local workers who already have most of the required skills, but may need modest top-up training. While this study's findings reflect in part the currently depressed state of the labour market in California, it also suggests caution about concluding that ambitious environmental policies generally will imply serious skill shortages in the absence of a major investment in new forms of VET.

28. Indeed, the general-equilibrium analysis in Section 1 emphasised how *indirect effects*, such as changes in labour demand due to rising energy prices, could potentially affect labour demand in all industries. Nonetheless, the CGE modelling of mitigation policy suggests that these effects will be relatively small during the next several decades, with sharp job losses being confined to a small number of high-emitting industries.

29. Inevitably, it is somewhat arbitrary where to set the threshold for inclusion in the high-polluting group. However, the qualitative conclusions from this analysis are robust to modest variations in the threshold. IILS-ILO (2011) also reached qualitatively similar conclusions using somewhat different thresholds, data sources and country coverage.

30. Indeed, the discussion of general-equilibrium analysis in Section 1 suggests that the most intensive restructuring will occur within the two energy sectors included in the industry taxonomy used in Figure 4.7.

31. Similarly, Capros *et al.* (2011) show that the least-cost policy mix for achieving EU-wide targets of reducing greenhouse gas emissions by at least 20% in 2020 compared with 1990 and supplying 20% of energy needs from renewable energy imply higher compliance costs, as a percentage of GDP, in EU countries with below-average GDP per capita.

32. See OECD (2012a) for a more detailed analysis.

33. In order to achieve more precise estimates and abstract from business-cycle effects, the flow estimates analysed here are averages over the period 2000-07. Following the methodology in OECD (2009b), these data are further harmonised on the basis of industry-level EUKLEMS employment data to ensure comparability over time at the industry level. (Since this normalisation could not be implemented for public administration, health and education, that sector is excluded from the analysis of worker mobility in this section.) Hirings are proxied by the number of currently employed workers with less than a year of job tenure, while separations are calculated as the difference between hirings and employment growth.

34. OECD (2012a) analyses three additional measures of labour turnover, but they show very similar patterns to those analysed here.

35. Among the countries analysed, Spain and Denmark have the highest worker reallocation rates, albeit for rather different reasons. High turnover in Spain reflects the large share of temporary workers, who frequently change jobs, whereas high turnover in Denmark reflects relatively high job changing rates for regular workers.

36. These mobility rates are averages across the 15 EU countries shown in Panel A of Figure 4.10. See Annex Table 4.A1.1 for definitions of the numeric industry codes used in Panel B.

37. While comparative data on involuntary dismissals are scarce, OECD (2009b) suggests that, on average, about 5% of dependent workers are dismissed each year in high-reallocation countries and about 3% in middle-to-low reallocation countries.

38. In a growing number of OECD countries, some of these re-employment services are provided by private firms and non-profits working as sub-contractors for the PES.

39. OECD (2012a) provides a more detailed discussion of the experience with targeted programmes for trade-displaced workers.

40. As is discussed below, the distinction between general and targeted measures can be rather artificial in some instances. A general characteristic of an effective PES system it that it constantly adjusts the reemployment and training services it provides to shifts in the labour market needs of both employers and workers. For example, the PES in some OECD countries sometimes reacts to

mass layoffs, particularly those having a major impact of the local labour market, by setting up temporary rapid response task forces to delivery adjustment assistance tailored to the local circumstances (OECD, 2005a). As green-growth-driven structural change becomes more prevalent, these types of general programmes will introduce green content into labour market programmes automatically.

41. More than 50% of 25-34 year-olds in Canada, Japan and Korea have completed tertiary education (OECD, 2011e). At the other extreme, only 16% of this age group have a tertiary degree in Turkey and this share is about 1:5 for another five OECD countries.

42. The fact that strict EP reduces job and worker flows is well documented (OECD, 2010b) whereas the link for PMR is less well established, although it stands to reason that barriers to new business formation would impede the reallocation of labour and other productive inputs. The strong potential link between PMR and the labour reallocation required to achieve green growth is the reason it is discussed here, even though it is not strictly a labour market policy.

43. Moreover, greater worker mobility in itself may foster the diffusion of technology among firms, between industry sectors, and between universities (or government laboratories) and industry.

44. These differences persist despite a broad trend during the past two decades to reform PMR, so as to reinforce competition. There have also been many reforms intended to relax EP, but comprehensive EP reforms have been rare. EP reform in a number of countries, especially in Europe, typically has taken the form of easing the use of temporary forms of employment while leaving relatively strict regulations on permanent contracts virtually intact.

45. Considering the three countries with the highest intensity of environmental patenting, the strictness of EP regulation is well below the OECD average in Japan and Switzerland, but it is above average in Germany.

46. Poland introduced reforms in 2009 and 2011 to reduce barriers to business start-ups (OECD, 2012g).

47. General tax revenues could also be used to reduce the labour market distortions discussed in this section. However, tax revenues for this purpose are typically difficult to find and it is worthwhile considering how increased revenue from greater environmental taxation might best be used to lower barriers to employment.

48. The Danish Ministry of Employment is in the process of developing a definition of green jobs and assessing whether to introduce green-specific measures into their extensive system of active labour market programmes.

49. OECD (2012b) provides a fuller discussion and more country examples.

50. The Slovak labour market authorities reported that they lacked an effective means to co-ordinate their programmes with environmental policy which falls under the competencies of several ministries.

51. OECD (2006a and 2006b) highlighted a taxonomy of labour market types which includes two different and equivalently successful implementations of much of the good practice guidelines put forth in the *Reassessed Jobs Strategy*, a more market-oriented implementation and a more Nordic implementation. There are no evident grounds to conclude that one or the other of these two models is better suited to manage the transition towards green growth.

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ANNEX 4.A1

List of Industries Used in the Analysis of Worker Mobility in Section 2

Table 4.A1.1. **List of industries and industry codes used in Section 2**[a]

ISIC	Description	CO_2 intensity[b]
01-05	Agriculture, hunting, forestry, fishing (Agriculture)	3.2
10-14	Mining and quarrying (Mining)	3.5
15-16	Food, beverage and tobacco (Food)	1.8
17-19	Textiles, wearing apparel, dressing and dying of fur, leather, leather and footwear (Textiles)	0.5
20	Wood and of wood and cork (Wood)	1
21-22	Pulp, paper and paper products; Printing, publishing and reproduction (Paper)	1.8
23	Coke, refined petroleum and nuclear fuel (Fuels)	16.5
24	Chemicals and chemical products (Chemicals)	3
25	Rubber and plastics products (Rubber)	0.7
26	Other non-metallic mineral products	9.2
27	Basic metals	10.9
28	Fabricated metal	1
29	Machinery, nec	0.5
30-33	Office, accounting and computing machinery; Electrical machinery and apparatus, nec; Radio, television and communication equipment; Medical, precision and optical instruments (ICT equipment)	0.5
34-35	Motor vehicles, trailers and semi-trailers; Other transport equipment (Transport equipment)	0.6
36-37	Manufacturing nec; Recycling	1.3
40	Electricity, gas (Electricity)	110.8
41	Water supply (Water)	0.6
45	Construction	0.9
50	Sale, maintenance and repair of motor vehicles and motorcycles; Retail sale of fuel (Vehicles sales/repair)	1.1
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles (Wholesale)	1.6
52	Retail trade, except of motor vehicles and motorcycles; Repair of household goods (Retail)	1.8
55	Hotels and restaurants	1.1
60	Land transport	5.9
61	Water transport	2.6
62	Air transport	17
63	Other Supporting and auxiliary transport activities; Activities of travel agencies (Other transport)	2.4
64	Post and telecommunications	0.4
65-67	Financial intermediation, except insurance and pension funding; Insurance and pension funding, except compulsory social security; Activities related to financial intermediation (Finance)	0.3
70	Real estate activities (Real estate)	0
71-74	Renting of machinery and equipment; Computer and related activities; Research and development ; Other business activities (Non-financial business services)	0.4

a) These numerical codes are based on two-digit codes from the International Standard Industrial Classification (ISIC), Revision 3.1. The main text sometimes refers to these industries using the short industry titles given in parenthesis following the official (and more complete) titles.

b) CO_2 intensities are ratios of the industry CO_2 emissions intensity to the median intensity and were calculated by the International Institute for Labour Studies of the ILO, using input-output tables for Germany.

Source: IILS-ILO (2009) for the CO_2 intensity data.

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Statistical Annex

Sources and definitions

Most of the statistics shown in these tables can also be found in the OECD central data repository: OECD.Stat (*http://stats.oecd.org*), which contains both raw data and derived statistics.

This database contains longer time series and more detailed datasets by age group, gender, educational attainment, part-time employment, temporary employment, duration of unemployment, and other series than are shown in this annex, such as, employee job tenure, involuntary part-time employment, distribution of employment by weekly usual hours worked intervals, etc. The datasets include information on definitions, notes and sources used by member countries,

So far, data available for Brazil, the Russian Federation and South Africa are included in a number of tables in addition to data for 34 OECD countries. For recent years, data are annual averages of monthly and quarterly estimates based on labour force surveys, except for Tables B and C for Chile where they refer to fourth quarter for data prior to 2010 and annual averages since then. Data shown for a number of European countries in Tables B, C, E, F and H are taken from now on from the European Labour Force Survey (EULFS), 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".

Please note that the 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 a number of charts and tables of Chapter 1 and Chapter 2 of this publication.

Interested users can refer to the online database (*www.oecd.org/employment/database*), which contains data series on the labour market situation in OECD countries: population, labour force, employment and unemployment disaggregated by gender and age, educational attainment, employment status and sector of activity, participation and unemployment rates, statistics on part-time employment and duration of unemployment, job tenure, etc. The online database contains additional series on labour market performances and on 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 full-time equivalent employee.

- Distribution of gross earnings of full-time workers by earnings decile and by sex for earnings dispersion measures.
- Gross mean and median earnings of full-time workers by age group and gender.
- Statutory minimum wages.
- Public expenditure on labour market programmes, number of beneficiaries and inflows into the labour market.
- Trade union density rates in OECD member countries.

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 F and Table H: Most of the breaks in series mentioned below 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), Belgium (1998/99), Czech Republic (1996/1997), Denmark (1993/94), Estonia (1999/2000), Finland (1999/2000, monthly results), France (2002/03), Germany (2004/05), Greece (1997/98), Hungary (2005/06, monthly results), Iceland (2002/03), Ireland (1996/97/98), Italy (2003/04), Luxembourg (2002/03, quarterly results as of 2007), Netherlands (1999/2000), Norway (1995/96), Poland (1998/99/2000), Portugal (1997/98), Slovak Republic (1997/98), Slovenia (1996/97/98), Spain (1998/99), Sweden (1992/93, monthly results) and United Kingdom (1991/92).
- *Redesign of labour force survey:* Germany (2010/11), Greece (1997/98), Hungary (2002/03), Portugal (1997/98), Slovak Republic (1998/99), Spain (2004/05), Turkey (1999/2000 – half-yearly to quarterly results – 2004/05 monthly results). New survey in Mexico since 2005 (*Encuesta Nacional de Ocupación y Empleo*, ENOE) with a different questionnaire from that of the previous survey. Introduction of a new survey in Chile since April 2010 (see below).
- *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) from 2010 onward.
- *Change in the operational definition of unemployment regarding:*
  - Active job-search methods, in particular change from registration to contact with the public employment service: France (2002/03), Spain (2000/01).
  - Work availability criteria changed from the reference week to two weeks after the reference week to be consistent with the operational definition in other EU countries: Sweden (2004/05). This criterion did not exist prior to 2010 in the Chilean *Encuesta Nacional de Empleo* (ENE) and has been introduced in the *Nueva Encuesta Nacional de Empleo* (NENE) since 2010.
  - Persons on lay-off considered as employed instead of unemployed: Norway (2005/06).

Major breaks in series *(cont.)*

- Duration of active job search changed from one week to four weeks: Korea (1999/2000). This change occurred in June 2005 and data were revised back since 2000 to take into account the new criteria. In Chile (2009/10), the duration of active job search has been shortened from last two months to previous four weeks including the survey week.
- 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) mainly increase in employment, and impact on unemployment estimates in Norway (2005/06) and Sweden (2004/05).
- *Change from seasonal to calendar quarters:* Czech Republic (1996/97), Slovak Republic (1999/2000), 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:* Norway (2005/06). Moreover, since 2006, age is defined as years reached at the survey reference week, instead of completed years at the end of the year, as earlier.
- *Inclusion of population controls based on Census results in the estimation process:* Israel (2007/08), Mexico (2009/10), Spain (1995/96), Turkey (2006/07), United Kingdom (revised series from 1992 onwards), United States (1999/2000).

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*.

The Russian Federation is currently undergoing an accession process.

Table A. **Harmonised unemployment rates in OECD countries**

As a percentage of civilian labour force

	1991	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	9.6	8.5	6.3	6.8	6.4	5.9	5.4	5.0	4.8	4.4	4.2	5.6	5.2	5.1
Austria	..	3.9	3.6	3.6	4.2	4.3	4.9	5.2	4.7	4.4	3.8	4.8	4.4	4.2
Belgium	6.4	9.7	6.9	6.6	7.5	8.2	8.4	8.5	8.2	7.5	7.0	7.9	8.3	7.2
Canada	10.3	9.5	6.8	7.2	7.7	7.6	7.2	6.8	6.3	6.0	6.1	8.3	8.0	7.4
Chile	8.2	7.3	9.7	9.9	9.8	9.5	10.0	9.2	7.8	7.1	7.8	10.8	8.2	7.1
Czech Republic	..	4.1	8.7	8.0	7.3	7.8	8.3	7.9	7.2	5.3	4.4	6.7	7.3	6.7
Denmark	7.9	6.8	4.3	4.5	4.6	5.4	5.5	4.8	3.9	3.8	3.4	6.1	7.5	7.6
Estonia	..	..	13.7	12.6	10.3	10.0	9.6	7.9	5.9	4.7	5.6	13.9	16.9	12.5
Finland	6.6	15.1	9.6	9.1	9.1	9.1	8.9	8.3	7.7	6.9	6.4	8.2	8.4	7.8
France	8.5	10.5	9.0	8.2	8.3	8.9	9.3	9.3	9.2	8.4	7.8	9.5	9.8	9.7
Germany	5.5	8.2	8.0	7.9	8.7	9.8	10.5	11.3	10.2	8.7	7.5	7.8	7.1	5.9
Greece	..	9.1	11.2	10.7	10.3	9.8	10.5	9.9	8.9	8.3	7.7	9.5	12.6	17.7
Hungary	..	10.4	6.4	5.7	5.8	5.9	6.1	7.2	7.5	7.4	7.8	10.0	11.2	10.9
Iceland	..	4.9	2.3	2.3	3.3	3.4	3.1	2.6	2.9	2.3	3.0	7.2	7.5	7.1
Ireland	14.8	12.3	4.2	4.0	4.5	4.6	4.5	4.4	4.5	4.6	6.3	11.9	13.7	14.5
Israel[a]	..	6.9	8.8	9.3	10.3	10.7	10.4	9.0	8.4	7.3	6.1	7.5	6.7	5.6
Italy	8.5	11.2	10.1	9.1	8.6	8.5	8.0	7.7	6.8	6.2	6.7	7.8	8.4	8.5
Japan	2.1	3.1	4.7	5.0	5.4	5.3	4.7	4.4	4.1	3.9	4.0	5.1	5.1	4.6
Korea	2.5	2.1	4.4	4.0	3.3	3.6	3.7	3.7	3.5	3.2	3.2	3.6	3.7	3.4
Luxembourg	1.7	2.9	2.2	1.9	2.6	3.8	5.0	4.6	4.6	4.2	4.9	5.2	4.6	4.8
Mexico	2.7	6.2	2.5	2.8	3.0	3.4	3.9	3.6	3.6	3.7	4.0	5.5	5.3	5.2
Netherlands	4.8	7.0	3.0	2.6	3.1	4.1	5.1	5.3	4.3	3.6	3.1	3.7	4.5	4.4
New Zealand	10.6	6.5	6.2	5.5	5.3	4.8	4.1	3.8	3.9	3.7	4.2	6.1	6.5	6.5
Norway	5.5	5.5	3.2	3.4	3.7	4.2	4.3	4.5	3.4	2.5	2.5	3.1	3.5	3.3
Poland	..	13.3	16.2	18.3	20.0	19.7	19.0	17.8	13.9	9.7	7.2	8.2	9.6	9.7
Portugal	4.2	7.2	4.5	4.6	5.7	7.1	7.5	8.6	8.6	8.9	8.5	10.6	12.0	12.9
Slovak Republic	..	13.1	18.7	19.3	18.7	17.6	18.2	16.2	13.3	11.2	9.5	12.0	14.4	13.6
Slovenia	..	..	6.7	6.2	6.3	6.7	6.3	6.5	6.0	4.9	4.4	5.9	7.3	8.2
Spain	14.5	20.1	11.7	10.5	11.4	11.4	10.9	9.2	8.5	8.3	11.4	18.0	20.1	21.7
Sweden	3.1	8.8	5.6	5.9	6.0	6.6	7.4	7.7	7.1	6.1	6.2	8.3	8.4	7.5
Switzerland	..	3.2	2.5	2.2	2.9	3.9	4.1	4.2	3.8	3.4	3.2	4.1	4.2	3.8
Turkey	..	..	..	..	..	..	..	9.2	8.7	8.8	9.7	12.5	10.6	8.8
United Kingdom	8.6	8.5	5.4	5.0	5.1	5.0	4.7	4.8	5.4	5.3	5.6	7.6	7.8	8.0
United States	6.8	5.6	4.0	4.7	5.8	6.0	5.5	5.1	4.6	4.6	5.8	9.3	9.6	9.0
OECD[b]	6.5	7.3	6.1	6.3	6.9	7.0	6.9	6.6	6.1	5.6	6.0	8.1	8.3	8.0

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 (EU) 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/dataoecd/21/0/44743407.pdf.*

a) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

b) Weighted average.

Source: OECD (2012), *OECD Main Economic Indicators,* Paris, June.

StatLink http://dx.doi.org/10.1787/888932652130

Table B. **Employment/population ratios, activity and unemployment rates**[a]

Persons aged 15-64 years (percentages)

	Employment/population ratio						Labour force participation rate						Unemployment rate					
	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011
Australia	67.7	69.3	73.2	72.0	72.4	72.7	74.1	74.0	76.5	76.4	76.5	76.7	8.6	6.4	4.3	5.7	5.3	5.2
Austria	68.7	68.3	72.1	71.6	71.7	72.1	71.4	70.8	75.0	75.3	75.1	75.3	3.7	3.5	3.9	4.8	4.5	4.2
Belgium	56.3	60.9	62.4	61.6	62.0	61.9	62.1	65.2	67.1	66.9	67.7	66.7	9.4	6.6	7.0	8.0	8.4	7.2
Canada	67.5	70.9	73.6	71.5	71.5	72.0	74.7	76.2	78.5	78.0	77.8	77.8	9.6	6.9	6.2	8.4	8.1	7.5
Chile	..	53.3	57.3	56.1	59.3	61.3	..	58.8	62.3	62.3	64.8	66.2	..	9.4	8.0	10.0	8.4	7.4
Czech Republic	69.4	65.2	66.6	65.4	65.0	65.7	72.3	71.6	69.7	70.1	70.2	70.5	4.0	8.8	4.4	6.8	7.4	6.8
Denmark	73.9	76.4	77.9	75.3	73.3	73.1	79.5	80.0	80.7	80.2	79.4	79.3	7.0	4.5	3.5	6.1	7.6	7.7
Estonia	65.9	61.0	69.7	63.5	61.0	65.2	72.9	70.8	73.9	73.9	73.7	74.7	9.7	13.8	5.6	14.0	17.2	12.7
Finland	61.9	67.5	71.3	68.4	68.3	69.2	73.2	74.9	76.1	74.6	74.6	75.1	15.4	9.8	6.4	8.4	8.5	7.9
France	59.5	61.7	64.8	64.0	63.8	63.8	67.6	68.8	70.0	70.5	70.5	70.4	11.9	10.3	7.4	9.2	9.4	9.3
Germany	64.6	65.6	70.2	70.4	71.2	72.6	70.4	71.1	75.9	76.4	76.6	77.2	8.2	7.8	7.6	7.8	7.2	6.0
Greece	54.5	55.9	61.9	61.2	59.6	55.6	60.1	63.0	67.1	67.8	68.2	67.7	9.3	11.3	7.8	9.6	12.7	17.9
Hungary	52.9	56.0	56.7	55.4	55.4	55.8	58.9	59.9	61.5	61.6	62.4	62.7	10.2	6.4	7.9	10.1	11.2	11.0
Iceland[b]	80.5	84.6	84.2	78.9	78.9	79.0	84.7	86.6	86.9	85.3	85.5	85.2	5.0	2.3	3.0	7.4	7.7	7.2
Ireland	54.1	65.0	68.1	62.5	60.4	59.6	61.8	68.1	72.3	71.3	70.2	69.8	12.4	4.6	5.8	12.2	13.9	14.6
Israel[c]	56.5	56.1	59.8	59.2	60.2	60.9	60.8	61.5	63.8	64.1	64.5	64.6	7.0	8.9	6.2	7.7	6.8	5.7
Italy	51.2	53.9	58.7	57.5	56.9	56.9	57.9	60.3	63.0	62.4	62.2	62.3	11.7	10.6	6.8	7.9	8.5	8.5
Japan	69.2	68.9	70.7	70.0	70.1	70.3	71.5	72.5	73.8	73.9	74.0	73.8	3.3	5.0	4.2	5.3	5.3	4.8
Korea	63.5	61.5	63.8	62.9	63.3	63.9	64.9	64.4	66.0	65.4	65.8	66.2	2.1	4.6	3.3	3.8	3.8	3.5
Luxembourg	58.5	62.7	63.4	65.2	65.2	64.6	60.3	64.2	66.8	68.7	68.2	67.9	2.9	2.4	5.1	5.2	4.4	4.9
Mexico	57.2	60.1	61.3	59.4	60.3	59.8	61.5	61.7	63.6	62.8	63.7	63.3	7.1	2.6	3.6	5.4	5.4	5.4
Netherlands	65.1	72.1	75.9	75.6	74.7	74.9	70.1	74.3	78.3	78.5	78.2	78.4	7.1	3.1	3.0	3.7	4.5	4.4
New Zealand	69.7	70.4	74.7	72.9	72.3	72.6	74.5	75.1	78.0	77.8	77.5	77.8	6.5	6.2	4.3	6.3	6.7	6.7
Norway[b]	73.5	77.9	78.1	76.5	75.4	75.3	77.4	80.7	80.2	79.0	78.2	78.0	5.0	3.5	2.6	3.2	3.7	3.3
Poland	58.1	55.0	59.2	59.3	59.3	59.7	67.4	65.8	63.8	64.7	65.6	66.1	13.7	16.4	7.2	8.3	9.7	9.8
Portugal	63.2	68.3	68.2	66.3	65.6	64.2	68.4	71.2	74.2	73.7	74.0	74.1	7.6	4.2	8.1	10.0	11.4	13.4
Slovak Republic	60.2	56.8	62.3	60.2	58.8	59.5	69.3	69.9	68.9	68.4	68.7	68.8	13.1	18.8	9.6	12.1	14.4	13.6
Slovenia	..	..	68.6	67.5	66.2	64.4	..	..	71.8	71.8	71.5	70.3	..	..	4.5	6.0	7.4	8.3
Spain[b]	48.3	57.4	65.3	60.6	59.4	58.5	62.6	66.7	73.7	74.0	74.4	74.7	22.8	13.9	11.4	18.1	20.2	21.8
Sweden[b]	72.2	74.3	75.8	72.3	72.7	74.1	79.5	79.0	80.8	78.9	79.5	80.3	9.2	5.9	6.1	8.5	8.5	7.6
Switzerland	76.4	78.4	79.5	79.0	78.6	79.3	79.1	80.6	82.3	82.5	82.4	82.8	3.4	2.7	3.4	4.2	4.6	4.2
Turkey	52.4	48.9	44.9	44.3	46.3	48.4	56.8	52.4	50.6	51.7	52.7	53.8	7.8	6.7	11.2	14.3	12.1	10.0
United Kingdom[b]	69.2	72.2	72.7	70.6	70.3	70.4	75.8	76.4	76.8	76.6	76.3	76.5	8.7	5.5	5.4	7.8	7.9	8.0
United States[b]	72.5	74.1	70.9	67.6	66.7	66.6	76.9	77.2	75.3	74.6	73.9	73.3	5.6	4.0	5.8	9.4	9.8	9.1
OECD weighted average	64.2	65.4	66.5	64.7	64.6	64.8	69.5	69.9	70.8	70.6	70.6	70.6	7.6	6.3	6.1	8.3	8.5	8.2
Brazil	..	..	68.3	67.6	..	..	..	..	73.7	73.9	..	..	..	..	7.3	8.5	..	..
Russian Federation	64.0	62.9	68.7	66.9	67.4	67.8	70.7	70.4	73.4	73.1	72.9	72.7	9.5	10.7	6.4	8.5	7.5	6.7
South Africa	..	..	44.8	42.7	40.8	40.8	..	..	58.0	56.1	54.3	54.4	..	..	22.8	23.9	24.9	24.9

Table B. **Employment/population ratios, activity and unemployment rates**[a] *(cont.)*

Men aged 15-64 years (percentages)

	Employment/population ratio						Labour force participation rate						Unemployment rate					
	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011
Australia	76.4	77.1	79.7	77.8	78.6	78.7	83.9	82.5	83.0	82.6	82.9	82.9	9.0	6.6	4.1	5.9	5.2	5.0
Austria	78.6	77.3	78.5	76.9	77.1	77.8	81.2	79.9	81.4	81.0	80.9	81.1	3.2	3.3	3.6	5.1	4.6	4.1
Belgium	66.9	69.8	68.6	67.2	67.4	67.1	72.3	73.8	73.3	72.8	73.4	72.3	7.4	5.3	6.5	7.8	8.2	7.2
Canada	73.4	76.2	77.2	73.9	74.2	75.0	81.5	81.9	82.7	81.7	81.5	81.5	9.9	7.0	6.7	9.6	8.9	8.0
Chile	..	71.9	72.6	70.0	72.1	73.6	..	78.9	78.1	77.3	77.8	78.6	..	9.0	7.0	9.4	7.4	6.3
Czech Republic	77.9	73.6	75.4	73.8	73.5	74.0	80.6	79.4	78.1	78.5	78.6	78.7	3.4	7.4	3.5	5.9	6.5	5.9
Denmark	80.7	80.7	81.6	78.0	75.6	75.9	85.6	84.0	84.3	83.6	82.6	82.3	5.7	4.0	3.2	6.8	8.5	7.9
Estonia	71.6	65.4	73.5	64.1	61.5	67.8	79.9	76.7	78.0	77.4	76.7	78.1	10.5	14.7	5.9	17.3	19.7	13.3
Finland	64.8	70.5	73.4	68.9	69.7	70.9	76.7	77.6	78.1	75.8	76.7	77.5	15.5	9.1	6.0	9.1	9.2	8.5
France	67.3	68.8	69.5	68.3	68.1	68.1	74.8	75.3	74.7	75.0	74.9	74.7	10.1	8.6	6.9	8.9	9.1	8.9
Germany	73.7	72.9	75.9	75.5	76.1	77.4	79.5	78.9	82.1	82.2	82.4	82.6	7.2	7.6	7.5	8.2	7.6	6.3
Greece	72.2	71.3	75.0	73.5	70.9	65.9	77.2	77.1	79.1	79.0	78.9	77.7	6.4	7.5	5.1	7.0	10.1	15.2
Hungary	60.2	62.7	63.0	61.1	60.4	61.2	67.9	67.5	68.3	68.2	68.3	68.8	11.4	7.1	7.7	10.3	11.6	11.0
Iceland[b]	84.0	88.2	87.8	80.6	80.6	80.8	88.4	89.8	90.9	88.4	88.2	87.8	5.0	1.8	3.4	8.9	8.6	8.1
Ireland	66.7	76.1	75.7	67.3	64.5	63.3	76.2	79.8	81.2	79.6	77.9	77.2	12.5	4.6	6.8	15.5	17.2	18.0
Israel[c]	65.0	61.4	64.1	62.5	63.4	64.3	69.0	67.1	68.1	67.8	68.2	68.2	5.7	8.6	5.8	7.7	6.9	5.7
Italy	67.0	68.2	70.3	68.6	67.7	67.5	73.6	74.3	74.4	73.7	73.3	73.1	9.0	8.2	5.6	6.9	7.7	7.7
Japan	81.9	80.9	81.6	80.2	80.0	80.2	84.5	85.2	85.2	84.8	84.8	84.4	3.1	5.1	4.3	5.5	5.6	5.0
Korea	76.8	73.1	74.4	73.6	73.9	74.5	78.7	77.1	77.3	76.9	77.1	77.4	2.4	5.1	3.7	4.3	4.1	3.7
Luxembourg	74.3	75.0	71.5	73.2	73.1	72.1	75.9	76.4	74.7	76.6	76.0	75.0	2.1	1.8	4.3	4.4	3.8	3.9
Mexico	79.9	82.8	80.7	77.7	78.5	77.8	85.2	84.7	83.5	82.3	83.0	82.3	6.2	2.3	3.4	5.6	5.4	5.5
Netherlands	76.0	81.2	82.4	81.5	80.0	79.8	80.8	83.2	84.8	84.6	83.8	83.6	5.9	2.5	2.8	3.7	4.5	4.5
New Zealand	78.2	77.9	80.9	78.6	78.2	78.2	83.7	83.2	84.4	83.9	83.6	83.6	6.5	6.4	4.2	6.3	6.4	6.6
Norway[b]	78.1	81.7	80.6	78.4	77.4	77.2	82.4	84.8	82.9	81.4	80.8	80.1	5.2	3.6	2.8	3.7	4.2	3.5
Poland	64.7	61.2	66.3	66.1	65.6	66.3	73.9	71.7	70.9	71.8	72.4	73.0	12.5	14.6	6.5	7.9	9.4	9.1
Portugal	72.1	76.3	74.0	71.1	70.1	68.1	77.3	78.9	79.5	78.5	78.2	78.5	6.8	3.3	6.9	9.4	10.4	13.2
Slovak Republic	67.6	62.2	70.0	67.6	65.2	66.3	77.3	76.8	76.4	76.3	76.0	76.7	12.6	19.0	8.4	11.4	14.3	13.6
Slovenia	..	..	72.7	71.0	69.6	67.7	..	..	75.8	75.6	75.4	73.9	..	..	4.1	6.1	7.6	8.3
Spain[b]	64.0	72.7	74.6	67.5	65.6	64.1	78.0	80.4	83.0	82.2	81.9	81.5	17.9	9.6	10.1	17.8	19.8	21.3
Sweden[b]	73.5	76.3	78.3	74.2	75.0	76.3	81.7	81.5	83.3	81.4	82.2	82.7	10.0	6.3	5.9	8.8	8.7	7.7
Switzerland	87.3	87.3	85.4	84.4	84.6	85.3	90.0	89.4	88.0	87.8	88.3	88.7	3.0	2.4	2.9	3.9	4.3	3.8
Turkey	74.6	71.7	66.6	64.6	66.7	69.3	81.1	76.9	74.8	75.2	75.4	76.4	8.0	6.8	11.0	14.2	11.7	9.4
United Kingdom[b]	76.1	78.9	78.6	75.7	75.3	75.5	84.7	84.1	83.4	83.1	82.5	82.7	10.2	6.1	5.8	8.9	8.8	8.7
United States[b]	79.5	80.6	76.4	72.0	71.1	71.4	84.3	83.9	81.4	80.4	79.6	78.9	5.6	3.9	6.2	10.5	10.7	9.5
OECD weighted average	75.4	76.1	75.6	72.9	72.7	73.0	81.2	80.9	80.4	79.8	79.7	79.5	7.1	5.9	6.0	8.7	8.7	8.2
Brazil	..	..	80.6	79.7	..	..	..	..	85.1	85.1	..	..	..	..	5.3	6.3	..	..
Russian Federation	69.3	67.2	73.0	70.7	71.6	72.2	76.8	75.4	78.1	77.7	77.9	77.8	9.7	10.9	6.6	9.1	8.0	7.1
South Africa	..	..	52.7	49.7	47.7	47.4	..	..	65.8	63.7	61.8	61.2	..	..	19.8	22.0	22.8	22.5

Table B. **Employment/population ratios, activity and unemployment rates**[a] *(cont.)*

Women aged 15-64 years (percentages)

	Employment/population ratio						Labour force participation rate						Unemployment rate					
	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011	1995	2000	2008	2009	2010	2011
Australia	59.0	61.4	66.7	66.3	66.2	66.7	64.2	65.4	70.0	70.1	70.0	70.5	8.1	6.1	4.6	5.5	5.5	5.4
Austria	58.9	59.4	65.8	66.4	66.4	66.5	61.6	61.8	68.6	69.6	69.3	69.5	4.4	3.8	4.2	4.6	4.3	4.4
Belgium	45.4	51.9	56.2	56.0	56.5	56.7	51.7	56.6	60.8	60.9	61.8	61.1	12.3	8.3	7.6	8.1	8.6	7.2
Canada	61.6	65.6	70.1	69.0	68.8	68.9	67.8	70.4	74.3	74.3	74.2	74.2	9.2	6.7	5.7	7.1	7.3	7.1
Chile	..	35.1	42.1	42.2	46.7	49.1	..	39.1	46.6	47.4	51.8	53.9	..	10.2	9.7	10.9	9.9	8.9
Czech Republic	61.0	56.9	57.6	56.7	56.3	57.2	64.1	63.7	61.0	61.5	61.5	62.2	4.8	10.6	5.7	7.8	8.5	8.0
Denmark	67.0	72.1	74.1	72.7	71.1	70.4	73.3	75.9	77.0	76.8	76.0	76.1	8.6	5.0	3.8	5.4	6.5	7.6
Estonia	60.6	57.0	66.3	63.0	60.5	62.7	66.5	65.3	70.0	70.6	70.9	71.4	8.9	12.8	5.4	10.8	14.7	12.1
Finland	59.0	64.5	69.0	67.9	66.9	67.5	69.5	72.1	74.0	73.5	72.5	72.7	15.2	10.6	6.8	7.6	7.8	7.2
France	52.0	54.8	60.2	59.9	59.7	59.7	60.6	62.5	65.4	66.1	66.1	66.1	14.2	12.3	7.9	9.4	9.7	9.8
Germany	55.3	58.1	64.3	65.2	66.1	67.7	61.1	63.3	69.7	70.4	70.8	71.8	9.5	8.1	7.7	7.4	6.6	5.7
Greece	38.0	41.3	48.7	48.9	48.1	45.1	44.3	49.7	55.1	56.5	57.6	57.5	14.1	16.9	11.5	13.3	16.4	21.6
Hungary	45.9	49.6	50.6	49.9	50.6	50.6	50.3	52.6	55.0	55.3	56.7	56.8	8.7	5.7	8.1	9.8	10.8	11.0
Iceland[b]	76.8	81.0	80.3	77.2	77.0	77.3	80.9	83.3	82.5	82.0	82.7	82.4	5.0	2.8	2.6	5.8	6.8	6.2
Ireland	41.5	53.8	60.5	57.8	56.4	56.0	47.3	56.4	63.3	62.9	62.6	62.6	12.3	4.5	4.5	8.1	9.9	10.5
Israel[c]	48.1	50.9	55.6	55.9	56.9	57.5	52.7	56.1	59.5	60.5	60.9	60.9	8.7	9.3	6.6	7.6	6.6	5.7
Italy	35.4	39.6	47.2	46.4	46.1	46.5	42.3	46.3	51.6	51.1	51.1	51.5	16.3	14.6	8.6	9.3	9.7	9.7
Japan	56.4	56.7	59.7	59.8	60.1	60.3	58.4	59.6	62.2	62.9	63.2	63.0	3.4	4.7	4.0	5.0	4.8	4.4
Korea	50.5	50.0	53.2	52.2	52.6	53.1	51.4	52.0	54.7	53.9	54.5	54.9	1.8	3.8	2.8	3.2	3.4	3.2
Luxembourg	42.2	50.0	55.1	57.0	57.2	56.9	44.1	51.7	58.7	60.7	60.3	60.7	4.4	3.2	6.1	6.1	5.1	6.3
Mexico	36.0	39.6	44.1	43.0	43.8	43.4	39.5	41.0	45.9	45.2	46.3	45.9	8.8	3.4	4.0	5.0	5.4	5.4
Netherlands	53.9	62.7	69.3	69.6	69.4	69.9	59.1	65.2	71.7	72.3	72.6	73.1	8.8	3.9	3.4	3.8	4.5	4.4
New Zealand	61.3	63.2	68.7	67.4	66.7	67.2	65.6	67.2	71.8	72.0	71.8	72.2	6.5	6.0	4.3	6.3	7.0	6.9
Norway[b]	68.8	74.0	75.4	74.4	73.3	73.4	72.1	76.5	77.4	76.5	75.6	75.8	4.7	3.2	2.5	2.7	3.1	3.1
Poland	51.8	48.9	52.4	52.8	53.0	53.1	61.0	59.9	57.0	57.8	59.0	59.4	15.1	18.4	8.0	8.8	10.1	10.5
Portugal	54.8	60.5	62.5	61.6	61.1	60.4	59.9	63.8	68.9	69.0	69.9	69.8	8.6	5.2	9.4	10.7	12.5	13.5
Slovak Republic	53.0	51.5	54.6	52.8	52.3	52.7	61.4	63.2	61.4	60.6	61.3	61.0	13.8	18.6	11.1	12.9	14.6	13.6
Slovenia	..	..	64.2	63.8	62.6	60.9	..	..	67.5	67.9	67.4	66.5	..	..	4.9	5.9	7.2	8.3
Spain[b]	32.5	42.0	55.7	53.5	53.0	52.8	47.1	52.9	64.1	65.7	66.8	67.9	31.0	20.6	13.1	18.5	20.6	22.3
Sweden[b]	70.9	72.2	73.2	70.2	70.3	71.9	77.3	76.4	78.2	76.4	76.7	77.7	8.3	5.4	6.4	8.1	8.3	7.6
Switzerland	65.6	69.4	73.5	73.6	72.5	73.2	68.3	71.7	76.6	77.1	76.4	76.7	3.9	3.1	4.0	4.6	5.1	4.5
Turkey	30.2	26.2	23.5	24.2	26.2	27.8	32.7	28.0	26.7	28.4	30.2	31.5	7.5	6.5	11.9	14.7	13.3	11.6
United Kingdom[b]	62.5	65.6	66.8	65.6	65.3	65.3	67.1	68.9	70.2	70.2	70.2	70.4	6.9	4.8	4.8	6.5	6.9	7.2
United States[b]	65.8	67.8	65.5	63.4	62.4	62.0	69.7	70.7	69.3	69.0	68.4	67.8	5.7	4.1	5.5	8.2	8.7	8.5
OECD weighted average	53.2	55.0	57.6	56.7	56.6	56.7	58.1	59.1	61.4	61.5	61.7	61.8	8.3	7.0	6.2	7.9	8.2	8.1
Brazil	..	..	56.8	56.4	..	..	..	..	62.9	63.5	..	..	..	..	9.8	11.3	..	..
Russian Federation	59.0	58.9	64.8	63.4	63.5	63.8	65.0	65.7	69.1	68.9	68.2	68.0	9.2	10.5	6.1	7.9	7.0	6.2
South Africa	..	..	37.4	36.2	34.4	34.6	..	..	50.8	49.0	47.4	47.9	..	..	26.4	26.2	27.5	27.8

a) Ratios refer to persons aged 15-64 years who are in employment or in the labour force divided by the working-age population, or in unemployment divided by the labour force.

b) Refers to persons aged 16-64. For Norway up to 2005.

c) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.* Ratios are under-estimated except unemployment rates. See details in the PDF reported below.

Source and definitions: *OECD Online Employment Database*: *www.oecd.org/employment/database* and *www.oecd.org/dataoecd/13/57/43103377.pdf.*

StatLink http://dx.doi.org/10.1787/888932652149

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups**

Total (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Australia	Unemployment rates	15.4	12.1	11.5	11.5	11.3	6.6	5.1	4.5	4.0	3.9	7.6	4.3	3.4	3.3	3.3
	Labour force participation rates	71.8	70.6	69.2	68.6	68.4	80.5	80.4	82.9	82.8	83.1	45.2	48.3	61.1	62.7	63.2
	Employment/population ratios	60.8	62.1	61.2	60.7	60.7	75.2	76.3	79.1	79.5	79.8	41.7	46.2	59.0	60.6	61.1
Austria	Unemployment rates	5.2	5.1	10.0	8.8	8.3	3.4	3.1	4.2	4.0	3.6	3.8	5.2	2.4	2.2	3.2
	Labour force participation rates	60.3	55.7	60.5	58.8	59.9	83.5	85.2	87.7	87.7	88.1	31.4	29.8	42.1	43.4	42.9
	Employment/population ratios	57.2	52.8	54.5	53.6	54.9	80.6	82.5	84.0	84.2	84.9	30.2	28.3	41.1	42.4	41.5
Belgium	Unemployment rates	21.5	15.2	21.9	22.4	18.7	8.3	5.8	6.8	7.3	6.4	4.0	3.2	5.1	4.6	4.0
	Labour force participation rates	33.9	35.7	32.4	32.5	32.0	80.4	82.8	85.6	86.3	84.7	24.2	25.9	37.2	39.2	40.3
	Employment/population ratios	26.6	30.3	25.3	25.2	26.0	73.8	77.9	79.8	80.0	79.3	23.3	25.0	35.3	37.3	38.7
Canada	Unemployment rates	14.8	12.7	15.2	14.8	14.1	8.5	5.8	7.1	6.9	6.2	8.3	5.5	6.9	6.6	6.7
	Labour force participation rates	63.2	64.4	65.5	64.5	64.6	83.3	84.8	86.4	86.4	86.4	47.1	50.9	61.9	62.5	62.9
	Employment/population ratios	53.8	56.2	55.5	55.0	55.4	76.2	79.9	80.3	80.5	81.0	43.2	48.1	57.6	58.3	58.7
Chile	Unemployment rates	..	21.3	22.6	18.6	17.5	..	7.6	8.5	7.1	6.0	..	5.6	5.3	4.3	3.9
	Labour force participation rates	..	33.6	33.3	37.5	38.4	..	70.4	75.6	77.6	79.0	..	50.3	58.4	60.6	62.2
	Employment/population ratios	..	26.4	25.8	30.5	31.7	..	65.0	69.2	72.1	74.2	..	47.5	55.4	58.0	59.7
Czech Republic	Unemployment rates	7.8	17.0	16.6	18.3	18.0	3.3	7.7	5.9	6.4	5.9	2.9	5.2	5.7	6.5	5.8
	Labour force participation rates	50.6	46.1	31.8	30.9	30.1	89.2	88.4	87.7	87.8	88.0	35.9	38.2	49.6	49.7	50.6
	Employment/population ratios	46.6	38.3	26.5	25.2	24.7	86.3	81.6	82.5	82.2	82.8	34.8	36.3	46.8	46.5	47.6
Denmark	Unemployment rates	9.9	6.7	11.8	14.0	14.2	6.2	4.1	5.2	6.6	6.6	8.0	4.0	4.1	5.5	5.7
	Labour force participation rates	73.2	71.9	70.9	67.5	67.1	87.1	87.9	89.4	88.7	88.2	53.6	56.9	60.8	61.8	63.2
	Employment/population ratios	65.9	67.1	62.5	58.1	57.5	81.7	84.3	84.7	82.8	82.3	49.3	54.6	58.2	58.4	59.5
Estonia	Unemployment rates	13.9	23.0	26.8	32.0	21.6	9.4	12.8	12.9	15.2	11.6	6.2	9.6	9.4	16.2	11.6
	Labour force participation rates	49.1	42.8	40.4	38.8	41.2	89.4	86.9	87.6	88.1	88.3	45.2	48.6	66.6	64.2	64.5
	Employment/population ratios	42.3	32.9	29.6	26.4	32.3	81.0	75.7	76.2	74.6	78.1	42.4	44.0	60.4	53.8	57.1
Finland	Unemployment rates	27.0	20.3	21.6	20.3	18.9	13.1	8.0	6.6	6.9	6.2	20.3	9.4	6.3	6.5	6.5
	Labour force participation rates	45.7	53.8	49.2	50.8	52.2	87.6	87.9	88.2	87.6	87.6	43.2	46.6	59.3	60.2	60.9
	Employment/population ratios	33.4	42.9	38.5	40.5	42.3	76.1	80.9	82.4	81.5	82.3	34.4	42.3	55.6	56.3	57.0
France	Unemployment rates	27.1	20.6	23.2	22.9	22.1	10.5	9.3	7.7	8.0	8.1	6.5	7.4	6.2	6.7	6.6
	Labour force participation rates	35.7	35.6	39.8	39.3	38.4	86.1	86.4	88.8	88.9	88.5	31.4	31.6	41.5	42.5	44.3
	Employment/population ratios	26.1	28.3	30.5	30.3	29.9	77.1	78.4	82.0	81.7	81.3	29.4	29.3	38.9	39.7	41.4
Germany	Unemployment rates	8.2	8.4	11.0	9.7	8.5	7.7	7.0	7.3	6.6	5.5	11.7	12.3	8.0	7.7	6.5
	Labour force participation rates	53.5	51.5	52.3	51.8	52.7	83.1	85.3	87.2	87.3	87.7	42.4	42.9	61.0	62.5	64.0
	Employment/population ratios	49.1	47.2	46.6	46.8	48.2	76.8	79.3	80.8	81.5	82.8	37.4	37.6	56.1	57.7	59.9
Greece	Unemployment rates	27.9	29.5	25.8	32.9	44.4	7.3	9.6	8.9	12.0	17.1	3.4	3.8	4.6	6.3	8.5
	Labour force participation rates	36.7	38.1	30.9	30.3	29.2	74.2	77.6	82.8	83.3	83.2	41.9	40.6	44.2	45.1	43.1
	Employment/population ratios	26.5	26.9	22.9	20.4	16.3	68.8	70.2	75.4	73.3	69.0	40.5	39.0	42.2	42.3	39.4
Hungary	Unemployment rates	18.6	12.7	26.5	26.6	26.1	8.9	5.7	9.1	10.4	10.1	5.4	3.0	6.3	7.8	8.7
	Labour force participation rates	38.4	37.2	24.6	24.9	24.7	77.6	77.3	80.2	80.9	81.3	18.1	22.6	35.0	37.3	39.2
	Employment/population ratios	31.3	32.5	18.1	18.3	18.3	70.7	73.0	72.9	72.5	73.1	17.1	21.9	32.8	34.4	35.8

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Total (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Iceland[a]	Unemployment rates	11.0	4.7	16.0	16.2	14.6	3.7	1.7	6.2	6.3	5.6	4.1	1.7	3.6	4.4	5.4
	Labour force participation rates	61.7	71.6	73.4	74.0	74.1	92.5	92.2	89.3	89.4	89.0	88.7	85.7	83.8	84.2	84.1
	Employment/population ratios	54.9	68.2	61.7	62.1	63.3	89.1	90.6	83.8	83.7	84.0	85.1	84.2	80.8	80.5	79.5
Ireland	Unemployment rates	19.1	7.6	25.9	28.7	30.3	11.1	4.0	10.8	12.6	13.5	7.8	2.7	6.0	8.2	9.0
	Labour force participation rates	46.1	53.4	49.0	43.1	40.4	72.8	78.6	81.3	81.0	80.7	42.7	46.4	55.2	55.3	55.9
	Employment/population ratios	37.3	49.4	36.3	30.7	28.1	64.7	75.5	72.6	70.8	69.8	39.4	45.2	51.9	50.8	50.8
Israel[b]	Unemployment rates	14.9	16.9	14.6	13.7	11.6	5.5	7.5	6.9	6.0	5.1	4.8	6.8	5.4	4.8	4.2
	Labour force participation rates	34.9	33.9	31.4	31.3	30.0	75.4	76.1	78.2	78.7	78.8	50.1	50.0	62.1	62.9	63.9
	Employment/population ratios	29.7	28.2	26.8	27.0	26.6	71.2	70.4	72.8	73.9	74.8	47.7	46.6	58.8	59.8	61.2
Italy	Unemployment rates	31.9	29.7	25.4	27.9	29.1	8.8	8.5	7.0	7.6	7.5	3.9	4.5	3.4	3.6	3.9
	Labour force participation rates	40.1	39.5	29.1	28.4	27.4	71.8	74.3	77.2	76.9	76.9	29.6	29.0	37.0	38.0	39.5
	Employment/population ratios	27.3	27.8	21.7	20.5	19.4	65.5	68.0	71.9	71.1	71.1	28.4	27.7	35.7	36.6	37.9
Japan	Unemployment rates	6.1	9.2	9.1	9.2	8.0	2.6	4.1	4.9	4.9	4.4	3.7	5.6	4.6	5.0	4.4
	Labour force participation rates	47.6	47.0	43.9	43.1	42.5	81.4	81.9	83.7	84.0	83.9	66.2	66.5	68.7	68.7	68.2
	Employment/population ratios	44.7	42.7	39.9	39.2	39.1	79.3	78.6	79.6	79.9	80.2	63.7	62.8	65.5	65.2	65.1
Korea	Unemployment rates	6.3	10.8	9.8	9.8	9.6	1.6	4.0	3.6	3.5	3.2	0.9	2.9	2.3	2.9	2.5
	Labour force participation rates	36.9	33.0	25.4	25.5	25.5	75.4	75.2	76.0	76.4	76.9	64.1	59.5	61.8	62.7	63.7
	Employment/population ratios	34.6	29.4	22.9	23.0	23.1	74.2	72.2	73.3	73.8	74.4	63.6	57.8	60.4	60.9	62.1
Luxembourg	Unemployment rates	7.2	6.4	17.2	14.2	16.8	2.5	2.0	4.2	3.9	4.3	0.3	1.4	3.0	2.3	2.8
	Labour force participation rates	41.2	34.0	32.3	24.7	24.9	73.8	79.8	84.8	85.7	85.6	24.0	27.6	39.4	40.6	40.4
	Employment/population ratios	38.2	31.8	26.7	21.2	20.7	71.9	78.2	81.2	82.3	82.0	24.0	27.2	38.2	39.6	39.3
Mexico	Unemployment rates	11.3	5.1	10.0	9.4	9.8	5.4	1.8	4.2	4.4	4.4	3.9	1.4	3.1	3.1	2.9
	Labour force participation rates	54.4	51.5	45.8	47.4	46.6	67.3	68.6	72.4	73.1	72.8	52.0	52.4	54.2	56.3	55.0
	Employment/population ratios	48.2	48.9	41.2	42.9	42.0	63.7	67.4	69.4	69.8	69.5	50.0	51.7	52.5	54.5	53.4
Netherlands	Unemployment rates	12.8	6.1	7.7	8.7	7.7	6.1	2.5	2.9	3.6	3.8	3.0	2.1	3.3	4.0	4.1
	Labour force participation rates	64.5	70.8	70.8	69.0	68.9	79.9	83.1	87.9	87.8	87.5	30.3	38.5	55.1	56.3	58.5
	Employment/population ratios	56.3	66.5	65.3	63.0	63.6	75.0	81.0	85.4	84.6	84.2	29.4	37.6	53.3	54.1	56.1
New Zealand	Unemployment rates	12.3	13.6	16.6	17.1	17.3	5.2	4.7	4.4	4.9	4.9	3.3	4.7	3.2	3.4	3.3
	Labour force participation rates	67.1	62.8	61.9	60.4	60.3	81.5	82.1	84.3	84.1	84.6	51.9	59.7	74.5	75.9	76.2
	Employment/population ratios	58.9	54.2	51.6	50.1	49.9	77.3	78.3	80.6	80.0	80.4	50.1	56.9	72.1	73.3	73.7
Norway[a]	Unemployment rates	11.9	10.2	9.2	9.3	8.6	4.1	2.6	2.5	3.1	2.7	2.6	1.3	1.1	1.4	1.3
	Labour force participation rates	55.9	64.7	58.5	57.4	56.2	85.9	87.6	88.1	87.4	87.1	64.8	68.0	69.5	69.6	70.5
	Employment/population ratios	49.2	58.1	53.2	52.0	51.4	82.4	85.3	86.0	84.7	84.7	63.1	67.1	68.7	68.6	69.6
Poland	Unemployment rates	31.2	35.2	20.7	23.7	25.8	11.7	13.9	6.9	8.3	8.3	5.9	9.4	6.3	7.1	6.9
	Labour force participation rates	39.7	37.8	33.8	34.5	33.6	84.0	82.4	83.4	84.1	84.2	35.9	31.3	34.5	36.7	39.6
	Employment/population ratios	27.3	24.5	26.8	26.3	24.9	74.2	70.9	77.6	77.1	77.2	33.8	28.4	32.3	34.0	36.9
Portugal	Unemployment rates	15.7	8.6	20.0	22.3	30.1	6.4	3.5	9.3	10.7	12.0	4.1	3.2	7.7	8.9	10.8
	Labour force participation rates	44.5	45.7	39.2	36.7	38.8	84.1	84.8	87.9	88.7	88.4	46.6	52.4	53.9	54.0	53.7
	Employment/population ratios	37.6	41.8	31.3	28.5	27.1	78.7	81.8	79.7	79.2	77.8	44.6	50.7	49.7	49.2	47.9

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Total (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Slovak Republic	Unemployment rates	24.8	37.0	27.3	33.6	33.2	11.0	15.5	10.8	12.8	12.0	7.6	12.3	7.7	10.1	10.0
	Labour force participation rates	46.3	46.0	31.3	31.0	30.2	88.4	88.4	87.2	86.9	87.0	23.4	24.3	42.9	45.2	46.0
	Employment/population ratios	34.8	29.0	22.8	20.5	20.2	78.7	74.7	77.8	75.8	76.5	21.7	21.3	39.6	40.6	41.4
Slovenia	Unemployment rates	..	..	13.6	14.7	15.7	..	..	5.3	7.0	7.8	..	..	3.6	4.0	6.3
	Labour force participation rates	..	..	40.9	39.9	37.4	..	..	89.6	90.0	90.1	..	..	36.9	36.5	33.3
	Employment/population ratios	..	..	35.3	34.1	31.5	..	..	84.8	83.7	83.1	..	..	35.6	35.0	31.2
Spain[a]	Unemployment rates	40.4	25.3	37.9	41.6	46.4	20.0	12.3	16.5	18.6	20.2	12.3	9.4	12.1	14.1	15.0
	Labour force participation rates	48.0	48.5	49.5	46.9	45.0	74.4	78.0	84.7	85.5	86.0	36.9	40.9	50.2	50.8	52.3
	Employment/population ratios	28.6	36.3	30.8	27.4	24.1	59.5	68.4	70.7	69.6	68.7	32.4	37.0	44.1	43.6	44.5
Sweden[a]	Unemployment rates	19.5	11.7	24.8	25.2	22.9	7.8	4.9	6.2	6.1	5.5	8.0	6.1	5.2	5.3	4.7
	Labour force participation rates	52.8	52.9	51.1	51.5	52.4	89.6	88.2	90.0	90.6	91.0	67.4	69.3	74.0	74.6	76.0
	Employment/population ratios	42.5	46.7	38.4	38.5	40.4	82.6	83.8	84.4	85.0	86.0	62.0	65.1	70.1	70.6	72.5
Switzerland	Unemployment rates	5.5	4.9	8.4	7.8	7.7	3.0	2.3	3.7	4.2	3.6	3.0	2.8	2.7	3.5	3.3
	Labour force participation rates	63.6	68.4	67.3	67.8	68.1	86.8	87.4	90.0	89.6	89.7	63.6	65.1	70.2	70.5	71.9
	Employment/population ratios	60.1	65.1	61.6	62.5	62.9	84.2	85.4	86.7	85.8	86.4	61.7	63.3	68.3	68.0	69.5
Turkey	Unemployment rates	15.6	13.1	25.3	21.7	18.4	5.2	4.9	12.3	10.4	8.6	2.5	2.1	6.4	5.8	4.9
	Labour force participation rates	48.6	42.5	38.7	38.3	39.3	63.8	59.6	60.3	61.8	62.9	42.7	37.2	30.1	31.4	33.0
	Employment/population ratios	41.0	37.0	28.9	30.0	32.1	60.5	56.7	52.9	55.4	57.5	41.7	36.4	28.2	29.6	31.4
United Kingdom[a]	Unemployment rates	15.3	11.7	19.0	19.3	20.0	7.4	4.4	6.1	6.1	6.1	7.6	4.4	4.6	4.8	4.8
	Labour force participation rates	69.6	69.7	64.0	62.8	62.7	83.3	83.9	85.0	85.0	85.3	51.4	52.7	60.3	59.7	59.6
	Employment/population ratios	59.0	61.5	51.9	50.7	50.1	77.1	80.2	79.8	79.8	80.1	47.5	50.4	57.5	56.9	56.8
United States[a]	Unemployment rates	12.1	9.3	17.6	18.4	17.3	4.5	3.1	8.3	8.6	7.9	3.6	2.5	6.6	7.1	6.6
	Labour force participation rates	66.3	65.8	56.9	55.2	55.0	83.5	84.0	82.6	82.2	81.6	57.2	59.2	64.9	64.9	64.2
	Employment/population ratios	58.3	59.7	46.9	45.0	45.5	79.7	81.5	75.8	75.1	75.1	55.1	57.8	60.6	60.3	60.0
OECD weighted average	Unemployment rates	14.5	12.1	16.7	16.7	16.2	6.4	5.4	7.3	7.5	7.2	5.2	4.9	5.7	6.1	5.8
	Labour force participation rates	52.9	51.7	47.9	47.4	47.2	79.9	80.2	81.2	81.4	81.3	48.7	50.1	56.9	57.5	57.8
	Employment/population ratios	45.3	45.5	39.9	39.5	39.5	74.8	75.9	75.3	75.2	75.4	46.1	47.6	53.6	54.0	54.4
Brazil	Unemployment rates	..	..	17.8	..	..	..	..	6.3	..	..	..	..	3.0	..	..
	Labour force participation rates	..	..	62.7	..	..	..	..	82.0	..	..	..	..	55.5	..	..
	Employment/population ratios	..	..	51.5	..	..	..	..	76.9	..	..	..	..	53.8	..	..
Russian Federation	Unemployment rates	18.8	20.7	18.6	17.2	15.5	8.1	9.2	7.2	6.4	5.7	5.6	7.3	5.6	4.9	4.5
	Labour force participation rates	49.8	43.2	43.8	43.5	42.4	87.5	87.7	88.6	89.0	89.7	35.5	37.4	49.7	46.6	45.8
	Employment/population ratios	40.5	34.3	35.6	36.0	35.8	80.4	79.6	82.2	83.3	84.6	33.5	34.6	47.0	44.4	43.8
South Africa	Unemployment rates	..	..	48.1	50.5	49.8	..	..	20.4	21.4	21.9	..	..	6.3	7.3	6.0
	Labour force participation rates	..	..	27.8	25.9	25.2	..	..	73.8	72.1	72.3	..	..	41.9	40.2	40.5
	Employment/population ratios	..	..	14.4	12.8	12.7	..	..	58.7	56.6	56.5	..	..	39.2	37.3	38.0

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Men (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Australia	Unemployment rates	15.9	12.8	12.5	11.9	11.9	7.0	5.2	4.5	3.7	3.6	9.3	5.1	3.7	3.7	3.7
	Labour force participation rates	73.8	72.3	70.6	69.8	69.1	91.8	90.4	90.3	90.6	90.6	61.4	60.8	69.3	71.3	71.6
	Employment/population ratios	62.1	63.0	61.7	61.5	60.9	85.4	85.7	86.3	87.2	87.4	55.7	57.7	66.7	68.6	69.0
Austria	Unemployment rates	4.8	5.0	10.5	8.9	7.9	2.8	2.8	4.4	4.2	3.4	4.2	5.4	2.5	2.5	3.8
	Labour force participation rates	64.3	60.6	64.0	63.6	64.9	93.7	94.0	92.6	92.5	92.8	44.7	42.8	52.3	53.0	52.6
	Employment/population ratios	61.2	57.6	57.3	57.9	59.8	91.1	91.4	88.5	88.7	89.6	42.8	40.5	51.0	51.6	50.6
Belgium	Unemployment rates	19.7	12.9	21.5	22.4	18.7	6.2	4.6	6.7	7.2	6.4	3.8	3.4	5.0	4.2	3.9
	Labour force participation rates	36.0	38.7	34.9	35.2	34.1	92.3	92.1	91.8	92.2	90.7	35.9	36.3	45.2	47.6	47.8
	Employment/population ratios	28.9	33.7	27.4	27.3	27.7	86.5	87.9	85.7	85.5	84.9	34.5	35.1	42.9	45.6	46.0
Canada	Unemployment rates	16.3	13.8	18.0	17.1	15.9	8.7	5.7	8.0	7.3	6.4	8.5	5.5	8.0	7.5	7.1
	Labour force participation rates	64.9	65.8	65.7	64.4	64.7	90.9	91.0	90.7	90.5	90.6	58.3	60.7	67.6	68.4	68.4
	Employment/population ratios	54.3	56.7	53.9	53.4	54.5	83.0	85.8	83.5	83.9	84.8	53.3	57.4	62.2	63.3	63.6
Chile	Unemployment rates	..	19.4	21.5	16.6	15.2	..	7.4	7.8	6.1	5.0	..	6.3	5.8	4.5	3.8
	Labour force participation rates	..	42.5	39.7	43.8	44.3	..	94.4	93.6	92.5	92.9	..	76.5	81.5	82.2	82.9
	Employment/population ratios	..	34.2	31.2	36.6	37.6	..	87.4	86.3	86.9	88.3	..	71.6	76.7	78.5	79.8
Czech Republic	Unemployment rates	7.2	16.7	16.6	18.3	18.1	2.6	6.0	4.8	5.2	4.6	2.5	5.0	5.6	6.5	5.9
	Labour force participation rates	58.7	51.3	37.3	36.2	35.6	95.4	94.9	95.1	95.5	95.3	52.4	54.5	63.2	62.5	62.6
	Employment/population ratios	54.5	42.8	31.1	29.6	29.2	92.9	89.3	90.5	90.5	90.9	51.1	51.7	59.6	58.4	58.9
Denmark	Unemployment rates	7.8	6.5	13.3	16.1	15.7	5.0	3.5	5.7	7.3	6.3	6.9	3.9	4.7	6.7	6.6
	Labour force participation rates	77.0	75.2	71.7	67.6	67.1	91.8	91.5	92.2	92.0	91.5	67.9	64.5	68.1	67.8	68.3
	Employment/population ratios	71.0	70.3	62.2	56.7	56.6	87.3	88.3	86.9	85.3	85.7	63.2	61.9	64.9	63.3	63.8
Estonia	Unemployment rates	12.4	22.6	30.3	33.5	22.4	10.5	13.6	15.8	17.6	11.5	7.8	12.1	11.8	19.0	14.5
	Labour force participation rates	58.3	49.9	46.0	43.3	45.4	93.1	90.5	91.4	91.4	92.1	60.1	62.2	67.4	64.5	66.7
	Employment/population ratios	51.1	38.6	32.1	28.8	35.2	83.3	78.2	77.0	75.4	81.5	55.4	54.7	59.4	52.2	57.0
Finland	Unemployment rates	25.7	18.9	24.5	21.6	19.3	13.2	7.2	7.1	7.4	6.7	21.6	9.3	7.1	7.3	7.6
	Labour force participation rates	51.7	56.4	47.2	52.1	53.7	90.7	90.7	90.8	90.6	90.8	44.6	48.1	58.9	60.0	61.4
	Employment/population ratios	38.4	45.7	35.6	40.8	43.3	78.7	84.1	84.4	83.9	84.7	34.9	43.7	54.7	55.6	56.7
France	Unemployment rates	23.7	19.0	24.0	22.2	21.2	8.7	7.5	7.2	7.5	7.5	6.9	7.3	6.4	6.9	6.5
	Labour force participation rates	37.6	38.7	43.1	42.9	41.7	95.1	94.3	94.4	94.2	93.8	36.1	35.4	44.3	45.2	47.1
	Employment/population ratios	28.7	31.4	32.7	33.4	32.9	86.8	87.3	87.6	87.1	86.7	33.6	32.8	41.5	42.1	44.0
Germany	Unemployment rates	8.3	9.2	12.0	10.4	9.1	6.5	6.6	7.6	7.1	5.7	10.6	11.5	8.0	8.1	6.6
	Labour force participation rates	56.8	54.7	55.2	54.7	55.2	92.8	93.4	93.2	93.1	93.1	53.9	52.4	69.3	70.7	71.7
	Employment/population ratios	52.1	49.7	48.6	49.0	50.2	86.8	87.2	86.1	86.5	87.7	48.2	46.4	63.8	65.0	67.0
Greece	Unemployment rates	19.4	22.1	19.4	26.7	38.5	5.1	6.1	6.4	9.4	14.5	3.6	3.5	4.1	6.2	8.7
	Labour force participation rates	41.3	41.0	34.4	33.4	31.8	94.5	94.3	94.4	94.2	93.5	61.1	57.3	60.1	60.2	57.3
	Employment/population ratios	33.3	31.9	27.7	24.5	19.6	89.7	88.6	88.4	85.3	80.0	58.9	55.3	57.7	56.5	52.3
Hungary	Unemployment rates	20.7	13.8	28.2	27.9	27.2	9.9	6.2	9.2	10.6	9.8	5.4	3.7	6.4	8.2	9.5
	Labour force participation rates	44.6	41.8	27.7	27.7	27.3	86.5	84.4	86.9	87.2	88.3	28.6	34.1	42.6	43.1	44.0
	Employment/population ratios	35.3	36.0	19.9	20.0	19.9	77.9	79.2	78.9	77.9	79.6	27.1	32.8	39.9	39.6	39.8

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Men (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Iceland[a]	Unemployment rates	13.1	5.7	19.9	18.3	18.4	3.1	1.1	7.2	7.0	5.6	4.2	0.5	4.9	5.1	7.1
	Labour force participation rates	63.8	70.1	70.7	71.7	72.3	96.8	96.1	93.7	93.4	92.7	92.7	94.7	89.3	88.4	88.7
	Employment/population ratios	55.4	66.1	56.7	58.5	59.0	93.9	95.1	86.9	86.9	87.5	88.8	94.2	85.0	83.9	82.4
Ireland	Unemployment rates	20.4	7.3	32.4	34.8	36.3	11.2	4.2	14.0	15.9	16.9	7.5	2.5	7.8	10.5	11.5
	Labour force participation rates	49.6	57.7	50.5	44.2	40.6	90.9	92.1	90.8	89.9	89.5	64.1	64.9	67.5	65.3	65.5
	Employment/population ratios	39.5	53.4	34.1	28.8	25.9	80.7	88.2	78.0	75.6	74.3	59.3	63.3	62.2	58.4	58.0
Israel[b]	Unemployment rates	12.8	17.1	15.7	14.5	11.8	4.3	7.1	6.9	6.2	5.1	4.9	8.1	5.6	5.2	4.6
	Labour force participation rates	35.1	32.4	29.1	28.9	28.0	86.0	84.0	83.3	83.8	83.8	69.0	63.9	72.1	72.5	74.1
	Employment/population ratios	30.6	26.9	24.6	24.7	24.7	82.2	78.1	77.5	78.6	79.5	65.6	58.7	68.0	68.8	70.7
Italy	Unemployment rates	27.0	25.4	23.3	26.8	27.1	6.5	6.3	5.9	6.6	6.6	3.8	4.4	3.7	3.9	4.6
	Labour force participation rates	46.0	44.6	34.0	33.2	31.7	90.3	90.6	90.0	89.4	89.2	46.5	42.7	48.5	49.6	50.7
	Employment/population ratios	33.6	33.2	26.1	24.3	23.1	84.4	84.9	84.7	83.5	83.4	44.7	40.9	46.7	47.7	48.4
Japan	Unemployment rates	6.1	10.4	10.1	10.4	8.9	2.2	3.9	4.9	4.9	4.4	4.7	6.8	5.4	6.1	5.3
	Labour force participation rates	48.0	47.4	43.0	42.3	41.7	97.5	97.1	96.1	96.2	95.9	84.8	84.1	84.4	83.9	83.1
	Employment/population ratios	45.1	42.5	38.7	37.9	38.0	95.3	93.4	91.3	91.4	91.6	80.8	78.4	79.8	78.8	78.7
Korea	Unemployment rates	7.8	13.5	11.9	11.2	12.1	1.9	4.5	4.1	3.8	3.4	1.2	3.9	2.8	3.4	3.0
	Labour force participation rates	31.2	28.4	20.4	20.2	20.6	94.6	92.2	90.0	90.3	90.5	79.6	71.3	76.6	77.7	78.9
	Employment/population ratios	28.8	24.6	18.0	17.9	18.1	92.7	88.0	86.3	86.8	87.5	78.7	68.5	74.5	75.1	76.5
Luxembourg	Unemployment rates	6.7	5.7	16.7	17.6	13.3	1.7	1.4	3.5	3.0	3.3	0.0	2.0	2.4	2.4	3.0
	Labour force participation rates	42.4	37.4	34.9	26.8	26.3	93.9	94.2	94.1	94.8	93.9	35.1	38.6	47.7	48.8	48.4
	Employment/population ratios	39.6	35.3	29.1	22.1	22.8	92.2	92.8	90.8	92.0	90.8	35.1	37.9	46.5	47.7	47.0
Mexico	Unemployment rates	9.2	4.4	9.7	9.0	9.5	5.1	1.5	4.5	4.4	4.4	3.9	1.5	3.9	3.9	3.7
	Labour force participation rates	71.8	67.7	59.6	61.8	60.4	94.7	95.2	94.5	94.7	94.3	78.8	79.3	77.8	79.0	77.3
	Employment/population ratios	65.2	64.7	53.9	56.2	54.6	89.9	93.8	90.2	90.5	90.2	75.7	78.1	74.7	76.0	74.5
Netherlands	Unemployment rates	12.0	5.3	8.2	8.8	7.5	5.0	1.9	2.8	3.6	3.9	2.6	2.5	3.4	4.1	4.2
	Labour force participation rates	65.5	71.6	71.2	68.5	67.8	92.8	93.2	94.0	93.3	93.0	42.3	50.9	66.8	67.6	68.6
	Employment/population ratios	57.7	67.9	65.4	62.5	62.7	88.2	91.4	91.4	90.0	89.4	41.1	49.7	64.6	64.8	65.7
New Zealand	Unemployment rates	12.4	14.6	16.0	16.8	18.2	5.3	4.6	4.4	4.4	4.4	3.7	5.5	3.8	3.8	3.2
	Labour force participation rates	71.2	65.9	64.2	62.2	62.8	91.8	91.2	91.5	91.8	91.8	65.0	71.9	82.7	82.7	82.8
	Employment/population ratios	62.4	56.3	53.9	51.8	51.3	87.0	87.0	87.5	87.8	87.8	62.6	67.9	79.5	79.6	80.2
Norway[a]	Unemployment rates	11.9	9.5	10.3	10.9	9.3	4.3	2.9	2.9	3.5	2.9	3.2	1.8	1.5	1.8	1.4
	Labour force participation rates	58.0	67.5	57.9	57.6	55.6	91.2	91.4	90.9	90.2	89.7	72.3	74.4	73.9	73.5	73.9
	Employment/population ratios	51.1	61.0	52.0	51.3	50.5	87.3	88.8	88.3	87.1	87.1	70.0	73.1	72.8	72.2	72.9
Poland	Unemployment rates	29.0	33.3	20.2	22.4	23.6	10.4	12.1	6.3	7.9	7.5	6.7	9.1	6.7	7.5	7.4
	Labour force participation rates	43.9	40.9	38.1	39.1	38.7	90.1	88.3	89.4	89.7	89.8	45.5	40.4	47.5	48.9	51.6
	Employment/population ratios	31.1	27.3	30.4	30.3	29.6	80.8	77.6	83.7	82.6	83.0	42.5	36.7	44.3	45.2	47.8
Portugal	Unemployment rates	14.0	6.2	18.7	21.1	28.7	5.5	2.7	8.5	9.3	11.7	5.0	3.6	8.3	10.0	12.1
	Labour force participation rates	49.3	50.5	40.8	38.6	41.1	93.4	92.4	92.4	92.5	92.3	60.7	64.4	62.7	61.8	61.6
	Employment/population ratios	42.4	47.4	33.2	30.4	29.3	88.3	89.9	84.5	83.9	81.6	57.7	62.1	57.5	55.6	54.2

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Men (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Slovak Republic	Unemployment rates	26.0	39.7	27.9	34.7	33.0	10.0	15.2	10.0	12.4	11.7	6.5	13.5	6.4	9.6	10.7
	Labour force participation rates	52.0	49.4	37.0	36.2	37.3	94.9	93.9	93.6	92.9	93.5	40.7	41.0	58.8	59.9	58.9
	Employment/population ratios	38.4	29.8	26.7	23.6	25.0	85.4	79.6	84.2	81.4	82.6	38.1	35.4	55.0	54.1	52.6
Slovenia	Unemployment rates	..	..	13.8	15.2	15.0	..	..	5.3	7.1	7.6	..	..	3.8	4.2	7.5
	Labour force participation rates	..	..	45.4	44.4	42.0	..	..	91.3	91.7	91.8	..	..	48.2	47.5	42.7
	Employment/population ratios	..	..	39.1	37.6	35.7	..	..	86.4	85.2	84.8	..	..	46.4	45.5	39.5
Spain[a]	Unemployment rates	33.6	19.4	39.1	43.2	48.2	15.3	8.0	16.2	18.1	19.6	12.6	8.6	11.3	14.3	15.3
	Labour force participation rates	52.8	53.6	53.1	49.7	46.7	92.8	93.0	92.3	92.5	92.6	55.4	60.5	64.0	63.9	63.7
	Employment/population ratios	35.1	43.2	32.4	28.2	24.2	78.6	85.6	77.3	75.7	74.5	48.4	55.2	56.7	54.7	53.9
Sweden[a]	Unemployment rates	20.6	12.1	25.9	26.7	23.8	8.6	5.3	6.4	6.0	5.4	9.0	6.8	5.8	6.2	5.2
	Labour force participation rates	52.9	54.4	51.3	51.7	52.4	91.9	90.7	92.8	93.6	93.8	70.9	72.6	77.9	79.2	80.1
	Employment/population ratios	42.0	47.9	38.0	37.9	39.9	84.0	85.9	86.9	88.0	88.8	64.5	67.7	73.3	74.3	75.9
Switzerland	Unemployment rates	5.7	5.7	7.9	7.3	7.6	2.3	1.7	3.3	3.8	3.2	3.9	3.0	3.0	3.6	3.2
	Labour force participation rates	65.0	70.5	66.1	69.1	69.3	98.3	96.8	96.0	95.7	95.9	82.6	79.1	79.5	80.5	81.7
	Employment/population ratios	61.3	66.5	60.9	64.1	64.0	96.0	95.2	92.8	92.0	92.8	79.4	76.7	77.1	77.6	79.1
Turkey	Unemployment rates	16.9	13.7	25.4	21.0	17.1	5.2	5.0	12.2	10.1	8.0	3.3	2.9	8.2	7.5	6.1
	Labour force participation rates	63.7	57.6	52.2	50.9	52.3	93.7	89.5	88.8	89.5	90.0	61.0	53.4	44.8	46.1	48.4
	Employment/population ratios	52.9	49.7	39.0	40.2	43.4	88.9	85.0	77.9	80.4	82.7	59.0	51.9	41.1	42.7	45.4
United Kingdom[a]	Unemployment rates	17.9	13.2	21.8	21.3	22.0	8.5	4.8	6.8	6.7	6.4	10.1	5.5	6.0	6.2	6.1
	Labour force participation rates	74.4	73.6	67.2	65.2	65.5	92.7	91.9	91.5	91.4	91.7	62.5	63.2	70.3	69.3	68.6
	Employment/population ratios	61.0	64.0	52.5	51.3	51.1	84.8	87.4	85.4	85.2	85.8	56.1	59.7	66.1	65.1	64.4
United States[a]	Unemployment rates	12.5	9.7	20.1	20.8	18.7	4.4	2.9	9.2	9.3	8.2	3.6	2.4	7.2	8.0	7.1
	Labour force participation rates	70.2	68.6	58.5	56.7	56.6	91.6	91.6	89.7	89.3	88.7	66.0	67.3	70.3	70.0	69.3
	Employment/population ratios	61.5	61.9	46.7	44.9	46.0	87.6	89.0	81.5	81.0	81.4	63.6	65.7	65.2	64.4	64.4
OECD weighted average	Unemployment rates	14.1	11.9	17.9	17.6	16.7	5.8	4.8	7.6	7.6	7.1	5.7	5.3	6.2	6.7	6.3
	Labour force participation rates	58.5	57.0	52.1	51.6	51.4	93.1	92.6	91.7	91.6	91.4	62.3	62.5	67.3	67.6	67.6
	Employment/population ratios	50.3	50.2	42.8	42.5	42.8	87.7	88.2	84.8	84.7	85.0	58.8	59.2	63.2	63.1	63.4
Brazil	Unemployment rates	..	..	13.9	..	..	..	..	4.3	..	..	..	..	2.7	..	..
	Labour force participation rates	..	..	71.3	..	..	..	..	93.4	..	..	..	..	71.7	..	..
	Employment/population ratios	..	..	61.4	..	..	..	..	89.4	..	..	..	..	69.8	..	..
Russian Federation	Unemployment rates	17.8	19.5	18.3	16.9	15.3	8.6	9.6	7.8	6.8	6.0	5.2	7.5	6.3	5.6	5.2
	Labour force participation rates	54.0	47.0	47.6	48.1	47.1	90.9	90.9	91.8	92.2	93.1	52.0	50.4	61.9	58.7	56.9
	Employment/population ratios	44.4	37.8	38.9	39.9	39.8	83.1	82.1	84.6	86.0	87.5	49.2	46.7	58.0	55.4	54.0
South Africa	Unemployment rates	..	..	44.5	47.2	45.4	..	..	18.7	19.4	19.6	..	..	7.5	8.4	6.9
	Labour force participation rates	..	..	30.5	28.5	27.1	..	..	84.0	82.3	81.9	..	..	55.1	51.6	51.3
	Employment/population ratios	..	..	16.9	15.0	14.8	..	..	68.3	66.4	65.8	..	..	51.0	47.2	47.7

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Women (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Australia	Unemployment rates	14.8	11.3	10.4	11.1	10.8	6.2	4.9	4.6	4.4	4.4	4.1	3.1	2.9	2.6	2.9
	Labour force participation rates	69.8	68.9	67.7	67.3	67.7	69.1	70.5	75.5	75.2	75.7	28.8	35.6	52.9	54.2	55.0
	Employment/population ratios	59.5	61.1	60.7	59.8	60.4	64.9	67.1	72.1	71.9	72.4	27.6	34.5	51.4	52.8	53.4
Austria	Unemployment rates	5.6	5.2	9.4	8.8	8.8	4.2	3.5	4.0	3.8	3.8	3.0	4.7	2.2	1.6	2.3
	Labour force participation rates	56.4	50.8	57.0	54.1	55.0	73.1	76.3	82.8	82.8	83.4	19.1	17.6	32.4	34.2	33.7
	Employment/population ratios	53.2	48.1	51.7	49.4	50.1	70.0	73.6	79.5	79.7	80.2	18.5	16.8	31.7	33.7	32.9
Belgium	Unemployment rates	23.7	18.2	22.5	22.4	18.7	11.1	7.4	6.9	7.5	6.3	4.4	2.8	5.2	5.2	4.2
	Labour force participation rates	31.7	32.6	29.9	29.8	29.8	68.2	73.2	79.2	80.4	78.7	13.3	15.8	29.3	30.9	33.0
	Employment/population ratios	24.2	26.7	23.2	23.1	24.2	60.6	67.8	73.8	74.4	73.8	12.7	15.4	27.7	29.2	31.6
Canada	Unemployment rates	13.2	11.4	12.3	12.4	12.3	8.3	5.8	6.1	6.4	6.0	8.0	5.5	5.7	5.6	6.2
	Labour force participation rates	61.3	62.9	65.2	64.6	64.4	75.7	78.5	82.1	82.3	82.1	36.2	41.4	56.3	56.7	57.5
	Employment/population ratios	53.3	55.7	57.2	56.6	56.4	69.4	73.9	77.2	77.0	77.2	33.3	39.1	53.1	53.5	53.9
Chile	Unemployment rates	..	24.8	24.4	21.7	21.1	..	8.1	9.5	8.6	7.4	..	3.4	4.1	4.0	4.1
	Labour force participation rates	..	24.2	26.3	30.4	32.0	..	47.3	58.4	63.2	65.5	..	25.5	36.6	40.8	43.2
	Employment/population ratios	..	18.2	19.8	23.8	25.3	..	43.4	52.8	57.7	60.6	..	24.6	35.1	39.2	41.5
Czech Republic	Unemployment rates	8.7	17.4	16.7	18.5	17.9	4.1	9.9	7.3	8.0	7.6	3.8	5.4	5.8	6.5	5.7
	Labour force participation rates	42.0	40.6	26.1	25.3	24.2	83.0	81.8	79.9	79.8	80.4	21.4	23.7	37.2	38.0	39.4
	Employment/population ratios	38.3	33.6	21.7	20.6	19.9	79.6	73.7	74.1	73.4	74.3	20.6	22.4	35.0	35.5	37.2
Denmark	Unemployment rates	12.3	7.0	10.3	11.8	12.7	7.6	4.7	4.6	5.9	6.9	9.8	4.2	3.4	4.0	4.7
	Labour force participation rates	69.4	68.8	70.0	67.4	67.1	82.1	84.3	86.5	85.3	84.7	40.1	48.2	53.5	55.9	58.0
	Employment/population ratios	60.9	64.0	62.8	59.5	58.5	75.9	80.4	82.5	80.3	78.9	36.1	46.2	51.7	53.6	55.3
Estonia	Unemployment rates	16.3	23.7	22.0	30.0	20.7	8.3	12.1	10.0	12.9	11.7	4.1	6.5	7.5	14.1	9.2
	Labour force participation rates	39.7	35.4	34.6	34.1	36.8	85.9	83.5	83.9	84.9	84.7	33.7	38.5	66.0	63.9	62.9
	Employment/population ratios	33.2	27.0	27.0	23.9	29.2	78.8	73.4	75.5	73.9	74.8	32.4	36.0	61.1	54.9	57.1
Finland	Unemployment rates	28.7	21.8	18.8	18.9	18.4	13.0	8.8	6.1	6.3	5.5	18.9	9.4	5.5	5.8	5.4
	Labour force participation rates	39.5	51.1	51.2	49.4	50.6	84.5	85.0	85.6	84.4	84.4	41.9	45.2	59.8	60.3	60.5
	Employment/population ratios	28.2	39.9	41.6	40.1	41.3	73.5	77.6	80.4	79.1	79.7	34.0	40.9	56.5	56.9	57.2
France	Unemployment rates	30.7	22.6	22.3	23.7	23.2	12.6	11.4	8.2	8.5	8.6	6.0	7.4	6.0	6.4	6.6
	Labour force participation rates	34.0	32.6	36.5	35.6	35.0	77.2	78.6	83.4	83.7	83.4	27.1	28.1	38.9	40.0	41.8
	Employment/population ratios	23.6	25.2	28.3	27.2	26.9	67.5	69.6	76.6	76.6	76.2	25.5	26.0	36.6	37.4	39.0
Germany	Unemployment rates	8.0	7.5	9.8	8.8	7.8	9.2	7.5	6.9	6.2	5.2	13.6	13.6	8.0	7.3	6.4
	Labour force participation rates	49.9	48.2	49.2	48.9	50.0	73.1	76.9	81.0	81.3	82.1	31.1	33.5	52.9	54.5	56.7
	Employment/population ratios	45.9	44.6	44.4	44.5	46.1	66.4	71.2	75.4	76.3	77.8	26.8	29.0	48.6	50.5	53.0
Greece	Unemployment rates	37.7	37.7	33.9	40.6	51.5	10.9	14.7	12.4	15.5	20.7	2.9	4.4	5.5	6.5	8.1
	Labour force participation rates	32.5	35.4	27.4	27.2	26.6	55.0	61.7	71.0	72.2	72.7	24.5	25.5	29.3	30.9	29.7
	Employment/population ratios	20.3	22.0	18.1	16.2	12.9	49.0	52.6	62.2	61.1	57.7	23.8	24.4	27.7	28.9	27.3
Hungary	Unemployment rates	15.6	11.2	24.2	24.9	24.6	7.7	5.0	9.0	10.1	10.4	5.3	1.6	6.2	7.3	7.8
	Labour force participation rates	31.9	32.5	21.5	22.1	22.1	68.9	70.5	73.6	74.6	74.3	9.7	13.3	28.8	32.4	35.2
	Employment/population ratios	27.0	28.8	16.3	16.6	16.7	63.6	66.9	66.9	67.1	66.6	9.2	13.1	27.0	30.1	32.4

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Women (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Iceland[a]	Unemployment rates	8.6	3.6	12.0	14.1	10.7	4.3	2.4	4.9	5.6	5.7	4.0	3.2	2.2	3.5	3.6
	Labour force participation rates	59.6	73.2	76.2	76.5	75.9	88.0	88.2	84.7	85.3	85.2	84.8	76.8	78.1	79.8	79.5
	Employment/population ratios	54.5	70.5	67.0	65.7	67.8	84.2	86.0	80.6	80.6	80.4	81.5	74.4	76.4	77.0	76.7
Ireland	Unemployment rates	17.5	7.9	19.1	22.4	24.2	10.8	3.7	6.7	8.5	9.3	8.4	2.9	3.1	5.0	5.4
	Labour force participation rates	42.4	49.0	47.5	42.0	40.1	54.8	65.2	71.9	72.2	72.1	21.3	27.8	42.7	45.3	46.2
	Employment/population ratios	35.0	45.1	38.5	32.6	30.4	48.8	62.8	67.1	66.0	65.4	19.5	27.0	41.4	43.0	43.7
Israel[b]	Unemployment rates	17.1	16.8	13.6	12.9	11.3	7.1	8.0	6.9	5.8	5.1	4.5	4.9	5.1	4.4	3.7
	Labour force participation rates	34.6	35.5	33.7	33.7	32.1	65.0	68.5	73.2	73.6	74.0	33.4	37.7	53.0	54.0	54.6
	Employment/population ratios	28.7	29.6	29.1	29.3	28.5	60.4	63.0	68.2	69.3	70.2	31.8	35.9	50.3	51.6	52.6
Italy	Unemployment rates	38.7	35.4	28.7	29.4	32.1	12.6	12.1	8.5	8.9	8.8	4.2	4.7	2.8	3.0	2.7
	Labour force participation rates	34.1	34.3	23.9	23.4	22.9	53.4	57.9	64.5	64.4	64.6	14.1	16.1	26.1	27.0	28.9
	Employment/population ratios	20.9	22.1	17.0	16.5	15.5	46.6	50.9	59.1	58.7	58.9	13.5	15.3	25.4	26.2	28.1
Japan	Unemployment rates	6.1	7.9	8.1	8.0	7.1	3.1	4.4	4.9	4.8	4.4	2.1	3.6	3.4	3.3	3.1
	Labour force participation rates	47.2	46.6	44.8	44.0	43.3	65.2	66.5	71.1	71.6	71.6	48.5	49.7	53.5	53.9	53.7
	Employment/population ratios	44.4	43.0	41.2	40.5	40.2	63.2	63.6	67.6	68.2	68.5	47.5	47.9	51.7	52.1	52.0
Korea	Unemployment rates	5.3	9.0	8.5	9.0	8.1	0.9	3.0	2.8	2.9	2.9	0.4	1.6	1.7	2.2	1.7
	Labour force participation rates	41.8	37.0	30.0	30.4	30.1	55.4	57.8	61.5	62.2	62.8	50.4	48.8	47.5	48.1	48.9
	Employment/population ratios	39.6	33.7	27.4	27.7	27.7	54.9	56.0	59.8	60.3	61.0	50.2	47.9	46.7	47.1	48.1
Luxembourg	Unemployment rates	7.8	7.3	17.8	10.2	20.8	3.9	2.9	5.2	5.0	5.5	1.0	0.0	4.0	2.2	2.4
	Labour force participation rates	40.0	30.6	29.5	22.7	23.4	52.7	64.9	75.3	76.4	77.1	13.3	16.8	30.6	32.0	32.1
	Employment/population ratios	36.8	28.3	24.2	20.3	18.5	50.6	63.0	71.4	72.6	72.9	13.2	16.8	29.4	31.3	31.3
Mexico	Unemployment rates	15.3	6.2	10.6	10.1	10.4	5.9	2.4	3.8	4.5	4.5	3.8	0.9	1.5	1.7	1.5
	Labour force participation rates	37.3	36.3	32.2	33.2	33.0	42.7	45.4	53.2	54.1	53.7	26.7	28.0	33.3	35.9	34.9
	Employment/population ratios	31.6	34.0	28.8	29.8	29.5	40.1	44.3	51.1	51.7	51.3	25.7	27.7	32.8	35.3	34.4
Netherlands	Unemployment rates	13.7	7.0	7.2	8.6	7.9	7.7	3.3	3.0	3.6	3.6	3.7	1.5	3.1	3.7	4.0
	Labour force participation rates	63.5	70.0	70.3	69.5	69.9	66.4	72.7	81.8	82.3	81.9	18.6	25.9	43.3	44.9	48.4
	Employment/population ratios	54.8	65.1	65.2	63.5	64.4	61.3	70.3	79.3	79.3	79.0	17.9	25.5	42.0	43.3	46.4
New Zealand	Unemployment rates	12.2	12.4	17.2	17.4	16.1	5.1	4.8	4.4	5.4	5.5	2.8	3.6	2.5	2.9	3.4
	Labour force participation rates	63.0	59.5	59.4	58.5	57.6	71.6	73.5	77.5	76.9	77.8	38.9	47.8	66.6	69.2	69.8
	Employment/population ratios	55.3	52.2	49.2	48.3	48.3	67.9	70.0	74.2	72.8	73.5	37.8	46.1	65.0	67.2	67.5
Norway[a]	Unemployment rates	11.8	10.9	8.0	7.7	7.9	3.7	2.3	2.0	2.6	2.6	1.9	0.7	0.6	0.9	1.2
	Labour force participation rates	53.7	61.8	59.2	57.1	56.9	80.4	83.5	85.2	84.4	84.3	57.4	61.6	65.0	65.6	66.9
	Employment/population ratios	47.3	55.0	54.4	52.7	52.4	77.4	81.6	83.5	82.2	82.2	56.4	61.2	64.6	65.0	66.1
Poland	Unemployment rates	33.8	37.3	21.2	25.4	28.9	13.2	16.0	7.6	8.7	9.2	4.9	9.7	5.5	6.5	6.2
	Labour force participation rates	35.6	34.8	29.4	29.7	28.2	78.0	76.5	77.5	78.6	78.7	27.6	23.7	23.2	25.9	29.1
	Employment/population ratios	23.5	21.8	23.2	22.1	20.1	67.7	64.3	71.6	71.7	71.4	26.3	21.4	21.9	24.2	27.3
Portugal	Unemployment rates	17.7	11.6	21.6	23.7	31.7	7.5	4.4	10.1	12.2	12.3	2.8	2.6	7.0	7.6	9.4
	Labour force participation rates	39.7	40.8	37.5	34.8	36.4	75.2	77.4	83.4	84.9	84.5	34.3	41.9	45.9	47.0	46.5
	Employment/population ratios	32.7	36.0	29.4	26.5	24.9	69.6	73.9	74.9	74.6	74.1	33.3	40.8	42.7	43.5	42.2

Table C. **Employment/population ratios, activity and unemployment rates by selected age groups** *(cont.)*

Women (percentages)

		15 to 24					25 to 54					55 to 64				
		1995	2000	2009	2010	2011	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Slovak Republic	Unemployment rates	23.1	33.8	26.5	32.0	33.6	12.0	15.8	11.8	13.3	12.4	11.4	8.7	10.0	11.0	9.1
	Labour force participation rates	40.4	42.6	25.4	25.5	22.8	82.0	82.9	80.8	80.8	80.4	9.3	10.7	29.1	32.4	34.6
	Employment/population ratios	31.1	28.2	18.6	17.3	15.1	72.1	69.8	71.2	70.1	70.4	8.2	9.8	26.2	28.8	31.5
Slovenia	Unemployment rates	..	..	13.4	13.8	16.8	..	..	5.4	6.8	7.9	..	..	3.2	3.6	4.0
	Labour force participation rates	..	..	35.8	34.8	32.3	..	..	87.9	88.1	88.4	..	..	25.6	25.5	23.7
	Employment/population ratios	..	..	31.0	30.0	26.9	..	..	83.2	82.1	81.3	..	..	24.8	24.5	22.7
Spain[a]	Unemployment rates	49.2	32.9	36.4	39.8	44.4	27.8	18.9	16.9	19.2	20.9	11.4	11.3	13.3	13.8	14.6
	Labour force participation rates	43.0	43.3	45.7	44.0	43.1	55.9	62.8	76.7	78.3	79.3	19.8	22.6	37.2	38.5	41.7
	Employment/population ratios	21.8	29.0	29.1	26.5	24.0	40.3	51.0	63.8	63.2	62.7	17.5	20.1	32.3	33.2	35.6
Sweden[a]	Unemployment rates	18.4	11.3	23.7	23.7	22.0	6.9	4.5	6.0	6.3	5.6	6.8	5.4	4.6	4.4	4.1
	Labour force participation rates	52.7	51.2	50.8	51.2	52.4	87.1	85.6	87.1	87.5	88.1	63.9	65.9	70.0	69.9	72.0
	Employment/population ratios	43.0	45.4	38.8	39.0	40.9	81.1	81.7	81.9	82.0	83.1	59.5	62.4	66.8	66.8	69.1
Switzerland	Unemployment rates	5.3	4.1	9.0	8.4	7.9	4.0	3.0	4.1	4.7	4.1	1.7	2.5	2.3	3.4	3.4
	Labour force participation rates	62.1	66.3	68.5	66.5	66.9	75.2	78.0	83.9	83.5	83.4	46.8	51.5	61.0	60.6	62.1
	Employment/population ratios	58.8	63.5	62.4	60.9	61.7	72.2	75.6	80.4	79.5	80.0	46.0	50.3	59.6	58.5	60.0
Turkey	Unemployment rates	13.1	11.9	25.0	23.0	20.7	5.1	4.6	12.5	11.4	9.9	0.4	0.5	1.6	1.5	1.7
	Labour force participation rates	34.2	28.1	25.8	26.3	26.8	33.1	28.9	31.6	34.0	35.7	25.1	21.6	16.3	17.3	18.2
	Employment/population ratios	29.7	24.8	19.3	20.3	21.2	31.4	27.6	27.6	30.1	32.2	25.0	21.5	16.0	17.1	17.9
United Kingdom[a]	Unemployment rates	12.2	10.1	15.7	16.9	17.7	6.0	4.0	5.2	5.4	5.8	3.8	2.7	2.8	3.0	3.0
	Labour force participation rates	64.8	65.7	60.7	60.3	59.7	74.0	76.2	78.5	78.7	79.0	40.8	42.5	50.7	50.6	51.0
	Employment/population ratios	56.9	59.1	51.2	50.1	49.2	69.5	73.1	74.4	74.4	74.4	39.2	41.4	49.3	49.0	49.5
United States[a]	Unemployment rates	11.6	8.9	14.9	15.8	15.7	4.5	3.3	7.2	7.8	7.6	3.6	2.5	6.0	6.2	6.1
	Labour force participation rates	62.3	63.0	55.2	53.5	53.3	75.6	76.7	75.6	75.2	74.7	49.2	51.9	60.0	60.2	59.5
	Employment/population ratios	55.1	57.4	47.0	45.1	44.9	72.2	74.2	70.2	69.3	69.0	47.5	50.6	56.4	56.4	55.9
OECD weighted average	Unemployment rates	15.0	12.3	15.2	15.7	15.7	7.2	6.2	7.0	7.5	7.4	4.6	4.4	5.0	5.2	5.1
	Labour force participation rates	47.4	46.5	43.6	43.1	42.9	66.8	67.9	70.9	71.2	71.2	36.0	38.3	47.0	47.9	48.5
	Employment/population ratios	40.3	40.8	37.0	36.4	36.2	62.0	63.7	65.9	65.9	66.0	34.4	36.7	44.7	45.4	46.0
Brazil	Unemployment rates	..	..	23.1	..	..	..	..	8.7	..	..	..	..	3.4	..	..
	Labour force participation rates	..	..	54.0	..	..	..	..	71.5	..	..	..	..	41.4	..	..
	Employment/population ratios	..	..	41.5	..	..	..	..	65.3	..	..	..	..	40.0	..	..
Russian Federation	Unemployment rates	20.0	22.2	19.0	17.5	15.7	7.6	8.8	6.6	5.9	5.4	6.2	7.1	4.7	4.0	3.7
	Labour force participation rates	45.5	39.4	39.8	38.8	37.6	84.3	84.7	85.6	85.9	86.6	22.9	27.7	40.7	37.8	37.6
	Employment/population ratios	36.4	30.6	32.2	32.0	31.7	77.9	77.2	80.0	80.8	81.9	21.5	25.8	38.8	36.2	36.3
South Africa	Unemployment rates	..	..	52.3	54.6	55.0	..	..	22.5	24.0	24.6	..	..	4.6	5.8	4.7
	Labour force participation rates	..	..	25.1	23.3	23.3	..	..	64.5	62.6	63.4	..	..	30.8	30.8	31.4
	Employment/population ratios	..	..	12.0	10.6	10.5	..	..	50.0	47.6	47.8	..	..	29.4	29.0	29.9

a) Age group 15-24 refers to 16-24. For Norway, up to 2005.

b) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*. Ratios are under-estimated except unemployment rates. See details in the PDF reported below.

Source and definitions: *OECD Online Employment Database*: *www.oecd.org/employment/database* and *www.oecd.org/dataoecd/13/57/43103377.pdf.*

StatLink http://dx.doi.org/10.1787/888932652168

Table D. **Employment/population ratios, activity and unemployment rates by educational attainment, 2010**

Persons aged 25-64 (percentages)

		Both sexes			Men			Women		
		Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education
Australia	Unemployment rates	6.2	3.6	2.8	6.6	3.1	2.8	5.8	4.3	2.8
	Labour force participation rates	69.4	83.4	86.4	82.8	90.6	92.3	58.4	73.8	81.6
	Employment/population ratios	65.1	80.5	84.0	77.3	87.8	89.7	55.0	70.6	79.3
Austria	Unemployment rates	7.3	3.5	2.3	9.7	3.7	2.1	5.6	3.3	2.5
	Labour force participation rates	60.5	80.8	87.7	71.6	84.9	91.2	54.5	76.3	83.4
	Employment/population ratios	56.1	77.9	85.7	64.7	81.8	89.3	51.4	73.7	81.4
Belgium	Unemployment rates	13.2	6.6	4.0	12.7	5.7	4.0	14.0	7.7	4.1
	Labour force participation rates	56.3	79.7	87.5	67.8	86.5	90.3	44.4	72.4	85.0
	Employment/population ratios	48.9	74.5	84.0	59.2	81.6	86.7	38.2	66.7	81.6
Canada	Unemployment rates	12.4	7.5	5.4	12.6	8.0	5.6	12.1	6.9	5.2
	Labour force participation rates	62.9	80.0	86.0	72.0	85.3	89.7	51.6	73.7	82.8
	Employment/population ratios	55.1	74.0	81.3	63.0	78.5	84.7	45.4	68.6	78.5
Chile	Unemployment rates	4.6	6.2	5.6	3.8	5.4	5.1	6.2	7.3	6.3
	Labour force participation rates	64.8	76.5	83.8	85.9	93.2	91.9	45.1	60.8	75.9
	Employment/population ratios	61.8	71.8	79.1	82.6	88.2	87.2	42.3	56.3	71.2
Czech Republic	Unemployment rates	22.7	6.2	2.5	24.1	5.1	2.5	21.8	7.6	2.5
	Labour force participation rates	55.8	79.4	85.5	70.0	87.8	93.4	49.0	70.3	77.0
	Employment/population ratios	43.2	74.5	83.3	53.1	83.3	91.0	38.3	65.0	75.0
Denmark	Unemployment rates	9.0	6.1	4.6	10.0	6.8	5.1	7.8	5.3	4.1
	Labour force participation rates	69.1	84.3	89.9	77.4	86.7	92.3	61.3	81.2	87.9
	Employment/population ratios	62.9	79.1	85.7	69.7	80.9	87.5	56.5	77.0	84.3
Estonia	Unemployment rates	27.5	18.0	9.1	32.2	17.8	12.2	18.5	18.2	7.2
	Labour force participation rates	61.8	83.7	87.8	67.4	87.5	92.3	53.2	79.4	85.4
	Employment/population ratios	44.8	68.6	79.9	45.7	71.9	81.1	43.3	65.0	79.2
Finland	Unemployment rates	11.6	7.5	4.4	11.6	8.0	4.6	11.7	6.9	4.2
	Labour force participation rates	62.2	80.1	88.0	66.9	82.7	91.0	56.0	76.9	85.7
	Employment/population ratios	55.0	74.1	84.1	59.1	76.1	86.8	49.4	71.6	82.1
France	Unemployment rates	12.9	7.2	4.9	12.7	6.4	4.8	13.2	8.1	5.1
	Labour force participation rates	63.6	80.2	87.9	71.5	84.0	91.2	56.8	75.9	85.2
	Employment/population ratios	55.4	74.4	83.6	62.4	78.6	86.8	49.3	69.8	80.8
Germany	Unemployment rates	15.9	6.9	3.1	18.4	7.5	3.0	13.3	6.3	3.3
	Labour force participation rates	65.8	82.0	89.7	80.3	87.4	92.9	55.6	76.7	85.6
	Employment/population ratios	55.3	76.3	86.9	65.5	80.8	90.1	48.2	71.9	82.8
Greece	Unemployment rates	11.9	12.5	8.7	10.4	9.2	6.6	14.6	17.1	11.0
	Labour force participation rates	64.4	76.7	87.4	82.4	89.1	90.3	46.4	64.3	84.4
	Employment/population ratios	56.7	67.1	79.8	73.8	80.9	84.3	39.6	53.3	75.1

Table D. **Employment/population ratios, activity and unemployment rates by educational attainment, 2010** *(cont.)*

Persons aged 25-64 (percentages)

		Both sexes			Men			Women		
		Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education
Hungary	Unemployment rates	23.5	9.5	4.1	24.9	9.5	4.5	22.2	9.5	3.8
	Labour force participation rates	49.2	73.2	82.0	59.6	79.0	87.0	42.0	66.5	78.2
	Employment/population ratios	37.6	66.2	78.6	44.8	71.5	83.1	32.7	60.2	75.2
Iceland	Unemployment rates	7.2	7.2	3.5	7.8	7.3	0.0	6.5	7.0	0.0
	Labour force participation rates	82.4	88.3	92.3	88.1	92.5	95.4	76.8	82.3	90.0
	Employment/population ratios	76.5	82.0	89.1	81.2	85.8	91.2	71.8	76.5	87.4
Ireland	Unemployment rates	19.5	13.7	6.8	23.2	16.9	7.9	11.3	9.3	5.9
	Labour force participation rates	58.2	77.0	87.1	72.9	88.0	91.7	39.9	65.9	83.2
	Employment/population ratios	46.8	66.4	81.1	56.0	73.1	84.5	35.4	59.7	78.3
Israel[a]	Unemployment rates	9.8	6.8	4.2	10.3	6.5	4.1	8.7	7.2	4.3
	Labour force participation rates	49.6	75.3	86.0	66.4	80.7	89.5	30.5	69.2	83.1
	Employment/population ratios	44.7	70.1	82.4	59.6	75.5	85.9	27.9	64.2	79.5
Italy	Unemployment rates	9.1	6.1	5.6	8.1	5.0	4.4	11.2	7.4	6.6
	Labour force participation rates	55.5	77.2	82.9	73.9	86.1	88.1	36.6	68.2	78.8
	Employment/population ratios	50.4	72.6	78.3	68.0	81.8	84.2	32.5	63.1	73.6
Japan	Unemployment rates	[b]	5.8	3.8	[b]	6.4	3.8	[b]	5.0	3.8
	Labour force participation rates	[b]	77.9	82.7	[b]	91.6	95.5	[b]	64.5	69.4
	Employment/population ratios	[b]	73.3	79.5	[b]	85.7	91.9	[b]	61.2	66.7
Korea	Unemployment rates	3.1	3.5	3.3	4.1	4.0	3.3	2.2	2.8	3.2
	Labour force participation rates	67.1	73.1	78.9	80.7	88.2	92.2	58.4	58.4	62.1
	Employment/population ratios	65.0	70.6	76.3	77.4	84.7	89.1	57.1	56.8	60.1
Luxembourg	Unemployment rates	4.1	3.6	3.6	3.1	2.7	2.9	5.3	4.7	4.5
	Labour force participation rates	64.5	74.8	88.1	77.0	83.4	93.4	55.0	66.3	81.6
	Employment/population ratios	61.9	72.1	85.0	74.6	81.1	90.7	52.1	63.2	77.9
Mexico	Unemployment rates	4.0	4.6	5.0	4.1	4.5	5.0	3.8	4.7	4.9
	Labour force participation rates	65.7	75.0	84.6	91.5	94.4	92.8	44.2	59.1	75.3
	Employment/population ratios	63.0	71.6	80.4	87.7	90.1	88.2	42.5	56.3	71.6
Netherlands	Unemployment rates	5.1	3.1	2.3	5.4	3.2	2.4	4.7	2.9	2.1
	Labour force participation rates	64.4	82.5	89.6	78.7	87.8	92.0	51.7	77.2	86.8
	Employment/population ratios	61.1	80.0	87.5	74.5	85.0	89.8	49.3	75.0	85.0
New Zealand	Unemployment rates	6.1	4.5	3.8	6.4	3.8	3.4	5.7	5.7	4.1
	Labour force participation rates	72.9	85.9	87.1	81.6	92.2	93.7	65.5	77.4	82.1
	Employment/population ratios	68.4	82.0	83.8	76.3	88.8	90.5	61.7	73.0	78.7
Norway	Unemployment rates	5.5	2.2	1.6	7.2	2.7	1.4	3.7	1.4	1.7
	Labour force participation rates	67.6	83.7	91.9	73.4	86.9	93.0	61.9	79.3	90.9
	Employment/population ratios	63.9	81.8	90.4	68.1	84.5	91.6	59.6	78.2	89.4

Table D. **Employment/population ratios, activity and unemployment rates by educational attainment, 2010** *(cont.)*

Persons aged 25-64 (percentages)

		Both sexes			Men			Women		
		Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education	Less than upper secondary education	Upper secondary education	Tertiary education
Poland	Unemployment rates	16.2	8.9	4.2	15.8	8.2	4.0	16.9	10.0	4.4
	Labour force participation rates	47.7	72.0	88.5	58.8	80.9	92.5	37.2	62.4	85.7
	Employment/population ratios	39.9	65.6	84.8	49.6	74.2	88.8	30.9	56.2	82.0
Portugal	Unemployment rates	11.8	9.7	6.3	10.6	7.6	5.5	13.2	11.8	6.8
	Labour force participation rates	77.3	88.5	91.1	84.5	90.5	90.9	69.7	86.6	91.3
	Employment/population ratios	68.2	79.9	85.4	75.5	83.6	85.9	60.5	76.3	85.1
Slovak Republic	Unemployment rates	40.8	12.3	4.8	42.4	11.4	5.2	39.2	13.3	4.5
	Labour force participation rates	50.2	79.7	86.4	64.4	87.1	92.8	40.9	71.6	81.2
	Employment/population ratios	29.7	69.9	82.2	37.1	77.2	88.0	24.9	62.1	77.5
Slovenia	Unemployment rates	11.2	6.9	4.1	12.1	6.6	3.9	10.0	7.3	4.2
	Labour force participation rates	57.5	78.4	91.0	69.2	81.5	93.3	47.8	74.4	89.4
	Employment/population ratios	51.1	73.0	87.3	60.8	76.1	89.6	43.0	68.9	85.7
Spain	Unemployment rates	24.7	17.4	10.4	23.8	16.0	9.6	26.0	19.2	11.3
	Labour force participation rates	70.2	83.4	89.0	83.1	90.0	91.9	56.5	76.7	86.3
	Employment/population ratios	52.9	68.9	79.7	63.3	75.6	83.1	41.8	61.9	76.5
Sweden	Unemployment rates	11.0	6.1	4.3	9.5	5.9	4.7	13.6	6.3	4.0
	Labour force participation rates	71.7	87.3	92.1	81.5	90.8	93.6	59.2	83.2	90.9
	Employment/population ratios	63.8	82.0	88.1	73.7	85.5	89.2	51.1	77.9	87.3
Switzerland	Unemployment rates	8.0	4.9	3.0	9.4	5.2	3.0	6.9	4.6	3.0
	Labour force participation rates	74.3	84.2	91.4	84.2	91.2	95.3	67.9	78.0	85.6
	Employment/population ratios	68.3	80.0	88.7	76.3	86.5	92.5	63.3	74.4	83.0
Turkey	Unemployment rates	10.6	11.3	7.9	10.9	9.0	6.1	9.3	20.4	11.3
	Labour force participation rates	54.2	67.7	82.2	81.7	87.3	88.6	26.5	36.0	72.6
	Employment/population ratios	48.5	60.0	75.7	72.8	79.4	83.2	24.1	28.6	64.4
United Kingdom	Unemployment rates	10.3	6.2	3.4	11.5	6.7	3.8	9.0	5.4	3.0
	Labour force participation rates	62.2	83.1	87.3	74.4	88.2	91.9	52.8	77.1	82.8
	Employment/population ratios	56.0	76.8	85.1	66.3	81.8	88.6	48.1	71.0	81.7
United States	Unemployment rates	16.8	11.2	5.3	17.8	12.8	5.9	15.0	9.3	4.8
	Labour force participation rates	62.6	76.5	84.5	74.4	82.9	89.8	48.9	70.0	80.0
	Employment/population ratios	52.1	67.9	80.0	61.2	72.2	84.5	41.6	63.5	76.2
OECD	Unemployment rates	12.5	7.6	4.7	13.1	7.3	4.6	11.8	8.1	4.9
(non weighted average)	Labour force participation rates	63.1	79.7	87.2	75.6	87.3	91.9	51.6	71.5	82.6
	Employment/population ratios	55.5	73.7	83.1	66.1	80.9	87.6	45.7	65.8	78.7
EU21	Unemployment rates	15.2	8.5	4.9	15.8	8.1	4.9	14.4	8.9	5.0
	Labour force participation rates	61.3	80.2	87.9	73.0	86.2	91.6	50.8	73.8	84.6
	Employment/population ratios	52.3	73.3	83.6	61.8	79.2	87.1	43.6	67.1	80.4

a) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*. Ratios are under-estimated except unemployment rates. See details in the PDF reported below.

b) Included in upper secondary education.

Source: OECD (2012), *Education at a Glance - OECD Indicators,* Paris.

StatLink http://dx.doi.org/10.1787/888932652187

Table E. **Incidence and composition of part-time employment**[a]

Percentages

	Part-time employment as a proportion of total employment									
	Men					Women				
	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Australia[b]	..	..	..	13.5	13.2	..	..	38.3	38.6	38.5
Austria	3.1	2.6	6.7	7.0	7.0	21.6	24.4	32.2	33.0	32.8
Belgium	4.3	7.1	6.6	6.7	7.0	29.9	34.5	31.8	31.7	32.4
Canada	10.8	10.4	12.0	12.1	12.9	28.5	27.2	27.1	27.4	27.2
Chile	..	3.1	7.1	12.0	11.8	..	8.7	17.0	25.7	25.5
Czech Republic	1.8	1.6	2.1	2.3	1.9	5.6	5.4	6.2	7.0	6.6
Denmark	9.7	9.3	13.6	13.5	13.8	25.8	24.0	24.5	25.4	25.2
Estonia	..	4.3	5.5	5.8	5.1	..	9.9	11.1	11.3	12.4
Finland	5.9	7.1	8.7	9.2	9.6	11.7	13.9	15.9	16.0	16.0
France	5.6	5.5	5.1	5.7	5.9	24.8	24.9	22.5	22.4	22.1
Germany	3.4	4.8	7.9	7.9	8.5	29.1	33.9	38.3	37.9	38.0
Greece	4.7	3.0	4.5	5.0	5.6	13.3	9.5	14.4	14.4	14.0
Hungary	1.6	1.5	2.3	2.3	3.4	4.3	4.5	5.0	5.2	6.4
Iceland	9.1	8.8	10.0	11.4	10.4	37.9	33.7	25.8	25.9	24.1
Ireland	6.7	7.8	10.8	11.9	12.6	27.0	33.0	37.4	38.2	39.3
Israel[c]	6.3	6.6	7.5	7.0	7.1	25.4	24.1	23.0	21.7	21.1
Italy	4.8	5.7	5.9	6.3	6.6	21.1	23.4	30.5	31.1	31.3
Japan[d]	..	..	10.5	10.4	10.3	..	..	33.8	33.9	34.8
Korea[d]	2.8	5.1	6.9	7.2	10.0	6.6	9.8	14.2	15.5	18.5
Luxembourg	1.9	2.0	5.4	4.6	5.0	28.4	28.4	31.1	30.4	30.2
Mexico	9.5	7.1	12.0	12.9	12.5	31.1	25.6	27.8	28.9	27.7
Netherlands	11.8	13.4	17.0	17.2	17.1	55.1	57.2	59.9	60.6	60.5
New Zealand	9.5	10.9	11.9	11.5	11.2	35.4	35.7	34.5	33.8	34.3
Norway	7.6	8.7	11.3	11.4	11.0	37.5	33.4	30.4	29.8	30.0
Poland	..	8.8	5.0	5.2	4.9	..	17.9	13.1	13.0	12.4
Portugal	3.8	4.9	5.9	6.1	8.8	14.5	14.9	13.8	13.0	14.4
Slovak Republic	1.1	1.0	2.2	2.8	2.7	3.8	2.9	4.1	5.0	5.7
Slovenia	..	..	6.6	7.2	6.7	..	..	10.4	12.1	10.9
Spain	2.4	2.6	4.4	4.9	5.5	15.8	16.5	21.4	21.7	21.9
Sweden	6.8	7.3	10.0	9.7	9.8	24.1	21.4	19.8	18.8	18.4
Switzerland[b]	6.5	8.4	9.2	9.4	9.4	44.9	44.7	46.7	46.1	45.5
Turkey	3.7	5.7	6.4	6.7	6.6	13.0	19.3	23.5	23.4	24.3
United Kingdom	7.4	8.6	10.9	11.6	11.7	40.8	40.8	38.8	39.4	39.3
United States[e]	8.3	7.7	9.2	8.8	8.4	20.2	18.0	19.2	18.4	17.1
OECD weighted average	5.4	5.8	8.8	9.0	9.1	20.2	20.2	26.1	26.3	26.0
Brazil	..	..	10.1	..	..	..	..	28.1	..	..
Russian Federation	2.2	4.9	3.3	3.0	2.8	7.2	10.0	6.3	5.6	5.4
South Africa	..	..	5.0	5.1	5.0	..	..	12.6	12.0	11.2

Table E. **Incidence and composition of part-time employment**[a] *(cont.)*

Percentages

	Part-time employment as a proportion of total employment					Women's share in part-time employment				
	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Australia[b]	..	..	24.7	24.9	24.7	..	..	70.8	70.4	70.9
Austria	11.1	12.2	18.5	19.0	18.9	84.2	88.1	80.6	80.3	80.2
Belgium	14.6	19.0	18.2	18.3	18.8	82.1	79.0	80.6	80.4	79.9
Canada	18.8	18.1	19.3	19.4	19.9	68.8	69.1	67.4	67.3	66.6
Chile	..	4.7	10.5	17.4	17.2	..	53.9	56.0	58.1	58.7
Czech Republic	3.4	3.2	3.9	4.3	3.9	70.2	72.5	68.7	69.2	72.9
Denmark	16.9	16.1	18.8	19.2	19.2	68.1	69.4	62.0	63.2	62.1
Estonia	..	7.1	8.4	8.7	8.8	..	69.0	68.1	67.4	71.5
Finland	8.7	10.4	12.2	12.5	12.7	64.6	63.8	63.6	62.2	61.0
France	14.2	14.2	13.3	13.6	13.6	77.9	78.8	79.9	78.1	77.2
Germany	14.2	17.6	21.9	21.7	22.1	86.3	84.5	80.4	80.5	79.2
Greece	7.8	5.5	8.4	8.8	9.0	61.3	65.4	67.7	65.9	62.8
Hungary	2.8	2.9	3.6	3.6	4.7	67.7	71.2	65.0	66.4	61.7
Iceland	22.5	20.4	17.5	18.4	17.0	78.5	77.0	70.0	67.6	68.0
Ireland	14.3	18.1	23.7	24.8	25.7	70.8	74.4	76.6	75.6	74.9
Israel[c]	14.5	14.6	14.8	14.0	13.7	75.1	75.3	73.4	73.5	72.6
Italy	10.5	12.2	15.8	16.3	16.7	70.8	70.5	77.6	76.9	76.6
Japan[d]	..	..	20.3	20.2	20.6	..	..	69.9	70.3	71.0
Korea[d]	4.3	7.0	9.9	10.7	13.5	61.6	57.7	59.3	60.3	56.6
Luxembourg	11.3	12.4	16.4	15.8	16.0	89.0	90.0	81.2	83.7	82.2
Mexico	16.6	13.5	17.9	18.9	18.3	61.3	65.1	58.2	57.6	57.1
Netherlands	29.4	32.1	36.7	37.1	37.2	76.2	76.2	75.0	75.0	75.3
New Zealand	20.9	22.2	22.5	21.9	22.0	74.7	73.2	71.9	72.0	73.0
Norway	21.4	20.2	20.4	20.1	20.0	80.7	77.0	70.8	70.3	71.1
Poland	..	12.8	8.7	8.7	8.3	..	61.7	68.4	67.5	67.4
Portugal	8.6	9.4	9.6	9.3	11.5	75.3	71.5	67.7	65.6	59.5
Slovak Republic	2.3	1.9	3.0	3.7	4.0	72.4	70.6	59.0	58.6	61.7
Slovenia	..	..	8.3	9.4	8.6	..	..	57.3	58.5	58.0
Spain	7.0	7.7	11.9	12.4	12.9	77.2	78.5	79.3	78.2	76.6
Sweden	15.1	14.0	14.6	14.0	13.8	76.8	72.9	64.2	63.3	62.8
Switzerland[b]	22.9	24.4	26.5	26.1	25.9	83.8	80.6	81.2	80.4	80.1
Turkey	6.4	9.4	11.1	11.5	11.7	58.8	55.4	58.4	58.0	60.0
United Kingdom	22.3	23.0	23.9	24.6	24.6	81.7	79.4	75.8	74.9	74.7
United States[e]	14.0	12.6	14.1	13.5	12.6	68.7	68.1	66.5	66.9	65.6
OECD weighted average	11.6	11.9	16.4	16.6	16.5	72.8	72.1	70.2	69.9	69.3
Brazil	..	..	17.8	..	..	..	..	67.5	..	..
Russian Federation	4.6	7.4	4.8	4.3	4.1	75.1	66.0	65.1	64.2	65.3
South Africa	..	..	8.3	8.1	7.7	..	..	65.9	64.2	63.2

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) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

d) Data are based on actual hours worked.

e) Data are for wage and salary workers only.

Source and definition: OECD Online 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, available on Internet (*www.oecd.org/els/workingpapers*).

StatLink http://dx.doi.org/10.1787/888932652206

Table F. **Incidence of temporary employment**[a]

Percentages

	Temporary employees as a proportion of total employees									
	Youth (15-24)					Prime age (25-54)				
	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Austria	18.9	33.0	35.6	37.0	37.2	3.3	3.8	4.5	4.9	5.0
Belgium	18.3	30.9	33.2	30.4	34.3	4.0	6.7	6.2	6.5	6.9
Canada[b]	25.1	29.1	27.8	30.0	30.5	8.6	8.8	9.1	9.9	10.2
Chile	..	..	..	47.5	45.8	..	..	..	28.5	28.4
Czech Republic	15.5	19.6	18.8	22.5	22.3	3.8	5.2	5.3	6.2	6.6
Denmark	31.9	29.8	22.8	21.1	22.1	7.7	6.5	6.5	6.6	6.9
Estonia	..	..	8.3	11.6	13.8	..	..	2.0	3.1	3.3
Finland[b]	54.3	45.6	39.0	43.1	43.4	14.7	13.0	12.4	13.0	13.2
France	45.6	55.0	52.4	54.9	55.0	9.1	11.7	10.4	11.0	11.4
Germany	38.9	52.4	57.3	57.2	56.0	6.5	7.5	9.4	9.8	10.0
Greece	23.3	28.8	28.4	30.4	30.1	8.5	11.4	11.3	11.7	11.0
Hungary[c]	12.1	13.9	21.4	24.9	22.9	5.4	5.9	7.8	8.9	8.3
Iceland	31.0	28.9	26.9	31.3	32.8	9.5	7.5	7.1	9.3	8.5
Ireland	19.3	12.3	25.0	30.4	34.2	7.9	2.5	6.2	6.9	7.5
Italy	17.9	26.2	44.4	46.7	49.9	5.8	8.6	10.7	11.1	11.8
Japan	16.2	24.9	25.5	26.6	26.4	8.3	9.5	10.8	10.6	10.6
Korea	..	..	32.5	30.1	27.3	..	..	21.3	18.2	19.3
Luxembourg[b]	10.9	14.5	39.4	36.5	34.5	1.6	2.3	4.9	5.6	5.7
Mexico	27.8	25.7	..	..	..	18.7	17.8	..	..	..
Netherlands	27.2	35.4	46.5	48.3	47.8	7.4	9.5	13.0	13.2	13.3
Norway[c]	39.3	28.5	25.0	26.5	23.7	9.9	6.9	5.9	6.0	6.2
Poland	..	..	62.0	64.6	65.6	..	..	22.5	23.5	23.8
Portugal	25.9	41.5	53.5	55.6	57.2	7.7	16.6	19.9	21.4	20.3
Slovak Republic	6.5	10.5	12.5	17.1	18.6	2.0	3.4	3.4	4.6	5.6
Slovenia	..	..	66.6	69.6	74.5	..	..	11.3	12.5	13.4
Spain	76.5	68.6	55.9	58.6	61.4	29.5	27.5	24.2	23.9	24.6
Sweden[c]	48.4	49.5	53.4	57.1	57.5	11.6	11.9	11.1	11.0	11.4
Switzerland	..	47.0	53.1	51.7	51.6	..	5.1	6.4	6.5	6.3
Turkey	25.8	23.7	15.0	17.2	18.4	17.9	18.6	9.5	9.9	10.5
United Kingdom	13.0	13.2	11.9	13.7	13.5	5.8	5.3	4.3	4.6	4.7
United States	9.9	..	..	..	..	4.1	..	..	..	..
OECD weighted average	21.3	24.3	24.9	25.4	25.3	8.3	8.8	9.6	9.7	9.9
Russian Federation	..	14.5	21.7	19.1	17.6	..	4.2	9.4	8.2	7.6

Table F. **Incidence of temporary employment**[a] *(cont.)*

Percentages

	Temporary employees as a proportion of total employees									
	Women					Total				
	1995	2000	2009	2010	2011	1995	2000	2009	2010	2011
Austria	6.3	8.4	9.0	8.9	9.5	6.0	7.9	9.1	9.3	9.6
Belgium	7.4	12.1	10.2	9.6	10.3	5.3	9.0	8.2	8.1	9.0
Canada[b]	11.7	13.2	12.9	13.7	14.0	11.3	12.5	12.5	13.4	13.7
Chile	..	..	..	29.4	29.4	..	..	..	30.6	30.3
Czech Republic	9.1	9.4	10.2	10.6	10.1	9.3	9.3	8.5	8.9	8.5
Denmark	13.5	11.7	9.6	8.7	9.4	12.1	10.2	8.7	8.4	8.8
Estonia	..	..	2.1	2.8	3.6	..	..	2.5	3.7	4.5
Finland[b]	21.0	19.8	18.4	18.5	18.5	18.3	16.5	14.6	15.6	15.7
France	13.4	16.5	15.7	15.9	15.8	12.3	15.5	14.3	15.0	15.3
Germany	11.1	13.1	14.7	14.9	14.8	10.4	12.7	14.5	14.7	14.7
Greece	11.2	15.7	14.1	14.4	13.0	10.2	13.1	12.1	12.4	11.6
Hungary[c]	6.2	6.5	7.8	9.2	8.4	6.6	7.1	8.5	9.7	8.9
Iceland	12.7	12.9	10.5	12.8	12.2	12.7	12.2	9.7	12.4	12.2
Ireland	12.2	6.0	9.6	10.1	10.4	10.2	4.7	8.6	9.4	10.0
Italy	9.1	12.2	14.6	14.5	14.7	7.2	10.1	12.5	12.8	13.4
Japan	18.3	20.9	21.3	20.9	20.7	10.5	12.5	13.7	13.8	13.7
Korea	..	..	30.2	25.8	27.2	..	..	26.1	23.0	23.8
Luxembourg[b]	3.1	4.6	8.4	8.3	8.2	2.6	3.4	7.2	7.1	7.1
Mexico	13.0	11.7	..	..	..	22.0	20.5	..	..	..
Netherlands	14.1	17.2	20.3	19.9	19.6	10.9	14.0	18.3	18.5	18.4
Norway[c]	15.1	11.5	9.8	9.8	9.4	13.0	9.3	8.1	8.3	7.9
Poland	..	..	26.6	27.1	26.2	..	..	26.5	27.3	27.0
Portugal	11.1	22.7	23.2	23.6	22.4	10.0	20.4	22.0	23.0	22.2
Slovak Republic	3.5	4.6	4.1	5.9	6.9	3.6	4.8	4.4	5.8	6.6
Slovenia	..	..	17.8	19.4	20.0	..	..	16.4	17.3	18.2
Spain	38.3	34.6	27.3	26.1	26.6	35.0	32.1	25.4	24.9	25.3
Sweden[c]	16.8	17.4	17.6	17.6	18.3	14.6	15.2	15.3	15.8	16.4
Switzerland		12.8	13.4	13.2	13.3		11.5	13.3	13.1	12.9
Turkey	17.8	12.6	11.4	12.5	11.8	20.5	20.3	10.7	11.4	12.3
United Kingdom	7.8	7.7	6.1	6.5	6.5	7.0	6.8	5.7	6.1	6.2
United States	5.4	..	..	..	..	5.1	..	..	..	..
OECD weighted average	11.3	12.0	12.6	12.5	12.5	10.6	11.3	11.8	11.9	12.0
Russian Federation	..	4.1	8.2	6.8	6.3	..	5.5	10.6	9.2	8.5

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. 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 refer to 1997 instead of 1995.

c) Data refer to 1996 instead of 1995.

Source and definitions : *OECD Online Employment Database* : *www.oecd.org/employment/database* and *www.oecd.org/dataoecd/13/57/43103377.pdf.*

StatLink http://dx.doi.org/10.1787/888932652225

Table G. **Average annual hours actually worked per person in employment**[a]

Total employment

	1979	1983	1995	2000	2007	2008	2009	2010	2011
Australia	1 832	1 785	1 792	1 776	1 711	1 716	1 685	1 687	1 693
Austria	..	..	1 720	1 727	1 667	1 648	1 608	1 599	1 600
Belgium	..	1 670	1 580	1 545	1 560	1 568	1 550	1 551	1 577
Canada	1 841	1 779	1 773	1 775	1 738	1 728	1 700	1 702	1 702
Chile	..	..	..	2 263	2 128	2 095	2 074	2 068	2 047
Czech Republic[b]	..	..	1 863	1 904	1 793	1 800	1 764	1 795	1 774
Denmark	1 636	1 638	1 541	1 581	1 570	1 570	1 559	1 560	1 522
Estonia	..	..	..	1 987	1 999	1 969	1 831	1 879	1 924
Finland	1 869	1 823	1 776	1 751	1 706	1 688	1 672	1 684	1 684
France[b]	1 804	1 685	1 590	1 523	1 485	1 492	1 472	1 478	1 475
Germany	..	..	1 529	1 471	1 422	1 422	1 383	1 408	1 413
Western Germany	1 770	1 705	1 503	1 450	1 405	1 407	1 366	1 393	1 399
Greece	..	2 208	2 132	2 130	2 038	2 051	1 995	2 017	2 032
Hungary	..	2 080	2 008	2 033	1 983	1 988	1 969	1 962	1 980
Iceland	..	..	1 832	1 885	1 783	1 787	1 706	1 691	1 732
Ireland	..	1 981	1 875	1 719	1 634	1 601	1 541	1 545	1 543
Israel[c]	..	..	..	..	1 921	1 898	1 889	1 888	1 890
Italy	..	1 876	1 859	1 861	1 816	1 803	1 771	1 775	1 774
Japan	2 126	2 095	1 884	1 821	1 785	1 771	1 714	1 733	1 728
Korea	..	2 911	2 648	2 512	2 306	2 246	2 232	2 193	..
Luxembourg	..	1 798	1 740	1 683	1 537	1 577	1 622	1 636	1 601
Mexico	..	..	2 294	2 311	2 262	2 260	2 253	2 242	2 250
Netherlands	1 556	1 524	1 456	1 435	1 388	1 392	1 384	1 381	1 379
New Zealand	..	..	1 841	1 828	1 766	1 750	1 738	1 758	1 762
Norway	1 580	1 553	1 488	1 455	1 419	1 423	1 407	1 414	1 426
Poland	..	..	..	1 988	1 976	1 969	1 948	1 939	1 937
Portugal	..	..	1 923	1 791	1 754	1 772	1 746	1 742	1 711
Slovak Republic	..	..	1 853	1 816	1 791	1 793	1 780	1 807	1 793
Slovenia	..	..	..	1 710	1 655	1 670	1 670	1 676	1 662
Spain	1 930	1 825	1 733	1 731	1 658	1 663	1 669	1 674	1690
Sweden	1 530	1 532	1 640	1 642	1 618	1 617	1 602	1 643	1 644
Switzerland[d]	..	..	1704	1688	1633	1623	1617	1 632	..
Turkey	1 964	1 935	1 876	1 937	1 911	1 900	1 881	1 877	1 877
United Kingdom	1 813	1 711	1 731	1 700	1 677	1 659	1 651	1 652	1 625
United States	1 829	1 820	1 844	1 836	1 798	1 792	1 767	1 778	1 787
OECD weighted average	1 915	1 886	1 866	1 843	1 798	1 790	1 765	1 773	1 775
Russian Federation			1 891	1 982	2 000	1 997	1 973	1 976	1 981

Table G. **Average annual hours actually worked per person in employment**[a] *(cont.)*

Dependent employment

	1979	1983	1995	2000	2007	2008	2009	2010	2011
Austria	..	..	1 455	1 510	1 486	1 483	1 437	1 424	1 431
Belgium	..	1 563	1 531	1 422	1 454	1 469	1 453	1 446	1 446
Canada	1 807	1 754	1 761	1 763	1 734	1 727	1 699	1 704	1 704
Chile	..	..	..	2 318	2 168	2 143	2 140	2 122	2 118
Czech Republic[b]	..	..	1 793	1 837	1 729	1 738	1 707	1 736	1 716
Denmark	1 600	1 614	1 514	1 549	1 545	1 550	1 538	1 538	1 496
Estonia	..	..	..	..	2 057	2 049	1 970	2 004	2 033
Finland	..	..	1 672	1 638	1 594	1 610	1 555	1 584	1 578
France[b]	1 662	1 550	1 488	1 427	1 401	1 409	1 390	1 395	1 392
Germany	..	..	1 438	1 375	1 340	1 339	1 296	1 323	1 330
Western Germany	1 689	1 621	1 403	1 349	1 321	1 323	1 278	1 307	1 315
Greece	..	1 760	1 785	1 818	1 782	1 803	1 777	1 754	1 751
Hungary[e]	..	1 829	1 765	1 795	1 778	1 786	1 766	1 818	1 816
Iceland	..	..	1 776	1 820	1 705	1 716	1 641	1 628	1 662
Ireland	..	1 702	1 655	1 596	1 549	1 522	1 466	1 468	1 469
Japan[f]	..	..	1 910	1 853	1 808	1 792	1 733	1 754	1 747
Korea[f]	..	..	..	..	2 090	2 057	2 074	2 111	..
Luxembourg	..	1 661	1 632	1 619	1 535	1 566	1 581	1 616	1 565
Mexico	..	..	2 360	2 360	2 338	2 341	2 323	2 330	2 331
Netherlands	1 512	1 491	1 414	1 381	1 340	1 348	1 339	1 335	1 336
New Zealand	..	..	1 766	1 769	1 748	1 729	1 718	1 742	1 746
Poland	..	..	..	1 963	1 953	1 940	1 914	1 911	1 910
Portugal	..	..	1 754	1 705	1 710	1 721	1 699	1 694	1 680
Slovak Republic	..	..	..	1 776	1 782	1 782	1 734	1 736	1 742
Slovenia	..	..	..	..	1 689	1 670	1 608	1 627	1 613
Spain	1 844	1 750	1 668	1 687	1 621	1 624	1 632	1 635	1 653
United Kingdom	1 747	1 649	1 695	1 680	1 658	1 641	1 637	1 632	1 611
United States	1 828	1 827	1 849	1 836	1 799	1 797	1 776	1 787	1 797
Russian Federation	..	..	1 886	2 000	2 021	2 016	1 994	1 996	2 002

a) The concept used is the total number of hours worked over the 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. Part-time and part-year workers are covered as well as full-time workers.

b) OECD estimates for all years for the Czech Republic and 2011 for France.

c) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

d) 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, referring both to National Accounts domestic concept.

e) Data refer to establishments in manufacturing with five or more employees.

f) Data refer to establishments with five or more regular employees.

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/statistics/productivity/compendium*). However, there may be some 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 18 countries: Austria, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Korea, the Netherlands, Norway, the Slovak Republic, Spain, Sweden, Switzerland and Turkey. OECD estimates for Belgium, Ireland, Luxembourg and Portugal for annual hours worked are based on the European Labour Force Survey, as are estimates for dependent employment only for Austria, Estonia, Greece, the Slovak Republic and Slovenia. The table includes labour-force-survey-based estimates for the Russian Federation.

Country specific notes can be found at: *www.oecd.org/employment/outlook* and data at the *OECD Online Employment Database*: *www.oecd.org/employment/database.*

StatLink http://dx.doi.org/10.1787/888932652244

Table H. **Incidence of long-term unemployment**[a, b]

As a percentage of total unemployment

	1995		2000		2009		2010		2011	
	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over
Australia	48.3	32.0	42.3	28.3	29.9	14.7	33.1	18.5	32.4	18.9
Austria	43.7	29.1	39.7	25.8	39.4	21.3	43.1	25.2	42.8	25.9
Belgium	77.7	62.4	71.8	56.3	60.2	44.2	66.1	48.8	64.1	48.3
Canada	29.5	16.8	19.5	11.3	17.9	7.8	23.2	12.0	23.3	13.5
Czech Republic	52.9	31.2	69.9	48.8	54.9	31.2	66.2	43.3	63.2	41.6
Denmark	46.6	27.9	38.1	20.0	25.6	9.5	38.7	20.2	42.1	24.4
Estonia	65.5	36.0	62.1	46.3	48.1	27.4	67.2	45.4	69.5	56.8
Finland	56.6	37.6	46.5	29.0	31.7	16.6	39.5	23.6	35.8	22.6
France	59.4	40.2	56.4	39.6	55.8	35.2	59.8	40.2	60.1	41.4
Germany	65.9	48.7	67.6	51.5	61.7	45.5	63.5	47.4	62.7	48.0
Greece	72.7	51.4	73.5	56.4	58.8	40.8	62.8	45.0	67.2	49.6
Hungary	73.0	50.6	69.7	48.9	66.7	42.6	73.4	50.6	68.7	49.1
Iceland[c, d]	(33.3)	(16.8)	(18.6)	(11.8)	(24.5)	(6.9)	(42.5)	(21.3)	(41.2)	(27.8)
Ireland[e]	78.2	61.6	76.1	55.3	53.5	29.2	70.2	49.3	75.3	59.4
Israel[f]	22.7	8.1	28.6	12.0	35.1	20.3	36.9	22.4	33.1	20.2
Italy	80.2	63.6	77.6	61.3	61.5	44.4	64.6	48.5	66.9	51.9
Japan	37.7	18.1	46.9	25.5	46.3	28.5	55.6	37.6	55.5	39.4
Korea	17.7	4.4	14.1	2.3	9.0	0.5	7.0	0.3	6.8	0.4
Luxembourg[d]	(49.2)	(23.2)	(37.0)	(22.4)	(48.7)	(23.1)	(45.3)	(29.3)	(52.8)	(28.8)
Mexico	8.0	1.5	5.1	1.2	6.4	1.9	7.5	2.4	5.9	2.0
Netherlands[e]	80.4	46.8	80.7	43.5	43.4	24.8	48.5	27.6	50.3	33.6
New Zealand	43.3	25.6	36.7	19.8	23.2	6.3	28.1	9.0	29.0	9.0
Norway[c]	39.3	24.2	16.6	5.3	25.1	7.7	31.3	9.5	32.5	11.6
Poland	63.1	40.0	63.0	37.9	44.7	25.2	46.5	25.5	52.1	31.6
Portugal	65.1	50.9	60.0	42.9	63.7	44.1	70.5	52.3	64.6	48.2
Slovak Republic	70.4	54.1	74.4	54.6	66.8	50.9	77.5	59.3	79.1	63.9
Slovenia	..	..	..	..	50.6	30.1	63.4	43.3	62.9	44.2
Spain[c]	72.9	54.6	62.2	42.4	46.5	23.7	57.7	36.6	60.2	41.6
Sweden[c]	45.6	27.8	41.5	26.4	29.4	12.8	34.0	16.6	32.6	17.2
Switzerland	50.8	33.6	45.7	29.0	48.0	30.1	55.9	33.1	56.7	38.8
Turkey	60.6	36.4	36.0	21.1	44.9	25.3	45.7	28.6	42.8	26.5
United Kingdom[c]	60.8	43.6	43.2	28.0	44.7	24.5	52.6	32.6	51.8	33.4
United States[c]	17.3	9.7	11.4	6.0	31.5	16.3	43.3	29.0	43.7	31.3
OECD[g]	49.3	33.5	46.0	30.8	40.5	23.7	47.9	31.6	48.4	33.6
Russian Federation	48.4	29.7	65.2	46.2	45.0	28.7	47.4	29.9	53.0	32.8
South Africa	..	..	..	..	68.4	49.3	73.4	56.1	75.1	58.8

Table H. **Incidence of long-term unemployment**[a, b] *(cont.)*

As a percentage of male unemployment

	1995		2000		2009		2010		2011	
	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over
Australia	52.1	35.4	45.9	31.8	31.0	15.0	35.0	20.3	32.8	19.7
Austria	39.1	27.9	39.0	28.1	39.7	21.5	44.9	27.8	44.2	27.5
Belgium	76.4	61.4	70.2	55.9	59.9	43.5	67.0	49.6	64.1	47.1
Canada	30.6	18.3	20.9	12.3	18.5	8.1	24.3	12.7	24.6	14.4
Czech Republic	51.9	30.9	68.4	47.5	52.0	29.0	66.2	43.3	63.1	41.7
Denmark	51.9	31.9	36.5	20.1	26.7	9.3	41.9	21.9	43.7	26.2
Estonia	68.1	39.9	63.6	49.0	50.2	26.8	69.8	48.4	70.2	59.7
Finland	59.7	41.4	49.6	32.2	34.9	18.2	44.4	27.0	39.9	26.6
France	57.7	39.1	55.3	38.3	55.8	35.3	61.7	41.6	60.3	42.1
Germany	63.3	45.9	65.9	50.1	60.9	44.4	64.3	48.1	63.5	49.3
Greece	64.3	42.3	67.1	49.4	53.4	34.4	58.0	38.8	63.7	45.0
Hungary	74.0	52.0	71.4	51.1	65.8	42.4	73.5	51.2	68.6	48.9
Iceland[c, d]	(31.4)	(16.5)	(17.4)	(8.7)	(25.1)	(7.0)	(44.2)	(22.9)	(42.1)	(28.3)
Ireland[e]	80.7	66.8	77.8	59.5	57.7	32.2	74.6	54.1	79.9	65.4
Israel[f]	24.0	8.4	31.3	13.5	37.5	23.4	41.0	25.7	35.6	21.4
Italy	78.9	62.7	76.8	61.4	60.1	42.0	64.2	47.2	67.2	51.4
Japan	43.7	23.5	52.8	30.7	52.0	34.8	63.1	44.8	63.9	47.3
Korea	19.0	4.9	16.8	3.1	10.5	0.6	8.6	0.5	8.2	0.5
Luxembourg[d]	(50.6)	(26.0)	(40.0)	(26.4)	(45.2)	(19.9)	(44.3)	(32.2)	(58.8)	(33.1)
Mexico	7.4	1.3	4.3	0.6	6.3	1.8	7.8	2.6	5.8	2.3
Netherlands[e]	78.7	51.6	75.1	47.7	42.2	23.7	49.2	27.7	52.1	35.3
New Zealand	48.4	29.7	40.0	23.7	23.7	6.3	29.1	8.9	31.5	10.2
Norway[c]	44.4	28.6	20.5	6.9	26.5	7.5	35.6	10.6	34.1	13.7
Poland	59.4	36.2	59.3	34.1	42.3	23.3	46.7	25.3	51.4	30.7
Portugal	63.0	48.4	60.1	46.7	61.7	40.7	70.3	51.7	64.7	47.9
Slovak Republic	69.0	52.5	74.1	54.1	64.3	47.8	76.9	58.3	79.8	65.0
Slovenia	..	..	..	..	51.8	28.3	66.8	45.0	64.2	45.1
Spain[c]	67.2	49.0	56.4	36.6	45.1	20.9	57.7	35.9	59.9	40.6
Sweden[c]	49.3	31.4	44.3	29.3	30.9	13.1	35.9	18.1	35.5	19.3
Switzerland	47.7	31.1	47.6	28.2	44.3	26.4	54.8	30.3	56.5	37.0
Turkey	56.2	32.3	33.1	18.1	42.4	22.6	41.9	24.7	38.7	22.5
United Kingdom[c]	66.2	49.6	48.1	33.7	47.7	26.5	57.2	37.2	55.7	37.8
United States[c]	18.7	11.0	12.1	6.7	31.7	16.4	44.6	29.9	44.1	32.2
OECD[g]	48.3	32.7	44.9	29.7	40.0	23.0	48.6	32.1	48.5	34.0
Russian Federation	45.0	27.1	61.9	42.7	43.1	27.0	46.6	28.9	52.2	32.3
South Africa	..	..	..	..	63.9	43.7	69.5	51.0	71.3	54.7

Table H. **Incidence of long-term unemployment**[a, b] *(cont.)*

As a percentage of female unemployment

	1995		2000		2009		2010		2011	
	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over	6 months and over	12 months and over
Australia	42.8	27.1	37.4	23.6	28.5	14.3	31.0	16.4	31.9	18.0
Austria	48.5	30.4	40.6	22.8	39.1	21.0	40.9	22.0	41.2	24.2
Belgium	78.7	63.2	73.1	56.7	60.5	45.0	65.1	47.8	64.1	49.8
Canada	27.9	14.8	17.8	10.0	17.1	7.3	21.7	11.0	21.6	12.3
Czech Republic	53.8	31.4	71.2	49.8	57.8	33.4	66.2	43.3	63.2	41.5
Denmark	42.5	24.9	39.6	20.0	24.2	9.8	34.1	17.8	40.3	22.3
Estonia	62.2	30.9	60.3	42.9	44.7	28.4	63.8	41.2	68.8	53.6
Finland	53.2	33.3	43.7	26.2	27.6	14.7	33.2	19.3	30.4	17.6
France	61.0	41.1	57.4	40.8	55.7	35.1	58.0	38.7	59.9	40.7
Germany	68.4	51.3	69.5	53.1	62.8	46.9	62.3	46.3	61.6	46.2
Greece	78.9	58.3	77.7	61.0	62.8	45.6	66.9	50.3	70.7	54.0
Hungary	71.2	48.3	67.2	45.7	67.8	42.8	73.3	49.9	69.0	49.2
Iceland[c, d]	(35.5)	(17.2)	(19.5)	(14.1)	(23.5)	(6.7)	(40.2)	(19.0)	(40.0)	(27.2)
Ireland[e]	74.0	52.9	72.9	47.5	43.7	22.1	60.7	38.6	65.7	47.2
Israel[f]	21.7	7.9	25.7	10.4	32.4	16.7	32.2	18.5	30.2	18.9
Italy	81.5	64.4	78.3	61.2	62.9	46.9	64.9	49.9	66.5	52.4
Japan	28.8	10.0	37.4	17.1	37.5	18.8	42.9	25.2	41.9	26.7
Korea	15.1	3.4	9.0	0.8	6.0	0.3	4.2	0.0	4.6	0.2
Luxembourg[d]	(48.0)	21.0)	(34.3)	(18.8)	(52.0)	(26.1)	(46.2)	(26.5)	(48.1)	(25.4)
Mexico	8.9	1.7	6.2	2.0	6.7	2.1	7.2	2.0	6.0	1.6
Netherlands[e]	82.1	42.0	84.9	40.4	44.7	26.1	47.6	27.4	48.3	31.6
New Zealand	36.6	20.3	32.5	14.7	22.6	6.4	27.0	9.0	26.4	7.7
Norway[c]	31.4	17.3	11.5	3.3	23.0	8.0	24.7	7.7	30.7	9.0
Poland	66.6	43.7	66.6	41.3	47.2	27.3	46.4	25.8	52.9	32.5
Portugal	67.2	53.4	60.0	40.0	65.6	47.5	70.6	52.8	64.6	48.5
Slovak Republic	71.9	56.0	74.8	55.1	69.6	54.4	78.1	60.5	78.2	62.5
Slovenia	..	..	..	..	49.0	32.1	59.1	41.2	61.5	43.1
Spain[c]	78.3	60.0	66.2	46.6	48.2	27.2	57.6	37.4	60.7	42.7
Sweden[c]	40.8	22.9	37.9	22.8	27.6	12.4	31.9	14.8	29.3	14.8
Switzerland	53.8	36.0	44.0	29.7	51.6	33.8	56.9	36.0	56.9	40.6
Turkey	72.0	47.2	44.2	29.8	51.4	32.2	53.8	37.0	50.9	34.2
United Kingdom[c]	50.6	32.3	35.6	19.0	40.1	21.4	45.7	26.0	46.4	27.5
United States[c]	15.6	8.1	10.6	5.3	31.2	16.1	41.5	27.7	43.3	30.2
OECD[g]	50.4	34.4	47.3	32.0	41.2	24.7	46.9	30.9	48.1	33.2
Russian Federation	52.5	32.8	68.8	50.0	47.2	30.8	48.5	31.2	53.8	33.3
South Africa	..	..	..	..	73.9	56.0	77.8	62.0	79.3	63.4

a) Persons for whom no duration of unemployment was specified are excluded from the total.

b) Data are annual averages of monthly or quarterly figures covering all weeks of the months or quarters for recent years in countries conducting continuous labour force surveys. Annual averages vary by countries and years. (See country details at: *www.oecd.org/dataoecd/13/57/43103377.pdf* containing further notes and sources related to data on unemployment by duration of job search.)

c) Data refer to persons aged 16-64. For Norway, up to 2005.

d) Data in brackets are based on small sample sizes.

e) Data for 2000 refer to 1999.

f) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

g) Weighted average.

Source: OECD Online Employment Database: www.oecd.org/employment/database.

StatLink http://dx.doi.org/10.1787/888932652263

Table I. **Earnings dispersion,[a] gender wage gap[b] and incidence of low pay[c]**

	Ratio of						Gender wage gap (%)		Incidence of low pay (%)	
	9th to 1st earnings deciles		9th to 5th earnings deciles		5th to 1st earnings deciles					
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Australia	3.01	3.33	1.80	2.00	1.67	1.67	17	14	14.6	16.1
Austria	..	3.39	..	1.94	..	1.74	23	19	..	16.5
Belgium	2.37	2.25	1.70	1.66	1.39	1.36	14	9	..	4.0
Canada	3.61	3.71	1.80	1.88	2.00	1.97	24	19	23.2	21.1
Czech Republic	2.90	3.19	1.76	1.84	1.65	1.74	22	18	14.0	17.1
Denmark	2.51	2.80	1.70	1.77	1.47	1.58	15	12	8.8	13.4
Finland	2.41	2.52	1.72	1.74	1.41	1.45	20	19	..	8.1
France	3.10	2.89	1.95	1.98	1.59	1.46	10	14	..	..
Germany	3.05	3.20	1.79	1.76	1.70	1.82	21	21	15.9	20.5
Greece	..	3.24	..	2.02	..	1.60	..	12	..	13.3
Hungary	4.66	4.25	2.27	2.39	2.06	1.78	14	6	23.4	21.0
Iceland	..	3.21	..	1.81	..	1.77	..	13	..	16.7
Ireland	3.27	3.63	1.92	2.00	1.70	1.81	20	11	17.8	20.1
Israel[d]	5.37	4.98	2.72	2.66	1.97	1.87	28	21	24.7	22.3
Italy	2.22	2.22	1.54	1.53	1.44	1.45	7	11	9.5	9.5
Japan	2.98	2.96	1.84	1.83	1.62	1.62	34	29	14.6	14.5
Korea[e]	4.04	4.72	2.00	2.26	2.02	2.09	40	39	24.6	25.9
Netherlands	2.90	2.91	1.75	1.76	1.66	1.65	21	17	14.8	..
New Zealand	2.63	2.83	1.69	1.81	1.55	1.56	7	7	11.7	12.8
Norway	2.00	2.30	1.42	1.47	1.41	1.56	10	8	..	..
Poland	..	3.52	..	2.08	..	1.69	..	6	..	19.6
Portugal	..	3.69	..	2.55	..	1.44	..	13	..	8.9
Slovak Republic	..	3.67	..	2.03	..	1.81	..	15	..	20.0
Spain	..	3.30	..	1.99	..	1.65	..	6	..	15.6
Sweden	2.35	2.23	1.69	1.62	1.39	1.38	15	14	..	..
Switzerland	2.56	2.70	1.72	1.84	1.49	1.47	22	19	9.6	9.2
United Kingdom[e]	3.46	3.57	1.90	1.97	1.82	1.81	25	18	20.4	20.6
United States	4.49	5.01	2.19	2.37	2.05	2.12	23	19	24.7	25.3
OECD[f]	3.14	3.29	1.85	1.95	1.67	1.68	20	15	17.0	16.3

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 2001 (instead of 2000) for Israel. They refer to 2005 (instead of 2010) for the Netherlands, to 2008 for Belgium and Iceland, and to 2009 for the Czech Republic and France.

b) 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 2001 (instead of 2000) for Israel. They refer to 2005 (instead of 2010) for the Netherlands, to 2008 for Belgium and Iceland, and to 2009 for the Czech Republic and France.

c) The incidence of low pay refers to the share of workers earning less than two-thirds of median earnings. Data refer to 1999 (instead of 2000) for the Netherlands and to 2001 for Israel. They refer to 2008 (instead of 2010) for Belgium and Iceland, and to 2009 for the Czech Republic and France.

d) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602* .

e) Data for 2000 refer to estimations obtained splicing *new-to-old series* . For Korea, there is a break in series in 2000, and data were spliced from new-to-old series on 2000 data. For the United Kingdom, there are breaks in series in 1997, 2004 and 2006; in each case, data were spliced from new-to-old series on 2006 data, then 2004 and finally 1997.

f) Unweighted average for above countries.

Source: OECD database on Earnings Distribution .

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Table J. **Average annual wages in the total economy**

Average gross annual wages per full-time and full-year equivalent dependent employee in the total economy[a]

	Average wages in 2011 in current USD[b]	Average wages in 2011 in USD PPPs[c]	Average annual growth rates of real average wages[d] (%)								
			1990-95	1995-2000	2000-07	2007-11	2007	2008	2009	2010	2011[e]
Australia	74512	44983	0.9	2.0	1.6	0.8	2.7	0.1	-0.9	1.3	2.4
Austria	52404	43555	1.9	0.6	0.9	0.6	0.7	1.4	1.5	-0.4	-0.3
Belgium	56252	44364	2.6	1.3	0.4	0.2	-0.2	0.2	1.3	-0.7	0.1
Canada	56008	42253	0.0	2.1	1.9	0.0	4.4	4.1	0.3	-3.0	-1.2
Czech Republic	16922	19630	6.7	3.7	4.9	0.4	3.1	0.1	-0.2	2.4	-0.8
Denmark	73032	45560	0.8	1.6	1.8	0.7	1.5	1.2	2.7	-0.5	-0.5
Estonia	14955	17323	..	..	8.1	-1.6	15.3	0.4	-2.8	-0.9	-3.1
Finland	53069	36676	0.1	1.4	2.3	1.1	1.6	0.3	2.0	1.6	0.6
France	47704	38128	1.0	1.1	1.2	0.9	0.6	-0.5	2.3	1.3	0.3
Germany	46984	40223	1.9	0.9	0.2	0.5	0.1	0.7	-0.4	0.0	1.6
Greece	28434	26295	2.5	1.9	2.1	-2.4	1.2	-0.2	5.6	-8.1	-6.1
Hungary	14177	19437	5.1	1.1	4.5	-1.2	-0.7	1.9	-3.2	-3.6	0.4
Ireland	66882	50764	2.5	2.2	2.1	1.7	1.3	1.1	5.0	-0.4	1.3
Israel[f]	35872	28804	..	..	..	-1.0	0.8	-2.5	-2.0	-0.2	0.6
Italy	39112	33517	-0.7	0.8	0.3	-0.1	0.1	0.0	0.2	0.7	-1.3
Japan	51613	35143	0.5	0.1	-0.3	0.9	-0.8	0.4	-1.3	2.0	2.7
Korea	29053	35406	4.8	0.4	2.5	1.3	1.8	-0.4	0.0	1.1	4.5
Luxembourg	73203	52847	1.9	1.2	1.1	-0.1	1.9	-0.7	1.1	1.4	-2.1
Netherlands	57001	47056	0.3	0.0	0.7	1.0	1.9	2.0	3.1	-0.3	-0.8
Norway	81475	43990	1.3	2.2	3.3	1.9	4.2	1.9	0.9	1.6	3.0
Poland	13811	20069	3.1	5.0	1.1	2.2	2.0	4.2	0.2	2.9	1.3
Portugal	22549	22742	1.0	2.5	0.1	0.3	1.3	0.9	7.5	-0.1	-6.7
Slovak Republic	15513	19068	6.6	5.7	3.6	1.7	6.2	-0.2	4.8	3.7	-1.4
Slovenia	30676	32480	..	..	..	1.8	1.9	1.9	2.2	3.5	-0.4
Spain	37583	34387	1.9	-0.5	-0.1	1.9	1.3	2.7	6.3	-0.1	-1.1
Sweden	54459	37734	-0.3	3.4	1.9	0.9	3.3	1.0	0.8	0.2	1.7
Switzerland	93235	50242	0.9	0.9	1.1	0.2	1.4	0.1	1.8	-0.8	-0.2
United Kingdom	50366	44743	0.8	2.8	1.8	-1.0	2.3	-1.4	0.9	-1.3	-2.2
United States	54450	54450	0.5	2.7	1.2	0.3	2.0	-0.7	0.7	0.7	0.6
EU15[g]	47780	40062	1.1	1.2	0.9	0.4	1.0	0.4	1.7	0.0	-0.5
EU21[g]	43828	37426	1.4	1.4	1.0	0.5	1.1	0.6	1.6	0.1	-0.4
OECD[g]	51043	44757	1.0	1.7	1.0	0.5	1.4	0.2	0.7	0.5	0.6

a) 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.*

b) Average wages are converted in USD using current exchange rates in USD.

c) Average wages are converted in USD PPPs using 2011 USD PPPs for private consumption.

d) Average annual wages are deflated by a price deflator for private final consumption expenditures in 2011 prices.

e) Provisional estimates.

f) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

g) Aggregates are weighted averages computed on the basis of 2011 GDP weights expressed in 2011 purchasing power parities and include the countries shown.

Source: OECD estimates based on *OECD National Accounts Database* (annual and quarterly) and OECD (2012), *OECD Economic Outlook,* No. 91, Paris, May.

StatLink http://dx.doi.org/10.1787/888932652301

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a]

Programme categories and sub-categories	Australia[b]						Austria						Belgium					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.16** [c]	**0.17** [c]	**0.17** [c]				**0.16**	**0.18**	**0.18**				**0.20**	**0.22**	**0.22**			
of which 1.1. Placement and related services[a]	..	..	..				0.08	0.09	0.10				0.07	0.08	0.08			
1.2. Benefit administration[a]	0.03	0.03	0.03				0.02 [i]	0.03 [i]	0.03 [i]				0.10 [k]	0.11 [k]	0.12 [k]			
2. Training	**0.03** [d, e]	**0.03** [d, e]	**0.03** [d, e]	**0.24** [e]	**0.53** [e]	**0.29** [e]	**0.37**	**0.52**	**0.52**	**2.44** [j]	**2.64** [j]	**2.70** [j]	**0.16**	**0.16**	**0.16**	**2.29** [j]	**2.63** [j]	**2.55** [j]
2.1. Institutional training	0.03	0.02	0.02	0.13	0.42	0.16	0.28	0.44	0.44	2.94	3.81	4.33	0.15	0.15	0.15	1.99	2.44	2.39
2.2. Workplace training	-	-	-	0.11	0.11	0.12	0.02	0.02	0.02	0.25	0.24	0.23	-	0.01	0.01	0.42	0.35	0.34
2.3. Alternate training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	-	-	-	-	-	-	0.07	0.06	0.05	0.87	0.67	0.50	-	-	-	0.23	0.22	0.21
4. Employment incentives[a]	**0.01** [d]	**0.01** [d]	**0.01** [d]	**..**	**..**	**..**	**0.06**	**0.05**	**0.06**	**1.49**	**1.62**	**0.63**	**0.45** [l]	**0.51** [l]	**0.60** [l]	**4.52** [l]	**4.72** [l]	**5.26** [l]
4.1. Recruitment incentives	0.01	0.01	0.01	..	..	..	0.03	0.03	0.05	0.32	0.31	0.43	0.45	0.50	0.60	4.52	4.72	5.26
4.2. Employment maintenance incentives	-	-	-	-	-	0.03	0.03	0.02	0.01	1.17	1.31	0.21	0.01	0.01	0.01	-	-	-
5. Supported employment and rehabilitation	**0.06** [d, f]	**0.07** [d, f]	**0.07** [d, f]	**1.08**	**1.24**	**1.36**	**0.04**	**0.04**	**0.03**	**..**	**0.35**	**0.33**	**0.12**	**0.14**	**0.13**	**0.79**	**0.78**	**0.80**
5.1 Supported employment	0.04	0.05	0.05	0.73	0.84	0.91	0.04	0.04	0.03	..	0.35	0.33	0.12	0.14	0.13	0.79	0.78	0.80
5.2 Rehabilitation	0.02	0.02	0.02	0.35	0.40	0.46	-	-	-	-	-	-	-	-	-	-	-	-
6. Direct job creation	**0.04** [d]	**0.04** [d]	**0.03** [d]	**0.40**	**0.15**	**0.06**	**0.04**	**0.05**	**0.04**	**0.16**	**0.17**	**0.19**	**0.34**	**0.37**	**0.36**	**3.18**	**3.20**	**3.21**
7. Start-up incentives	**0.01** [d]	**0.01** [d]	**0.01** [d]	**..**	**..**	**..**	**0.01**	**0.01**	**0.01**	**0.06**	**0.08**	**0.09**	**-**	**-**	**-**	**0.03**	**0.03**	**0.04**
8. Out-of-work income maintenance and support[a]	**0.45**	**0.55**	**0.51**	**5.25**	**5.49**	**5.11**	**0.96**	**1.31**	**1.23**	**4.59**	**6.36**	**5.69**	**1.26**	**1.62**	**1.53**	**12.33**	**14.46**	**13.55**
8.1. Full unemployment benefits	0.44 [g]	0.54 [g]	0.50 [g]	5.25 [g]	5.49 [g]	5.11 [g]	0.84	1.12	1.08	4.51	5.55	5.35	1.03	1.18	1.16	8.43	9.02	8.91
of which: Unemployment insurance	-	-	-	-	-	-	0.53	0.74	0.67	2.67	3.42	3.06	1.03	1.18	1.16	8.43	9.02	8.91
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	0.01	0.05	0.03	0.08	0.81	0.35	0.19	0.38	0.32	3.90	5.45	4.60
8.4, 8.5. Redundancy and bankruptcy compensation	0.01	0.01	0.01	..	..	..	0.11	0.14	0.12	-	-	-	0.04	0.05	0.05	..	-	0.04
9. Early retirement[a]	**-**	**-**	**-**	**-**	**-**	**-**	**0.20**	**0.18**	**0.17**	1.20	1.11	1.11	**0.74**	**0.76**	**0.74**	4.53	4.43	4.29
TOTAL (1-9)	**0.76**	**0.87**	**0.82**				**1.83**	**2.34**	**2.24**				**3.27**	**3.77**	**3.75**			
Active measures (1-7)	0.31	0.32	0.31				0.67	0.85	0.84				1.28	1.40	1.48			
of which Categories 2-7 only	0.16	0.16	0.15	1.71 [h]	1.93 [h]	1.74 [h]	0.51	0.67	0.66	4.21	4.86	3.94	1.08	1.18	1.26	10.81	11.36	11.85
Passive measures (8-9)	0.45	0.55	0.51	5.25	5.49	5.11	1.16	1.49	1.40	5.79	7.47	6.81	2.00	2.37	2.27	16.86	18.90	17.84

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Fiscal years starting on 1 July.

c) Category 1 includes the Australian Apprenticeships Access Program (formerly reported in Category 2) and expenditure through the Employment Pathway Fund (EPF). Slightly over half of EPF expenditure relates to training and wage subsidies, which should in principle be reported in Categories 2 to 7.

d) Reported expenditure in Categories 2 to 7 includes income support payments for participants in the Community Development Employment Program but not those in other programmes.

e) Category 2 data do not include about 80 000 participants in training (often in state-run vocational training) who are supported by unemployment benefits, or the tuition costs for these participants.

f) Category 5 data include Disability Employment Services (DES). Within DES some of the expenditure, and a majority of the participants, relates to employment services (Category 1) rather than participation in "full-time or significant part-time activity" (which is a key criterion for the inclusion of a programme in Categories 2 to 7), but a statistical breakdown between Categories 1 and 5 is not available for this programme.

g) Category 8 data do not include Parenting Payments subject to participation requirements (*i.e.* conditional on availability for work and job search).

h) Participants stocks for Categories 4 "Employment incentives" and 7 "Start-up incentives" are not included.

i) Staff costs of the unemployment insurance service.

j) Adjustments for double-counting (relevant in cases of simultaneous participation in two or more programmes, *e.g.* the budget for training centres and training subsistence allowances) are applied to database totals for the main categories (*e.g.* 2. "Training"), but not to sub-category data.

k) Includes administration costs of union and auxiliary benefit payment organisations.

l) Includes the "titres services" programme, which is only partly targeted on the unemployed.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Canada[b]						Chile						Czech Republic					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.13** [c]	**0.14** [c]	**0.14** [c]				**0.02** [g]	**0.02** [g]	**0.02** [g]				**0.12**	**0.13**	**0.11**			
of which 1.1. Placement and related services[a]	0.04 [d]	0.04 [d]	0.05 [d]				0.01	0.01	0.01				0.03	0.04	0.03			
1.2. Benefit administration[a]	0.03	0.04	0.03				0.01	0.01	0.01				..	..	..			
2. Training	**0.09** [c]	**0.14** [c]	**0.13** [c]	**0.62**	**0.74**	**0.62**	**0.12**	**0.19**	**0.35**	**..**	**..**	**..**	**0.01**	**0.03**	**0.04**	**0.09**	**..**	**..**
2.1. Institutional training	0.06	0.09	0.08	0.30	0.41	0.28	0.02	0.05	0.11	..	..	..	0.01	0.01	0.02	0.09	0.08	0.13
2.2. Workplace training	0.01	0.01	0.01	0.12 [f]	0.11 [f]	0.13 [f]	0.08	0.12	0.12	..	..	..	-	0.02	0.03	-	..	..
2.3. Alternate training	-	-	-	-	-	-	0.01	0.01	0.12	..	..	..	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	0.01	0.01	0.01	0.20 [f]	0.22 [f]	0.20 [f]	0.01	0.01	0.01	..	..	-	-	-	-	-	-	-
4. Employment incentives[a]	**0.01**	**0.01**	**-**	**0.03**	**0.03**	**0.02**	**0.01**	**0.01**	**0.02**	**0.33**	**0.34**	**0.58**	**0.05**	**0.03**	**0.05**	**0.16**	**0.13**	**0.15**
4.1. Recruitment incentives	0.01	0.01	-	0.03	0.03	0.02	0.01	0.01	0.02	0.33	0.34	0.58	0.05	0.03	0.05	0.15	0.13	0.15
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-
5. Supported employment and rehabilitation	**0.02**	**0.02**	**0.01**	**..**	**..**	**..**	**-**	**-**	**-**	**-**	**-**	**-**	**0.07**	**0.07**	**0.08**	**0.55**	**0.49**	**0.45**
5.1 Supported employment	-	-	-	0.05	0.05	0.05	-	-	-	-	-	-	0.07	0.07	0.08	0.55	0.49	0.45
5.2 Rehabilitation	0.01	0.01	0.01	.. [f]	.. [f]	.. [f]	-	-	-	-	-	-	-	-	-	-	-	-
6. Direct job creation	**0.02**	**0.02**	**0.02**	**..**	**..**	**..**	**0.03**	**0.05**	**0.05**	**0.25**	**0.31**	**0.46**	**0.02**	**0.04**	**0.04**	**0.17**	**0.21**	**0.24**
7. Start-up incentives	**0.01**	**0.01**	**0.01**	**0.04**	**0.04**	**0.03**	**-**	**-**	**-**	**-**	**0.01**	**0.01**	**-**	**-**	**-**	**0.07**	**0.06**	**0.08**
8. Out-of-work income maintenance and support[a]	**0.66**	**0.97**	**0.81**	**3.09**	**4.42**	**3.73**	**0.16**	**0.22**	**0.19**	**1.52**	**2.01**	**1.70**	**0.19**	**0.43**	**0.37**	**2.09**	**3.56**	**3.10**
8.1. Full unemployment benefits	0.66	0.97	0.81	3.09	4.42	3.73	0.16	0.22	0.19	1.52	2.01	1.70	0.18	0.40	0.35	2.09	3.56	3.10
of which: Unemployment insurance	0.66	0.97	0.81	3.09	4.42	3.73	0.16	0.22	0.19	1.52	2.01	1.70	0.18	0.40	0.35	2.09	3.56	3.10
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.01	-	-	-
9. Early retirement[a]	**-**	**-**	**-**	..	..	..	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-
TOTAL (1-9)	**0.94**	**1.33**	**1.15**				**0.35**	**0.49**	**0.64**				**0.45**	**0.72**	**0.70**			
Active measures (1-7)	0.29 [e]	0.35 [e]	0.33 [e]				0.19	0.26	0.44				0.26	0.29	0.33			
of which Categories 2-7 only	0.16 [e]	0.22 [e]	0.20 [e]	1.26 [e, f]	1.45 [e, f]	1.27 [e, f]	0.17	0.24	0.42	..	..	..	0.15	0.16	0.22	1.04	0.98 [h]	1.06 [h]
Passive measures (8-9)	0.66	0.97	0.81	3.09	4.42	3.73	0.16	0.22	0.19	1.52	2.01	1.70	0.19	0.43	0.37	2.09	3.56	3.10

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Fiscal years starting on 1 April. Some participant stock data lines are revised from those published previously, and some lines remain under review.

c) Labour Market Agreements expenditure is allocated 20% to Category 1, 60% to Category 2, and 20% outside the scope of the database (training for people in employment). A small proportion of the expenditure is devoted to work experience but this is not separately accounted for.

d) Employment Assistance Service.

e) Includes the Aboriginal Human Resources Development Agreements, which have not been allocated across the main categories.

f) Data under review (see note b above). Participant stocks for Categories 5.2 "Rehabilitation" and 6 "Direct job creation" are not included.

g) Secretariat estimate based on the staff of local employment offices (OMIL) (654 staff, about 0.01% of total employment, in 2007), and assuming a further 0.01% of GDP is spent on other counselling and benefit administration functions.

h) Participant stocks for Category 2.2 "Workplace training" are not included.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Denmark						Estonia						Finland					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.36**	**0.45**	**0.51**				**0.03**	**0.09**	**0.09**				**0.15**	**0.17**	**0.18**			
of which 1.1. Placement and related services[a]	0.17	0.23	0.34				..	..	0.06				0.09	0.09	0.10			
1.2. Benefit administration[a]	0.13 [b]	0.14 [b]	0.13 [b]				..	..	-				0.04 [h]	0.06 [h]	0.06 [h]			
2. Training	**0.23**	**0.30**	**0.42**	**2.08**	**2.20**	**2.70**	**0.03**	**0.13**	**0.06**	**0.15**	**0.38**	**0.21**	**0.36**	**0.43**	**0.53**	**1.58**	**1.73**	**2.11**
2.1. Institutional training	0.21 [c]	0.27 [c]	0.40 [c]	1.71	1.89	2.46	0.02	0.11	0.03	0.10	0.28	0.08	0.29	0.35	0.44	0.98	1.10	1.45
2.2. Workplace training	-	-	-	-	-	-	0.01	0.02	0.03	0.05	0.11	0.13	0.05	0.06	0.07	0.41	0.45	0.49
2.3. Alternate training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	0.02	0.03	0.01	0.38	0.31	0.24	-	-	-	-	-	-	0.02	0.02	0.02	0.19	0.18	0.17
4. Employment incentives[a]	**0.13** [d]	**0.19** [d]	**0.32** [d]	**0.78** [d]	**1.05** [d]	**1.57** [d]	**-**	**-**	**0.06**	**0.01**	**0.01**	**0.60**	**0.13** [d]	**0.13** [d]	**0.13** [d]	**0.84** [d]	**0.74** [d]	**0.79** [d]
4.1. Recruitment incentives	0.13	0.19	0.32	0.78	1.04	1.56	-	-	0.06	0.01	0.01	0.60	0.08	0.08	0.08	0.54	0.48	0.53
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Supported employment and rehabilitation	**0.61**	**0.68**	**0.66**	**2.23**	**2.25**	**2.27**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**	**0.09**	**0.10**	**0.30**	**0.29**	**0.31**
5.1 Supported employment	0.45	0.52	0.52	1.86	1.92	1.98	-	-	-	-	-	-	0.02	0.01	0.02	0.10	0.09	0.09
5.2 Rehabilitation	0.16	0.16	0.15	0.37	0.33	0.29	-	-	-	-	-	-	0.07	0.08	0.08	0.20	0.21	0.22
6. Direct job creation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.07**	**0.08**	**0.09**	**0.52**	**0.51**	**0.62**
7. Start-up incentives	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.02**	**0.02**	**0.02**	**0.04**	**0.10**	**0.02**	**0.02**	**0.02**	**0.17**	**0.19**	**0.20**
8. Out-of-work income maintenance and support[a]	**0.72**	**1.28**	**1.20**	**2.46**	**4.27**	**5.14**	**0.21**	**1.38**	**0.87**	**1.70**	**5.71**	**4.52**	**0.95**	**1.48**	**1.48**	**6.58**	**8.70**	**8.54**
8.1. Full unemployment benefits	0.69 [e]	1.21 [e]	1.17 [e]	2.46 [e]	4.27 [e]	5.14 [e]	0.15	1.12	0.66	1.70	5.71	4.52	0.87	1.36	1.36	5.76	7.74	7.64
of which: Unemployment insurance	0.44 [f]	0.87 [f]	0.83 [f]	1.55 [f]	3.08 [f]	3.79 [f]	0.10	0.92	0.42	0.56	3.67	2.72	0.57	0.96	0.97	2.83	4.11	3.95
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.10	0.10	0.82	0.96	0.90
8.4, 8.5. Redundancy and bankruptcy compensation	0.04	0.07	0.04	-	-	-	0.06	0.26	0.21	-	-	-	0.01	0.02	0.02	-	-	-
9. Early retirement[a]	**0.48** [g]	**0.44** [g]	**0.37** [g]	1.90	1.61	1.37	**-**	**-**	**-**	-	-	-	**0.39**	**0.40**	**0.30**	1.77	1.85	1.76
TOTAL (1-9)	**2.54**	**3.33**	**3.48**				**0.28**	**1.62**	**1.10**				**2.16**	**2.80**	**2.82**			
Active measures (1-7)	1.33	1.61	1.91				0.07	0.24	0.23				0.82	0.92	1.04			
of which Categories 2-7 only	0.97	1.17	1.40	5.09	5.50	6.54	0.03	0.15	0.14	0.18	0.43	0.91	0.67	0.75	0.86	3.41	3.47	4.03
Passive measures (8-9)	1.20	1.72	1.57	4.37	5.89	6.50	0.21	1.38	0.87	1.70	5.71	4.52	1.34	1.88	1.78	8.35	10.55	10.31

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Three-quarters of the administration costs of independent unemployment insurance funds (the last quarter concerns administration of benefits outside the scope of this database), which provide some placement-related services.

c) Includes income support paid to participants in "Specially arranged activation" (in 2010, "Guidance and upgrading"), but not the corresponding services.

d) The totals shown for Category 4 include non-zero spending on Eurostat Category 3 "Job rotation and sharing" in Denmark, Finland, Germany, Italy, Korea and Spain.

e) Includes social assistance benefits paid to unemployed but not inactive recipients.

f) Includes part-time and partial benefits.

g) Early retirement benefits (*efterløn*) only when paid to recipients who entered the scheme from unemployment.

h) Includes the administration costs of independent unemployment insurance funds.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	France						Germany						Greece					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.21**	**0.26**	**0.30**				**0.29**	**0.37**	**0.38**				**..**	**..**	**..**			
of which 1.1. Placement and related services[a]	0.15	0.09	0.11				0.17	0.19	0.19				0.01	0.01	0.01			
1.2. Benefit administration[a]	0.05	..	..				0.04	0.10	0.10				..	..	..			
2. Training	**0.28** [b]	**0.36** [b]	**0.38** [b]	**2.10** [b]	**2.05** [b]	**2.17** [b]	**0.27**	**0.35**	**0.31**	**1.80**	**1.90**	**1.85**	**0.09**	**0.02**	**0.02**	**0.29**	**0.03**	**0.03**
2.1. Institutional training	0.11	0.11	0.11	0.85	0.83	0.88	0.19	0.26	0.22	1.33	1.40	1.28	0.03	-	-	0.18	0.02	0.02
2.2. Workplace training	-	-	-	-	0.01	0.02	0.01	0.01	0.01	0.11	0.13	0.14	-	-	-	-	-	-
2.3. Alternate training	-	-	0.01	0.03	0.02	..	-	-	-	-	-	-	0.06	0.01	0.01	0.11	0.02	0.02
2.4. Special support for apprenticeship[a]	0.08	0.11	0.10	1.07	0.97	0.95	0.02	0.02	0.02	0.35	0.36	0.36	-	-	-	-	-	-
4. Employment incentives[a]	**0.10**	**0.10**	**0.11**	**..**	**..**	**..**	**0.08** [c]	**0.11** [c]	**0.10** [c]	**0.45** [c]	**0.62** [c]	**0.63** [c]	**0.04**	**0.10**	**0.11**	**0.46**	**1.30**	**1.29**
4.1. Recruitment incentives	0.10	0.10	0.11	..	..	..	0.08	0.11	0.10	0.45	0.62	0.63	0.04	0.10	0.11	0.46	1.30	1.29
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Supported employment and rehabilitation	**0.07**	**0.08**	**0.07**	**0.52**	**0.52**	**0.53**	**0.03**	**0.04**	**0.03**	**0.11**	**0.10**	**0.10**	**-**	**-**	**-**	**-**	**-**	**-**
5.1 Supported employment	0.07	0.08	0.07	0.52	0.52	0.53	0.01	0.01	0.01	0.04	0.03	0.03	-	-	-	-	-	-
5.2 Rehabilitation	-	-	-	-	-	-	0.03	0.03	0.03	0.07	0.07	0.06	-	-	-	-	-	-
6. Direct job creation	**0.15**	**0.16**	**0.22**	**0.85**	**0.82**	**1.03**	**0.07**	**0.06**	**0.05**	**0.79**	**0.71**	**0.63**	**0.01**	**-**	**-**	**0.02**	**-**	**-**
7. Start-up incentives	**0.03**	**0.04**	**0.05**	**0.48**	**0.54**	**0.73**	**0.07**	**0.07**	**0.08**	**0.43**	**0.35**	**0.38**	**0.01**	**0.09**	**0.10**	**0.10**	**0.51**	**0.51**
8. Out-of-work income maintenance and support[a]	**1.16**	**1.42**	**1.45**	**8.01**	**8.88**	**9.42**	**1.05**	**1.48**	**1.28**	**7.42** [d]	**10.27** [d]	**8.30** [d]	**0.47**	**0.70**	**0.71**	**4.44**	**5.45**	**5.41**
8.1. Full unemployment benefits	1.15	1.40	1.43	8.00	8.66	9.21	1.00	1.19	1.10	7.44	7.87	7.41	0.47	0.70	0.71	4.44	5.45	5.41
of which: Unemployment insurance	1.02	1.26	1.29	6.54	7.20	7.68	0.56	0.73	0.67	2.20	2.73	2.45	0.41	0.63	0.65	2.63	3.63	3.60
8.2, 8.3. Partial and part-time unemployment benefits	-	0.02	0.02	0.01	0.23	0.20	0.02	0.22	0.15	0.22	2.69	1.14	-	-	-	-	-	-
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	0.03	0.07	0.03	-	-	-	-	-	-	-	-	-
9. Early retirement[a]	**0.02**	**0.02**	**0.01**	0.14	0.09	0.05	**0.06**	**0.06**	**0.05**	0.24	0.23	0.22	**-**	**-**	**-**	..	..	..
TOTAL (1-9)	**2.03**	**2.42**	**2.59**				**1.91**	**2.53**	**2.28**				**..**	**..**	**..**			
Active measures (1-7)	0.85	0.99	1.14				0.80	0.99	0.94				..	..	..			
of which Categories 2-7 only	0.64	0.73	0.83	5.61	5.23	5.76	0.51	0.62	0.56	3.58	3.68	3.59	0.14	0.22	0.22	0.87	1.85	1.83
Passive measures (8-9)	1.18	1.43	1.46	8.15	8.97	9.47	1.11	1.54	1.34	7.66	10.50	8.52	0.47	0.70	0.71	4.44	5.45	5.41

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Includes training allowances which have not been allocated across sub-categories.

c) The totals shown for Category 4 include non-zero spending on Eurostat Category 3 "Job rotation and sharing" in Denmark, Finland, Germany, Italy, Korea and Spain.

d) The totals shown for Category 8 include an adjustment for double-counting of participants.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Hungary						Ireland						Israel[f]					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.09**	**0.09**	**0.09**				**0.14** [b]	**0.18** [b]	**0.18** [b]				**0.03**	**0.02**	**0.02**			
of which 1.1. Placement and related services[a]	..	..	0.06				0.04	0.05	0.05				..	..	..			
1.2. Benefit administration[a]	..	..	..				0.04 [c]	0.07 [c]	0.08 [c]				..	..	..			
2. Training	**0.06**	**0.05**	**0.05**	**0.39**	**0.32**	**0.44**	**0.30** [d]	**0.37** [d]	**0.46** [d]	**1.54** [d]	**2.55** [d]	**3.11** [d]	**0.07**	**0.08**	**0.07**	**1.43**	**1.61**	**1.50**
2.1. Institutional training	0.06	0.05	0.05	0.39	0.32	0.44	0.16	0.22	0.30	0.88	1.95	2.45	0.03	0.04	0.03	1.04	1.22	1.07
2.2. Workplace training	-	-	-	-	-	-	0.02	0.02	0.02	0.11	0.13	0.20	-	-	-	-	0.01	0.02
2.3. Alternate training	-	-	-	-	-	-	0.09	0.10	0.10	0.46	0.38	0.37	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	-	-	-	-	-	-	-	-	-	-	..	..	0.04	0.04	0.04	0.40	0.38	0.41
4. Employment incentives[a]	**0.08**	**0.07**	**0.08**	**1.11**	**0.65**	**1.03**	**0.04**	**0.05**	**0.06**	**0.20**	**0.10**	**0.07**	**0.02**	**0.02**	**0.02**	**0.07**	**0.08**	**0.13**
4.1. Recruitment incentives	0.08	0.05	0.06	1.10	0.54	0.83	0.04	0.05	0.06	0.20	0.10	0.07	0.02	0.02	0.02	0.07	0.08	0.13
4.2. Employment maintenance incentives	-	0.02	0.02	0.02	0.11	0.20	-	-	-	-	-	-	-	-	-	-	-	-
5. Supported employment and rehabilitation	**-**	**-**	**-**	**-**	**-**	**-**	**0.01**	**0.01**	**0.01**	**0.14**	**0.16**	**0.17**	**0.03**	**0.03**	**0.03**	**0.56**	**0.58**	**0.55**
5.1 Supported employment	-	-	-	-	-	-	0.01	0.01	0.01	0.14	0.16	0.17	-	-	-	0.03	0.02	0.02
5.2 Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03	0.03	0.54	0.56	0.54
6. Direct job creation	**0.04**	**0.24**	**0.39**	**0.32**	**1.14**	**2.41**	**0.23**	**0.26**	**0.26**	**1.09**	**1.13**	**1.14**	**-**	**-**	**-**	**-**	**-**	**-**
7. Start-up incentives	**0.01**	**0.01**	**0.01**	**0.07**	**0.03**	**0.06**	**-**	**-**	**-**	**0.21**	**0.26**	**0.36**	**-**	**-**	**-**	**0.19**	**0.20**	**0.16**
8. Out-of-work income maintenance and support[a]	**0.37**	**0.69**	**0.72**	**3.18**	**7.48**	**8.31**	**1.27**	**2.55**	**2.94**	**9.84**	**18.17**	**20.05**	**0.61**	**0.75**	**0.66**	**5.64**	**6.23**	**5.53**
8.1. Full unemployment benefits	0.37	0.69	0.72	3.18	7.48	8.31	1.16	2.32	2.62	9.67	17.39	19.40	0.58	0.72	0.62	5.41	6.01	5.34
of which: Unemployment insurance	0.37	0.46	0.43	2.32	3.62	2.95	0.52	1.07	0.82	4.60	8.23	6.64	0.25	0.40	0.31	1.62	2.38	1.86
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	.. [e]	.. [e]	.. [e]	0.16	0.78	0.66	-	-	-	-	-	-
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	0.11	0.22	0.32	-	-	-	0.03	0.03	0.04	0.23	0.22	0.19
9. Early retirement[a]	**-**	**-**	**-**	0.01	-	-	**0.07**	**0.06**	**0.05**	0.40	0.34	0.31	**-**	**-**	**-**	-	-	-
TOTAL (1-9)	**0.65**	**1.15**	**1.34**				**2.06**	**3.47**	**3.96**				**0.76**	**0.90**	**0.80**			
Active measures (1-7)	0.28	0.46	0.62				0.72	0.87	0.96				0.15	0.15	0.15			
of which Categories 2-7 only	0.19	0.37	0.53	1.90	2.16	3.95	0.58	0.69	0.78	3.18	4.19	4.85	0.12	0.13	0.12	2.25	2.47	2.35
Passive measures (8-9)	0.37	0.69	0.72	3.19	7.48	8.31	1.34	2.61	2.99	10.24	18.51	20.37	0.61	0.75	0.66	5.64	6.23	5.56

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Category 1 includes the Local Employment Service, Job Clubs, and the overheads, pension and staff costs of the employment and training organisation FÁS, except for Training Services (which are allocated to Category 2) and Services to Business.

c) Secretariat estimate based on the ratio of benefit administration costs to benefits paid for a wider range of benefits (as reported in annual reports of DSFA, the Social Affairs Ministry).

d) Includes the Specialist Training Providers programme which has not been allocated across sub-categories.

e) Expenditure on Systematic short-time is included in Category 8.1

f) Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries[a]** *(cont.)*

Programme categories and sub-categories	Italy						Japan[f]			Korea[j]			Luxembourg					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Public expenditure as a percentage of GDP			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008-09	2009-10	2010-11	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.10**	**0.11**	**0.11**				**0.05** [g]	**0.05** [g]	**0.05** [g]	**0.01** [k]	**0.01** [k]	**0.01** [k]	**0.05**	**0.05**	**0.05**			
of which 1.1. Placement and related services[a]	0.01	-	-				..	..	..	0.01	0.01	0.01	0.02	0.03	0.03			
1.2. Benefit administration[a]	0.05 [b]	0.08 [b]	0.08 [b]				..	..	..	..	..	..	0.01	0.01	0.01			
2. Training	**0.19**	**0.18**	**0.18**	**3.39**	**3.81**	**..**	**0.03** [h]	**0.11** [h]	**0.07** [h]	**0.06**	**0.09**	**0.07**	**0.03**	**0.03**	**0.04**	**0.36**	**0.33**	**0.40**
2.1. Institutional training	0.04	0.03	0.02	..	..	..	..	..	..	0.06	0.08	0.07	-	-	-	..	..	..
2.2. Workplace training	0.01	0.01	-	0.20	0.23	0.18	..	..	..	-	-	-	0.01	0.01	0.01	0.09	0.08	0.10
2.3. Alternate training	-	-	0.04	..	..	..	-	-	-	-	-	-	0.02	0.02	0.02	0.15	0.14	0.19
2.4. Special support for apprenticeship[a]	0.14 [c]	0.14 [c]	0.11 [c]	2.51	2.37	2.12	-	-	-	-	0.01	-	0.01	0.01	0.01	0.12	0.11	0.12
4. Employment incentives[a]	**0.16** [d]	**0.16** [d]	**0.15** [d]	**2.55** [d]	**2.43** [d]	**2.46** [d]	**0.08** [i]	**0.17** [i]	**0.10** [i]	**0.03** [d]	**0.06** [d]	**0.02** [d]	**0.25** [l]	**0.28** [l]	**0.32** [l]	**5.61** [l]	**6.12** [l]	**6.76** [l]
4.1. Recruitment incentives	0.15 [e]	0.15 [e]	0.14 [e]	2.47	2.36	2.39	..	..	..	0.03	0.02	0.02	0.03	0.04	0.06	2.09	2.11	2.60
4.2. Employment maintenance incentives	-	-	-	-	-	-	..	..	..	-	0.03	0.01	0.07	0.10	0.11	0.80	0.94	0.95
5. Supported employment and rehabilitation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.02**	**0.03**	**0.03**	**0.01**	**0.01**	**0.01**	**-**	**-**	**0.02**
5.1 Supported employment	-	-	-	-	-	-	-	-	-	0.02	0.03	0.03	0.01	0.01	0.01	-	-	0.02
5.2 Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Direct job creation	**0.01**	**0.01**	**0.01**	**0.09**	**0.08**	**0.08**	**0.03**	**0.10**	**0.05**	**0.19**	**0.42**	**0.28**	**0.09** [m]	**0.12** [m]	**0.13** [m]	**0.74** [m]	**0.81** [m]	**0.86** [m]
7. Start-up incentives	**0.02**	**0.02**	**0.02**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
8. Out-of-work income maintenance and support[a]	**0.71**	**1.28**	**1.35**	**2.96**	**4.77**	**4.73**	**0.28** [i]	**0.42** [i]	**0.35** [i]	**0.30**	**0.42**	**0.34**	**0.37**	**0.72**	**0.64**	**3.59**	**7.68**	**7.03**
8.1. Full unemployment benefits	0.62	0.96	0.98	2.57	3.44	3.49	..	..	..	0.28	0.39	0.31	0.33	0.49	0.48	2.23	2.91	2.96
of which: Unemployment insurance	0.58	0.89	0.91	2.52	3.35	3.40	..	..	..	0.28	0.39	0.31	0.33	0.49	0.48	2.23	2.91	2.96
8.2, 8.3. Partial and part-time unemployment benefits	0.09	0.33	0.37	0.39	1.33	1.24	-	-	-	-	-	-	0.02	0.20	0.13	1.36	4.77	4.08
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	..	..	..	0.02	0.03	0.02	0.02	0.03	0.03	-	-	-
9. Early retirement[a]	**0.09**	**0.10**	**0.10**	1.32	1.28	1.25	**-**	**-**	**-**	**-**	**-**	**-**	**0.15**	**0.17**	**0.16**	0.59	0.58	0.59
TOTAL (1-9)	**1.28**	**1.86**	**1.91**				**0.47**	**0.85**	**0.63**	**0.61**	**1.02**	**0.76**	**0.95**	**1.38**	**1.35**			
Active measures (1-7)	0.47	0.47	0.46				0.19	0.43	0.28	0.31	0.61	0.42	0.43	0.50	0.54			
of which Categories 2-7 only	0.38	0.36	0.35	6.03	6.33	5.12	0.14	0.37	0.22	0.31	0.59	0.41	0.38	0.45	0.49	6.71	7.25	8.04
Passive measures (8-9)	0.81	1.39	1.45	4.28	6.06	5.98	0.28	0.42	0.35	0.30	0.42	0.34	0.52	0.89	0.80	4.18	8.25	7.63

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).
b) Secretariat estimate based on data for total administration costs and human resources administering income support payments within the National Social Security Institute (reported in INPS General Accounts and Annual Report).
c) Mainly exemptions from employer social security contributions, not restricted to the unemployed or those at risk. "Training post compulsory education and post diploma" is included in the total for Category 2 but not in this sub-category.
d) The totals shown for Category 4 include non-zero spending on Eurostat Category 3 "Job rotation and sharing" in Denmark, Finland, Germany, Italy, Korea and Spain.
e) Much spending in this category refers to tax relief for firms that have increased total employment and for the conversion of temporary contracts into permanent ones, not otherwise conditional on employment status.
f) Fiscal years starting on 1 April. Revised data relate to expenditures on an actual outlay basis as reported in financial statements (data previously published related to budget allocations).
g) Revised data: some items that were previously reported in Category 1 are now reported in Category 2.
h) Includes education and training allowances, but not unemployment benefits paid to programme participants.
i) Employment Adjustment Subsidies and the Employment Continuation Benefit of the Employment Insurance (EI) system are reported in Category 4. The Re-employment Allowance of the EI system is reported in Category 8.
j) Revised data.
k) Does not include the labour costs of public officials working in job centres.
l) Includes the re-employment bonus and measures of professional (re)integration of disabled workers which have not been allocated across sub-categories.
m) Includes Secretariat estimates in Category 6 for "Special measures".

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Mexico			Netherlands						New Zealand[h]						Norway					
	Public expenditure as a percentage of GDP			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**-** [b]	**-** [b]	**-** [b]	**0.34**	**0.42**	**0.43**				**0.11**	**0.12**	**0.12**				**..**	**..**	**..**			
of which 1.1. Placement and related	-	-	-	0.19	0.24	0.28				0.02	0.02	0.03				..	..	..			
1.2. Benefit administration[a]	..	..	-	0.14	0.18	0.15				0.07 [i]	0.07 [i]	0.07 [i]				..	..	..			
2. Training	**0.01**	**0.01**	**0.01**	**0.10** [d]	**0.13** [d]	**0.13** [d]	**1.60**	**2.03**	**2.20**	**0.17** [j]	**0.16** [j]	**0.14** [j]	**1.23**	**1.15**	**0.96**	**0.21**	**0.23**	**0.22**	**1.14**	**0.97**	**1.00**
2.1. Institutional training	-	-	-	0.04	0.04	0.05	0.41	0.43	0.48	0.06	0.05	0.05	0.24	0.20	0.36	0.19 [m]	0.23 [m]	0.22 [m]	0.99	0.97	1.00
2.2. Workplace training	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	0.15	-	-
2.3. Alternate training	-	-	-	0.01	0.02	0.02	0.09	0.28	0.28	0.11	0.10	0.08	1.00	0.95	0.61	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	-	-	-	0.05 [e]	0.06 [e]	0.06 [e]	1.33 [e]	1.57 [e]	1.70 [e]	-	-	-	-	-	-	-	-	-	-	-	-
4. Employment incentives[a]	**-**	**-**	**-**	**-** [f]	**0.01** [f]	**0.01** [f]	**-** [f]	**0.28** [f]	**0.31** [f]	**0.01**	**0.02**	**0.02**	**..**	**..**	**..**	**0.02**	**0.05**	**0.06**	**0.19**	**0.39**	**0.53**
4.1. Recruitment incentives	-	-	-	-	0.01	0.01	-	0.28	0.31	0.01	0.02	0.01	..	..	..	0.02	0.05	0.06	0.19	0.39	0.53
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	-	..	..	..	-	-	-	-	-	-
5. Supported employment and rehabilitation	**-**	**-**	**-**	**0.47**	**0.50**	**0.48**	**1.68**	**1.77**	**1.71**	**0.05**	**0.05**	**0.05**	**1.22**	**1.13**	**1.11**	**0.14**	**0.17**	**0.18**	**0.54**	**0.55**	**0.61**
5.1 Supported employment	-	-	-	0.41	0.44	0.42	1.17	1.16	1.15	0.02	0.02	0.02	0.77	0.65	0.62	0.10	0.13	0.13	0.41	0.42	0.48
5.2 Rehabilitation	-	-	-	-	-	-	-	-	-	0.03	0.03	0.03	0.45	0.47	0.50	0.04	0.04	0.05	0.13	0.13	0.13
6. Direct job creation	**-** [c]	**-** [c]	**-** [c]	**0.15** [f]	**0.17** [f]	**0.17** [f]	**0.37** [f]	**0.32** [f]	**0.27** [f]	**-**	**0.02**	**0.01**	**..**	**..**	**..**	**0.04**	**0.04**	**0.04**	**0.26**	**0.20**	**0.21**
7. Start-up incentives	**0.01**	**0.01**	**0.01**	**-**	**-**	**-**	**-**	**-**	**-**	**0.01**	**0.01**	**-**	**..**	**..**	**..**	**-**	**-**	**-**	**0.01**	**0.01**	**0.01**
8. Out-of-work income maintenance and support[a]	**-**	**-**	**-**	**1.29** [g]	**1.70** [g]	**1.75** [g]	**5.88** [g]	**7.18** [g]	**7.48** [g]	**0.27** [k]	**0.47** [k]	**0.46** [k]	**2.29**	**2.76**	**2.44**	**0.16**	**0.39**	**0.47**	**1.12**	**2.36**	**2.65**
8.1. Full unemployment benefits	-	-	-	1.29 [g]	1.70 [g]	1.75 [g]	5.88 [g]	7.18 [g]	7.48 [g]	0.27 [k]	0.47 [k]	0.46 [k]	2.29	2.76	2.44	0.13 [n]	0.24 [n]	0.30 [n]	1.12	..	..
of which: Unemployment insurance	-	-	-	0.62	0.98	1.06	2.47	3.46	3.46	-	-	-	-	-	-	0.12	0.24	0.30	1.09	..	..
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.15	0.16	-	..	..
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9. Early retirement[a]	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	-	-	-
TOTAL (1-9)	**0.02**	**0.02**	**0.01**	**2.35**	**2.92**	**2.97**				**0.63**	**0.84**	**0.79**				**..**	**..**	**..**			
Active measures (1-7)	0.02	0.02	0.01	1.06	1.22	1.22				0.36	0.37	0.34				..	..	..			
of which Categories 2-7 only	0.02	0.02	0.01	0.72	0.80	0.78	3.65	4.41	4.49	0.25	0.25	0.22	2.45 [l]	2.27 [l]	2.08 [l]	0.41	0.48	0.51	2.13	2.12	2.36
Passive measures (8-9)	-	-	-	1.29	1.70	1.75	5.88	7.18	7.48	0.27	0.47	0.46	2.29	2.76	2.44	0.16	0.39	0.47	1.12	2.36	2.65

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).
b) Federal government expenditure is 0.002% of GDP. State government expenditure may be similar or greater.
c) The Temporary Employment Programme (*Programa Empleo Temporal*) is not reported here as an active or passive labour market programme. It is included in the Income Maintenance area of the *OECD's SOCX Database (www.oecd.org/els/social/expenditure).*
d) Unemployment benefits paid to participants in training are included.
e) Employer tax reductions payable for every apprentice who does not earn more than 130% of the minimum wage.
f) Wage cost subsidies component of "Flexible reintegration budget for municipalities" measure is allocated to Category 6 in order to improve time-series consistency.
g) Includes social assistance benefits paid to inactive individuals as well as unemployed recipients.
h) Fiscal years starting on 1 July.
i) Includes employment services case management.
j) Includes training benefits (often paid to participants in alternate training, Category 2.3) and Training Incentive Allowance which covers course fees and related expenses, but not unemployment benefits which are paid to many other participants.
k) Excludes training benefits and includes unemployment benefits paid to participants in active programmes.
l) Participant stocks for Categories 4 "Employment incentives", 6 "Direct job creation" and 7 "Start-up incentives" are not included.
m) Mainly rehabilitation benefits paid to participants in education in regular schools.
n) Revised data: rehabilitation benefits paid in between measures are no longer included in Category 8 although rehabilitation benefits paid to participants in active programmes are still included in Categories 2 to 7.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Poland						Portugal						Slovak Republic					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.09**	**0.10**	**0.09**				**0.15**	**0.14**	**0.14**				**0.11**	**0.10**	**0.10**			
of which 1.1. Placement and related services[a]	0.01	0.01	0.01				0.06	0.05	0.05				0.04	0.03	0.03			
1.2. Benefit administration[a]	..	..	..				0.02 [b]	0.02 [b]	0.02 [b]				..	..	..			
2. Training	**0.12**	**0.04**	**0.04**	**0.63**	**0.11**	**0.10**	**0.24**	**0.43**	**0.40**	**0.89**	**1.46**	**1.48**	**0.01**	**0.01**	**0.01**	**0.04**	**0.04**	**0.05**
2.1. Institutional training	0.02	0.03	0.04	0.12	0.11	0.11	0.16	0.32	0.29	0.50	0.93	0.89	0.01	0.01	0.01	0.04	0.04	0.05
2.2. Workplace training	0.03	0.01	-	0.15	0.02	0.01	0.04	0.07	0.07	0.18	0.30	0.33	-	-	-	-	-	-
2.3. Alternate training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	0.07	-	-	0.39	-	-	0.04	0.04	0.04	0.21	0.22	0.26	-	-	-	-	-	-
4. Employment incentives[a]	**0.06**	**0.16**	**0.21**	**0.48**	**1.04**	**1.13**	**0.12**	**0.12**	**0.10**	**1.48**	**1.42**	**1.27**	**0.02**	**0.03**	**0.10**	**0.35**	**0.50**	**1.04**
4.1. Recruitment incentives	0.06	0.16	0.21	0.48	1.04	1.13	0.11	0.11	0.09	1.42	1.36	1.21	0.02	0.03	0.10	0.35	0.50	1.04
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	..	..
5. Supported employment and rehabilitation	**0.21**	**0.21**	**0.21**	**3.65**	**3.49**	**2.23**	**0.03**	**0.04**	**0.03**	**0.11**	**0.10**	**0.03**	**0.02**	**0.03**	**0.03**	**0.07**	**0.10**	**0.13**
5.1 Supported employment	0.20	0.21	0.21	3.64	3.48	2.22	-	-	-	0.01	0.01	0.01	0.02	0.03	0.03	0.07	0.10	0.13
5.2 Rehabilitation	-	-	-	0.01	0.01	0.01	0.03	0.04	0.03	0.10	0.09	0.03	-	-	-	-	-	-
6. Direct job creation	**0.02**	**0.03**	**0.04**	**0.07**	**0.06**	**0.10**	**0.02**	**0.04**	**0.05**	**0.37**	**0.57**	**0.74**	**0.05**	**0.01**	**0.01**	**2.12**	**0.75**	**1.56**
7. Start-up incentives	**0.06**	**0.08**	**0.10**	**0.30**	**0.34**	**0.40**	**-**	**-**	**-**	**0.11**	**0.11**	**0.09**	**0.06**	**0.07**	**0.08**	**0.78**	**1.00**	**1.05**
8. Out-of-work income maintenance and support[a]	**0.14**	**0.21**	**0.23**	**1.59**	**2.20**	**1.85**	**0.90**	**1.21**	**1.29**	**3.90**	**6.02**	**6.29**	**0.11** [c]	**0.29** [c]	**0.24** [c]	**0.83**	**1.87**	**1.59**
8.1. Full unemployment benefits	0.14	0.21	0.23	1.59	2.20	1.85	0.85	1.14	1.21	3.84	5.87	6.17	0.10	0.27	0.23	0.83	1.87	1.59
of which: Unemployment insurance	0.14	0.21	0.23	1.59	2.20	1.85	0.66	0.88	0.96	2.63	4.02	4.38	0.10	0.27	0.23	0.83	1.87	1.59
8.2, 8.3. Partial and part-time unemployment benefits	-	-	-	-	-	-	0.01	0.02	0.01	0.07	0.15	0.11	-	-	-	-	-	-
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	0.04	0.05	0.06	-	-	-	0.01	0.02	0.01	-	-	-
9. Early retirement[a]	**0.21**	**0.12**	**0.11**	1.08	0.90	0.85	**0.09**	**0.10**	**0.10**	0.60	0.55	0.45	**0.33**	**0.38**	**0.36**	2.14	2.09	1.77
TOTAL (1-9)	**0.90**	**0.96**	**1.04**				**1.54**	**2.08**	**2.11**				**0.69**	**0.93**	**0.94**			
Active measures (1-7)	0.56	0.62	0.69				0.55	0.77	0.72				0.26	0.25	0.33			
of which Categories 2-7 only	0.47	0.53	0.60	5.12	5.04	3.96	0.41	0.63	0.58	2.96	3.66	3.62	0.15	0.15	0.23	3.37	2.38	3.83
Passive measures (8-9)	0.35	0.34	0.34	2.67	3.10	2.70	0.99	1.31	1.39	4.51	6.57	6.74	0.43 [c]	0.67 [c]	0.61 [c]	2.96	3.97	3.36

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook* . Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Secretariat estimate based on the ratio of benefit administration costs to benefits paid (2.1%) for a wider range of benefits (reported in IGFSS, Conta da Segurança Social 2007).

c) Does not include social assistance, which is the form of income support received by the majority of registered unemployed.

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Slovenia						Spain[b]						Sweden					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force[e]			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.09**	**0.10**	**0.11**				**0.13**	**0.17**	**0.17**				**0.21**	**0.26**	**0.35**			
of which 1.1. Placement and related services[a]	0.04	0.05	0.05				0.02	0.04	0.03				0.10 [h]	0.14 [h]	0.22 [h]			
1.2. Benefit administration[a]	0.01	0.01	0.01				0.02	0.03	0.03				0.04 [i]	0.05 [i]	0.05 [i]			
2. Training	**0.03**	**0.07**	**0.07**	**0.33**	**3.22**	**0.92**	**0.17**	**0.19**	**0.20**	**1.31**	**1.60**	**1.87**	**0.07**	**0.06**	**0.09**	**0.20**	**0.20**	**0.31**
2.1. Institutional training	0.01	0.02	0.02	0.25	0.32	0.74	0.10	0.10	0.09	0.64	0.90	0.87	0.07	0.06	0.09	0.20	0.19	0.30
2.2. Workplace training	0.01	0.05	0.04	0.08	2.90	0.16	0.02	0.02	0.04	0.47	0.46	0.82	-	-	-	-	-	0.01
2.3. Alternate training	-	-	-	-	-	0.02	0.05	0.06	0.05	0.17	0.21	0.17	-	-	-	-	-	-
2.4. Special support for apprenticeship[a]	-	-	-	-	-	-	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-
4. Employment incentives[a]	**0.01**	**0.05**	**0.09**	**0.06**	**0.25**	**0.50**	**0.28** [c]	**0.27** [c]	**0.27** [c]	**11.58** [c]	**9.88** [c]	**9.07** [c]	**0.37** [c]	**0.37** [c]	**0.45** [c]	**1.73** [c]	**1.80** [c]	**2.30** [c]
4.1. Recruitment incentives	0.01	0.05	0.09	0.06	0.25	0.50	0.19 [d]	0.17 [d]	0.15 [d]	8.66 [d]	6.45 [d]	4.58 [d]	0.37	0.37	0.45	1.73	1.80	2.30
4.2. Employment maintenance incentives	-	-	-	-	-	-	0.08	0.09	0.11	2.51	3.03	4.04	-	-	-	-	-	-
5. Supported employment and rehabilitation	**-**	**-**	**-**	**-**	**-**	**-**	**0.03**	**0.03**	**0.04**	**0.25**	**0.24**	**0.26**	**0.19**	**0.22**	**0.24**	**0.79**	**0.90**	**0.98**
5.1 Supported employment	-	-	-	-	-	-	0.02	0.03	0.03	0.24	0.23	0.24	0.19	0.21	0.22	0.62	0.68	0.74
5.2 Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.01	0.02	0.17	0.22	0.24
6. Direct job creation	**0.04**	**0.06**	**0.13**	**0.23**	**0.29**	**0.45**	**0.09**	**0.10**	**0.10**	**..**	**..**	**..**	**-**	**-**	**-**	**-**	**-**	**-**
7. Start-up incentives	**0.02**	**0.06**	**0.06**	**0.08**	**0.39**	**0.19**	**0.11**	**0.10**	**0.12**	**1.71**	**1.74**	**1.61**	**0.01**	**0.01**	**0.02**	**0.05**	**0.06**	**0.10**
8. Out-of-work income maintenance and support[a]	**0.27**	**0.63**	**0.73**	**1.40**	**5.43**	**3.66**	**1.82**	**2.94**	**3.10**	**7.94**	**11.64**	**13.18**	**0.57**	**0.91**	**0.72**	**4.84**	**6.55**	**6.14**
8.1. Full unemployment benefits	0.27	0.54	0.65	1.40	2.32	2.82	1.78	2.82	2.96	7.93	11.58	13.13	0.38 [j]	0.57 [j]	0.51 [j]	2.93 [j]	4.80 [j]	4.57 [j]
of which: Unemployment insurance	0.27	0.54	0.65	1.40	2.32	2.82	1.41	2.27	2.11	4.80	7.00	6.32	0.25	0.37	0.32	2.12	3.41	2.99
8.2, 8.3. Partial and part-time unemployment benefits	-	0.09	0.08	-	3.10	0.84	0.01	0.05	0.04	0.01	0.06	0.05	0.17	0.25	0.21	1.91	1.74	1.57
8.4, 8.5. Redundancy and bankruptcy compensation	-	-	-	-	-	-	0.03	0.06	0.10	-	-	-	0.03	0.10	-	..	..	..
9. Early retirement[a]	**-**	**-**	**-**	-	-	-	**0.07**	**0.06**	**0.04**	..	..	..	**-**	**-**	**-**	-	-	-
TOTAL (1-9)	**0.45**	**0.96**	**1.19**				**2.70**	**3.86**	**4.03**				**1.43**	**1.84**	**1.87**			
Active measures (1-7)	0.18	0.33	0.45				0.81	0.86	0.89				0.86	0.93	1.15			
of which Categories 2-7 only	0.09	0.23	0.34	0.69	4.15	2.06	0.68	0.70	0.72	14.85 [f]	13.47 [f]	12.82 [f]	0.65	0.67	0.80	2.78	2.96	3.70
Passive measures (8-9)	0.27	0.63	0.73	1.40	5.43	3.66	1.89	2.99	3.14	7.94 [g]	11.64 [g]	13.18 [g]	0.57	0.91	0.72	4.84	6.55	6.14

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).
b) Categories 1 to 7 include expenditure by the autonomous communities and municipalities (additional to data published by Eurostat).
c) The totals shown for Category 4 include non-zero spending on Eurostat Category 3 "Job rotation and sharing" in Denmark, Finland, Germany, Italy, Korea and Spain.
d) Includes an employer subsidy for the conversion of temporary contracts into permanent contracts, not otherwise conditional on employment status.
e) Participant stock data do not include participants in municipal programmes.
f) Participant stocks for Category 6 "Direct job creation" are not included.
g) Participant stocks for Category 9 "Early retirement" are not included.
h) Income support payments to participants in the "Individual case management" component of the Job and Development Programme and the Youth Job Programme are included in Category 8.1.
i) Administration costs of independent unemployment insurance funds.
j) Includes "basic insurance" which is not a contribution-based benefit, and income-support payments to participants in individual case management (see note h above).

Table K. **Public expenditure and participant stocks in labour market programmes in OECD countries**[a] *(cont.)*

Programme categories and sub-categories	Switzerland						United Kingdom[e]						United States[g]			OECD unweighted average[j]					
	Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force			Public expenditure as a percentage of GDP			Public expenditure as a percentage of GDP			Participant stocks as a percentage of the labour force		
	2008	2009	2010	2008	2009	2010	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008	2009	2010	2008	2009	2010
1. PES and administration[a]	**0.11**	**0.12**	**0.13**				**0.28**	**0.34**	**..**				**0.04**	**0.05**	**0.04**	**0.13**	**0.16**	**0.16**			
of which 1.1. Placement and related services[a]	..	..	..				0.14	0.20	..				0.01	0.01	0.01	0.06	0.07	0.07			
1.2. Benefit administration[a]	0.04	0.04	0.04				0.06 [f]	0.07 [f]	0.05 [f]				0.03 [h]	0.04 [h]	0.03 [h]	0.05	0.06	0.05			
2. Training	**0.16**	**0.20**	**0.22**	**0.55**	**0.66**	**0.75**	**0.02**	**0.02**	**..**	**0.07**	**..**	**..**	**0.07**	**0.05**	**0.04**	**0.13**	**0.16**	**0.17**	**1.07**	**1.40**	**1.26**
2.1. Institutional training	0.16	0.19	0.21	0.53	0.62	0.70	0.02	0.02	..	0.07	..	..	0.03	0.02	0.02	0.08	0.11	0.11	0.68	0.87	0.96
2.2. Workplace training	0.01	0.01	0.01	0.02	0.03	0.05	-	-	-	-	-	..	-	-	-	0.01	0.02	0.02	0.11	0.22	0.14
2.3. Alternate training	-	-	-	-	-	-	-	-	-	-	-	..	0.04	0.03	0.02	0.01	0.01	0.02	0.08	0.08	0.07
2.4. Special support for apprenticeship[a]	-	-	-	-	-	-	-	-	-	-	-	..	-	-	-	0.02	0.02	0.02	0.31	0.29	0.28
4. Employment incentives[a]	**0.05**	**0.07**	**0.08**	**0.50**	**0.59**	**0.71**	**0.01**	**0.01**	**..**	**0.13**	**0.12**	**..**	**0.01**	**0.01**	**0.01**	**0.08**	**0.10**	**0.12**	**1.40**	**1.45**	**1.62**
4.1. Recruitment incentives	0.05 [b]	0.07 [b]	0.08 [b]	0.50 [b]	0.59 [b]	0.71 [b]	0.01	0.01	..	0.13	0.12	..	0.01	0.01	0.01	0.07	0.08	0.10	1.08	1.08	1.22
4.2. Employment maintenance incentives	-	-	-	-	-	-	-	-	-	-	-	..	-	-	-	0.01	0.01	0.01	0.17	0.21	0.22
5. Supported employment and rehabilitation	**..**	**..**	**..**	**..**	**..**	**..**	**0.01**	**0.01**	**..**	**..**	**..**	**..**	**0.04**	**0.03**	**0.03**	**0.08**	**0.08**	**0.09**	**0.61**	**0.60**	**0.56**
5.1 Supported employment	..	..	..	..	..	..	0.01	-	..	0.05	0.01	..	-	-	-	0.06	0.07	0.07	0.45	0.44	0.42
5.2 Rehabilitation	0.13	0.15	0.16	0.42	0.50	0.57	-	-	-	..	..	..	0.04	0.03	0.03	0.01	0.02	0.02	0.11	0.11	0.12
6. Direct job creation	**-**	**-**	**-**	**-**	**-**	**-**	**0.01**	**-**	**..**	**0.03**	**0.03**	**..**	**0.01**	**0.01**	**0.01**	**0.06**	**0.08**	**0.09**	**0.48**	**0.46**	**0.59**
7. Start-up incentives	**-**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**-**	**-**	**-**	**-**	**-**	**..**	**-**	**-**	**-**	**0.02**	**0.02**	**0.02**	0.19	0.23	0.25
8. Out-of-work income maintenance and support[a]	**0.49**	**0.94**	**0.82**	**2.03**	**4.26**	**3.49**	**0.20**	**0.32**	**0.30**	**3.28**	**5.07**	**4.70**	**0.82**	**1.02**	**0.76**	**0.60**	**0.96**	**0.95**	**4.28**	**6.40**	**6.19**
8.1. Full unemployment benefits	0.48 [c]	0.70 [c]	0.73 [c]	1.95	2.69	2.88	0.20	0.32	0.30	3.28	5.07	4.70	0.82 [i]	1.02 [i]	0.76 [i]	0.56	0.86	0.86	3.96	5.68	5.72
of which: Unemployment insurance	0.43	0.68	0.73	1.95	2.69	2.88	..	..	..	..	..	..	0.82	1.01	0.75	0.41	0.65	0.61	2.46	3.63	3.42
8.2, 8.3. Partial and part-time unemployment benefits	0.01	0.23	0.09	0.08	1.57	0.61	-	-	-	-	-	-	-	-	-	0.02	0.06	0.06	0.32	0.88	0.61
8.4, 8.5. Redundancy and bankruptcy compensation	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.04	0.04	0.01	0.01	0.01
9. Early retirement[a]	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**0.09**	**0.09**	**0.09**	**0.64**	**0.60**	**0.56**
TOTAL (1-9)	**..**	**..**	**..**				**0.52**	**0.71**	**..**				**1.00**	**1.18**	**0.90**	**1.23**	**1.69**	**1.72**			
Active measures (1-7)	..	..	..				0.32	0.38	..				0.18	0.17	0.14	0.50	0.61	0.66			
of which Categories 2-7 only	..	..	..	1.06 [d]	1.25 [d]	1.48 [d]	0.04	0.04	..	0.28	0.22	..	0.14	0.12	0.10	0.36	0.45	0.49	3.60	3.89	4.12
Passive measures (8-9)	0.49	0.94	0.82	2.03	4.26	3.49	0.20	0.32	0.30	3.28	5.07	4.70	0.82	1.02	0.76	0.70	1.05	1.03	4.85	6.94	6.69

a) See the introductory note about scope and comparability at *www.oecd.org/employment/outlook*. Sub-categories 1.1 and 1.2 refer only to separately-identified spending. Active and passive participant stocks should not be added (some people appear in both).

b) Mainly the "intermediate earnings" programme, which resembles partial unemployment benefits paid subject to an earnings taper.

c) Excludes unemployment benefits paid to participants in active programmes.

d) Participant stocks for Category 5.1 "Supported employment" are not included.

e) Coverage of expenditure and participants in Northern Ireland is incomplete. Fiscal years starting on 1 April.

f) Includes the administration of benefits (JSA) and other benefits for persons of working age (incapacity benefit, income support and certain supplementary benefits), although only JSA is included in Category 8.

g) Fiscal years starting on 1 October.

h) Mainly costs of running unemployment insurance offices. Also includes various national activities such as information, research and evaluation.

i) Includes TANF work-related activities (estimated as 0.02% of GDP). Other TANF expenditure (0.20% of GDP) on child care, transport, family and social work, etc., administration and cash benefits is not included.

j) Expenditure averages for Categories 2 to 9 refer only to countries for which both Category 2-7 and Category 8-9 totals are reported for the year in question. Expenditure data for Category 1 and its sub-categories, and all participant data, are averages for all countries with non-missing data for the particular sub-category, category or total. Averages are not always additive across categories, or comparable through time, owing to variable country coverage. For some years and countries, expenditure by sub-categories is estimated by applying the shares in the corresponding category calculated for countries with non-missing data.

Source: For European Union countries and Norway, Eurostat (2012), *Labour Market Policy: 2012 edition* and detailed underlying data supplied to OECD by Eurostat with certain Secretariat adjustments. For other countries: *OECD Database on Labour Market Programmes.*

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OECD Employment Outlook 2012

This 30th edition of the *OECD Employment Outlook* examines recent labour market trends and short-term prospects in OECD countries. It finds that the recovery from the recent economic and financial crisis has been slow and uneven. Unemployment remains unacceptably high in many countries and long-term unemployment has risen, increasing the risk of higher unemployment becoming entrenched. An analysis of how labour markets weather economic shocks shows that policies to lower structural unemployment also help to dampen the adverse effects of economic downturns on unemployment, earnings losses and earnings inequality. The report documents the decline in the labour share of national income that has been occurring in many OECD countries, primarily as a result of globalisation and technological change. Enhanced investment in education and better targeted tax and transfer programmes can help to ensure that the fruits of economic growth are more broadly shared. Finally, the impact of climate-change mitigation policies on the labour market is examined. Some sectors could experience large employment changes even if the impact on the overall level of employment may only be small. As for other structural shocks, policies should be put in place to facilitate labour market mobility.

Contents

Editorial – Achieving a Sustainable Recovery: What Can Labour Market Policy Contribute?

Chapter 1. Waiting for the Recovery: OECD Labour Markets in the Wake of the Crisis

Chapter 2. What Makes Labour Markets Resilient During Recessions?

Chapter 3. Labour Losing to Capital: What Explains the Declining Labour Share?

Chapter 4. What Green Growth Means for Workers and Labour Market Policies: An Initial Assessment

Statistical Annex

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