Divided We Stand

WHY INEQUALITY KEEPS RISING

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Please cite this publication as:
OECD (2011), *Divided We Stand: Why Inequality Keeps Rising*, OECD Publishing.
http://dx.doi.org/10.1787/9789264119536-en

ISBN 978-92-64-11163-9 (print)
ISBN 978-92-64-11953-6 (PDF)

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Foreword

Concerns of growing income inequality loom large in public debate and policy discussion. Indeed, in most OECD countries and many emerging economies, the gap between rich and poor has widened over the past decades. This occurred even when countries were going through a period of sustained economic growth prior to the Great Recession. Today, the economic crisis is putting additional pressure on the distribution of incomes. Greater inequality raises economic, political and ethical challenges as it risks leaving a growing number of people behind in an ever-changing economy.

The 2008 OECD report Growing Unequal? *documented and analysed the key features and patterns of trends in income inequality in OECD countries. This publication* Divided We Stand: Why Inequality Keeps Rising *is the follow-up to this report. It analyses the underlying forces and key drivers of rising inequality and discusses policies which are most promising to counter it.* Divided We Stand *examines whether and how trends in globalisation, technological change and institutions and policies translated into wage and earnings inequality. It analyses how inequality in labour and capital markets translates into household income inequality, looking also at factors such as the impact of changing family structures and changes in other income sources. Finally,* Divided We Stand *examines the effects of tax and benefit systems as well as public services in smoothing market-based inequality and how these effects have changed over time.*

This book is the outcome of a collective effort and reflects the contribution of a team of analysts largely from the OECD Social Policy Division of the Directorate for Employment, Labour and Social Affairs. The overview and summary was prepared by Michael Förster; the special focus on emerging economies by Alessandro Goglio and Ana Llena-Nozal; Chapters 1, 4 and 5 by Wen-Hao Chen and Michael Förster; Chapters 2, 3 and 6 by Wen-Hao Chen, Michael Förster and Ana Llena-Nozal; Chapter 7 by Herwig Immervoll, currently on leave to the World Bank, and Linda Richardson; Chapter 8 by Michael Förster and Gerlinde Verbist (University of Antwerp); and Chapter 9 by Stephen Matthews (OECD Centre for Tax Policy and Administration).

Michael Förster led the team and co-ordinated the project. Monika Queisser, Head of the OECD Social Policy Division, supervised the preparation of this report and provided useful comments on various drafts. Pauline Fron provided statistical assistance and prepared all tables and figures for publication. Marlène Mohier prepared the manuscript for publication and Ken Kincaid contributed to the editing of the report.

The analyses in this report rely partly on the standardised data on household income distribution and poverty prepared by national experts, many of whom have also provided advice on country-specific results. They are too numerous to mention here but details can be found on the OECD inequality website www.oecd.org/els/social/inequality. The collection of these data has been co-ordinated by Michael Förster and Maxime Ladaique. The report makes use of many other data, in particular the OECD earnings database (www.oecd.org/employment/database) and the micro data from the Luxembourg Income Study (LIS) (www.lisdatacenter.org). Discussions of data methodology and other supporting material for this report can be found on the website www.oecd.org/els/social/inequality.

We are very grateful to John P. Martin and Stefano Scarpetta, Director and Deputy Director of Employment, Labour and Social Affairs at the OECD for their guidance and extensive comments on various versions of the report. The report also benefited from comments received by colleagues in and outside the OECD. We gratefully acknowledge the many suggestions provided by members of the Working Party on Social Policy and the Employment, Labour and Social Affairs Committee of the OECD as well as by colleagues from various OECD Directorates: the Development Centre, the Economics Department, the Directorate for Employment, Labour and Social Affairs, the Directorate for Science, Technology and Industry and the Trade and Agriculture Directorate. Finally, we are indebted to Professors Anthony B. Atkinson, Markus Jäntti and Brian Nolan for their comments and suggestions on the first draft of this report discussed in a peer review seminar in May 2011.

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Acronyms, Country ISO Codes and Conventional Signs

AC	Actual consumption
AE	Annual earning
AFDC	Aid to Families with Dependent Children
AW	Average wage
BERD	Business enterprise expenditure on R&D
CCT	Conditional cash transfer
CGE	Computable general equilibrium
CIT	Corporate income tax
DPI	Disposable income
ECEC	Early childhood education and care
EEs	Emerging Economies
EITC	Earned Income Tax Credit
EPL	Employment protection legislation
EPO	European Patent Office
ETCR	Energy, transport and communications
EU-SILC	European Union Statistics on Income and Living Conditions (EU-SILC)
FDI	Foreign direct investment
FPI	Foreign portfolio investment
GDP	Gross domestic product
GE	Generalised entropy
GFCF	Gross fixed capital formation
HILDA	Household, Income and Labour Dynamics Survey in Australia
ICT	Information and communication technology
IRS	Internal Revenue Service
IUSA	Individual unemployment savings account
IV	Insurance value
LIS	Luxembourg Income Study
LTC	Long-term care
MI	Market income
MNC	Multinational corporations
NAFTA	North American Free Trade Area
NRR	Net replacement rate
PIT	Personal income tax
PMR	Product market regulation

PWP	Public work programme
R&D	Research and development
SA	Social assistance
UA	Unemployment assistance benefit
UB	Unemployment benefit
UI	Unemployment Insurance
UNCTAD	United Nations Conference on Trade and Development
USPTO	United States Patent and Trademark Office

OECD COUNTRIES ISO CODES

Australia	AUS	Japan	JPN
Austria	AUT	Korea	KOR
Belgium	BEL	Luxembourg	LUX
Canada	CAN	Mexico	MEX
Chile	CHL	Netherlands	NLD
Czech Republic	CZE	New Zealand	NZL
Denmark	DNK	Norway	NOR
Estonia	EST	Poland	POL
Finland	FIN	Portugal	PRT
France	FRA	Slovak Republic	SVK
Germany	DEU	Slovenia	SVN
Greece	GRC	Spain	ESP
Hungary	HUN	Sweden	SWE
Iceland	ISL	Switzerland	CHE
Ireland	IRL	Turkey	TUR
Israel	ISR	United Kingdom	GBR
Italy	ITA	United States	USA

OTHER MAJOR ECONOMIES ISO CODES

Brazil	BRA	Indonesia	IDN
China	CHN	Russian Federation	RUS
India	IND	South Africa	ZAF

CONVENTIONAL SIGNS

. . Not available

(↘) in the legend relates to the variable for which countries are ranked from left to right in decreasing order.

(↗) in the legend relates to the variable for which countries are ranked from left to right in increasing order.

Editorial

Mind the gap

The landmark 2008 OECD report *Growing Unequal?* showed that the gap between rich and poor had been growing in most OECD countries. Three years down the road, inequality has become a universal concern, among both policy makers and societies at large. Today in advanced economies, the average income of the richest 10% of the population is about nine times that of the poorest 10%.

In some countries such as Israel and the United States – inequality has increased further. But even in traditionally egalitarian countries – such as Germany, Denmark and Sweden – the income gap between rich and poor is expanding – from 5 to 1 in the 1980s to 6 to 1 today. Only a few countries have been able to buck this trend: income inequality has recently fallen in Chile and Mexico, but the richest in these two countries still have incomes more than 25 times those of the poorest.

In emerging economies, economic growth has helped to reduce sharply the prevalence of poverty. But at the same time high levels of income inequality have risen further. Among the BRICs, only Brazil managed to reduce inequality substantially, although with a ratio of 50 to 1 it is still a far more unequal country than any of the OECD countries.

The economic crisis has added urgency to deal with the policy issues related to inequality. The social compact is starting to unravel in many countries. Young people who see no future for themselves feel increasingly disenfranchised. They have now been joined by protesters who believe that they are bearing the brunt of a crisis for which they have no responsibility, while people on high incomes appear to have been spared. From Spain to Israel, from Wall Street to Syntagma Square, popular discontent is spreading rapidly. Due to the crisis, uncertainty and inequality-related issues have reached the middle classes in many societies.

The challenges are clear, but it is less obvious what has caused such inequality and what can be done about it – and what polices are needed. This report aims to untangle the complex web of factors behind the growing gap between rich and poor. The single most important driver has been greater inequality in wages and salaries. This is not surprising: earnings account for about three-quarters of total household incomes among the working-age population in OECD countries in most cases. The earnings of the richest 10% of employees have taken off rapidly, relative to the poorest 10% in most cases. The largest gains were reaped by the top 1% and in some countries by an even smaller group: the top 0.1% of earners. New data for the United States, for example, show that the share of after-tax household income for the top 1% more than doubled, from nearly 8% in 1979 to 17% 2007. Over the same period, the share of the bottom 20% of the population fell from 7% to 5%.

The labour market should therefore be the first place to act. Finding the right counterbalance to rising income inequality requires an understanding of why wages are becoming more polarised. Technological progress has been a motor for economic growth, but not all workers have been able to benefit in the same way. We have to acknowledge that better-educated, higher-earning workers have reaped higher gains while those with lower skills have been left behind. The rise of the share going to the top earners is also the result of companies operating in a global market for talent, a spectacular rise in pay of executives and bankers, and of the emergence of a winner-takes-all culture in many countries.

Labour markets have profoundly changed in OECD countries since the 1980s, marked by a series of reforms to increase their flexibility. The markets for goods and services have also been deregulated, and policies to increase competition have been pursued. These reforms have promoted productivity and economic growth and have brought more people into work. But on the "*b–moll*" side they have also contributed to widening earnings gaps: many of these jobs were part-time or low-paid.

More unequal wages have contributed to the fact that more people needed the help of social-protection systems to maintain their living standards. The sheer volume of redistribution through social policies increased. But with more people needing support, these systems were unable to reduce inequality by as much as they had done before. Overall, tax-benefit policies offset some of the large increases in inequality attributable to growing market-income disparities, the main driver of inequality trends between the mid-1980s and the mid-1990s. However, from the mid-1990s to 2005, the reduced redistributive capacity of tax-benefit systems was sometimes the main source of widening household-income gaps. Currently, these systems reduce inequality among the working-age population by about one-quarter on average across OECD countries, with higher redistribution in most Nordic countries and Belgium, and levels well below average in Chile, Iceland, Korea, Switzerland and the United States. The main reason for less effective redistribution over the past 15 years was on the benefit side: levels were cut and eligibility rules tightened to contain expenditures for social protection.

Tax plays a less important role than benefits in reducing income inequalities. This is especially the case over the last two decades which have seen a move away from highly progressive income tax rates and the elimination of net wealth taxes. Nevertheless, the growing share of income going to top earners means that this group now has a greater capacity to pay taxes than before and in some countries they are already paying a greater share of income taxes than in the past. It is in this context than many governments are re-examining the redistributive role of taxation to ensure that wealthier individuals contribute their fair share of the tax burden. This reassessment is not confined to a consideration of raising marginal tax rates on income, which might not be the most effective measure to raise tax revenues. It extends to include better tax compliance from tackling offshore tax evasion; eliminating tax expenditures which disproportionally benefit higher income groups; and reassessing the role of taxes on all forms of property and wealth, including the transfer of assets.

Reforming tax and benefit policies is the most direct and powerful instrument for redistribution. Yet strategies focusing only on reshuffling income would be neither effective nor financially sustainable, especially in the constrained fiscal climate that prevails today. The most promising way of tackling inequality is more than ever by the

employment route. More and better jobs, enabling people to escape poverty and offering real career prospects, is the most important challenge.

This report clearly identifies *upskilling* of the workforce as one of the most powerful instruments at the disposal of governments to counter rising inequality. *Upskilling* is singled out as the only force which succeeded not only in reducing wage dispersion but also in increasing employment rates.

Investing in the workforce is therefore crucial. The investment in people must begin in early childhood and be followed through into formal education and the transition from school to work. This is vital to ensure equality of opportunity for children from disadvantaged backgrounds. At the same time, human capital investment needs to be sustained over the full course of working life. The way that training is provided needs careful assessment and both employers and individuals need the means and incentives to invest in human capital.

Many of the driving forces of income inequality are the same in both emerging and OECD economies. But the setting is not the same. Emerging economies have large informal sectors: workers who are outside of social-protection systems and generally in low-paid, low-productivity jobs. Informal employment remains stubbornly high in many emerging economies despite strong overall economic growth. In these countries, disparities between ethnic groups and regions, rural and urban populations, and migrant and non-migrant workers are also significant.

Another important instrument especially for emerging economies is the provision of freely accessible and high-quality public services, such as education, health, and family care. On average, OECD governments spend as much – some 13% of GDP – on public social services as they do on all cash benefits taken together and this spending reduces inequality by about one fifth on average. Ensuring equal access for all of the population to such services will help reduce inequality and provide equal opportunities of personal and professional development for all citizens.

There is nothing inevitable about high and growing inequalities. For economies and societies as a whole, globalisation and technological changes offer opportunities. To reap the maximum reward from these opportunities, policies must make markets more efficient while encouraging employment and reducing inequalities. This study dispels the assumption that the benefits of economic growth will automatically trickle down to the disadvantaged and that greater inequality fosters greater social mobility. Without a comprehensive strategy for inclusive growth, inequality will continue to rise. We need to put better policies for better lives at the centre of our policy efforts, while providing people with hope and equal opportunities. This report provides powerful evidence of the need to "go social!" The OECD stands ready to support its member and partner countries in achieving this objective.

Angel Gurría,
OECD Secretary-General

An Overview of Growing Income Inequalities in OECD Countries: Main Findings

This overview summarises the key findings of the analytical chapters of this report. It sketches a brief portrait of increasing income inequality in OECD countries and the potential driving forces behind it. It reviews changes in these driving forces and examines their relative impact on inequality. In particular, it looks at the role of globalisation and technological changes, regulatory reforms in labour and product markets, changing household structures, and changes in tax and benefit regulations. It assesses what governments can do about increasing inequality and concludes by examining possible specific policy avenues.

1. The big picture: inequality on the rise in most OECD countries

Over the two decades prior to the onset of the global economic crisis, real disposable household incomes increased by an average 1.7% a year in OECD countries. In a large majority of them, however, the household incomes of the richest 10% grew faster than those of the poorest 10%, so widening income inequality. Differences in the pace of income growth across household groups were particularly pronounced in some of the English-speaking countries, some Nordic countries, and Israel.[1] In Israel and Japan, the real incomes of those at the bottom of the income ladder actually fell compared with the mid-1980s (Table 1).

In OECD countries today, the average income of the richest 10% of the population is about nine times that of the poorest 10% – a ratio of 9 to 1. However, the ratio varies widely from one country to another. It is much lower than the OECD average in the Nordic and many continental European countries, but reaches 10 to 1 in Italy, Japan, Korea, and the United Kingdom; around 14 to 1 in Israel, Turkey, and the United States; and 27 to 1 in Mexico and Chile.

The Gini coefficient, a standard measure of income inequality that ranges from 0 (when everybody has identical incomes) to 1 (when all income goes to only one person), stood at an average of 0.29 in OECD countries in the mid-1980s. By the late 2000s, however, it had increased by almost 10% to 0.316. Significantly, it rose in 17 of the 22 OECD countries for which long-term data series are available (Figure 1), climbing by more than 4 percentage points in Finland, Germany, Israel, Luxembourg, New Zealand, Sweden, and the United States. Only Turkey, Greece, France, Hungary, and Belgium recorded no increase or small declines in their Gini coefficients.

Income inequality followed different patterns across the OECD countries over time (Figure 2). It first started to increase in the late 1970s and early 1980s in some English-speaking countries, notably the United Kingdom and the United States, but also in Israel. From the late 1980s, the increase in income inequality became more widespread. The latest trends in the 2000s showed a widening gap between rich and poor not only in some of the already high-inequality countries like Israel and the United States, but also – for the first time – in traditionally low-inequality countries, such as Germany, Denmark, and Sweden (and other Nordic countries), where inequality grew more than anywhere else in the 2000s. At the same time, Chile, Mexico, Greece, Turkey, and Hungary reduced income inequality considerably – often from very high levels. There are thus tentative signs of a possible convergence of inequality levels towards a common and higher average level across OECD countries.[2]

Increases in household income inequality have been largely driven by changes in the distribution of wages and salaries, which account for 75% of household incomes among working-age adults. With very few exceptions (France, Japan, and Spain), the wages of the 10% best-paid workers have risen relative to those of the 10% lowest paid. This was due to both growing earnings' shares at the top and declining shares at the bottom, although top earners saw their incomes rise particularly rapidly (Atkinson, 2009). Earners in the top 10% have been leaving the middle earners behind more rapidly than the lowest earners have been drifting away from the middle.

Table 1. **Household incomes increased faster at the top**

Trends in real household income by income group, mid-1980s to late 2000s

	Average annual change, in percentages		
	Total population	Bottom decile	Top decile
Australia	3.6	3.0	4.5
Austria	1.3	0.6	1.1
Belgium	1.1	1.7	1.2
Canada	1.1	0.9	1.6
Chile	1.7	2.4	1.2
Czech Republic	2.7	1.8	3.0
Denmark	1.0	0.7	1.5
Finland	1.7	1.2	2.5
France	1.2	1.6	1.3
Germany	0.9	0.1	1.6
Greece	2.1	3.4	1.8
Hungary	0.6	0.4	0.6
Ireland	3.6	3.9	2.5
Israel[1]	1.7	–1.1	2.4
Italy	0.8	0.2	1.1
Japan	0.3	–0.5	0.3
Luxembourg	2.2	1.5	2.9
Mexico	1.4	0.8	1.7
Netherlands	1.4	0.5	1.6
New Zealand	1.5	1.1	2.5
Norway	2.3	1.4	2.7
Portugal	2.0	3.6	1.1
Spain	3.1	3.9	2.5
Sweden	1.8	0.4	2.4
Turkey	0.5	0.8	0.1
United Kingdom	2.1	0.9	2.5
United States	1.3	0.5	1.9
OECD27	**1.7**	**1.3**	**1.9**

Note: Income refers to disposable household income, corrected for household size and deflated by the consumer price index (CPI). Average annual changes are calculated over the period from 1985 to 2008, with a number of exceptions: 1983 was the earliest year for Austria, Belgium, and Sweden; 1984 for France, Italy, Mexico, and the United States; 1986 for Finland, Luxembourg, and Norway; 1987 for Ireland; 1988 for Greece; 1991 for Hungary; 1992 for the Czech Republic; and 1995 for Australia and Portugal. The latest year for Chile was 2009; for Denmark, Hungary, and Turkey it was 2007; and for Japan 2006. Changes exclude the years 2000 to 2004 for Austria, Belgium, Ireland, Portugal and Spain for which surveys were not comparable.

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

Source: OECD Database on Household Income Distribution and Poverty.

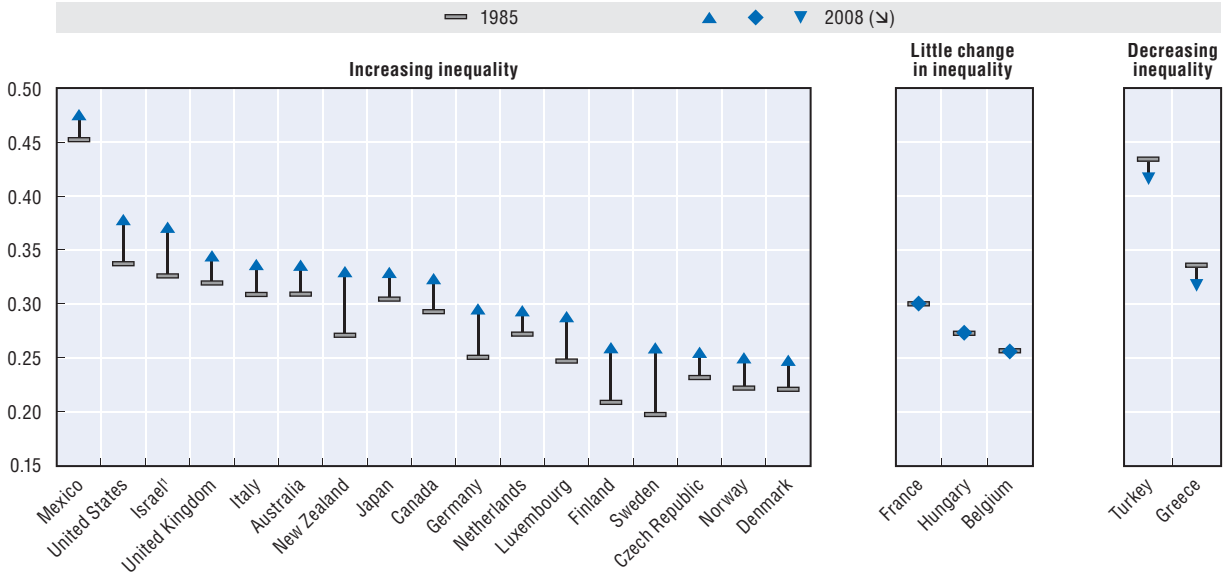
StatLink http://dx.doi.org/10.1787/888932537370

The 2008 OECD report *Growing Unequal?* highlighted that inequality in the distribution of market incomes – gross wages, income from self-employment, capital income, and returns from savings taken together – increased in almost all OECD countries between the mid-1980s and mid-2000s. Changes in the structure of households due to factors such as population ageing or the trend towards smaller household sizes played an important role in several countries. Finally, income taxes and cash transfers became less effective in reducing high levels of market income inequality in half of OECD countries, particularly during the late 1990s and early 2000s.

While these different direct drivers have been described and analysed in depth and are now better understood, they have typically been studied in isolation. Moreover, while growing dispersion of market income inequality – particularly changes in earnings inequality – has been identified as one of the key drivers, the question remains open as to

Figure 1. **Income inequality increased in most, but not all OECD countries**

Gini coefficients of income inequality, mid-1980s and late 2000s



Note: For data years see Table 1. "Little change" in inequality refers to changes of less than 2 percentage points.

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932535185

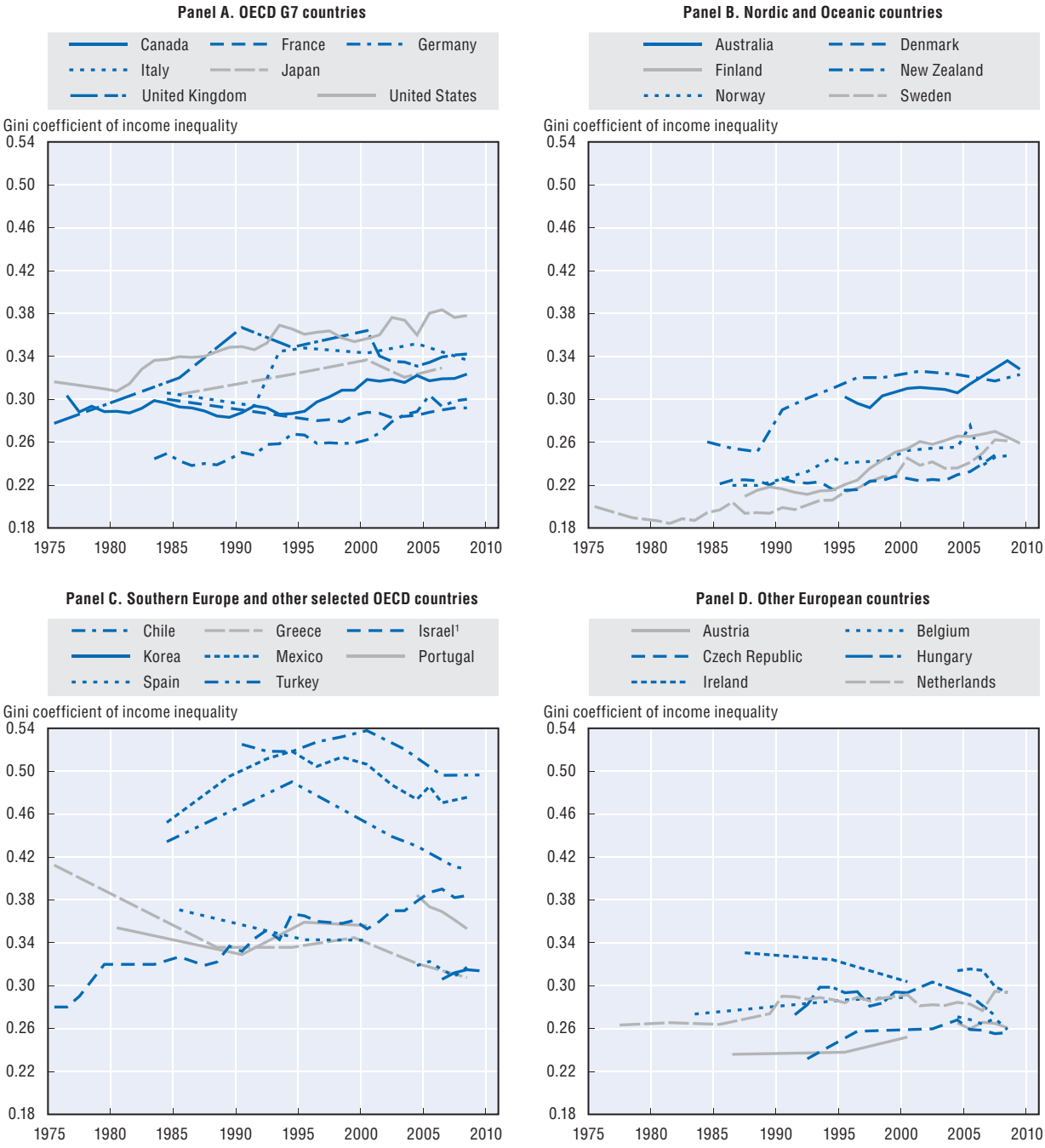
the major underlying, indirect causes of changes in inequality. Is globalisation the main culprit? To what degree were changes in labour and product market policies and regulations responsible? Do changes in household structure matter? Finally, what can governments do to address rising inequality? These and other questions are addressed in detail in the present report which identifies key drivers and possible policy measures for tackling inequality trends among the working-age population.

Globalisation has been much debated as the main cause of widening inequality. From a political point of view, protectionist sentiments have been fuelled by the observation that the benefits of productivity gains in the past two decades accrued mainly – in some cases, exclusively – to highly skilled, highly educated workers in OECD countries, leaving people with lower skills straggling. From a conceptual point of view, the standard reading of traditional international trade theory[3] is that increased trade integration is associated with higher relative wages of skilled workers in richer countries, thus contributing to greater inequality in those countries (*e.g.* Kremer and Masking, 2006).

However, evidence as to the role of globalisation in growing inequality is mixed. A number of international cross-country studies find trade integration to have increased inequality in both high-wage and low-wage countries, which is at odds with traditional trade theory (for a review, see Milanovic and Squire, 2005). Other studies, by contrast, suggest that rising imports from developing countries are actually associated with declining income inequality in advanced countries (Jaumotte *et al.*, 2008). Recently, some leading trade economists, such as Krugman (2007) or Slaughter (Scheve and Slaughter, 2007) have changed tack from their earlier views that the effect of trade on inequality was modest at best: they now consider that globalisation may have had a more significant

Figure 2. **Inequality increased in most countries over the long term, but recently fell in some high-inequality countries**

Gini coefficients of income inequality in 27 OECD countries, 1975-2008



Note: National sources have been used to complement the standardised OECD data for Australia, Chile, Finland, Norway, New Zealand and Sweden. Their methodology is as close as possible to OECD definitions. Break in series between 2000 and 2004 for Austria, Belgium, Ireland, Portugal and Spain. Break in series in 1997 for Israel.

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

Source: OECD Income Distribution and Poverty Database.

StatLink http://dx.doi.org/10.1787/888932535204

impact on the income distribution in the United States through trade and other channels, such as foreign direct investment (FDI) and offshore activities.

Next to globalisation, there are, however, other equally plausible explanations for the growing inequality in the distribution of market income. Technological progress in particular is often cited. For example, advances in information and communication technology (ICT) are often considered to be skill-biased and, therefore, an inequality-increasing factor. Some studies put the ICT revolution at the forefront of their explanation of inequality: the IMF (2007), for example, found that "technological progress had a greater impact than globalisation on inequality within countries", while an OECD report (OECD, 2007) suggests that "technical change is a more powerful driver of increased wage dispersion than closer trade integration". In practice, however, it is very difficult to disentangle technological change from globalisation patterns that also increase the value of skills. Advances in technology, for instance, lie behind the fragmentation of economic activities and the offshoring of production. As Freeman (2009) puts it, "offshoring and digitalisation go together".

Finally, policy choices, regulations, and institutions can have a crucial impact. They can shape how globalisation and technological changes affect the distribution of income. They can also influence income distribution directly, *e.g.* through deregulation in product markets, changes in social transfers, wage-setting mechanisms, or workers' bargaining power. However, connecting these factors with overall earnings inequality and household income inequality is not straightforward, as regulatory and policy reforms may have counteracting effects on employment and wage inequality among workers.

The empirical evidence as to the key drivers of inequality remains largely inconclusive and is made more so by a lack of precise definitions and concepts used in different studies. When assessing the possible causes of increased inequality, three main issues require particularly precise definition. They are: *i)* inequality itself, *ii)* globalisation, and *iii)* reference populations.

First, use of term "inequality" should clearly state inequality of what and among whom. Different income aggregates[4] and population subgroups will be affected differently by different driving forces. It is useful, therefore, to consider the following concepts:

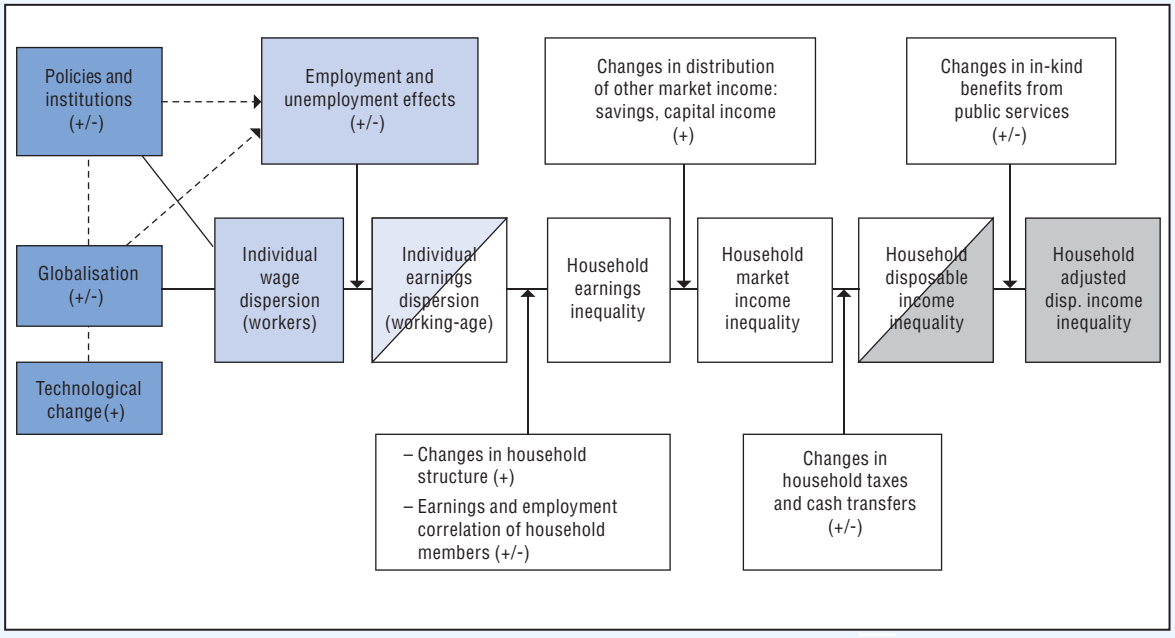
- Dispersion of hourly wages among full-time (or full-time equivalent) workers.
- Wage dispersion among workers (*e.g.* annual wages, including wages from part-time work or work during only part of the year).
- Individual earnings inequality among all workers (including the self-employed).
- Individual earnings inequality among the entire working-age population (including those who are inactive, *i.e.* not working).
- Household earnings inequality (including the earnings of all household members).
- Household market income inequality (including incomes from capital, savings and private transfers).
- Household disposable income inequality (taking into account public cash transfers received and direct taxes paid).
- Household adjusted disposable income inequality (taking into account the values of publicly provided services such as health or education).

Box 1. **A roadmap: the analytical framework and structure of the report**

Globalisation and skills-biased technological change can affect policies via multiple pathways just as policies can, in turn, can affect both market and final disposable income inequality. It would therefore be difficult to develop one single empirical model to explain changes in final household income inequality drawn directly from macroeconomic variables. Instead, this study adopts a partial, step-wise approach that separately investigates the relevant pathways between the main driving factors and income inequality.

This approach is illustrated in the figure below which describes the different links when along the pathways from the macroeconomic explanatory variables to household income inequality. The first pathway goes through the impact on labour earnings inequality – from the dark blue to light blue shaded boxes. Earnings inequality in this framework is assessed in terms of both wage dispersion among workers and individual earnings dispersion among the whole working-age population, which takes into account under-employment and inactivity. The second pathway is the transmission of labour earnings inequalities to household income inequalities – the move from the light blue to the unshaded boxes. This pathway involves several steps, which takes into account the importance of earnings dispersion together with other factors (*e.g.* changes in household structure and the influence of other income sources). The third pathway is the one to final household disposable and adjusted disposable income – from the unshaded to the grey shaded boxes. This pathway takes into account the impact of taxes and transfers, both cash and in-kind.*

Analytical framework for the analysis of income inequality used in the report



The empirical analysis examines in a first step whether and how trends in globalisation, technological change and institutions and policies have translated into inequalities in wages and earnings. It then, in a second step, determines the extent to which trends in labour earnings inequality are responsible for changes in income inequality. The third step examines possible reasons for changes in the redistributive effectiveness of tax/transfer systems over time and the impact of publicly provided services.

* This "step-wise" and partial approach does not capture the full general equilibrium and dynamic complexity of the process. For instance, globalisation will also have a direct impact on tax/transfer policies and institutions and policies on changes in the distribution of savings or capital income. These interactions are, however, not modelled in the simplified analytical framework presented here.

The second term that requires clarification is "globalisation". There are different aspects to economic globalisation[5] and they are likely to impact on trends in wage, earnings and income inequalities in different ways and in possibly opposing directions:

- Trade integration (goods and services mobility).
- Financial integration (capital mobility).
- Technology transfers (information mobility).
- Production relocation (firm mobility).
- International migration (labour mobility).

Third, it should be clear which reference population is being examined. Most studies that analyse the drivers of inequality refer to income inequality among the entire population. But globalisation, technology, and regulatory reform do not impact on people of working age as they do on children or senior citizens, one reason being that very specific policies in place address their particular needs. Changes in pension systems (in the past) will affect the present income situation of retired people, for instance, which can obscure findings and blur the picture. The analyses in this study focus on the *working-age population,* which allows the report to paint a more precise picture of the processes at work in the labour market and how they shape the incomes of households.[6] The analytical framework of the report is outlined in Box 1.

On the basis of the analytical framework set out in the box above, this report addresses inequality in three parts. Part I looks at whether and how trends in globalisation, technological change and institutions and policies translated into inequalities in wages and earnings. The focus is on identifying the main driving forces of increased wage and earnings inequality *within*, rather than *between*, countries. Part II analyses what comprises the transition from earnings to income inequality, looking at such factors in household earnings inequality as the impact of changing family structures as well as other income sources that contribute to households' disposable income. Part III analyses the possible reasons for changes in the impact of tax and transfer systems in OECD countries. It also looks at the impact of publicly provided services, updating and extending the work presented in OECD (2008). Finally, it discusses the tax policy implications of recent top-income trends.

2. What drives growing earnings and income disparities?

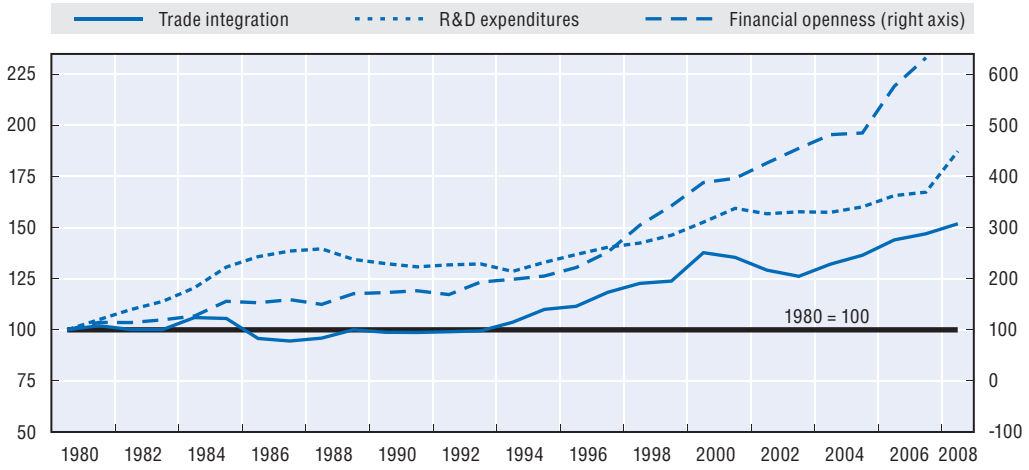
Is globalisation the main culprit in higher wage inequality?

Over the past decades, OECD countries underwent significant structural changes, driven by their closer integration into the global economy and to rapid technological progress. These changes often brought highly skilled workers greater rewards than low-skilled ones and thus affected the way earnings from work were distributed. The rising gap between the earnings of the highly skilled and those of the low-skilled springs from several factors. First, a rapid rise in the integration of trade and financial markets generated a relative shift in labour demand in favour of highly skilled workers. Second, technological progress shifted production technologies in both industries and services in favour of skilled labour. These structural changes got underway in the early 1980s and accelerated from the mid-1990s (Figure 3).[7]

The share of global trade in world GDP grew from about one-third to over a half in the 30 years to 2008 (IMF, 2007). In that time, trade integration – the sum of imports and exports as a share of GDP – doubled in many OECD countries. But globalisation is not only about trade in goods and services. It also concerns foreign direct investment. Outward stocks of FDI increased steeply in all OECD countries – from an average of less than 5% of GDP in 1980 to nearly 50% in

Figure 3. **The integration of trade and financial markets and technological progress grew rapidly, especially from the mid-1990s**

Developments in trade integration, financial openness and technological change, OECD average, 1980-2008 (1980 = 100)



Note: Trade integration is defined as the sum of imports and exports as a percentage of GDP. Financial openness is defined as the sum of cross-border liabilities and assets as a percentage of GDP. R&D expenditures refer to business-sector expenditures on research and development as a percentage of GDP.

Source: OECD Trade Indicators Database; External Wealth of Nations Mark II Database (EWN II), IMF dataset; *OECD Main Science and Technology Indicators.*

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the late 2000s. OECD countries have seen substantial growth in the number of multinational corporations as well as their overseas operations, which reflects greater offshore outsourcing of their activities. A common assumption is that offshoring disproportionately hurts lower-skilled jobs. Globalisation also went hand-in-hand with the rapid adoption of new technologies which may have penalised those workers who did not have the necessary skills to use them effectively. Technological progress is therefore often seen as inherently "skills-biased". But disentangling the different effects of these forces is not easy. Technological progress may, for instance, be enhanced by closer trade integration while, at the same time, better communication facilities and technology may lead to greater trade integration.

This report finds that neither rising trade integration nor financial openness had a significant impact on either wage inequality or employment trends within the OECD countries. The wage-inequality effect of trade appears neutral even when only the effects of increased import penetration from emerging economies are considered – a finding that runs counter to the expectation that trade flows should drive down wages of workers in manufacturing and/or services in OECD countries. However, increased imports from low-income countries do tend to heighten wage dispersion, although only in countries with weaker employment protection legislation.

The study also shows, however, that increased financial flows and technological change had an impact on inequality. Growing outward FDI was associated with increases in wage dispersion, albeit only in the upper half of the wage distribution, while technological progress contributed to the increase in overall wage dispersion, chiefly in the upper half of the distribution.

The impact of regulatory reforms

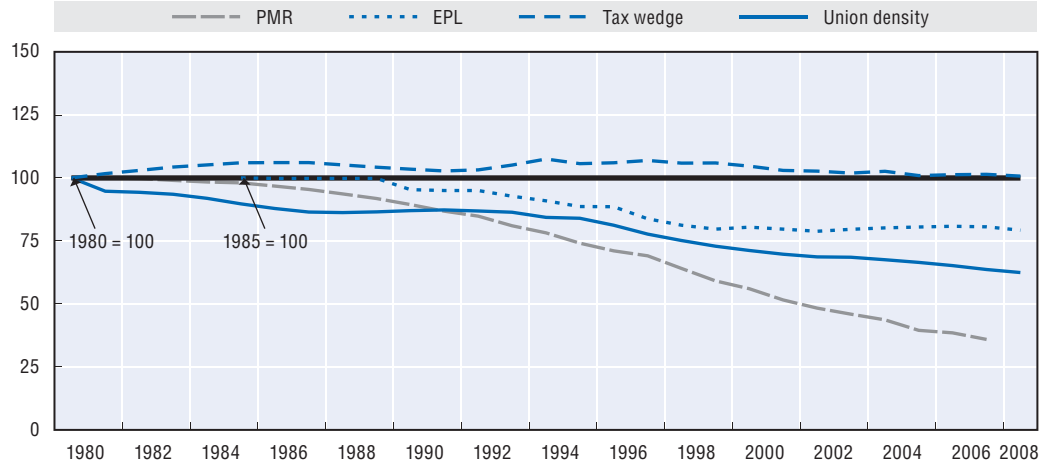
In the two decades from 1980 to 2008, most OECD countries carried out regulatory reforms to strengthen competition in the markets for goods and services and to make labour markets more adaptable. All countries, for example, significantly relaxed anti-competitive product-market regulations and many also loosened employment protection legislation (EPL) for workers with temporary contracts. Minimum wages also declined relatively to median wages in a number of countries between the 1980s and 2008. Wage-setting mechanisms also changed: the share of union members among workers fell across most countries, although the coverage of collective bargaining generally remained rather stable over time. A number of countries cut unemployment benefit replacement rates and, in an attempt to promote employment among low-skilled workers, some also reduced taxes on labour for low-income workers (Figure 4).

These changes in policies and institutions affected the ways in which globalisation and technological changes translated into distributional changes. On the one hand, past empirical evidence points to the significant positive impact of reforms on *employment levels* (*e.g.* OECD, 2006). Greater product market competition in particular has been found to increase aggregate employment by reducing market rents and expanding activity, which in turn leads to stronger labour demand (Blanchard and Giavazzi, 2003; Spector, 2004; Messina, 2003; Fiori *et al.*, 2007; Bassanini and Duval, 2006). There is also some evidence that lower unemployment benefit replacement rates and lower tax wedges are associated with higher employment. The analyses in Chapter 3 confirm these findings. With the exception of EPL, all aspects of regulatory and institutional changes analysed exerted a significant positive impact on the employment rate.

On the other hand, most policy and institutional reforms also contributed to widening *wage disparities*, as more low-paid people entered employment and the highly skilled

Figure 4. **Product and labour market regulations and institutions became weaker**

Developments in product market regulation, employment protection legislation, tax wedges and union density, OECD average, 1980-2008 (1980 = 100)



Note: "PMR" is a summary indicator for product market regulation. "EPL" is a summary indicator of the strictness of overall employment protection legislation (only available from 1985 onwards). "Tax wedge" refers to an average worker and is the sum of income tax and employees and employers payroll taxes as a percentage of labour costs. "Union density" is the number of union members as a proportion of all employees eligible to be members.

Source: See Chapter 1, Figure 1.18.

StatLink http://dx.doi.org/10.1787/888932535242

reaped more benefits from a more dynamic economy. A number of previous studies associated less strict EPL and declines in union density and bargaining coverage with higher wage dispersion among those in work (*e.g.* Koeninger *et al.*, 2007; Visser and Cecchi, 2009; Wallerstein, 1999). The analyses in Chapter 2 confirm that many dimensions of regulatory reform and institutional change impacted on increasing wage inequality. More flexible product market regulation, for instance, contributed to increase wage dispersion in the OECD area. Lower market rents and increased competition led to a greater demand for skilled labour and a more dispersed wage structure. Lower tax wedges also contributed to increased wage dispersion. Dwindling benefit replacement rates for low-wage workers (but not for workers on the average wage) also drove up wage dispersion – lower replacement rates mean lower reservation wages. Furthermore, less strict EPL is associated with greater wage dispersion, driven entirely by reforms to EPL for temporary workers.

It is therefore important to emphasize that regulatory and institutional changes tend to have contrasting effects on employment and wage distribution – *i.e.* they tend to increase employment opportunities while, at the same time, contributing to wider wage disparities. However, the *combined* influence of these factors on *overall* earnings inequality and household income inequality is less straightforward. Promoting employment opportunities for under-represented groups could increase market income for certain households and increase the overall resources available for redistribution. At the same time, rises in the overall employment rate do not necessarily have a direct impact on reduced household income inequality (*e.g.* ILO, 2008).

The analyses in Chapter 3 are a first step in answering the question of the "overall" effect of regulatory and institutional changes. They calculate the relative contributions of the employment rate and the wage inequality effect, respectively, to an estimate of "overall earnings inequality" among the entire working-age population (*i.e.* including workers and jobless individuals). Combining the employment and wage effects reveals that they tend to cancel each other out and that the net effect of regulatory reforms on trends in "overall earnings inequality" remains indeterminate in most cases.

As the estimate of "overall earnings inequality" is sensitive to the assumption about the "potential earnings" of non-workers, Chapter 3 provides upper- and lower-bound values for the employment effect and the wage effect. In the lower-bound scenario (which assumes zero earnings for non-workers), some regulatory reforms (*e.g.* changes in unionisation and tax wedges) may have had an overall equalising effect. In the upper-bound scenario (which imputes "shadow" wages to non-workers), some reforms (*e.g.* changes in PMR and unemployment benefit replacement rates) may have had an overall disequalising effect. In both scenarios, changes in EPL had an overall disequalising effect.

Finally, the results from the study highlight the central role of education. The rise in the supply of skilled workers considerably offset the increase in wage dispersion associated with technological progress, regulatory reforms and institutional changes. The upskilling of the labour force also had a significant impact on employment growth. The growth in average educational attainment thus appears to have been the single most important factor contributing not only to reduced wage dispersion among workers but also to higher employment rates. On the basis of these results, the evolution of earnings inequality across OECD countries over the past few decades could be viewed mainly as the difference between the demand for and supply of skills or, as neatly summarised by Tinbergen (1975), the outcome of a "race between education and technology" (Table 2).

Table 2. **Trends in technology, policies and education were the key drivers of changes in wage inequality and employment in the OECD area**

Summary of regression results from Chapters 2 and 3

	Economic impact on		Impact on changes in estimated "overall" earnings inequality
	Wage dispersion	Employment rate	
Globalisation and technology			
Trade integration	=	=	=
Foreign direct investment (FDI) deregulation	=	=	=
Technological progress	+ (**)	=	+
Policies and institutions			
Declining union coverage	+ (*)	+ (***)	= / –
Product market deregulation (PMR)	+ (**)	+ (**)	+ / = / –
Less strict employment protection legislation (EPL)	+ (***)	=	+
Declining tax wedges	+ (***)	++ (***)	= / –
Declining unemployment benefit replacement rate	+ (***)	+ (***)	+ / = / –
Other control			
Upskilling (increased education level)	– (***)	+ (***)	– –

Note: Summary results from pooled regression analysis (fixed-effects model, controlling for output gap, female employment shares and sectoral employment shares), covering 22 OECD countries for the period 1980 to 2008 (352 observations).
Wage dispersion defined as the ratio of the 10% best-paid workers to that of the least-paid workers (D9/D1 ratio). Trade integration refers to detrended series of total trade exposure. Technological progress refers to detrended series of business-sector expenditures on R&D as a percentage of GDP.
A positive/negative sign indicates an effect which increases/decreases wage dispersion or employment rate. "+" (or "-") indicates that the standardised coefficient is positive (or negative) and is less than one-third (0.33) for one standard deviation change in the unit, and "++" (or "–") if the standardised coefficient is 0.33 or more. Values in parentheses (***, **, *) indicate that the estimated coefficient is significant at the 1%, 5% and 10% levels, respectively. "=" indicates insignificant estimates (less than at the 10% level), regardless of the value of the coefficient.
Source: Chapter 3, Table 3.3.

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Changes in hours worked favour higher-wage earners

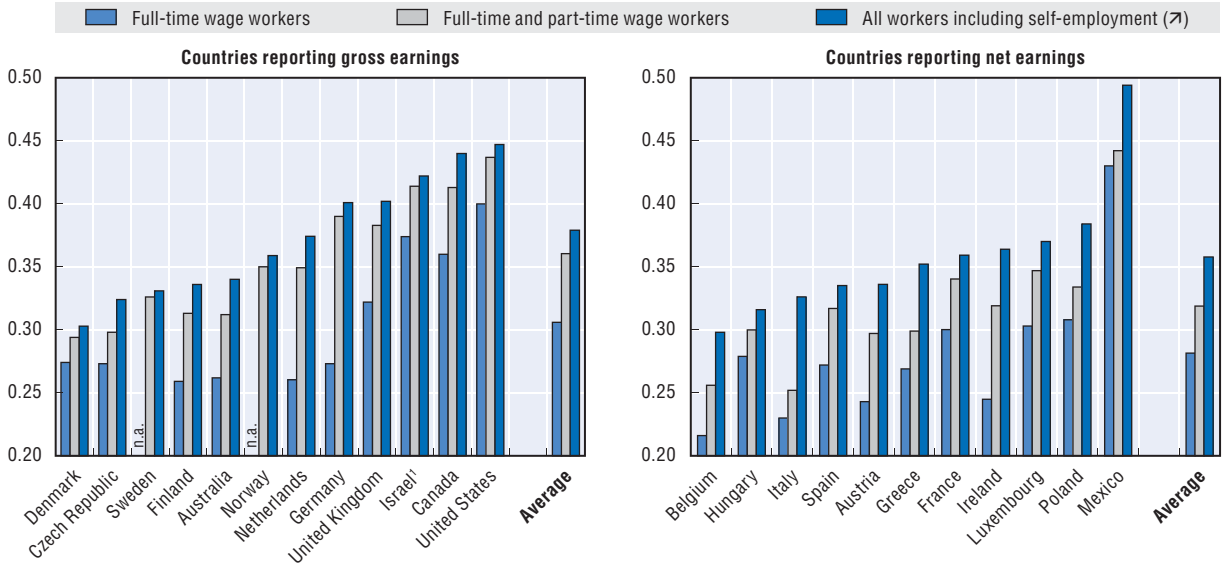
Types of jobs and work arrangements are another important factor in earnings inequality. Although previously under-represented groups, such as women, participate increasingly in the labour market, they often only work part-time and tend to suffer from a wage gap with their male counterparts. Cross-national differences in the variation of hours worked may be due to differences in macroeconomic conditions, while also reflecting supply-side and policy differences, *e.g.* preferences for part-time work or the strictness of regulations governing working time across countries.

On average across the OECD, the share of part-time employment in total employment increased from 11% in the mid-1990s to about 16% by the late 2000s, with the strongest increases observed in some European countries – Germany, Ireland, the Netherlands, and Spain (OECD, 2010). While offering suitable employment opportunities for traditionally under-represented groups, part-time work also contributed to widening gaps in the distribution of wages. Indeed, adding part-time workers to the full-time gross earnings distribution increases the Gini coefficient of inequality by more than five percentage points on average and by another two points when self-employed workers are also included (Figure 5).

However, changes in working-time arrangements affected high- and low-wage workers differently. Average annual hours worked per person in dependent employment fell slightly in most OECD countries between the late 1990s and 2008. However, more

Figure 5. **Levels of earnings inequality are much higher when part-timers and self-employed are accounted for**

Earnings inequality (Gini coefficients) among full-timers, part-timers and all workers including the self-employed, mid-2000s



Note: Working-age individuals living in a working household. Countries are presented in increasing order of earnings inequality among all workers.

Data refer to a year between 2003 and 2005, except for Belgium and France (2000).

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

Source: Chapter 4, Figure 4.1.

StatLink http://dx.doi.org/10.1787/888932535261

working hours were lost among low-wage than among high-wage earners, again contributing to increasing earnings inequality. In many countries, there was a trend towards an increasing divide in hours worked between higher- and lower-wage earners.

Variations in hourly wage rates still explain the largest part of the *level* of gross earnings inequality among all workers in most countries (55-63% on average). However, *changes* in earnings inequality over time seem to be driven as much by the trends in hours worked, as outlined in Figure 6.

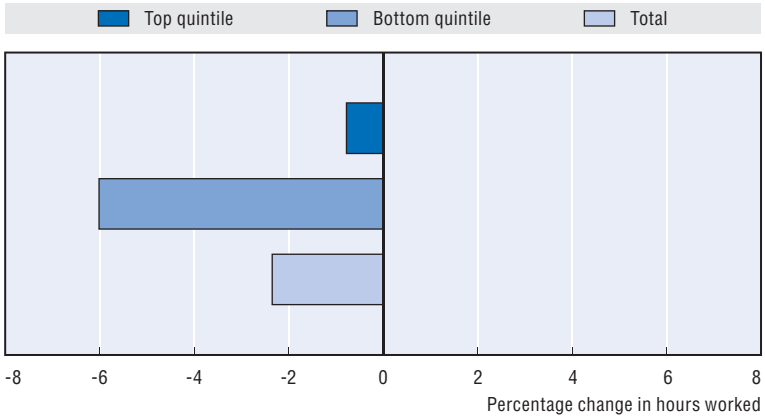
Do changes in household structure matter for inequality?

Household structures changed profoundly over the past decades in OECD countries. There are *more single-headed households* with and without children today than ever before: their share of working-age households increased in all OECD countries, from an on average of 15% in the late 1980s to 20% in the mid-2000s. Smaller households are less able to benefit from the savings associated with pooling resources and sharing expenditures. A trend toward smaller households is therefore likely to increase earnings and income inequality.

In couple households, the wives of top earners were those whose employment rates increased the most. There was also in all countries a rise in the phenomenon known as "assortative mating", that is to say people with higher earnings having their spouses in the same earnings bracket – *e.g.* doctors marrying doctors rather than nurses. Today, 40% of couples where both partners work belong to the same or neighbouring earnings deciles compared with 33% some 20 years ago.

Figure 6. **Hours worked declined more among lower-wage workers**

Trends in annual hours worked by the bottom and top 20% of earners, OECD average, mid-1980s to mid-2000s



Note: Paid workers of working age.

Source: Chapter 4, Figure 4.5.

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These trends contributed to higher household earnings inequality in the period under study. Some observers even consider changes in family formation to be the main reason for rising inequality. Daly and Valletta (2006), for instance, suggest that the increase in single-headed families is responsible for much of the growth in inequality in the United States, while several studies also suggest that the growing correlation of spouses' earnings across couple households contributes significantly to widening inequality (Cancian and Reed, 1999; Hyslop, 2001; Schwartz, 2010). For an overall assessment, it is important to consider the effect of such demographic changes along with the impact of changes related more to the labour market.

This report suggests that household structure changes played a much more modest part in rising inequality than changes related exclusively to the labour market. The analysis in Chapter 5 suggests that the increase in men's earnings disparities was the main factor driving household earnings inequality. Depending on the country, it accounted for between one-third and one-half of the overall increase. Increased employment opportunities for women, however, worked in the opposite direction in all countries, contributing to a more equal distribution of household earnings. Finally, changes in household structures (assortative mating and increases in single-headed households) increased household earnings inequality, albeit to a lesser extent than often suggested (Figure 7). These patterns hold true for all countries.

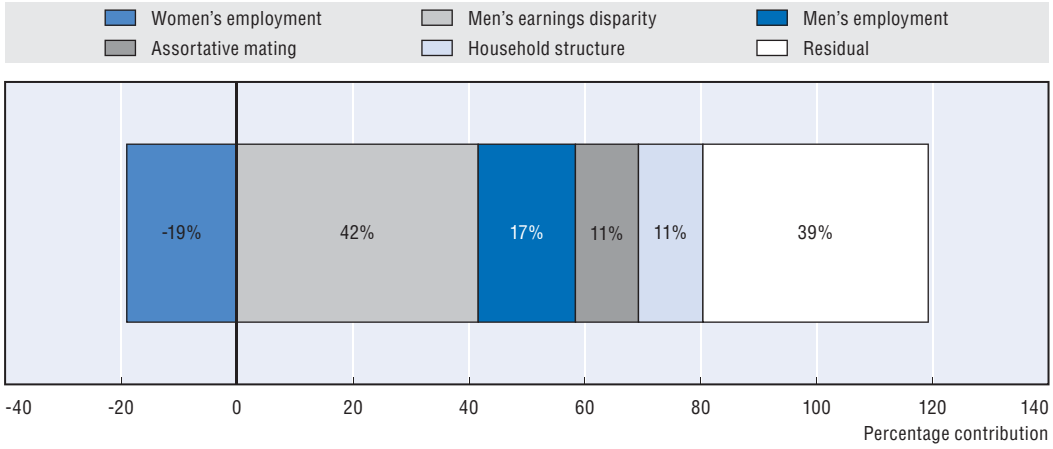
Beyond earnings: the impact of capital and self-employment income

Changes in the earnings distribution account for much but not all of the trends in household *income* inequality in OECD countries. A much debated driver of income inequality in OECD countries is the distribution of incomes from capital, property, investment and savings, and private transfers. Such distribution has grown more unequal over the past two decades. *Capital income*, in particular, saw a greater average increase in inequality than earnings in two-thirds of OECD countries between the mid-1980s and the late 2000s.

But how important is the share of capital income in household income? Even though its share increased in most countries, it remained at a moderate average level of around 7% of total income. Not surprisingly, rises in the share of capital income were due predominantly to movements in the *upper* part of the distribution (Figure 8). Capital income shares grew

Figure 7. **Demographic changes were less important than labour market trends in explaining changes in household earnings distribution**

Percentage contributions to changes in household earnings inequality, OECD average, mid-1980s to mid-2000s



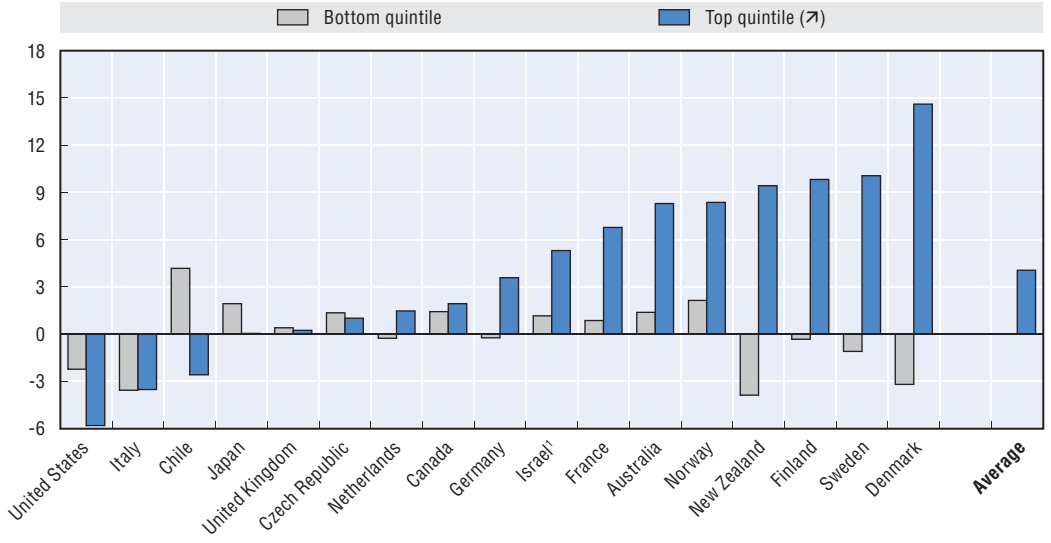
Note: Working-age population living in a household with a working-age head. Household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size). Percentage contributions of estimated factors were calculated with a decomposition method which relies on the imposition of specific counterfactuals such as: "What would the distribution of earnings have been in recent year if workers' attributes had remained at their early year level?" The residual indicates the importance of unmeasured factors. These include other changes in household characteristics, such as trends in ageing or migration.

Source: Chapter 5, Figure 5.9.

StatLink http://dx.doi.org/10.1787/888932535299

Figure 8. **Capital income became a greater source of household income, but mainly in rich households**

Percentage-point changes in the shares of capital income in total household income, mid-1980s to late 2000s



1. Information on data for Israel: http://dx.doi.org/10.1787/888932315602.

Source: Chapter 6, Table 6.2.

StatLink http://dx.doi.org/10.1787/888932535318

particularly fast in the Nordic countries and in New Zealand. Compared with labour earnings, the contribution of capital income to household income inequality was comparatively low, even though it rose in the 1990s and 2000s. Although earnings remained the most important driver of income inequality in any given year in any OECD country, their relative contribution to income inequality fell in most, particularly from the mid-1990s.

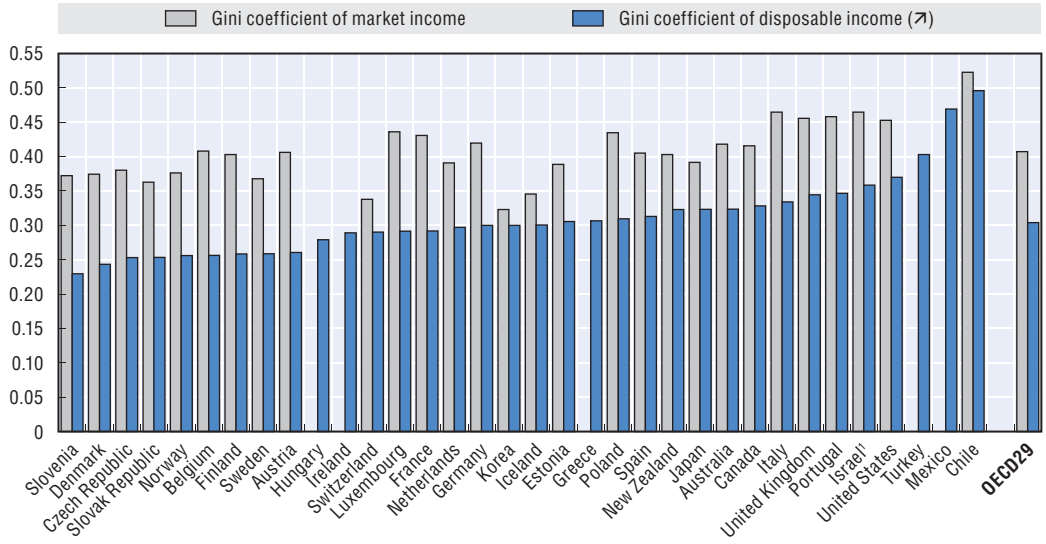
Self-employment can also have an impact on overall earnings inequality because the income it generates is much more unevenly distributed than wages and salaries, as shown in Figure 5. Furthermore, the self-employed are disproportionally concentrated in the lower and middle tails of the distribution in most OECD countries. However, the effect of self-employment on overall inequality remained modest. This was because the share of self-employment income fell in most countries and accounted for only a relatively small share of gross labour income – between 3% and 13%, depending on the country. Self-employment income thus accounted for generally less than 15% of overall inequality among all workers – a contribution that changed little over the period of time under study.

Have income taxes and benefit systems become less effective in redistributing income?

Public cash transfers, as well as income taxes and social security contributions, played a major role in all OECD countries in reducing market-income inequality. Together, they were estimated to reduce inequality among the working-age population (measured by the Gini coefficient) by an average of about one-quarter across OECD countries. This redistributive effect was larger in the Nordic countries, Belgium and Germany, but well below average in Chile, Iceland, Korea, Switzerland and the United States (Figure 9).

Figure 9. **Market incomes are distributed much more unequally than net incomes**

Inequality (Gini coefficient) of market income and disposable (net) income in the OECD area, working-age persons, late 2000s



Note: Late 2000s refers to a year between 2006 and 2009. The OECD average excludes Greece, Hungary, Ireland, Mexico and Turkey (no information on market income available). Working age is defined as 18-65 years old. Countries are ranked in increasing order of disposable income inequality.

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

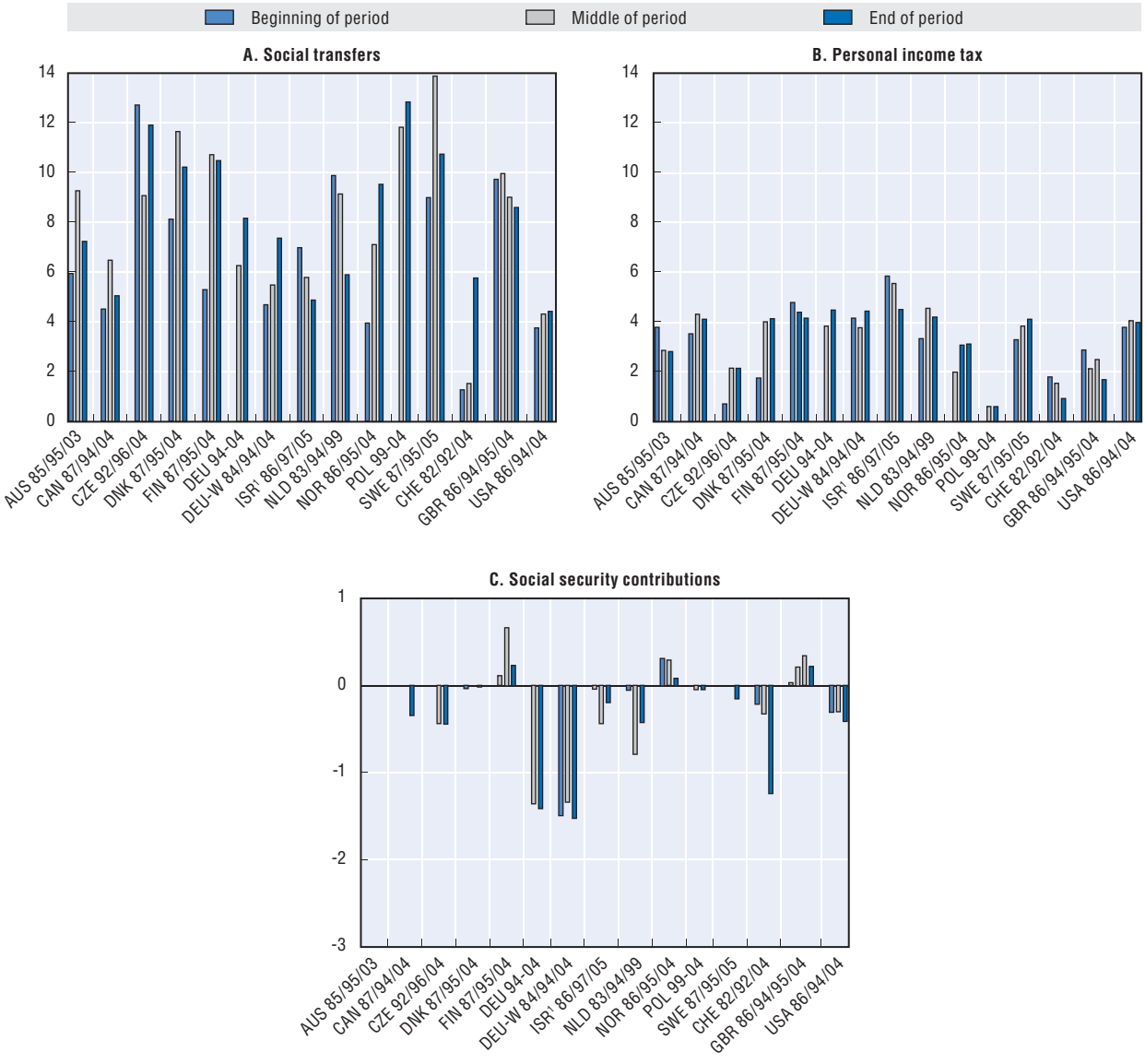
Source: Chapter 6, Figure 6.1.

StatLink http://dx.doi.org/10.1787/888932535337

In most countries, the extent of redistribution has increased over the period under study as a whole. As a result, tax-benefit policies offset some of the large increases in market-income inequality, although they appear to have become less effective at doing so since the mid-1990s. Until the mid-1990s, tax-benefit systems in many OECD countries offset more than half of the rise in market-income inequality. However, while market-income inequality continued to rise after the mid-1990s, much of the stabilising effect of taxes and benefits on household income inequality declined (Figure 10).

Figure 10. **While market income inequality rose, redistribution through tax/transfers became less effective in many countries**

Changes in cash redistribution of social transfers, personal income taxes and social security contributions, mid-1980s to mid-2000s



Note: Redistribution is the difference between the Gini coefficients before and after the respective tax or benefit. Households headed by a working-age individual.

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

Source: Chapter 7, Figure 7.3.

StatLink http://dx.doi.org/10.1787/888932535356

Why did the tax-benefit system became less redistributive since the mid-1990s? Cash redistribution relies on three instruments: benefits, income taxes, and social security contributions. Overall, the redistribution trends were driven chiefly by *benefits* or, to be more precise, by changes in their receipt patterns and generosity. Changes in the numbers of unemployed and reforms to benefit eligibility criteria appear to have been particularly important factors, whereas benefit targeting seems to have played less of a role. Although governments tended to spend more on benefits overall, transfers did not become more progressive.[8] In addition, spending on out-of-work benefits shifted towards "inactive" benefits, which resulted in reduced activity rates and thus exacerbated the trend towards higher market-income inequality.

Despite the substantial gains of high-income earners in some countries, *income taxes* played a relatively minor role in moderating trends towards higher inequality. The reason is that trends towards lower income taxes, on the one hand, and more progressive taxation, on the other, had opposite effects on redistribution and partly cancelled each other out. Finally, because of their relatively flat-rate structure, *social security contributions* redistributed very little. Where contribution ceilings were in place they may even have been regressive. As a result, social contributions did not play a major role in altering redistribution directly, despite their growing importance as a revenue source (up from an average of 8% of GDP in 1985 across OECD countries to almost 11% in 2005).

How redistributive are non-cash transfers from public services?

Redistribution is not only about cash. Governments spend as much – some 13% of GDP – on *public social services* (education, health, care services, etc.) as they do on all cash benefits taken together. Some countries even spend much more on the provision of such "in-kind" services than on cash benefits: it is the case in the English-speaking and Nordic countries, Korea, and Mexico. While the prime objective of social services is not redistribution, but the provision of a decent education, basic health care, and acceptable living standards for all, they are in fact redistributive. Across OECD countries, they reduced income inequality by one-fifth on average (Figure 11) and their share of GDP and redistributive impact remained constant over the 2000s.[9]

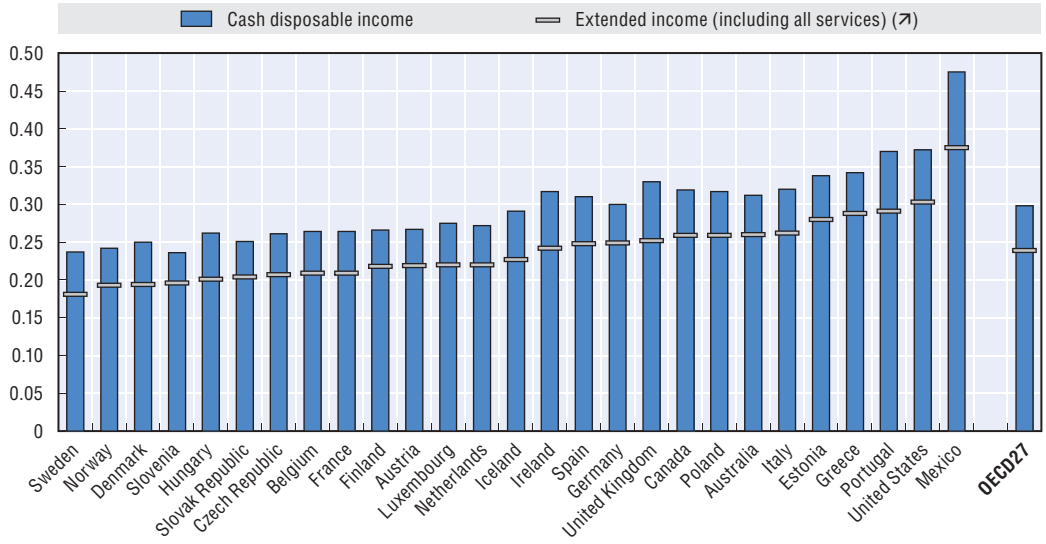
Rising top-income shares: what implications for tax policy?

There was a rise in the share of top-income recipients in total gross income in the three decades from 1980 to 2010 in all countries, with considerable variation from country to country. It was most marked in the United States: prior to the onset of the financial and economic crisis in 2008, the share of the richest 1% in all income reached close to 20%. However, it was also large in a number of other English-speaking countries (Australia, Canada, Ireland and the United Kingdom). Elsewhere, increases tended to be greater in the Scandinavian and Mediterranean countries than in Continental European countries (Figure 12).

Even within the group of top income earners, incomes became more concentrated (Atkinson *et al*., 2011). In the United States, for instance, the share of the top 0.1% in total pre-tax income quadrupled in the 30 years to 2008. Just prior to the global recession, the top 0.1% accounted for some 8% of total pre-tax incomes in the United States, some 4-5% in Canada, the United Kingdom, and Switzerland, and close to 3% in Australia, New Zealand, and France (Chapter 9).

Figure 11. **In-kind benefits from public services are redistributive in all OECD countries**

Household income inequality (Gini coefficients) before and after accounting for services from education, health, social housing and care services, 2007



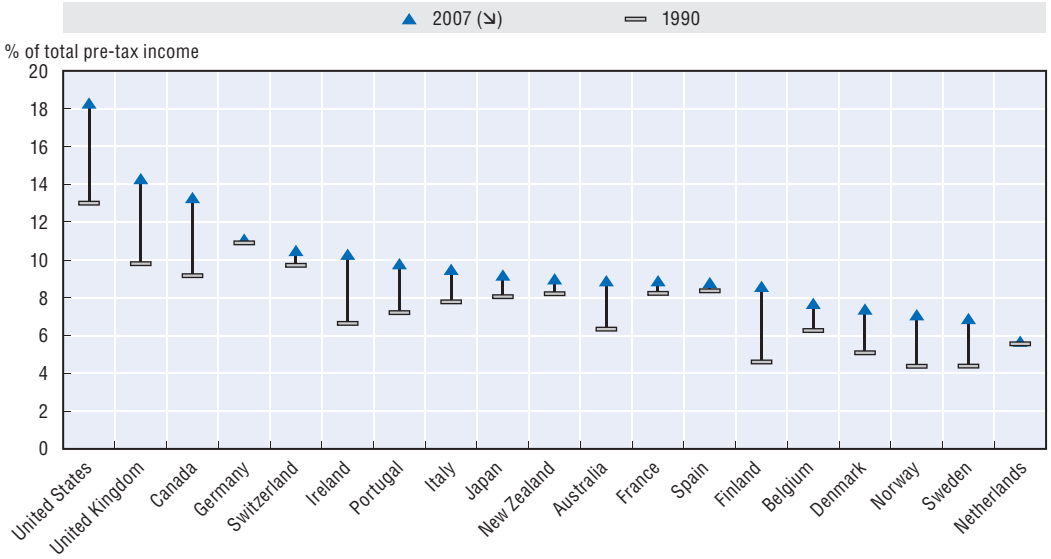
Note: Countries are ranked in increasing order of inequality of extended income, *i.e.* disposable income adjusted for the money value of services in education, health care, social housing, and the care of children and the elderly.

Source: Chapter 8, Table 8.2.

StatLink http://dx.doi.org/10.1787/888932535375

Figure 12. **The share of top incomes increased, especially in English-speaking countries**

Shares of top 1% incomes in total pre-tax incomes, 1990-2007 (or closest year)



Note: 2007 values refer to 2006 for Belgium, France and Switzerland; 2005 for Japan, Netherlands, New Zealand, Portugal, Spain and the United Kingdom; 2004 for Finland; and 2000 for Germany and Ireland. Countries are ranked by decreasing shares in the latest year.

Source: Chapter 9, Figure 9.A2.2.

StatLink http://dx.doi.org/10.1787/888932535394

There are several reasons why the share of top incomes surged in the 1990s and 2000s. They include a more global market for talent and a growing use of performance-related pay which particularly benefitted top executives and finance professionals, as well as changes in pay norms. Behavioural responses to reductions in marginal tax rates played a significant part in these developments. Top rates of personal income tax, which were in the order of 60-70% in major OECD countries, fell to around 40% on average by the late 2000s.

These marginal rates reveal how much tax is paid on the last dollar earned, which is what drives incentives. However, the redistributional effects of tax regimes depend on the percentage of total income actually paid in taxes, the so-called "effective tax rate". Just prior to the 2008-09 global downturn, effective tax rates of the top percentile group were in the order of 35-38% for a group of typical OECD countries (Australia, Belgium, Canada, Italy, Netherlands, Norway, and Sweden). The rise in the share of top-income recipients in total income is a sign that their capacity to pay tax increased and progressive tax reforms may thus be an effective tool. In particular, tax reforms that increase average tax rates without raising marginal rates (*e.g.* by scaling back tax reliefs) could enable greater redistribution without undue blunting of incentives.

3. Lessons for policies

Rising income inequality creates economic, social and political challenges. It can stifle upward social mobility, making it harder for talented and hard-working people to get the rewards they deserve. Intergenerational earnings mobility is low in countries with high inequality such as Italy, the United Kingdom, and the United States, and much higher in the Nordic countries, where income is distributed more evenly (OECD, 2008). The resulting inequality of opportunity will inevitably impact economic performance as a whole, even if the relationship is not straightforward. Inequality also raises political challenges because it breeds social resentment and generates political instability. It can also fuel populist, protectionist, and anti-globalisation sentiments. People will no longer support open trade and free markets if they feel that they are losing out while a small group of winners is getting richer and richer.

Reforming tax and benefit policies is the most direct and powerful instrument for increasing redistributive effects. Large and persistent losses in low-income groups following recessions underline the importance of well-targeted income-support policies. Government transfers – both in cash and in-kind – have an important role to play in guaranteeing that low-income households do not fall further back in the income distribution.

At the other end of the income spectrum, the relative stability of higher incomes – and their longer-term trends – are important to bear in mind in planning broader reforms of redistribution policies. It may be necessary to review whether existing *tax provisions* are still optimal in light of equity considerations and current revenue requirements. This is especially the case where the share of overall tax burdens borne by high-income groups has declined in recent years (*e.g.* where tax schedules became flatter and/or where tax expenditures mainly benefitted high-income groups).

However, redistribution strategies based on government transfers and taxes alone would be neither effective nor financially sustainable. First, there may be counter-productive disincentive effects if benefit and tax reforms are not well designed. Second, most OECD countries currently operate under a reduced fiscal space which exerts strong

pressure to curb public social spending and raise taxes. *Growing employment* may contribute to sustainable cuts in income inequality, provided the employment gains occur in jobs that offer career prospects. Policies for *more and better jobs* are more important than ever.

A key challenge for policy, therefore, is to facilitate and encourage *access to employment* for under-represented groups, such as youths, older workers, women and migrants. This requires not only new jobs, but jobs that enable people to avoid and escape poverty. Recent trends towards higher rates of in-work poverty indicate that job quality has become a concern for a growing number of workers. Policy reforms that tackle inequalities in the labour market, such as those between standard and non-standard forms of employment, are needed to reduce income inequality. The lessons from the Restated Jobs Strategy (OECD, 2006), adapted to recent experience, provide important guidelines in this respect, *e.g.* with regard to more balanced policy measures between temporary and permanent employment contracts.

Finally, policies that invest in the *human capital* of the workforce are key. Over the past two decades, the trend to higher educational attainment has been one of the most important elements in counteracting the underlying increase in earnings inequality in the long run. Policies that promote the up-skilling of the workforce are therefore key factors for reversing the trend towards further growth in inequality.

Human capital policies comprise two main strands. First, better *job-related training and education* for the low-skilled (on-the-job training) would help to boost their productivity potential and future earnings. This requires measures to ensure that training markets perform better, as well as ensuring sufficient incentives for both workers and firms to invest more in on-the-job training (OECD, 2006). To compensate for mobility (staff turnover), corporate tax policies that encourage employers to make additional investments in the human capital of their employees are warranted (*e.g.* deduction of training expenses as business costs).

The second strand is equal access to *formal education over working life*. Access to tertiary education is important for improving the prospects and living standards of lower-skilled people and giving individuals the opportunity to acquire the skills needed in the labour market. Educational or learning accounts can be a means to help achieve this objective (OECD, 2005), but tax incentives need to be designed in such a way that they do not disproportionally benefit higher-wage earners in high marginal tax rates.

The new OECD work presented in this report shows that there is nothing inevitable about growing inequalities. Globalisation and technological changes offer opportunities but also raise challenges that can be tackled with effective and well-targeted policies. Regulatory reforms can be designed in such a way that they make markets more efficient and encourage employment while reducing inequalities at the same time. Labour market and social policies also need to be adapted to changing household structures. Policies for inclusive growth are required in the current situation. Any policy strategy to reduce the growing divide between the rich and poor should rest on three main pillars: more intensive human capital investment; inclusive employment promotion; and well-designed tax/transfer redistribution policies.

Notes

1. 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.
2. Due to data availability at the time of writing, this report considers trends in income inequality up to 2008. The possible distributive effects of the global recession of 2008-09 could not be captured. Little international empirical evidence has become available since then. To make a first assessment of the distributive impacts of the Great Recession and subsequent recovery, an important recent study by Jenkins *et al.* (2011) uses microdata up to 2009 in combination with macroeconomic aggregates for the 2007-11 period in 21 OECD countries. It finds that the recession had no significant short-term distributional impacts in most countries, partly because the household sector was protected by additional public support through the tax and benefit system. Further, the effects of increasing unemployment, which drove inequality up, and declining capital income, which had an equalising effect, tended to cancel each other out.
3. This is often associated with the so-called Heckscher-Ohlin-Samuelson model or variants thereof (for a review see Freeman, 2009).
4. Of course, "inequality" can also be framed in a broader sense than income, *e.g.* inequality in consumption, or inequality of resources, including assets and wealth. This report is, however, concerned with *income* inequality and its subaggregates.
5. Some authors also include aspects of political and social globalisation into their empirical models, using composite globalisation indicators (Dreher and Gaston, 2008; Heshmati, 2004). These aspects are excluded from the framework applied here.
6. The parts of the report which look at household earnings and household income use the "equivalised income" concept which corrects for household size. This means that the status of other household members (including children and pensioners), as well as their income sources, influence the individual's income position. The unit of observation remains, however, the working-age individual. Exceptions are the two final chapters which consider the entire population.
7. Figure 3 uses the sum of cross-border liabilities and assets as a proxy for financial openness and R&D expenditures as a proxy for technological change. Other proxies for these drivers have been used in the literature and additional proxies have been applied in the analyses in Part I of this report.
8. This report considers tax and benefit programmes up to the late 2000s. It therefore does not capture more recent measures and initiatives that countries have implemented, partly in response to the recession. Many of these measures are focused on lower-income groups and are likely to impact on the distribution of household income. As an example, Chile introduced a cash transfer known as "Asignacion Social" alongside other means-tested programmes in 2011.
9. Chapter 8 includes only those 27 OECD countries for which micro-data were available for imputing the value of spending on public services. However, there is also evidence from national sources in some of the remaining countries that public services have had a significant redistributive impact, *e.g.* Engel *et al.* (1999) for Chile.

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ANNEX A1

Trends in Different Income Inequality Measures

Table A1.1. **Trends in different income inequality measures**

	Levels in late 2000s					Percentage point change									
						Gini		S80/S20		P90/P10		SCV		MLD	
	Gini coefficient	Interquintile share ratio (S80/S20)	Interdecile ratio (P90/P10)	Squared coefficient of variation (SCV)	Mean log deviation (MLD)	Mid-1980s to mid-1990s	Mid-1990s to late 2000s	Mid-1980s to mid-1990s	Mid-1990s to late 2000s	Mid-1980s to mid-1990s	Mid-1990s to late 2000s	Mid-1980s to mid-1990s	Mid-1990s to late 2000s	Mid-1980s to mid-1990s	Mid-1990s to late 2000s
Australia	0.336	5.7	4.5	0.374	0.183	. .	2.7	. .	0.8	. .	0.5	. .	–0.9	. .	–0.6
Austria	0.261	3.8	3.2	0.281	0.114	0.2	. .	0.1	. .	0.1	. .	1.4	. .	–0.2	. .
Belgium	0.259	3.8	3.3	0.285	0.114	1.3	. .	0.0	. .	0.0	. .	7.5	. .	0.4	. .
Canada	0.324	5.4	4.2	0.754	0.193	–0.4	3.5	–0.2	0.8	–0.1	0.4	0.8	34.8	–1.1	4.0
Chile	0.494	12.8	8.5	1.751	0.449	. .	–3.3	. .	–2.6	. .	–1.7	. .	–30.4	. .	–5.5
Czech Republic	0.256	3.6	2.9	0.360	0.111	2.6	–0.1	0.4	0.0	0.3	0.0	5.3	0.1	1.9	0.1
Denmark	0.248	3.5	2.8	0.671	0.122	–0.6	3.3	–0.1	0.5	–0.2	0.2	3.0	39.0	–0.7	3.9
Estonia	0.315	5.1	4.3	0.384	0.171	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Finland	0.259	3.8	3.2	0.318	0.114	2.1	3.2	0.0	0.8	0.1	0.4	7.8	7.5	1.2	2.4
France	0.293	4.3	3.4	0.525	0.148	–2.3	1.6	–0.4	0.3	0.0	0.0	–77.7	20.2	–3.0	1.8
Germany	0.295	4.5	3.5	0.634	0.149	1.5	3.0	0.4	0.6	0.3	0.3	4.1	29.8	1.6	2.9
Greece	0.307	4.8	4.0	0.473	0.162	0.0	–2.8	–0.1	–1.0	–0.2	–0.7	1.1	–9.3	–0.4	–3.7
Hungary	0.272	3.9	3.1	0.398	0.128	2.1	–2.1	0.4	–0.4	0.3	–0.4	12.1	–6.6	1.7	–1.6
Iceland	0.301	4.4	3.2	0.571	0.155	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Ireland	0.293	4.4	3.7	0.376	0.144	–0.6	. .	–0.4	. .	–0.1	. .	32.0	. .	–3.0	. .
Israel[1]	0.371	7.7	6.2	0.911	0.270	1.2	3.3	0.3	2.1	0.5	1.4	17.5	1.0	0.9	7.7
Italy	0.337	5.6	4.3	0.595	0.221	3.9	–1.1	1.4	–0.7	0.8	–0.5	20.0	–5.3	6.8	–1.8
Japan	0.329	6.0	5.0	0.453	0.202	1.9	0.6	0.7	0.3	0.5	0.5	4.6	–6.5	3.0	0.0
Korea	0.315	5.7	4.8	0.374	0.190	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Luxembourg	0.288	4.2	3.4	0.405	0.138	1.2	2.9	0.2	0.6	0.2	0.3	2.6	13.2	1.0	2.7
Mexico	0.476	13.0	9.7	2.827	0.417	6.6	–4.3	4.1	–2.5	2.1	–1.1	150.2	20.2	11.3	–7.2
Netherlands	0.294	4.4	3.3	. .	. .	2.5	–0.3	0.6	0.0	0.5	–0.1	. .	. .	. .	. .
New Zealand	0.330	5.3	4.2	. .	. .	6.4	–0.5	1.3	0.0	0.7	0.1	. .	. .	. .	. .
Norway	0.250	3.7	3.0	0.096	0.132	2.1	0.7	0.4	0.2	0.0	0.1	2.8	–20.2	2.9	1.3
Poland	0.305	4.8	4.0	0.418	0.158	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Portugal	0.353	6.1	4.9	0.620	0.211	3.0	. .	0.8	. .	0.4	. .	14.5	. .	3.6	. .
Slovak Republic	0.257	3.7	3.1	0.255	0.113	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Slovenia	0.236	3.4	3.0	0.204	0.095	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Spain	0.317	5.7	4.6	0.340	0.188	–2.8	. .	–1.3	. .	–0.9	. .	–65.6	. .	–6.0	. .
Sweden	0.259	3.9	3.2	1.074	0.125	1.4	4.8	0.2	0.9	0.1	0.7	7.9	87.1	1.5	4.2
Switzerland	0.303	4.7	3.7	0.527	0.164	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Turkey	0.409	8.1	6.2	1.130	0.291	5.6	–8.1	2.0	–3.1	0.3	–0.7	. .	. .	. .	. .
United Kingdom	0.345	5.8	4.6	0.861	0.252	2.7	0.9	0.8	0.2	0.5	0.2	18.7	–6.8	3.9	3.2
United States	0.378	7.7	5.9	0.752	0.286	2.3	1.8	0.5	0.8	0.0	0.5	30.2	2.7	2.9	3.7
OECD20	0.316	5.5	4.3	0.735	0.192	2.1	0.5	0.6	0.0	0.3	0.1	12.4	11.8	2.1	1.4
OECD34	0.314	5.4	4.3	0.625	0.185	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .

Note: Income refers to disposable household income, corrected for household size and deflated by the consumer price index (CPI). Earliest year refers to 1985, except for Austria, Belgium, Sweden (1983); France, Italy, Mexico, United States (1984); Finland, Luxembourg, Norway (1986); Ireland (1987); Greece (1988); Portugal (1990); Hungary (1991); Czech Republic (1992). Latest year refers to 2008, except for Chile (2009); Denmark, Hungary, Turkey (2007); Japan (2006). OECD20 excludes countries for which no longer-term trends are available.

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932537408

Special Focus: Inequality in Emerging Economies (EEs)

Emerging countries are playing a growing role in the world economy. It is a role that is expected to be even greater in the future. It is important, therefore, that any comprehensive assessment of inequality trends worldwide considers the emerging economies. This chapter discusses inequality patterns and related issues in the biggest emerging economies. It begins with a brief overview of such patterns in selected countries, before going on to examine in greater detail the main drivers of inequality. The following section outlines the key features and challenges of underlying institutional settings. Finally, the chapter sets out some key policy challenges that the emerging economies need to address to improve income distribution and curb inequalities, while promoting more and better jobs.

1. Introduction

Emerging countries are playing a growing role in the world economy. It is a role that is expected to be even greater in the future. It is important, therefore, that any comprehensive assessment of inequality trends worldwide considers the emerging economies.

This special focus chapter examines inequality patterns and key related policy challenges in Argentina, Brazil, China, India, Indonesia, the Russian Federation and South Africa. These countries form the group of the world's largest emerging economies. Henceforth collectively referred to as EEs, they total about one fifth of global GDP and close to half the world's population. At a time when restoring sustainable growth after the Great Recession is a key priority, they are playing a very crucial role in supporting the global economy. As active participants in the Group of Twenty (G20), the EEs are also actively engaged in shaping the post-crisis global governance architecture.

The emerging economies represent a highly heterogeneous group, in terms of economic size, population, levels of per capita income and growth performance over the past decade (OECD, 2010a; OECD, 2010b). China and India, for example, are among the largest economies and the two most populous countries in the world, while Argentina and South Africa are considerably smaller economies. Moreover, the EEs have reached different stages of development, with the variation among their incomes being similar to that among the 34 OECD countries. Their long-term patterns of development also differ.

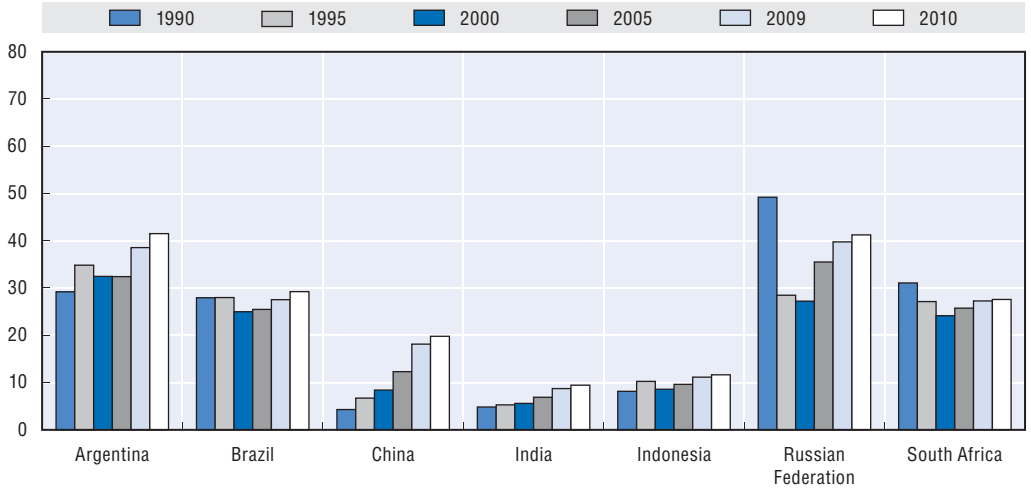
While diverse, the EEs share several important economic features:

- First, prior to the onset of the Great Recession, virtually all EEs enjoyed a prolonged period of relatively robust growth – with growth rates generally higher than the OECD average. Moreover, the EEs have shown a greater resilience than the OECD member countries during the global crisis of 2008-09. Their growing integration into the world economy, supported by domestic policy reforms, has been a key determinant in helping the move towards stronger and more sustainable growth.
- Second, economic growth has enabled the EEs to achieve considerable progress in the fight against poverty. During the two decades to 2008, the fall in the extent of absolute poverty was particularly dramatic for Brazil, China and Indonesia, while India and South Africa recorded more modest reductions.[1] As of today, important cross-country differentiation in absolute poverty remains observable, however. At one end, India has the highest headcount poverty rate of the seven countries – with about 42% of its population still living on less than USD 1.25 per day. At the other end, Argentina and Russia have virtually eradicated absolute poverty, using the same yardstick.
- Third, it is undeniable that the potential for catch-up to the income levels of the OECD countries remains significant for the EEs going forward (Figure 0.1).

Figure 0.1. **GDP per capita**

Constant 2005 PPPs

Relative to the median of the upper half of OECD countries



Source: World Bank, International Comparison Program Database.

StatLink http://dx.doi.org/10.1787/888932535413

This chapter focuses on within-country inequality in the EE countries. Its main findings and policy challenges are as follows:

- *All EEs have levels of income inequality significantly higher than the OECD average.*
- *Brazil, Indonesia and, on some indicators, Argentina have recorded significant progress in reducing inequality over the past 20 years.* By contrast, China, India, the Russian Federation and South Africa have all become less equal over time and inequality levels in Argentina and Brazil do remain high. Inequality in South Africa and Russia has also reached high levels.
- *While the challenge of tackling inequality is common to EEs and OECD countries, the underlying forces of inequality in the EEs are different from those in the OECD countries.* Key sources of inequality include a large, persistent informal sector, widespread regional divides (*e.g.* urban-rural), gaps in access to education, and barriers to employment and career progression for women.
- *The benefit and tax systems in EEs play a lesser role than in the OECD countries in easing market-driven inequality.* The coverage and generosity of social protection systems is generally lower than in most OECD countries. Social spending is highest in Brazil and Russia, where it represents about three-quarters of the OECD average, while in China and India it is three to four times lower than the OECD average. At the same time, the tax system delivers only modest redistribution, reflecting such problems as tax evasion and administrative bottlenecks to collect taxes on personal income. The background is one of high levels of self-employment and sizeable informal sectors, which together limit the capacity of the tax authorities to verify taxpayers' declared income.
- *Reducing inequality while at the same time promoting more and better jobs in the EEs requires a multipronged approach.* Such an approach should encompass four key areas: 1) better incentives for more formal employment; 2) provisions of social assistance that target those most in need; 3) spreading the rewards from education; and 4) preparing to finance higher social spending in the future. While these are the selected areas reviewed in the

present chapter, it is important to underline that tackling inequality goes beyond the remit of labour, social welfare and tax policies. Other policies, such as those aimed at improving the business environment, product market regulation, infrastructure development, health care and public administration reforms also have a role to play in reducing inequality. They may not be expensive for governments and can help reduce inequality by facilitating the creation and expansion of firms – and therefore jobs – in the formal sector. That being said, the main conclusions from analysis of the areas covered in this chapter are as follows:

- Shifting the emphasis from protecting jobs to enhancing employability could lead to more hiring in the formal sector and to the creation of better quality jobs. Labour market policies could thus complement policy measures in other areas to expand the size of the formal sector – *e.g.* in the tax domain, along with product market regulatory reforms to enhance competition.
- Social welfare programmes could be further strengthened by better targeting individuals most in need, together with promoting mechanisms of in-work benefits. Given the large informal sector in all EEs, it is more difficult to use taxes for redistribution purposes and greater focus should be placed on benefit systems.
- Conditional cash transfers may be particularly well suited to reducing inequality and promoting social mobility in the EEs. The fact that they combine income support with the requirement to maintain investment in human capital and child health means that they can be useful tools not only for tackling household poverty, but also for promoting school enrolment and improving healthcare for children. This approach will have longer-term beneficial effects on labour market outcomes in the EEs.
- Addressing inequalities in both access to, and quality of, education can also make an important contribution to lowering inequality in labour income.
- Enhancing the distributive capacity of the tax system would require an emphasis on improving revenue collection procedures and strengthening the extent to which taxpayers comply voluntarily with their obligations. A focus on the fight against corruption would also help improve tax collection.

The reminder of this special focus chapter is in four parts. Section 2 gives a brief overview of inequality patterns in the EEs. Section 3 discusses the main drivers of inequality, while Section 4 sketches out the key features of the underlying institutional settings. Section 5 sets out the key policy challenges to improve redistribution and curb inequalities while promoting more and better jobs in this group of countries. Although the chapter chiefly analyses the EEs, the experience of some OECD countries – *e.g.* Chile, Mexico and Turkey, which are more suitable to be compared with the EEs – may also be relevant to provide valuable insights about how to address inequality. Thus, where appropriate for adding value to discussion of institutional arrangements and policy challenges, the chapter refers to the practices and reforms that have worked well in these OECD countries.

2. Inequality patterns in EEs

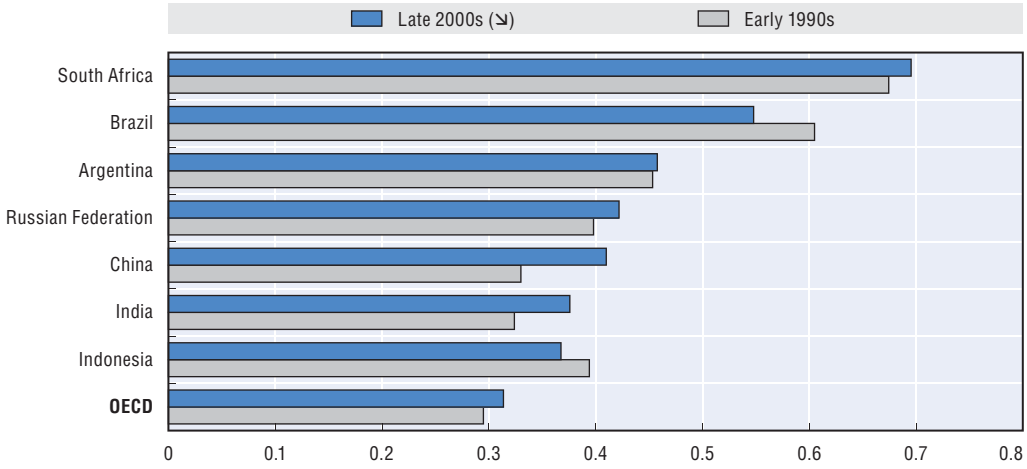
Assessing the extent of income inequality and its evolution over time in the EEs is made particularly complex by the fact that they use different statistical measures of household well-being. Some countries tend to rely on the collection of household income data and others on consumption expenditure, with inequality estimates based on

household consumption typically showing a lower level of inequality than those based on income measures. In addition, assessing inequality raises specific measurement issues within each statistical source of information.[2]

With measurement-related differences in mind, two main points stand out in Figure 0.2, which shows the EEs' Gini indicators, based on available household statistics. First, EE countries have higher levels of income inequality than the OECD average – the Gini indicator for Brazil is almost twice as large, while an even bigger difference is observed for South Africa.

Figure 0.2. **Change in inequality levels, early 1990s *versus* late 2000s**[1]

Gini coefficient of household income[2]



1. Figures for the early 1990s generally refer to 1993, whereas figures for the late 2000s generally refer to 2008.
2. Gini coefficients are based on equivalised incomes for OECD countries and *per capita* incomes for all EEs except India and Indonesia for which per capita consumption was used.

Source: OECD-EU Database on Emerging Economies and World Bank, World Development Indicators.

StatLink http://dx.doi.org/10.1787/888932535432

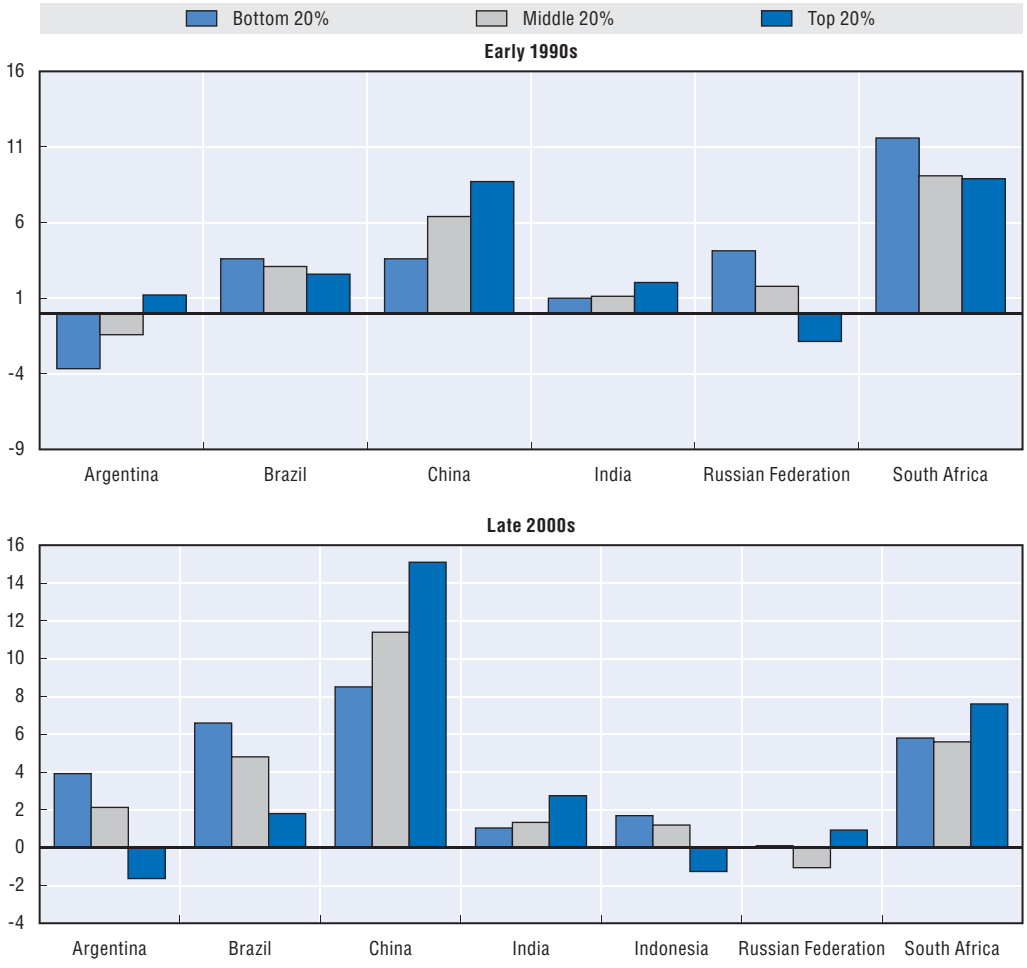
Second, inequality trends show wide differences across EEs. At one extreme, strong output growth during the past decade went hand-to-hand with declining income inequality in two countries (Brazil and Indonesia). At the other extreme, four countries (China, India, the Russian Federation and South Africa) recorded steep increases in inequality levels during the same period, even though their economies were also expanding strongly. Argentina is the only country where inequality was broadly stable.[3]

Another way to describe inequality is by looking at changes in household income for different groups, notably those at the bottom, the middle and the top of the distribution (Figure 0.3). Larger rises in income for those at the bottom and middle of the income distribution may, in particular, signal that opportunities and equalisation are both growing. This analysis is also important for gauging a possible dynamic towards the emergence of a significant middle class in the EEs.[4]

Figure 0.3 suggests that in Argentina, Brazil and Indonesia, where the Gini coefficient has declined or remained stable overall for the period observed, the main beneficiaries were those at both the bottom and the middle of the income distribution. Indeed, the three countries stand out for their observed increases in real household incomes in the bottom and the middle quintiles which, during the 2000s outpaced the performance of the top

Figure 0.3. **Change in real household income by quintile**[1, 2]

Average annual change in %



1. Figures for the early 1990s generally refer to the period between 1992-93 and 1999-2000, whereas figures for the late 2000s generally refer to the period between 2000 and 2008.
2. For China, data refer to urban areas only and data for India refer to real household consumption.

Source: OECD-EU Database on Emerging Economies and World Bank, World Development Indicators.

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quintile by a significant margin. For Argentina and Indonesia, the real household income of the top quintile declined on average over the period. Conversely, where inequality worsened, according to the Gini indicator, the distribution of income became increasingly concentrated: specifically in China, India, the Russian Federation and South Africa, the highest increases in real household income were systematically observed in the top quintile.

Although real income growth in Argentina and Brazil largely benefitted the lowest and middle incomes during the past decade, the top quintile still accounted for about 55% of total income in the mid-2000s in Argentina and 60% in Brazil. These levels place the two countries between South Africa – where the share for the top quintile total income was 75% – and the Asian EEs. In the latter, the shares for the top quintile range specifically between 40-45%, which is more in line with the OECD average (about 40%; see OECD, 2010a).[5]

3. Economic factors behind inequality

The economic factors behind high and often growing income inequality in the EEs tend to differ from those at work in most OECD countries. Widespread informality, together with persistently large geographical differences in economic performances, plays a particularly important role in shaping income inequality in all EEs. Informality and geographical disparities are, in turn, closely intertwined with other key drivers of inequality, namely gender, ethnic disparities, alongside disparities in educational outcomes and in labour market conditions (contract type, productivity, and so on). This section reviews each of these drivers of inequality in turn.

Spatial inequality

The forces underlying regional inequality are difficult to disentangle and often overlap. They typically involve the interplay of geographic, historical and institutional factors such as weak resource endowments and distance from markets, which constrain development in lagging regions. At the same time, spatial differences in economic outcomes can stem from long-standing power imbalances between advantaged and lagging regions, allied to institutional weaknesses, and ethnic and racial disadvantages.

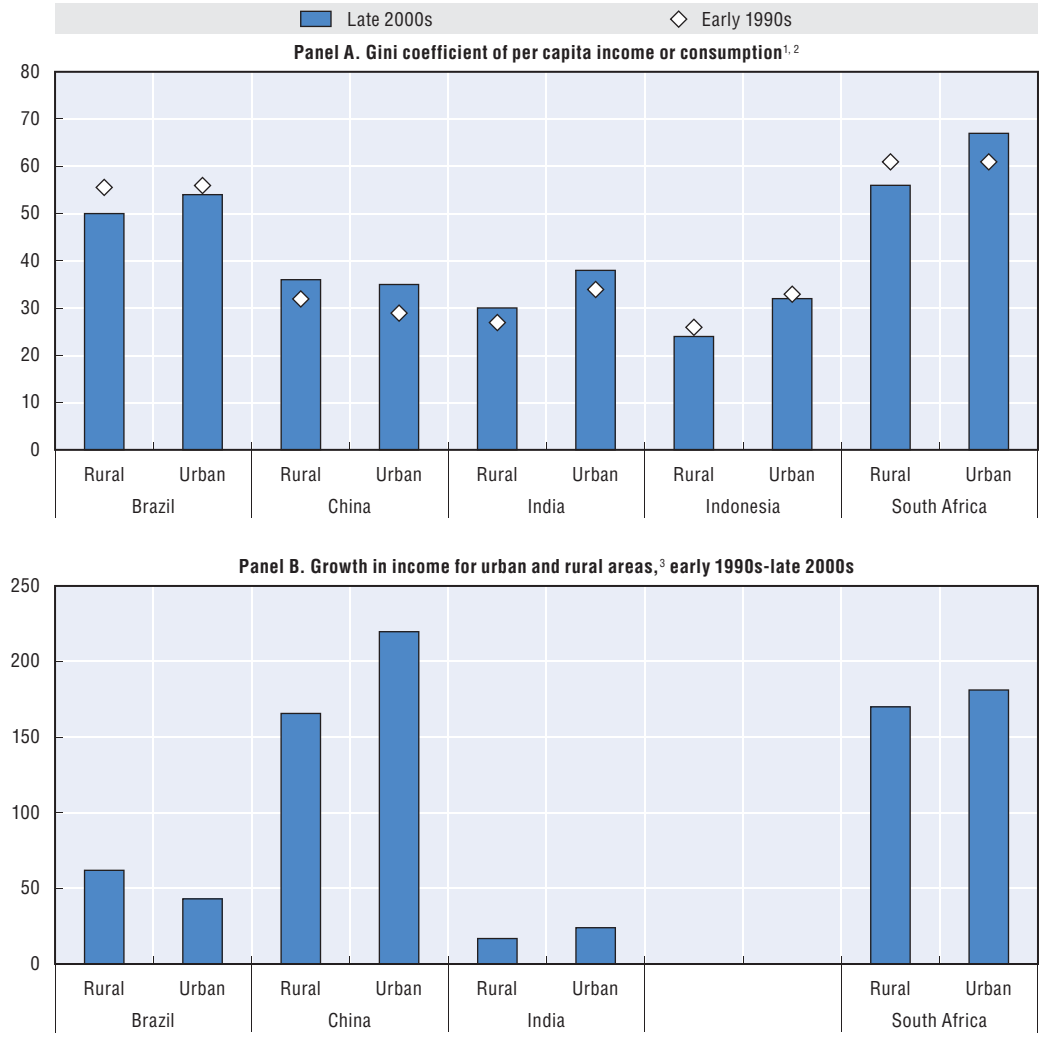
With regard to the EEs, inequality *within* both rural and urban areas is higher in Brazil and South Africa, than in China, India and Indonesia. That said trends differ across countries. Both China and India experienced some increase in income inequality within urban and rural areas alike from the early 1990s (Figure 0.4, Panel A). In Brazil and Indonesia, by contrast, income inequality declined over time in both urban and (especially) rural areas. For South Africa, the evidence is more mixed: urban inequality rose over time, in parallel to an easing of the rural divide.

Comparing the evolution of real incomes *between* rural and urban areas also yields interesting results. China and India, and, to a lesser extent, South Africa, saw greater rises in their *per capita* urban incomes than rural incomes, thereby suggesting an increase of inequality to the advantage of urban inhabitants (Figure 0.4, Panel B). Brazil is the only country among those observed where rural areas outpaced urban areas in *per capita* income growth – by as much as 40% from the 1990s. Such distributional gains were partly helped by the rural pension scheme (*previdência rural*), which provides benefits equal to the minimum wage to 8.4 million rural workers in Brazil (OECD-ILO, 2011d).

The forces behind observed patterns of spatial inequality vary. For China, there is increased evidence that growing spatial inequality stems mainly from differences within provinces rather than a divide across provinces. As documented by OECD work on rural policy in China (OECD, 2009b), there are great disparities in access to basic services between rural and urban populations within provinces. One example of such unequal access is that, while the permanent urban population (which excludes most migrants), is covered by medical insurance, the vast majority of the rural population is not. Access to education is also still very unequal (Herd, 2010). By contrast, trends in India tend to reflect the accentuation of imbalances between that country's states. Indeed, there appears to be growing concern in India that the benefits of growth were concentrated in the already richer states, ultimately contributing to widening the gap with the poorest and most populous states (*i.e.* Bihar, Madhya, Pradesh, Uttar Pradesh and Kerala).

Where historically disadvantaged ethnic, racial, and social groups are concentrated in particular regions, group-based inequality becomes reflected in regional inequalities

Figure 0.4. **Inequality in urban and rural areas**



1. China figures refer to 1993 and 2005, India figures refer to 1994 and 2005, Indonesia figures refer to 1993 and 1999 and South Africa figures refer to 1993 and 2008.
2. India data refer to household consumption.
3. Data refer to real incomes except for South Africa where it is nominal income.

Source: OECD-EU Database on Emerging Economies and World Bank, World Development Indicators.

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(World Bank, 2006). This is a particularly serious challenge for South Africa, where geographical divides reflect inequality between races. Although real incomes have been rising for all groups since the end of apartheid, many Africans still live in poverty. At any poverty yardstick, Africans are very much poorer than Coloureds, who are very much poorer than Indians/Asians, themselves poorer than whites. According to Leibbrandt *et al.* (2010), these are important factors in explaining the changing patterns of inequality according to rural and urban "geotypes" in South Africa.

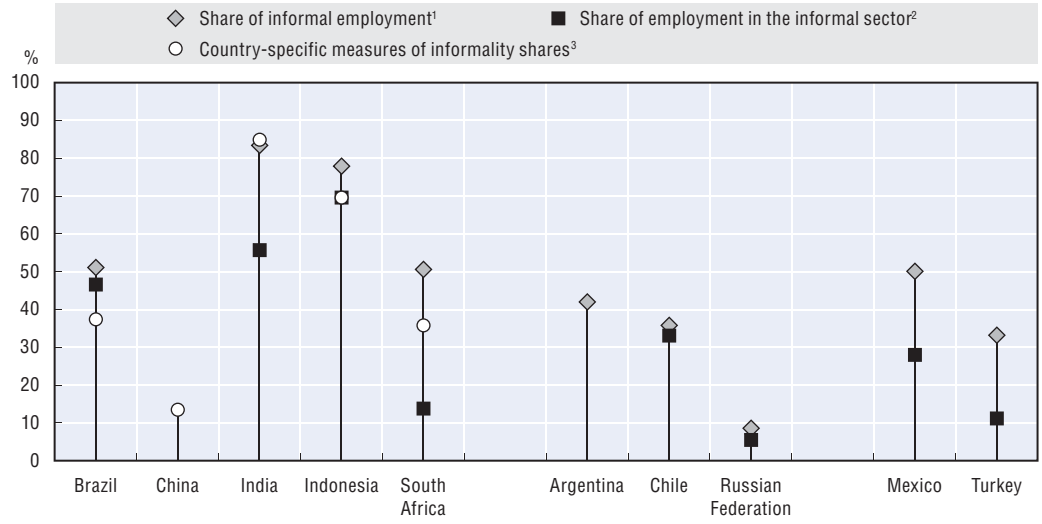
Gustafsson *et al.* (2011) take a closer look at the comparison between China and Russia, with the former being the world's largest country in terms of population, the latter in terms of territorial area, and both sharing a history of a centrally-planned economy. Based on a new, more comprehensive micro-data set of household income levels, the authors report a wider gap in average income between urban and rural households in still predominantly

rural China than in more urbanized Russia. China has long had in place such restrictions on-rural-to-urban migrations as the so-called *hukou* system. In addition, while the social insurance system tended over time to reduce urban-rural income inequality in Russia, it had the opposite effect in China, where for long it almost exclusively targeted the urban population. However, because the study refers to the early 2000s, it neglects to take into account the significant progress made in extending social protection in China's rural areas during the second half of the decade.

Informality

Although the extent of informality is difficult to measure, various indicators suggest that informal economic relations are particularly widespread in India and Indonesia and to a lesser, albeit still sizeable extent, in Brazil, China, South Africa and Russia (Figure 0.5). In Brazil, informal jobs are mainly concentrated in low-skill-intensive sectors such as agriculture, construction, hotels and restaurants, domestic services, and wholesale and retail trade. In China, undeclared rural migrants and workers laid off by urban state and collective enterprises account for the largest share of informal employment. In both India and Indonesia, informal employment includes a disproportionate number of women, home-based workers, street sellers and workers sub-contracted by firms in the formal sector.

Figure 0.5. **Informality in emerging economies**



1. The share of informal employment is based on a standardized definition, and excludes agriculture. Latest available estimate shown: 2000-07 (Brazil and South Africa); 1995-99 (India and Indonesia); unavailable for China. See Jutting and Laigesia (2009) for more details.
2. The share of employment in the informal sector is based on the ILO KLIM database. Definition for Argentina (2001): urban population only; Brazil: unincorporated urban enterprises employing five or less employees and producing goods and services for sale (excludes agriculture). India (2000): all unincorporated proprietary and partnership enterprises producing all or some of their goods or services for sale. Indonesia (2004): all own-account and unpaid family workers and employees in agriculture, and own-account workers (unless professional, administrative, or clerical) not assisted by other persons. South Africa (2004): business activities which are not registered for taxation, for professional groups' regulatory requirements, or for similar acts.
3. Country-specific measures of informality shares based on *OECD Economic Surveys* (OECD, 2007a, 2008a, 2008b, 2009a) and *OECD Employment Outlook* (2007b). Definition for Brazil (2009): own-account workers and employees without social contributions. China (2008): self-employed. India (2004): workers not covered by the employee's provident fund. Indonesia (2004): own-account workers and unpaid workers. South Africa (2008): workers without pension and medical plans.

Source: OECD (2010), *Economic Policy Reforms 2010: Going for Growth*.

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Prima facie informality does not necessarily translate into higher income inequality. This is because informal work favours increases in household income, mainly at the bottom of the income distribution. Nevertheless, there is supportive evidence for the view that the persistent informal economic relations lead to greater income inequality (Jutting and Laigesia, 2009). In the EEs, this outcome reflects the interplay of several forces. First, informal jobs typically carry a sizeable wage penalty. Second, informal jobs are significantly more unstable than formal ones. Third, informal jobs considerably limit opportunities for human capital accumulation and career progression. Furthermore, employment in the informal sector can also be detrimental to a worker's subsequent prospects for formal employment, thereby entrapping the low-skilled and contributing to the persistence of income inequality.

While there might be a voluntary upper tier among informal workers, most find themselves in the informal sector involuntarily. Informality affects the less privileged – *e.g.* youth and the low skilled, who, because of their demographics and levels of educational attainments, account for a relatively large share of labour supply in the EEs (OECD, 2010b). Moreover, the informal sector includes many self-employed workers with low levels of physical capital, which is reflected in low productivity and subsistence levels of income.

Importantly, informality means that many workers in the EEs remain outside the scope of labour market and social protection regulations. Only better-off workers, typically in the formal sector, enjoy any protection in the event of dismissal. Even for them, however, the loss of their job is likely to mean a move into worse working conditions, often in the informal sector. Labour reallocation then imposes on workers high welfare costs and inefficient job matching that negatively affects wage earnings and labour productivity.

Education

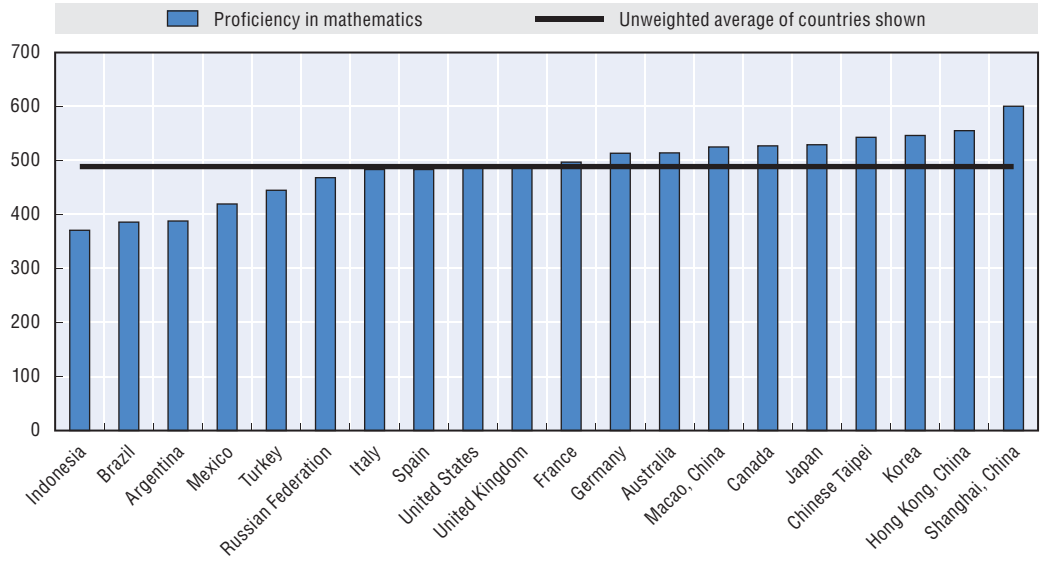
Education is of great intrinsic importance when assessing inequalities of opportunity. Educational institutions that give children from different backgrounds equal opportunities to benefit from quality education are generally associated with improved employment prospects and higher average earnings. Furthermore, education tends to be positively associated with well-being and social outcomes such as health status and willingness to participate and become socially active. By fostering social cohesion, the benefits of greater opportunities for education accrue to society as a whole.

School attainment rates have increased markedly in the EEs. With the exception of India and South Africa, primary attainment rates are today broadly similar to the average seen in the OECD for younger cohorts, although they remain lower for secondary and tertiary enrolments (OECD-ILO, 2011a; OECD, 2010b). Notwithstanding the improvements achieved, enrolment varies markedly, both geographically and between population groups – *i.e.* it is significantly lower in rural areas and is lower for girls than for boys. While in most EEs primary education is generally available in every local community, secondary education may require travelling or moving to larger urban areas, making attendance more difficult for children from disadvantaged households in rural areas, especially for girls still spending time working or helping with household duties. The lack of role models for girls and entrenched social roles still hamper the closing of the gender gap in education in several EEs.

Increasing attendance cannot be an end in itself. Rather, it should be a means to improving learning outcomes and the employability and competences of the workforce. In this regard, indicators included in the OECD Programme for International Student

Assessment (PISA) as to the level of 15-year-olds' cognitive skills in the EEs show considerable variation in cognitive outcomes (Figure 0.6). In Argentina, Brazil and Indonesia, 15-year-olds perform comparatively poorly in mathematics and in PISA's other two cognitive domains, namely reading and science. Such weak outcomes may partly be associated with insufficient investment given that total public spending on education relative to GDP is generally low in the EEs.

Figure 0.6. **PISA scores in mathematics, 2009 (proficiency levels)**



Source: OECD Programme for International Student Assessment (PISA).

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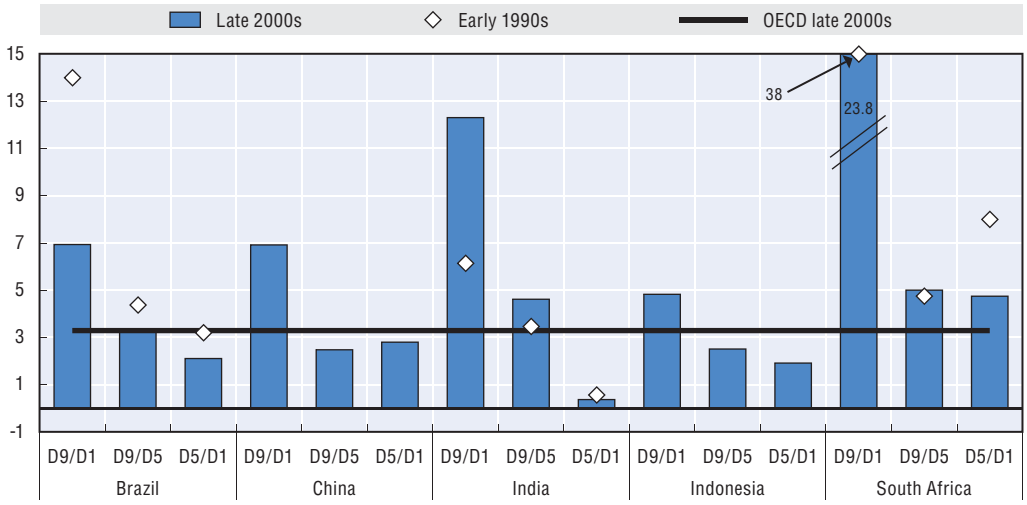
Impacts on earnings

The combination of marked spatial divides, persistently high shares of informal-sector jobs and disparities in access to education accounts for much of the widespread variation in earnings from work in the EEs. In Indonesia, Brazil and China, for example, the earnings in the top decile (conventionally labelled as D9) were by the late 2000s five to six times higher than those in the bottom decile (this latter labelled D1, Figure 0.7). In South Africa the gap was significantly larger, with the earnings in the top decile exceeding those in the bottom by more than twenty times. In India it is twelve times larger.

One country that has experienced a significant increase in earnings inequality over time is India, where the ratio between the top and the bottom deciles of the wage distribution has doubled since the early 1990s. The main driver has been an increase in wage inequality between regular wage earners – *i.e.* contractual employees hired over a period of time. By contrast, inequality in the casual wage sector – workers employed on a day-to-day basis– has remained more stable.

Unlike India, Brazil and South Africa underwent a marked compression of the ratio between the top and bottom deciles (D9/D1) of the earnings distribution, which was almost halved during the period between the early 1990s and late 2000s. The figures for South Africa, however, mask the fact that it had achieved most of the progress shown by the end of the 1990s. Thereafter, top earnings increased at a somewhat faster pace than those at the bottom of the distribution, which points to a partial erosion of earlier progress.

Figure 0.7. **Earnings inequality, decile ratios**[1, 2]



Note: D9/D1: ratio of the wages of the 10% best-paid workers to those of the 10% least-paid workers, calculated as the ratio of the upper bound value of the 9th decile to the upper bound value of the 1st decile. D9/D5 (D5/D1): ratio of the wages of the 10% best-paid workers to those at the median of the earnings distribution. D5/D1: ratio of the wages of the workers at the median of the earnings distribution to those of the 10% least-paid workers. The OECD average refers to the D9/D1 decile ratio of full-time wage workers across 23 OECD countries. Data for the early 1990s generally refer to 1993, while for late 2000s generally refer to 2008.

1. For India, the weekly earnings distribution has been calculated irrespective of how many days in a week workers have actually worked. For China, only mean incomes per decile rather than upper-bound values are available. Nonetheless, comparison of the upper bounds with the mean incomes in other countries (*i.e.*, India and Indonesia) shows that the differences are not significant, while they are also relatively stable across the income distribution. Thus for China means instead of upper bounds have been used.
2. The age group for wage calculations is 15-64 for Brazil and South Africa and 15-59 for India.

Source: OECD-EU Database on emerging economies for Brazil, India and South Africa, and World Bank, World Development Indicators for China and Indonesia. StatLink http://dx.doi.org/10.1787/888932535527

Empirical studies highlight that gender and race discrimination in the labour market are important factors behind the often high levels of earnings inequality in the EEs, although it is important not to ascribe the gender wage gap to discrimination alone. Other concurrent contributory factors include differences in skills and work experience and sector-based composition of the workforce. With these caveats in mind, the evidence for Brazil shows that women's full-time real wages were half those of men in 1993, although the gap has progressively narrowed since then. As a result, Brazilian women earned two-thirds of men's real wages in 2008. Although the gap has fluctuated significantly depending on the year considered in South Africa, women were earning 60% of men's wages in real terms in both years observed (1993 and 2008). Some improvement in the breakdown of wage inequality by race can be observed from the early 1990s. Thus, by 2008 Africans earned on average four times less than whites – measured in real wages – against five times less in 1993 (Leibbrandt *et al.*, 2010).

4. Institutional arrangements shaping redistribution

Against the backdrop of important spatial economic gaps, large informality and, sometimes, very uneven access to education services, a comprehensive policy strategy is required to tackle the challenges posed by sizeable inequalities in income and earnings. Such a strategy should involve a mix of reciprocally reinforcing social and labour-market policies alongside education and tax policies. This certainly represents a difficult task in any country, including OECD members. As far as the EEs are concerned, strong economic

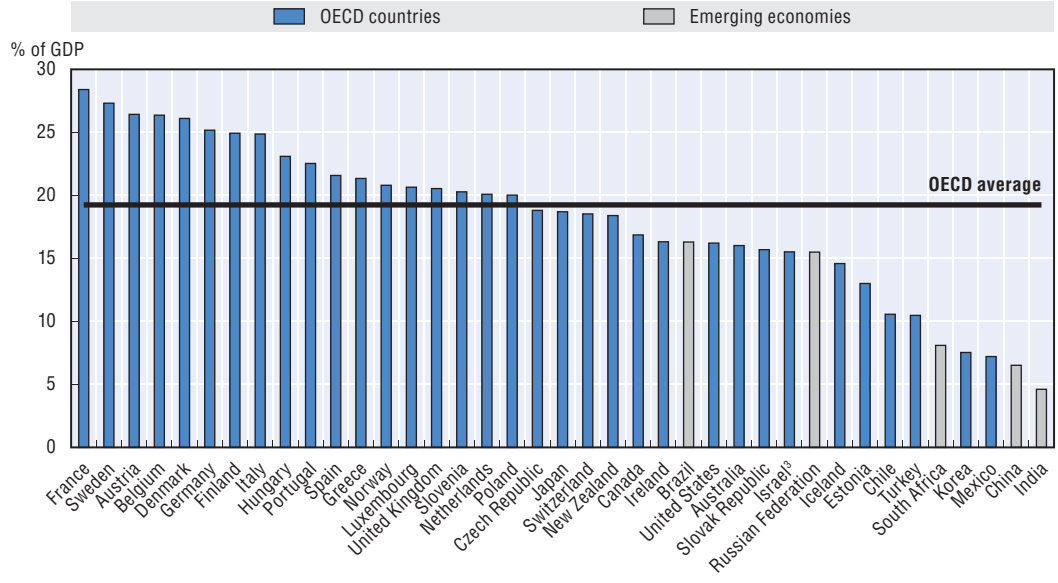
growth certainly provides a sound base for launching such a comprehensive strategy. On the other hand, the task is more difficult where less structured labour market and social welfare institutions come together with a tax infrastructure whose revenue raising and administrative capacities are relatively limited. Such institutional weaknesses hinder the expansion of public expenditure for social programmes.

How is social protection structured in the EEs?

The coverage and generosity of social protection is generally lower in the EEs than in most OECD countries. Total public social expenditure is well below the OECD average of almost 20% of GDP (Figure 0.8). However, there are significant variations among the EEs. Social spending as a percentage of GDP is highest in Brazil and Russia, where it represents about three quarters of the OECD average. China and India, by contrast, spend three to four times less on social protection than the OECD average.

Figure 0.8. **Public social expenditure in OECD countries and emerging economies**

Total public social expenditure, latest year available[1, 2]



1. Data refer to 2007 for OECD member countries, 2005 for Brazil, 2006-07 for India and South Africa and 2008 for China.
2. Policy areas covered include old-age, survivors, incapacity-related benefits, family, health, active labour market policies, unemployment, housing.
3. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD (2011), *OECD Employment Outlook*.

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Contributory social insurance programmes account for the bulk of public social expenditure in most EEs, particularly in China, India and Indonesia (OECD, 2010a). Even though programmes' coverage varies across countries, it is generally limited, and social expenditure is comparatively low. Most contributory social insurance tends to be in the form of pension schemes, covering workers chiefly in the formal sector and leaving the others unprotected. The share of the workforce contributing to a pension and/or health insurance plan ranges from about 10% India and Indonesia to 50-60% in Brazil and South Africa (OECD, 2011). To a large extent, low coverage reflects a high incidence of informality and self-employment.

Turning to EEs' unemployment compensation schemes, two main instruments are in place to protect workers against the income losses induced by job loss: severance pay (SP) and unemployment insurance (UI). In most EEs, SP is the main form of income support for workers from the formal sector who lose their jobs. Two exceptions are the Russian Federation – where UI and SP, are similar in size – and South Africa, where UI has a higher value than SP. In comparison, the value of unemployment benefits available to workers during the first year of unemployment exceeds that of severance pay in most OECD countries. Moreover, most have universal UI systems in place, while many do not have any mandatory SP programmes. Among OECD members who bear comparison with the EEs, SP for workers unemployed for one year exceeds UI in Chile and Turkey, for example. Mexico, by contrast, has an SP system in place, but no UI.

The value of *de jure* income support available to eligible job losers during the first year of unemployment differs substantially across emerging economies. In Brazil, for example, income support is markedly more generous than the OECD average. This reflects a combination of high SP with moderate levels of UI. In India, income support is substantially below the OECD average, with little or no benefits for the unemployed.

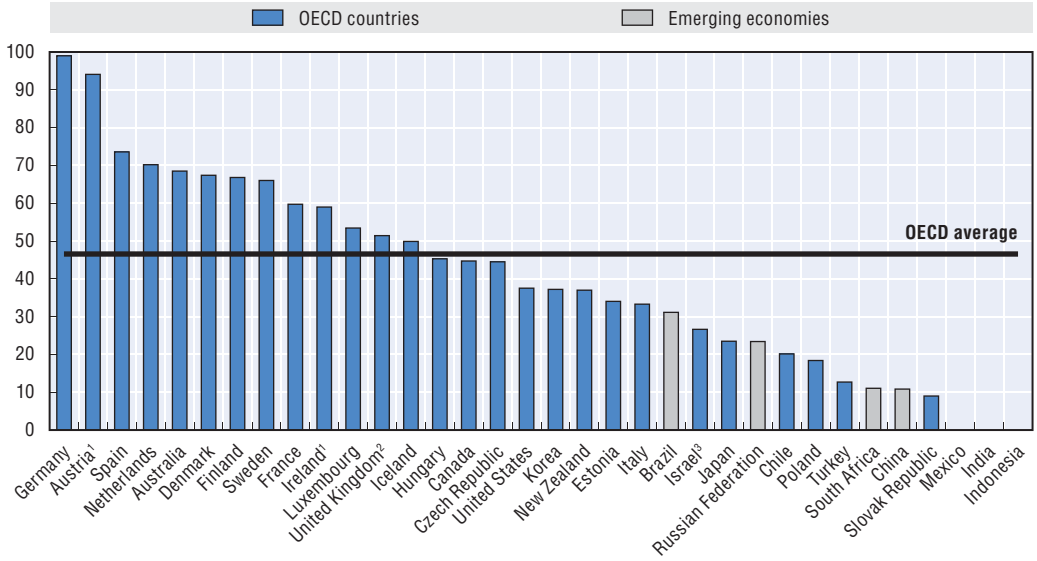
In practice, however, the average level of income support available to job losers in the EEs is much lower than in the OECD because most are not eligible to any form of income support. Workers employed in firms that fail to pay social security contributions are necessarily excluded from UI as they do not meet minimum contribution requirements. Moreover, eligible job losers often do not receive any severance pay, or only part of what they are entitled to, due to widespread "non-performance" – *i.e.*, the inability or refusal of firms to live up to their severance-pay commitments. In Indonesia, for example, only 34% of eligible workers who were separated from their jobs in 2008 actually received severance pay and, of those, a large majority received less than their full entitlement amount (World Bank, 2010).[6] Formal-sector job losers often fail to qualify for UI because of strict eligibility requirements or the short maximum duration of benefits, which results in workers exhausting their benefits before they find a new job (OECD, 2010a). Eligibility conditions are particularly stringent in India where workers should have contributed for at least five years, and Turkey where workers should have contributed during at least 20 of the last 36 months. Minimum contribution requirements of one year in China and Chile could also exclude many job losers from unemployment benefits, once job turnover rates are taken into account (see below for a discussion of the Chilian case). The short maximum duration of UI limits overall coverage in Brazil and Chile, where it does not exceed five months.

Figure 0.9 shows the coverage of unemployment benefits as measured by the ratio of beneficiaries to the number of unemployed. It shows that benefit-recipiency rates are much lower in the EEs than the OECD average. Recipiency is just over 30% in Brazil where it is highest), 25% in the Russian Federation, and some 10% in both China and South Africa. The low level of coverage in the EEs greatly limits the ability of UI systems to prevent unemployment-related poverty and inequality and increases the importance of informal coping mechanisms. It may also impose higher adjustment costs on people who return to work and may represent an inefficient use of resources when individuals are credit-constrained.

Although non-contributory social assistance, aimed chiefly at tackling poverty, remains limited, it has increased over the past decade. The latter dynamic reflects, amongst other things, the expansion of conditional cash-transfer programmes and health-assistance programmes. The conditionality attached to these programmes implies that in

Figure 0.9. **Unemployment benefit recipiency rates in OECD countries and emerging economies**

Percentage of total unemployed, 2007/08



1. Data do not include unemployment assistance which exists in case the unemployed do not meet minimum eligibility conditions for UI or have exhausted the right to UI benefits.
2. Includes Jobseeker's allowance (social insurance and social assistance).
3. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: ILO Social Security Inquiry Database and national sources for Brazil and Mexico; OECD (2011), *OECD Employment Outlook*.

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addition to directly tackling poverty, they are also intended to improve school attendance and the health status of mothers and children. Still, both the coverage and incidence of cash transfer programmes vary greatly across emerging economies. They account for 58% of household income for the lowest quintile in South Africa, about 20% in the comparable OECD countries Chile and Mexico and about 15% in Brazil (OECD, 2011a).

In addition to conditional cash-transfer mechanisms, non-contributory social assistance is provided through other mechanisms. Food programmes play an important role in India and Indonesia; means-tested cash transfers to the poor are available in China and Indonesia, while the Russian Federation and South Africa provide means-tested child support (OECD, 2010c). In addition, the EEs spend considerably more on public work programmes (PWPs) than the average among OECD countries, with spending being relatively higher in India and South Africa. By far, the largest programme is the Indian Mahatma Gandhi National Rural Employment Guarantee (ex-Maharashtra Employment Guarantee Scheme/NREGA), which spent about 0.52% of GDP and covered about 10% of the labour force in 2008-9, compared with 0.05% of GDP and 0.6% of the labour force on average in the OECD in 2007. South Africa also spends much more than the OECD average: the coverage of its Expanded Public Works Programme (EPWP) was about 3.5% of the labour force in 2008-9. Chile and Indonesia spend a slightly higher share of GDP on direct job creation programmes than the OECD average. While coverage was low in Chile and Turkey, it reached 5% of the labour force in Indonesia in the early 2000s – significantly higher than in OECD countries as Belgium, France and Ireland, which in 2007 operated direct employment programmes covering between 1.1% and 2.7% of the labour force. In

Argentina, a special large-scale cash-for-work programme (*Jefes y Jefas de Hogar*, launched in 2002 in the aftermath of the economic crisis) has evolved over time to become one of the main factors behind the reduction of inequality in the country.

How are social spending requirements financed?

Measured as a percentage of GDP, the levels of tax revenues in Argentina, Brazil, the Russian Federation and South Africa are broadly similar to those in OECD countries (Table 0.1). In principle, therefore, these countries enjoy the revenues needed to finance public social programmes in support of the less well-off. The share of tax revenues in GDP has risen significantly in China. Although less pronounced, India, Argentina, Brazil and South Africa have also recorded rises in their tax takes.

Table 0.1. **Total tax revenue as a percentage of GDP for major non-OECD economies**

	1995	2000	2007	2008	2009 provisional
Argentina	20.0	21.5	29.1	30.7	31.4
Brazil	26.8	30.0	33.4	33.6	32.6
China[1]	9.8	14.5	20.7	22.0	n.a
India	14.6	14.5	18.9	17.3	15.7
Indonesia[2]	17.0	11.9[5]	12.8[6]	n.a	n.a
Russian Federation[3]	n.a	n.a	36.5	37.0	n.a
South Africa	25.0	26.5	30.8	29.8	27.6
Unweighted average					
OECD Total[4]	**34.4**	**35.5**	**35.4**	**34.8**	**n.a**

n.a. Not available.
1. Figures for mainland China only excluding Hong Kong and Macao.
2. Figures for Central Government only.
3. Revenue and GDP figures obtained from Russian National Accounts.
4. Excludes Estonia because the country was not an OECD member when this annual dataset was compiled.
5. 2001.
6. 2004.

Source: Brys *et al.* (forthcoming).

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However, EEs' tax revenues differ significantly from OECD countries' in that consumption taxes are the main source (Table 0.2). Most OECD countries tend to offset the regressive effects of consumption taxes through the progressivity of personal income tax (PIT) and insurance-based and income-related benefits or in-work tax credits. This redistribution through government budgets means that post-tax and benefit incomes are less unequally distributed than gross incomes.

With the exception of South Africa, none of the EEs raises much revenue from the PIT. The latter accounts for between 1% and 3% of GDP, compared with an average of around 9% in the OECD. Such low PIT shares partly reflect thresholds that are high relative to incomes with the result that only the better-off pay the PIT – in India, for example, only the top percentile group until recently. However, low PIT shares are also an outcome of administrative bottlenecks in revenue collection and of tax evasion that stems from high levels of self-employment and sizeable informal sectors, which limit the tax authorities' ability to verify taxpayers' declared income. For example, estimates of the "tax gap" – *i.e.* the difference between actual receipts and what may be expected from incomes and the tax schedule – are often in the order of 50% in Latin America (Jimenez *et al.*, 2010).

Table 0.2. **Tax systems of selected EE countries: a comparative overview**

	Tax/GDP ratio		% of total tax revenus[1]				Top statutory personal income tax rate[2]	Top corporate income tax rate[3] on 1 January	Standard VAT rate
			Personal income tax	Corporate tax	Social security contribution	Consumption taxes			
	2009 (Provisional)	2008	2008	2008	2008	2008	2010	2011	2010
Argentina	31.4	30.7	6.0	11.0	15.0	54.0	35.0		21.0
Brazil	32.6	33.6	n.a.	n.a.	24.0	46.0	27.5	34.0	20[7]
China[4]	n.a.	22.0	5.0	16.0	15.0	51.0	45.0	25.0	17[8]
India	15.7	17.3	12.0	21.0	0.0	58.0	30.0	30.0	10[9]
Russian Federation[5]	n.a.	37.0	10.0	18.0	15.0	51.0	13.0	20[10]	18.0
South Africa	27.6	29.8	29.0	28.0	2.0	34.0	40[11]	28[11]	14.0
OECD average[6]	***n.a.***	***34.8***	***25***	***10***	***25***	***32***	***41.7***	***25.4***	***18.0***

n.a. Not available.

1. Tax categories defined in *OECD Revenue Statistics Interpretative Guide*: personal income taxes = 1 100, corporate taxes = 1 200, social security contributions = 2000, consumption taxes = 5000.
2. These are the top statutory personal income tax rates (combined central and sub-central (measured on either an average or representative basis depending on the country). Where changes in tax rates have occurred during the tax year, the figure represents an annual average (*Source*: *OECD Tax Database*).
3. This column shows the basic combined central and sub-central (statutory) corporate income tax rate given by the adjusted central government rate plus the sub-central rate (*Source*: *OECD Tax Database*).
4. Figures for mainland China only, excluding Hong Kong and Macao.
5. Revenue and GDP figures obtained from Russian Federation National Accounts.
6. Unweighted averages. Excludes Estonia because the country was not an OECD member when this annual dataset was compiled.
7. Federal government levies VAT on industrial products (IPI) on manufactured/imported goods. Rates depend on the type of product.
8. The central government levies VAT at a rate of 17% on supplies of goods and services directly related to production and the delivery of goods. Other services not subject to VAT are subject to business tax at provincial level.
9. The central government levies a central VAT (CENVAT) on the manufacture/production of goods at a standard rate of 10%, as well as a service tax.
10. 2010 data for corporate tax rate.
11. 2008 data for top personal income tax and corporate tax rates.

Source: Brys *et al.* (forthcoming).

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Unlike PIT, the corporate income tax (CIT) generates a greater share of revenues in the EEs than in OECD countries, partly thanks to royalties and profit taxes from operations related to oil and other minerals in countries like Russia and South Africa. Furthermore, the high CIT share reflects the fact that the audited profits of public companies may make it easier to levy such tax. Although raising tax revenues from corporate profits might be expected to be redistributive as businesses tend to be owned by richer people, the incidence of taxation on capital income is not clear-cut. Where taxation leads to lower investment (*e.g.* because MNEs opt to invest elsewhere), the burden may fall in part on labour through lower real wages and employment. At 35% and 34%, respectively, Argentina and Brazil have CIT rates that are exceeded only by the United States in the OECD countries, suggesting that they may be more vulnerable to tax competition and profit shifting.

In only one EE country, Brazil, the share of social security contributions in total revenues is comparable with the average of the OECD countries. In all others the share is significantly smaller, ranging from 2% of total revenues for South Africa to 15% in Argentina, China and the Russian Federation. The Indian social security system is structured in a way that India does not collect any social security contributions that meet the international definition of such contributions.

5. Policy challenges for tackling inequality while creating more and better jobs

The broad challenge of gradually reducing inequality in the EEs over the long-term can be framed in the context of a multipronged approach that addresses four areas:

1. better incentives for more formal employment;
2. targeting social assistance to those in need;
3. spreading the rewards from education; and
4. preparing to finance higher social spending in the future.

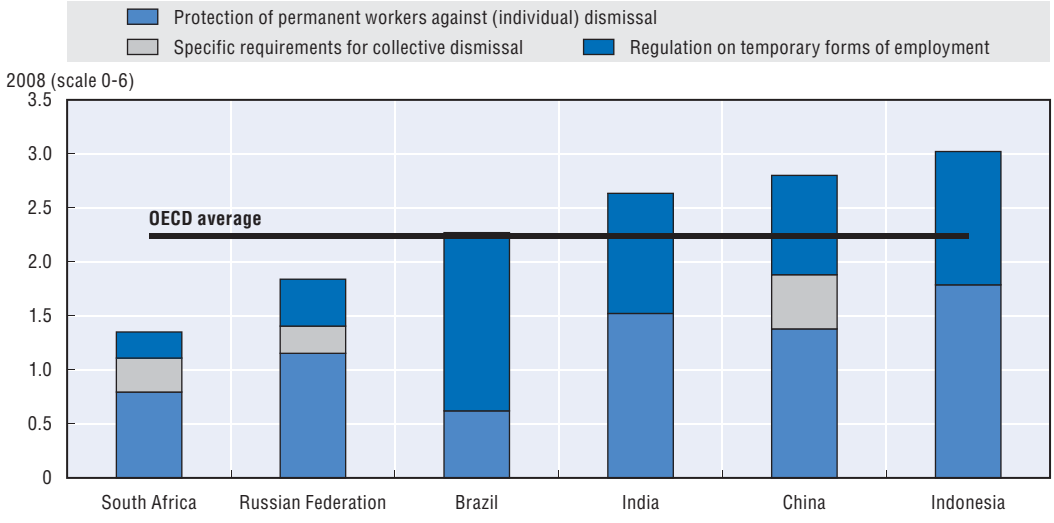
The EEs can alter the distribution of incomes by adjusting their benefits and government transfer systems and improving tax provisions. Such redistributive policies, once appropriately assessed to reflect domestic circumstances and priorities, can be powerful tools for reducing inequality. Indeed, one salient common denominator between the options for policies considered below is that they all help enhance equality, while acting as catalysts for better job creation. This final section reviews the role that key aspects of labour market, social and tax policies play in reducing inequality, focussing on implementation challenges and possible trade-offs.

Better incentives for more formal employment

Employment protection legislation

Excessively strict regulations governing the firing and hiring of workers are usually seen as an important factor in increasing the reluctance of firms to employ workers on a formal basis. At the same time, they exacerbate wage disparities. The overall stringency of employment protection varies widely across the EEs (Figure 0.10). South Africa and Russia have relatively low levels of regulation. By contrast, in Indonesia, China and India, regulation is well in excess of the OECD average. Brazil is positioned between these two extremes, with regulation being broadly in line with the OECD average.

Figure 0.10. **Employment protection legislation**



Note: OECD average is the unweighted average for the 30 countries that were members of the OECD in 2008.

Source: Venn (2009) and OECD Indicators of Employment Protection as accessible from *www.oecd.org/employment/protection*.

StatLink http://dx.doi.org/10.1787/888932535584

Despite the wide cross-country variation in employment protection in the EEs, their observed costs of individual dismissal are almost universally higher than the OECD average. This is the result of complicated or time-consuming notification requirements and regulations within the formal sector that make it difficult, if not impossible, to lay off workers for economic reasons. Regulation of individual dismissal is particularly strict in India, China and Indonesia. In India and Indonesia, while there are no additional costs or notification requirements for collective dismissals, the effective cost of such dismissals (the sum of costs for individual dismissal and any additional costs for collective dismissal) puts both countries among the top third of OECD countries, while China exceeds all OECD countries on this measure (Venn, 2009). India's employment protection legislation (EPL) makes lay-offs essentially impossible for firms with above 50 and, even more so, 100 employees. Above these thresholds, in fact, EPL plays a strong role in discouraging formalisation of firms and firm expansion (OECD, 2007b).

One way for the EEs to address these issues could be to ease EPL where it is too strict, while assigning a more prominent role to the safety net for employment (see below). By shifting the focus from job security to policies more oriented to supporting job search and improving the employability of workers, this approach could lead to higher job quality by supporting the expansion of formal employment. It could also help to reduce overall wage inequality.

Unemployment compensation schemes

Increasing the coverage of unemployment compensation schemes represents an important challenge for the EEs. Yet, a straight transposition of the UI schemes that prevail in the OECD countries would not be a viable solution for meeting the targets of increased coverage, better work incentives and reduced labour market inequalities. One reason is that public provision of UI tends be more costly in the EEs due to widespread informal work, which reinforces problems of *adverse selection* and *moral hazard*. Conditions of widespread informality mean that workers know more about their own risk of job loss than insurance providers (*adverse selection*) while mandatory requirements in emerging economies are seldom enough to preclude problems of adverse selection when large parts of the labour force operate outside the reach of the rules. Furthermore, it is difficult to control the use of UI when beneficiaries are able to work in the informal sector while claiming benefits (*moral hazard*).

In this context, two countries offer particularly instructive examples for policy purposes. They are Brazil and Chile. Brazil is an interesting case due to its relatively generous unemployment compensation, high coverage by emerging-economy standards and its rich institutional set-up that combines individual severance pay accounts held in the so-called Guarantee Fund for Length of Service (*Fundo de Garantia po Tempo de Servico,* FGTS) with a system of public unemployment insurance (*Seguro Desemprego*). The Chilean case is noteworthy for the hybrid nature of its Individual Unemployment Savings Accounts (IUSAs), which mix unemployment insurance and severance pay. The scheme design combines mandatory individual saving accounts for unemployment (which, like SPs, workers may access after dismissal) with UI to guarantee support for a limited period to unemployed job-losers who have insufficient savings. Any savings left over upon retirement may be converted into a pension or withdrawn in their entirety. Box 0.1 outlines the key institutional features of the two approaches.

Box 0.1. **Unemployment compensation systems in Brazil and Chile**

Brazil

Income support to the unemployed in Brazil is restricted to formal workers who are dismissed without just cause and workers who lost their jobs when their firms closed down. Access to unemployment-related benefits is thus denied to the vast majority of the unemployed, who include previously informal workers, labour-market entrants and individuals who quit voluntarily. The system of unemployment compensation consists of two components:

- The Guarantee Fund for Length of Service (*Fundo de Garantia po Tempo de Servico*, FGTS) combines mandatory savings accounts with a firing penalty upon unfair dismissal. The FGTS – established in 1967 – represents a fund that can be used for special occasions, including dismissal without just cause; the acquisition of a home; and retirement. Withdrawals in the case of unfair dismissal account for about two-thirds of FGTS expenditure (Caixa Economia Federal, 2009). Every Brazilian worker with a formal employment contract governed by the Brazilian Labour Code (*Consolidação das Leis do Trabalho,* CLT) is eligible to FGTS. To constitute this fund, the employer deposits 8% of the worker's monthly earnings into a saving account in the worker's name (2% for fixed-term workers). Moreover, workers with more than three months of tenure are entitled to an indemnity based on the total amount deposited by the employer in their FGTS account. This indemnity, or firing penalty, was initially set at 10% of the amount deposited, but was increased to 40% in 1988. In 2001, the firing penalty was further increased to 50%, although the indemnity to the worker remained unchanged as the additional 10% is to be paid to the government, rather than the employee.
- Universal Unemployment Insurance (*Seguro Desemprego,* SD) was established in 1986 as part of the Cruzado plan for macro-economic stabilisation and has operated in the current institutional structure since 1994. Eligibility is restricted to formal-sector job losers in the private sector with at least six months of contributions in the previous three years. Unemployment benefits are means-tested. The insured workers must have no other resources to support themselves or their family and must not receive other social insurance benefits. The benefits range from 1 to 1.87 times the minimum wage, depending on the level of previous earnings. The maximum duration of benefits is three months for individuals who have had between 6 and 12 months of formal employment in the previous three years; four months for individuals who have had between 12 and 24 months formal employment; and five months for individuals with more than 24 months. Under special conditions, the benefit may be extended for an additional two months. SD is financed by the government through earmarked taxes on businesses. The law that instituted SD also tasked the public employment service (SINE) with helping the unemployed back into work.

Chile

Chile introduced its insurance job-loss compensation scheme in October 2002. The scheme departs from traditional unemployment insurance in that it is based on the combination of a privately managed individual savings accounts (*Régimen de Seguro de Cesantía*) and a publicly financed contingency fund (*Fondo de Cesantía Solidario*) from which workers can draw under certain conditions should their individual funds be insufficient. Workers can access the solidarity fund only once they have depleted their own account. The scheme covers all workers over 18 years of age employed in private sector salaried jobs. Participation is compulsory for those who started a new job after the introduction of the scheme and voluntary for those already in work.

- A fixed percentage of a worker's wage (0.6% for the employee and 1.6% for the employer) is deposited in each worker's individual account. These contributions and their return can be withdrawn according to a predetermined schedule at the end of the employment relationship. The contingency fund is financed by an additional contribution by the employer of 0.8% of the workers' wage and a government subsidy.

Box 0.1. **Unemployment compensation systems in Brazil and Chile** *(cont.)*

- To benefit from the unemployment compensation scheme, the worker must have: *i)* contributed for 12 months (not necessarily continuously) for permanent workers or six months for fixed-term contracts; and *ii)* been unemployed for at least 30 days. If accumulated savings amount to more than two monthly wages (which would require about five years of contribution), the sum is provided to the worker in five incrementally decreasing monthly instalments.
- Workers previously on fixed-term contracts or those with less than 18 months of contributions can withdraw the sum in a single instalment. If the unemployed person has been dismissed for unjust reasons and has accumulated less than two monthly wages, she/he is entitled to a top-up from the contingency fund and will receive five monthly payments decreasing progressively from 50% to 30% of their previous average wage. If workers change jobs, they can either withdraw the accumulated funds or leave them in the account. The same happens with the remaining sum if an unemployed person finds a job within the five-month period.

Recent OECD works identify and address the main challenges of the Brazilian and Chilean social insurance programmes (OECD, 2008c; OECD, 2011a; Hijzen, 2011). They suggest specific policy options, some of which could work well in other EEs. First, unemployment compensation has a greater impact on workers in households that are liquidity-constrained. This suggests that in some EEs there might be a case for reducing inequality by ensuring that unemployment compensation specifically targets those job losers who need it most. First and foremost, the broadening of coverage is important from a growth perspective thanks to the greater capacity of workers to alleviate the impact of job loss on consumption during periods of unemployment. In addition, it is relevant for social fairness, reflecting the possibility for job-losers to receive adequate means as they focus on the search for a suitable job.

Beyond coverage, which remains low in Brazil, targeting also requires unemployment compensation to be sufficiently redistributive among those eligible for income support. At present, the Brazilian FGTS is not redistributive in that it lacks risk-pooling mechanisms. UI is strongly redistributive in most OECD countries, where strong pooling is a key to supporting redistribution from low-risk to high-risk workers. Implementing a more targeted unemployment compensation system in the Brazilian case is likely to require a shift in emphasis, away from FGTS and toward UI. This is where the Chilean hybrid approach could be relevant to Brazil and other EEs. The Chilean IUSA scheme is based on a combination of individual savings accounts managed by a private firm and a solidarity, or contingency, fund from which workers can withdraw money under certain conditions should individual funds be insufficient. Self-insurance provides good incentives for workers to either stay employed or return to work when unemployed, while possibly increasing the incentives to work in the formal sector. This frees up resources that might be withdrawn from the solidarity fund by those with inadequate savings.

The Chilean IUSA model also reveals the importance of fine-tuning conditions for access to benefits. If set in an overly restrictive manner, the capacity of the scheme to encourage workers to move from the informal to the formal sector may be limited. In Chile, more than two years after the introduction of IUSAs, about 80% of salaried workers were affiliated to the IUSAs because they had taken on new jobs. Against the very high rate of job turnover that these numbers suggest, requiring job losers to have paid contributions for 12 months before they can benefit from the unemployment compensation scheme makes

for a restrictive condition. Informal workers have little schooling and low incomes, and are more likely to find only precarious jobs at the margins of subsistence. The scheme might therefore be perceived more as a tool to force savings, rather than to encourage the move into the formal sector. These considerations underscore the importance of well balanced benefit entitlement requirements, which should be based on an assessment of the country's job turnover rate.

Furthermore, a high degree of co-ordination between the different components of unemployment compensation could also help achieve an appropriately targeted system. At present, for example, the Brazilian system leaves little scope for co-ordinating the design and implementation of FGTS and SD. More closely integrated programmes reduce administrative costs and in the case of social insurance increase the ability of the government to pool risk, so making social protection more affordable and support reductions in inequality. Moreover, better integration frees up extra resources that could be used to go beyond the alleviation of hardship. For example, they could be directed towards strengthening the complementarities between income support schemes and the mechanisms for assisting beneficiaries in their job search or used to help them overcome social problems (in the same way as the anti-poverty programme *Chile Solidario*).

In order to limit the possible *moral hazard* effects in UI systems, EEs could also consider accompanying investments in UI with greater efforts to strengthen their benefit administration and activation policies. Activation hinges on the principle of "mutual obligation" where, in return for paying benefits and offering re-employment services, the government requires recipients to register with the public employment services (PES), search actively for a new job or participate in active labour market programmes to improve their employability. In the particular case of Brazil, job losers could be required to register with the Brazilian PES (SINE) in order to be able to claim benefits.

Minimum wage policies

Minimum wages are useful tools for ensuring that fair wages are paid, thus helping to prevent poverty among workers, which includes supporting living standards for the low-skilled – many of whom are youth (OECD-ILO, 2011a). Furthermore, redistributing income to workers at the low end of the pay scale decreases wage dispersion and is likely to boost aggregate demand through a multiplier effect. An advantage of minimum wages from an administrative perspective is that they require little monitoring.

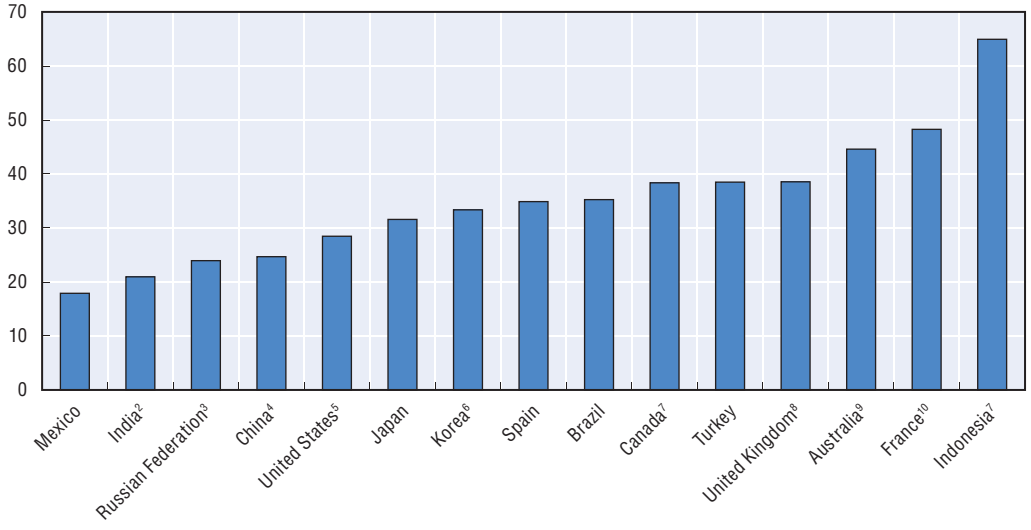
There is evidence from some emerging economies – *e.g.* Argentina, Brazil and Mexico – for the view that minimum wages influence wage determination in both the formal and informal economies, even though, at least in principle, a minimum wage policy can be expected to be less relevant in countries where many workers are in the informal sector. At the same time, minimum wages should be used with caution as anti-poverty instruments since their impact depends upon the distribution of employment across household members. As a result, they are unlikely to work as substitutes for other income support measures to target specific groups.

A balance needs to be struck when setting a minimum wage. If set too low, it may miss its targets. When too high with respect to the average wage, it may discourage the hiring of low-skilled workers or encourage hiring them informally. With these caveats in mind, Figure 0.11 shows the ratio of minimum wages to the average wage for the group of G20 countries that have a statutory minimum wage and for which this share is available. In

most EEs, the ratio of the minimum wage to the average wage ranges between 18 and 25%, which places them at the bottom of the list of observed countries. At the opposite end of the spectrum, Indonesia has the highest observed ratio – with a minimum wage that is 65% of the average wage. Nevertheless, Indonesian legislation contains exception clauses that allow companies to opt out of minimum wages if they prove that they cannot afford them. As it turns out, such exceptions are obtained relatively easily (Saget, 2008; OECD-ILO, 2011a). With a minimum to average wage ratio comparable to those of many OECD countries, Brazil falls within the top half of the spectrum.

Figure 0.11. **Minimum wages in G20 countries, 2009**[1]

Percentage of average wages



1. All ratios refer to 2009, except for Brazil (2010), China (2008), and India (2008). These ratios are approximations, as most countries are characterised by national, regional or state exceptions, Nevertheless, such special cases should not affect the ratio too much.
2. Federal rate; state rates exist but should be higher than federal rate; special rates for adolescents (14–18-year-olds) and children (under 14-years-olds) can be set.
3. National rate; regional rates exist.
4. Average of 286 cities.
5. Federal rate, state rates above the federal minimum are allowed. Sub-minima for youth can be applied at the state level but must be above the federal minimum (in 2009, only Illinois had a binding youth sub-minimum). A federal sub-minimum for youth under 20 during the first 90 days of work with a new employer also exists and is equivalent to 65% of the adult wage.
6. Up to 2006, workers under 18 were entitled to 90% of the adult minimum wage (MW) for the first six months of employment. In 2007, the age criteria was abolished on discrimination grounds, and all workers with less than three months of tenure (probation period) are now entitled to 90% of the MW.
7. Average of provincial rates.
8. Sub-Minimum Wage applies to youths under 21. It is around 83% of the adult rate for youth aged 18–20 and around 61% of the adult rate for youth aged 16-17.
9. Youth are subject to a reduced MW to be set out in collective agreements.
10. Youth aged 17 and 18 with less than six months experience receive 90% of the adult MW and youth 16 or younger receive 80% of the adult MW.

Source: OECD Minimum Wages Database for Australia, Canada, Spain, France, Japan, Korea, Mexico, Turkey, United Kingdom and United States; ILO Minimum Wage Database for Brazil and the Russian Federation; OECD (2007) for India; OECD (2010f) for China; and *http://dds.bps.go.id/booklet/boklet_mei_2010.pdf?* for Indonesia.

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In addition to its low minimum wage ratio by international norms, India allows even lower rates to apply to youth in sectors such as agriculture and tea plantations. Good international practices, however, suggest that there may be stronger grounds for applying

lower sub-minimum wages to young workers when the job requires investment in training (OECD-ILO, 2011a). The rationale is that a more differentiated minimum wage setting offers the advantage of encouraging more firms to invest in hiring and training young workers, while enabling them to share the related cost burden with the young workers. OECD countries following this practice include Germany and the United Kingdom, where salaries and training allowances are initially set at relatively low levels to account for the lower labour productivity expected during the training period.

Among the EEs, sub-minimum wage practices could be particularly appealing to Brazil, a country with comparatively high social security contributions, which act as an incentive for informal employment and the under-declaration of earnings. Until recently, the observed overall effects of the minimum wage in Brazil have been positive. It has, for example, supported the increase in earnings at the bottom of the distribution, which has helped to compress the wage distribution. Nonetheless, there is also strong evidence that these positive effects are fading (OECD, 2010a). Social partners have an important role in determining a desirable level for the sub-minimum wage. When it is predicated on training provision, regular monitoring to avoid abuses should be enforced.

Targeting social assistance to those most in need

Cash transfers

Cash transfer programmes provide income support to a population's most vulnerable groups in the form of income-tested benefits. Although most EEs' cash transfer schemes are permanent, there are also examples of one-off or temporary transfers to mitigate the effects of a specific shock. Conditional cash transfers (CCTs) appear to have been particularly effective, both in reducing inequality and in meeting other long-term development objectives, such as raising school enrolment rates and improving educational and health outcomes. The effectiveness of CCTs stems from the fact that they are typically means-tested and contingent upon certain behaviours (*e.g.*, the use of specific health and education services for children). Box 0.2 discusses three particular cash transfer programmes, the Brazilian *Bolsa Família*, the Chinese *Dibao* and the South African *Child Support Grant*.

One example of such positive results has to do with the gender dimension of CCTs. First, the programmes themselves are often focussed principally on women, whose role in the allocation of household resources is enhanced by the fact that the monetary transfer is made to them.[7] Second, CCTs enhance the scope for "double dividends" – they reduce the costs of education so boosting children's school enrolments and freeing up mothers' time to work and earn salaries. Such dual gains can be particularly beneficial to households at the bottom of the income distribution and with young children. Finally, CCT programmes' gender equality gains may stem from the fact that the beneficiaries of higher enrolments include girls, so helping to raise their generally low school attendance and reduce their higher drop-out and repetition rates. It goes without saying, however, that these benefits remain contingent upon the availability and quality of health and education infrastructure. This is a critical factor especially in regions and urban ghettos where the poor are concentrated. Even so, CCT programmes have been instrumental in reducing poverty in most EEs (OECD, 2010c). All programmes have also been found to reduce inequality.[8]

Means-testing is very important for proper targeting. It needs to be appropriately designed, keeping the right balance between adequate protection and incentives to

Box 0.2. **Examples of cash transfers programmes: *Bolsa Família*, *Dibao* and *Child Support Grant***

Dibao (China)

Started as a pilot programme in Shanghai in 1993, the *Dibao* programme was implemented in all Chinese cities in 1997, and progressively extended to the whole country through 2007. The aim was to provide assistance to workers laid off by state-owned enterprises in their restructuring process and avoid social unrest related to rapid economic transformation (Chen and Barriento, 2006). The amount of the benefit equals the household's size multiplied by the gap between per capita household income and a locally determined minimum living standard. The *Dibao* is financed by central government and the municipalities, whose share varies according to their financial capacity (in the wealthy coastal region, municipalities pay most of the expenditure, while poor municipalities, like those in the west of the country, bear almost none; Solinger, 2008).

Although the very rapid increase in coverage is a significant achievement, a majority of poor households are still not covered. Rural migrants are explicitly excluded, due to the urban registration system (*hukou*). Fiscal constraints tend to lower the threshold for the determination of local poverty lines by local governments, implying that entitlements do not properly reflect the extent of the poverty gap. Another upshot is that the benefit often fails to cover the basic needs of the poor. Intrusive methods used to determine eligibility and administer the benefit might also discourage people from applying (Cai *et al*., 2010). Individual applicants' relatives and neighbours, for example, are questioned. The results of the scrutiny are publicly posted in a common community space, in order to solicit the views not just of immediate neighbours but of everyone acquainted with the applicant family's true state of eligibility, and in a position to see their daily comings and goings (Solinger, 2008). Some aspects of the *Dibao* programme may also be seen as preventing recipients from exiting poverty. In some cities, households which have a computer or a car, use a cell phone, and enrol their children in special educational establishments are not eligible (Solinger, 2008). Furthermore, the benefit is calculated in such a way that it is reduced if there is any increase in income, which, in effect, implies a 100% marginal tax on labour income.

Bolsa Familía (Brazil)

Brazil introduced *Bolsa Família* in 2003 by bringing together four existing federal schemes to boost school attendance, improve maternal nutrition, fight child labour and provide a cooking gas subsidy. The programme targets two groups on the basis of self-declared income: the very poor and the poor. Both groups are eligible for monthly payments for each child below the age of 15 up to a maximum of five children. The very poor also receive a flat payment regardless of household composition. The payment of the benefit is conditional on children enrolling in school, health visit requirements and pregnant women undergoing medical check-ups. Such conditions are actually intended to encourage beneficiaries to take up their rights to free education and health-care, and non-compliance is seen as evidence of some kind of obstacle to accessing the service, rather than unwillingness to comply (Fizbein and Schady, 2009). Consequently, benefit is temporarily suspended only after three warning notices and the possible visit of a social worker.

Overall, the programme is generally considered to have successfully increased consumption, reduced poverty and raised poor children's attendance at school (see below). However, the selection method has often been criticised on the grounds that it can lead to selection distortions such as patronage and leakage. Hall (2008) reports cases of clientelism and manipulation to electoral ends. It also leads to high inclusion errors compared, for example, with the Mexican CCT programme.

Box 0.2. **Examples of cash transfers programmes: *Bolsa Família*, *Dibao* and *Child Support Grant*** *(cont.)*

Evidence also suggests that *Bolsa Família* affects the allocation of expenditure to food, educational materials, and children's clothing (Soares *et al.*, 2007). Although the programme has been successful in raising enrolment rates, more children are falling behind at school. Nor has there been a significant impact on the vaccination of children. Such evidence points to the importance of tackling supply constraints in the provision of public services. The capacity of *Bolsa Família* to fulfil its objectives is limited by the country's ability to meet the demand for social policies. The lack of investment in the quality of education available to disadvantaged children (Soares *et al.*, 2007), and the lack of access to a set of public services (Paes Souza and Pacheco Santos, 2009) reduce the capacity of the programme to break the inter-generational transmission of poverty.

Child Support Grant (CSG, South Africa)

The *Child Support Grant* (CSG), created in 1998, was initially based on a household income means-test and came with various requirements attached. These included the requirement to produce documents and demonstrate efforts to secure income from other sources. The resulting low take-up prompted the government to review eligibility conditions and related requirements. The CSG's approach was therefore changed by switching the payment of the benefit in favour of the care-giver instead of the child. Women, who account for the majority of primary care-givers, were granted some freedom in the way they used and allocated funds. In addition, while the means-test initially applied to the household income, the government restrained the reference income to that of the care giver and his/her spouse only. In 2008, further amendments set the income threshold for qualifying for the CSG at ten times its value. Moreover, the threshold test was doubled for married couples with two earners, making it more generous and therefore more likely for poor households to qualify. Furthermore, the benefit level was substantially increased from ZAR 100 in 1998 to ZAR 250 in 2010/11, corresponding to 2% of average wages.

CSG take-up has increased dramatically in the decade to 2010. By that year, it was paid monthly to the care-givers of 10.4 million children, who accounted for about 68% of all social security recipients (OECD-ILO, 2011f). A substantial increase was also observed in recipiency rates among the mothers of newborn children who began increasingly to apply for the CSG as the programme gained momentum and the poorest households found out about it. The increase in coverage reflects to a large extent greater confidence in the system.

However, the bulk of the increase is the result of the gradual extension in age eligibility introduced over the years. The CSG was initially available only to children until their seventh birthday. It was gradually raised in three phases to take in higher age groups. From April 2005, the age threshold was set at 14 (*i.e.* children had to be under 14 years old to receive the grant). Between June 2005 and July 2006, over 1.5 million new children received the grant, after which take-up slowed again. In 2008, eligibility conditions were once more amended with the aim of phasing in coverage of all children to the age of 18 in three stages by 2012. It is estimated that this raising of the age ceiling will further increase the number of beneficiary children by about 2.4 million by 2013. There have been recent discussions on making reception of the CSG conditional on school enrolment and attendance.

participate in the labour market. The risk to avoid is creating dependency among the low-skilled, which may ultimately lessen incentives to work. Possible solutions to this difficult trade-off include establishing different thresholds for entry into and exit out of social assistance programmes and the gradual withdrawal of benefits (OECD, 2011a). Importantly, the inequality-reducing effect of programmes, such as *Bolsa Familia,* is attributed mainly to

service contacts and attainments, rather than the amount of the associated cash transfer (OECD, 2010a). Overall, the available evidence points to CCTs exerting negligible adverse effects on the supply of labour.

Whether or not they are subject to conditionality, all cash transfer programmes should be properly targeted on benefiting the poor to ensure effective implementation that ultimately supports inequality reductions. In practice, however, the task of appropriately identifying the population in need may be difficult to fulfil. Russia is an example of a country where there remains significant scope for improving the targeting of housing and child allowances (OECD, forthcoming). While, in principle, allowances are income-tested, a relatively large share accrues in practice to the middle income segment.

In addition, there are often trade-offs between reducing under-coverage, or exclusion errors, and improving efficiency. A case in point is South Africa, where about 55% of the households in the bottom quintile receive the Child Support Grant compared to less than 10% in the top quintile (OECD, 2010a). *Prima facie* these outcomes suggest that targeting mechanisms are working and that its mechanisms are indeed well designed (Box 0.2). Yet these upsides mask the fact that the system is still unable to reach out to 2.9 million children who remain uncovered even though they are in need. Full effective implementation of cash transfer systems requires the backing of a comprehensive administrative structure, combining measurement information and institutional capacity.

Putting in place such a structure involves administrative costs (UNRISD, 2007). Some countries such as Indonesia rely on proxy means-tests that use household characteristics while South Africa and Brazil use income declarations, which may be less effective as they are more prone to errors or under-declaration. Adequate monitoring and the enforcement of sanctions in the event of non-compliance need to be in place for targeting requirements to work. Although the frequency of conditionality monitoring varies across countries, there is also evidence suggesting that mild verifications may be enough to induce participants to comply (Grosh *et al*., 2008).

Public Work Programmes (PWPs)

Compared with cash transfer schemes, public work programmes (PWPs) can be more easily introduced to provide income support to the newly unemployed workers not covered by unemployment compensation schemes. Their main objectives are twofold, namely to provide a safety net to poor segments of the population through labour-intensive public works, and to contribute to local development through investment in infrastructure. These twin objectives differentiate them from the PWPs generally used in advanced economies. First, they are used more as social policy tools to afford temporary income support to disadvantaged groups than as active labour market measures to improve participants' employability. Second, the projects undertaken not only create employment but benefit local communities, *e.g.* through road construction and maintenance, drainage projects, public building maintenance (Grosh *et al*., 2008).The EEs have often launched or scaled up their PWPs to tackle unemployment and poverty – particularly among the most disadvantaged groups (*e.g.* women, youth and the disabled) – during economic crises. Box 0.3 considers two PWPs, India's National Rural Employment Guarantee Scheme and South Africa's Expanded Public Works Programme.

Again, design and institutional setup are important factors. Setting PWP wages at relatively low levels (*e.g.* the minimum wage, as in India) ensures participant's self-selection. Under certain circumstances – *e.g.* in the event of a cyclical economic downturn –

Box 0.3. **Two examples of public work programmes, India and South Africa**

India

The National Rural Employment Guarantee Scheme (NREGA) is India's largest public works' scheme and possibly one of the largest in the world in terms of coverage (10% of the labour force in 2008-09). It was initially established in 1978 in the state of Maharashtra and was gradually extended so that by 2009 it covered the entire country. The scheme aims to guarantee to all rural households up to 100 days of unskilled manual wage employment per year (mainly in water conservation, land development and drought proofing) at the minimum wage for agricultural workers in the state. If claimants are offered no work in the 15 days after their application, they are entitled to receive an unemployment benefit of between 30 and 50% the minimum wage. Although the scheme was scaled-up in 2009, this could have been for electoral reasons, rather than because of the global economic downturn.

Although the NREGA can play an important role in reducing short-term poverty and smooth employment and income throughout the year for rural labourers, its enormous potential has not yet been fully exploited (Chhibber *et al.*, 2009). It remains little used, particularly in poorer states, possibly because of its funding design. Fund allocation is not pre-determined according to state income levels, but based on the Annual Work Plan and Budget Proposal that each state submits to the Ministry of Rural Development. As a result, low-income states with higher numbers of households below the poverty line, and lower than average capacities to plan, manage and forecast labour demand, tend, on average, to receive less resources (Chakraborty, 2007). In addition, weak implementation capacity at local level limits the benefits that poor rural communities derive from the scheme. The average duration of jobs is only 50 days, possibly because rural labourers tend to participate in the scheme only in the lean season and at times of drought.

South Africa

The South African Expanded Public Works Programme (EPWP) was launched in 2004 to revamp the National Public Works Programme (NPWP) and the Community Based Public Works Programme (CBPWP). It is the third-biggest infrastructure spending programme in the world and a key component of South Africa's social protection strategy. The programme provides short-term work to the unemployed and to marginalised groups, mainly the unskilled, poor and young people, in four sectors (infrastructure, economic, environment and social sectors, with infrastructure being the most important). The scheme aims to not only provide the poor and unemployed with temporary work, but also strengthen their skills through training and by offering them "exit strategies" at the end of their participation in the programme.

However, the EPWP has been criticised for its limited capacity to pursue both objectives at the same time (Hemson, 2007). As a result, the second phase of the scheme announced in April 2009, places more emphasis on generating employment than on training in order to maximise the benefits of immediate job creation. The quality of jobs offered by the EPWP is low both in terms of job duration and wages. As in the Indian scheme, average job duration is shorter than initially stipulated, especially in areas with high unemployment rates because of pressure to rotate jobs (Lieuw-Kie-Song, 2009) and wages are low (Hemson, 2008). In addition, low actual spending, and weak implementation capacity further limit the effectiveness of the scheme. The second phase of the programme aims to address these shortcomings by improving co-ordination across governmental bodies and providing incentives to promote programme expansion and lengthen job duration.

this self-selection is important because it speeds up implementation at relatively low costs. In effect, PWPs can be rapidly scaled-up in times of crisis to provide income support to newly unemployed workers not covered by unemployment compensation schemes. They may thus offer several advantages over cash transfer schemes when it comes to the need to counter the impact of adverse cyclical developments. On the other hand, their effectiveness in reducing inequality and endemic poverty over the long-term is more debatable. Furthermore, they also become prone to misuses over time (OECD, 2010a).

One important way to increase the effectiveness of PWPs is by including some training. Improving beneficiaries' skills, would enhance their job opportunities and lessen repeated use of PWPs by the same individuals. Interesting examples in this direction are the *Jefes y Jefas de Hogar* programme in Argentina and EPWP in South Africa.[9] The Argentinean scheme gives participants the option of either working or attending training courses or educational classes in exchange for benefits. The South African EPWP's training provision includes the possibility of acquiring national qualifications, with a view to preparing for possible longer-term employment. So far, however, the percentage of participants who opt for or are offered training has been low, which has limited the added value on the labour market in terms of newly acquired skills (Box 0.3).

Interactions with regional inequality

One important aspect of social policy is that its effects may help to reduce regional inequalities. Many targeted cash transfers can contribute to reducing regional disparities for the very reason that they are allocated to the poor and, as such, are distributed primarily in regions which have the largest shares (and even highest absolute numbers) of poor individuals and households. Work by Silveira-Neto and Azzoni (2008) shows that in Brazil cash transfers (*Bolsa Familia*), together with the appreciation of the minimum wage, account for approximately 40% of the observed reduction in regional income inequality in the country since 1995. PWPs such as India's NREGA have sometimes been focussed on lagging states, as tools to help redress regional inequalities. While the realms of social and regional policies differ, the former may support the latter.

Spreading the rewards from education

Another important policy challenge is to invest in policies that promote the up-skilling of the workforce. Higher educational attainments *per se* do not necessarily contribute to lower inequality because the related increased returns to education can accrue mainly to the highly-skilled workers. However, where attainments have been shared more widely, so contributing to the upgrading of the workforce's skills as a whole, they have also been associated with higher rates of employment and higher average earnings. In regional areas where access to education is hindered by the need to travel long distances, a focus on the elimination of possible shortcomings in the transport infrastructure and/or services becomes an important requirement if conditions of access to education are to be improved. Over time, the elimination of such bottlenecks will widen the scope for greater use of conditional cash transfers.

Argentina and Brazil are interesting examples of countries that have been successful over the past two decades in promoting equal access to education, while broadening the distribution of school attainment (Lopez-Calva and Lustig, 2010). In both countries, the expansion of basic education – supported by non-school family policies to improve early-childhood health and nutrition programmes, and progress in the service infrastructure – has contributed to narrowing the earnings gap between skilled and low-skilled workers. Such

educational initiatives may have played a role in supporting reductions in labour income inequality that the two countries have achieved in the recent past. Investments in education in India and Indonesia have likewise increased access to education, even though progress so far in reducing income gaps has been less tangible, particularly among the most disadvantaged.

Recent OECD work suggests that wider access to vocational pathways in secondary education can help youth, disaffected with academic education, stay engaged with education (Quintini and Manfredi, 2009). More vocational education could be a particularly interesting option for the EEs to consider, insofar as it could not only improve nationwide graduation rates, it could also play a considerable role in smoothing paths of transition from school to work. Interestingly, the available evidence suggests that when class-based vocational training is combined with work-based apprenticeships, the transition from school to work becomes smoother even for those young people not subsequently retained by the firm providing the training. Youths can leave the programme with skills that are immediately usable at work with little or no need for further training. Such dual forms of vocational training could be appealing to emerging economies where only low percentages of students are generally involved in vocational education. For instance, no more than 10% or upper secondary students attend vocational courses in Brazil, India and Mexico (OECD-ILO, 2011a). The National Policy on Skill Development in India is an interesting example in this respect: it encompasses the creation of a private-public partnership to strengthen industry engagement in skills development and promotes greater employer involvement in the country's Industrial Training Institutes. This policy initiative is helping to reduce skills mismatches and has visibly increased graduates' placement rates (OECD-ILO, 2011e).

Preparing to finance higher social spending in the future

The development of a comprehensive social protection system could put upward pressure on government spending. This suggests that one key challenge for the EEs is to meet the long-term need for greater additional revenue to finance social protection expenditure while sustaining growth. The question is how to do so in a way that promotes redistribution and does not hinder growth.

Faced with high levels of informality, one important priority would be to widen the coverage of the formal sector in order to enhance the distributive capacity of the tax system. This would require special emphasis on improving revenue-collection procedures through measures to underpin the capacity of the tax administration to enforce compliance.[10] There would also have to be initiatives to address tax simplification to encourage taxpayers' voluntary compliance with their obligations. Tax simplification is reported to have helped the significant expansion of formal jobs recorded in Brazil since the early 2000s (OECD-ILO, 2011d). Focus on the fight against corruption would also help improve tax collection. Over time, the pay-offs from these efforts would be visible both in terms of improved horizontal equality – individuals with the same gross income paying the same amount of tax – and vertical equality – as better-off individuals who are typically better able to evade taxation have to pay their fair share in taxes.

Broadening tax bases could also contribute to meeting efficiency, growth and distribution objectives. Broader tax bases would have to be supported by careful re-assessments of tax relief systems. Tax relief and exemptions often exist because of the influence of the rich and powerful on the drafting of tax codes. Greater transparency, particularly as to the amounts of revenue forgone and the beneficiaries, is often a good first step in eliminating tax relief arrangements.

A broad base and low PIT rate approach represent a good starting point for a tax policy aimed at keeping distortions to a minimum. A low tax burden also has positive effects on economic growth as it enhances entrepreneurship and incentivises foreign direct investment and education.

Looking to the future, however, greater redistribution in EEs requires a change in the structure of the tax system. Special attention should be given to striking a better balance between tax revenues through PIT and property taxation, on the one hand, and consumption taxes, on the other. Indeed, achieving such balance is a long-standing feature of the broad effort by emerging and developing economies to promote income equality. A shift in the tax structure from consumption to income taxes would increase the redistributive potential of the tax system by making the tax regime more progressive. Tackling inequality and relative poverty would be made easier.

Implementing such an approach, however, is not straightforward. In principle, where countries are growing fast, they may have the scope to raise additional revenues from PIT and make the tax regime more progressive by keeping thresholds unchanged, thus letting the "fiscal drag" kick-in. In practice, this option may not be the best one to pursue, at least until there are strong signs that the size of the informal sector has begun to shrink. Meanwhile, the EEs differ in their attitudes towards the use of the "fiscal drag". On the back of fast growth and an under-indexed tax schedule, the Chinese population subject to income tax increased from less than 0.1% in 1986 to about 20% in 2008 (Piketty and Qian, 2009). While the mechanical effect of the "fiscal drag" may have contributed to this result, China's latest reform has chosen to offset the impact of the "fiscal drag" through large increases in personal allowances. By comparison, India has made much less use of the "fiscal drag" over time. Reflecting the constant adaptation of exemption levels and income brackets in India, the share of population paying income tax has remained stable at the low level of around 2-3%.

All in all, under current conditions of widespread informality and tax evasion, the role of taxes in income redistribution remains limited. Changing this situation is likely to take time, unless countries rapidly put in place ways and means to expand the tax base and reform the tax administration. Until then, reducing inequality is better addressed through well-targeted social welfare programmes and the recourse to mechanisms of in-work benefits. In-work benefits may take the form of tax credits, wage-related transfers, or lump-sum payments. Where there are significant earnings or income disparities at the bottom of the distribution, they have been shown to reduce inequality and increase employment in OECD countries if they provide regular payments to low-income workers (Immervoll and Pearson, 2009). As such, they could be an attractive additional policy option in emerging economies.

Notes

1. Extreme poverty is conventionally measured by the share in the total population of those living on less than USD 1.25 or USD 2 per day (in purchasing power parities).
2. Important factors limiting the comparability of Gini indices based on consumption survey data include differences in definitions of consumption; variation in the number of consumption items that are separately distinguished in surveys; whether survey participants record their consumption or are asked to recall their consumption in an interview; changes in the length of the recall period during which survey participants are asked to report their consumption; different methods used to impute housing, durables, and home production, which alters the incidence of in-kind consumption; and underreporting for some items. Income inequality data can also vary depending on whether the income is pre- or post-tax; whether and how in-kind income, imputed rents, and home production are included; and whether all income – including remittances, other

transfers, and property income – or only wage earnings are captured. World Bank (2006) and IMF (2007) provide detailed overviews of methodological issues.

3. It should be noted, however, that the comparison between points in time may hide the presence of infra-period variations. In Argentina, for example, the period between the early 1990s and the end-2000s was characterised by a sharp increase in inequality until the early 2000s and a decline thereafter. In effect, the period comprises two contrasting economic policy approaches. Following several years of limited social protection in the 1990s, social policies became more redistributive during the 2000s, which helped to moderate the income gap between unskilled and skilled workers. See Gasparini and Cruces (2010) for an in-depth discussion.
4. Middle-class issues have been the focus of a recent OECD report discussing the critical role that the middle class plays in improving social cohesiveness and fostering economic progress in developing and emerging economies (OECD, 2011b).
5. The analysis of income at the very top of the distribution has a counterpart in recent studies. For example, Banerjee and Piketty (2005) report that in India the income share of the top 1% of the distribution reached 9-10% in the late 1990s, with the income for the narrower top 0.1% group also increasing. Although comparable data on top incomes remain scarce, it appears that, after falling markedly over time, the share of the richest 1% in Indonesia was lower than in Argentina and in India (Leigh and van der Eng, 2009). Shares of the top 1% are high in South Africa too, accounting for almost one fifth of taxable incomes in 2005 when dividend incomes are included (Alvaredo and Atkinson, 2010). Leibbrandt *et al.* (2010) found that the top decile of the income distribution in South Africa accounted for 58% of total income in 2008 compared with 54% in 1993.
6. In addition, judicial procedures related to disputes over reasons for dismissal tend to be time-consuming and costly in many emerging economies, resulting in financial insecurity for firms and inadequate compensation for dismissed workers (Venn, 2009).
7. CCT benefits in Brazil and Indonesia are all paid to the mother since women tend to spend a higher share of benefits on children and household-related expenditure than men.
8. Soares *et al.* (2007) show that about 21% of the fall in income inequality measured by the Gini coefficient between 1995 and 2005 in Brazil and Mexico can be associated with *Bolsa Família* and *Oportunidades*, respectively. Similar positive effects on inequality for the two programmes are found by Fiszbein *et al.* (2009) and Barros *et al.* (2006) for Brazil only. In contrast, the impact of *Chile Solidario* on inequality was smaller, most likely because of the low benefit paid to participants (Soares et al., 2007) and the fact that the cash transfer is seen as a way to motivate people to make greater use of social workers' services, rather than supporting their income.
9. As part of the responses to the recent economic downturn, Mexico's public employment services offer funds for training grants that particularly target youth.
10. Partly related, both Argentina and Brazil have strengthened labour inspections over the recent past, either through increasing the number of inspectors (Argentina, see OECD-ILO, 2011c) or by improving the incentive structure and adopting better inspection methods for meeting targets (Brazil, see OECD-ILO, 2011d). Brazil has introduced a bonus system that ties a percentage of inspectors' salaries to performance.

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ANNEX 0.A1

Main Features of Social Protection Systems in EEs

Social protection systems can be described using three main dimensions: *i)* the relative importance of social insurance *versus* general public expenditure and/or social assistance; *ii)* the overall coverage of the schemes; and *iii)* the unification/fragmentation of the schemes.

Argentina's social insurance scheme is financed by social contributions, which covers old-age pensions, survivors and disability and health care for all private and public sector employees and self-employed workers. Contributory family allowances are paid to children of formal salaried workers and unemployment insurance can only be paid to formal workers who have contributed for six months. In the wake of the 2001 national economic crisis, Argentina extended social security benefits and non-contributory old-age pensions as well as transfer programmes for the unemployed. Transfer programmes include community work schemes and vocational training. Another important programme is the universal child allowance for school-age children who attend school and register for health-care services. It covers over 46% of the poor population of the targeted group (ECLAC, 2010). According to ILO (2010), 75% of children and adolescents are supported by family allowances and 89% of adults older than 65 receive retirement benefits or a pension. Last, at least 350,000 persons of working age are covered by programmes related to unemployment, problems of labour market entry and job loss risk.

Brazil has a comprehensive social insurance scheme financed by social contributions, which covers old-age pensions, maternity, disability, and work-accident benefits for all private sector employees and the self-employed, and their dependents. There is also an unemployment insurance scheme. Most public servants are covered by their own social security schemes. According to PNAD data, 52% of the workers were affiliated to social security in 2007. Public health care is provided on a universal basis and financed out of general taxation. Social protection also includes a (rather generous) non-contributory basic old-age pension, as well as a conditional cash transfer scheme for the poorest (*Bolsa Família*).

China has various social insurance schemes for medical care, pension, unemployment, etc. Most schemes are administered at a decentralised level (*e.g.*, county, municipality) and contribution rates often vary across provinces or even within the same province, thus limiting the scope for risk-pooling. Until recently, social insurance schemes covered only urban areas, but efforts have been made to widen coverage in rural areas under different types of schemes, which are largely subsidised. According to Zhu (2009), coverage rates in 2008 were 55% for the urban basic pension and 85% for urban and rural medical care. A

means-tested minimum subsistence benefit (*Dibao*) is also provided in urban and rural areas.

India has a very fragmented social protection system. A number of social insurance schemes exist, all of very limited coverage. The main one provides health insurance and maternity benefits to highly-skilled employees (earning wages above a certain ceiling) in large and medium-sized businesses (it covered 8.7 million workers in 2006 compared with about 400 million employed persons in 2004). A number of contributory schemes are also run by the state governments (often with funding from the central government) for workers in small enterprises. However, their coverage is limited to certain areas and population groups (Mazundar, 2010). The most important non-contributory safety nets for poor households are the national rural public employment programme and the product subsidies on rice and fuel. A large number of cash transfer programmes for poor households are also available, but most of them are of very limited coverage.

Indonesia only recently established social insurance schemes based on social contributions. They offer (low) old-age pensions, life and health insurance, and job-related disability and illness compensation. Participation in health insurance is optional if the enterprise has alternative arrangements. The scheme covers only workers (and their families) employed in firms with more than ten employees or a payroll of more than one million rupiah (OECD, 2008a). In 2008, about 8% of the workers were registered with the scheme (*Jakarta Post*, 19/08/2009). Informal workers can register on a voluntary basis, but contribution rates are high, and very few actually do contribute. Several safety nets targeted at the poor have been in place since the 1997 Asian crisis. Some have relatively high coverage, notably a food security programme providing subsidised rice and a cash transfer programme.

The Russian Federation has a number of social insurance schemes (pension, health, disability, etc.) covering employees and the self-employed, and financed out of a unified social contribution. Health insurance accounts for a minor share of public health expenditure. Data on the coverage of the social security system are not available. It was high at the beginning of the transition period, but is likely to have fallen, due to the growth of employment in the unincorporated sector – less likely to be declared to social security – and the rise in non-standard forms of employment (workers with civil or verbal contracts). Social assistance includes some income-tested programmes for low-income families (child allowances and housing subsidies), food subsidies for children in full-time education and financial support for children in kindergartens. In addition, Russia inherited the so-called "privileges" system inherited from the Soviet era: it comprises benefits (often in-kind) for specific categories of citizens, who include the disabled, special-merit categories (veterans) and a large group of workers and retirees with long employment records.

South Africa: the only social insurance scheme is for unemployment. The pension system is a fully-funded scheme managed by private pension funds. According to a labour force survey, about 75% of the workers were covered by a pension scheme or the unemployment insurance scheme in 2007. Public health expenditure is financed out of general taxation. Social assistance is fairly well developed, notably through a (relatively generous) basic old-age pension and means-tested child allowances and disability grants (covering respectively 5%, 10.5% and 3% of the population in 2008, according to National Income Dynamics Study). Public works programmes are also available for the unemployed.

PART I

How Globalisation, Technological Change and Policies Affect Wage and Earnings Inequalities

PART I

Chapter 1

Trends in Wage Inequality, Economic Globalisation and Labour Market Policies and Institutions*

This chapter affords an overview of longer-term and recent trends in wage inequality, examines developments in various aspects of economic globalisation and technological change, and looks at changes in product and labour market regulations and policies. It also supplies empirical evidence as to the association between, on the one hand, changes over time in wage inequality and, on the other, growing globalisation, technological progress and developments in policies.

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1.1. Introduction

This chapter sets the stage for the econometric analysis in Chapters 2 and 3 of the possible causes of growing wage and earnings inequality. It affords an overview of longer-term and recent trends in wage inequality, discusses several notable developments in various aspects of economic globalisation, and looks at changes in product and labour market regulations and policies. The time period under consideration runs from the early 1980s to the late 2000s, prior to the onset of the economic downturn.

The chapter also supplies empirical evidence as to the association between, on the one hand, changes in wage inequality over time and, on the other, changes in the degree of economic globalisation, technological progress, and developments in policies. While such correlations cannot establish actual causation, they do provide useful initial insight into how inequality outcomes and driving factors have evolved across countries over time.

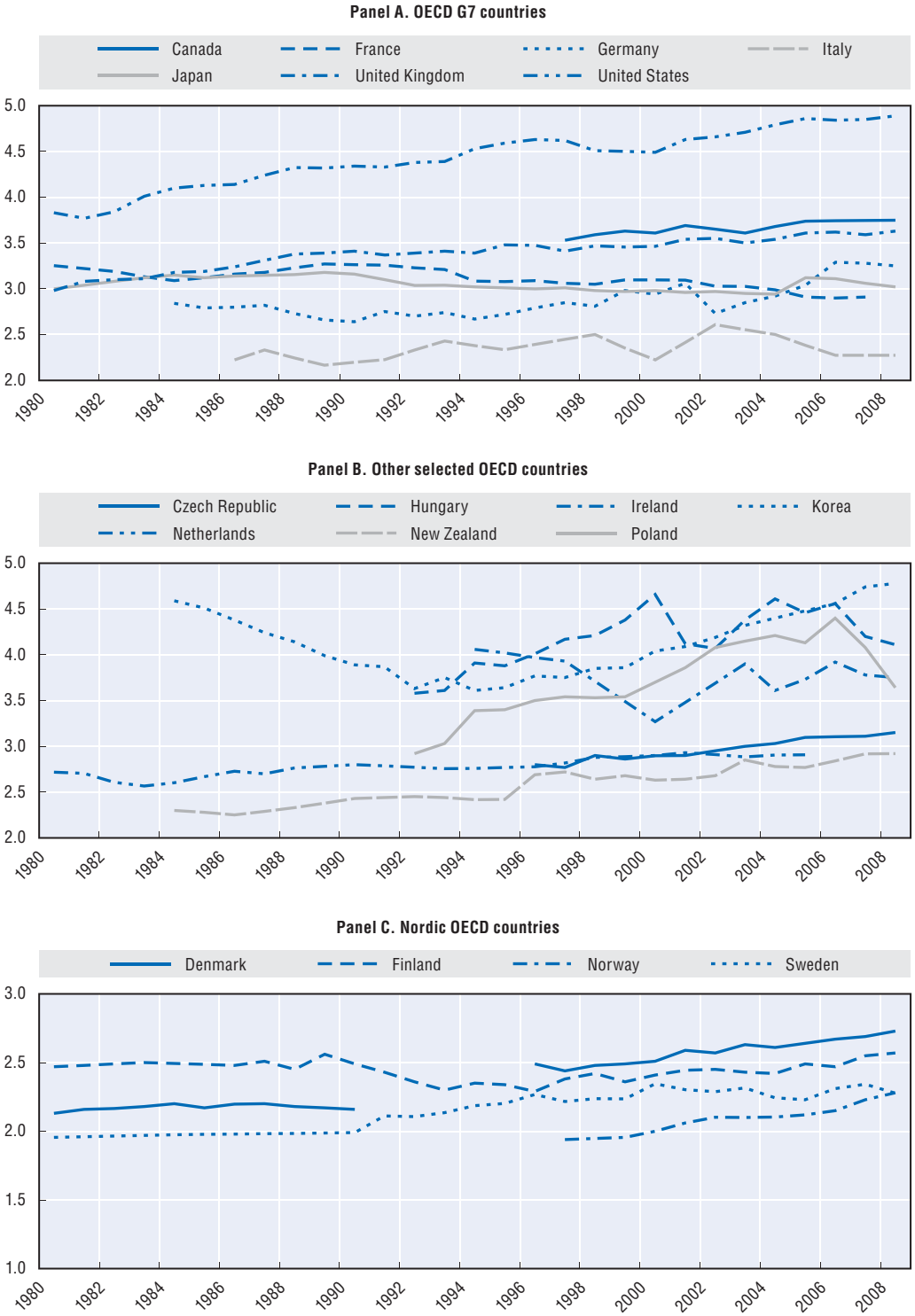
1.2. Trends in wage dispersion

Has the wage distribution within OECD countries become less equal? A key measure of wage dispersion is the decile ratio of the top 10% to the bottom 10% of full-time or equivalent wage earners.[1] Figure 1.1 shows the evolution of wage dispersion for selected OECD countries and groupings over the period 1980-2008. It draws on data from the *OECD Earnings Database* for 23 OECD countries. This dataset provides comparable and consistent measures of wages through time for each country.[2]

Figure 1.1 reveals a widespread and significant increase in wage dispersion in the OECD area over the past three decades, with a few notable exceptions such as France and Japan. The increases were particularly marked in the United States, the United Kingdom as well as some central eastern European economies such as Hungary and Poland. In the United States, for instance, the earnings gap between the richest and poorest 10% of full-time workers has widened from 3.8 times in 1980 to nearly 5 times in 2008. The comparable figures are 3.6 (1992) and 4.6 (2006) for Hungary and 2.9 (1992) and 4.2 (2004) for Poland. The extent of rising wage inequality was stronger during the late 1990s and 2000s than in the previous decades. This can be observed in Germany, New Zealand, Netherlands and Demark, where decile ratios remained stagnant throughout the 1980s, but started to increase in the mid-1990s. Korea's wage inequality trend was characterised by a unique U-shaped pattern, decreasing sharply during the 1980s and the early 1990s, before increasing at the same speed since the mid-1990s.[3] It is worth noting that the trend towards greater wage inequality, although more moderate, was also observed in some Nordic countries – a region that traditionally had rather low levels of wage inequality.[4] Overall, many OECD countries saw an increase in the D9/D1 ratio of between one fifth and a quarter during the past quarter century.

The widening of the wage distribution has resulted from both growing earnings shares at the top and declining shares at the bottom. But top earners experienced particularly sharp rises. The distance between the highest 10% earners and those in the middle has been growing faster than the distance between the middle and the lowest wage earners.

Figure 1.1. **Trends in wage dispersion, selected OECD countries, 1980-2008**



Note: Wage dispersion: D9/D1 ratios of full-time earnings, *i.e.* the ratio of the wages of the 10% best-paid workers to those of the 10% least-paid workers, calculated as the ratio of the upper bound value of the 9th decile to the upper bound value of the 1st decile.

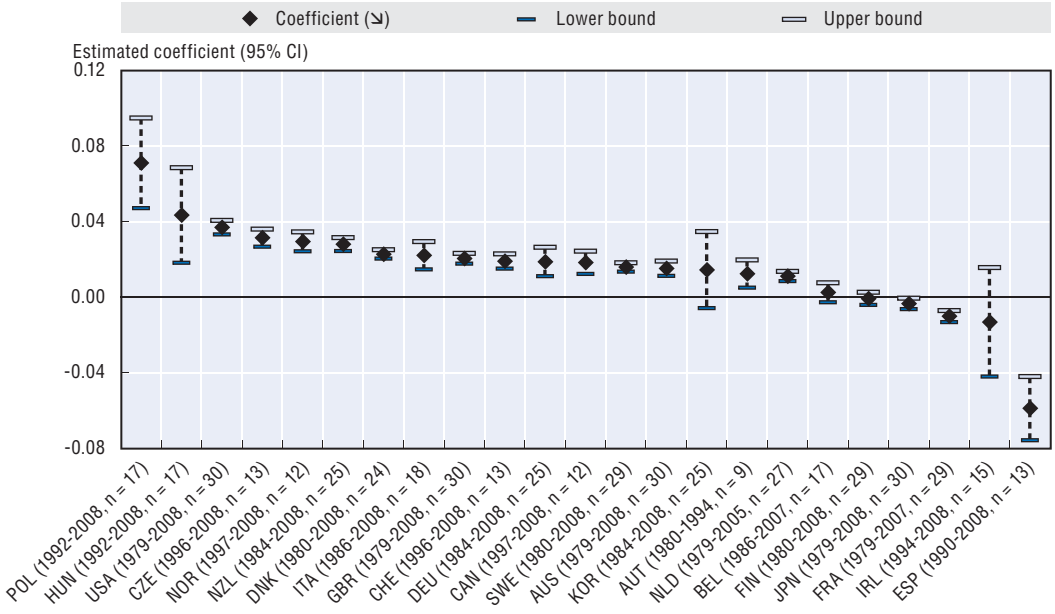
Source: OECD Earnings Database.

StatLink http://dx.doi.org/10.1787/888932535622

Thus, in most countries wage disparities grew more in the upper half of the distribution than in the bottom half.

To show whether one can speak of a "generalised" tendency towards greater wage dispersion across the 23 OECD countries under study, Figure 1.2 presents a summary statistic. It shows the results of country-specific regressions where D9/D1 ratios are regressed against time. A positive and significant coefficient therefore indicates an upward trend in wage inequality. Overall, using available time-series data, wage dispersion increased in a majority (16 out of 23) of the OECD countries over this period, at the 5% level of significance. Only two countries (France and Spain) registered a moderate and statistically significant decline in wage inequality, whereas no significant trend was estimated for the other five countries (Korea, Belgium, Finland, Japan and Ireland).

Figure 1.2. **Country-specific regression of wage inequality (D9/D1) on time trend (years indicated)**



CI: Confidence interval.
Note: Lower and upper-bound signs refer to 95% confidence intervals.
Source: OECD Earnings Database.

StatLink http://dx.doi.org/10.1787/888932535641

1.3. Globalisation: recent trends in global economic developments

The term "globalisation" needs to be clearly specified when assessing its possible impact on increased inequality. There are different aspects of economic globalisation, and both trade and non-trade dimensions need to be considered. This section looks at trends in various global economic developments. In particular, it focuses on several different aspects of trade and financial integration, which provide further insights regarding possible transmission mechanisms through which global developments may affect wage inequality.

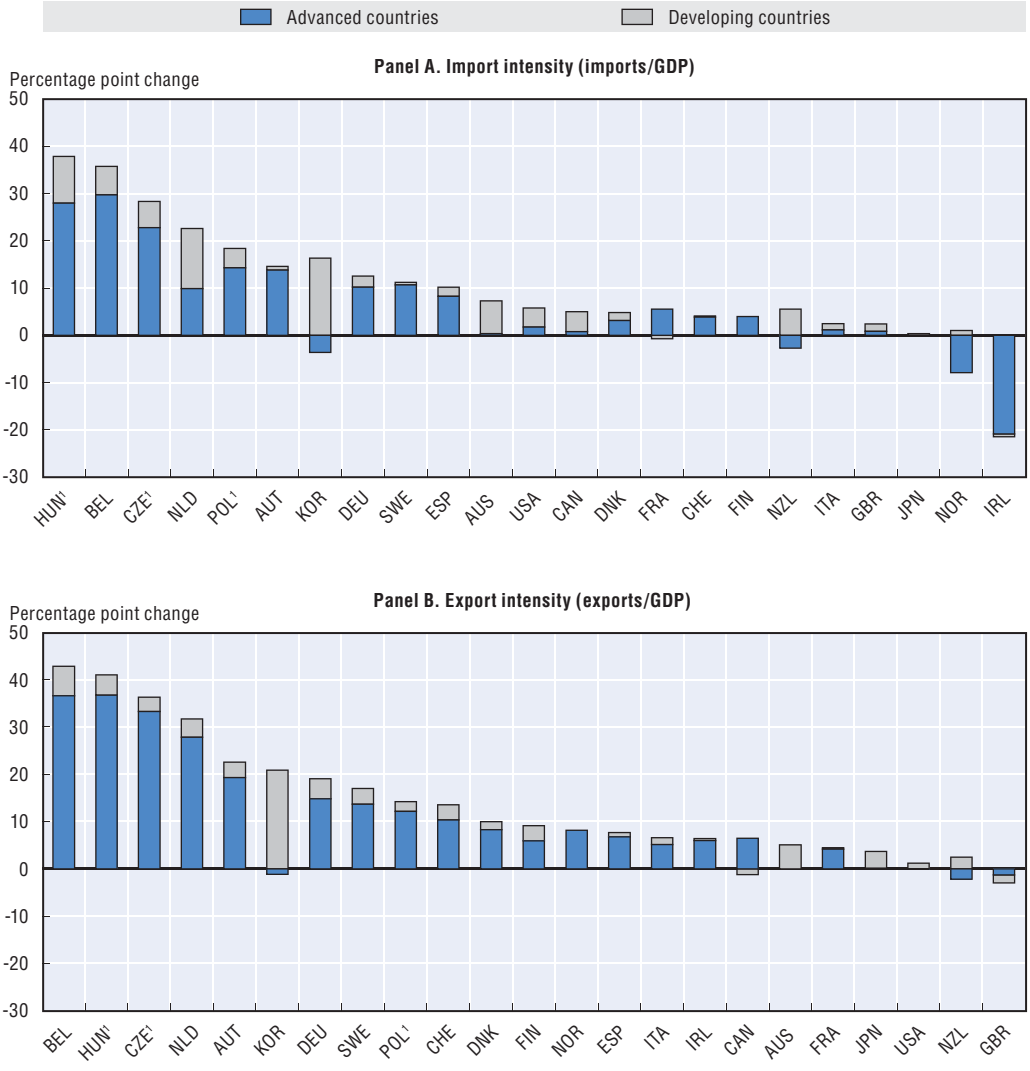
Trade integration

Trade integration increased substantially since the 1980s. The share of trade to GDP rose in practically all OECD countries, and most of the increase occurred during the past

10-15 years.[5] An important driver behind the fast expansion in merchandise imports in OECD countries over this period is related to rapid export growth of the emerging trade giants, in the Asian region.

Figure 1.3 reveals that in most OECD countries growth in trade intensity from developing countries contributed less than a quarter of the total increase in merchandise imports. The extent of OECD-developing world integration was much stronger in non-EU areas: strikingly, nearly all the increase in merchandise imports and exports in Australia, New Zealand, Korea and Japan over this period can be attributed to a rise in trade with developing countries. Similar developments in imports were also seen in the United States and some EU member countries such as Netherlands and Italy.[6] Only France and Ireland registered a modest decline in imports from developing countries over this period while the same was true for exports in Canada and the United Kingdom.

Figure 1.3. **Change in trade intensity by region of origin, 1980-2008**



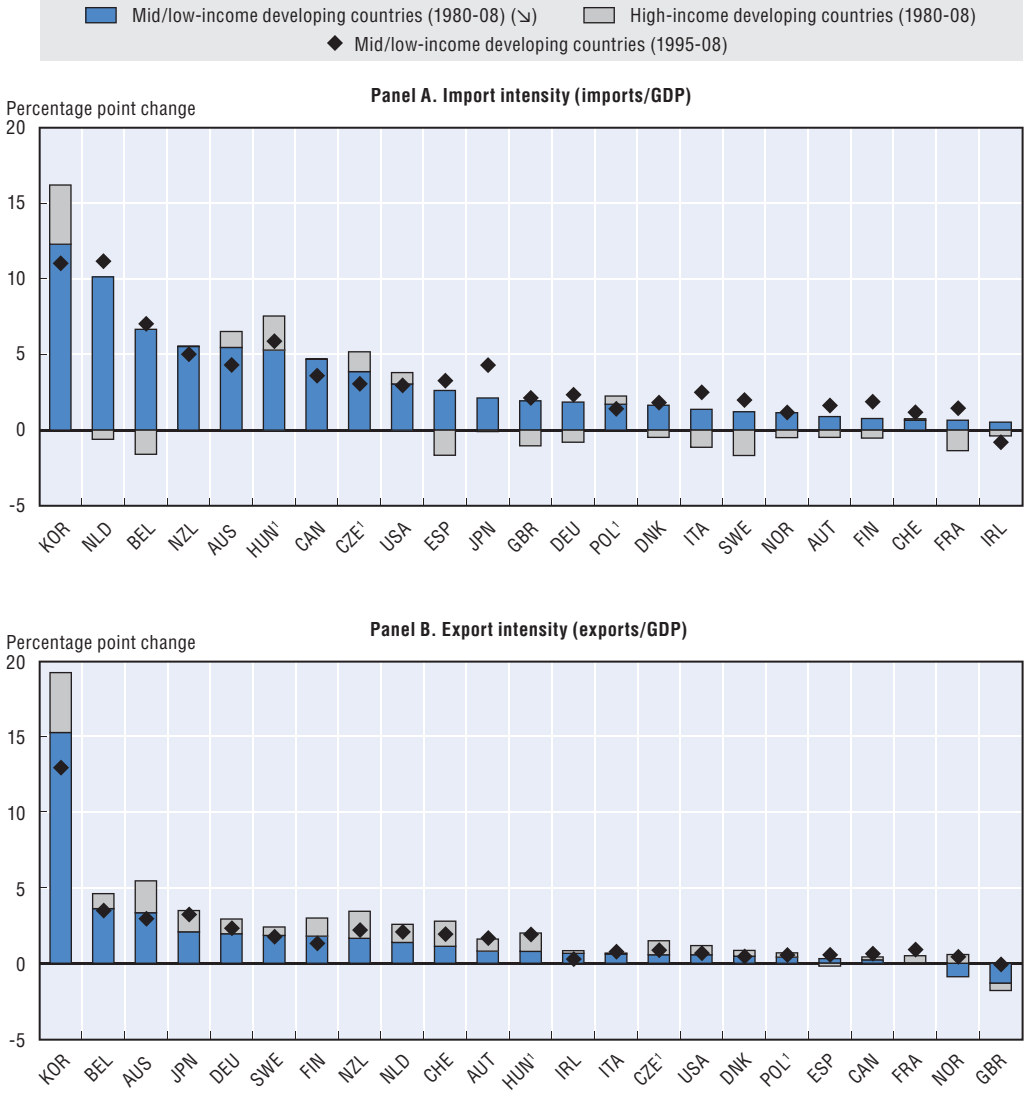
Note: Trade in services is not included.
1. Data series begin in early 1990s.

Source: United Nation Conference on Trade and Development (UNCTAD), *Handbook of Statistics*.

StatLink http://dx.doi.org/10.1787/888932535660

To investigate how much of the increase in trade across the OECD nations over this period can be accounted for by enhancing trade with the emerging market economies such as China and India, the analysis is further disaggregated in two income groups for developing countries (*i.e.* high-income and mid/low-income groups) in Figure 1.4.[7] It reveals an across-the-board increase in imports from mid/low-income developing countries in all 23 OECD countries under study. The trade relationship with high-income developing countries, on the other hand, has become less important in many OECD countries. Indeed, more than a dozen countries registered a decline in imports from this group of developing countries over this period. The rise in exports to mid/low-income developing countries has been less pronounced but it constitutes twice the increase in

Figure 1.4. **Change in trade intensity with developing countries, by income group of developing country**



Note: Trade in services is not included.
1. Data series begin in early 1990s.

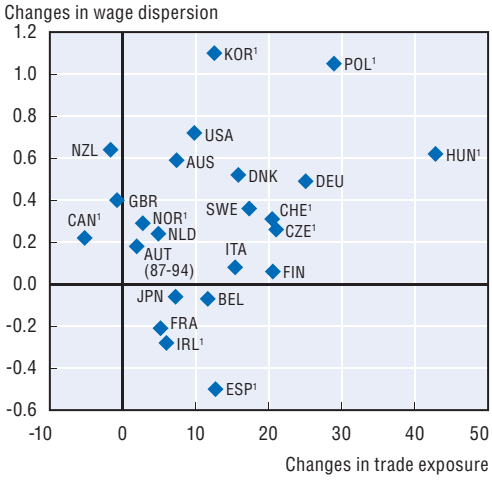
Source: United Nation Conference on Trade and Development (UNCTAD), *Handbook of Statistics*.

StatLink http://dx.doi.org/10.1787/888932535679

exports to high-income developing countries. Interestingly, countries such as Ireland, which registered declines in overall trade from the developing economies now also show enhanced trade with mid/low-income countries. In most cases, the enhanced ties with mid/low-income trading partners dominated the entire trade growth with developing countries, and most of the developments took place during the past 10-15 years.

Overall, was there an association between changes in the degree of trade integration and changes in wage dispersions across countries? Simple cross-country correlations of trends between one often-used indicator of trade integration – trade exposure – and gross wage dispersion show an inconclusive picture for the OECD area (Figure 1.5). At first sight, there is a moderate positive correlation which is, however, influenced by some few countries such as Hungary and Poland. Further, such correlation tells us nothing about causation and it is necessary to take into account many other determinants before we could draw some useful inferences about possible links between trade openness and wage inequality.

Figure 1.5. **Association between trends in wage dispersion and trade openness, 1985-2007**



Note: Trade exposure is defined as a weighted average of export intensity and import penetration openness: sum of exports and imports as a percentage of GDP. Wage dispersion: D9/D1 ratios of full-time earnings.

1. Series start from mid-1990s. All changes in percentage points.

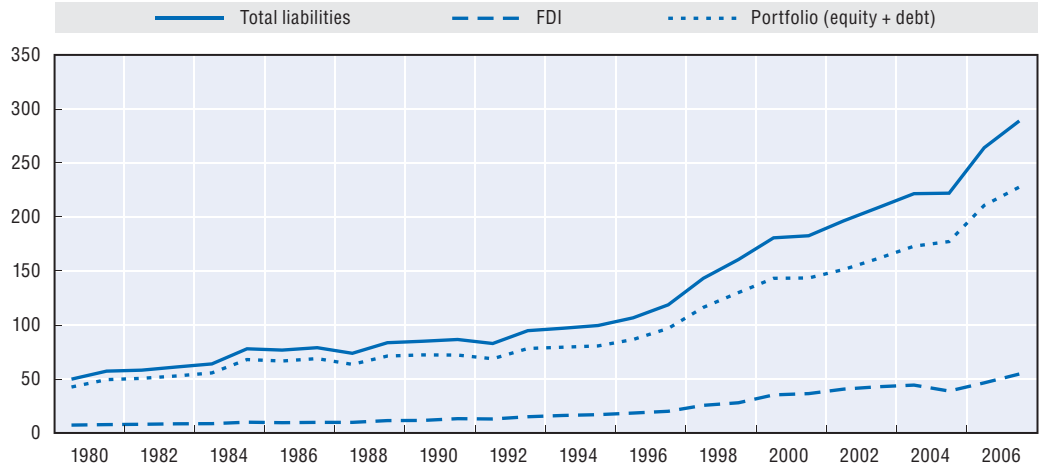
Source: *OECD Trade Indicators Database* and *OECD Earnings Distribution Database.*

StatLink http://dx.doi.org/10.1787/888932535698

International financial flows

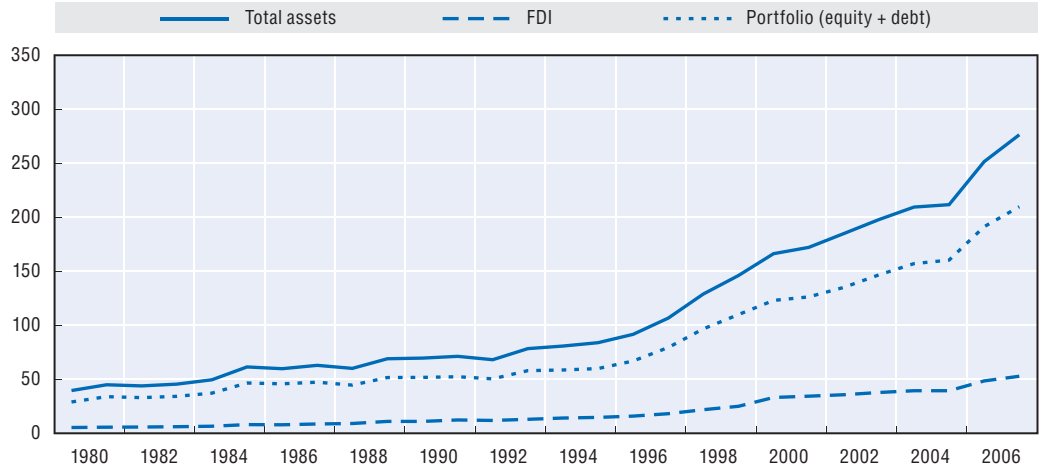
Another trend of the recent stage of economic globalisation are the fast-growing financial transactions across national borders. Figure 1.6 shows that total cross-border liabilities increased exponentially, from 50% of GDP (average across 23 OECD countries) in 1980 to nearly 300% in 2007. The movement is especially stark since the mid-1990s. The growing importance of capital flows likely reflects the trend towards liberalisation and integration in the areas of investment and finance. Among foreign capital movements, foreign portfolio investment (FPI) accounted for the majority of the increase of this trend, while foreign direct investment (FDI) also played a noticeable role in contributing to growing cross-border transfer in recent years. Figure 1.7 reveals a similar trend concerning total cross-border assets.

Figure 1.6. **Cross-border liabilities by components (% of GDP), OECD average, 1980-2007**



Note: Total cross-border liabilities include FDI liabilities, portfolio liabilities and financial derivatives.
Source: External Wealth of Nations Mark II Database (EWN II), IMF dataset; Lane and Milesi-Ferretti (2007).
StatLink http://dx.doi.org/10.1787/888932535717

Figure 1.7. **Cross-border assets by components (% of GDP), OECD average, 1980-2007**



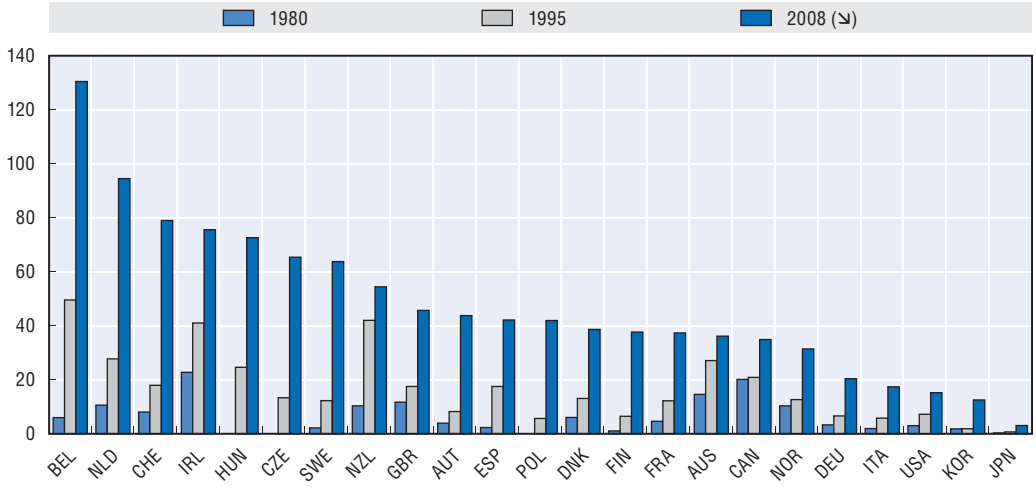
Note: Total cross-border assets include FDI assets, portfolio assets, financial derivatives and total reserves minus gold.
Source: External Wealth of Nations Mark II Database (EWN II), IMF dataset; Lane and Milesi-Ferretti (2007),
StatLink http://dx.doi.org/10.1787/888932535736

Although foreign portfolio investment dominated the changes in overall capital flows and stocks, it is expected to have less impact (than FDI) on the domestic labour market and wage structure. By definition, foreign portfolio investment refers to financial capital of an enterprise in a country, but does not involve any management control in the enterprise. It can be channelled to recipient countries through, for instance, venture capital or investment funds. In order words, portfolio investment is typically more volatile since it is attracted by the prospect of immediate gain rather than by the prospect of long-term growth. On the other hand, FDI refers to an investment made to acquire lasting and significant management interest in enterprises operating outside of the economy of the investor (*i.e.* owns 10% or more of the equity or voting power of an enterprise). For this

reason, this report focuses on the development of FDI, which reflects growing numbers of multinational corporations (MNC) in both home and host states, as well as a widespread phenomenon of globalisation of production.

Since the second half of the 1990s, FDI has played a fundamental role in furthering international integration and has been the most dynamic factor in industrial restructuring at the global level (OECD, 2005). Figure 1.8 shows that inward FDI stock as a percentage of GDP increased in all countries: on average from less than 7% in 1980 to over 45% in 2008. The increase was more than 40 percentage points in 11 out of 23 countries, and most of the increase has been experienced in the past decade. Belgium, the Netherlands, Switzerland and Ireland had the highest ratios for inward FDI stock, while foreign investment only accounted for about 2% in Japan, which is the lowest ratio amongst all OECD countries. The rapid expansion of inward FDI investment may well reflect a tremendous growth of foreign affiliates in the OECD area. If the utilisation of capital and the technology it embodies requires a change in the skill composition of workers, it is likely to have an impact on the domestic wage distribution.

Figure 1.8. **Inward (liabilities) foreign direct investment stock to GDP ratios, 1980-2008**



Note: FDI inward stock is measured as a percentage of GDP.

Source: United Nation Conference on Trade and Development (UNCTAD), FDI statistics online.

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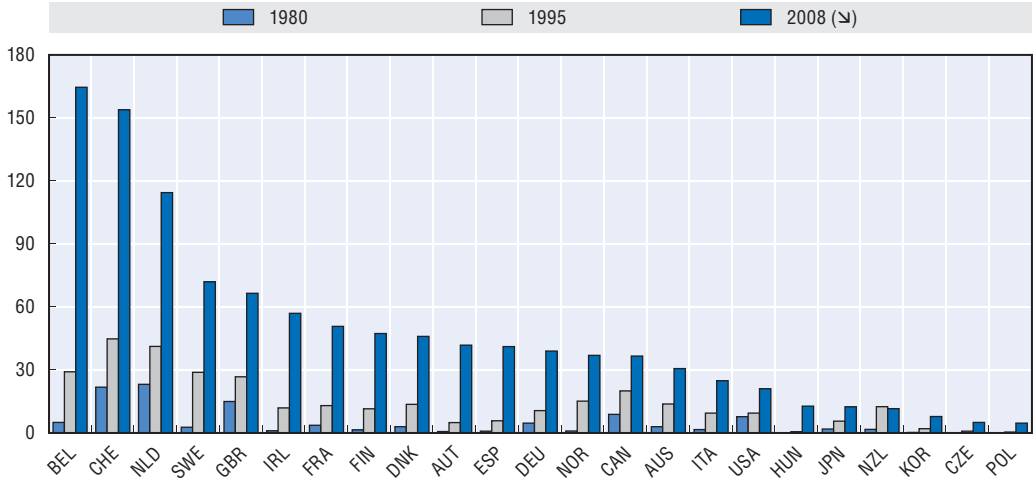
Figure 1.9 reveals a similar development for outward investment. Outward FDI stock as a percentage of GDP increased in all 23 countries between 1980 and 2008: on average from less than 5% in 1980 to nearly 50% at the end of the 2000s. Again, most of the increase occurred during the past 15 years. The growth towards more outward investment suggests that OECD countries have substantially increased the number of multinational corporations as well as their overseas operation over the years. This may also reflect an increase in offshore outsourcing activities in many OECD countries. Overall, the relative share of outward FDI stock in most OECD countries is higher than their inward investment. This suggests that OECD countries are net exporters of FDI. Countries which underwent an economic transition during the 1990s, such as the Czech Republic, Hungary and Poland, however, are exceptions from the general trend. These economies are mostly recipients of FDI.

Figure 1.9. **Outward (assets) foreign direct investment stock to GDP ratios, 1980-2008**



Note: FDI outward stock is measured as a percentage of GDP.

Source: United Nation Conference on Trade and Development (UNCTAD), FDI statistics online.

StatLink http://dx.doi.org/10.1787/888932535774

FDI trends are likely to be interdependent with other global developments. For instance, trade liberalisation is very often accompanied by the removal of restrictions on FDI; and international investment may in turn facilitate more trade since multinational enterprises often export goods from the host state. Furthermore, growing FDI implies that more capital, as well as embodied foreign technologies and know-how, is transferred to the host countries. The transfers of technology and know-how may increase productivity and indeed lead to more trade or investment. The complex interplay among these factors is expected to impact on the domestic wage distribution, for instance via a change in the skill composition of labour demand toward skilled workers.

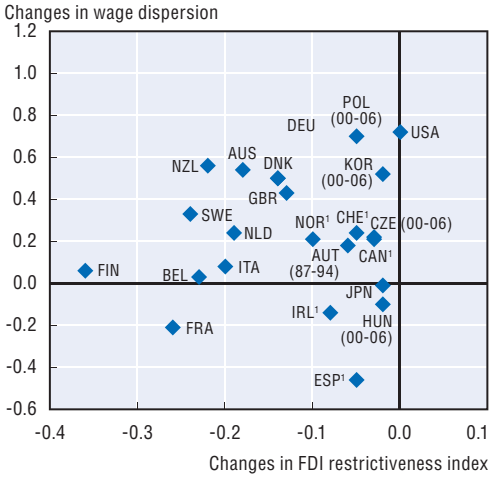
The development of overall financial openness can be instrumented by a *de jure* FDI measure, the FDI restrictiveness index, which takes a value between 0 (open) and 1 (closed). There was no apparent association between changes in FDI restrictiveness and changes in wage dispersion (Figure 1.10).

Technological progress

The rapid advance of technology has been a notable trend in OECD economies during recent decades. Such development is also linked to globalisation in complex ways. The challenge, similar to other globalisation drivers, is the lack of consensus about its measurement and definition. In general, the stock of knowledge, measured either by innovative investments (*e.g.* R&D expenditure), output of knowledge production (*e.g.* patents) or by the degree of computerisation (*e.g.* the use of ICT[8] by firms), increased considerably over time.

Figure 1.11 shows that privately-funded expenditure on business sector R&D as a share of GDP has increased since the 1980s in most OECD countries. This is observed despite the fact that public R&D expenditure, as well as the share of publicly financed business sector R&D, has declined over time generally. Rising investment in R&D by the private sector increases the demand for skilled workers needed to perform R&D, such as scientists, technicians and research workers. Some part of R&D spending eventually results in technological innovation,

Figure 1.10. **Association between trends in wage dispersion and foreign direct investment restrictiveness, 1985-2006**



Note: FDI restrictiveness is a de-jure measure which takes a value between 0 (open) and 1 (closed). Wage dispersion: D9/D1 ratios of full-time earnings.
1. Series start from mid-1990s. All changes in percentage points.

Source: Kalinova *et al.* (2010); *OECD Earnings Distribution Database.*

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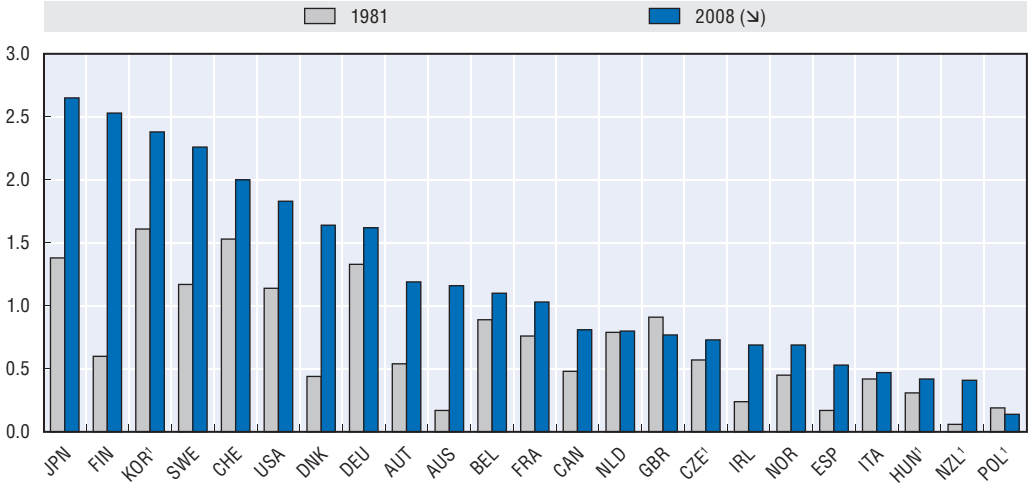
Figure 1.11. **BERD as a percentage of GDP, 1981-2008**



1. Data series begin in 1990s. BERD is business sector expenditures on research and development.

Source: OECD Main Science and Technology Indicators.

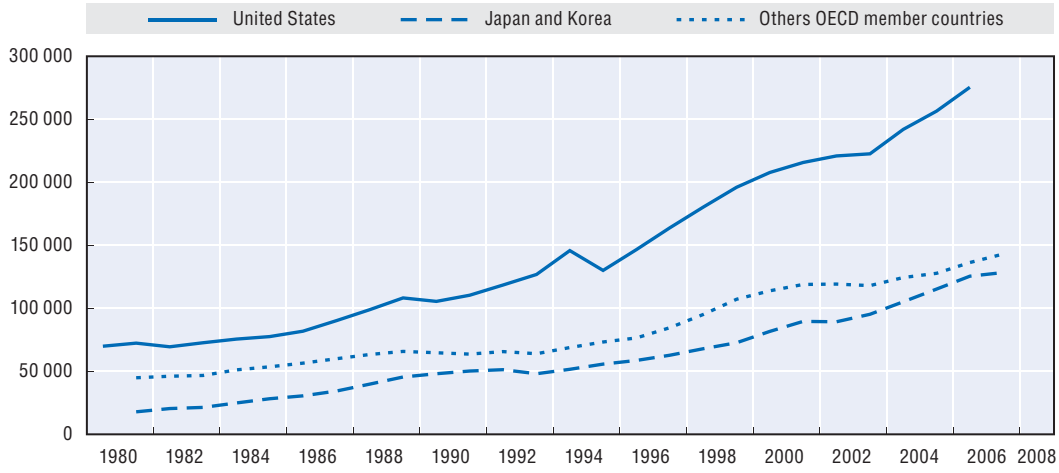
StatLink http://dx.doi.org/10.1787/888932535812

and/or facilitates the absorption of technology, which is likely to be skill-intensive, and thus may result in changing wage differentials. The increase in R&D investment was most apparent in Scandinavian countries, Japan and Australia, while less so in Italy and Netherlands. In fact, the United Kingdom and Poland are the only countries which registered a decline in this source. In the United Kingdom, privately funded business sector R&D expenditure (as a percentage of GDP) dropped from 0.91% in 1981 to 0.76% in 2008.

In addition to resources devoted to R&D, other measures are also devised to capture the output of scientific and technological activities. A commonly-used indicator in the literature is patents (see Griliches, 1991 for a review).[9] Figure 1.12 shows a clear upward

trend in total patent counts across the OECD regions. In the United States, for instance, the number of total patent applications to both the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO) has increased four-fold from 70 000 in 1981 to nearly 280 000 in 2007.

Figure 1.12. **Total patent counts, 1980-2007**

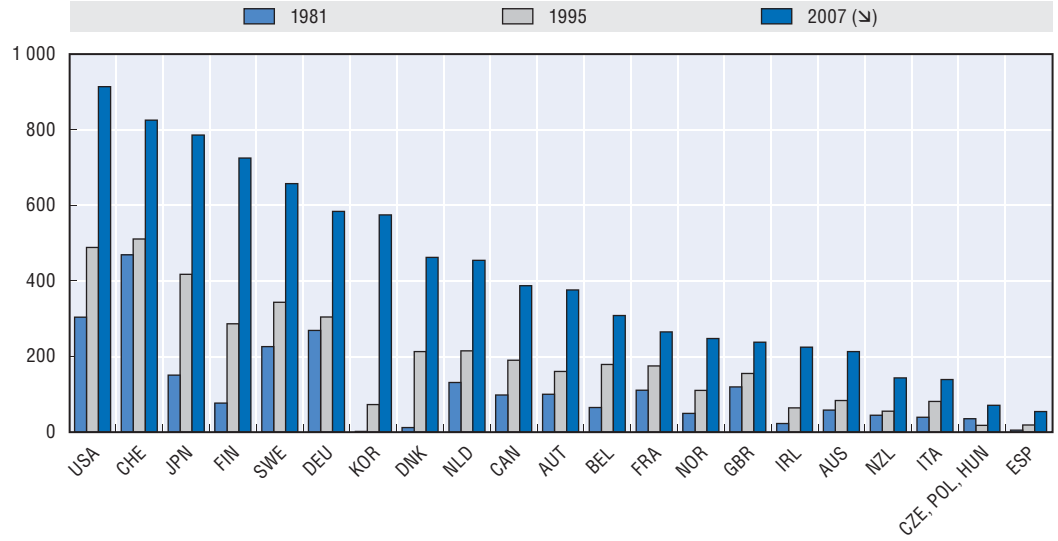


Note: Total patent counts refer to the sum of patent applications to the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO).

Source: OECD Patent Statistics. StatLink http://dx.doi.org/10.1787/888932535831

The speed of growth in patents accelerated particularly after the mid-1990s. Even controlling for country size, Figure 1.13 suggests that technological progress captured by patents is indeed a widespread phenomenon. Inventive activities increased in all countries under study. There are a few notable increases such as Korea where the number of patent

Figure 1.13. **Patents per capita (per million persons)**



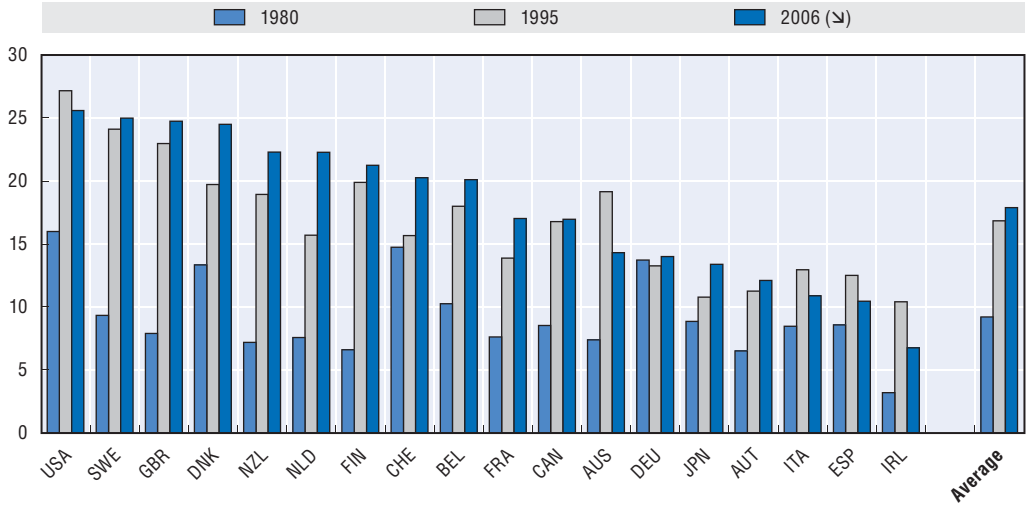
Note: Total patent counts refer to the sum of patent applications to the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO).

Source: OECD Patent Statistics. StatLink http://dx.doi.org/10.1787/888932535850

applications per million persons of the population increased from virtually nothing in the beginning of the 1980s to a considerable number (*i.e.* around 600) in 2007.

Recent literature relating inequality to technological progress also focuses on the role of ICT. Autor *et al.* (2003), for instance, argue that the increased use of computer or ICT may hollow out the wage distribution by reducing labour input of routine and manual tasks (including some middle-class jobs), and increasing demand for workers performing non-routine, complex tasks – for both high-skill, high-wage jobs (*e.g.* scientists, managers), and for low-skill, low-wage jobs that are difficult to routinise (*e.g.* janitors, care workers). Figures 1.14 and 1.15 indicate a growing importance of ICT with respect to both the

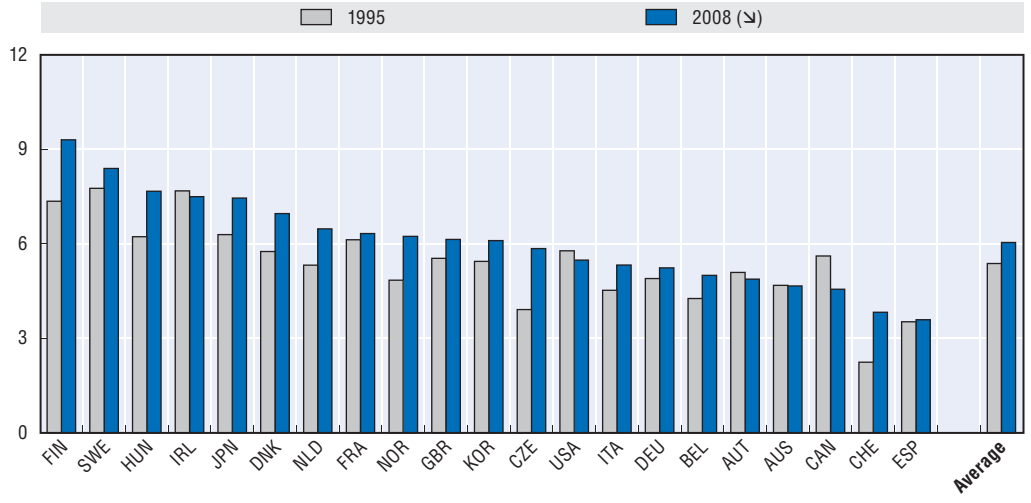
Figure 1.14. **Shares of ICT investment in non-residential gross fixed capital formation**



Note: For starting year, Canada is 1981, Germany 1991 and Japan 1990 instead of 1980. For recent year, Belgium is 2004 and Finland 2005 instead of 2006.

Source: *OECD Productivity Database.* StatLink http://dx.doi.org/10.1787/888932535869

Figure 1.15. **Share of ICT employment in business sector employment**



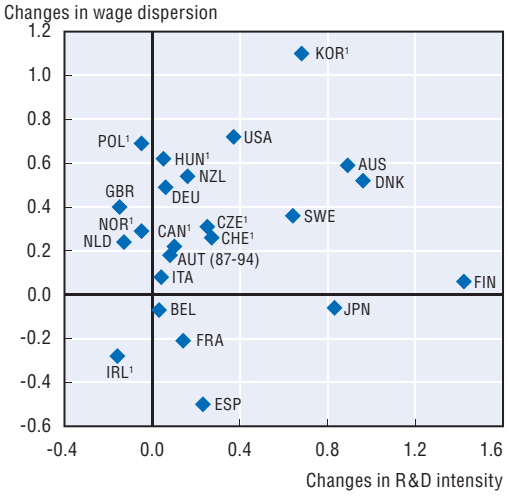
Note: 2007 instead of 2008 for the United States; 2000 instead of 1995 for Hungary.

Source: OECD (2010), *Information Technology Outlook 2010.* StatLink http://dx.doi.org/10.1787/888932535888

investment shares and the employment shares, respectively. In general, the shares of ICT investment in total non-residential gross fixed capital formation (GFCF) rose over time – on average from 9.2% in 1980 to 18% in 2006 – with a significant increase occurring during the 1990s.[10] The increase is more prominent for the United Kingdom (16.8 points), Sweden (15.7) and New Zealand (15.1). In the United States, Australia, Italy, Spain and Ireland, the ICT intensity declined between mid-1990s and recent years. On the employment side, the share of ICT jobs in business sector employment (Figure 1.15) also expanded, albeit modestly, since 1995 in most of the countries.[11] Finland, the Czech Republic and Switzerland registered a largest increase, while Canada showed a noticeable decline in ICT employment during this period.

When relating technological change to trends in wage inequality, a weak but positive association can be found across countries (Figures 1.16 and 1.17). The correlation is less obvious when using business R&D investment as the proxy for technology, as it is likely to be driven by a few outliner countries such as Korea.[12] A positive correlation is more visible when trends in ICT were used, but this may be due to the reduced country sample (data for only 18 countries are available, excluding countries which recorded higher growth in wage dispersion, but lower growth in innovative activities, *e.g.* Hungary and Poland). Taken together with the findings of the sections above, casual observation therefore does not seem to suggest an obvious association between trends in wage inequality and changes that occurred in various aspects in which countries have globalised.

Figure 1.16. **Association between trends in wage dispersion and R&D intensity, 1985-2007**



Note: R&D intensity refers to business sector expenditures on research and development as a percentage of GDP. Wage dispersion: D9/D1 ratios of full-time earnings.

1. Series start from mid-1990s. All changes in percentage points.

Source: OECD Main Science and Technology Indicators; *OECD Earnings Distribution Database*.

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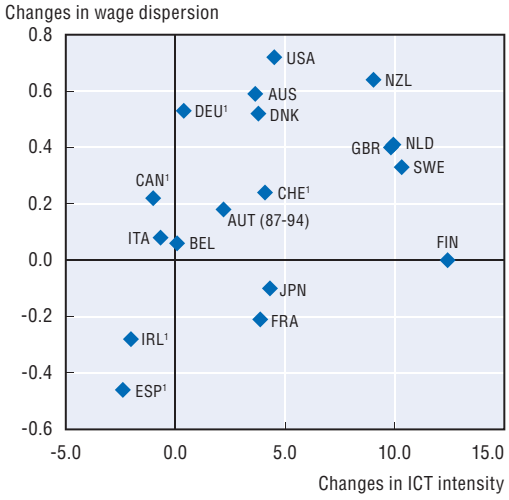
Figure 1.17. **Association between trends in wage dispersion and ICT intensity, 1985-2007**



Note: ICT intensity refers to the share of ICT investment in total non-residential gross fixed capital formation (GFCF). Wage dispersion: D9/D1 ratios of full-time earnings. All changes in percentage points.

1. Series start from mid-1990s.

Source: *OECD Productivity Database*.

StatLink http://dx.doi.org/10.1787/888932535926

1.4. Trends in labour market policies, institutions and regulations

Recent studies have highlighted the importance of taking into account labour market institutions and regulations for changes that occurred to the distribution of earnings, particularly to understand differences in inequality trends across countries (Checci and Garcia-Penalosa, 2005; Piketty and Saez, 2006; Lemieux, 2008). A notable observation is that the rise in wage inequality since the 1980s has coincided with more lenient labour market institutions and policies, such as trade unions and minimum wage-setting. It has been argued that the declining role of institutions and policies has significantly reduced the government's redistributive potential, and thus widened the distribution of earnings or incomes.

This section provides evidence on trends in institutions, policies and regulations in the past 20 to 25 years across OECD countries (see Box 1.1 for details on data sources and type of institutions). Figure 1.18 confirms that the strength of labour market institutions and policies has declined over time in many OECD countries. Trade union density rates (Panel A), which are computed as the percentage of union members among the employed, have fallen almost across the board over this period, with the exception of Spain.[13] But the data also show an apparent drawback of using union membership as a main indicator in the analytical framework, in that it does not adequately capture the bargaining coverage – an issue particularly important in France and Spain where the density is relatively low but the bargaining power is strong. An alternative is to use the union coverage rate as an indicator (Panel B). Compared with the density rate, the union coverage rate is more stable across time, as many countries cluster around the 45° line. In three of the Nordic countries, coverage rates increased despite a decline in union membership, while in Australia, New Zealand and Czech Republic both density and coverage rates showed a marked decline over the period.

In addition to density or coverage rates, the extent of union wage-setting may be influenced by the dominant levels at which bargaining takes place (*i.e.* the degree of centralisation and co-ordination of bargaining). Panel C of Figure 1.18 shows that there are significant cross-national variations in the degree of union centralisation and co-ordination, but the scores are relatively stable over time within countries. The pattern remains very similar when an alternative OECD-developed measure (corporatism) is used.[14] Since the value of centralisation/co-ordination is often invariant across time within countries, it seems to suggest that this variable is more relevant in the analysis of inequality between-countries rather than within-countries.

Evolutions in policies concerning product market regulation (PMR) in the non-manufacturing sectors and the strictness of employment protection for regular and temporary workers are presented in Panels D, E and F of Figure 1.18, respectively. Panel D focuses on regulations that affect competitive pressures in areas where competition is economically viable, while Panels E and F deal with the rules governing dismissals, fixed-term contracts and notice and severance pay for regular and temporary workers. A high value of these indices reflects stricter product/employment regulations. Overall, Panel D shows a marked decline in PMR in all countries under study. The value (average across countries) dropped from 4.9 (of 6) in 1985 to 1.9 in 2007. For EPL, developments were different for legislation for regular than for temporary workers. Legislation for regular workers changed little and became more flexible mainly in countries which had stricter regulations in 1985. Such trend reveals a slight pattern of convergence in employment

Box 1.1. **Data sources for institutional and policy variables**

The main source of data on labour market institutions and regulations comes from the *OECD Employment Database*, covering 23 OECD countries for a period between the mid-1980 and late 2000s (see Annex Table 2.A1.1 in Chapter 2). It contains various dimensions of institutional variables including wage-bargaining mechanisms (union density, union coverage rate and union corporatism), strictness of employment protection legislation (EPL), generosity of unemployment benefits, labour taxation (tax wedges) and minimum wages.

Union density rate is defined as the percentage of employees who are members of a trade union (*OECD Employment Database*). Data on union coverage rates are taken from AdjCov of Visser (2009). It refers to employees covered by wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining. Centralisation/co-ordination is taken from WCoord of Visser (2009). It is a five-point classification of wage-setting co-ordination scores, ranging from one (no co-ordination or fragmented bargaining) to five (economy-wide bargaining).

The EPL indicator contains information on the stringency of national legislation on employment. An overall score ranging from 0 to 6 is available with higher scores representing stricter regulation. The score is based on regulations on such topics as collective dismissals, difficulty of dismissal, fixed-term contracts and notice and severance pay for no-fault individual dismissal. EPL data are drawn from the *OECD Employment Database*

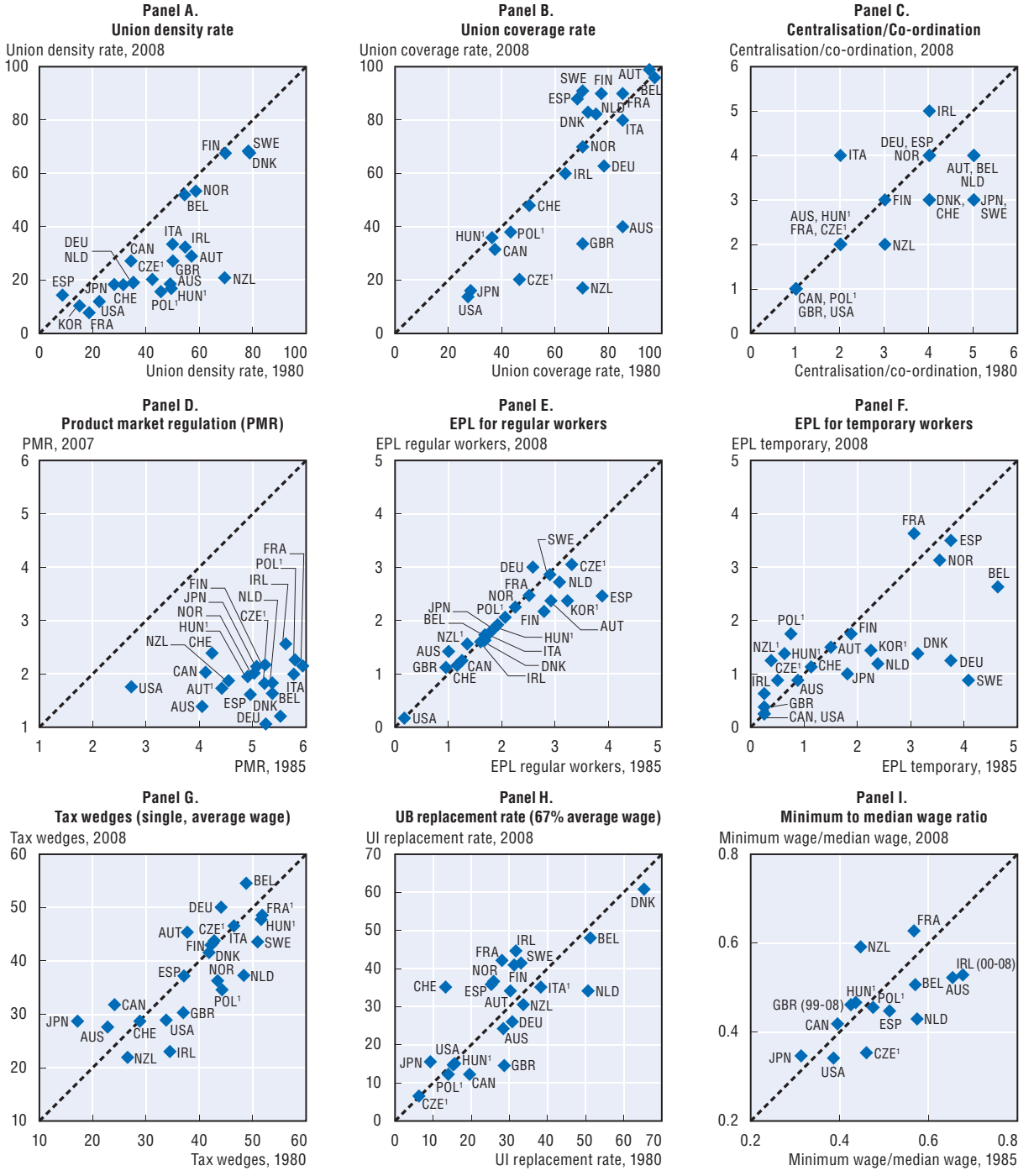
Product market regulation (PMR) is available on a time-series basis in the form of the indicator of regulation in energy, transport and communications (ETCR). This indicator, which ranges from 0 to 6 (least to most restrictions to competition), summarises regulatory provisions in seven sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight. Conway and Nicoletti (2006) argue that measuring changes in the regulation of non-manufacturing sectors is important because these sectors represent around two thirds of economic activity and are the most dynamic part of the economy (in terms of productivity growth and employment) in many OECD countries. Moreover, non-manufacturing is the area in which most economic regulation is concentrated and where domestic regulations are most relevant for economic activity and the welfare of consumers. PMR data are drawn from OECD PMR indicators.

Gross replacement rates are calculated as gross unemployment benefit levels divided by previous gross earnings. The data refer to the average of the gross unemployment benefit replacement rates for two earnings levels, three family situations and three durations of unemployment. The reference earnings are 67% of the average level. Data on gross replacement rates are drawn from the *OECD Benefits and Wages Database*.

Tax wedges are calculated by expressing the sum of personal income tax, employee plus employer social security contributions and payroll tax, as a percentage of labour costs (gross wages + employer social security contributions and payroll taxes). The reference rates are for a single person without children earning the average wage. Tax wedge data are drawn from the *OECD Taxing Wages Database*.

Minimum wages are measured relative to the median value of basic earnings (excluding overtime and bonus payments) of full-time employees. Median rather than mean earnings provide a better basis for international comparisons as it accounts for differences in earnings dispersion across countries. However, such data are not available for a large number of countries. The ratio of minimum-to-median earnings data are taken from the *OECD Employment Database*.

Figure 1.18. **Changes in labour market institutions and policies, 1980-2008**



1. Series start from mid-1990s. See Box 1.1 for definition of variables.

Source: Union coverage (B) and union centralisation/co-ordination (C) from Visser (2009); all others are from *OECD Employment Database*, *OECD Taxing Wages Database* and *OECD Benefits and Wages Database*.

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protection legislation for regular workers across OECD countries. On the other hand, there was more of diversity in EPL trends for temporary workers. In about one third of countries, EPL decreased significantly. On the other hand, in a group of countries with rather flexible regulations employment protection for temporary workers became stricter over the years.

Panel G plots tax wedges on earnings for 1980 and 2008. These vary sharply across OECD countries, ranging from 22% in New Zealand to 54% in Belgium. In terms of changes over this period, the picture is mixed. Tax wedges exhibited a declining trend in many countries over this period. The decline is more noticeably in Ireland and the Netherlands, dropping about 11 percentage points between 1980 and 2008. There are, however, a few exceptions. Austria, Belgium, Canada, Germany and Japan all have seen a marked increase in tax wedges over the last 25 years.

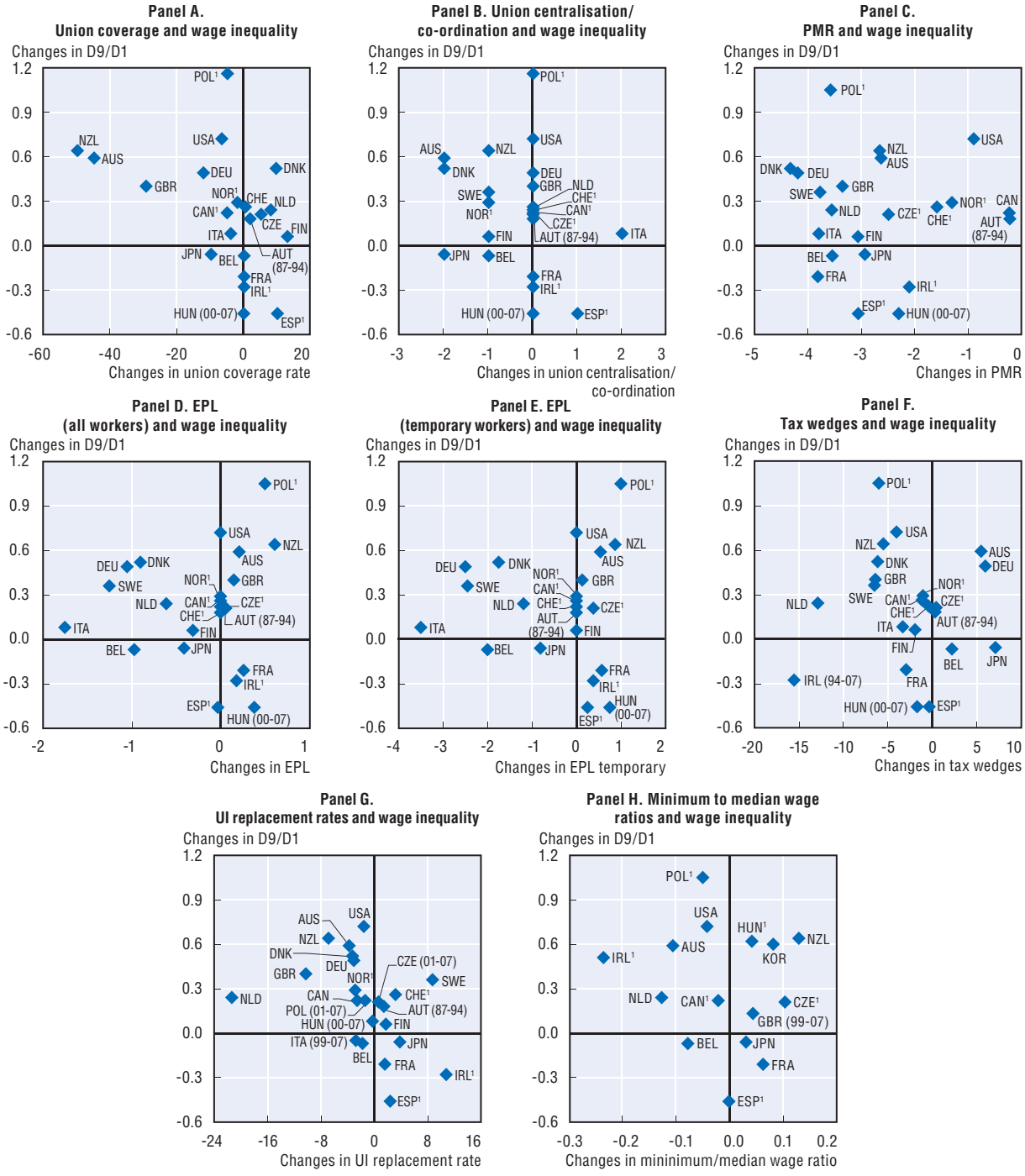
The development of benefit replacement levels, in particular those embedded in unemployment insurance benefits, was rather heterogeneous across the OECD area (Panel H). Gross unemployment benefit replacement rates increased by 22 percentage points in Switzerland and by more than 10 points in France, Ireland, Norway and Spain over this period, while the rates decreased noticeably Netherlands (–16.3), the United Kingdom (–13.9) and Canada (–7.1). The figure also shows a great deal of cross-national differences in levels of replacement rates. Average replacement rates were lower in the three central eastern European countries but also in Canada, Japan and the United States, but higher in Belgium and Denmark.[15]

Finally, Panel I illustrates the evolution of statutory minimum wages with regard to the median wage. Statutory national minimum wages exist in 14 of the 23 countries included in the analysis. Among this sample, the minimum wage ratio declined in eight countries, particularly in the Netherlands, Australia, and Czech Republic where it dropped more than 10 percentage points over this period. A marked decline in the minimum wage ratio can also be seen in Ireland during the 2000s. The only country that registered a considerable increase in the relative minimum wage is New Zealand: from 44% of median wage in 1985 to 59% in 2008.

The association between trends in wage inequality and labour market institutions is presented in Figure 1.19. Changes in institutions, policies and regulations in general are negatively correlated, albeit very modestly in most cases, with changes in wage dispersion within countries. For instance, a decline in union coverage is associated with an increase in wage dispersion (Panel A), but driven by a few countries. A similar negative relationship is also witnessed between changes in centralisation/co-ordination of wage bargaining and change in inequality (Panel B), but such correlation is rather moderate as many countries indeed did not register a change in this index over time.

Changes in both product market and employment regulations are also correlated with changes in wage inequality. For EPL, it is argued that stricter employment protection laws increase employers' costs to hire/dismiss workers and raise the reservation wage of the unemployed. Such policies would compress the wage differential if the associated labour adjustment costs are relatively more important for unskilled workers. For PMR, the channel of inequality transmission is more indirect as lower PMR values are expected to lead to an increase in competition in a respective sector which, in turn, should shift labour demand and increase the returns to skills. The effect of PMR may indeed run through at the finer (firm) level. Less-regulated product markets tend to raise stronger competitive pressure

Figure 1.19. **Association between trends in wage dispersion and labour market policies and institutions, 1985-2007**



1. Series start from mid-1990s.

Source: Union coverage (B) and union centralisation/co-ordination (C) from Visser (2009); all others are from *OECD Employment Database*, *OECD Taxing Wages Database* and *OECD Benefits and Wages Database*.

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and create more incentives to innovation and technological adoption with differential effects across workers within sectors and firms. The data suggest a very moderate negative relationship between changes in product market regulation and wage inequality (Panel C). There is no correlation between the trends in overall employment protection and wage dispersion (Panel D) but some moderate negative association seems to exist between EPL for temporary workers and wage inequality trends (Panel E).

Changes in tax wedges may also impact on trends in wage dispersion, *e.g.* a higher marginal tax rate may discourage less-skilled workers to enter the labour force for lower-paid jobs. A reduction in tax wedges could thus imply an increase in the supply of low-skilled labour and lead to higher wage differentials. The generosity of unemployment benefits could also have effects on wage inequality. It has been hypothesised that high replacement rates would strengthen the bargaining position of lower-paid workers more than that of higher-paid workers, and hence would lower the wage differential. Finally, an increase in the real minimum wage is likely to result in lower wage dispersion because it tends to benefit low-skilled workers. The casual observation in Figure 1.19 seems to provide some support to these hypotheses: changes in tax wedges (Panel F), UI replacement rates (Panel G) and minimum-to-median wage ratios (Panel H) are somewhat negatively associated with changes in wage inequality.

1.5. Summary and conclusions

There were marked changes in the wage distribution, economic globalisation, and product and labour market policies in OECD countries during the quarter-century between the early 1980s and the late 2000s. The main patterns were as follows.

Trends in wage distribution

- There was a general trend towards greater wage inequality in the OECD area. With very few exceptions, the ratio of the wages of the 10% best-paid workers to those of the 10% worst-paid (D9/D1 decile ratios) increased significantly across the 23 OECD countries under review. In the United States, for instance, the wage gap between the richest and poorest 10% of full-time workers widened from 3.8 times in 1980 to nearly 5 times in 2008. Over that period, the D9/D1 decile ratio grew on average across countries by one-half of 1%. While the widening gap has affected the entire wage distribution, disparities were greater in the upper half than in the lower half.

Trends in economic globalisation and technological change

- The trade integration spread and deepened substantially in practically all OECD countries from the 1980s, with the pace particularly accelerating from the early 1990s. Another trend was the fast-growing transfer of finance across national borders, with the GDP share of foreign direct investment (FDI) doubling to 50% between the mid-1990s and the mid-2000s. The share of financial resources granted to the private sector (loans, trade credits etc.) also grew. Finally, the rapid advance of technology was another notable feature of global integration, whether considered as innovative investments (R&D expenditure), the output of knowledge (patents) or the degree of computerisation (the use of information and computer technology by firms).

Trends in labour market institutions, policies and regulations

- The strength of some product and labour market institutions and policies declined in most OECD countries over the period in question. Union density, the strictness of employment protection legislation and product market regulation, and tax wedges all decreased particularly significantly. In those countries where they exist minimum wage fell substantially relatively to median wages. Trade union coverage remained relatively stable, while union co-ordination showed a trend towards more decentralised wage bargaining.

Association between trends in wage dispersion, globalisation and regulatory reform

- At first sight, there is little correlation between growing wage inequality and the significant increase in trade and financial openness across OECD countries. Links – albeit loose ones – with some technological change indicators can be observed, however. Ties between changes in policies and institutions also seem to be weak. But such correlations – or the absence thereof – say nothing about causal links or the interplay between the different factors which have influenced the increase in wage dispersion in OECD countries.

Notes

1. Full-time, full-year earnings are often taken as an approximation of the wage rate (Blau and Kahn 2009). Changes in these therefore reflect "price" rather than "quantity" effects. Adding in earnings of part-time workers would lead to higher levels of earnings inequality in all countries. This is discussed in Chapter 4 below.
2. *www.oecd.org/dataoecd/9/59/39606921.xls*. See Annex 2.A1 in Chapter 2 for data description. These data are drawn from different available sources, including surveys, administrative registers and tax records. While great care has been taken to standardise these data to common concepts and units (annual gross earnings of working-age individuals holding a full-time job), differences remain. In particular, the comparability of the earnings series *across* countries, is less compelling due to differences in both population coverage and definitions. These data are therefore more suited for assessing changes in earnings distributions *over* time than for comparing levels across countries (see Atkinson, 2008).
3. Kang and Yun (2008) investigated this particular pattern and concluded that factors related to human capital played an important role in moulding the U-shaped changes in wage inequality in Korea. They speculate that the rapid growth in wage inequality since the 1990s may be related to skill-biased technological change since the Korean economy was transformed into a more knowledge-intensive, high-tech industrial economy around the mid-1990s. They also suggest that an increase in outsourcing to China and other low-wage countries may explain the surge in wage inequality in recent years.
4. The D9/D1 ratio in Denmark, for instance, has increased from 2.1 in 1980 to 2.7 in 2007. This finding does not seem to support the conventional view of downward nominal wage rigidity, which is predicted in this region (Holden and Wulfsberg, 2007).
5. OECD macro trade indicators (*http://dotstat.oecd.org/index.aspx*).
6. That said, other EU countries such as Belgium and Hungary recorded higher absolute increases in trade with developing countries, as shown by the extent of percentage point changes.
7. The distribution of developing countries by income group is defined according to the UNCTAD classification (*www.unctad.org/sections/wcmu/docs/stat2011_classification_en.pdf*). That is, the high-income group is defined as countries where per capita GDP in 2000 (corrected for fluctuations in the exchange rates) is above USD 4 500; mid-income countries, between USD 1 000 and USD 4 500; and low-income countries, below USD 1 000).

8. ICT stands for Information and Communication Technology.

9. The patent data are drawn from the OECD patent database *www.oecd.org/document/41/0,3343,en_2649_34451_40813225_1_1_1_1,00.html*.

10. This measure, ICT/GFCF, shows the intensity of ICT in terms of investment (*i.e.* how much of total fixed asset investment is due to ICT). The data is drawn from *OECD Productivity Database* (*http://www.oecd.org/dataoecd/27/37/46098342.xls*). The estimates are based on national data, the Groningen Growth and Development Centre Total Economy Growth Accounting Database (*www.ggdc.net*) and the EU KLEMS database (*www.euklems.net/*). Total GFCF and GDP are based on estimates from the OECD Annual National Accounts.

11. Information on ICT employment share prior to 1995 is not available.

12. For instance, no association between changes in wage dispersion and R&D is found when Korea is removed; but it becomes positive and significant when Finland is dropped.

13. Trade union density rates declined the most in New Zealand where they dropped from nearly 70% in 1980 to 17% in 2008

14. Corporatism is an indicator of the degree of centralisation/co-ordination of the wage bargaining processes, which takes values 1 for decentralised and uncoordinated processes, and 2 and 3 for intermediate and high degrees of centralisation/co-ordination, respectively (see Bassanini and Duval, 2006). This indicator could not be used in the main analysis below because there are no data available for the period after 2003.

15. For the first group of countries this is due to a shorter maximum duration of benefits (*e.g.* six months in the Czech Republic, compared with 48 months in Denmark). Replacement rates are calculated as the unweighted average of three time periods: the first year; the second and third years; and the fourth and fifth years of unemployment).

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PART I

Chapter 2

The Impact of Economic Globalisation and Changes in Policies and Institutions on Rising Earnings Inequality*

This chapter analyses possible causes of the increase in wage inequality among full-time workers recorded in OECD countries during the past 25 years. It looks at the impact of economic globalisation that has come with trade and financial integration, together with the effects of technological change and developments in the fields of product and labour market regulations and institutions. It examines the interplay between these factors and separately considers shifts in the lower and upper halves of the wage distribution. It also addresses trends in sector-based wage disparities between skilled and unskilled workers.

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2.1. Introduction

Empirical studies of inequality that used data from the 1980s and 1990s have generally been inconclusive as to causal links between developments in globalisation (particularly trade) and inequality (*e.g.*, Bound and Johnson, 1992; Berman *et al.*, 1994; Krugman, 1995, 2007; Tóth, 2007; ILO-WTO, 2007). Over the past decade, however, there have been several notable shifts in patterns of globalisation. The share of imports into OECD countries from emerging economies, for example, has grown sharply, while the entire OECD area has seen a rise in the number of multinational enterprises (OECD, 2005). As more information and time-series data become available, there is renewed interest in examining whether global processes alter wage structures.

While globalisation and technological change were long considered the prime explanation for wage inequality, empirical studies are now documenting the importance of changes in labour market institutions and policies. For instance, the decline in unionisation in the United States (Card, 1996) and the United Kingdom (Machin, 1997) is associated with higher wage inequality (as Atkinson, 1996, has also observed). Minimum wage levels that have fallen in relation to median wages have also been found to increase inequality, particularly at the lower end of the distribution (DiNardo *et al.*, 1996; Lee, 1999; Dickens *et al.*, 1999). The same finding is also evident in cross-country studies. Drawing on data from 11 OECD countries, Koeninger *et al.* (2007) show that institutions and policies account for much of the change in wage inequality: the authors argue that union density, employment protection, tax wedges, levels and duration of benefit replacement rates, and the minimum wage all negatively affect the wage differential. Policies may also impact on the degree of competition and comparative advantages in labour markets. It has been argued that increased product market integration may lead more firms to compete for both domestic and foreign markets, thereby affecting the bargaining power of wage setters (Andersen, 2005; Andersen and Sorensen, 2010).[1]

Many of the above studies look at the impact of institutions and regulations on inequality in isolation. This chapter considers how a variety of labour market institutions, regulations, and policies in OECD countries have changed since the mid-1980s, and how much of the rise in within-country wage inequality can be attributed to these changes rather than to globalisation and technological change. The chapter highlights the following key findings:

- Overall, increasing trade exposure and financial openness have no significant impact on rising wage inequality in OECD countries.
- Skill premiums are no higher in sectors that are more exposed to trade globalisation. The increase in the wage gap between skilled and unskilled workers is driven by inequality within rather than between sectors.
- Technological change is positively related to increasing wage dispersion and predominantly affects the upper half of the wage distribution.

- Regulatory reform has a significant impact on wage inequality among full-time workers, in particular weaker employment protection legislation governing temporary workers, product market deregulation, declining unionisation, lower tax wedges, and lower replacement rates.
- By contrast, the rise in the skilled labour supply as well as in women's share of employment constitute sizeable counterweights to the increase in wage inequality.

2.2. Effects of economic globalisation, technological change, and changes in policies and institutions on wage inequality

Regression analysis of trends in within-country inequality

The econometric specification below examines the distributional consequences of economic globalisation, technological progress, and labour market polices and institutions. It uses annual cross-county, time-series data covering 22 OECD countries from the early 1980s to 2008.[2] (Sources and details about the data are given in the Annex 2.A1.)

The analysis focuses on the *within*-country variation in inequality, relating changes in wage dispersion to various channels through which globalisation might operate and to technology and policy factors that are considered crucial drivers of inequality trends in countries over recent decades. The following fixed-effects specification is used for within-country changes of inequality:

$$\ln(\text{Wage dispersion}_{it}) = \alpha + \beta' \ln(\text{GLOBs}_{it}) + \lambda \ln(\text{Tech}_{it}) + \theta' \ln(\text{Instit}_{it}) + \gamma' X_{it} + C_i + \eta_t + \varepsilon_{it} \quad (1)$$

where wage dispersion is measured by the decile ratio (D9/D1) of weekly earnings among full-time workers.[3] The explanatory variables are:

- *GLOBs* are a set of globalisation indicators, including measures for both trade and financial movements.
- *Tech* is an indicator of technological progress, principally measured by expenditure on business sector R&D as a share of GDP.[4]
- *Instit* includes the institutional variables documented in Chapter 1.
- *X* is a vector of control variables, which includes the sectoral share of employment (*i.e.* agriculture, industry and service sectors), education (percentage of the population with post-secondary education), the share of female employment and the output gap (to capture cyclical fluctuations in aggregate demand).

Equation 1 is estimated by a fixed-effects model with both country-specific effects, C_i, (to focus on within-country changes) and year-specific effects, η_t (to capture common global shocks and business cycle effects). ε_{it}, is a random disturbance. The dependent variable and most explanatory variables are logarithm-transformed.[5]

Baseline specification

The baseline specification of the regression uses summary indicators to capture the impact of global economic developments on wage inequality among full-time or full-time equivalent workers. Trade integration is captured by trade exposure, defined as a weighted average of export intensity and import penetration, while technical progress is proxied by the business R&D-to-GDP share deviated from its long-term trend.[6] The development of financial openness is instrumented by a *de jure* foreign direct investment (FDI) measure – the FDI restrictiveness index – which takes a value between 0 (open) and 1 (closed).[7] The advantage of using *de jure* indices rather than *de facto* (volume-based) measures of

international financial flows is that they mitigate the problem of endogeneity since *de facto* measures are often endogenously determined by other factors included in the framework, *e.g.* the openness of the economy to international trade or technological progress. The baseline specification uses four variables for policies and institutions: union coverage, product market regulation (PMR), employment protection legislation (EPL) and tax wedges.[8] The results from the regression analysis are presented in Table 2.1.

Table 2.1. **The impact of globalisation, technological progress and regulatory reform on trends in wage dispersion**

Dependent variable: natural logarithm of D9/D1 ratio of full-time earnings

	Baseline (Trade)	With financial regulation	With technology	With institutions and policies
	(1)	(2)	(3)	(4)
Trade integration				
ln(Total trade exposure)	0.049	0.059*	0.060*	0.035
	(1.37)	(1.72)	(1.66)	(0.95)
Financial integration				
ln(FDI restrictiveness index)		–0.049***	–0.049***	–0.001
[0-1, 0 open, 1 closed]		(–3.36)	(–3.35)	(–0.04)
Technology				
ln(Business R&D/GDP)[1]			0.103**	0.097**
			(1.98)	(2.06)
Labour market institutions and policies				
ln(Union coverage rate)				–0.039*
				(–1.90)
ln(PMR)				–0.040**
				(–2.26)
EPL				–0.052***
				(–4.62)
ln(Tax wedges)				–0.112***
				(–3.66)
Other controls				
ln(% has attained post-secondary education)	–0.119***	–0.152***	–0.156***	–0.116***
	(–6.56)	(–6.91)	(–6.89)	(–4.57)
ln(female employment share)	–0.173	–0.260**	–0.273**	–0.351***
	(–1.44)	(–2.22)	(–2.30)	(–2.92)
Other[2]	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	333	333	333	333
Number of countries	22	22	22	22
Adjusted R-squared (within)	0.45	0.48	0.48	0.55

Note: *t*-statistics (in parentheses) are obtained from heteroskedasticity-robust standard errors. For definition of variables, see Annex 2.A1. *, **, ***: significant at the 10%, 5% and 1% level, respectively.

1. The variable is detrended using the Hodrick-Prescott (HP) filter (see note 6).
2. Other controls include the output gap, the sectoral share of employment (*i.e.* agriculture, industry and service) and the trend component of technology variable from the HP filter.

Source: See Annex 2.A1; OECD Secretariat calculations.

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Without controlling for other macroeconomic developments and changes in regulations and institutions, Column 1 in Table 2.1 suggests that trade integration has no significant impact on trends in wage dispersion among full-time wage earners within countries, at least at the aggregate level. An inequality-increasing effect of trade, however,

becomes marginally significant (t = 1.72) when changes in FDI restrictiveness are controlled for (see Column 2). This suggests a possible interplay between trade and financial openness, as growing trade exposure tends to be accompanied by certain inequality-reducing elements in financial flows (*e.g.* inward investment). As a result, a disequalising effect of trade becomes apparent when financial factors are held constant.

With respect to financial deepening, Column 2 shows that relaxing FDI regulation (to attract more external investment) is associated with higher wage inequality. The effect is strong and statistically significant at the 1% level. The coefficient indicates that a 10% decrease in the average FDI restrictiveness index would yield a roughly 0.5% increase in the mean wage differential. For a baseline D9/D1 of 3.0, this is an equivalent of an increase of 0.015 points (*i.e.* $3 \times 1.005 = 3.015$).

Column 3 includes the impact of increased expenditure on science and technological activities, controlling for both trade and financial determinants. Technological progress has a large, significant disequalising impact on wage distribution: an increase of BERD-to-GDP ratio by 10% above its long-run trend value is associated with a 1% increase in the D9/D1 ratio.[9] The result, despite focusing on shocks, is consistent with previous findings that technological progress tends to widen the wage distribution by making the demand for skilled labour higher than for unskilled labour. The result, similar to IMF (2007) findings, also suggests that advances in technology have a greater impact than trade and financial factors on inequality within countries.[10]

Column 4 is the preferred specification and includes the effects of regulatory reform and changes in institutions. It presents the overall picture of the relationship between globalisation, technology, policies/institutions, and within-country wage inequality. The results, which are discussed in more detail below, show that changes in labour market policies and institutions (in particular PMR, EPL and tax wedges) and technological change were generally the main determinants of the increase in wage inequality between the early 1980s and the late 2000s. Trade integration and international financial flows exerted little distributional impact, once policies and institutional effects were taken into account.

Over the same period, however, the rise in educational attainment led to an increase in the supply of skilled labour, which reduced wage differentials and helped to considerably offset growing inequality. Rising female labour force participation also exerted a sizable equalising effect, a trend in line with the hypothesis of a gender-biased demand shift in favour of female labour.[11] It raises relative wages for women and thus reduces overall wage inequality.

Some of the aggregate indicator results above may hide the effects of certain subcomponents of economic globalisation and institutions on inequality. The next three subsections therefore examine in detail the impact of changing trade, financial and institutional patterns on wage dispersion, looking at several subaggregates of these global developments.

The impact of trade integration on wage inequality

Table 2.2 disaggregates the overall trade exposure variable into subcomponents to gain insight into the channels through which trade may affect wage dispersion. Columns 1 and 2 report the distributional impact of exports and imports, considering other macroeconomic developments to be constant. Neither estimate is statistically significant, a finding consistent with previous empirical literature which generally shows

Table 2.2. **The impact of trade integration on trends in wage dispersion**

Dependent variable: natural logarithm of D9/D1 ratio of full-time earnings

	(1)	(2)	(3)	(4)	(5)	(6)
Trade integration						
ln(Export intensity)	0.038					
	(1.33)					
ln(Import penetration)		–0.052				
		(–1.38)				
ln(Imports from DC-to GDP)			–0.018		–0.028*	
			(–1.08)		(–1.75)	
ln(Imports from low/med-income DC-to GDP)[1]				–0.017		–0.037**
				(–1.11)		(–2.39)
Interaction (trade x institutions)						
ln(Imports from DC-to GDP) x dummy for less-regulated economies[2]					0.053**	
					(2.26)	
ln(Imports from low/med-income DC-to GDP) x dummy for less-regulated economies[2]						0.073***
						(4.67)
Financial integration						
ln(FDI restrictiveness index)	0.003	0.007	–0.001	0.001	–0.001	–0.004
[0-1, 0 open, 1 closed]	(0.20)	(0.39)	(–0.03)	(0.04)	(–0.02)	(–0.24)
Technology						
ln(Business R&D/GDP)[3]	0.098**	0.103**	0.094**	0.093**	0.094**	0.090*
	(2.05)	(2.20)	(2.03)	(1.96)	(2.02)	(1.90)
Labour market institutions and policies						
ln(Union coverage rate)	–0.040*	–0.033*	–0.037*	–0.039*	–0.017	–0.004
	(–1.91)	(–1.68)	(–1.82)	(–1.93)	(–0.82)	(–0.20)
ln(PMR)	–0.039**	–0.041**	–0.038**	–0.036**	–0.042**	–0.048***
	(–2.22)	(–2.33)	(–2.16)	(–2.01)	(–2.43)	(–2.69)
EPL	–0.052***	–0.058***	–0.054***	–0.053***	–0.060***	–0.066***
	(–4.68)	(–5.04)	(–4.86)	(–4.85)	(–5.14)	(–5.65)
ln(Tax wedges)	–0.110***	–0.106***	–0.099***	–0.102***	–0.108***	–0.110***
	(–3.59)	(–3.54)	(–3.18)	(–3.34)	(–3.39)	(–3.76)
Dummy for less-strict EPL economies[2]					–0.008	0.001
					(–0.12)	(0.02)
Other controls						
ln(% has attained post-secondary education)	–0.120***	–0.102***	–0.116***	–0.115***	–0.100***	–0.089***
	(–4.68)	(–4.02)	(–4.62)	(–4.70)	(–3.66)	(–3.53)
Other variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	333	333	333	333	333	333
Number of countries	22	22	22	22	22	22
Adjusted R-squared (within)	0.55	0.55	0.55	0.55	0.56	0.57

Note: *t*-statistics (in brackets) are obtained from heteroskedasticity-robust standard errors**.** Other controls include the output gap, female and sectoral employment shares, and the trend of technology variable. For definition of variables, see Annex 2.A1. *, **, ***: significant at the 10%, 5% and 1% level, respectively.

1. The income level of developing countries is defined according the United Nation Conference on Trade and Development's (UNCTAD) classification (*www.unctad.org/sections/wcmu/docs/stat2011_classification_en.pdf*). High-income countries are defined as countries where per capita GDP in 2000 (corrected for fluctuations in the exchange rates) is above USD 4 500; mid-income countries, between USD 1 000 and USD 4 500; and low-income countries, below USD 1 000.
2. Less-strict EPL economies refer to counties in which the average score of the employment protection over the study period is 1.5 or less, on a scale of 0 (least restrictions) to 6 (most restrictions).
3. The variable is detrended using the Hodrick-Prescott (HP) filter (see note 6).

Source: See Annex 2.A1; OECD Secretariat calculations.

StatLink http://dx.doi.org/10.1787/888932537484

no conclusive evidence between trade integration and income or earnings inequality (*e.g.* IMF, 2007; ILO, 2008).

Columns 3 and 4 further disaggregate the trade indicator by region of origin and destination,[12] focusing on imports from developing countries. Theoretical models have predicted different distributional impacts between trade among advanced countries (North-North)[13] and trade with developing countries (North-South) (see, for example, Krugman, 1981; Helpman, 1981; or Wood, 1994). The results, however, indicate no apparent disequalising impact from trade (imports) with emerging economies, as well as with low- and mid-income countries.[14]

However, the impact of trade integration on wage inequality might depend on the institutional setting of the country considered. Rising import competition, for instance, may have a larger effect on wage dispersion in countries with less strict regulations, *e.g.* in terms of employment protection. To test this hypothesis, in Columns 5 and 6 we interact the measures of trade integration with a binary policy dummy, *p*, which indicates whether or not a country has less strict employment protection.[15] The coefficient of trade integration therefore reflects the impact on wage inequality for countries with a more rigorous EPL regime ($p = 0$), and the estimate of the interaction term captures the difference in the wage inequality effect of trade between these two types of country groups, "strict EPL" and "weak EPL" countries. The results suggest that trade (imports) with emerging economies tends to reduce wage inequality among countries in which stronger employment protection legislation prevails. At the same time, the interaction term indicates the opposite scenario for countries with less strict EPL,[16] namely that growing import competition from developing regions was associated with higher wage inequality (Column 5). These results get stronger when the impact of imports from low-income developing countries like China and India is considered (Column 6).

While the effect of trade integration has been estimated to be insignificant for wage dispersion at the aggregate level, there are reasons to believe that there were effects on the more disaggregated level. Recent literature has emphasised the importance of firm heterogeneity in international trade and a number of possible new mechanisms (see Tybout, 2003; and Harrison *et al.,* 2010 for a survey). One such mechanism at play is that trade induces a "quality" upgrading of products, plants, and workers in exporting firms, and thus leads to an increase in the wage premium between exporters and non-exporters. Such trade-induced reallocation of resources is likely to occur across firms within the same sector (Melitz, 2003). Empirically, the quality-upgrading mechanism is more evident for developing countries, especially in Latin America.[17] There are also a few recent studies that document the presence of exporter wage premiums in industrial countries. Klein *et al*. (2010), for instance, find that an increase in the average export share in Germany raises wage inequality along the dimension of skill, but diminishes wage gaps between genders and between German citizens and non-citizens, leaving the overall impact ambiguous. The analysis presented above focus on the country-level and does not take account of developments at the more disaggregated level. Annex 2.A2 examines sector-specific developments in skill wage gaps.

The impact of international financial integration on wage inequality

In the baseline specification (Table 2.1), international financial integration is measured by a *de jure* variable based on legal restrictions on FDI transactions. This indicator, however, may not adequately reflect actual exposure of countries to

international capital markets, and in particular, does not distinguish between inward and outward financial transactions. This section investigates the impact of financial integration by testing a series of *de facto* measures of financial openness. These include total cross-border assets and liabilities as a share of GDP, which reflect the overall exposure of countries to international capital markets.[18] The overall capital stock is further disaggregated into foreign portfolio investment (FPI) and foreign direct investment (FDI). The results of the analyses are shown in Table 2.3.

In general, financial deepening, measured at the aggregate level, has no significant impact on changes in the distribution of wages in OECD countries over the period studied. The coefficients of the overall cross-border capital movement (Column 1), foreign portfolio investment (Column 2) and foreign direct investment (Column 3) are all imprecisely estimated, holding other effects constant. This seems to suggest at first sight that the growing importance of multinational corporations (MNC), which can be accounted for a large part of FDI, have little impact on widening wage disparity. The use of the overall FDI measure, however, could mask important information since the impact of FDI flows on inequality depends on the direction of flows.[19] To investigate the issue further, the overall FDI is disaggregated into two subcomponents, inward (liabilities) and outward (assets) stocks.

Column 4 suggests indeed that an increase in the inward FDI-to-GDP ratio has an equalising impact on the wage distribution in OECD countries. This finding is consistent with previous cross-national studies that focus on advanced economies.[20] However, it is somewhat different from studies which used pooled data from both advanced and developing countries (IMF, 2007; Baccaro, 2008; Reuveny and Li, 2003).[21] The latter studies generally find an inequality-increasing effect of FDI, particularly inward FDI, for developing countries since inward investment is expected to be relatively skill-intensive in these countries, leading to higher inequality through more demand for skilled labour.

The second finding in Column 4 refers to an apparent interplay between trade and inward FDI stock, linked to the fact that growing trade exposure seems to be correlated with more inward investment. By holding inward investment constant, increased trade exposure exerts a disequalising albeit weakly significant impact on the wage distribution. One explanation may be that the estimate of trade integration in Column 4 is overstated if much of the increase in inward investment is trade-induced.[22]

The impact of outward FDI stock on wage dispersion is shown in Column 5. According to the outsourcing hypothesis, growing outward investment reflects the rapid development of international production-sharing (from home companies to their foreign affiliates) which may, in turn, distort the wage distribution of home countries by shifting relative labour demand within industries (*e.g.* Feenstra and Hanson, 1996, 1997, 2003; Hijzen, 2007).[23] Column 5 suggests that an increase in the outward FDI-to-GDP ratio tends to raise wage inequality, but the effect is rather modest. To test whether outward FDI has different effects in countries with distinct institutional settings, Column 6 interacts the measures of outward FDI with a policy dummy for EPL (see description in Table 2.2). The estimated coefficient on the interaction term is trivial and insignificant, indicating outsourcing plays no major role in wage inequality trends regardless of the institutional (EPL) setting of the country considered. This result is also consistent with the fact that outsourcing activities to developing economies in general only account for a small portion of total outward FDI stock in most advanced countries. Intra-OECD investment, in fact, accounts for over 75% of total outward FDI stocks in more than half of OECD countries (OECD, 2005, p. 49).

Table 2.3. **The impact of trends in financial openness on trends in wage dispersion**

Dependent variable: natural logarithm of D9/D1 ratio of full-time earnings

	(1)	(2)	(3)	(4)	(5)	(6)
Trade integration						
ln(Total trade exposure)	0.044	0.044	0.033	0.067*	0.021	0.023
	(1.09)	(1.09)	(0.90)	(1.82)	(0.60)	(0.67)
Financial integration						
ln(Cross-border assets_liabilities /GDP)	–0.01					
	(–0.52)					
ln(FPI/GDP)		–0.008				
[FPI: Foreign portfolio investment]		(–0.54)				
ln(FDI/GDP)			0.004			
[FDI: Foreign direct investment]			(0.22)			
ln(Inward FDI stock /GDP)				–0.041***		
				(–3.23)		
ln(Outward FDI stock /GDP)					0.021**	0.019
					(2.12)	(1.56)
ln(Outward FDI stock/GDP) x dummy for less-regulated economies[1]						0.007
						(0.62)
Technology						
ln(Business R&D /GDP)[2]	0.095**	0.095**	0.098**	0.083*	0.097**	0.099**
	(2.02)	(2.02)	(2.08)	(1.90)	(2.04)	(2.08)
Labour market institutions and policies						
ln(Union coverage rate)	–0.036*	–0.038*	–0.042*	–0.009	–0.060***	–0.055**
	(–1.76)	(–1.84)	(–1.84)	(–0.42)	(–2.73)	(–2.33)
ln(PMR)	–0.039**	–0.039**	–0.038**	–0.040**	–0.021	–0.026
	(–2.36)	(–2.32)	(–2.12)	(–2.45)	(–1.17)	(–1.40)
EPL	–0.052***	–0.052***	–0.052***	–0.058***	–0.057***	–0.058***
	(–4.93)	(–4.92)	(–4.92)	(–5.29)	(–5.30)	(–5.13)
ln(Tax wedges)	–0.120***	–0.120***	–0.110***	–0.131***	–0.103***	–0.102***
	(–3.61)	(–3.61)	(–3.38)	(–4.27)	(–3.43)	(–3.42)
Dummy for less-strict EPL economies[1]						0.041
						(0.66)
Other controls						
ln(% has attained post-secondary education)	–0.113***	–0.114***	–0.116***	–0.103***	–0.123***	–0.123***
	(–4.97)	(–5.05)	(–5.00)	(–4.56)	(–5.24)	(–5.20)
Other variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	333	333	333	333	333	333
Number of countries	22	22	22	22	22	22
Adjusted R-squared (within)	0.55	0.55	0.55	0.57	0.56	0.56

Note: *t*-statistics (in parentheses) are obtained from heteroskedasticity-robust standard errors**.** Other controls include output gap, female and sectoral employment shares, and the trend of technology variable. For definition of variables, see Annex 2.A1. *, **, ***: significant at the 10%, 5% and 1% level, respectively.

1. Less-strict EPL economies refer to counties in which the average score of the employment protection over the study period is 1.4 or less, on a scale of 0 (least restrictions) to 6 (most restrictions).
2. The variable is detrended using the Hodrick-Prescott (HP) filter (see note 6).

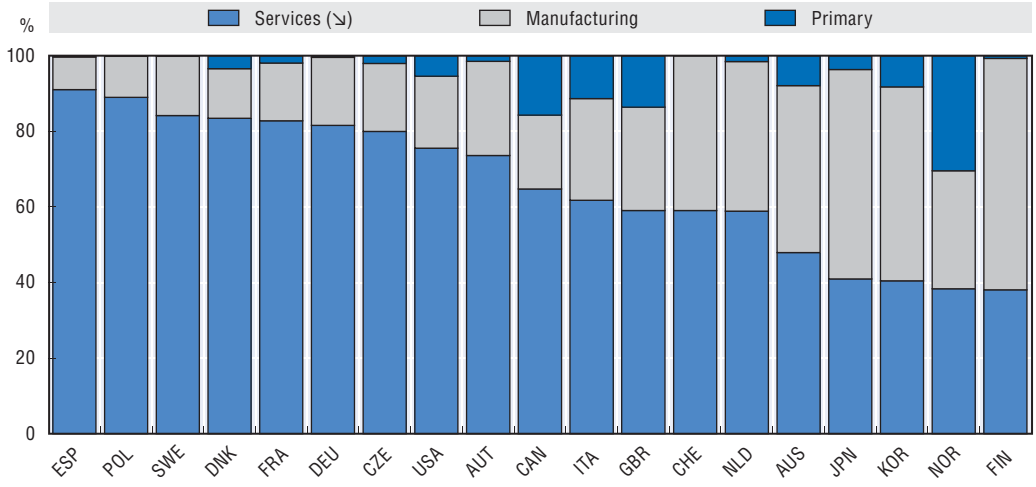
Source: See Annex 2.A1; OECD Secretariat calculations.

StatLink http://dx.doi.org/10.1787/888932537503

One possible reason why the outward FDI stock has only a moderate impact on the wage distribution may be related to the industry from which the investment originated. If a firm in tradable sectors expanded by moving its activities abroad to produce tradable goods, one would expect a substitution between the foreign and the home labour market,

as the firm could either export goods produced at home or produce them in its foreign affiliates and export the good back to its home market (*e.g.* Braconier and Ekholm, 2000, for Sweden). Figure 2.1 shows that in most countries the majority of direct investors were actually located in the non-tradable services sector.[24] In 2007, the share of outward investment in the service sector on average represented about 66% of total outward FDI stock. Only in Finland, Japan and Korea does manufacturing play a more important role (50% of outward FDI or more). Given that pattern, it is reasonable to infer that many goods produced in the foreign affiliates are non-tradable and cannot substitute for home-country exports. This may partially explain why outward FDI has a rather small distributional impact in the findings above.

Figure 2.1. **Share of outward FDI stock by industry sectors, selected OECD countries, 2007**



FDI = Foreign direct investment.

Source: OECD FDI statistics by industry.

StatLink http://dx.doi.org/10.1787/888932535983

Another noteworthy finding (not shown here) is that the distributional impacts of trade (in particular imports) and financial flows (*e.g.* inward FDI) changed significantly in size when a technology variable (business R&D) is taken into account, suggesting a (likely positive) correlation between technology and trade as well as international capital flows. This echoes a growing literature that focuses on the interplays between globalisation and technological change.[25] If scientific activities were induced in response to a more integrated global economy, then the interactions between globalisation and technology may create an important mechanism leading to a rise in wage differentials in OECD countries. In such a case, one may argue that the distributional impacts of technology estimated above are likely to be overstated, while the impacts of economic globalisation may partly be understated.

In sum, the empirical findings suggest that financial deepening generally had no significant impact on the distribution of wages in OECD countries when measured at the aggregate level and when other macroeconomic changes and changes in policy and institutions are controlled for. However, the average results hide two opposing effects of growing foreign direct investment, which closely relates to the presence of multinational corporations. By disaggregating the overall FDI into inward and outward components, we find inward investment contributing to reducing wage dispersion and outward investment, although to a lesser extent, contributing to increasing wage dispersion.

The impact of policies and institutions on wage inequality

Table 2.1 above suggested that changes in policies and institutions (in particular PMR, EPL and tax wedges) exerted an important impact on rising wage inequality in OECD countries. This section discusses the distributional impact of these different policy instruments in more detail. It also looks at additional policy variables, namely the unemployment replacement rate and the minimum wage ratio, though at the expense of a reduced sample size.[26] The results are presented in Table 2.4.

Column 1 repeats the baseline specification as shown in Table 2.1. In line with previous studies (*e.g.* Burniaux *et al.*, 2006; Checchi and Garcia-Penalosa, 2005), declining union coverage rates had a disequalising, albeit moderate, effect on the wage distribution. Also both more flexible PMR and weaker EPL are found to be associated with higher wage inequality. The estimated coefficients indicate that the D9/D1 ratio would increase by 0.4% (0.5%) for a 10% decline in the PMR (EPL) index. For a baseline D9/D1 of 3.0, this is equivalent to an increase of 0.012 (or 0.015) points. The result for the impact of EPL on wage inequality is in line with previous literature (*e.g.* Koeniger *et al.*, 2007). For PMR, most previous empirical studies focused on its impact on employment while the wage inequality impact remained less analysed. Nonetheless, the results are consistent with Nicoletti *et al.* (2001) who argue that product market liberalisation tends to reduce market rents available for unions to capture through collective bargaining. This may lead to a decline in union power (or more decentralised bargaining) and hence result in greater wage dispersion.

In Column 2, the synthetic employment protection (EPL) indicator is disaggregated into its two major components: for dismissal of employees on regular contracts, and for strictness of regulation on temporary contracts – the overall EPL is a weighted average of these two subcomponents. Since in most OECD countries a weakening in overall EPL occurred primarily in the area of temporary and fixed-term contracts, it is expected that the temporary component of EPL would play a more important role for wage inequality trends. It is put forward that EPL tends to protect unskilled workers more than skilled workers due to a substantial fixed-cost component (Boeri *et al.,* 2006). Weakening of employment protection, in particular the liberalisation of temporary contracts, would therefore contribute to higher wage inequality. Results in Column 2 confirm this hypothesis. The distributional effect of the overall EPL measure is entirely driven by changes in the employment protection for temporary workers.

Lower taxation of earnings (tax wedges) has a strong and significant effect on increased wage inequality. The estimated coefficient indicates that a 10% decline in tax wedges would increase the D9/D1 ratio by 1.1%. Higher tax wedges imply higher labour costs for employers and lower take-home pay for employees, which discourages recruitment and acceptance of (as well as the participation in) low-paid jobs. A fall in tax wedges therefore would increase the share of low-skilled labour leading to higher wage differentials.

Consistent with literature, higher UI replacement rates are negatively associated with wage dispersion (Column 3). The level of generosity in Table 2.4 is proxied with the replacement rate of a lower-wage worker at two thirds of average earnings. If the average level is used instead, the effect of gross replacement rates becomes quite modest and not significant at the 5% level (data not shown). This suggests that the effect of UI replacement rates are relatively more important for unskilled labour and the findings support evidence that more generous UI benefit rates for low-wage workers raises the reservation wage and compresses the wage distribution.[27]

Table 2.4. **Impact of changes in product and labour market policies and institutions on trends in wage inequality**

Dependent variable: natural logarithm of D9/D1 ratio of full-time earnings

	Baseline	With EPL split	With UIRR	With min. wage	Lagged policy[2]
	(1)	(2)	(3)	(4)	(5)
Trade integration					
ln(Total trade exposure)	0.035	0.036	–0.041	0.007	–0.004
	(0.95)	(1.00)	(–0.98)	(0.17)	(–0.09)
Financial integration					
ln(FDI restrictiveness index)	–0.001	0.004	0.030*	–0.040**	–0.007
[0-1, 0 open, 1 closed]	(–0.04)	(0.27)	(1.92)	(–2.34)	(–0.38)
Technology					
ln(Business R&D /GDP)[1]	0.097**	0.096**	0.086*	0.028	0.063
	(2.06)	(2.08)	(1.81)	(0.69)	(1.33)
Labour market institutions and policies					
ln(Union coverage rate)	–0.039*	–0.041**	–0.043**	–0.097***	–0.026
	(–1.90)	(–2.15)	(–2.27)	(3.09)	(–1.24)
ln(PMR)	–0.040**	–0.033*	–0.028*	0.034	–0.040**
	(–2.26)	(–1.91)	(–1.65)	(1.02)	(–2.04)
EPL	–0.052***		–0.078***	0.01	–0.048***
	(–4.62)		(–7.06)	(0.53)	(–4.23)
EPL_regular		0.01			
		(1.01)			
EPL_temporary		–0.062***			
		(–5.76)			
ln(Tax wedges)	–0.112***	–0.134***	–0.135***	–0.103***	–0.083***
	(–3.66)	(–4.27)	(–4.55)	(–3.33)	(–2.49)
ln(UI replacement rate) for low-wage workers			–0.074***		
			(–3.11)		
ln(min/median wage)				–0.298***	
				(–5.88)	
Other controls					
ln(% has attained post-secondary education)	–0.116***	–0.101***	–0.073**	0.007	–0.119***
	(–4.57)	(–4.00)	(–2.54)	(0.15)	(–4.38)
Other variables	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	333	333	318	190	317
Number of countries	22	22	22	14	22
Adjusted R-squared (within)	0.55	0.57	0.6	0.69	0.53

Note: *t*-statistics (in parentheses) are obtained from heteroskedasticity-robust standard errors**.** Other controls include the output gap, female and sectoral employment shares, and the trend of technology variable. For definition of variables, see Annex 2.A1.

1. The variable is detrended using the Hodrick-Prescott (HP) filter (see note 6).
2. All policy variables, ln(union coverage), ln(PMR), EPL, ln(tax wedges) and ln(FDI restrictiveness), were instrumented using their lagged (for one year) value.

Source: See Annex 2.A1; OECD Secretariat calculations.

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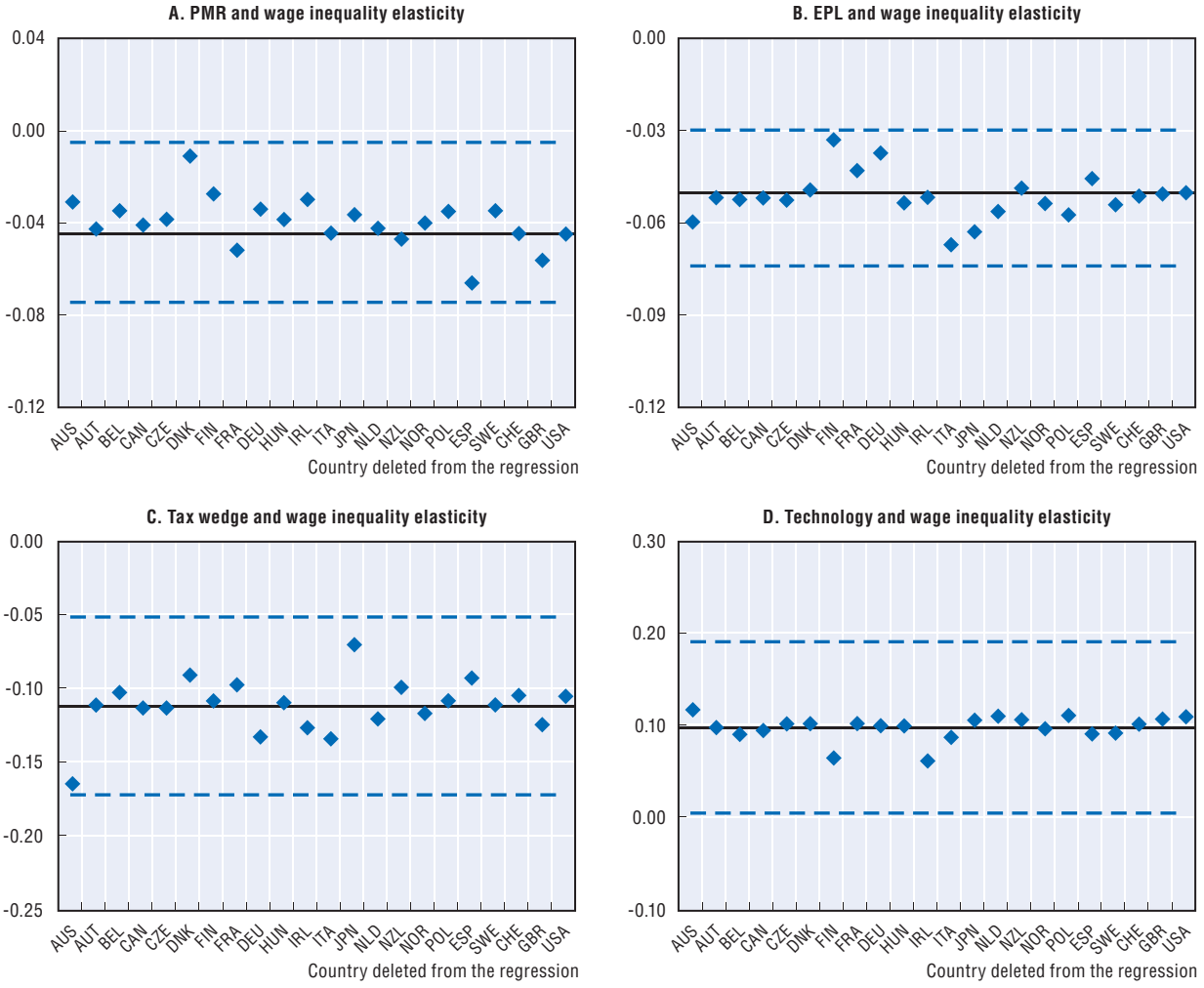
Column 4 looks at the impact of changes in the minimum wage (relative to the median wage) on wage inequality. This reduces the country sample, excluding mostly countries that are characterised by relatively strict labour market institutions.[28] Not surprisingly, higher minimum wages are negatively associated with wage inequality. The effect of minimum wages is strong and statistically significant: a 10% increase in the minimum/median wage ratio reduces the D9/D1 differential by 3%. Overall, the findings on the

distributional impact of changes in policies and institutions are in line with previous studies (Koeninger *et al.*, 2007; Visser and Cecchi, 2009; Wallerstein, 1999).

Several sensitivity tests confirm the results above. To address concerns of reverse causality in which inequality may itself influence institutional variables, in Column 5 all institutional and policy variables were instrumented using their lagged (for one year) value. The results confirm the findings are robust. Furthermore, in macro regressions with limited observations and time-series, results may be influenced by outliers. To test whether the inclusion of a given country significantly alters the regression results discussed above, the preferred specification (Column 1) has been re-estimated by successively dropping one country at a time from the sample. 22 separate estimates of coefficients were obtained and plotted in Figure 2.2 for PMR, EPL, tax wedges and technology variables, respectively.

Figure 2.2. **Robustness tests: influential country in the regression of wage inequality**



Note: The robustness tests have been applied to the specification of Column 1 in Table 2.4. Dashed lines indicate 95% confidence intervals.
EPL = Employment protection legislation.
PMR = Product market regulation.

Source: OECD Secretariat calculations.

StatLink http://dx.doi.org/10.1787/888932536002

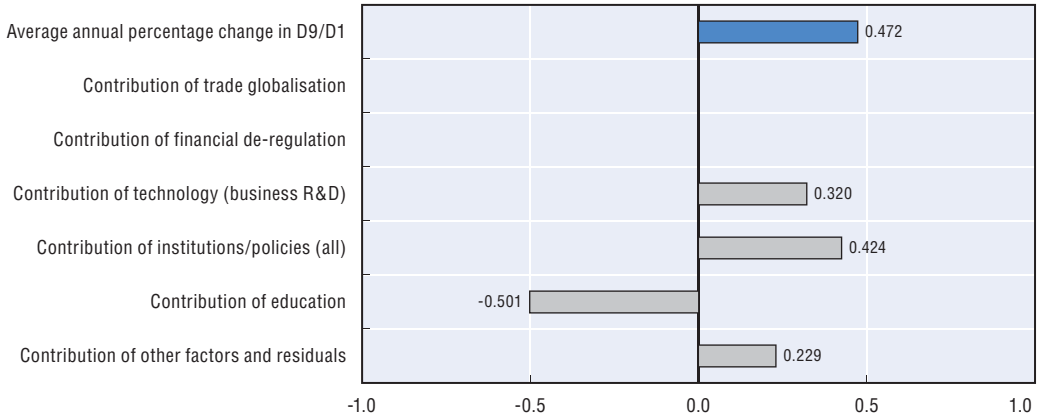
The results show that the estimated coefficients of these variables are always within 95% confidence intervals (dashed lines) of the preferred estimates based on the full sample. This suggests that the general findings above are robust and not affected by any particularly influential country data. This exercise, however, highlights a few influential countries that may have a noticeable impact on the point estimate. For instance, removing Denmark from the sample would reduce the disequalising effect of PMR. The opposite is true when Spain was removed from the estimation. Dropping Finland from the country sample also tends to greatly mitigate the impact of EPL on wage inequality. The distributional impact of tax wedges would be stronger if Australia or Italy were removed from the samples. Finally, results for the technology variable appear to be quite robust and do not depend on the sample coverage.

Quantifying the contribution of changes to wage inequality

To what extent have economic globalisation, technological advancement and changes in policies and institutions contributed to the overall rise in wage inequality over the past decades? Using the estimated coefficients which are statistically significant from the preferred specification in Table 2.1 (Column 4), the contribution of macroeconomic developments to changes in wage inequality can be estimated. This is done by calculating the average annual change in each of the significant explanatory variables, multiplied by the coefficients (the elasticity) from the regression results to obtain a simulated change in wage inequality arising from changing globalisation or other factors.[29] The results are shown in Figure 2.3. The D9/D1 ratio of wage dispersion grew on average (across countries) by 0.47% annually between the early 1980s and the late 2000s. For a baseline D9/D1 of 3.0, this translates to a rise of 0.014 point per year.

Figure 2.3. **Accounting for changes in wage inequality: the role of globalisation, technology and labour market policies and institutions**

Average annual percentage changes



Note: Other factors include sectoral employment shares and female employment share. The contributions of trade and financial deregulation are not reported due to imprecise estimates of coefficients.

Source: Table 2.1; OECD Secretariat calculations.

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The results suggest that changes in policies and institutions[30] on the one hand and technological progress on the other are the two main forces that contribute to the annual increase in the D9/D1 wage differential: institutions together contribute a 0.42% annual

increase to this ratio, and technological progress contributes another 0.32% average increase in inequality annually. The increased share of educated workers exerted a sizable equalising effect, offsetting about two-thirds of the rise in the D9/D1 ratio due to the combined effects of institutions and technology. The impact of trade and financial integration on wage dispersion is not reported as their coefficients were insignificant. Other factors, which combine changes in sectoral and female employment shares as well as the residuals, account for the rest of 0.23% annual increase in the wage differential. When leaving aside institutions and other unexplained factors, Figure 2.3 would suggest that the evolution of wage dispersion can be viewed, to some extent, as the differences between demand and supply, or in Tinbergen's terms (1975), a "race between education and technology" (see also Goldin and Katz, 2008). The results obtained suggest that policies focusing on education can be a successful tool as the increase of average years of schooling more than balanced out the increase in wage inequality brought by technological change in OECD countries.

2.3. Effects on the top and the bottom of the wage distribution: tail-sensitive analyses

Policies and institutions have been found in previous studies to have a greater impact at the bottom end of the wage distribution and to affect unskilled workers more than skilled workers (*e.g.* Lemieux, 2008). Similarly, globalisation and technological progress could also have a different impact on inequalities on different income groups. Analysis of the OECD earnings data reveals an increase in wage disparity in both halves of the distribution, but with larger increases at the top than at the bottom (OECD, 2008a). Recent studies document the sharp rise in top incomes since the 1970s (Atkinson, 2005; Atkinson and Leigh, 2010; Piketty and Saez, 2006; see also Chapter 9), while some other empirical evidence points to a polarisation of the labour market (*e.g.* Goos and Manning, 2003) which may also lead to greater wage disparity both at the top and at the bottom.[31] This section applies tail-sensitive inequality measures, namely D9/D5 and D5/D1 decile ratios of earnings, to test the distributional impact of the different drivers in these two parts of the distribution.

Table 2.5 shows that increased trade integration in general had no impact on both halves of the wage distribution.[32] FDI deregulation appears to exert two opposing effects: reducing dispersion at the bottom half of the wage distribution and widening it at the top half. The disequalising effect of FDI deregulation for the upper part of the distribution is mainly driven by outward investment (Column 5). This may be partly explained by the off-shoring hypothesis that outsourcing, through moving non-skill-intensive activities abroad, has shifted employment towards skilled labour, widening dispersion predominantly among the top due to increased wage premiums for skilled labour (Feenstra and Hanson, 1996). The equalising effect of FDI deregulation for the lower half of the wage distribution is partially driven by inward investment (not shown).[33] As for the impact of technological change proxied by business R&D, it contributed to increasing inequality predominantly for the upper part of the wage distribution.

By contrast, changes in product market regulation and employment protection policies seem to impact exclusively on the lower part of the wage distribution: both changes in PMR and EPL have a negative and significant effect on the D5/D1 but not on the D9/D5 ratio. Trends in tax wedges have a notable impact on both parts of the wage distribution, with marginally more influence on higher-wage workers. Given that the variable for tax wedges used in the analysis here refers to a single individual without children at the average earnings levels, one might expect that changes in tax wedges would

Table 2.5. **Globalisation, labour market policies/institutions and inequality among lower-wage and higher-wage workers**

	Dependent variable			Dependent variable		
	ln(D5/D1)			ln(D9/D5)		
	Baseline	Outward FDI stock	With UIRR	Baseline	Outward FDI stock	With UIRR
	(1)	(2)	(3)	(4)	(5)	(6)
Trade integration						
ln(Total trade exposure)	0.033	0.046	0.012	–0.001	–0.028	–0.052*
	(1.21)	(1.63)	(0.39)	(–0.05)	(–1.13)	(–1.75)
Financial integration						
ln(FDI restrictiveness index)	0.030**		0.044***	–0.032***		–0.014
[0-1, 0 open, 1 closed]	(2.49)		(3.64)	(–2.94)		(–1.29)
ln(Outward FDI stock /GDP)		–0.005			0.026***	
		(–0.74)			(3.19)	
Technology						
ln(Business R&D /GDP)[1]	0.01	0.011	–0.008	0.092***	0.091***	0.099***
	(0.26)	(0.28)	(–0.26)	(2.96)	(3.00)	(2.99)
Labour market institutions and policies						
ln(Union coverage rate)	0.002	0.001	–0.003	–0.038***	–0.056***	–0.037***
	(0.10)	(0.05)	(–0.20)	(–2.93)	(–3.75)	(–3.16)
ln(PMR)	–0.045***	–0.041***	–0.040***	0.005	0.019	0.012
	(–3.16)	(–2.72)	(–2.98)	(0.49)	(1.59)	(1.08)
EPL	–0.044***	–0.036***	–0.065***	–0.008	–0.012	–0.013
	(–4.75)	(–4.14)	(–6.39)	(–1.09)	(–1.45)	(–1.51)
ln(Tax wedges)	–0.042*	–0.032**	–0.056**	–0.069***	–0.071***	–0.077***
	(–1.83)	(–1.42)	(–2.49)	(–3.77)	(–4.12)	(–4.44)
ln(UI replacement rate) for low-wage workers			–0.044***			–0.029**
			(–2.70)			(–2.06)
Other controls						
ln(% has attained post-secondary education)	–0.045**	–0.058***	–0.041*	–0.071***	–0.065***	–0.034*
	(–2.30)	(–3.30)	(–1.82)	(–3.82)	(–3.83)	(–1.69)
ln(female employment share)	–0.160*	–0.185**	–0.113	–0.186**	–0.143**	–0.188**
	(–1.89)	(–2.38)	(–1.36)	(–2.44)	(–1.98)	(–2.48)
Output gap	Yes	Yes	Yes	Yes	Yes	Yes
Sector employment shares	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	333	333	318	333	333	318
Number of countries	22	22	22	22	22	22
Adjusted R-squared (within)	0.33	0.32	0.44	0.64	0.65	0.65

Note: *t*-statistics (in parentheses) are obtained from heteroskedasticity- robust standard errors**.** For definition of variables, see Annex 2.A1.

1. The variable is detrended using the Hodrick-Prescott (HP) filter (see note 6).

Source: See Annex 2.A1; OECD Secretariat calculations.

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have a more considerable impact on the wage distribution at the lower part if the reference rates that correspond to lower-wage workers (67% of average earnings) were used. However, such data are not available as longer-time series. A fall in the UI replacement rates tends to widen wage dispersion for both lower- and higher-wage workers, and the effects are somewhat stronger among the lower part of the distribution (Columns 3 and 6): to the difference of tax wedges, the level of generosity is measured on the basis of rates for lower-wage workers. Higher union coverage rates exert some an equalising impact predominantly on the upper part of the wage distribution. The finding is in line with

Koeniger *et al.* (2007), who also find that union density is more important for the upper part of the distribution than for the lower part. They argue that more powerful unions tend to transfer rents from the very skilled high-earners to other workers.

Finally, an increase in the proportion of skilled workers tends to reduce wage differentials at both halves of the distribution. Likewise, the increase in women's employment also contributed to equalising the wage differential, and the effects are quantitatively similar for both lower- and higher-wage workers.

2.4. Summary and conclusions

This chapter has assessed ways in which facets of economic globalisation, technological change, and regulatory reform may have affected wage inequality among full-time workers in OECD countries. Overall, changes in labour and product market institutions, regulations and policies, on the one hand, and technological change on the other, have been the main determinants of the increase in wage disparities in recent decades. Trends in trade integration and financial flows exert no significant impact, once changes in institutions and policies are taken into account. The increase in the supply of skilled workers and the share of women in employment considerably offset the trend to increased wage differentials. The key findings from the analyses are set out below.

Links between globalisation and rising wage inequality

- Trends in trade exposure have no distributional impact at the aggregate level. This result holds when exports and imports are examined separately or are further disaggregated by region of origin and destination. However, increased imports from emerging economies – in particular from low-income developing countries – tend to heighten wage dispersion in OECD countries with weaker employment protection legislation.
- Financial deepening, proxied by either *de jure* or *de facto* measures, has no significant impact on within-country trends in wage inequality in OECD countries. However, inward FDI seems to contribute to reducing wage dispersion while outward FDI appears to increase it.
- There is a possible interplay between trade exposure and inward FDI insofar as increases in trade are accompanied by greater financial inflows.
- Technological progress considered as business expenditure on R&D is positively related to increases in wage dispersion.
- The rise in the supply of skilled labour and in the share of women in employment constitutes substantial counterweights to the increase in wage inequality.

Links between institutions and policies and rising wage inequality

- Trends in labour and product market policies and institutions are generally negatively related to trends in wage dispersion within countries. In particular, a decline in tax wedges and a trend towards more flexible employment protection and product market regulation have contributed substantially to the increase in wage inequality among full-time workers.
- The distributional effect of EPL is driven entirely by the weakening of employment protection for temporary workers.
- Furthermore, drops in union coverage and lower unemployment benefit replacement rates for low-wage workers (but not for average-wage workers) tend to increase wage inequality.

Effects on the upper and lower part of the wage distribution

- Trends in trade exposure generally have little impact on either end of the wage distribution.
- Financial deepening in terms of increased outward investment seems to widen inequality only in the upper part of the distribution. Technological change also impacts predominantly on the upper part of the wage distribution.
- Less strict product market and employment protection regulations are associated with an increase in wage inequality exclusively in the lower part of the wage distribution. On the other hand, wage inequality in the upper half of the distribution is more sensitive to changes in average tax wedges and union coverage. Reductions in unemployment replacement rates tend to widen wage distribution with quantitatively similar effects on both lower- and higher-wage workers.
- Upskilling of the workforce is closely associated with inequality reduction in both the upper and lower halves of the wage distribution. The same pattern is found in the rise of women's employment.

Notes

1. A review of the literature that ties trends in wage (and income) inequality to globalisation, technological change, and regulatory and institutional changes can be found in Chen *et al.* (2011).
2. With regard to the descriptive analyses in Chapter 1, Korea had to be excluded from the regression analyses due to lack of comparable data on the output gap and institutional and policy variables.
3. In most cases, "wage" refers to gross weekly or monthly earnings of full-time workers (see Annex 2.A1). There are, however, a few exceptions. Wage data for Finland, France and the Netherlands refer to annual earnings of full-time (and full-year equivalent) wage earners. In these countries, changes in wage dispersion may be influenced by changes in work patterns towards atypical work (*i.e.* full-time to part-time as well as full-year to part-year employment).
4. The analyses also use alternative science and technology measures – such as patent counts, trade performance of R&D-intensive industries and ICT intensity – for sensitivity testing of alternative technology indicators.
5. Since both dependent and independent variables used in the analysis tend to be skewed by their very nature (*i.e.* ratios), the use of logarithmic transformations makes the distribution more symmetric. In addition, there is a considerable heteroskedasticity in the cross-country data that could make some of the tests and confidence intervals invalid. For instance, trade volumes as a percentage of GDP range from as little as 25% in one country to over 150% in another. A logarithmic transformation reduces unequal variability and therefore makes the within-group variability more similar across groups.
6. This is based on the suggestion that unexpected technology shocks rather than the long-term trend would affect the demand for skilled/unskilled labour. The variable for technological progress is thus derived using the Hodrick-Prescott (HP) filter which decomposes a time series into a growth component and a cyclical component: $y_t = \tau_t + \theta_t$. Here y is the logarithm of technology variables (business R&D-to-GDP ratio), τ is its growth component and θ is its cyclical component. The former reflects a long-term growth curve around which the variable fluctuates, while the latter captures a transitory deviation from its growth curve which can be interpreted as "technology shock". Note that the appropriate values of the smoothing parameter depend upon the periodicity of the data. Following Ravn and Uhlig (2002), a smoothing parameter of 6.25 for annual data has been chosen.
7. The OECD FDI restrictiveness index covers four types of financial regulations: *i)* foreign equity restrictions, *ii)* screening and prior approval requirements, *iii)* rules for key personnel, and *iv)* other restrictions on the operation of foreign enterprises (see Kalinova *et al.*, 2010). The consistency of sources used in constructing the FDI restrictiveness index makes it possible to track the progress of financial investment liberalisation over time.
8. The country sample is thus restricted to those in which information on all variables used in the regression analysis is available.

9. The following hypothesis illustrates this finding. If the BERD-to-GDP ratio grows about 5% on average per year in the long run, an unexpected spurt in growth one year of 8% (*i.e.* 3% deviation from the mean) would increase the D9/D1 ratio by 0.3%. For a baseline D9/D1 of 3.0, this translates into an increase of nearly 0.01 point (*i.e.* 3 × 1.003 = 3.01).

10. Including public sector R&D investment in a separate specification shows little impact on wage inequality. The result is not surprising since public-sector R&D is often directed at improvements in fields not directly related to general labour markets (such as defence or medical sciences). In addition to the standard measure of technology, two alternatives were used as proxies for technological progress: the ratio of ICT capital stocks to GFCF and per capita patents. On the basis of a smaller sample (18 countries only), ICT intensity showed, as expected, a positive, albeit weak, effect on trends in wage inequality. The effects of patents were, however, insignificant at the 10% level, which may reflect the fact that patent counts do not adequately capture technological progress for two reasons. First, not all inventions are patented and certain companies can rely on other mechanisms to gain market dominance. Second, not all patents reflect innovation. Rather, firms increase their number of patents by taking out more intellectual property protection so as block imports from developing countries. Simple patent counts, which give the same weight to all patents regardless of their value, may therefore be misleading.

11. The demand for female labour could be driven by changes in technology conducive to occupations in services where women have a comparative advantage. It could also spring from changes in social norms that encourage women to seek highly paid jobs and employers to hire them (Goldin, 2006).

12. The data source here is UNCTAD (*http://unctadstat.unctad.org*), which provides trade (in merchandise) statistics by region of origin and destination. Unfortunately, regional information for trade in services is not available. As a result, analyses in Columns 3-6 of Table 2.2 concern only trade in merchandise.

13. We also examine the inequality impact of increasing trade with advanced countries (see Chen *et al.*, 2011). Closer integration of high-income countries during this time period (*e.g.* via NAFTA, Maastricht, or the Uruguay Round liberalisation) could have had an impact on wage inequality. However, the regression result indicates that trade (in merchandise) with advanced countries had no effect on the D9/D1 wage differential.

14. This finding remains very similar when the export dimension is examined (see Chen *et al.*, 2011).

15. The dummy is specified in a way that 1 indicates an economy with less strict employment protection, and 0 otherwise. A country is defined as having less-strict employment protection if its average EPL score over the period studied is below 1.4, on a scale of 0 (least restrictions) to 6 (most restrictions). This less-strict group includes 8 countries: Australia, Canada, Hungary, Ireland, New Zealand, Switzerland, the United Kingdom and the United States. The median EPL value over all 22 countries under study is 1.9.

16. The wage inequality impact of imports for countries with less strict EPL can be gauged by the sum of the coefficient on imports and the coefficient on the interaction. This implies that its significance cannot be determined as such.

17. Hanson and Harrison (1999) and Verhoogen (2007), for example, both find evidence of upgrading for exporting firms in Mexico. A somewhat different mechanism involving rising exporter wage premium is the possible interplays between technology, skills and exports. Bustos (2011), for instance, argues that increased export opportunities make the adoption of new technologies profitable for more firms, and thus generate increased demand for skilled workers in Argentina, leading to a widening skill premium.

18. This volume-based measure of international financial integration is derived by Lane and Milesi-Ferretti (2003). The components of the variable include, for assets and liabilities, 1) FDI, 2) portfolio equity, 3) debts, 4) financial derivatives, and 5) total reserves minus gold.

19. The wage inequality impact of FDI may also depend on the destination/source country of FDI. For instance, Griffiths and Sapsford (2004) in their study on Mexico argued that FDI from countries that are closer to the world technology frontier should have a greater impact than FDI from technologically less advanced countries. The physical distance to investors' home countries may play a role, too. Javorcik *et al.* (2004), using data from Romania, show that the share of intermediates sourced locally by multinationals is likely to increase with the distance between the host and the source economy. Unfortunately, the data at hand do not allow for testing these hypotheses.

20. Figini and Gorg (2006), for example, find that wage inequality decreases with inward FDI stock for developed countries; IMF (2007) also shows that inward debt and FDI stock tend to reduce inequality in advanced countries, though for the latter the estimate is not statistically significant.

21. For country-specific studies, see Taylor and Driffield (2005) for the United Kingdom and Bruno *et al.* (2004) for the Czech Republic, Hungary and Poland.

22. The interplay between trade integration and financial deepening may, however, exist in both directions.

23. There are also studies suggesting that outward FDI bears little distributional effect. Slaughter (2000), for instance, shows that outsourcing activities of US multinational enterprises tend to have small, imprecisely estimated effects on the US relative labour demand. Similarly, OECD (2007a, 2007b) also concludes that outsourcing in general only has a rather moderate effect on shifting relative demand away from low-skill workers within the same industry. Lorentowicz *et al.* (2005) suggest that outsourcing actually has *lowered* the skill premium in Austria, a skill-abundant country, while it has increased the wage gap in Poland, a relatively labour-abundant country.

24. However, some services are tradable, due to technical progress in telecommunications. Services such as call centres or IT hotlines are leading examples and may account for a non-negligible part of outsourcing activities to emerging economics.

25. For hypotheses related to trade-induced skill-biased technological change, see, for instance, Wood (1994, 1995), De Santis (2002), Thoenig and Verdier (2003), Stojanovska and Cuyvers (2010), Bloom *et al.* (2008). For endogenous technological change related to capital deepening, see Coe and Helpman (1995), Schiff and Wang (2006). See also Goldberg and Pavcnik (2007) for a review of the literature on mechanisms through which globalisation induces technical change in developing countries.

26. By including the UI replacement rate, the year coverage drops notably for Czech Republic, Hungary, Italy and Poland as the comparable time-series UI replacement data for these countries are only available from the early 2000s. For the minimum wage model, the number of observations is almost halved (from 327 to 188) and the number of countries covered is reduced from 22 to 14.

27. This refers to the first-order effect. A possible second-order effect could be a risk of human capital erosion, where long periods of unemployment could lead to higher levels of wage dispersion.

28. The eight countries removed from the sample are Austria, Denmark, Finland, Germany, Norway, Sweden and Switzerland.

29. The contributions of the variables of interest to the change in the D9/D1 ratio are computed as the average annual change in the respective variable multiplied by the corresponding coefficient in Table 2.4 (Column 1). Following IMF (2007), the averages across country groups are weighted by the number of years covered for each country in order to give more weight to countries with a longer period of observation.

30. For ease of presentation, all institutional and policy effects were grouped together.

31. Polarisation of the labour market refers to a growth in employment of both low wage and high wage jobs at the expense of middle-skill jobs. See also Autor *et al.* (2006) for discussion of the US market and Goos *et al.* (2009) for Europe.

32. Previous studies report mixed findings on the effect of trade openness on the different segments of the earnings distribution also in developing countries (*e.g.* Birdsall and Londono, 1997, Lundberg and Squire, 1999).

33. The coefficient of inward FDI is about –0.15 and is only significant at the 10% level.

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ANNEX 2.A1

Data Sources and Variables

Table 2.A1.1. **OECD structure of earnings database**

	Source	Years available	Earnings	Type of worker
		First/latest		
Australia	Labour force survey	1979/2008	Weekly	Full-time
Austria	Social security data	1987/1994	Monthly	All workers
Belgium	Social security data	1986/2007	Weekly	Full-time
Canada	Labour force survey	1997/2008	Weekly	Full-time
Czech Republic	Enterprise survey	1996/2008	Monthly	Full-time/Full-year
Denmark	Tax registers	1980/2008	Hourly	All workers
Finland	Income distribution survey	1980/2008	Annual	Full-time/Full-year
France	Salary records of enterprises	1979/2007	Annual (net)	Full-time/Full-year
Germany	Socio-economic panels	1984/2008	Monthly	Full-time
Hungary	Enterprise survey	1992/2008	Monthly	Full-time
Ireland	Living in Ireland/EU-SILC	1994/2008	Weekly	Full-time
Italy	Survey of H income and wealth	1986/2008	Monthly	Full-time
Japan	Enterprise survey	1979/2008	Monthly	Full-time
Korea	Enterprise survey	1984/2008	Monthly	Full-time
Netherlands	Enterprise survey	1979/2005	Annual	Full-time/Full-year
New Zealand	Household economic survey	1984/2008	Hourly	Full-time
Norway	Enterprise survey	1997/2008	Monthly	Full-time
Poland	Enterprise survey/EU-SILC	1992/2008	Monthly	Full-time
Spain	ECHP/EU-SILC	1994/2008	Hourly	Full-time
Sweden	Income distribution survey	1980/2008	Monthly	Full-time
Switzerland	Employer survey	1996/2008	Monthly (net)	Full-time
United Kingdom	Enterprise survey and Annual survey of hours and earnings	1979/2008	Weekly	Full-time
United States	Current population survey	1979/2008	Weekly	Full-time

Note: 2011 version.

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Table 2.A1.2. **Explanatory variables and data sources**

Title	Definition	Sources
Globalisation and SBTC indicators		
Trade globalisation	*Preferred definition* Trade exposure (a weighted average of import penetration and export intensity) *Other definitions tested in the analysis* • Trade openness (trade volume /GDP) • Export (import)-to-GDP ratio • Import penetration • Exports (imports) from advanced countries /GDP • Exports (imports) from developing countries /GDP • Exports (imports) from high-income* developing countries /GDP • Exports (imports) from mid/low-inc* developing countries /GDP * income level according to UNCTAD definition	OECD trade statistics & United Nations Conference on Trade and Development (UNCTAD)
Financial factors	*Preferred definition* • FDI restrictiveness index	OECD FDI index
	Other definitions used/tested in the analysis • Cross-border assets and libabilities /GDP • Private credit by deposit money bank to GDP • Foreign portfolio investment (FPI) /GDP • Foreign direct investment (FDI) Inward FDI stock/GDP	External Wealth of Nations Mark II database & Financial Structure Dataset (Beck and Demirgüç-Kunt, 2009)
	Outward FDI stock /GDP	UNCTAD and OECD
Technological progress	*Preferred definition* • Business sector Expenditure on R&D/GDP *Other definitions used/tested in the analysis* • Patent counts (total patent applications to both the European Patent Office and the United States Patent and Trademark Office) • Patents per million population • Gross Domestic Expenditure on R&D investment /GDP • ICT investment /GDP • ICR employment/Business sector employment • Export performance in R&D intensive industries	OECD Science and Technology Indicators
	• Technology Balance of Payment /GDP	OECD Science and Technology Indicators and OECD Patents Database
Other variables in the regression		
Education	% of population has post-secondary education	OECD Education at a Glance
	Note: Data for 1980, 85, 90, 95 and 2000 are drawn from Barro and Lee (2000) dataset, and for the years 2001-08 are from OECD education at a glance. For years between 1985 and 2000 are interpolated linearly.	Barro and Lee (2000)
Sectoral employment share	% of employment in industry % of employment in service % of employment in agriculture	OECD statistics
Female employment share	Women as a % of total employment	OECD statistics
Aggregate output	• Gross domestic product (GDP) • Output gap between actual and potential output as a % of potential output *Other definitions tested in the analysis* • GDP per capita	OECD statistics

Table 2.A1.2. **Explanatory variables and data sources** *(cont.)*

Title	Definition	Sources
Institutional variables		
Union density rate	% of employees who are members of a trade-union	OECD Employment Database
Union coverage rate	The variable "AdjCov" from Visser (2009) (0-100) It refers to employees covered by wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining	Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS)
Union Centralisation and Coordination index	The variable "WCoord" from Visser (2009) 5 = economy-wide bargaining 4 = mixed industry and economy-wide bargaining 3 = industry bargaining with no or irregular pattern setting 2 = mixed industry- and firm level bargaining, 1 = none of the above, fragmented bargaining	
Union corporatism	Indicator of the degree of centralisation/coordination of the wage bargaining processes 3 = high corporatism 2 = intermediate corporatism 1 = low corporatism	OECD Employment Outlook
Product Market Regulation (PMR)	From 0 – 6 (least to most restrictions) The indicators of regulation in energy, transport and communications (ETCR) summarise regulatory provisions in seven sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight.	OECD PMR indicators
Employment protection legislation (EPL)	From 0 – 6 (least to most restrictions)	OECD Employment Database
Tax wedges	Tax wedges are calculated by expressing the sum of personal income tax, employee plus employer social security contributions and payroll tax, as a percentage of labour costs (gross wages + employer social security contributions and payroll taxes). The reference rates are for single person without children at 100% of the average level.	OECD Taxing Wages
Gross UI replacement rate	Gross replacement rates are calculated as gross unemployment benefit levels divided by previous gross earnings. The data refer to the average of the gross unemployment benefit replacement rates for two earnings levels, three family situations and three durations of unemployment. The reference earnings are 67% of the average level.	OECD Benefits and Wage
Minimum wages	Minimum relative to mean and median wages of full-time workers	OECD Employment Database

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ANNEX 2.A2

Changes in the Skill Wage Gap and the Role of Sectors

The analysis above is confined to the overall impact of globalisation and other drivers on the wage distribution among all full-time workers. However, there are good reasons to believe that these impacts will not be evenly distributed across different sectors and by skill level. Globalisation may well have affected wage inequality in specific sectors which were more exposed to trade opening, for instance, and the overall results which showed globalisation to be distribution neutral may hide such effects. This annex examines whether this was indeed the case.

Real wages may fall after trade barriers are lowered mainly for those whose skills are specialised in *specific* import-competing industries and wage inequalities will persist in the absence of mobility of production factors across sectors. On the other hand, following Acemoglu (2003), changes in technology predict a rising skill premium across *all* sectors. Technological change can be endogenous and trade openness might be contributing to the diffusion of new technologies which induce skilled-biased technical change, resulting in a greater impact of trade on a rising skill gap. The result will be an increase in wage inequality and in relative skilled employment within each industry instead of skill-intensive sectors gaining at the expense of low-skill intensive sectors. In addition, the growing importance of trade in intermediate inputs (outsourcing) may also lead to rising skill gaps across all sectors (Feenstra and Hanson, 2003).

The analysis below examines inequality between skilled and unskilled workers to test whether the increase in wage inequality in OECD countries is also associated with an increase in the skill gap (*i.e.* the wage gap between skilled and unskilled workers). It looks at i) whether the skill gap increased across all countries and whether such an increase was steady across periods and sectors; and ii) whether changes in the skill gap coincided across sectors and countries with similar changes in trade, financial investment and skill-biased technological change.

Trends in skill wage gaps by sectors

Skill wage gaps measured by the ratio of the average wage of high-skilled to low-skilled workers increased across almost all sectors between 1985 and 2005, on country average[1] (Figure 2.A2.1). This seems to confirm that industries have raised their skill-intensity of production rather than skill-intensive sectors increasing in employment at the expense of less skill-intensive sectors (see Box 2.A2.1 for the definition of wages by skill level). At the same time, there is a large variation in the changes in the skill wage gap across sectors, ranging from quasi-stability in the sectors “paper” (pulp, paper, printing

and publishing) and "textiles" (textiles, leather and footwear) to an increase of over 10% in the sectors "finance and transport equipment". The increase appears to be more pronounced since the mid-1990s than it was in the 1980s.[2]

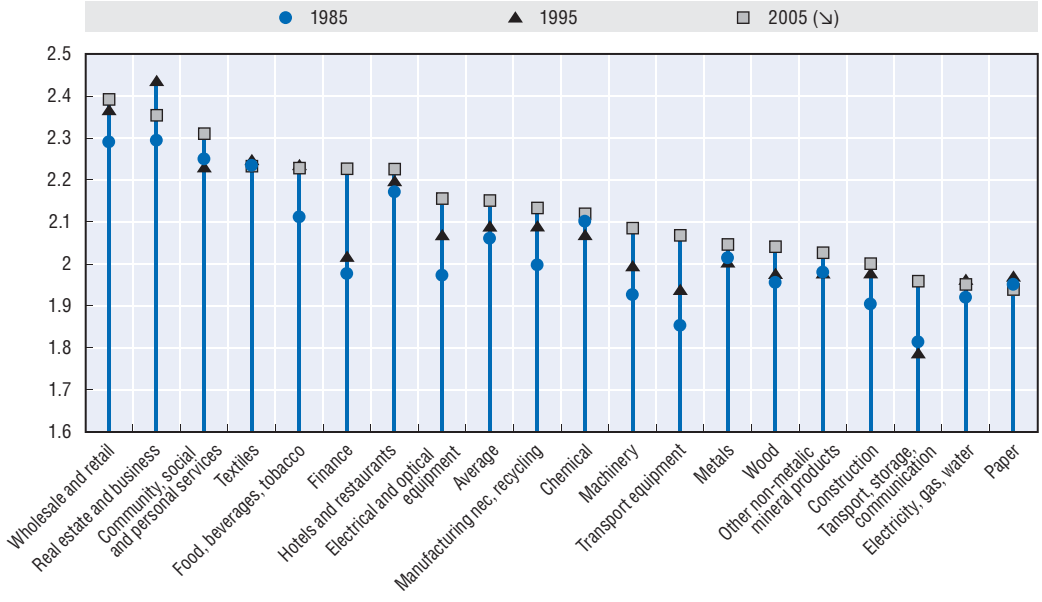
Box 2.A2.1. **Constructing ratios of hourly wages by skills**

The EU-KLEMS dataset which has been used for the analyses includes wage compensation by educational attainment for three types of educational levels corresponding to high, medium and low-skilled workers (W_h, W_m, W_l) and hours worked by education attainment (H_h, H_m, H_l). The wage rate for each skill level is obtained by dividing the share of the labour compensation by hours worked. Therefore, the relative compensation level of high-skilled workers compared with the industry average corresponds to $w_h = W_h/H_h$. The wage ratios examined in this annex (high/low) correspond to w_h/w_l. The term skill gap refers to this wage ratio.

The data have several shortcomings. Data on educational attainment is used to define high, medium and low education in each country. The definitions are consistent over time for each country, but might differ across countries. Data by labour type are only available in most countries for the number employed. Therefore, the EU-KLEMS dataset assumes that 1) hours worked by labour types in a particular industry are identical to the industry average; 2) labour characteristics of self-employed and employees are the same within an industry; and 3) the compensation per hour of self-employed workers is equal to the compensation per hour of employees.

Figure 2.A2.1. **Increased gap between the wages of high and low-skilled workers, 1985-2005**

Ratio of high to low-skilled hourly wages relative to industry average, average for 12 OECD countries



Note: Values are ranked from left to right in decreasing order of ratios for 2005. Countries included are Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom and the United States.

Source: OECD Secretariat calculations based on EU-KLEMS. See Annex Table 2.A2.2 for more details on the country coverage.

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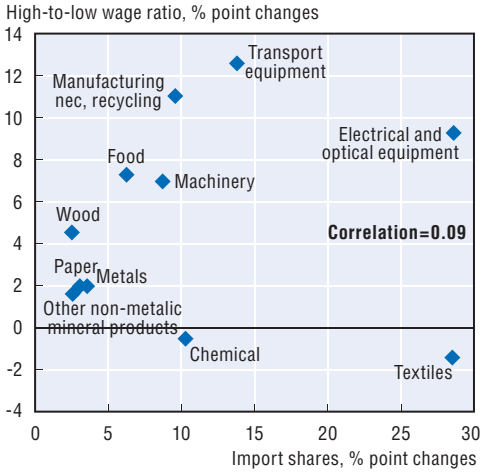
While a majority of OECD countries have experienced an increase in the skill wage gap across all sectors, its evolution is mixed across countries and within sectors (analysis not shown). The United States tends to have the largest relative increase in the skill wage gap between 1985 and 2005 except in transport where it occurred in the United Kingdom. Other countries such as Spain show a moderate increase in some sectors while inequality was reduced in others (*e.g.* Austria, Denmark).

Sectoral wage gaps and trade flows

The largest relative increase in import penetration and in the export shares of production was observed in textiles which in parallel saw a small relative decrease in wage gaps between high and low-skilled workers (Figure 2.A2.2). Changes in the sectoral skill wage gaps are not related to increased imports. Instead patterns of wage dispersion by skill may rather be related to the overall skill intensity of the sectors.

Figure 2.A2.2. **Wage gaps and trade openness by sector, 1985-2005**

Increases in import shares and skill wage gaps by sector, average of 12 OECD countries



Note: Percentage point changes refer to the difference between 1995-2005 averages and 1985-1995 averages. Data for imports are only available for manufacturing. Countries included: see Figure 2.A2.1.

Source: OECD Secretariat calculations based on STAN and EU-KLEMS. See Table 2.A2.2 for more details.

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Sectoral wage gaps and technological change

The share of the wage bill going to high-skilled labour in total labour compensation increased. But which part of this increase in is due to between-industry shifts and which part to within-industry shifts of the shares? Table 2.A2.1 reports the results from a decomposition analysis (based on Berman *et al.*, 1994 and described in Chen *et al.*, 2011). This shows that around four fifths of the 12% increase in the OECD average share of high-skilled wages are accounted for by rising wage dispersion within the same industry. Rising inequality has been dominated by increasing wage dispersion *within* rather than *between* industries.

Table 2.A2.1. **Changes in the share of high-skilled workers wages, 1985-2005**

	Change in the share	Between industry shifts	Within industry shifts
Share in labour compensation going to high-skilled labour	12.3	2.1	10.2

Source: OECD Secretariat calculations using EU-KLEMS.

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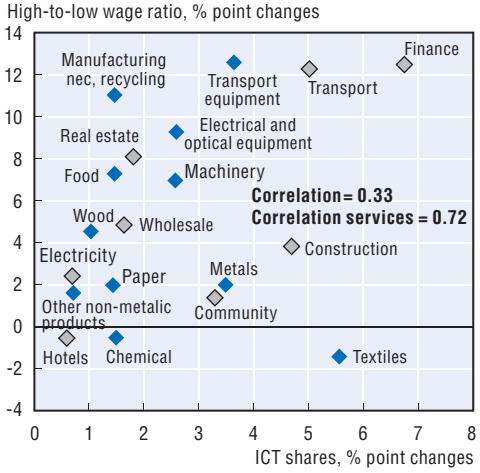
A greater pace of skill-biased technological change could be behind such changes in relative wages (Berman *et al.*, 1994; Autor *et al.*, 1998). Figure 2.A2.3 provides a correlation analysis to further test the hypothesis of a link between skill wage gaps and technological change, proxied by the share of ICT in capital investment.[3] The data do not suggest a strong correlation at first glance. However, sectoral analysis reveals that technological change was pronounced in the same sectors as wage disparities within services, but not within the manufacture.

Figure 2.A2.3. **Wage gaps and technological change by sector, 1985-2005**

Increases in ICT and high-to-low wage ratios, average of 12 OECD countries



Note: Percentage point changes refer to the difference between 1995-2005 averages and 1985-1995 averages. Countries included: see Figure 2.A2.1. Grey diamonds refer to services including transport, finance, real estate, hotels, community, construction, electricity and wholesale.

Source: OECD calculations based on STAN and EU-KLEMS. See Annex Table 2.A2.2 for more details.

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One explanation for the weak correlation between changes in skill wage gaps and technological change is that no account is taken for growing wage inequality among workers with similar skills. A growing body of literature has shown that, even after accounting for observable differences across workers the dispersion of wages has risen, *i.e.* there has been an increase in residual wage variation. The simple distinction between skilled and unskilled workers is not detailed enough to capture such recent changes in employment and inequality. In fact, technological change, in particular ICT developments, is accompanied by shifts away from routine and toward non-routine labour (Autor *et al.*, 2003; Michaels *et al.*, 2010; Goos and Manning, 2007).

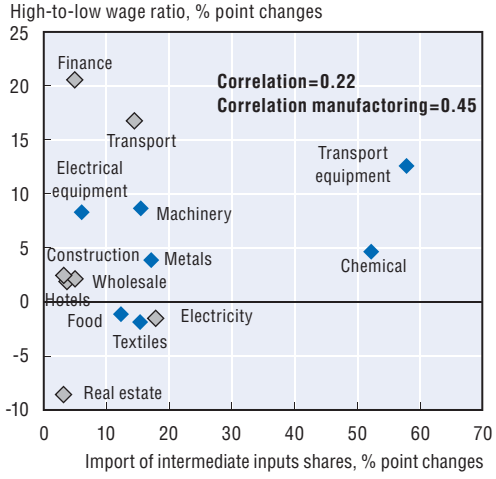
Sectoral wage gaps and other forms of globalisation

Outsourcing is also a likely explanation for within-industry shifts in wage inequality. Outsourcing is predicted to increase both the skill gap and the skill intensities of final goods in OECD countries. Some estimates of the effect of outsourcing have shown that it could explain between 15 to 40% of the increase in wage inequality, depending on the specification (Feenstra and Hanson, 1999). While additional research using comparative data is still needed to settle the issue, some studies suggest that technological change remains the dominant effect (Hijzen, 2007).

While recent evidence has found that international outsourcing to low-income countries has a negative effect on the demand for workers at the bottom of the skill distribution in manufacturing in OECD countries, less is known about outsourcing of services because of measurement problems. The analysis below looks at the correlation between trends in imports of intermediate inputs and the skill wage gap using newly available data[4] for both goods and services across OECD countries (Figure 2.A2.4). The correlation is weak overall (0.22) but somewhat higher (0.45) when looking at the manufacturing sector only.

Figure 2.A2.4. **Wage gaps and trade in intermediate inputs, 1995-2005**

Increases in trade in intermediate inputs and high-to-low wage ratios, average of 12 OECD countries



Note: Countries included: see Figure 2.A2.1. Grey diamonds refer to services including transport, finance, real estate, hotels, community, construction, electricity and wholesale.

Source: OECD calculations based on EU-KLEMS and OECD Imports of Intermediate Goods and Services dataset. See Annex Table 2.A2.2 for more details on the country coverage.

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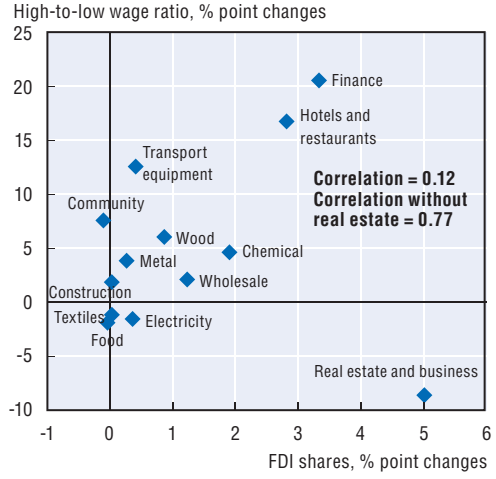
Capital flows from OECD to developing economies might capture another dimension of outsourcing by MNCs and may have contributed to an increase in the relative demand for skilled labour (Feenstra and Hanson, 1996). Globalisation is also characterised by international production networks where different stages of production are performed in different countries. As a result, a particular country may import goods from another country and use them as input for other goods which are exported. OECD countries may outsource activities that use relatively large amounts of unskilled labour.

FDI has seen a progressive shift towards services at the expense of manufacturing and, often, the largest growth in inward FDI within services has been among knowledge-intensive sectors such as finance and real estate (OECD, 2008b). But also some non-knowledge-intensive sectors such as restaurants and hotels have experienced a substantial growth. A gradual shift in both outward and inward FDI towards more technological and skill-intensive sectors would point to a possible link between FDI and wage inequality. At first glance, correlation analysis does not confirm a stron link between FDI and skill wage gaps across sectors (Figure 2.A2.5). However, the association between changes in FDI and skill wage gaps is sensitive to the outlier industry "real estate". Once excluded, a stronger correlation is found.

Figure 2.A2.5. **Changes in wage gaps and outward FDI, 1995-2005**

FDI shares and high/low wage ratio, average of 12 OECD countries



Note: Percentage point changes refer to the difference between 2000-2005 averages and 1995-2000 averages. See Annex Table 2.A2.2 for more details on the country coverage. Countries included: see Figure 2.A2.1. FDI = Foreign direct investment.

Source: OECD Secretariat calculations based on EU-KLEMS data.

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Summary

The analysis has found that the skill wage gap increased across almost all industry sectors and correlation analysis tends to confirm the findings in the chapter above that trade is not the main explanatory factor behind the trend. Sectors which were particularly exposed to trade openness were not necessarily the ones which recorded higher increases in skill wage gaps. Most of the increase was driven by inequality *within* sectors rather than *between* sectors. Correlation between changes in the skill wage gap and possible drivers such as trade in total and intermediate goods and services was weak.

Changes in other drivers linked to globalisation did show a very moderate correlation with changes in the skill wage gap across sectors. This is the case for technological change (but only within services and not within manufacturing) and FDI (after excluding the outlier sector "real estate") and trade in intermediate output (but to an even weaker degree and only for the manufacturing sector).

Table 2.A2.2. **Data sources, country and sector coverage**

			Country coverage	Industry coverage (ISIC Rev. 3)
Wage	Share of high-skilled, medium and low-skilled in total labour compensation and in hours worked	EU-KLEMS 1985-2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 21-22, 23-25, 26, 27-28, 29, 30-33, 34-35, 36-37,45, 50-52, 55, 60-64, 65-67, 70-74, 75-99
Import of in intermediate inputs	Import values of Intermediate Goods and Services, estimates based on I/O tables dataset as a share of GDP	OECD Globalisation indicators 1995, 2000, 2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 23-25, 27-28, 29, 30-33, 34-35, 36-37,45, 50-52, 55, 60-64, 65-67, 70-74, 75-99
Import penetration	Imports as a percentage of total demand (= production plus imports less exports)	OECD STAN Database 1985-2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 21-22, 23-25, 26, 27-28, 29, 30-33, 34-35, 36-37
Export share of production	Exports as a percentage of production	OECD STAN Database 1985-2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 21-22, 23-25, 26, 27-28, 29, 30-33, 34-35, 36-37
Inward FDI	Inward positions in direct investment as a share of GDP	OECD International Direct Investment Statistics database 1985-2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 23-25, 27-28, 34-35, 45, 50-52, 55, 60-64, 65-67, 70-74, 75-99
Outward FDI	Outward positions in direct investment as a share of GDP	OECD International Direct Investment Statistics database	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 23-25, 27-28, 34-35, 45, 50-52, 55, 60-64, 65-67, 70-74, 75-99
Share of ICT	Share of ICT in total capital compensation	EU-KLEMS 1985-2005	Austria, Belgium, Denmark, Germany, Finland, Japan, the Netherlands, Poland, Spain, Sweden, the United Kingdom, the United States	15-16, 17-19, 20, 21-22, 23-25, 26, 27-28, 29, 30-33, 34-35, 36-37,45, 50-52, 55, 60-64, 65-67, 70-74, 75-99

StatLink http://dx.doi.org/10.1787/888932537617

Notes

1. The analysis of wage inequality by skill level was performed for 12 OECD countries. Including additional four countries for which data are only available since the 1990s results in a higher increase in inequality between 1995 and 2005. The detailed analysis shows large similarities in terms of the sectors which experienced the highest growth (machinery, electrical equipment, transport, finance).
2. Inequality between medium and low-skilled workers has increased on average by a similar amount to that between high and low-skilled workers (analysis not shown) and the largest increases occur in the same sectors within services but not for the manufacturing sector.
3. This indicator is available in time series for a number of OECD countries at the sector-specific level and has been widely used in the literature (Wheeler, 2005; Autor *et al.*, 1998). Technological change measured by the share of ICT in capital investment has experienced a large surge since 1980 but it appears to have preceded changes in wage inequality as the largest increase occurred in the first decade studied.
4. Data are only available for more recent years (1995 to 2005). See Chen *et al.* (2011) for the methodology applied.

Divided We Stand
Why Inequality Keeps Rising

PART I

Chapter 3

Inequality Between the Employed and the Non-employed*

This chapter considers trends in the earnings distribution across the whole working-age population, i.e. workers and non-workers taken together. It examines and quantifies the respective impacts of two forces: changes in wage disparities among workers and changes in non-employment rates. The chapter relates such inequality dynamics to macroeconomic developments. It analyses the effects on employment of globalisation, evolving technologies, and institutional and policy changes, and combines the results of the analysis with findings on the determinants of wage inequality trends. The chapter then estimates the overall effect of each determinant on changes in earnings inequalities across the whole working-age population.

* This chapter was prepared by Wen-Hao Chen, Michael Förster and Ana Llena-Nozal, OECD Social Policy Division.

3.1. Introduction

The preceding chapter focused on changes in wage inequality among workers. However, trends in economic globalisation, policies, and institutions affect labour markets not only through changes in wage rates but also through unemployment and inactivity. Inequality in the entire working-age population, therefore, may widen even if wage inequality among the employed remains unchanged – particularly in labour markets where wages and labour flows are constrained by institutional rigidities. Alternatively, if earnings inequalities across the entire working-age population are considered, rising employment may act as a considerable counterweight to growing wage inequality. Analyses that look only at changes in wage dispersion and fail to consider the possible impacts of employment and unemployment may therefore tell only a partial story.

A vast body of empirical evidence points to the significant impact of both product market regulation (PMR) and labour market policies on employment levels (OECD, 2006). Greater product market competition, in particular, tends to increase aggregate employment because it reduces market rents and expands activity (Blanchard and Giavazzi, 2003; Spector, 2004; Messina, 2003; Fiori *et al.*, 2007; Bassanini and Duval, 2006). There is also some evidence that the higher unemployment benefits are and the longer they last, the greater are the levels of unemployment (Nickell, 1998; Nunziata, 2002). Similarly, higher tax wedges can discourage the labour supply and curb employment.

Labour market bargaining models (Layard *et al.*, 1991; Pissarides 1990) suggest that, other things being equal, an increase in the bargaining power of workers may lead to higher labour shares and, possibly, to a more compressed wage structure and lower levels of employment. The effect of employment protection legislation (EPL) is uncertain: although it may raise wages and lower employment by strengthening workers' bargaining power, it may also widen wage dispersion by promoting greater dualism (strict EPL for regular workers associated with lax regulations for temporary workers).

At the same time, there is an interaction between labour market and product market institutions that affects employment: unions' power to bid for higher wages also depends on the extent to which product market rents can be shared between employers and workers. Empirical evidence in this respect is mixed. Some studies find that product market deregulation is more effective when labour market policies are less restrictive (Berger and Danniger, 2006; Bassanini and Duval, 2006). Others, however, show that employment gains from product market deregulation are greater when labour market settings give workers strong bargaining power (Nicoletti and Scarpetta, 2005; Fiori *et al.*, 2007; Griffith *et al.*, 2007).

There is also a strand of literature that examines globalisation's impact on employment (*e.g.* OECD, 1997, 2007a, 2007b; Helpman and Itskhoki, 2007). Unfortunately, though, most such studies do not factor inequality into the story (Acemoglu, 1999: and Helpman *et al.,* 2008 being among the few exceptions). In particular, they fail to explain to what extent a potential rise in unemployment – due to globalisation – might spread

inequality across the whole working-age population. Empirically, little has been done to assess the overall distributional impact of globalisation by combining analyses of both the wage inequality effect and the employment effect.

This chapter aims to fill that knowledge gap. It addresses two questions in particular. To what extent do globalisation, evolving technology, and changes in institutions and regulations affect inequality in the whole working-age population (rather than only among the employed)? Through which channel (wage dispersion or employment) is inequality transmitted?

The chapter proceeds in two steps. First, it quantifies how inequality *within groups* (due to wage dispersion among the employed) and *between groups* (caused by inequality between the employed and the non-employed) affects inequality across the entire working-age population. In the second step, it relates such inequality dynamics to macroeconomic developments, particularly globalisation and institutional and policy changes. To that end, it assesses the impact of institutional and policy changes on trends in employment rates and combines that assessment with the findings on determinants of wage inequality trends from Chapter 2. The following key patterns emerge:

- Trends in the overall earnings dispersion across the whole working-age population between the mid-1980s and mid-2000s were shaped by two opposing forces: increased wage dispersion among workers and growing employment rates. Overall, the two factors tended to cancel each other out.
- Rising trade integration and financial openness seem to have had significant effects on neither wage inequality nor employment rate trends in OECD countries.
- Regulatory reform and institutional change in the fields of PMR, tax wedges, unemployment replacement rates, and union coverage had contrasting effects, as they tended to increase both wage dispersion and employment rates.
- Upskilling appears to be the only force which, between the mid-1980s and mid-2000s, succeeded not only in reducing wage dispersion among workers but also in increasing employment rates.

3.2. Earnings inequality among the whole working-age population

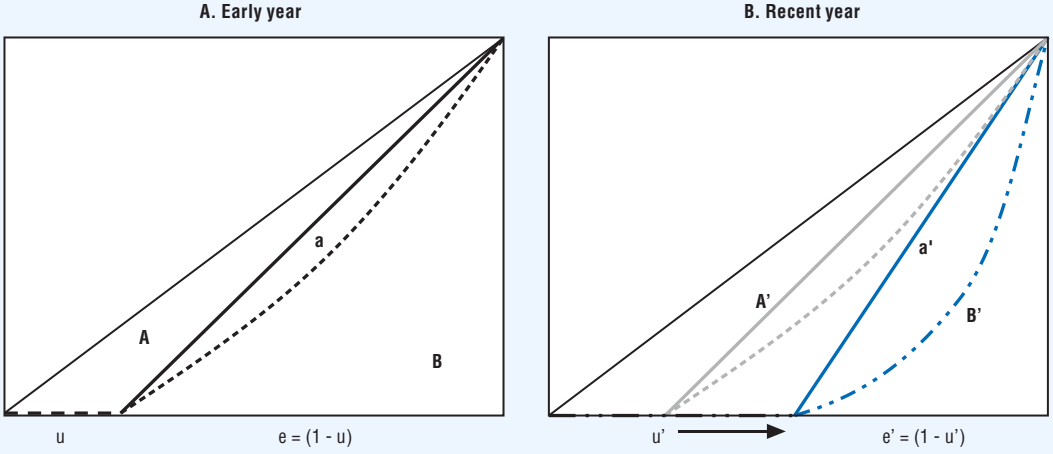
Changes in earnings inequality among the whole working-age population can be decomposed into two major components: those due to changes in wage dispersion and those due to changes in the non-employment rate. A theoretical framework to connect the change in earnings dispersion among the employed to earnings inequality among the whole working-age population is presented in Box 3.1. This framework is based on the model proposed in Atkinson and Brandolini (2006), which offers a way to measure the overall impact on inequality accounting for both the wage effect and the employment effect. The main idea is to use the Lorenz curve to represent inequality, measured by the Gini coefficient. The extent of inequality is represented by the areas underneath the curve which may be decomposed between the employed and the non-employed[1] under the assumption that the non-employed have zero earnings. While this assumption is problematic,[2] it allows to derive some indicative findings on one possible indicator for gauging the extent of "overall earnings inequality".

Equation 5 in Box 3.1 implies that changes in earnings inequality among the whole working-age population can be decomposed into two major components; they are positively associated with wage dispersion among the employed and negatively related to the

Box 3.1. **Framework on earnings dispersion among the working-age population**

Let *u* be the share of the non-employed and *e = (1-u)* the share of the employed. The Lorenz curve of the entire population can be depicted as a dashed line in Panel A. Also let B denote the area of the inner triangle (*i.e.* distribution of the employed only) and A + B be the area of the large triangle (*i.e.* distribution of the entire working-age population). Given this, inequality (as measured by the Gini coefficient) of the employed and of the whole working-age population can be expressed, respectively, as $gini_{emp}$ = a/B and $Gini_{all}$ = (A + a)/(A + B). The Gini coefficient is computed as the area between the Lorenz curve and the line of perfect equality (*i.e.* the 45° line).

Lorenz curves and changes in inequality among the employed and among the whole working-age population



Now suppose globalisation or changes in institutions in a recent year not only widened wage dispersion among the employed (from *a* to *a'*), but also increased unemployment or inactivity rates (from *u* to *u'*) as shown in Panel B. As a result, $gini'_{emp}$ = a'/B' and $Gini'_{all}$ = (A' + a')/(A' + B'). Changes in inequality among the employed and among the whole population can be expressed, respectively, as:

$$\Delta gini_{emp} = a'/B' - a/B \quad (1)$$

$$\Delta Gini_{all} = (A' + a')/(A' + B') - (A + a)/(A + B). \quad (2)$$

Since areas A and B (also A' and B') can be expressed in terms of the unemployment share, *u* (and *u'*), we rewrite equations (1) and (2) as:

$$\Delta gini_{emp} = 2a'/(1-u') - 2a/(1-u) \quad (3)$$

$$\Delta Gini_{all} = (u' + 2a') - (u + 2a). \quad (4)$$

Note that B=(1-u)/2 and A=u/2; similarly, B'=(1-u')/2 and A= u'/2.

Using equation (3) to substitute 2a (and 2a') in equation (4) gives:

$$\begin{aligned}\Delta Gini_{all} &= u' + gini'_{emp}\,(1-u') - u - gini_{emp}\,(1-u) \\ &= (1-u) \bullet (gini'_{emp} - gini_{emp}) + (1-gini'_{emp}) \bullet (u'-u) \quad (5) \\ &= e\,\Delta gini_{emp} - (1-gini'_{emp})\,\Delta e\end{aligned}$$

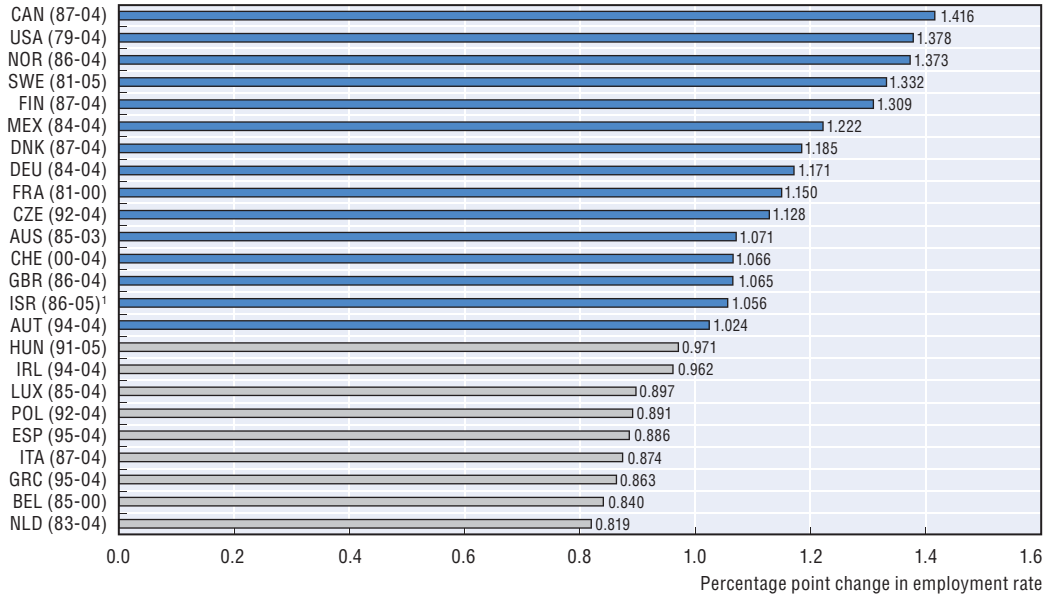
Keeping inequality among the whole population constant over the study period gives:

$$\Delta e = e\,\Delta gini_{emp}\,/(1 - gini'_{emp}). \quad (6)$$

employment rate. Equation 6 provides an indicator of how much increase in the employment rate is needed to compensate for a 1-percentage point increase in wage inequality, in order keep "overall" earnings inequality among the whole population unchanged. We carry out this exercise by using microdata from the Luxembourg Income Study (LIS) for 24 OECD countries for a period between mid-1980s and mid-2000s (see Annex 3.A1 for data sources).

Figure 3.1 reveals the responsiveness of the employment rate to the change in wage dispersion. In general, there is a great variation across countries, with simulated values ranging from 0.82 (Netherlands) to 1.42 (Canada). A value greater than one indicates that more than a 1-percentage point increase in the employment rate is needed to compensate for a 1-percentage point rise in the Gini coefficient of wages among workers in order to maintain the *status quo* of inequality among the whole working-age population. This occurs in 15 of the 24 countries under study, with a stronger effect in Canada and the United States as well as in Nordic countries.

Figure 3.1. **Change in employment rate needed to compensate change in wage inequality among workers, in order to keep earnings inequality among the whole working-age population unchanged**



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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536135

Contributions of the wage and employment effects to earnings inequality among the whole working-age population

Equation 5 in Box 3.1 allows us to decompose country-specific changes in overall inequality into the wage effect and the employment effect. To provide an estimate of the average impact of these two components on the change in overall inequality across the OECD area over the period studied, we fit parameters in equation 5 with a fixed-effects model using pooled observations from all countries.[3] The results are presented in Table 3.1. It shows that trends in both wage dispersion and the employment rate contribute to changes in earnings inequality among the whole working-age population. On average, a

1-percentage point increase in the Gini coefficient of annual earnings among the employed would raise the Gini coefficient of the working-age population by about 0.6 percentage points in the OECD area, holding the employment rate constant. Likewise, a 1-point increase in the employment share would reduce the overall Gini coefficient of the working-age population by 0.65 percentage points, other things being equal. These estimates are statistically significant at the 1% level.

Table 3.1. **Wage inequality and employment effects on overall inequality among the working-age population**

Dependent variable: Gini coefficient of annual earnings among the working-age population

Gini of annual earnings among the employed	0.614***
	(18.7)
Percent of workers with positive annual earnings	–0.646***
	(–33.2)
Country-fixed effects	Yes
Year-fixed effects	Yes
Number of observations	123
Number of countries	24
Adjusted R-squared (within)	0.97

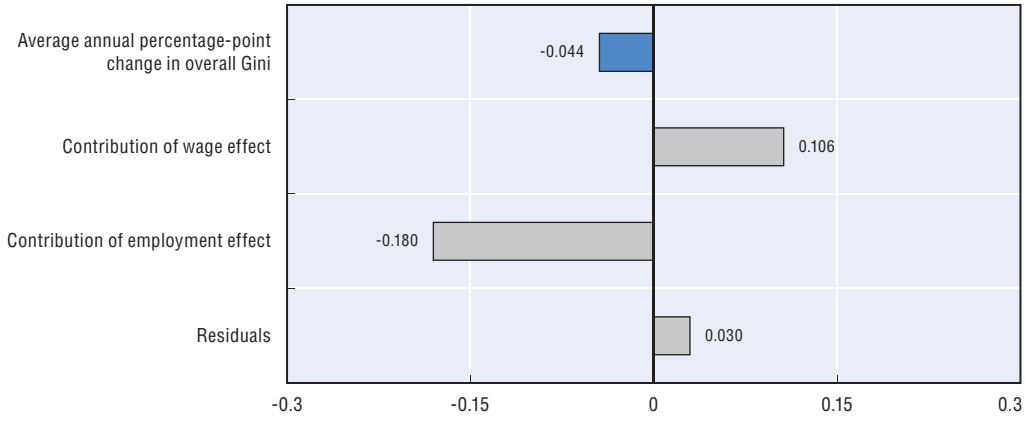
*** Statistically significant at the 1% level.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537636

Using estimated coefficients, we compute a crude decomposition to quantify how much of the annual change in inequality among the entire working-age population can be attributed to the wage and the employment effects, respectively (Figure 3.2). Overall, it indicates that the Gini coefficient of earnings among the whole working-age population on average decreased by 0.04 percentage points annually over the mid-1980s to mid-2000s. This is the net outcome of the two opposing forces: increasing wage dispersion among the employed has exerted a disequalising impact, contributing 0.11 percentage point a year to

Figure 3.2. **Estimated contributions of wage dispersion and employment effects to overall earnings inequality among the working-age population**



Note: The contribution of each variable is computed as the average annual change in the variable multiplied by the regression coefficient (Table 3.1) on that variable.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536154

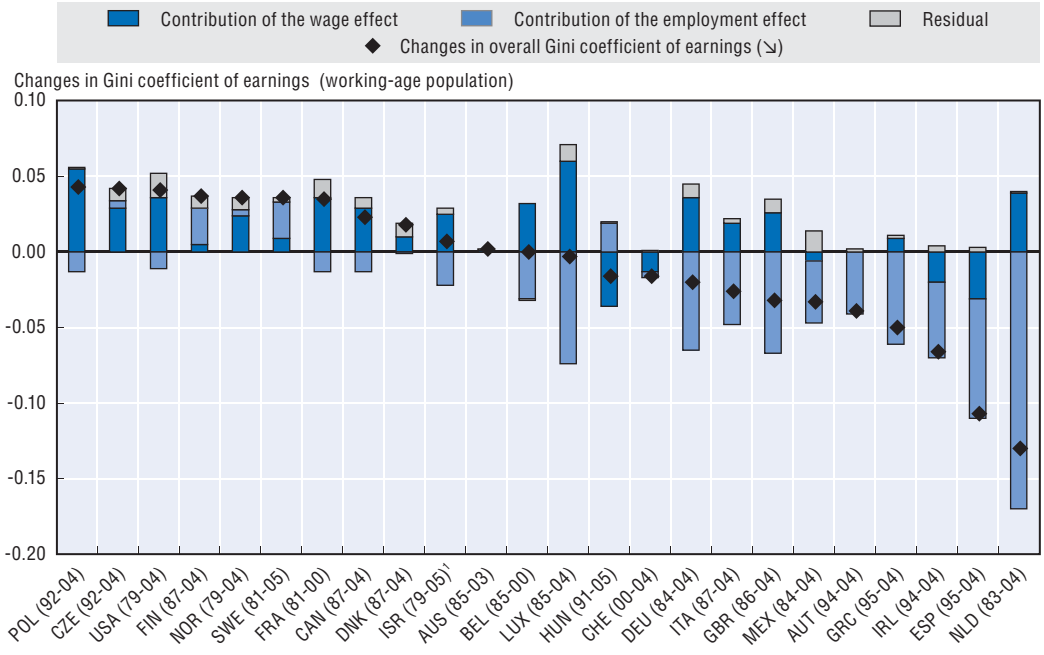
raising the population inequality; whereas the growing employment rate has contributed to offset rising inequality by a slightly stronger reduction (0.18 point annually) over the period examined.

Country-specific counterfactuals

Figure 3.3 presents country-specific counterfactuals to illustrate the quantitative importance of the wage dispersion and employment effect. Basically, two counterfactuals are computed.[4] The first one is the predicted Gini coefficient of earnings of the whole working-age population (*i.e.* including the non-employed) for each country by holding the wage dispersion of workers constant at the initial-year levels, and the second one calculates the predicted value by holding both wage dispersion and the employment rate at the previous levels (see Table 3.A2.1 in the annex). Differences between the first predicted Gini coefficient and the actual Gini coefficient of the recent year indicate the contribution of the wage effect; and differences between the first and second predicted values indicate the contribution of the employment effect. Finally, the residual is the gap between the second predicted value and the actual Gini coefficient of the initial year.

Countries are ranked (from high to low) in Figure 3.3 according to the increase of overall Gini coefficients. In Norway, for example, earnings inequality of the whole working-age population increased by 3.6 points between 1979 and 2004, and both the wage and employment effects contributed to this rising inequality among the population. The former contributed about 67% of the total increase, and the latter about 10%, while unexplained factors were responsible for the remaining fifth of the total change.

Figure 3.3. **Decomposing changes in the Gini coefficient of earnings among the entire working-age population**



Note: Gini coefficient of earnings among the entire working-age population estimated by assigning zero earnings to non-workers.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536173

For countries that experienced a rise in overall earnings inequality over the period examined, rising wage dispersion among workers appeared to be the driving force of the change in most cases. Two notable exceptions are Finland and Sweden in which a decline in the employment share is the main driver of rising inequality among the whole working-age population. For countries that registered a decline in overall earnings inequality over time, an increase in the employment rate is the main reason for this change. In the Netherlands, the country with the largest decline in overall inequality, more than 130% of the total decline between 1983 and 2004 can be attributed to the rising employment share. Figure 3.3 also shows that in half of the countries, the wage dispersion and the employment effect exerted opposite influences on inequality over time. Residuals are generally small, suggesting a good model fit to the data.

Accounting for the value of non-market activities

The above analyses show the importance of the employment effect as a determinant of an estimate of "overall" earnings inequality among the whole population. It suggests that the potential distributional impact of globalisation or other contextual changes may be off-set if the widening wage dispersion among workers is also associated with raising employment. However, the estimated employment effect above may be considered as an *upper bound estimate* since by assigning zero earnings to non-workers it does not account for the value of leisure (Atkinson and Brandolini, 2006).

To estimate a *lower bound value*, we arbitrarily impute some "shadow" earnings for all non-workers under the assumption that people out of work have "potential earnings" equivalent to an amount to lift them above the poverty threshold. For simplicity, potential earnings are defined here as one-half of median annual earnings among the working-age population in each country and each year. This amount is assigned to all non-workers as "potential earnings".

We redo Table 3.1 and Figure 3.2 by calculating the Gini coefficient of annual earnings among the working-age population using such imputed earnings for non-workers. The results are presented in Annex Table 3.A2.2 and Figure 3.A2.1 Compared with previous estimates, the fixed-effect regression now shows a much larger coefficient for the wage effect (0.982) and a reduced coefficient (–0.445) for the employment effect. With imputed earnings for non-workers, the Gini coefficient of earnings among the whole working-age population increased marginally over the mid-1980s to mid-2000s (0.013 point annually). As expected, the disequalising effect of rising wage dispersion among the employed is now stronger, contributing 0.17 percentage point a year to raising inequality among the whole population, whereas the growing employment rate has contributed to offset rising inequality by about 0.12 point annually over the period examined.

The results from Figure 3.2 and 3.A2.1 together therefore provide upper and lower bound estimates of the wage effect and the employment effect with respect to inequality among the whole working-age population. Combining these results, on average, it is reasonable to conclude that both rising wage dispersion and growing employment rates contributed to considerable but opposing effects. Both effects tend to cancel each other out and result in little change in an estimate of "overall" earnings inequality trends among the whole working-age population (workers and non-workers taken together).

3.3. Linking globalisation and developments in policies and institutions to changes in earnings inequality among the working-age population

The previous section identified the respective contributions of the wage inequality effect and the employment effect to an estimate of overall earnings inequality among the whole working-age population. The following question is to evaluate to what extent such inequality trends may be explained by globalisation and other institutional changes, and through which channels (wage inequality, employment or both)? We use a simple two-step approach to identify such channel(s). In the first step we examine the employment impact of globalisation and policy/institutions based on a macro-regression framework, and in the second step, we assess the distributional impact of these macroeconomic developments among the working-age population by summarising – in qualitative terms – findings from its influence on both the wage dispersion (derived from Chapter 2) and the employment outcome (discussed in the section below).

The impact of globalisation and policy/institutional developments on employment

To assess the impact of globalisation, technological progress and institutions on employment, the following macro-regression model is estimated:

$$Emp_{it} = \delta\, Glob_{it} + \rho\, Tech_{it} + \gamma\, Instit_{it} + \Sigma\beta_j\, X^j_{it} + \alpha_i + \lambda_t + \varepsilon_{it}. \quad (7)$$

The dependent variable, employment rates (*Emp*), is obtained from the *OECD Employment Database*. As for explanatory variables, *Glob* denotes two globalisation factors, namely trade and financial integration, *Tech* refers to business-sector R&D that captures technological change,[5] *Instit* includes a set of institutional and policy variables, *X* refers to other controls such as the output gap (to capture "excess demand" of economic activity) and education, and α_i and λ_t refer to country-specific and time-specific fixed effects, respectively. The regression coefficients are estimated using the fixed-effects procedure, identifying the average impact of the *within*-country variation. The final sample consists of an unbalanced country-year panel of the same 22 OECD countries which have been analysed in Chapter 2, for a period between 1985 and 2007. The regression results for the whole working-age population are presented in Table 3.2.

Trade integration

The findings from Table 3.2 suggest that trade exposure in general has little impact on changes in the employment rates in OECD countries over the period studied. This result is consistent with previous OECD studies, which generally find the net employment effects of changes in trade have not been significant in OECD countries (OECD, 1985, 1992, 2007b).[6] A recent OECD study (Dee *et al.*, 2011), however, uses a different methodological approach and reaches a more positive result: in the long-run, trade openness has been estimated to increase employment (among both lower-skilled and skilled workers). Rather than regression analyses, this study is based on computable general equilibrium (CGE) simulations.[7]

Financial openness

A rapid growth in international financial transactions may affect job creation and destruction. Foreign corporations that establish new local plants or affiliates (*i.e.* greenfield investment) may potentially stimulate economic growth and create jobs linked to their activities in the host country. On the other hand, increased subcontracting by multinational

Table 3.2. **Globalisation, polices and institutions and changes in the employment rate**

Dependent variable: employment rate (working-age population)

	Baseline	With EPL split	With UIRR	With public employment rate
	(1)	(2)	(3)	(4)
Trade integration				
ln(Total trade exposure) /100	–0.028	–0.032	–0.015	–0.021
	(–1.55)	(–1.61)	(–0.73)	(–1.00)
Financial integration				
ln(FDI restrictiveness index) /100	–0.006	–0.015*	–0.006	–0.011
[0-1, 0 open, 1 closed]	(–0.69)	(–1.71)	(–0.64)	(–1.11)
Technology				
ln(Business R&D /GDP)[1] /100	–0.004	0.005	–0.009	0.004
	(–0.14)	(0.20)	(–0.30)	(0.15)
Labour market institutions and policies				
Union coverage rate	–0.077***	–0.136***	–0.074**	–0.111***
	(–2.63)	(–4.36)	(–2.50)	(–4.07)
PMR	–0.896**	–0.781**	–0.770*	–0.718*
	(–2.16)	(–2.16)	(–1.73)	(–1.71)
EPL	0.928		0.757	–0.088
	(1.44)		(1.02)	(–0.13)
EPL_temporary		0.646*		
		(1.92)		
EPL_regular		–3.95***		
		(–3.97)		
Tax wedges	–0.294***	–0.276***	–0.302***	–0.344***
	(–5.69)	(–5.11)	(–5.34)	(–5.63)
UI replacement rate for low-wage workers			–0.113***	–0.107***
			(–3.43)	(–3.80)
Other controls				
% has attained post-secondary education	0.172***	0.136***	0.172***	0.142**
	(3.57)	(2.80)	(2.68)	(1.97)
Output gap	0.607***	0.615***	0.634***	0.598***
	(7.60)	(8.08)	(7.97)	(6.18)
Public employment rate				0.925***
				(3.90)
Other variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	406	406	389	366
Number of countries	22	22	22	21
Adjusted R-squared (within)	0.59	0.63	0.61	0.64

Note: *t*-statistics (in parentheses) are calculated based on heteroskedasticity-robust standard errors**.** Other controls include country fixed effects and the trend component of technology variable. For definition of variables, please see Annex 2.A1. *, **, ***: statistically significant B50at the 10%, 5% and 1% level, respectively.

1. The variable is detrended (see note 6 in Chapter 2).

Source: See Annex 2.A1; OECD Secretariat calculations.

StatLink http://dx.doi.org/10.1787/888932537655

corporations across national boundaries (in particular, outsourcing to developing countries) may lead to job displacement in the home country. There is mixed evidence on whether outsourcing affects employment in advanced countries.[8]

Overall, international financial flows appear to have little impact on employment in OECD countries. In general, FDI deregulation (*i.e.* a decline in the value of the FDI

restrictiveness index) seems to have a labour-augmenting effect as the coefficients are negatively estimated in all specifications, albeit not statistically significant in most specifications. A labour-augmenting effect of FDI deregulation, however, becomes slightly stronger (at the 5% level) once institutional and policy variable are excluded from the regression (not shown). When replacing the proxy of FDI regulation by two *de facto* FDI measures (inward and outward FDI-to-GDP stock) we find that a labour-creating effect of FDI is mainly derived from its inward component, while the employment effect of outward movement remains insignificant (results not shown).[9]

Technological progress

Technological progress is expected to result in substantial changes in the demand for labour. Process innovation that introduces automated assembly lines may increase productivity, but may result in a decline in the demand for unskilled workers. On the other hand, product innovation that leads to an increase in total consumption may stimulate employment due to stronger sales or exports and counterbalance the decline in demand linked to improved processes. Previous empirical evidence on the employment consequences of technological change is mixed, and depends largely on the forms of innovation and the levels of unit (firms, sectors or the whole economy) analysed (Vivarelli, 2007). The results in Table 3.2 suggest that technological progress, proxied by the deviation of the BERD-to-GDP ratio from its long-term trend, has no significant impact on employment in OECD countries over the period studied.

Policies and institutions

The relation between regulatory reform and employment trends among OECD countries is well documented (*e.g.* Bassanini and Duval 2006; Fiori *et al.*, 2007). In general, the results in Table 3.2 are consistent with previous studies. Changes in the union coverage are found to be negatively correlated with employment: a 10-percentage point decline in the union coverage rate would increase the employment rate by roughly 0.8 points. This is consistent with a view that higher union coverage is often assumed to strengthen workers' bargaining power over wages, and thus lower employers' demand for labour. Hence, the declining trend of union coverage in OECD countries over recent decades would be expected to contribute to higher employment.

Regulations that curb competition by state control and barriers to entry are expected to have a significant impact on labour demand. This is confirmed in Table 3.2 which shows that the decline in product market regulation (PMR) has contributed to increasing employment rates among OECD countries: a 5-percentage point decrease in the indicator would increase the average employment rate by roughly 3.5-4 percentage points. As noted by Nicoletti and Scarpetta (2005), these are likely to be lower bound estimates of the potential employment effects of product market reforms because the PMR indicator used in the study covers only reforms in a subset of non-manufacturing (see Annex 2.A2).

The impact of changing employment protection on employment is more difficult to predict as it depends crucially on the extent to which the extra costs can be shifted onto workers from employers. A decline in employment protection legislation (EPL) may reduce the costs of employment adjustment (both hiring and firing), and as a result, lead to little change in the aggregate employment rate if both inflows to and outflows from employment tend to cancel each other out. The results in Table 3.2 indicate that changes in overall EPL have no impact on aggregate employment. The findings are also consistent

with previous OECD studies (*e.g.* Nicoletti and Scarpetta, 2005; Bassanini and Duval, 2006). By splitting EPL into two subcomponents (Column 2), we find that deregulation of temporary contracts exerted a negative effect on employment, while the stringency in the protection for regular contracts are found to be negatively associated with employment.[10]

Concerning changes in labour costs, higher tax wedges tend to reduce overall employment. Coefficient estimates imply that a 10-percentage points rise in the tax wedges would reduce the aggregate employment rate by about 3 percentage points. This result echoes previous studies (Nickell, 1997; Bassanini and Duval, 2006) according to which an increase in the overall tax burden may raise unemployment and reduce employment.

The employment effect of unemployment benefits is examined in Column 3.[11] The findings indicate that a generous UI benefit (for low-wage workers) is detrimental for employment, and the estimated coefficient is significant at the 1% level. This is consistent with the view that more generous UI benefits tend to increase unemployment because the costs of being unemployed is reduced (*e.g.* Nickell, 1997; Layard *et al.*, 1991; OECD, 1994).

Previous studies have also suggested that public employment is an important predictor of overall employment since public jobs may crowd out employment opportunities in the private sector by creating wage pressures, thus increasing the equilibrium unemployment rate (*e.g.* Holmlund and Linden, 1993).[12] As a robustness check, Table 3.2 further includes the public employment rate (measured as public employees/population ratio) in Column 4, at the cost of reducing the sample coverage.[13] The findings reveal that public employment has a positive and significant impact on aggregate employment. This might suggest that a one-to-one substitution effect between public and private employment is not likely to occur. Moreover, both Columns 3 and 4 suggest that the main findings in the baseline specification (Column 1) are generally robust to the sample coverage.

Among other controls, changes in the output gap have a strong employment effect as expected, and increased supply of skilled workers (measured by the percentage of the population which has a post-secondary education) also improves job creation. These results are generally robust to different specifications.

3.4. Globalisation, regulatory reforms and changes in overall earnings inequality: bringing together the evidence

Having examined the respective impacts on employment (in Section 3.3 above), together with the findings on the impacts on wage dispersion (from Chapter 2), it is possible to evaluate the impact of these main drivers on an estimate of "overall earnings inequality" among the entire working-age population (*i.e.* workers and non-workers taken together). This is done in Table 3.3 by synthesizing the evidence (in a qualitative approach) from the previous analyses on both the wage inequality effects and the employment effects.

An important caveat has to be made here. The results used from the employment equation include full-time and part-time workers as well as self-employed people, while the results for wage dispersion refer to full-time workers only. However, as will be shown in more detail in Chapter 4, the level of earnings dispersion among all workers (including part-timers and self-employed) is higher and also increased at a higher pace than that of full-time workers. Therefore, the estimates given here of the wage inequality effect will be underestimated with regard to the employment effect.

Table 3.3. **Main drivers for changes in the earnings distribution among the whole working-age population**

Summary results from pooled regression analysis in Chapters 2 and 3

	Economic impact (statistical inference) on:		Impact on the overall inequality of the working-age population due to:		Impact on changes in estimated "overall" earnings inequality
	Wage dispersion	Employment rate	Wage effect	Employment effect	
	(1)	(2)	(3)	(4)	(5)
Globalisation and technology					
Trade integration	=	=			=
Foreign direct investment (FDI) deregulation	=	=			=
Technological progress	+ (**)	=			+
Policies and institutions					
Declining union coverage	+ (*)	+ (***)			=/–
Product market deregulation (PMR)	+ (**)	+ (**)	+ (***)	– (***)	+/=/–
Less strict employment protection legislation (EPL)	+ (***)	=			+
Declining tax wedges	+ (***)	++ (***)			=/–
Declining unemployment benefit replacement rate	+ (***)	+ (***)			+/=/–
Other control					
Upskilling (increased education level)	– (***)	+ (***)			– –

Note: Columns 1 and 2 are derived from the regression results from Table 2.4 and Table 3.2 respectively; and Columns 3 and 4 are obtained from Table 3.1. Column 5 is a qualitative assessment of the overall effect, taking into account two alternative hypotheses of potential earnings of non-workers (zero and imputed earnings) from Figure 3.2 and Figure 3.A2.1, respectively. Definitions of signs are given in the text.

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

Source: OECD Secretariat calculations.

StatLink http://dx.doi.org/10.1787/888932537674

Since the variables under examination are measured in different *units of measurement* (for example, trade exposure is measured in ratios and EPL is measured on a 0-6 scale), we re-estimate the above analyses using standardised variables in order to answer the question of which of the explanatory factors played a greater role on influencing the wage dispersion or the employment effect.[14] In Columns 1 and 2 of Table 3.3, we denote with "+" (or "–") if the standardised coefficient is positive (or negative) and is less than one-third (0.33) for one standard deviation change in the unit, and "++" (or "– –") if the standardised coefficient is 0.33 or more.[15] We also include statistical inference in the parentheses (***, **, *) indicating the estimated coefficient is significant at the 1%, 5% and 10% levels respectively. Finally, a "=" is indicated for imprecise estimates (less than the 10% level) regardless of the value of the coefficient. In Columns 3 and 4, we report the findings from the first part of this chapter (from Tables 3.1 and 3.A2.2) that changes in wage dispersion and changes in the employment rate contributed a considerable (but opposing) effect to earnings inequality among the whole working-age population.

Based on Columns 1 to 4, we then evaluate the overall impact of each contextual change on an estimate of overall earnings inequality of the working-age population in Column 5. This is done in a suggestive and qualitative way by taking into account both the absolute magnitudes (in Columns 1 and 2) and relative contributions to annual percentage changes in overall earnings inequality (in Columns 3 and 4), considering the two alternative hypotheses of potential earnings of non-workers, namely zero earnings and imputed earnings of one half of median earnings.[16] Under the first hypothesis, the

employment effect slightly outweighs the wage-inequality effect while the inverse is true under the second hypothesis. Therefore, some of the results in Column 5 appear as undetermined.

The mechanisms through which inequalities are transmitted to the earnings distribution of the whole working-age population are complex. Technological progress appears to be a main factor behind the rise in earnings inequality among the working-age population. This factor exerted a disequalising effect predominantly through the wage inequality channel (the "within-group" inequality component). The trends toward greater trade exposure and less regulated FDI tend to be overall distribution neutral when institutional and policy variables are also controlled for.

Changes in many policies and institutions exert opposing effects. Lower union coverage, less PMR, lower tax wedges and less generous UI benefits all contributed to increasing wage dispersion on the one hand, and to increasing employment rates on the other, resulting in little change in overall inequality of the working-age population. Changes in EPL (for temporary contracts) tend to have a moderate disequalising effect on the overall earnings distribution among the entire population, mainly through the wage inequality channel.

The disequalising effects from various transmission channels mentioned above is offset to a large extent by a similar reduction in inequality from the growth in the supply of skilled workers. This factor affects the earnings distribution among the working-age population through both the wage and the employment channels: it reduces both wage inequality among workers and inequality between the employed and the non-employed.

3.5. Summary and conclusions

This chapter has combined the findings on drivers of wage inequality from the previous chapter with an analysis of the impact of those drivers on employment in order to estimate the overall distributive effect. Indeed, trends in economic globalisation, technological change, and policies and institutions may affect inequality across the whole working-age population not only by increasing wage disparities among the employed, but also by widening or closing the gap between the employed and the non-employed. Two possible indicators of overall earnings inequality across the whole working-age population (including non-earners) are calculated, one that assumes zero earnings among non-workers and another which imputes some "shadow wage". As both indicators rely on particular assumptions of the "potential earnings" of non-workers, the findings from the analyses are indicative and illustrative. The findings can be summarised as follows.

Decomposing earnings inequality among the whole working-age population

- "Overall earnings inequality" among the whole working-age population (*i.e.* employed and non-employed) increased little in the typical OECD country between the mid-1980s and the mid-2000s. This was the result of two opposing forces, increasing wage dispersion and growing employment cancelling each other out. The increasing wage dispersion among workers exerted a marked disequalising impact, while the mounting employment rate contributed to offset rising earnings inequality by an almost equivalent reduction.

- When non-workers are assumed to have zero earnings, the employment effect slightly outweighs the wage inequality effect. When shadow wages are imputed to non-workers to account for their potential earnings, the wage inequality effect slightly outweighs the employment effect.

Employment effects of economic and policy drivers

- Neither rising trade integration nor financial openness seem to have had any significant effect on employment.
- However, more flexible product market regulation, together with declining union coverage, lower tax wedges, and less generous unemployment replacement rates all appear to have contributed to higher employment rates within OECD countries. Relaxing employment protection legislation did not impact significantly on the overall employment rate.
- Technological change, which is one of the main determinants of increased wage inequality, seems not to have had a significant impact on employment rates once changes in globalisation and institutions are taken into account.

Contributors to inequality of earnings among the whole working-age population

- Technological progress appears to have been an important factor behind the rise in overall earnings inequality among the working-age population – predominantly through the wage inequality channel.
- Overall, trade and financial globalisation trends tended to be distribution-neutral.
- More relaxed PMR, dwindling union coverage, declining tax wedges, and less generous UI replacement rates all had undetermined effects on overall earnings inequality among the working-age population. As they contributed to greater wage dispersion and higher employment rates at the same time, they resulted in little change in overall earnings inequality trends (*i.e.* among workers and non-workers).
- Weaker employment protection (in particular for temporary contracts), however, widened the wage distribution among the employed and so had an overall disequalising effect.
- The sizable disequalising effect of these various factors was largely offset by a similar reduction in overall earnings inequality attributable to the growth in average educational attainment. Upskilling appears to have been the only force which, between the mid-1980s and mid-2000s, succeeded not only in reducing wage dispersion among workers but in increasing employment rates.

Notes

1. The data which will be used in the following do not allow distinguishing the unemployed from inactive people.
2. Rather than assigning zero earnings to non-workers, it would be preferable to impute some shadow wage or "potential" marginal income (such as the minimum wage or unemployment benefits) since many unemployed receive unemployment benefits and for some people inactivity is related to their preference for leisure over work or job search. As a result, by assigning zero earnings we artificially inflate the "between-groups" effect. Subsection "Accounting for the value of non-market activities" in Section 3.2 proposes a way to account for this issue.

3. This is done on the basis of an unbalanced panel of 24 OECD countries with on average 5 time-series observations per country.

4. The counterfactuals are computed using the estimated coefficients from Table 3.1.

5. For consistency reasons with previous analyses, trade globalisation is measured by ln(trade exposure), financial integration is instrumented by ln(FDI restrictiveness index), and technological progress is assessed by the detrended unit of ln(business R&D-to-GDP ratio).

6. Although the overall employment effect of trade has been estimated as insignificant, these studies also reveal that, at industrial level, the increased import competition had adverse employment effects in certain sectors (OECD, 1992), and imports from emerging economies tended to reduce sectoral labour demand (OECD, 2007b).

7. The CGE model in this study considers the effects of two policy scenarios. One assumes weak labour markets ("unemployment scenario"), while the other assumes absence of involuntary unemployment ("full-employment scenario"). The model covers global world trade and production, using the latest GTAP database.

8. Falk and Wolfmayr (2005), Harrison and McMillan (2006), Anderton and Brenton (1999), and Hijzen *et al.* (2005) find that international outsourcing has had a strong negative impact on the demand for unskilled labour. However, Slaughter (2000) shows that outsourcing activities of US multinational enterprises tend to have small, imprecisely estimated effects on US relative labour demand. Similarly, using industrial data for a group of OECD countries, OECD (2007b) also concludes that outsourcing in general only has a rather moderate effect on shifting relative demand away from low-skill workers within the same industry.

9. Some empirical studies also find a labour-saving effect of inward FDI. A possible reason is that multinational corporations tend to provide better pay than their domestic counterparts (OECD, 2008), so the entry of multinationals may skim the domestic labour market and cause the labour supply to fall by crowding out local entrepreneurs at least in the short-run. See De Backer and Sleuwaegen (2003) for a discussion of Belgium. Misun and Tomsik (2002) also find that FDI tends to crowd out domestic investment in Poland.

10. As emphasized in Bassanini and Duval (2006), the result for regular contracts is highly fragile, as it is mainly driven by an outlier country, Spain – the country which underwent the deepest reforms of EPL for regular workers over the period considered. For other countries in the sample, EPL for regular contracts in general experienced little change over time.

11. The inclusion of UI benefits reduces the sample coverage by three countries (Czech Republic, Hungary and Poland) as the information of benefit rates is only available from 2001 and onward for these countries.

12. These studies argue that wage premium in the public sector can generate "wait unemployment" phenomena, in which unemployed workers reduce job search efforts and wait for a job in the public sector.

13. New Zealand must be dropped from the sample due to lack of employment data for public sector.

14. Standardised coefficients (or beta coefficients) are the estimates obtained by first standardising for all variables to have a mean of zero and a standard deviation of 1. They indicate the expected change in the dependent variable, per standard deviation increase in the predictor variable (see Chen *et al*., 2011).

15. The threshold of 0.33 is somewhat arbitrary. It implies that every time the independent variable changes by one standard deviation, the estimated outcome variable changes by one-third a standard deviation, on average.

16. Quantitatively, one may interpret the results in Column 5 as a simple weighted average of the wage and the employment effect from Columns 1-4 [*i.e.*, (1)*(3)+(2)*(4)].

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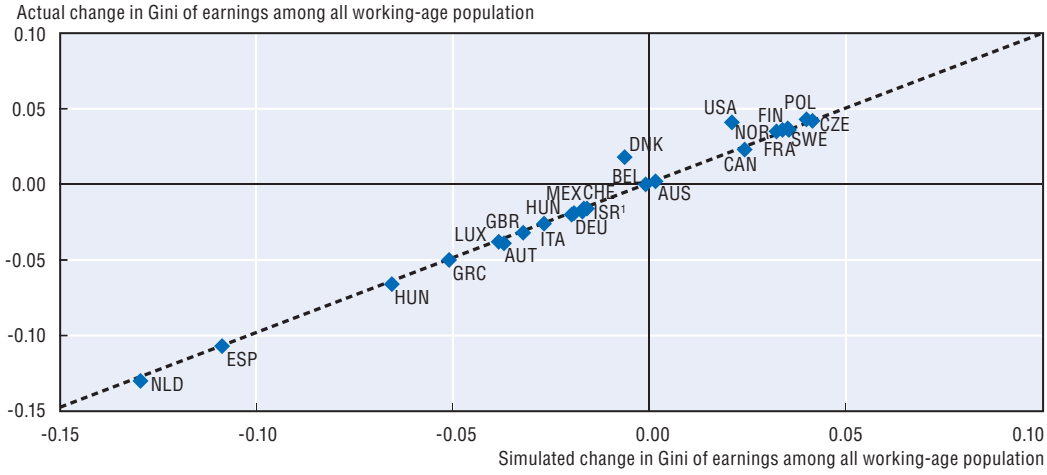
ANNEX 3.A1

Data for the Analyses in Section 3.2

For the empirical analyses in Section 3.2, the *OECD Earnings Database* from the previous analyses is not adapted because it covers only the earnings of workers. The challenge for estimating equation 5 in Box 3.1 is that the three variables – the Gini coefficient of the working-age population, the Gini coefficient of the employed population and the employment share – need to be obtained from the same data source to avoid discrepancies due to different sample coverage or variable definitions. For this reason, these factors are obtained from the microdata using the Luxembourg Income Study (LIS) for 24 OECD countries for a period between mid-1980s and mid-2000s (*www.lisdatacenter.org/*).

To test whether the LIS data fit the proposed model, real earnings data are applied to equation 5 from Box 3.1 for 24 OECD countries for a period between the mid-1980s and mid-2000s. Figure 3.A1.1 plots the simulated change in Gini coefficients among the working-age population (computed from equation 5) against the actual change in the Gini coefficients on the y-axis. If the Gini coefficient and employment shares are estimated precisely from the data, one should expect both the simulated change and the actual change to be the same, and all countries should lie along the 45° line.

Figure 3.A1.1. **Actual *versus* simulated changes in Gini coefficients among the working-age population**



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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536192

In general, Figure 3.A1.1 shows that this is the case of nearly all countries under study, suggesting an overall fit of the theoretical framework to the empirical data. The only two minor deviations are Denmark and the United States which data points lie slightly above the 45° line, suggesting possible minor measurement issues of the data for these countries.

ANNEX 3.A2

Additional Tables and Figures

Table 3.A2.1. **Simulation of the wage and employment effects by country, entire working-age population**

	Actual Gini coefficient of earnings			Decomposition of change in Gini coefficient		
	First year	Last year	Change (2)-(1)	Wage inequality effect	Employment effect	Residuals
	(1)	(2)	(3)	(4)	(5)	(6)
Australia (85-03)	0.531	0.533	0.002	0.001	0	0.001
Austria (94-04)	0.542	0.503	–0.039	0	–0.041	0.002
Belgium (85-00)	0.546	0.546	0	0.032	–0.031	–0.001
Canada (87-04)	0.516	0.539	0.023	0.029	–0.013	0.007
Czech Republic (92-04)	0.446	0.488	0.042	0.029	0.005	0.008
Denmark (87-04)	0.428	0.446	0.018	0.01	–0.001	0.009
Finland (87-04)	0.412	0.449	0.037	0.005	0.024	0.008
France (81-00)	0.482	0.517	0.035	0.036	–0.013	0.012
Germany (84-04)	0.537	0.517	–0.02	0.036	–0.065	0.009
Greece (95-04)	0.614	0.564	–0.05	0.009	–0.061	0.002
Hungary (91-05)	0.578	0.562	–0.016	–0.036	0.019	0.001
Ireland (94-04)[1]	0.609	0.543	–0.066	–0.02	–0.05	0.004
Israel (79-05)	0.591	0.598	0.007	0.025	–0.022	0.004
Italy (87-04)	0.579	0.553	–0.026	0.019	–0.048	0.003
Luxemboug (85-04)	0.541	0.538	–0.003	0.06	–0.074	0.011
Mexico (84-04)	0.69	0.657	–0.033	–0.006	–0.041	0.014
Netherlands (83-04)	0.645	0.515	–0.13	0.039	–0.17	0.001
Norway (79-04)	0.405	0.441	0.036	0.024	0.004	0.008
Poland (92-04)	0.61	0.653	0.043	0.055	–0.013	0.001
Spain (95-04)	0.635	0.528	–0.107	–0.031	–0.079	0.003
Sweden (81-05)	0.395	0.431	0.036	0.009	0.024	0.003
Switzerland (00-04)	0.446	0.43	–0.016	–0.013	–0.004	0.001
United Kingdom (86-04)	0.59	0.558	–0.032	0.026	–0.067	0.009
United States (79-04)	0.519	0.56	0.041	0.036	–0.011	0.016

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537693

Table 3.A2.2. **Wage and employment effects on overall inequality among the working-age population: alternative scenario**

Dependent variable: the Gini coefficient of annual earnings among the working-age population with imputed earnings for non-workers

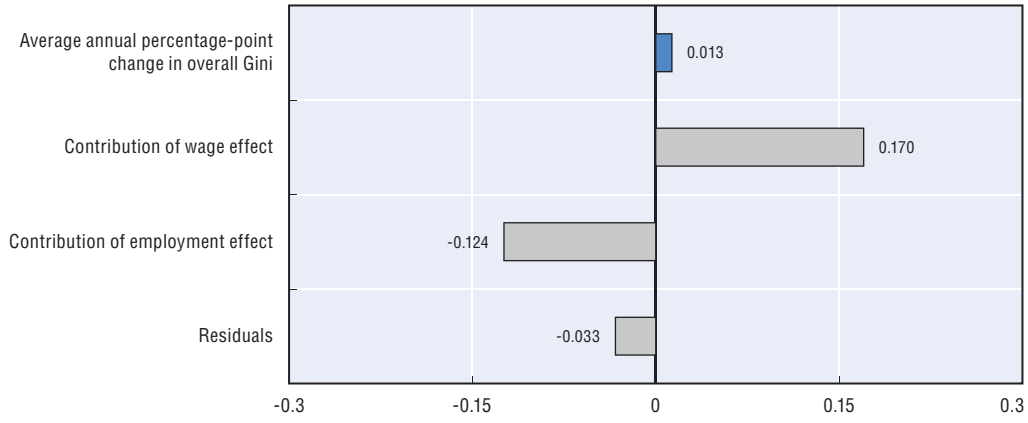
Gini of annual earnings among the employed	0.982***
	(23.2)
Percent of workers with positive annual earnings	–0.445***
	(–17.7)
Country-fixed effects	Yes
Year-fixed effects	Yes
Number of observations	123
Number of countries	24
Adjusted R-squared (within)	0.96

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537712

Figure 3.A2.1. **Contributions of wage and employment effects to overall earnings inequality among the working-age population: alternative scenario**



Note: The contribution of each variable is computed as the average annual change in the variable multiplied by the regression coefficient (Table 3.A2.2) on that variable.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536211

PART II

How Inequalities in Labour Earnings Lead to Inequalities in Household Disposable Income

PART II

Chapter 4

Hours Worked, Self-Employment and Joblessness as Ingredients of Earnings Inequality*

This chapter broadens the focus from wage inequality among full-time workers to earnings inequality among all workers. It accounts for the effects of adding part-time workers and the self-employed and includes both groups in analyses of levels of and trends in the distribution of earnings. The chapter first identifies the contribution of self-employment and its distributional patterns to inequality of annual earnings. It then examines whether trends in "prices", i.e. trends in hourly wage rates, have a lesser or greater impact on levels of and changes in inequality than trends in "quantities", i.e. trends in hours worked. In a second step, the chapter broadens the focus to the whole working-age population and analyses to what extent shifts in joblessness affect estimates of an "overall" earnings distribution, i.e. including workers and the jobless.

* This chapter was prepared by Wen-Hao Chen and Michael Förster, OECD Social Policy Division.

4.1. Introduction

The analysis in Part I discussed how various facets of globalisation, technological progress, institutional change, and policy reform impact on the increase in earnings inequality in the OECD area. The focus was on disparities in the gross earnings of full-time (or full-time equivalent) workers. This chapter broadens the focus to overall earnings inequality in order to capture the effects of part-time employment, self-employment, and joblessness. It extends this broader population coverage in two stages: first, from full-time dependent workers to all workers; and then to the entire working-age population.

Changes in employment patterns "within" the employed population may either reinforce or reduce inequality. More self-employment, for example, could change earnings inequality among workers if self-employed workers were concentrated in high or low earner groups. Moving from full-year or full-time jobs to part-year or part-time work may also affect the distribution of annual earnings among the employed by increasing the share of lower earnings in the distribution. The rapid expansion of part-time work in the past two decades has led to policy initiatives in many OECD countries to combine labour market flexibility and security for part-time workers. The European Union, for instance, implemented a part-time work directive (Directive 97/81/EC) as early as 1997.[1]

Higher unemployment or inactivity also increases earnings inequality. Chapter 3 analysed the average effect of non-employment on the earnings distribution of the working-age population in the OECD area using a macro-regression framework. This chapter uses micro-level data to analyse *individual countries* and address the following questions:

- To what extent are changes in earnings inequality among workers due to compositional effects and, in particular, what are the roles of self-employment and changes in working time?
- To what extent has overall earnings inequality among the working-age population been driven by unemployment and inactivity?

To answer the first question, a decomposition of inequality by income source (Shorrocks, 1982) is used to address the role of self-employment.[2] To account for inequality originating from changes in "quantities" of employment (*i.e.* hours worked), the chapter looks in a second step at trends in both the hourly wage distribution and the patterns of hours worked by income groups to assess their role in shaping inequality trends. In response to the second question, an inequality decomposition by population subgroup is used to calculate aggregate earnings inequality among the working-age population as the sum of the inequalities within each group (employed and jobless) and between these groups.[3]

The analysis draws on microdata from the Luxembourg Income Study (LIS) for a period running roughly from the mid-1980s[4] to the mid-2000s in 23 OECD countries. Consistent with previous definitions, the sample is restricted to working-age civilians aged 25-64.

Workers are defined as those who received a positive amount of labour earnings from either paid work or self-employment during the reference year. Unfortunately, earnings data in 11 of the 23 countries are available only on a *net* basis, *i.e.* after taxation. Levels and trends in the earnings distribution will not be identical for these two earnings concepts, as tax systems in OECD countries reduce gross earnings disparities. The two groups of countries are therefore discussed separately below.

This chapter's analysis yields the following key findings:

- Adding part-time workers to the full-time gross earnings distribution increases the level of earnings inequality considerably.
- Adding earnings from self-employment increases inequality further. However, because of its low share of total earnings and despite being much more unequally distributed, self-employment income generally accounts for less than 15% of gross earnings inequality – a contribution that has changed little over time.
- Variations in hourly wage rates are the single largest contributory factor in the *level* of gross earnings inequality among all workers in most countries. However, *changes* in earnings inequality over time seem to be driven as much by trends in hours worked.
- As regards hours worked, there has been a growing divide between higher-wage earners and lower-wage earners in many OECD countries. Annual hours worked declined among the lower-wage group, sometimes significantly.
- Strong rises in employment offset a widening wage dispersion.

4.2. Trends in inequality among full-time workers and all workers

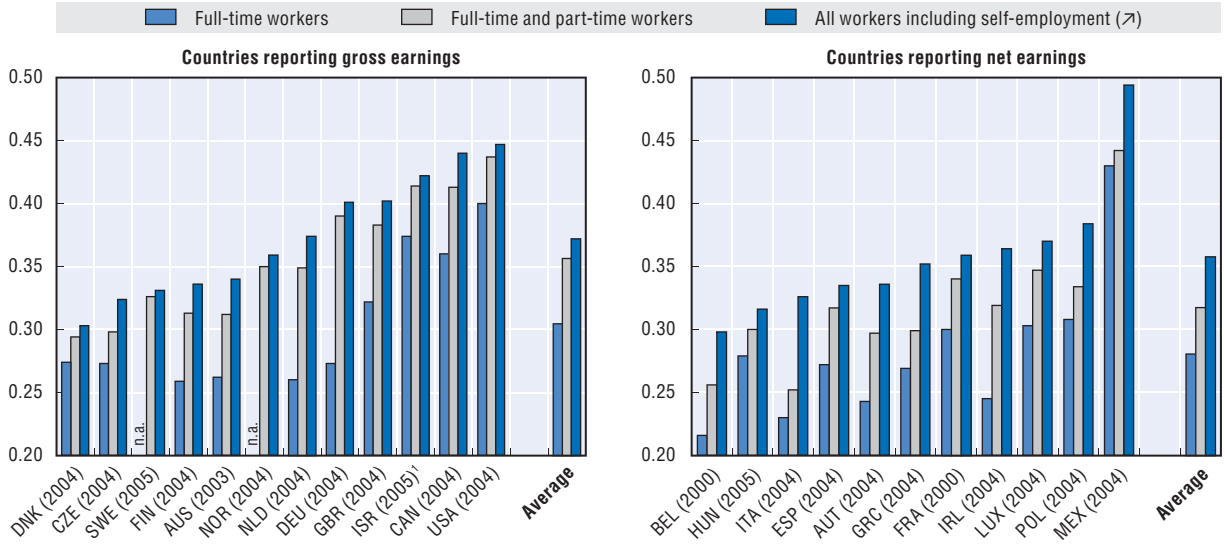
Previous OECD work covering 19 OECD countries for a year around 2000 pointed to significant increases in earnings inequality when all employees, rather than full-time employees, were considered (OECD, 2008). On average, the Gini coefficient for all employees was one-fifth, or 6 percentage points, higher than for full-time workers.

The new analysis presented below uses more recent data and confirms this general pattern. Figure 4.1 illustrates how earnings inequality changes when considering three groups of workers: *i)* full-time workers; *ii)* full-time and part-time workers[5] taken together; and *iii)* all workers, including the self-employed. Earnings inequality increases incrementally as each group is added and is highest when part-time workers and the self-employed are included.

In the countries reporting *gross* earnings, the Gini coefficient increases on average by 5 percentage points with the first group and by a further two points when it covers the self-employed. The Gini coefficient ranges from "0" – when all people have the same income – to "1", when all income goes to only one person.[6] Since part-timers have lower earnings, their inclusion widens wage inequality. The effect is very marked in Germany and the Netherlands where part-time employment is particularly common.[7] Including the self-employed has a more significant effect in Finland, Australia, and Canada.

The pattern is somewhat different for the countries reporting *net* earnings. Including part-timers increases the level of earnings inequality by about four points, while the increase when the self-employed are accounted for is even greater – on average, an additional four points. The inequality impact of self-employment is especially strong in Italy, Poland, and Mexico – where informal sector work may, in some cases, be a partial factor.

Figure 4.1. **Earnings inequality (Gini coefficient) among full-time workers, full-time and part-time workers and all workers, mid-2000s**



Note: Samples are restricted to the civilian working-age population (25-64 years).
n.a.: Not available.
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.
Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

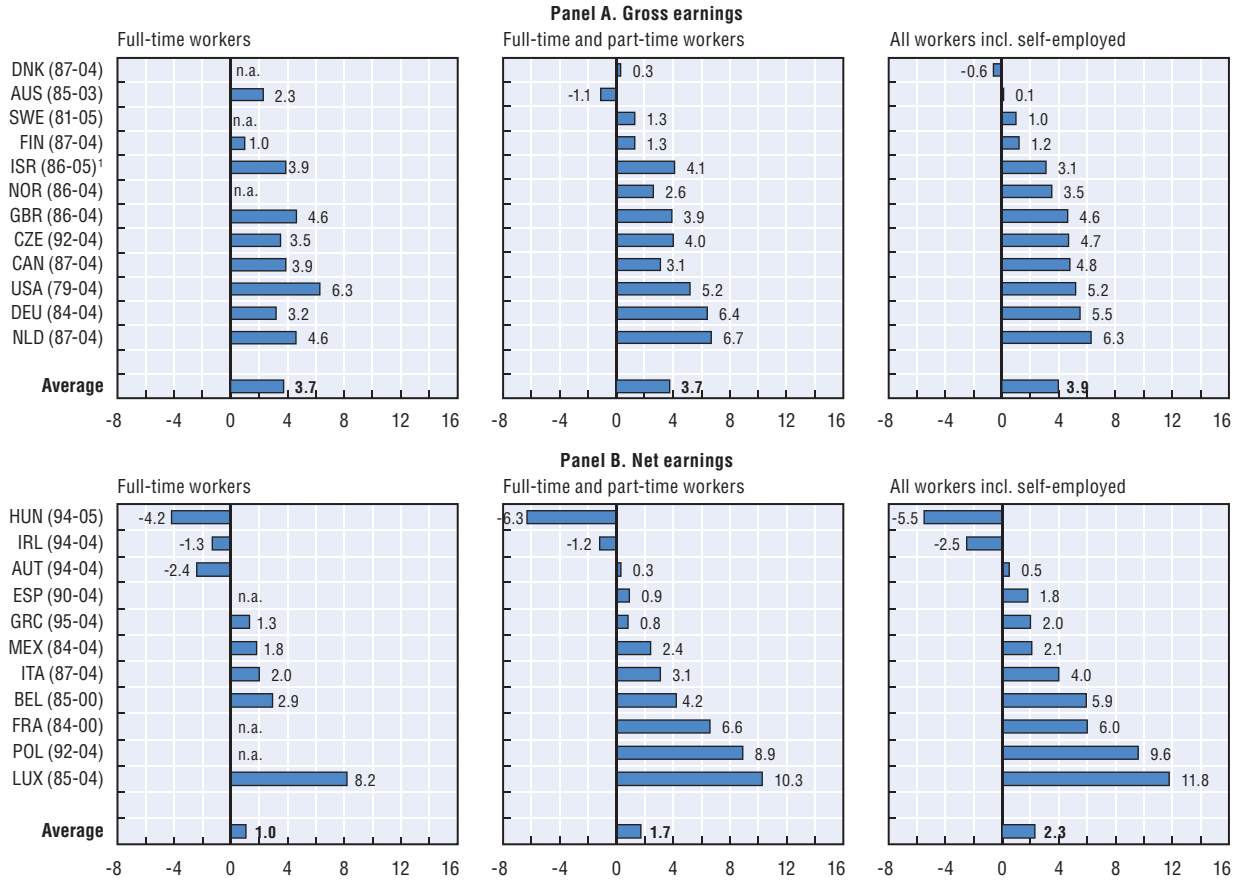
StatLink http://dx.doi.org/10.1787/888932536230

How has earnings inequality evolved over time among the three groups of workers under consideration? In the sample of countries reporting gross earnings (Panel A, Figure 4.2), inequality increased between the mid-1980s and mid-2000s by almost four percentage points in all three groups. There were, however, strong variations across countries. In Germany and the Netherlands, earnings inequality increased by a larger amount when part-timers were included (middle panel). Both countries experienced rapid growth in part-time jobs over time, often associated with lower pay and irregular work patterns. Interestingly, the story was somewhat different in the English-speaking countries, where there was a lower rise in earnings inequality among full-timers and part-timers together than among full-timers alone. This may be related to a relative improvement in part-time pay or labour market attachment over the given period in those countries. Australia stands out as an exceptional case: earnings inequality among full-timers rose, while inequality among both full-timers and part-timers fell.

In general, the development of inequality among the self-employed has relatively little effect on inequality trends among all workers, as comparison of the middle and right panels reveals. There are, however, a few noticeable exceptions. One is Canada, where the expansion in self-employment seems to account for a larger increase in earnings inequality of the overall workforce over time.[8] This pattern appears to be more common among the countries reporting net earnings (Panel B of Figure 4.2), which suggests that different taxation of different forms of work might play a role.

These results illustrate why it is important to gauge and understand trends in "earnings" inequality not only in terms of "prices" – *i.e.* wage rates (for which full-time, full-year earnings often are used as an approximation) – but also in terms of "quantities", *i.e.* differences in hours worked and in the make-up of groups of workers (employees and self-

Figure 4.2. **Evolution of earnings inequality among full-time workers, full- and part-time workers and all workers, mid-1980s to mid-2000s**



Note: Samples are restricted to the civilian working-age population (25-64 years). Averages exclude countries for which data are not available for all three groups of workers: n.a. denotes data not available. Countries ranked by increasing inequality values for all workers.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536249

employed). In some countries, trends may reflect the rapid diffusion of non-standard employment, shaped by changes in employment legislation.[9] Comparative studies (Smith *et al.*, 1998; Sandor, 2011) show that the expansion of part-time work has been uneven across countries and sectors and that part-timers are often concentrated in low-paid jobs and have less career development prospects. The result may be a wider gap between rich and poor in the long run.

4.3. Compositional changes and their impact on trends in earnings inequality

This section examines how earnings dispersion among paid full-time workers affects annual earnings inequality among all workers (paid and self-employed, full-timers and part-timers). The distribution of hourly wages may evolve differently from that of annual earnings because of changes in the composition of employment. The analysis below first examines how self-employment contributes to changes in earnings inequality, then assesses the effect of changes in hours worked.

The role of self-employment in earnings inequality

Since the 1980s, self-employment – particularly entrepreneurship and small business creation – has become an important source of job growth in many OECD countries (OECD, 2000). On average, self-employment grew faster than civilian employment as a whole during the 1990s. The rise in women's labour market participation, the introduction of special tax policies to foster entrepreneurship, and the growth of certain types of occupations (*e.g.* accountants and consultants) are some of the many reasons for this trend. Several studies have shown that the self-employed are a more heterogeneous group than paid employees (Meager *et al.*, 1996; Parker, 1997). Lower earnings among the self-employed and a greater dispersion of earnings in this group have resulted in higher overall earnings inequality. Jenkins (1995), for instance, suggests that self-employment was the main factor explaining the increase in income inequality in the United Kingdom during the 1980s.

A straightforward way to identify how self-employment contributes to annual earnings inequality is to decompose earnings inequality by population subgroups, of which there are two: paid workers and the self-employed, respectively. This approach may, however, pose problems of interpretation as a person may change status, switching from paid to self-employment (or *vice versa*) during the reference year. To avoid making arbitrary choices, decomposition by income sources is used instead (following Shorrocks, 1982; Lerman and Yitzhaki, 1985). Annual earnings of individuals are the sum of two sources: paid labour earnings and self-employment income. Total inequality (I) can be expressed as the sum of factor contributions from each of the factor (income) sources:

$$I = \sum_{k=1}^{2} C_k \tag{1}$$

where C_K is the absolute contribution of factor k to overall inequality. Factor components provide a disequalising contribution to inequality if $C_k > 0$, and an equalising contribution if $C_k < 0$. Using the Gini coefficient as the measure of inequality,[10] the absolute contribution of a given factor can be rewritten in terms of three summary components: the factor shares in total earnings (*S*), the factor correlations with total earnings (*R*) and the factor inequalities (*G*):

$$C_k = S_k R_k G_k \tag{2}$$

The change in aggregate inequality can, therefore, be decomposed as

$$\Delta I_{gini} = \Sigma_k \Delta C_k = \Sigma_k \Delta [S_k R_k G_k] \tag{3}$$

The analysis in this chapter uses this way of calculating aggregate earnings inequality from LIS data. The results from the decomposition are presented in Annex Table 4.A1.1. As many workers do not engage in any self-employment, the share of self-employment income in total earnings is low in most countries. It ranges from 2% (Sweden) to 19% (Czech Republic) in countries reporting gross earnings and from 9% (Belgium) to 34% (Greece and Italy) in countries reporting net earnings. Because these shares are low and although they are more unequally distributed than paid labour earnings, self-employment income accounts for less than 15% of gross earnings inequality among all workers. The sole exception is the Czech Republic, where it accounts for almost one-third of earnings inequality.

Over the period from the mid-1980s to the mid-2000s, the shares of self-employment income in total earnings remained fairly stable. There are notable drops in the extent of self-employment income in Israel,[11] Belgium, Mexico, Spain and, to a lesser degree, the

Nordic countries. Significant increases were recorded in Canada and, even more so, in the central European countries.[12] In the Czech Republic, for instance, self-employment income accounted for about 11% of earnings in 1992 but increased to nearly 20% in 2004: the transition from planned to market economy led to a rise in the number of small private enterprises in industry and services.

Self-employment income is not particularly concentrated in the upper tail of the total earnings distribution. The contrary is in fact nearer the truth,[13] as indicated by the relatively low values of "factor correlation" in Column 10 of Table 4.A1.1. The higher the factor correlation of an income source, the more people there are at the upper end of the overall earnings distribution receiving income from that source. In countries reporting gross earnings, the correlation is, on average, around 0.4 for self-employment income, but 0.9 for earnings of dependent employees. There are exceptions, however. In the Czech Republic and Germany, self-employment income seems more predominant in the upper half of the distribution, as it does in a number of countries reporting net earnings, including Austria, Belgium, Hungary, Ireland, Italy, and Luxembourg. In Italy, for instance, the factor correlation between self-employment income and total earnings is as high as 0.65 in 2004 (compared with 0.47 for paid labour earnings), which points to higher earnings for the self-employed.[14]

How did changing patterns in income earned by employees and the self-employed affect the development of overall earnings inequality? Figure 4.3 shows the contribution to changes in inequality for the two sources of income over a 20-year period. Overall, inequality of annual earnings increased in ten out of the twelve countries reporting gross earnings (Panel A) and nine out of the eleven countries reporting net earnings (Panel B). With the exception of the Czech Republic, paid employment earnings were by far the main contributor to the rise of total earnings inequality in the countries in Panel A. In the Netherlands, the United States, Israel, and Norway, the rise in earnings inequality among all workers was driven entirely by changes in the distribution of paid earnings, while self-employment exerted an opposite force by contributing to lower overall inequality. In the same four countries, as well as in Denmark, the fall in the share, rather than a lower concentration, of self-employment income was the prime driving factor in this result.

Findings are more diverse for the countries reporting net earnings (Panel B). Paid employment earnings were the main factor for rising earnings inequality in five out of the nine countries which recorded an increase in inequality. The contribution of self-employment income dominated in the other four – Austria, Poland, Greece and Italy – for different reasons. In the two Mediterranean countries it was the growing share of self-employment income in total earnings, while the higher concentration of self-employment income was the main factor in the two Central European countries (a pattern also recorded in Hungary).

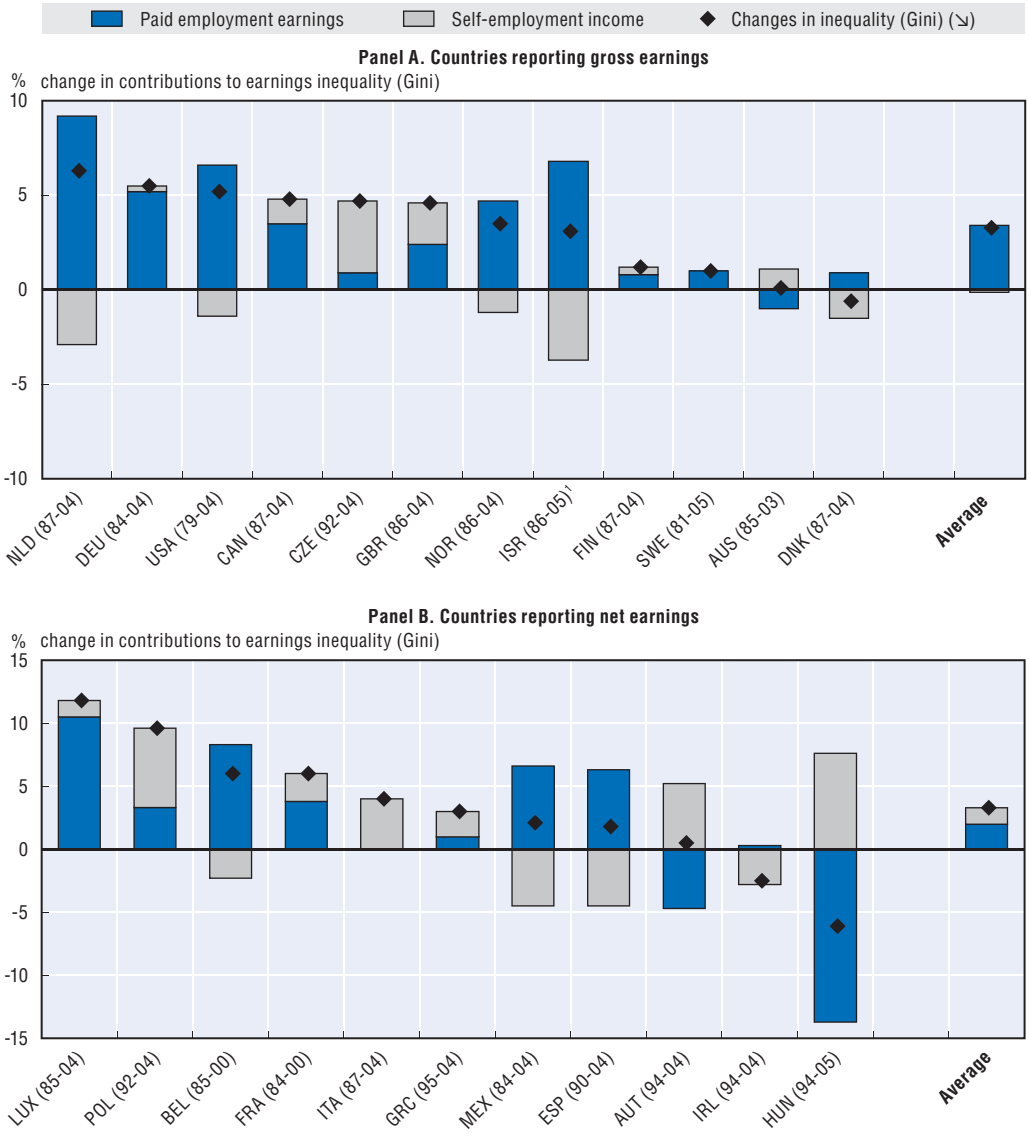
Working hours: the role of changing employment "quantities" among paid workers

The second important source of inequality transmission from full-time to annual earnings originates from changes in the quantities (*i.e.* hours) of employment, as annual earnings (AE) are equal to the hourly wage rate (*hw*) times annual hours worked (*ah*):

$$AE = hw \times ah \qquad (4)$$

The development of annual earnings inequality among paid workers may thus be driven by changes in hourly wage rates ("price effect"), changes in total hours worked

Figure 4.3. **The contribution of paid employment earnings and self-employment income to earnings inequality (Gini coefficient) among all workers, mid-1980s to mid-2000s**



Note: Samples are restricted to the working-age population (25-64 years) and individuals with positive earnings.
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

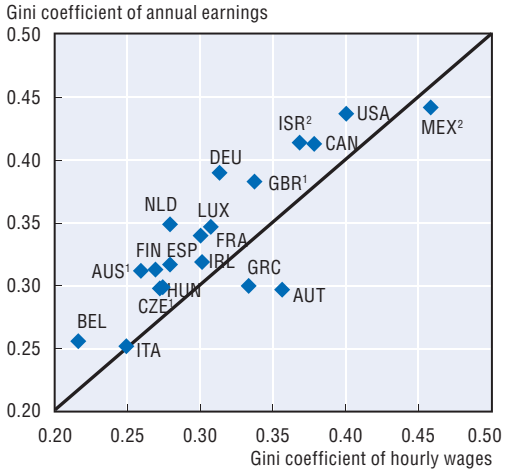
StatLink http://dx.doi.org/10.1787/888932536268

("quantity effect"), or both. To distinguish between the price and quantity effects, hourly wage rates and annual hours worked have been estimated from the microdata to hand. Annual hours are obtained from two LIS variables: hours worked per week and weeks worked per year. The hourly wage rate is therefore estimated as total annual wages and salaries divided by annual hours worked.[15]

Figure 4.4 plots inequality (Gini coefficients) in hourly wages against inequality in annual earnings for the latest year available. If all employees worked the same number of hours, then the extent of annual earnings inequality would be determined purely by hourly

wage rates and all countries would lie along the 45° line.[16] Inequality in annual earnings tends to be higher than hourly wage inequality if more people work part-time or part-year and/or if high-paid workers tend to work more hours than the low-paid. Higher inequality levels in annual earnings are, in fact, observed in most of the countries under study. In the Netherlands, the Gini coefficient climbs from a low of 0.28 for hourly wages to 0.35 for annual earnings. This is related to the share of part-timers in the country – the highest of any OECD country.

Figure 4.4. **Inequality of hourly wages *versus* inequality of annual earnings, all paid workers**



Note: Samples are restricted to all paid workers (aged 25-64) with positive wages/positive hours worked during the reference year. Data refer to the year 2004, except for Australia (2003), Belgium and France (2000). For Finland, hourly wage is calculated based on imputed hours worked per week.

1. Hourly wage is calculated based on imputed weeks worked.
2. Hourly wage is calculated based on working 52 weeks. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536287

On the other hand, annual earnings may be more equally distributed than hourly wages if low-paid workers have greater access to work (*i.e.* more hours) and/or high-paid workers tend to work less hours. Austria, Greece and Mexico are examples of such a pattern. In Austria, for instance, the hourly wage Gini coefficient was estimated to be 0.36, while the figure fell to 0.30 for annual wages.

A decomposition analysis (see Box 4.1) makes it possible to estimate which of the two elements – wage rates or hours – accounts for the largest portion of the variance in annual earnings. The figures in brackets in Columns 2 and 3 of Table 4.1 set out the relative fractions. These suggest that, in general, hourly wages account for the lion's share of earnings inequality in most countries: wage rate variation explains 55% of earnings variation on average across the countries in Panel A and 63% in Panel B. In Panel A the Czech Republic records the highest values and in Panel B, it is Mexico. There are, however, a few countries – Australia, France and Ireland – where the variation in working hours accounts for a larger share of earnings inequality than variation in hourly wages. Cross-country variation in annual hours may well reflect different statutory laws in working weeks. In France, for instance, lower statutory weekly hours (the 35-hour rule introduced

Box 4.1. **Decomposing income inequality by sources**

To examine which component, "prices" (wage rates) or "quantities" (hours), explains a larger portion of the variation in annual earnings, a decomposition analysis is applied below, following Blau and Kahn (2009). Taking the logarithm of the identity (equation 4) above, the variance of annual earnings can be decomposed into the variance of hourly wages, the variance of annual hours, and the covariance of the two components, as follows:

$$Var(lnAE) = var\ (\ln_{hw}) + var\ (\ln_{ah}) + 2\text{cov}(\ln_{hw},\ln_{ah}) \quad (5)$$

This decomposition exercise allows us in a first step to determine whether and to which extent there is a cross-country correlation between variation in annual earnings and in hourly wages on the one hand and annual hours on the other. The decomposition results are presented in Table 4.1. In general, the table reveals that both hourly wages and annual hours are positively correlated to annual earnings inequality across countries, with a stronger relation for the former.

Looking first at the panel of countries reporting gross earnings, we obtain a correlation coefficient of 0.91 between the variance of earnings and the variance of hourly wages, and 0.43 between the variance of earnings and the variance of hours. Among countries with relatively high levels of annual earnings inequality, Canada, the Czech Republic, Israel and the United States also have high levels of hourly wage inequality, suggesting a large proportion of earnings inequality is indeed influenced by the returns (prices) to observable and unobservable individual characteristics. Germany and Netherlands are the two countries which have relatively high earnings inequality but where the variation in hours (quantities) appears to play an important element in contributing to the variance of annual earnings.

Among the second panel of countries reporting net earnings, the correlation between the variance of earnings and the variance of hourly wages is also high (0.78), but the one between the variance of earnings and the variance of hours is somewhat lower (0.31), mainly because of the results for Mexico: this country combines by far the highest variation in hourly wages with one of the lowest variations in annual hours.

in 2000), as well as more generous entitlements linked to various paid leaves, might explain the large variation in annual hours since such laws or entitlements facilitate heterogeneity in work-leisure preferences across different population groups.

Column 4 in Table 4.1 shows to what extent wages and hours are correlated. In most countries reporting gross earnings, higher-income workers tend to work more than lower-income workers. This exacerbates the earnings gap between highly paid and low-paid workers and leads to higher earnings inequality. A different pattern is found in Australia and some of the countries reporting net earnings, namely Austria, Greece, Italy and Mexico, where low-paid workers work longer hours. The literature does not develop the reasons why highly paid and/or low-paid workers tend to supply more or less hours of work and cross-national differences in the variation of hours worked may reflect both employer behaviour and labour supply behaviour.[17] The above results suggest that variations in hours worked (quantities) play a non-negligible role in portraying the pathway between wage inequality and annual earnings inequality.

Adverse macroeconomic shocks may result in more regular full-time, full-year workers switching to part-time or part-year employment and/or pushing middle-class

Table 4.1. **Decomposition of the variance of log annual earnings, paid workers, mid-2000s**

	Var(ln_annual earnings)		Var(ln_hourly wages)		Var(ln_annual hours)		2xCov(ln_hwage, ln_ahours)	
	(1)		(2)		(3)		(4)	
Panel A. Countries reporting gross earnings								
Australia 2003[1]	0.460	(1.00)	0.210	(0.457)	0.255	(0.554)	–0.005	–(0.011)
Canada 2004	1.539	(1.00)	0.934	(0.607)	0.222	(0.144)	0.383	(0.249)
Czech Republic 2004[1]	0.416	(1.00)	0.300	(0.721)	0.055	(0.132)	0.061	(0.147)
Finland 2004	1.085	(1.00)	0.553	(0.510)	0.233	(0.215)	0.298	(0.275)
Germany 2004	1.089	(1.00)	0.441	(0.405)	0.333	(0.306)	0.315	(0.289)
Israel 2005[2]	0.769	(1.00)	0.504	(0.655)	0.198	(0.257)	0.066	(0.086)
Netherlands 2004	0.877	(1.00)	0.394	(0.449)	0.286	(0.326)	0.197	(0.225)
United Kingdom 2004[1]	0.700	(1.00)	0.347	(0.496)	0.229	(0.327)	0.123	(0.176)
United States 2004	0.972	(1.00)	0.600	(0.617)	0.218	(0.224)	0.154	(0.158)
Average	0.879		0.476	(0.546)	0.225	(0.276)	0.177	(0.177)
			Corr(AE, hw) = 0.91		Corr(AE, ah) = 0.43			
Panel B. Countries reporting net earnings								
Austria 2004	0.532	(1.00)	0.386	(0.726)	0.267	(0.502)	–0.121	–(0.227)
Belgium 2000	0.358	(1.00)	0.209	(0.584)	0.139	(0.388)	0.010	(0.028)
France 2000	0.654	(1.00)	0.273	(0.417)	0.308	(0.471)	0.073	(0.112)
Greece 2004	0.440	(1.00)	0.318	(0.723)	0.191	(0.434)	–0.069	–(0.157)
Hungary 2005	0.498	(1.00)	0.299	(0.600)	0.156	(0.313)	0.043	(0.086)
Ireland 2004	0.604	(1.00)	0.264	(0.437)	0.340	(0.563)	0.000	(0.000)
Italy 2004	0.326	(1.00)	0.238	(0.730)	0.137	(0.420)	–0.049	–(0.150)
Luxembourg 2004	0.582	(1.00)	0.330	(0.567)	0.200	(0.344)	0.052	(0.089)
Mexico 2004[2]	0.846	(1.00)	0.813	(0.961)	0.142	(0.168)	–0.108	–(0.128)
Spain 2004	0.529	(1.00)	0.280	(0.529)	0.208	(0.393)	0.041	(0.078)
Average	0.537		0.341	(0.627)	0.209	(0.400)	–0.013	–(0.027)
			Corr(AE, hw) = 0.78		Corr(AE, ah) = 0.31			

Note: Samples are restricted to all paid workers (aged 25-64) with positive wages and positive hours worked during the reference year. For Finland, hourly wage is calculated based on imputed hours worked per week. Numbers in parentheses refer to the fraction of variance of log annual earnings.

1. Hourly wage is calculated based on imputed weeks worked.
2. Hourly wage is calculated based on working 52 weeks. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

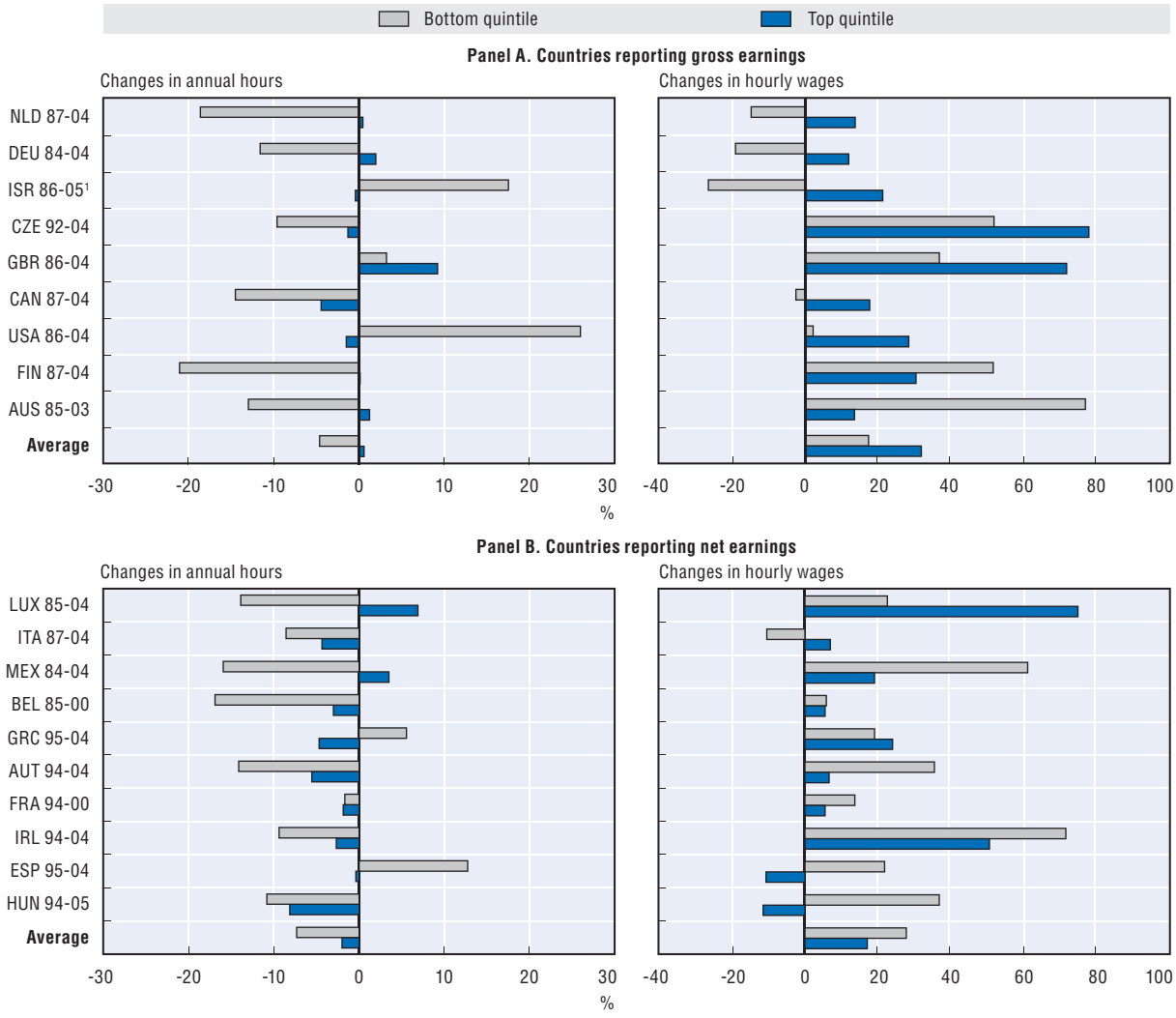
StatLink http://dx.doi.org/10.1787/888932537731

workers into lower-paid jobs: both developments lead to lower earnings and to higher earnings inequality. If annual hours worked increase more (or decrease less) among high wage earners, *i.e.* wages and hours are correlated positively, changes in hours will also exacerbate earnings inequality. But if, on the other hand, the annual hours of low-paid workers rise more, changes in hours will have an equalising effect.[18]

The following analysis considers changes in both the hourly wage distribution and the patterns of hours worked across quintiles for the period between the mid-1980s and mid-2000s. Table 4.A1.2 in Annex 4.A1 shows the components of annual earnings for two different years in the bottom and top quintiles of the earnings distribution among paid workers. Columns 1 to 4 report mean weekly hours and mean weeks per year; Columns 5 and 6 display mean annual hours calculated as the product of the first two components; and Columns 7 and 8 show mean hourly wage rates calculated as total annual wages/salaries divided by annual hours worked. The main results are summarised in Figure 4.5

which compares the percentage change in annual hours (left panel) and the change in hourly real wages (right panel) among workers in the bottom and top quintiles. At first glance, Figure 4.5 suggests that a decline in low-paid workers' hours is an important factor in the rise of inequality in most countries.

Figure 4.5. **Changes in annual hours worked and in hourly real wages by earnings quintile, mid-1980s to mid-2000s**



Note: Samples are restricted to all paid workers (aged 25-64) with positive wages and positive hours worked during the reference year with information on annual hours worked. Mean wages in national currencies at constant 2005 values. Countries ranked in descending order of changes in earnings inequality (see Table 4.A1.2).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536306

Among the countries reporting gross earnings, both changes in hours and hourly wage rates between higher- and lower-wage earners drove inequality trends. In the Netherlands, Germany, the Czech Republic, and Canada, the rise in annual earnings inequality among paid workers was associated with a significant decline in annual hours for the bottom quintiles, together with an increased dispersion of hourly wages. In Israel and the

United States, mean hours worked in the bottom quintiles actually increased while there was no change for the top. At the same time, however, the hourly wage gap widened considerably so accentuating inequality in annual earnings. The increase in annual hours in the bottom quintile in the United States can probably be linked to incentive policies such as the earned income tax credit (EITC) but also the relatively low level of the minimum wage and the discontinuing of the Aid to Families with Dependent Children programme (AFDC) in 1996. In Finland and Australia, declining wage-rate gaps and increasing gaps of annual hours tended to cancel each other out, resulting in little change in the distribution of annual earnings.

Among the countries reporting net earnings, only Luxembourg experienced a substantial increase in annual earnings inequality. Not only did hourly wage ratios between the top and bottom quintiles rise (driven by the top), but higher-paid workers also worked longer hours and the lower-paid worked fewer. In all other countries where inequality increased, the growing divide in hours worked between the top and the bottom quintiles played a major role. This was due, however, less to a disproportionate increase in hours worked by high-wage workers than to the significant decline in hours worked by lower-wage workers. France was the only country where inequality hardly changed as both wage dispersion and hours worked remained stationary. Spain and Hungary registered a significant drop in net earnings inequality among paid workers between the mid-1990s and mid-2000s. In Spain, the drop was primarily a result of hours that low-paid workers gained, while in Hungary wage moderation (*i.e.* a real wage gain at the bottom and wage loss at the top) and lower hour dispersion (mainly from the top) were the main driving forces (for a discussion of the results for Hungary, see also Box 5.3).

Public debate has advanced a number of explanations as to why mean annual hours worked by low-wage workers fell markedly in many countries over the period under observation. In part, the fall may reflect the low-skilled workers' growing difficulty in gaining access to the labour market due, for example, to growing international competition or technological progress (see Chapter 2). It may also be the result of growth in part-time work, possibly because of rising female labour market participation or changes in work and leisure time preferences. The growth in part-time work may also lead to changes in the composition of the earnings distribution. Hence the downward trend in hours worked, if new part-time workers tend to be concentrated in lower-paid jobs that are more loosely attached to the labour market. Moreover, national differences in hours worked may also be shaped by different countries' labour-law arrangements, as well as social services (like access to childcare). The European Union issued two directives to encourage part-time work in the 1990s,[19] which may partly explain why the decline in hours worked is generally greater in European economies than in non-European ones.

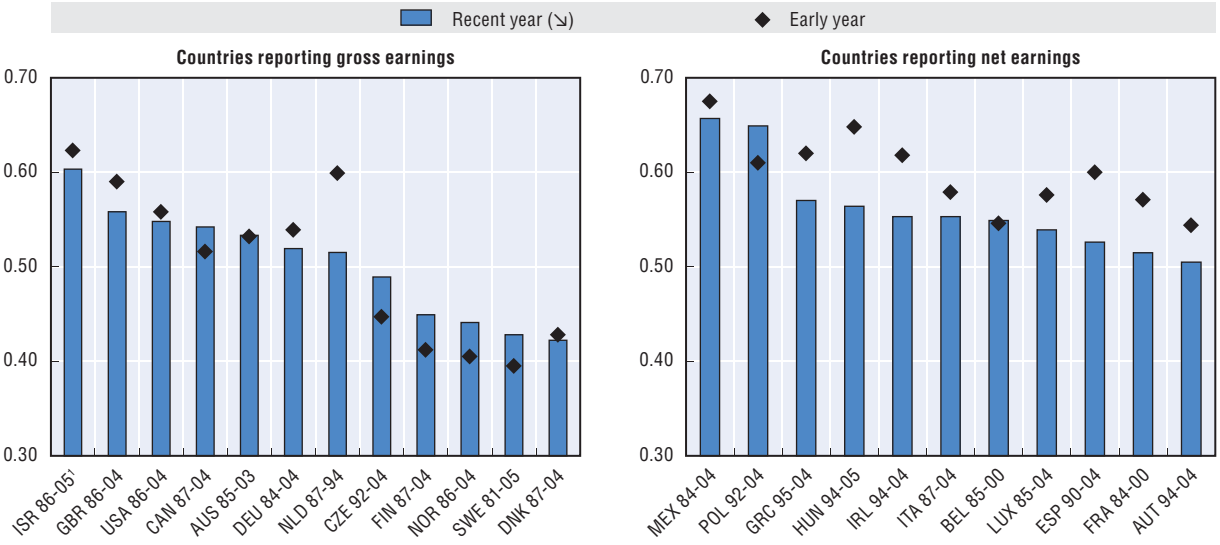
4.4. Earnings inequality and joblessness

This section addresses the issue of joblessness as a factor in inequality. The inclusion of the jobless in the working-age population may help to reveal to what extent changes in "overall" earnings inequality results from the fact that the employed receive earnings and the non-employed do not – an example of "between-group" inequality. The employed are defined here as those who have received a positive amount of labour earnings, which includes marginal or seasonal workers as well as the self-employed. The non-employed are both unemployed and inactive people who had no earnings during the reference period.[20]

Following the approach laid out in Chapter 3, "overall" earnings inequality among the whole working-age population is estimated by assigning zero earnings to the non-employed. The zero-earnings assumption is an extreme one that is likely to overstate the extent of "between-group" inequality:[21] by definition, the resulting summary measures of overall earnings inequality will be significantly higher than when considering workers alone. This is shown in the left-hand panel of Figure 4.6 which suggests Gini coefficients of between 0.52 and 0.60 in most countries, but considerably lower ones (0.42 to 0.45) in the four Nordic countries, probably because of their higher employment rates. Countries reporting net earnings (right-hand panel) record slightly higher inequality levels: between around 0.50 in Austria and France and up to 0.64 in Mexico and Poland.

Figure 4.6 reveals that the distribution of annual earnings across the entire working-age population has become more equal in about half of the countries reporting gross earnings (particularly in the Netherlands) and in all but two of the countries reporting net earnings. The analyses in Chapter 1, however, highlighted the fact that earnings inequality among workers has increased in most OECD countries over the past three decades. The explanation for this discrepancy with the findings discussed above is that more people, women in particular, have been entering employment and receiving earnings. Compared to a situation where women previously had no earnings, earnings inequality among the entire working-age population has fallen, even if the distribution of earnings has grown more unequally distributed among workers.

Figure 4.6. **Inequality of earnings (Gini coefficient) among the entire working-age population, mid-1980s and mid-2000s**



Note: Samples are restricted to the civilian working-age population (aged 25-64). They include workers and the jobless to whom zero earnings are assigned. Earnings refer to annual labour earnings from both paid work and self-employment.

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

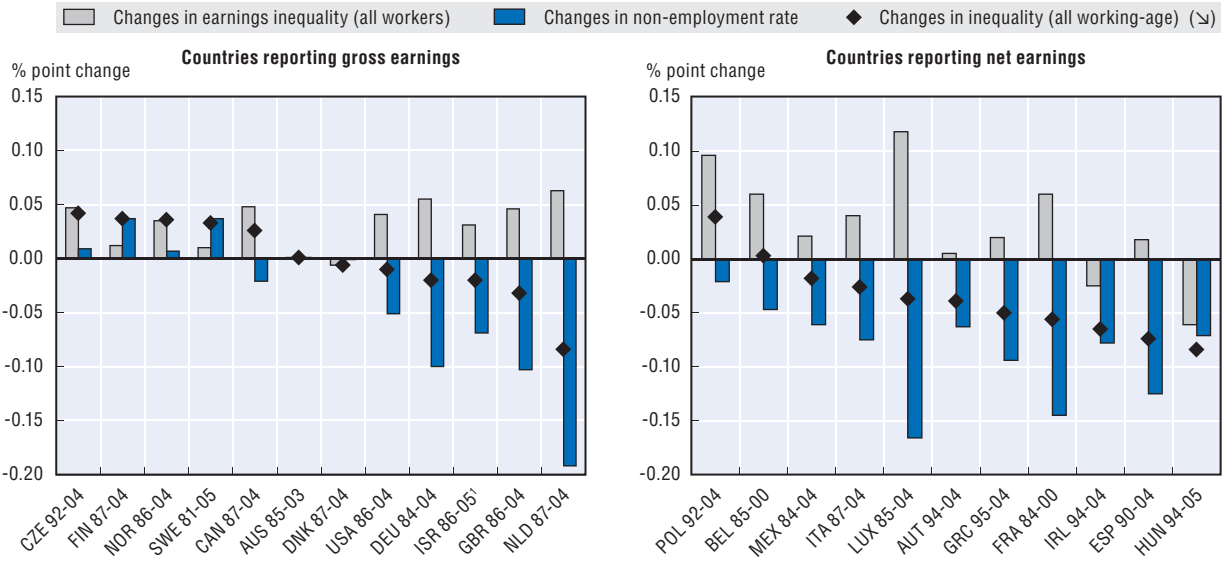
Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536325

Almost all countries that saw a decline in earnings inequality across the whole working-age population also experienced a marked decline in their non-employment rates over the period from the mid-1980s to the mid-2000s (Figure 4.7). At the same time, many also showed a hike in earnings inequality among workers, which indicates that rising

employment rates acted as a considerable counterbalance to mounting labour earnings inequality. Annex 4.A2 shows estimates for quantifying the effects of changes in "between-group" inequality (between workers and jobless) and "within-group" inequality (earnings disparities among workers).

Figure 4.7. **Earnings inequality among workers and the entire working-age population and developments in non-employment rates**



Note: Samples are restricted to the civilian working-age population (aged 25-64). Inequality among the working-age population includes workers and non-workers and assigns zero earnings to the latter. Earnings refer to annual labour earnings from both paid work and self-employment.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS); *OECD Employment Database*.

StatLink http://dx.doi.org/10.1787/888932536344

4.5. Summary and conclusions

How did inequality of earnings among full-time, full-year workers translate into inequality among *all* workers between the mid-1980s and the mid-2000s? And how did it affect the distribution of earnings among the *entire* working-age population, including people without jobs?

Adding part-time workers to the analysis increased the Gini coefficient of gross earnings by an average of five percentage points over results for full-time workers only. The addition of self-employed workers increased inequality by a further two points, pushing the Gini coefficient total up from 0.30 to 0.37. The earnings distribution evolved differently among full-time workers, part-timers, and the self-employed across countries. In a few countries, for instance, gross earnings inequality among full-timers was on the rise, while factoring in part-timers and the self-employed led to stability or even drops in inequality (*e.g.* Australia). In others, like the Czech Republic, Germany and the Netherlands, the opposite happened. It is therefore important to analyse trends in earnings inequality not only in terms of "prices" – *i.e.* wage rates (for which full-time full-year earnings often serve as an approximation) – but also in terms of "quantities", *i.e.* adjusting for differences in hours worked and whether workers were employees or self-employed.

Earnings from self-employment were much more unequally distributed than wages and salaries and were more concentrated among lower-income groups in most OECD countries. The share of self-employment income fell in most countries under study and continued to account for a minor share of gross earnings – between 3% and 13% – depending on the country. Because of its low share of earnings and despite being much more unequally distributed, self-employment income generally accounted for less than 15% of gross earnings inequality among all workers. This contribution changed little in most countries, though not in the English-speaking countries where it increased or the Netherlands where it decreased.

The second important cause of earnings inequality transmission originates in changes in hours worked. Variations in "prices", *i.e.* hourly wages, were generally the major contributory factor in *levels* of gross earnings inequality among all workers in most countries (some 55-63%). Yet *changes* in earnings inequality over time seem to be driven as much by "quantities", *i.e.* trends in hours worked, with the trend towards an increasing divide between hours worked by higher-wage and lower-wage earners in most countries. This suggests that variations in hours worked have played an important role in determining the transmission of inequalities.

Finally, trends in the distribution of earnings among the *entire* working-age population, not just the employed, also depend on the development of joblessness. Estimating an overall earnings distribution among the working-age population significantly increases inequality – almost by definition. The Gini coefficients range between 0.52 and 0.60 in most countries, but are considerably lower (between 0.42 and 0.45) in the three Nordic countries – although they are on the rise in all of them. However, during the past 10 to 20 years such estimates of "overall" earnings inequality declined in at least half of the countries, due to substantive reductions in non-employment. Strong employment growth more than offset widening wage dispersion, resulting in a smoother distribution of earnings among the entire working-age population in many countries. This is confirmed by the results of a decomposition analysis which suggests that, in virtually all the OECD countries under study, changes in the earnings distribution across the working-age population were driven largely by changes in the employed and the non-employed shares of that population.

Notes

1. The purpose of the directive is to eliminate discrimination against part-time workers and to improve the quality of part-time work. It aims to facilitate the development of part-time work on a voluntary basis and to contribute to the flexible organisation of working time in a manner which takes into account the needs of employers and workers (*http://europa.eu/legislation_summaries/employment_and_social_policy*).
2. The decomposition calculates annual earnings of individuals as the sum of two sources: paid labour earnings and self-employment income. Shorrocks (1982) showed that total inequality can be expressed as the sum of factor contributions from each of the factor sources.
3. The method is based on Shorrocks (1984), Jenkins (1991), and Cowell (1995). The contribution of within- and between-group components to the trend in aggregate inequality is further analysed by applying a dynamic decomposition model (see Annex 4.A2).
4. In the first section which includes analysis of self-employment, the reference year for the mid-1980s for the United States is 1979 rather than 1986, as there were no data available on self-employment income in the latter year.
5. Part-time employment is defined as working less than 30 usual hours per week.
6. This and the following chapters use the Gini coefficient as a main inequality measure, rather than the D9/D1 percentile ratio which has been used in the analysis of Part I. While the Gini coefficient is more

sensitive to changes in the middle of the distribution, it is built on the basis of the entire distribution and not just two income values. For a discussion of inequality measures, see Cowell (1995, 2011).

7. In 2008, part-time employment accounted for 36% in the Netherlands and 22% in Germany (OECD, 2009).

8. Self-employment has grown relatively fast in Canada since the 1970s (OECD, 2000), reaching a peak of 17.8% of total employment in 1998, fell back slightly in the early 2000s, and remained stable since (Kamhi and Leung, 2005; LaRochelle-Côté, 2010).

9. See Sciarra (2004) for a discussion of employment policies towards part-time working in the European Union and a detailed analysis of part-time regulations in seven European countries.

10. The type of decomposition can also be applied to other inequality summary measures such as the Generalised Entropy (GE) measures.

11. 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.

12. The share of self-employment income for Hungary 1994 in LIS data appears to be underestimated, probably due to a low response rate from self-employed workers.

13. Hamilton (2000), for instance, finds that returns to self-employment or entrepreneurship are low relative to the returns to paid work in the United States. These findings have been associated with the non-pecuniary benefits of business ownership.

14. The raw data for these countries confirm this finding: in Italy, for instance, the median annual earnings of self-employed workers are greater (EUR 31 200 in 2004) than those of paid employees (EUR 28 400).

15. The variable "weeks per year" is not collected in all countries or years. For countries which collect this information only in some years, the number of weeks worked are assigned on the basis of information on the decile distribution of hours from the nearest year (Netherlands, Luxembourg, Spain, Hungary and the United Kingdom for the earliest year, and Australia, Czech Republic and the United Kingdom, for the most recent year). For Israel and Mexico, the variable "weeks per year" is not available in all survey years and 52 weeks worked are assigned to all paid workers. This assumption is likely to overestimate annual hours for workers in the bottom quintile, while it is expected to have little impact on the estimates of annual hours for the top quintile since most workers in that quintile work 52 weeks a year. For Finland, hours worked per year are estimated on the basis of the 1991 hours distribution. Four countries (Denmark, Norway, Poland and Sweden) have no information either on hours per week or weeks per year and had to be excluded from the analysis in this section.

16. It is also possible that the level of inequality (Gini) is the same for both hourly wage and annual earnings without every employee working the same hours. A hypothetical case is the presence of two asymmetric distributions where the hourly wage distribution is skewed to the left (low dispersion on the bottom and high dispersion on the top), while the distribution of annual earnings is skewed to the right (high dispersion at the bottom and low dispersion on the top), or *vice versa*. Empirically, this may be the case for Italy (Figure 4.4).

17. See, for instance, Blau and Kahn (2002) on the United States and Bell and Freeman (2001) for an explanation of differences between the United States and Germany in hours worked. They argue that the difference in wage inequality between these two countries is a major factor underlying the US-German difference in hours worked. They show that labour supply decisions are forward looking and incentive driven (*e.g.* promotion), and the extent to which more work effort are supplied depends on the level of wage inequality.

18. Overall, the amount of average annual hours actually worked per person in dependent employment remained rather stable over the ten years since the late 1990s with a slight trend decline apparent in almost all countries. Levels, however, varied substantially across countries, ranging from around 1 300 hours in Germany and the Netherlands to 1 900 hours and above in Mexico and Korea (OECD, 2010).

19. The Working-Time Directive (93/104/EC) in 1993 and the Part-Time Work Directive (97/81/EC) in 1997.

20. Earnings replacement payments during unemployment or inactivity, *e.g.* unemployment compensation, are not taken into account.

21. Assigning zero earnings to non-workers does not account for the value of leisure or non-market activities. The estimates for "overall earnings inequality" therefore represent one extreme. This issue is discussed in section "Accounting for the value of non-market activities" in Chapter 3.

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ANNEX 4.A1

Additional Tables

Table 4.A1.1. **Decomposition of annual earnings inequality by income source, all workers (aged 25-64)**

Panel A. Countries reporting gross earnings

		Overall inequality (Gini)	Paid employment earnings				Self-employment income			
			Absolute contribution	Factor share	Factor correlation	Factor inequality (Gini)	Absolute contribution	Factor share	Factor correlation	Factor inequality (Gini)
		C	C_k	S_k	R_k	I_k	C_k	S_k	R_k	I_k
Australia	1985	0.338	0.316	0.903	0.877	0.399	0.022	0.097	0.244	0.931
	1995	0.328	0.299	0.899	0.862	0.386	0.027	0.101	0.279	0.961
	2003	0.340	0.307	0.900	0.874	0.390	0.033	0.100	0.343	0.954
Canada	1987	0.392	0.365	0.933	0.918	0.426	0.027	0.067	0.415	0.970
	1997	0.388	0.358	0.919	0.903	0.431	0.030	0.081	0.383	0.953
	2004	0.440	0.400	0.905	0.918	0.481	0.041	0.095	0.455	0.947
Czech Republic	1992	0.277	0.207	0.895	0.750	0.309	0.069	0.105	0.687	0.955
	2004	0.324	0.216	0.802	0.663	0.406	0.108	0.198	0.601	0.908
Denmark	1987	0.309	0.272	0.921	0.865	0.341	0.037	0.079	0.488	0.960
	1995	0.305	0.279	0.938	0.882	0.337	0.026	0.062	0.421	1.000
	2004	0.303	0.281	0.947	0.899	0.330	0.022	0.053	0.422	0.970
Finland	1987	0.324	0.301	0.903	0.876	0.380	0.023	0.097	0.260	0.925
	1995	0.357	0.323	0.899	0.871	0.413	0.034	0.101	0.358	0.936
	2004	0.336	0.309	0.918	0.887	0.380	0.026	0.082	0.340	0.949
Germany	1984	0.346	0.284	0.890	0.829	0.385	0.062	0.110	0.591	0.952
	1994	0.361	0.317	0.917	0.874	0.396	0.044	0.083	0.547	0.959
	2004	0.401	0.336	0.887	0.854	0.444	0.065	0.113	0.604	0.953
Israel[1]	1986	0.391	0.282	0.822	0.756	0.453	0.109	0.178	0.660	0.929
	1997	0.412	0.329	0.848	0.809	0.480	0.083	0.152	0.586	0.930
	2005	0.422	0.350	0.866	0.840	0.481	0.072	0.134	0.575	0.939
Netherlands	1987	0.311	0.241	0.892	0.797	0.339	0.070	0.108	0.682	0.957
	1994	0.336	0.307	0.941	0.909	0.359	0.029	0.059	0.505	0.972
	2004	0.374	0.333	0.909	0.879	0.417	0.041	0.091	0.461	0.973
Norway	1986	0.324	0.265	0.873	0.783	0.388	0.060	0.127	0.507	0.927
	1995	0.330	0.276	0.895	0.826	0.374	0.054	0.105	0.541	0.947
	2004	0.359	0.312	0.909	0.877	0.391	0.047	0.091	0.519	1.000
Sweden	1981	0.321	0.320	0.949	0.932	0.362	0.001	0.051	0.030	0.953
	1992	0.324	0.325	0.976	0.969	0.344	–0.001	0.024	–0.044	0.982
	2005	0.331	0.330	0.979	0.971	0.347	0.001	0.021	0.049	0.996
United Kingdom	1986	0.356	0.326	0.902	0.865	0.418	0.030	0.098	0.331	0.937
	1995	0.384	0.279	0.822	0.753	0.451	0.105	0.178	0.637	0.925
	2004	0.402	0.350	0.884	0.866	0.457	0.052	0.116	0.478	0.941
United States	1979	0.395	0.353	0.915	0.886	0.435	0.042	0.085	0.518	0.958
	1994	0.431	0.402	0.935	0.930	0.462	0.029	0.065	0.464	0.970
	2004	0.447	0.419	0.939	0.941	0.474	0.029	0.061	0.480	0.976
Average	Mid-1990s	0.354	0.309	0.904	0.857	0.398	0.045	0.096	0.442	0.956
	Mid-2000s	0.373	0.328	0.903	0.872	0.416	0.045	0.097	0.442	0.958

Table 4.A1.1. **Decomposition of annual earnings inequality by income source, all workers (aged 25-64)** *(cont.)*

Panel B. Countries reporting net earnings

		Overall inequality (Gini)	Paid employment earnings				Self-employment income			
			Absolute contribution	Factor share	Factor correlation	Factor inequality (Gini)	Absolute contribution	Factor share	Factor correlation	Factor inequality (Gini)
		C	C_k	S_k	R_k	I_k	C_k	S_k	R_k	I_k
Austria	1994	0.331	0.268	0.886	0.828	0.365	0.063	0.114	0.579	0.958
	2004	0.336	0.221	0.828	0.717	0.373	0.115	0.172	0.713	0.934
Belgium	1985	0.238	0.143	0.771	0.495	0.374	0.096	0.229	0.486	0.859
	1992	0.249	0.162	0.804	0.570	0.354	0.086	0.196	0.496	0.889
	2000	0.298	0.226	0.901	0.848	0.296	0.072	0.099	0.750	0.965
France	1984	0.299	0.269	0.915	0.861	0.342	0.029	0.085	0.363	0.952
	1994	0.375	0.300	0.873	0.829	0.414	0.075	0.127	0.625	0.950
	2000	0.360	0.307	0.905	0.873	0.389	0.052	0.095	0.570	0.958
Greece	1995	0.332	0.188	0.648	0.556	0.522	0.144	0.352	0.516	0.794
	2004	0.352	0.198	0.667	0.585	0.507	0.154	0.333	0.558	0.827
Hungary	1994	0.377	0.360	0.978	0.988	0.373	0.016	0.022	0.757	0.989
	2005	0.316	0.223	0.843	0.706	0.374	0.094	0.157	0.645	0.928
Ireland	1994	0.389	0.216	0.734	0.643	0.457	0.173	0.266	0.719	0.906
	2004	0.364	0.219	0.760	0.660	0.437	0.145	0.240	0.667	0.904
Italy	1987	0.286	0.141	0.692	0.478	0.426	0.145	0.308	0.559	0.840
	1995	0.299	0.205	0.726	0.612	0.462	0.094	0.274	0.413	0.833
	2004	0.326	0.141	0.662	0.473	0.451	0.185	0.338	0.645	0.847
Luxembourg	1985	0.252	0.189	0.866	0.667	0.328	0.063	0.134	0.510	0.921
	1997	0.340	0.305	0.931	0.889	0.369	0.034	0.069	0.518	0.963
	2004	0.370	0.294	0.902	0.872	0.374	0.076	0.098	0.807	0.965
Mexico	1984	0.473	0.312	0.674	0.746	0.621	0.161	0.326	0.581	0.849
	1994	0.521	0.385	0.730	0.816	0.647	0.135	0.270	0.578	0.868
	2004	0.494	0.378	0.774	0.829	0.589	0.116	0.226	0.577	0.889
Poland	1992	0.288	0.226	0.878	0.770	0.335	0.062	0.122	0.537	0.945
	2004	0.384	0.259	0.782	0.712	0.465	0.125	0.218	0.631	0.907
Spain	1990	0.317	0.249	0.808	0.705	0.437	0.068	0.192	0.402	0.877
	1995	0.381	0.294	0.811	0.761	0.477	0.087	0.189	0.509	0.900
	2004	0.335	0.312	0.893	0.869	0.402	0.023	0.107	0.230	0.922
Average	Mid-1990s	0.353	0.265	0.818	0.751	0.434	0.088	0.182	0.568	0.909
	Mid-2000s	0.358	0.253	0.811	0.740	0.423	0.105	0.189	0.618	0.913

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537750

Table 4.A1.2. **The developments of hourly wages and annual hours worked by top and bottom quintiles of the annual earnings distribution**

		Bottom quintile (20% <)								Top quintile (> = 80%)							
	Changes in overall Gini (points) (↘)	Mean weekly hours (if imputed)[1]		Mean weeks per year (if imputed)[1]		Mean annual hours		Mean hourly wages (2005 values)		Mean weekly hours (if imputed)[1]		Mean weeks per year (if imputed)[1]		Mean annual hours		Mean hourly wages (2005 values)	
		Early year	Recent year	Early year	Recent year	Early year	Recent year	Early year	Recent year	Early year	Recent year	Early year	Recent year	Early year	Recent year	Early year	Recent year
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Countries reporting gross earnings																	
Netherlands 87-04	0.067	21.4	21.0	(43.8)	38.4	978	796	27.6	23.5	38.9	39.1	(51.7)	51.7	2 013	2 022	60.8	69.2
Germany 84-04	0.064	23.8	23.9	41.3	36.6	1 002	886	15.7	12.7	44.0	44.8	51.0	51.1	2 243	2 287	44.9	50.3
Israel 86-05[2]	0.041	22.5	26.4	(52.0)	(52.0)	1 170	1 375	26.7	19.6	49.8	49.6	(52.0)	(52.0)	2 590	2 579	72.7	88.2
Czech Republic 92-04	0.040	38.1	34.6	50.7	(50.4)	1 938	1 752	28.7	43.6	46.1	45.5	52.0	(52.0)	2 395	2 364	89.3	159.0
United Kingdom 86-04	0.039	21.6	22.8	(46.8)	(45.6)	1 020	1 053	4.6	6.3	43.6	47.7	(51.5)	(51.4)	2 244	2 451	13.9	23.9
Canada 87-04	0.031	32.3	29.2	41.0	36.3	1 284	1 098	7.8	7.6	43.0	41.3	51.8	51.5	2 224	2 125	37.8	44.5
United States 86-04	0.028	27.9	30.1	32.3	39.1	1 030	1 300	8.7	8.9	46.0	45.3	51.3	51.3	2 366	2 331	37.0	47.5
Finland 87-04	0.013	(28.8)	(27.6)	46.8	40.4	1 263	997	29.2	44.3	(39.3)	(39.4)	51.9	51.9	2 043	2 046	109.6	143.0
Australia 85-03	–0.011	27.5	23.2	47.6	(47.6)	1 278	1 112	9.6	17.0	44.1	44.6	51.9	(51.9)	2 287	2 315	34.5	39.2
Average	0.035	26.9	26.4	43.3	38.2	1 218	1 152	17.6	20.4	44.4	44.7	51.7	51.5	2 267	2 280	55.6	73.9
B. Countries reporting net earnings																	
Luxembourg 85-04	0.103	35.1	31.2	(43.0)	43.6	1 550	1 335	292	358	40.6	43.4	(51.9)	51.9	2 108	2 254	741	1296
Italy 87-04	0.031	37.0	33.4	42.1	43.8	1 576	1 441	12.4	11.1	41.8	40.0	51.9	51.9	2 170	2 076	24.6	26.3
Mexico 84-04	0.024	49.3	41.4	(52.0)	(52.0)	2 563	2 155	4.9	7.9	46.9	48.6	(52.0)	(52.0)	2 439	2 525	53.3	63.5
Belgium 85-00	0.018	35.7	28.3	(43.6)	43.6	1 585	1 317	266	281	46.5	45.0	(51.8)	51.9	2 410	2 338	558	589
Greece 95-04	0.008	31.3	35.6	35.4	39.6	1 315	1 388	1238	1475	42.9	40.4	51.5	51.8	2 192	2 089	3403	4222
Austria 94-04	0.003	29.9	27.5	41.8	43.1	1 375	1 181	73.3	99.4	44.8	42.5	51.7	51.8	2 330	2 201	226	241
France 94-00	–0.009	29.1	28.1	36.6	37.7	1 018	1 001	38.8	44.1	44.1	43.3	51.7	51.7	2 281	2 239	113	119
Ireland 94-04	–0.012	25.1	20.3	32.1	41.8	962	872	4.6	7.9	42.1	41.0	51.9	51.9	2 184	2 126	13.4	20.2
Spain 95-04	–0.050	26.0	28.7	(38.0)	38.0	1 044	1 177	646	787	42.1	41.9	(51.7)	51.7	2 176	2 168	2461	2196
Hungary 94-05	–0.065	36.1	32.9	(44.1)	37.6	1 616	1 441	210	288	44.6	40.9	(51.7)	50.8	2 306	2 119	1011	895
Average	0.005	33.5	30.7	37.6	41.0	1 460	1 331	278.6	335.9	43.6	42.7	51.7	51.7	2 260	2 214	860.4	996.8

Note: Samples are restricted to all paid workers (aged 25-64) with positive wages and positive hours worked during the reference year with information on annual hours worked. Mean wages in national currencies at constant 2005 values.

1. See note 15 at the end of the chapter.
2. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537769

ANNEX 4.A2

Accounting for the Effect of Joblessness on Earnings Inequality Among the Whole Working-Age Population

This annex quantifies the extent to which changes in earnings inequality in the entire working-age population can be accounted for by the fact that the employed receive earnings and the non-employed do not ("between-group" inequality), *versus* the extent to which changes can be accounted for by inequality of earnings among the employed ("within-group" inequality). It applies a method of inequality decomposition by population subgroup following Shorrocks (1984). The decomposition uses the two generalised entropy class inequality measures (the Theil inequality measure and the mean log deviation) rather than the Gini coefficient, which cannot be properly decomposed by subgroups into within- and between-group components. Both static and dynamic decompositions are presented.

Static decomposition

The decomposition equation for the GE0 (mean log deviation) and GE1 (Theil) measures* can be expressed, respectively, as:

$$I_0 = \sum_k v_k l_0^k + \sum_k v_k ln(\frac{1}{\lambda_k}) \quad (6)$$

$$I_1 = \sum_k v_k \lambda_k l_1^k + \sum_k v_k \lambda_k ln\lambda_k \quad (7)$$

where:

v_k is the population share of group k

λ_k is group k's mean earnings relative to the population mean.

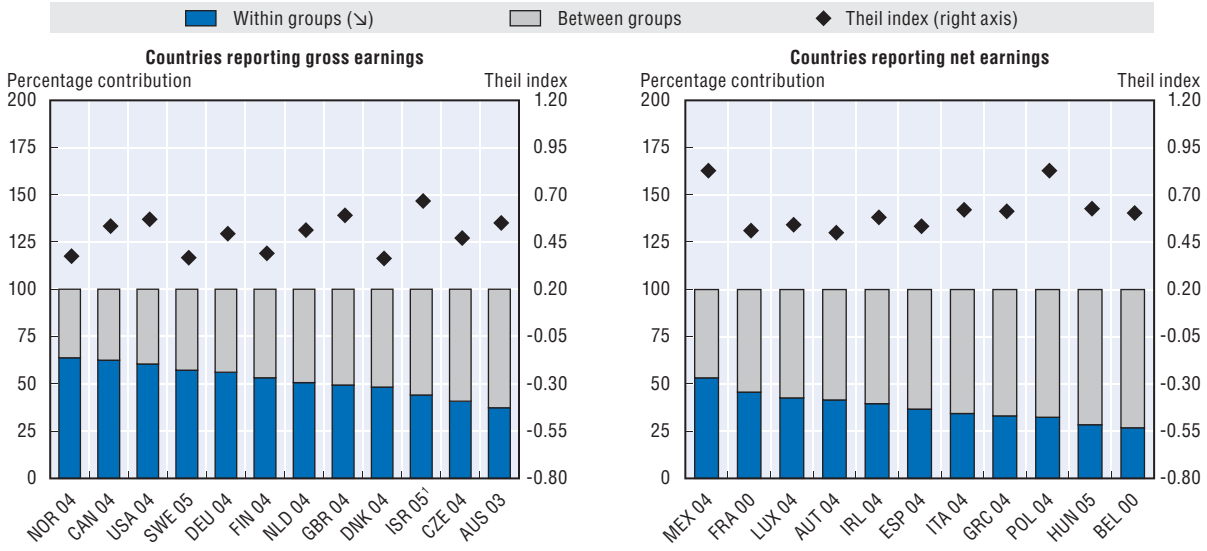
The first term on the right hand of equations 6 and 7 represents the within-group component, which is a weighted sum of the subgroup inequality values. The second term is the between-groups component, reflecting the inequality attributed to differences in the subgroup means. The within-group component refers to the relative extent of inequality among the employed. The between-groups component measures the extent of earnings inequality as explained by the difference between the mean earnings of workers and the assumed zero earnings of non-workers.

Figure 4.A2.1 shows the results of this decomposition for the latest available year. Among the countries reporting gross earnings, both within- and between-group inequality

* The properties of subgroup decomposability of generalised entropy indices are well documented (Shorrocks, 1984; Jenkins, 1991; Cowell, 1995).

contributed roughly equal weights to overall inequality (some 40-60%). Within-group inequality (i.e. inequality of earnings among workers) played a slightly more important role in the Nordic countries, Germany, Canada, and the United States. Between-group inequality (i.e. inequality along the employment divide) seems to be greater only in Australia, the Czech Republic, and Israel. Net earnings being more equally distributed than gross earnings, the between-groups effect is generally greater in the countries in the second panel. Its contribution amounts to almost three-quarters in Belgium and Hungary.

Figure 4.A2.1. **Static decomposition of earnings inequality among the working-age population, by earnings dispersion among workers and employment status, mid-2000s**



Note: Samples are restricted to the civilian working-age population (aged 25-64). Inequality among the working-age population (Theil index) includes workers and non-workers to whom zero earnings are assigned. Earnings refer to annual labour earnings from both paid work and self-employment.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536363

More detailed results for different years and alternative inequality measures are to be found in Chen *et al.* (2011). They show that the between-group component contributes a considerably larger share to inequality among the working-age population when a bottom-sensitive inequality measure (mean log deviation, GE0) is used. In fact, the between-group component outweighs the within-group effect in all countries, even those where the within-group effect was considerably more important according to the GE1 measure. The analysis also suggests that the effect of within-group inequality has increased in most countries.

Dynamic decomposition

While the static decomposition analysis yields estimates as to the relative contributions of the between- and within-groups effects at any given moment, estimating the contribution to changes in inequality requires a dynamic approach. Applying a dynamic decomposition model proposed by Mookherjee and Shorrocks (1982) affords more detailed understanding of the contribution of within- and between-group components to the trend in aggregate inequality. However, this decomposition is possible only when using the mean log deviation (GE0) as the measure of inequality, a measure which is more

sensitive to the bottom of the distribution. Following Mookherjee and Shorrocks, changes in earnings inequality among the working-age population can be decomposed as:

$$\Delta I_0 \approx \Sigma_k \overline{v}_k \Delta l_{0k} + \Sigma_k \overline{l}_{0k} \Delta v_k + \Sigma_k [\overline{\lambda}_k - \overline{log(\lambda_k)}] \Delta v_k + \Sigma_k (\overline{\theta}_k - \overline{v}_k) \Delta log(u_k) \quad (8)$$

(A) (B) (C) (D)

where

v_k is the population share of group k

λ_k is group k's mean earnings relative to the population mean.

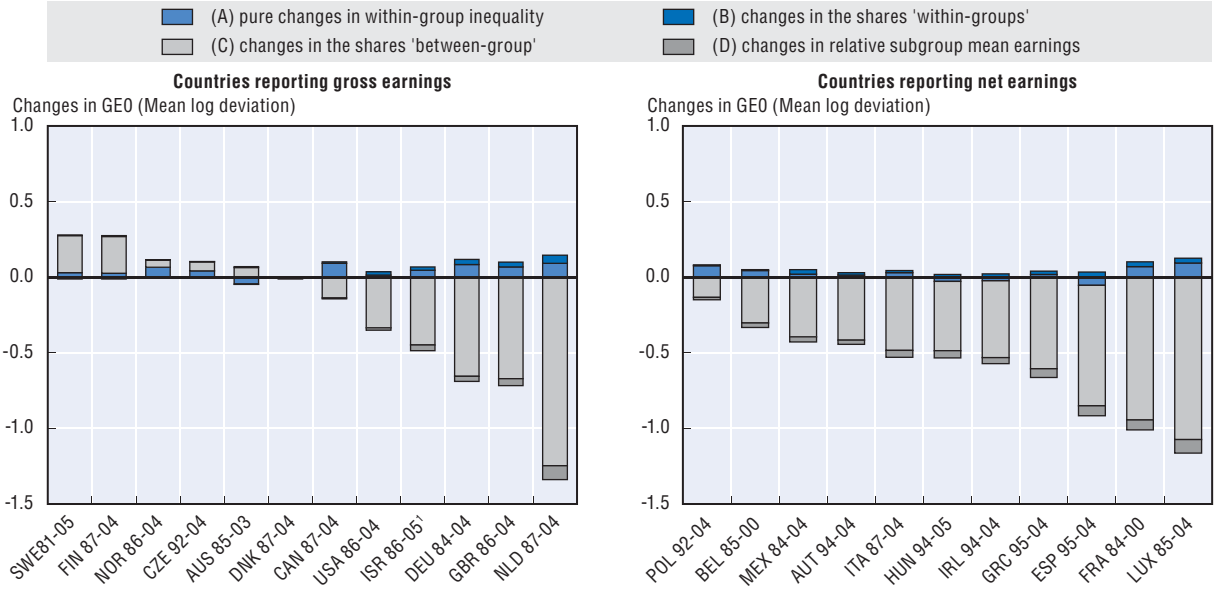
θ_k is earnings share of subgroup k

u_k is mean earnings of subgroup k.

A bar over a variable indicates an average between the base and final-period values. The overall change in I_0 can be decomposed into (A) pure earnings inequality changes within groups, (B) changes in the population shares within groups, (C) changes in the population shares between groups, and (D) changes in the relative earnings of subgroups.

The results shown in Figure 4.A2.2 suggest that changes in the distribution of earnings among the entire working-age population over the past two decades were driven largely by changes in the population shares between the employed and non-employed (C) in virtually all OECD countries under study. The only noticeable exceptions were Australia and Norway (and, to a lesser extent, Canada) where "pure" changes in inequality within groups (A) played a more important role. Changes in relative mean earnings of subgroups (D) provide a modest inequality-reducing (or inequality-augmenting) effect for countries which experienced a shift towards less (or more) non-employment.

Figure 4.A2.2. **Dynamic decomposition of changes in earnings inequality among the working-age population (GE0)**



Note: Samples are restricted to the civilian working-age population (aged 25-64). Inequality among the working-age population (MLD, GE0 index) includes workers and non-workers. Zero earnings are assigned to non-workers. Earnings refer to annual labour earnings from both paid work and self-employment. Countries presented in descending order of overall changes in MLD (GEO index).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536382

Divided We Stand
Why Inequality Keeps Rising

PART II

Chapter 5

Trends in Household Earnings Inequality: The Role of Changing Family Formation Practices*

This chapter looks at the transmission of earnings inequality from individual to household. There are a number of factors at play. Some are related to labour market trends, such as the increasing polarisation of male earnings and changes in men's and women's employment rates. Other factors relate to changes in the composition of households, such as increases in single-headed households or growing marital sorting. The chapter begins with an overview of the development of individual and household earnings inequality, and then examines patterns of change in its labour market and family formation drivers over the past 20 years. Finally, it analyses and assesses the relative contributions of labour market and demographic factors to the increase in overall household earnings inequality.

* This chapter was prepared by Wen-Hao Chen and Michael Förster, OECD Social Policy Division

5.1. Introduction

The focus of the previous chapters has been on changes in wage and earnings dispersion among *individuals*. Individuals, however, often pool and share their earnings (and other income sources)[1] with other household members. The links between individual and household earnings distributions are complex and depend on a number of factors, such as household composition, how earners are clustered within households, and how jobs are distributed among people. While some of these factors partly offset each other, existing evidence suggests that, both among working individuals and overall, household earnings are distributed more equally than individual earnings (*e.g.* Parker, 1995, on the United Kingdom; Saunders, 2005, on Australia; OECD, 2008, for a sample of 19 OECD countries).

Analysis in the previous chapters shows that individual wage and earnings inequality has increased in the past 25 years in most OECD countries, which has undoubtedly contributed to rising household earnings inequality. But other developments also play a role (McCall and Percheski, 2010; and Burtless, 2011 for a review of the literature). Demographic shifts, in particular changes in family formation, also influence household earnings. The steady increase in the share of single-parent families combined with people's tendency to choose their spouses in groups at similar earnings levels (so-called "assortative mating") may have contributed to a further increase in inequality.[2] Conversely, women's employment rates have increased substantially, which may have helped reduce household earnings inequality.

In the analytical framework used in this chapter, inequality of household earnings is determined by two broad sets of factors, referred to as "labour market" factors (earnings dispersion and employment rates) and "family formation" factors (assortative mating and household structure). The aim is to assess their relative influences on changes in household earnings inequality.

The chapter begins by discussing the main trends in the distribution of household *versus* individual earnings. It then looks at the characteristics of the factors most likely to influence the trends in overall household earnings inequality: the polarisation of men's earnings, changes in female employment rates, and choice of spouses, *i.e.* assortative mating. Finally, it assesses the relative contributions of these factors to overall earnings inequality trends.

Analysis in this chapter highlights the following key findings:

- Between the mid-1980s and mid-2000s, household earnings inequality increased in 21 of the 23 OECD countries studied.
- There was a trend towards more single-headed households, higher female employment, and greater earnings correlation among partners in couples.
- Marital sorting and household structure changes contributed, albeit moderately, to increasing inequality.

- By contrast, rising women's employment exerted a sizable equalising effect.
- Changes in labour market factors, in particular increases in men's earnings disparities, remain the main driver of household earnings inequality, contributing between one-third and one-half to the overall increase in most countries.

5.2. Levels and trends in household earnings inequality

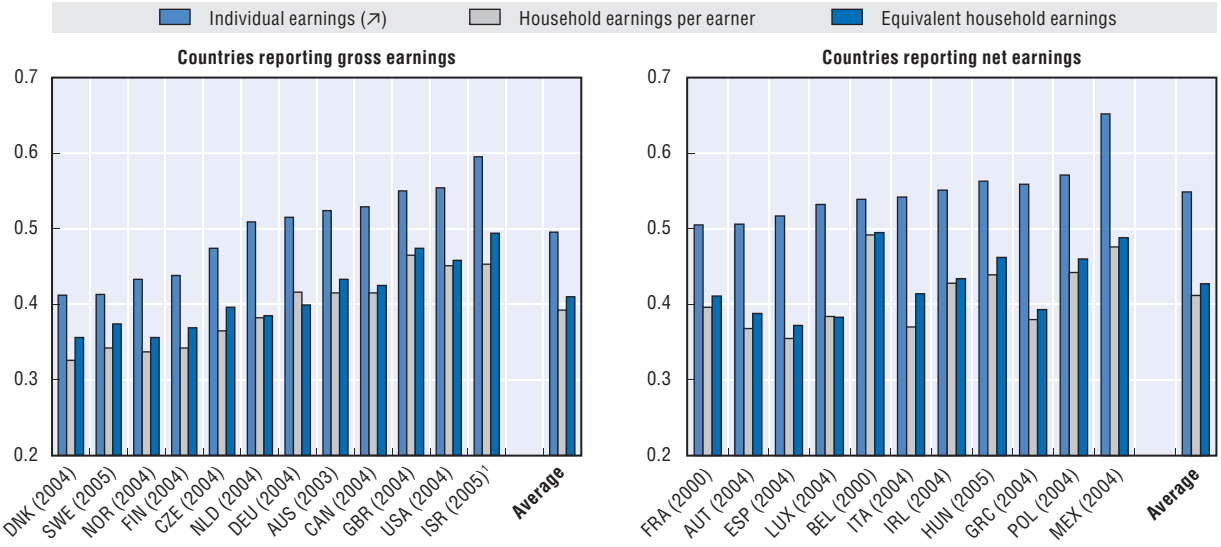
By shifting the focus from individual to household earnings, we introduce mechanisms that may reinforce or offset the trend toward widened wage dispersion. Similar to the previous chapter, the analysis uses household microdata from the Luxembourg Income Study (LIS) for a period between the mid-1980s and the mid-2000s, covering 23 OECD countries.[3] Samples are restricted to working-age civilians aged 25-64 living in a household with a working-age head. Household earnings are the sum of annual wages and self-employment income from all members. Figure 5.1 compares levels of individual earnings inequality with those of household earnings inequality, in two steps. The first bar denotes the level of earnings inequality among working-age individuals (including non-earners) which is equivalent to the concept of "overall" earnings inequality among the whole working-age population used in the final section of the previous chapter. The second bar shows the level of household earnings inequality per earner when earnings of all working-age household members are lumped together and divided by earners. The third bar shows the level of equivalent household earnings inequality which accounts for the economies of scale associated with larger households.[4] The two estimates of household earnings inequality include households without workers.

Figure 5.1 shows that including the earnings of other household members significantly reduces earnings inequality in all OECD countries. But the extent of reduction in earnings inequality when moving from individual to household earnings differs largely across countries. Among the panel of countries reporting *gross* earnings, the Gini coefficient of household earnings is lower by almost 9 points than the one of individual earnings, but the difference is much less in Sweden and Denmark and more in Canada and Germany. Among the panel of countries reporting *net* earnings, differences between individual and household earnings inequality are even more pronounced: about 12 points on average.

The difference between individual and household earnings inequality levels is much less pronounced, however, when looking only at households in which there is at least one person working (Figure 5.2). Again, assuming sharing of resources among earners (within a household) reduces inequality in all but one case (second bar). However, the picture is less clear when earnings are shared equally among all household members (including children, based on the equivalence scale) (third bar). In some countries, inequality of equivalent household earnings actually is higher than that of individual earnings. For gross earnings, this is the case in Australia, the Czech Republic, Israel[5] and Sweden; and for net earnings, this concerns Italy, Poland and, in particular Hungary. Overall, Figures 5.1 and 5.2 highlight marked differences in inequality between individual earnings and household earnings; composition of households and the economies of scale are important in shaping the distribution of household earnings.

Household earnings inequality has increased in most OECD countries over the past two to three decades. Both for working-age households as a whole and for the subsample of households with at least one earner, the Gini coefficients rose by more than 2 percentage points or more in a large majority of countries (Figure 5.3). There is a more consistent trend

Figure 5.1. **Inequality (Gini coefficient) of annual earnings among individuals and households, all working-age households (including individuals and households with no earnings)**



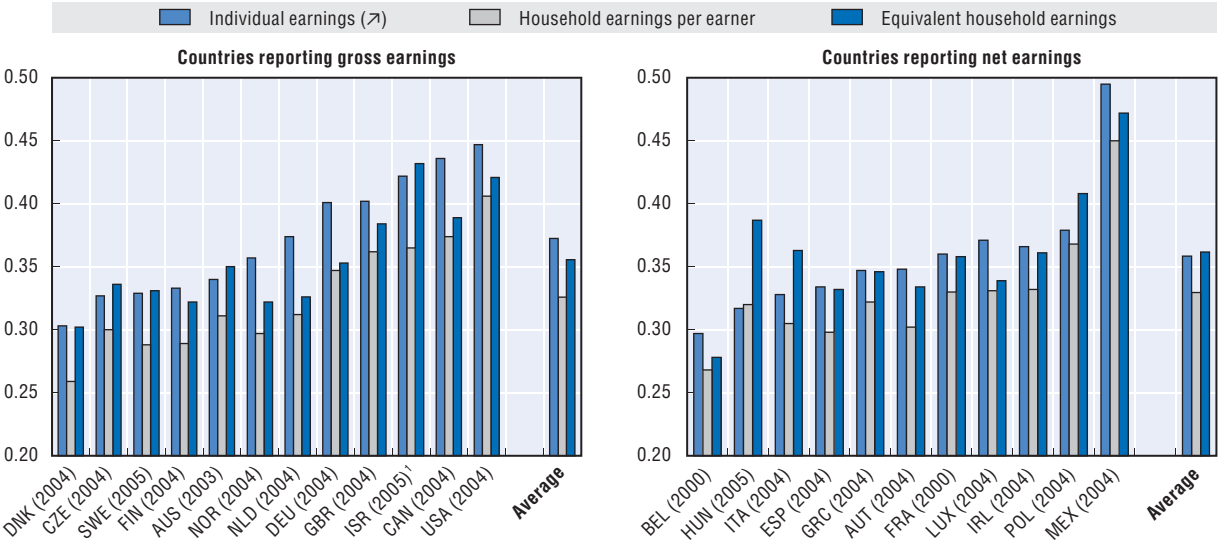
Note: Samples are restricted to the working-age population (25-64 years) living in a household with a working-age head. Estimates include individuals and households with no earnings. Equivalent household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536401

Figure 5.2. **Inequality (Gini coefficient) of annual earnings among individuals and households, workers and working households**



Note: Samples are restricted to the working-age population (25-64 years) living in a household with a working-age head and positive earnings. Equivalent household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size).

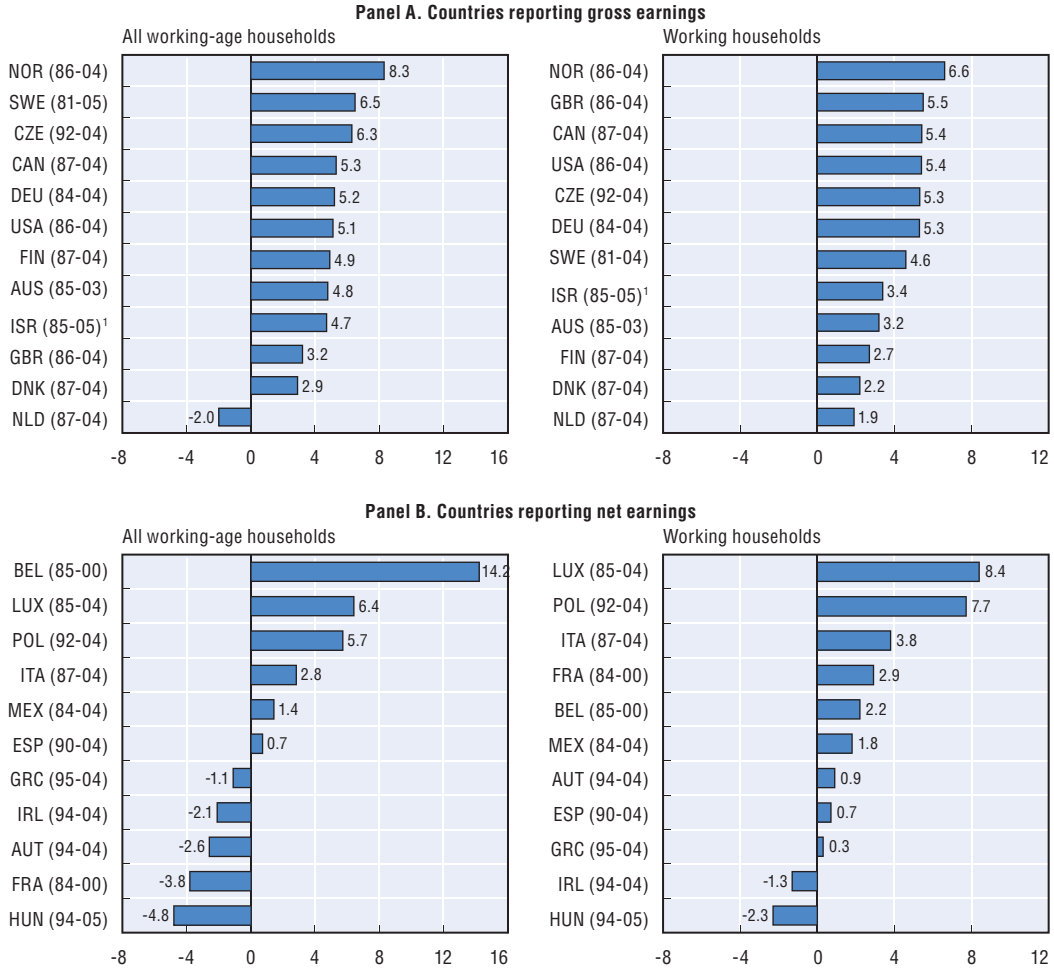
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536420

Figure 5.3. **Evolution of equivalent household earnings inequality (Gini coefficient)**

Gini coefficient changes in percentage points



Note: Samples are restricted to the working-age population (25-64 years) living in a household with a working-age head. Equivalent household earnings are calculated as the sum of earnings from all household members (including elderly and young adults if they lived in a household with a working-age head), corrected for differences in household size with an equivalence scale (square root of household size).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536439

among those countries which report gross rather than net earnings (Panel A). Finland, Norway, and Sweden initially had low inequality but experienced a considerable increase over the years, while Canada and the United States started with relatively high inequality which further increased by the end of the period. Trends are more diverse among countries which report net earnings only (Panel B). In some of these countries, earnings inequality was stable or even fell, indicating that changes in tax systems have played an equalising role.

Despite the fact that the broad and the restricted samples exhibit similar patterns in the evolution of earnings inequality, the underlying mechanisms that drive the change will be quite different. Trends in earnings inequality among all households (the broad samples above) depend more strongly on changes in the proportion of non-working households

than trends in earnings inequality among working households. The propensity of a household to participate in the labour market is likely to be determined also by its access to other income sources (*e.g.* capital income or social transfers). These links between changes in earnings inequality and changes in the share of other income sources, as well as the correlations between them, influence the final income distribution and will be examined in more detail in the next chapter. As the focus of this chapter is on the driving forces for trends in the distribution of household earnings (rather than income), the remainder of this chapter will restrict the analysis to the sample of households with at least one earner.

5.3. The determinants of changes in household earnings inequality: labour market and demographic factors

Based on a large strand of past research (see Box 5.1), the analysis assumes that inequality of household earnings is affected by two types of determinants: labour market factors and household formation factors. The impact of the labour market on household earnings inequality is measured by: 1) men's earnings dispersion; 2) men's employment rate; and 3) women's employment rate.[6] The impact of household formation factors on changes in earnings inequality is modelled by two additional influences: 4) assortative mating, *i.e.* the degree to which individuals marry within their own income group; and 5) household structure.[7] This section examines changes in labour market and demographic factors from the mid-1980s to the mid-2000s for 23 OECD countries.[8]

Trends in men's earnings distribution

Figure 5.4 presents the annual percentage change of real earnings[9] among men in the bottom and the top deciles. Male earnings became more polarised in a large majority of the countries studied – 21 out of 23. In ten countries (such as Poland, Canada and Germany), polarisation was a result of growth in real earnings in the top decile combined with a decrease for the bottom decile.

Changes in household earnings inequality are smaller in countries where polarisation of men's earnings is less severe. The Gini coefficient of household earnings changed very little in Austria, Spain and Greece where the growth of earnings in the top and bottom deciles was either modest or increased at a similar rate. In Ireland, men's earnings increased at both ends of the earnings distribution, but more so in the bottom decile resulting in a drop in household earnings inequality. Such a pattern is also observed in Mexico, though this did not move in hand with decreased overall household earnings inequality, suggesting other important factors at play. In Hungary, which experienced a notable drop in household net earnings inequality, earnings polarisation actually decreased among men as real earnings declined in the top decile and rose in the bottom (for details on the results for Hungary, see Box 5.3 below).

Trends in employment rates

The other important trend affecting household earnings inequality was the substantial increase in female employment rates. Figure 5.5 shows that women's employment rates rose substantially in most OECD countries included in our sample regardless of the economic cycle.[10] The increase exceeded 10 percentage points in 14 of the 23 countries under study, with the largest increases seen in the Netherlands, Luxembourg

Box 5.1. **The role of demographic change for household earnings and income inequality: a review**

The demographic-related factors behind the growth in household earnings and income inequality have been investigated extensively in the literature. For instance, Karoly and Burtless (1995), Burtless (1999), and Daly and Valletta (2006) suggest that the increase in single-headed families is responsible for a sizeable proportion (more than one fifth) of the spread in overall income inequality in the United States. Peichl *et al.* (2010) find that the changing household composition in Germany between 1991 and 2007 was associated with increasing inequality but the effect was stronger for pre-tax household income inequality than after accounting for taxes. Focusing on family earnings in Canada, Lu *et al.* (2011) show that about 20% (30%) of the growth in inequality between 1980 and 1995 (1995 and 2005) can be explained by changing family composition. By contrast, Jäntti (1996) finds that demographic shifts cannot be assigned any major role in the increase in inequality in five OECD countries (including Canada) over the 1980s.

There is also a literature that discusses the increasing role of wives' earnings in family income growth. Shorrocks (1983), Lerman and Yitzhaki (1985), and Karoly and Burtess (1995) decompose the change in inequality indices (*e.g.* Gini coefficient) by family income components and find that wives' earnings magnify family income inequality. Esping-Andersen (2009) observes, for five OECD countries, that women's employment participation increased to a much larger extent at the top end of the income distribution, contributing to increased household income inequality. In contrast, Cancian *et al.* (1993) and Cancian and Reed (1998) suggest that wives' earnings equalise the distribution of family income and Harkness (2010) finds an inverse relationship between female employment and income inequality for a sample of 17 OECD countries.

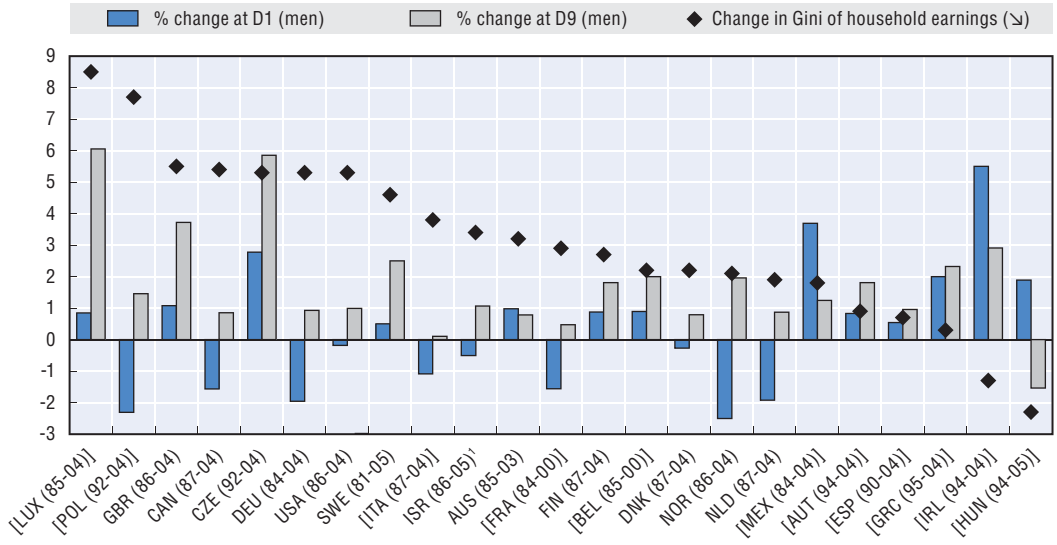
The relative role of changes to men's and women's labour market outcomes (*i.e.* employment rate and wages) in explaining household earnings inequality also depends on how the family is formed and the extent to which it has changed over time. There is increasing evidence that men and women with similar characteristics are more likely to be married to each other, the phenomenon described as "assortative mating". Juhn and Murphy (1997), for instance, find that the increase in female labour supply over time (either in terms of participation or hours worked) has been strongly non-uniform among all married women in the United States, with wives of high-paying husbands experiencing more pronounced increases in labour market activities than wives of low-paying husbands. Morissette and Hou (2008) also report similar findings for Canada. Pencavel (1998) and Devereux (2004) stress that an increasing trend towards marital homogamy needs to be taken into account when interpreting the increased relation between wives' work decisions and husbands' earnings. Past studies have shown that the increasing resemblance of spouses' earnings across couple households contributes a nontrivial portion to widening inequality (Cancian *et al.*, 1993; Blackburn and Bloom, 1995; Cancian and Reed, 1999; Hyslop, 2001; Schwartz, 2010). On the other hand, Callan *et al.* (1998) find that despite an increased correlation in the earnings of spouses increases in female labour force participation and female wage rates account for between one quarter to half of the fall in income inequality in Ireland between the mid-1980s and mid-1990s.

and Spain.[11] This trend may lead to higher household earnings inequality if the increased female employment is greater among wives of higher-wage earners.

Contrary to female employment, Figure 5.5 reveals no obvious trend for male employment rates. For some countries, the variations may be cyclical as male employment

Figure 5.4. **Polarisation of men's earnings distribution**

Annual percentage changes in men's real earnings at the bottom and top decile and percentage point changes in Gini coefficients of household earnings, mid-1980s to mid-2000s



Note: Earnings refer to net earnings for countries in brackets and to gross earnings for other countries. Men's earnings refer to working-age men (25-64) with positive annual earnings. Sample refers to working-age persons in households with positive earnings.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536458

Figure 5.5. **Women's employment rates have increased markedly**

Percentage point changes of male and female employment rates and unemployment rates, mid-1980s to mid-2000s

Note: Samples are restricted to the working-age population (25-64 years) living in a household with a working-age head. The shares of working men and women are calculated from the LIS data. An individual is considered as a worker if he/she has received positive amount of earnings during the reference year. Statistics for unemployment rates are drawn from the *OECD Employment Database*.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS); *OECD Employment Database*.

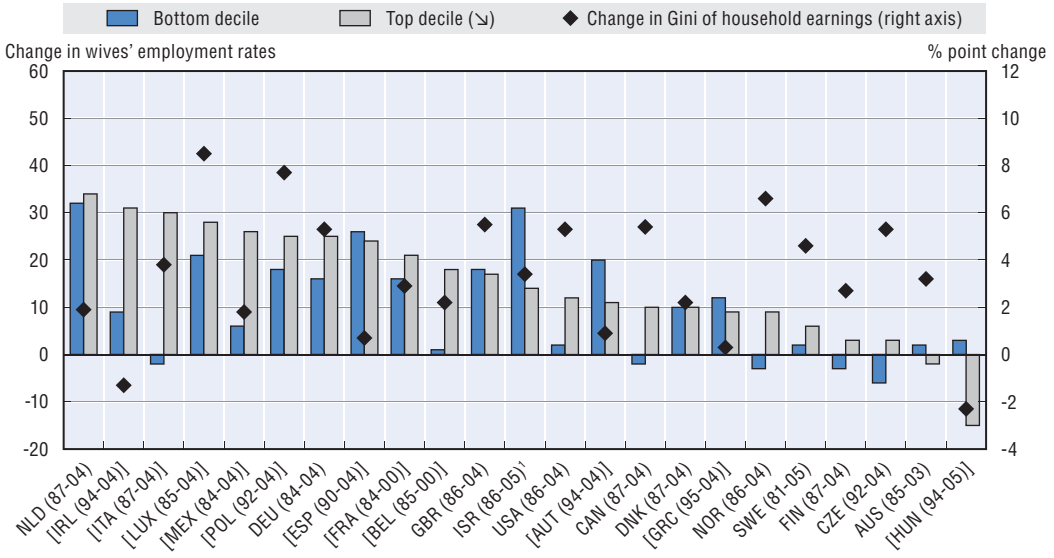
StatLink http://dx.doi.org/10.1787/888932536477

tended to be lower when the national unemployment rates increased (*e.g.* Sweden and Finland) and *vice versa* (*e.g.* Hungary). Two noticeable exceptions are France and Poland where the proportion of men working grew by 10 percentage points or more despite an overall increase in unemployment levels.[12]

Figure 5.6 examines whether the rise in female employment rates has been greater among wives of top earners, *i.e.* those receiving the highest 10% in the male earnings distribution. If female participation rates increased disproportionately more in high-earnings husband households, this may lead to higher household earnings inequality among working households - provided spouses of male top earners do not earn lower wages than those of low-earning husbands. To investigate this issue, we look at changes in wives' employment rates by husbands' earnings deciles among couple households with a working husband. In most countries, employment rates rose more among wives of men in the top than in the bottom earnings decile. This was particularly the case in Italy, Mexico, Belgium, Canada and Norway. By contrast, employment rates of wives of low-wage earners increased relatively more in only six countries, in particular in Israel and Austria.

Figure 5.6. **Female employment rates increased the most among wives of top earners**

Wives' employment rates by husbands' earnings (top and bottom decile), couple households, changes mid-1980s to mid-2000s



Note: Sample for employment rates restricted to couple households with a working husband. Earnings refer to net earnings for countries in brackets and to gross earnings for other countries.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536496

There is, however, no apparent link between trends in wives' employment rates and husbands' earnings on the one hand, and trends in overall household earnings inequality on the other. For instance, a growing association between wives' employment rates and husband's earnings status and is not only observed in countries with a noticeable increase in earnings inequality such as Norway, Canada, Italy and the United States but also in countries with less of an inequality change such as Ireland, Mexico and Belgium. This suggests, at first

sight, that the observed higher growth in participation rates of wives of top-earner husbands is not a prime candidate for explaining trends in household earnings inequality.

Trends in assortative mating

To examine the level and development of earnings correlations between spouses more directly, Annex Figure 5.A1.1 shows working wives' real annual earnings, ranked by husbands' earnings deciles. If there is indeed a growing trend of "liking to live with like" (either along educational or occupational characteristics),[13] one would see higher earnings correlations among household members which in turn would accentuate earnings inequality between households.

The level of wives' earnings increases continuously when moving up the ladder of husbands' earnings, especially in the top three deciles. This trend is a departure from the past; in the mid-1980s, wives' annual earnings were still rather equally distributed across the husbands' earnings spectrum in many countries.

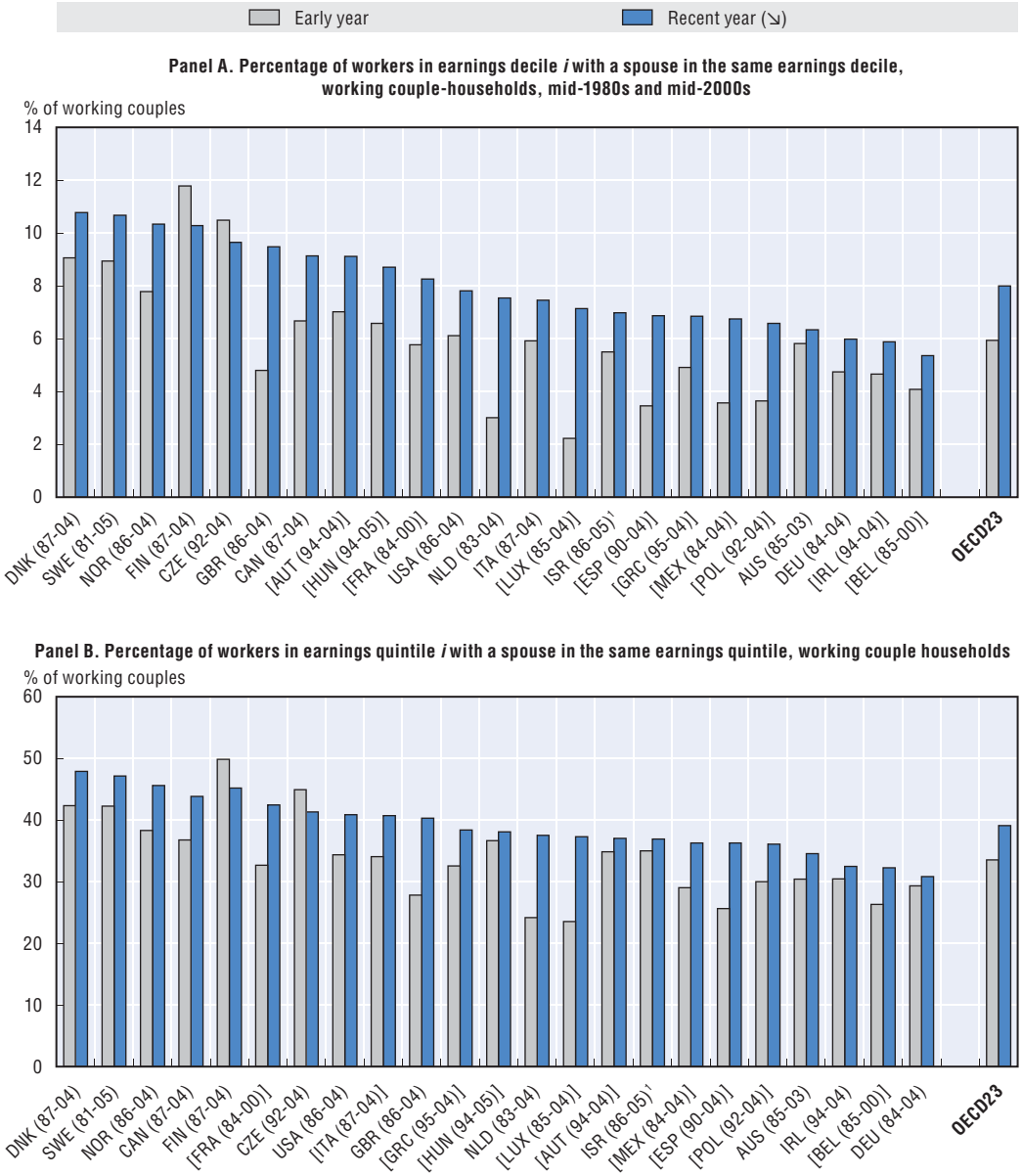
The greatest changes took place in the English-speaking countries, Luxembourg, Poland, Norway and Sweden. In the United Kingdom, for example, the earnings gap between wives of husbands in the top and the bottom decile was about GBP 3 900 in 1987, and this gap increased to GBP 10 200 in 2004 (both figures are expressed in 2005 constant values of national currency). The earnings gap almost tripled in Norway and Poland. In most countries, wives of men in the top deciles benefited most from earnings increases. Poland is a particularly striking example: working wives' earnings rose by almost two-thirds in the top decile, while there was no sizeable increase in the first five deciles.

There is, however, another group of countries which bucked the trend. In Italy and Mexico, the already existing strong correlation between men's and their wives' earnings did not increase further. In Finland, it decreased (when excluding the top decile). And in Austria and Germany, the correlation continues to be weak.

In order to build a summary measure of the degree of sorting, we follow Fortin and Schirle (2006) to define assortative mating by the likelihood of a person in earnings decile i to be married to a spouse in earnings decile j, according to their respective earnings distribution.[14] In general, we find that assortative mating has increased in nearly all OECD countries (Figure 5.7, Panel A). On average for the 23 OECD countries, the share of workers married to a person in the same earnings decile grew from about 6% in the mid-1980s to 8% in the mid-2000s. Luxembourg stands out with the largest increase: the proportion of husbands and wives in the same earnings deciles increased from 2.3% in 1985 to 7.4% in 2004. Significant increases were also recorded in the United Kingdom and the Netherlands (more than 4.5 points), in Spain, Mexico and Poland (between 3.0 and 3.5 points), and in Norway, France and Canada (about 2.5 points). Finland and the Czech Republic are the only two countries that experienced a drop in the degree of assortative mating over the past two decades. Levels of assortative mating in terms of earnings have been converging across countries, with the highest levels recorded in the Nordic countries.

In Panel B of Figure 5.7 we broaden our definition by defining assortative mating as the likelihood of a person in earnings decile i to be married to a spouse in the same *or* the adjacent earnings decile j, where $|j\text{-}i| \leq 2$. This is equivalent to using quintiles (instead of deciles) to categorise the earnings distribution. The overall pattern as well as country rankings remains very similar as before. With the broader definition, between one third and half of earners are living with spouses in the same gender-specific earnings quintile.

Figure 5.7. **Degree of assortative mating, stricter and broader definitions**



Note: Refers to couple households with both partners working. Earnings refer to net earnings for countries in brackets and to gross earnings for other countries.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536515

The OECD average degree of assortative mating, under this broader measure, increases from 34% to almost 40%.[15]

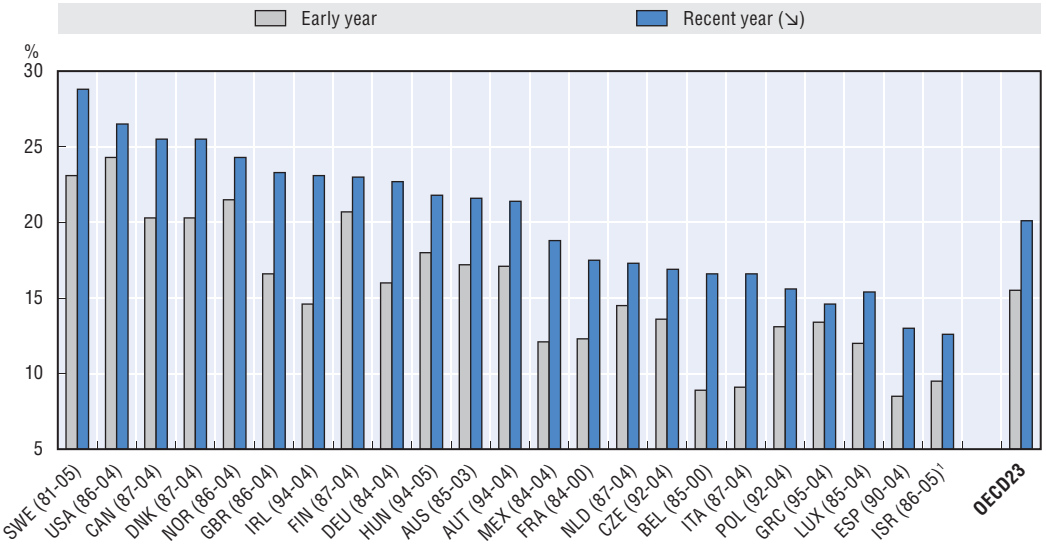
Trends in household composition

Another major change that has been happening at the household level and which may affect inequality is the increase of single-headed (*i.e.* single-parent, single unattached or single with unrelated persons) households. Single-headed households are more common in the Nordic countries and in Canada and the United States where they make up about 25%

and more of all working-age households (Figure 5.8). The share of this household type has increased across the board in all OECD countries under study, on average by almost 5 percentage points. By the mid-2000s, this household type accounted for more than 15% of all households in 20 out of the 23 countries under study. Some single-headed households are more likely to have low earnings (single parents) while others may more often be found among high earners (prime-age singles). An increase in the share of single-headed households therefore could contribute to widening the household earnings dispersion.

Figure 5.8. **The share of single-headed households has increased in all OECD countries**

Single-headed households in percentage of all working-age households, mid-1980s and mid-2000s



Note: Single-headed households refer to single parents with children under 18, singles and singles with unrelated adults. Sample refers to all working-age households (head 25-64 years old).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536534

5.4. Explaining changes in household earnings inequality

Decomposing changes: methodology and illustration

What were the relative contributions of each of these factors to the rise in inequality? The analysis below decomposes[16] the overall change in household earnings inequality among working-age households with at least one earner and assesses the relative impacts of changes in:

1. the dispersion of male earnings;
2. male employment rates;
3. female employment rates;
4. assortative mating, in terms of the earnings correlation between working spouses; and
5. household structure, according to five household types: *i)* couple households with children; *ii)* couple households without children; *iii)* single-parent households; *iv)* single unattached persons; and *v)* single persons with other adults.

Box 5.2. **An illustration of decomposition results: Canada**

This box provides a graphic presentation to illustrate the conditional reweighting and decomposition procedure introduced above and described in Chen *et al.* (2011), using Canadian data for 1987 and 2004 as an example. Panels A to E in the figure below display the density of equivalent household earnings for these two years in primary-order decomposition sequences. Each panel adjusts an additional modelled factor to its 1987 levels, and the impact of a given factor can then be assessed by comparing the differences between the counterfactual distribution with the actual and prior distribution.

The solid line and the dashed line in Panel A represent the original density of equivalent earnings for the years 1987 and 2004, respectively. They show that the distribution of household earnings across working-age households became more unequal in Canada over the years, as density moved from the middle to both tails. The increase in household earnings inequality in Canada is also documented by the summary indicators presented in Tables 5.1 and 5.A1.1 in Annex 5.A1. The dotted line in Panel A delineates the counterfactual density for 2004 with adjustment of men's earnings to 1987 levels. The differences between the dashed and dotted lines therefore reveal the effect of the changing dispersion of men's earnings alone. It shows that the distribution of equivalent household earnings would have been clearly less dispersed if the structure of men's earnings were held constant at its 1987 levels: the adjusted distribution moved density from both tails to the middle.

Panel B further adjusts for changes in the employment rate of men. The effect of changing the conditional distribution of men's labour supply appears to have had almost no impact. If any, it reduced the density in the lower half and marginally increased the mass in the upper middle of the distribution, suggesting a very limited contribution to the overall increase in household earnings inequality.

Panel C displays the sequential effect of the increase in women's employment rates. The entire adjusted density shifts uniformly toward the left with a relatively greater mass of density in the lower tail. This suggests that the increase in women's employment rates had an appreciable equalising effect as it reduced the density in the left and moved it to the middle and the upper part of the distribution. Panel C also suggests that the change in this factor likely contributed a notable gain in median income between these periods.

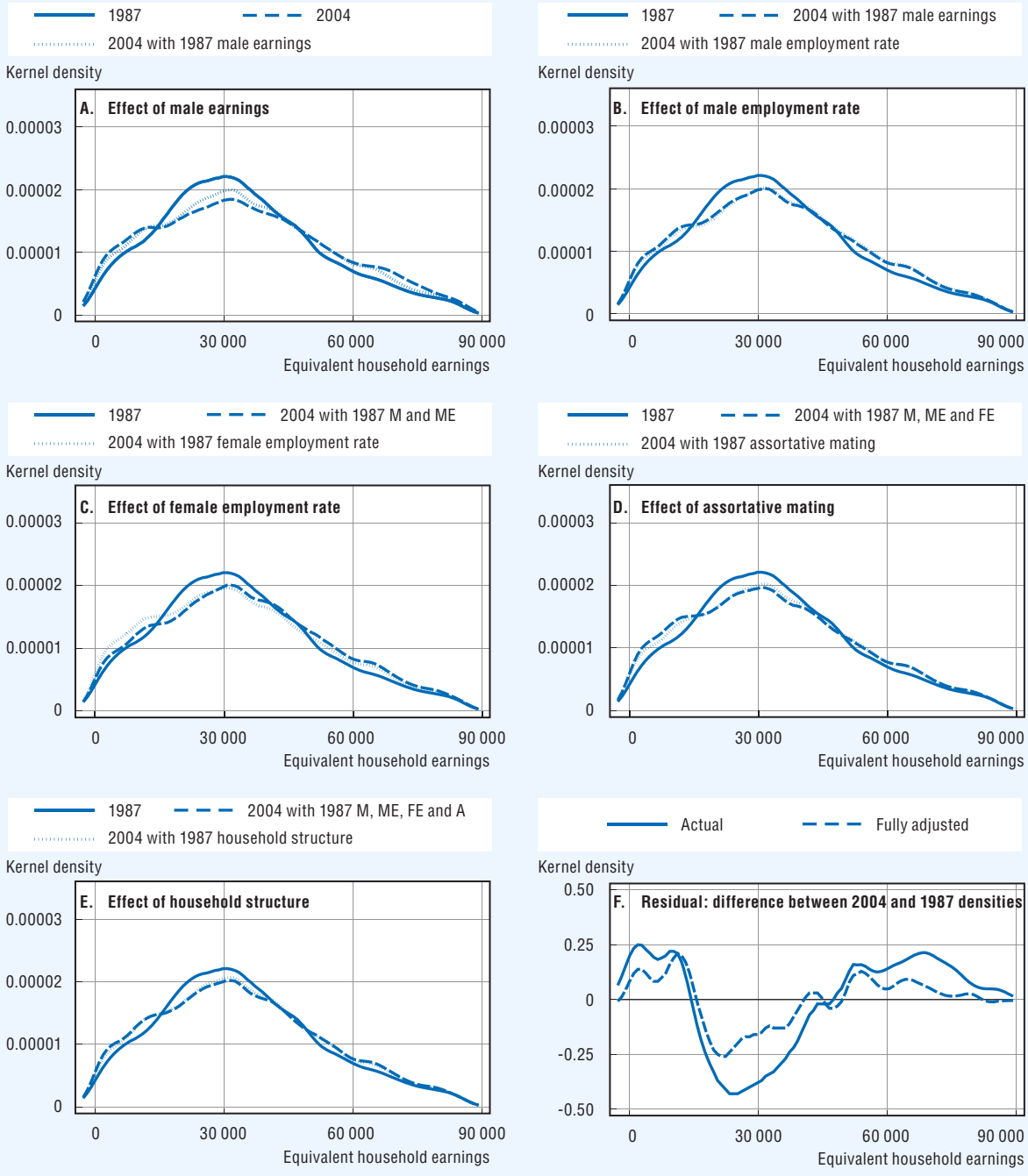
The effect of the growing tendency to assortative mating is shown in Panel D. The impact is more visible in the lower tail of the distribution as the adjusted distribution shifted density from the lower tail to the middle. Inequality would have been somewhat lower in the absence of trends to increased assortative mating. This indicates a disequalising effect of this factor though the effect appears lower than the factor of men's earnings dispersion (in Panel A above).

Panel E brings in the effect of the changing household structure. This seems to have had a fairly moderate but disequalising impact. The adjusted distribution appears to be less dispersed with a slightly reduced density mass in both tails and a corresponding increase of the mass in the middle of the distribution.

Finally, the residual effect is illustrated in Panel F, which displays the difference between the adjusted distribution (accounting for the five aforementioned factors) and the original 1987 distribution (*i.e.* the dashed line). If our controlled factors fully accounted for the observed change in the distribution of equivalent household earnings, we would have obtained a flat line instead. The difference between the dashed line and the flat line therefore represents the residuals. Compared with the difference between the actual distributions for 1987 and 2004 (solid line), Panel F shows that accounting for the five factors explains a substantial share in the changing distribution of household earnings between the two periods: the sizable mass that is presented at the bottom, middle and the upper portions of the 2004 distribution has greatly reduced.

Box 5.2. **An illustration of decomposition results: Canada** *(cont.)*

Density of equivalent household earnings, Canada (1987-2004), primary-order decomposition



Note: Samples are restricted to working-age households with positive household earnings. *M* refers to male earnings, *ME* and *FE* are male and female employment rates respectively, and *A* refers to assortative mating. Earnings are expressed in 2005 national currency.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

Results of the decomposition analysis

The quantitative assessment of the contribution of each explanatory factor to the changes in the distribution of household earnings is shown in Tables 5.1, in Panel A for countries reporting gross earnings and in Panel B for countries reporting net earnings. It is important to interpret results for the two samples of countries separately because first-order effects of changes to the tax system impact on changes in the distribution of *net*

Table 5.1. **Factors influencing changes in household earnings inequality**

Panel A. Countries reporting gross earnings

	Australia (1985, 2003)		Canada (1987, 2004)		Czech Republic (1992, 2004)		Denmark (1987, 2004)		Finland (1987, 2004)		Germany (1984, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.318	4.757	0.335	5.965	0.283	3.669	0.280	4.236	0.295	4.355	0.300	3.725
Recent year	0.350	5.815	0.389	8.222	0.336	4.954	0.302	4.837	0.322	5.380	0.353	6.687
Change	0.032	1.059	0.054	2.257	0.053	1.285	0.022	0.601	0.027	1.025	0.053	2.962
Contribution to change in inequality												
Primary-order decomposition												
1. Men's earnings dispersion	0.0173	0.288	0.0222	1.188	0.0049	0.0091	0.0092	0.311	0.0088	0.221	0.0227	1.589
	(.548)	(.272)	(.413)	(.526)	(.092)	(.007)	(.425)	(.517)	(.325)	(.215)	(.429)	(.537)
2. Male employment	0.0116	0.544	0.0037	0.138	0.0018	0.1548	0.0022	0.080	0.0071	0.358	0.0173	0.815
	(.367)	(.514)	(.070)	(.061)	(.034)	(.120)	(.099)	(.133)	(.261)	(.349)	(.326)	(.275)
3. Female employment	–0.0035	–0.241	–0.0134	–0.806	0.0073	0.2387	–0.0082	–0.337	0.0015	0.077	–0.0168	–0.622
	(–.112)	(–.227)	(–.249)	(–.357)	(.136)	(.186)	(–.380)	(–.561)	(.055)	(.075)	(–.317)	(–.210)
4. Assortative mating	0.0062	0.387	0.0082	0.595	–0.0035	–0.1164	0.0066	0.372	–0.0042	–0.200	0.0078	0.352
	(.197)	(.366)	(.152)	(.264)	(–.065)	(–.091)	(.306)	(.619)	(–.154)	(–.193)	(.147)	(.119)
5. Household structure	0.006	0.300	0.0043	0.393	0.0028	0.1385	0.0073	0.248	0.0041	0.249	0.0088	0.398
	(.190)	(.283)	(.080)	(.174)	(.053)	(.108)	(.338)	(.413)	(.152)	(.243)	(.167)	(.135)
6. Residual	–0.006	–0.219	0.0288	0.749	0.0402	0.8606	0.0046	–0.073	0.0098	0.319	0.0131	0.429
	(–.190)	(–.207)	(.535)	(.332)	(.750)	(.670)	(.212)	(–.121)	(.361)	(.311)	(.248)	(.145)

	Israel[1] (1986, 2005)		Netherlands (1987, 2004)		Norway (1986, 2004)		Sweden (1981, 2005)		United Kingdom (1986, 2004)		United States (1986, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.398	7.324	0.305	3.668	0.256	3.242	0.285	4.017	0.329	5.259	0.367	7.229
Recent year	0.432	9.130	0.326	4.831	0.322	5.630	0.331	5.609	0.384	7.255	0.420	7.988
Change	0.034	1.806	0.021	1.163	0.065	2.388	0.047	1.593	0.055	1.996	0.054	0.759
Contribution to change in inequality												
Primary-order decomposition												
1. Men's earnings dispersion	0.0155	0.732	0.0241	0.8352	0.0333	1.429	0.0204	0.690	0.0261	1.173	0.0246	0.625
	(.456)	(.408)	(1.122)	(.718)	(.509)	(.598)	(.439)	(.433)	(.474)	(.587)	(.459)	(.824)
2. Male employment	0.0144	0.475	–0.0023	–0.0574	0.0089	0.348	0.0088	0.412	0.0015	0.132	–0.0052	–0.298
	(.424)	(.264)	(–.108)	(–.049)	(.136)	(.146)	(.189)	(.258)	(.027)	(.066)	(–.098)	(–.393)
3. Female employment	–0.0203	–0.178	–0.0397	–0.4398	–0.0013	–0.020	–0.0038	–0.140	–0.0201	–0.722	–0.0037	–0.17
	(–0.597)	(–0.100)	(–1.852)	(–.378)	(–.021)	(–.008)	(–.082)	(–.088)	(–.364)	(–.362)	(–.069)	(–.225)
4. Assortative mating	0.0056	0.139	0.0051	0.2264	0.0057	0.160	0.0063	0.256	0.0064	0.322	0.0052	0.229
	(.165)	(.077)	(.236)	(.195)	(.088)	(.067)	(.134)	(.161)	(.117)	(.161)	(.098)	(.302)
5. Household structure	0.0011	0.168	0.0022	0.2273	0.0029	0.111	0.0055	0.194	0.001	0.292	0.0016	0.188
	(.034)	(.094)	(.104)	(.196)	(.045)	(.046)	(.117)	(.122)	(.018)	(.146)	(.029)	(.248)
6. Residual	0.0177	0.460	0.0321	0.3708	0.0159	0.361	0.0095	0.181	0.0402	0.800	0.0311	0.185
	(.518)	(.256)	(1.497)	(.319)	(.243)	(.151)	(.203)	(.113)	(.729)	(.401)	(.580)	(.244)

Table 5.1. **Factors influencing changes in household earnings inequality** *(cont.)*

Panel B. Countries reporting net earnings

	Austria (1994, 2004)		Belgium (1985, 2000)		France (1984, 2000)		Greece (1995, 2004)		Hungary (1994, 2005)		Ireland (1994, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.325	4.522	0.256	3.233	0.329	4.639	0.343	5.039	0.410	7.714	0.374	7.653
Recent year	0.334	4.597	0.278	3.439	0.358	5.878	0.346	5.000	0.387	7.427	0.361	6.632
Change	0.009	0.075	0.022	0.206	0.029	1.239	0.003	–0.039	–0.023	–0.287	–0.013	–1.021
Contribution to change in inequality												
Primary-order decomposition												
1. Men's earnings dispersion	0.0122	0.091	0.0203	0.042	0.0236	0.746	–0.001	–0.357	–0.0166	–2.410	–0.0050	–0.409
	(1.333)	(1.220)	(1.000)	(.202)	(.818)	(.602)	(–.152)	(8.925)	(.736)	(8.390)	(.371)	(.401)
2. Male employment	–0.0072	–0.346	0.0099	0.260	–0.0001	0.050	0.002	0.080	–0.0210	–2.210	0.0020	0.258
	(–.787)	(–4.63)	(.049)	(1.260)	(–.002)	(.040)	(.636)	(–2.000)	(.930)	(7.690)	(–.150)	(–.253)
3. Female employment	–0.0110	–0.227	–0.0258	–0.491	–0.0230	–0.420	–0.017	–0.578	0.0033	0.242	–0.0151	–0.620
	(–1.20)	(–3.04)	(–1.28)	(–2.38)	(–.800)	(–.339)	(–5.061)	(14.450)	(–.145)	(–.844)	(1.13)	(.608)
4. Assortative mating	0.0021	–0.101	0.0083	0.166	0.0029	–0.036	0.011	0.249	–0.0029	–0.520	0.0026	0.029
	(.232)	(–1.35)	(.411)	(.808)	(.102)	(–.029)	(3.364)	(–6.225)	(.127)	(1.810)	(–.197)	(–.028)
5. Household structure	–0.0001	0.059	–0.0050	–0.097	0.0018	0.115	0.000	0.093	0.0035	1.255	0.0010	0.245
	(–.016)	(.786)	(–.245)	(–.469)	(.062)	(.092)	(.121)	(–2.325)	(–.154)	(–4.37)	(–.078)	(–.240)
6. Residual	0.0131	0.599	0.0126	0.325	0.0236	0.786	0.007	0.473	0.0112	3.350	0.0010	–0.524
	(1.430)	(8.010)	(.620)	(1.580)	(.820)	(.634)	(2.091)	(–11.825)	(–.495)	(–11.7)	(–.078)	(.513)

	Italy (1987, 2004)		Luxembourg (1985, 2004)		Mexico (1984, 2004)		Poland (1992, 2004)		Spain (1990, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.325	4.155	0.254	3.204	0.454	9.700	0.331	4.962	0.325	4.748
Recent year	0.363	5.190	0.340	5.363	0.472	10.230	0.408	7.497	0.331	5.073
Change	0.038	1.035	0.086	2.159	0.018	0.533	0.076	2.535	0.007	0.325
Contribution to change in inequality										
Primary-order decomposition										
1. Men's earnings dispersion	0.0213	0.642	0.0218	1.087	0.0014	–1.316	0.0302	1.231	0.0083	0.261
	(.556)	(.620)	(.254)	(.503)	(.082)	(–2.47)	(.396)	(.486)	(1.270)	(.802)
2. Male employment	0.0052	0.168	0.0033	0.134	0.0019	0.419	–0.006	–0.098	–0.0018	–0.035
	(.136)	(.163)	(.038)	(.062)	(.109)	(.787)	(–.079)	(–.038)	(–.272)	(–.107)
3. Female employment	–0.0082	–0.11	–0.0196	–0.235	–0.0096	–1.411	–0.0025	–0.091	–0.0158	–0.233
	(–.213)	(–.106)	(–.228)	(–.109)	(–.544)	(–2.65)	(–.033)	(–.036)	(–2.43)	(–.715)
4. Assortative mating	0.0134	0.28	0.0221	0.43	0.0137	1.695	0.0106	0.2843	0.0165	0.465
	(.349)	(.270)	(.257)	(.199)	(.778)	(3.181)	(.139)	(.112)	(2.530)	(1.430)
5. Household structure	0.0003	0.066	0.0028	0.086	0.0058	0.0902	0.0061	0.367	0.0017	0.09
	(.007)	(.063)	(.032)	(.040)	(.331)	(.169)	(.080)	(.145)	(.253)	(.277)
6. Residual	0.0063	–0.011	0.0555	0.657	0.0043	1.056	0.0378	0.841	–0.0023	–0.223
	(.164)	(–.011)	(.647)	(.304)	(.245)	(1.982)	(.495)	(.332)	(–.355)	(–.686)

Note: Numbers in parentheses show the share of the explained change in the total change.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

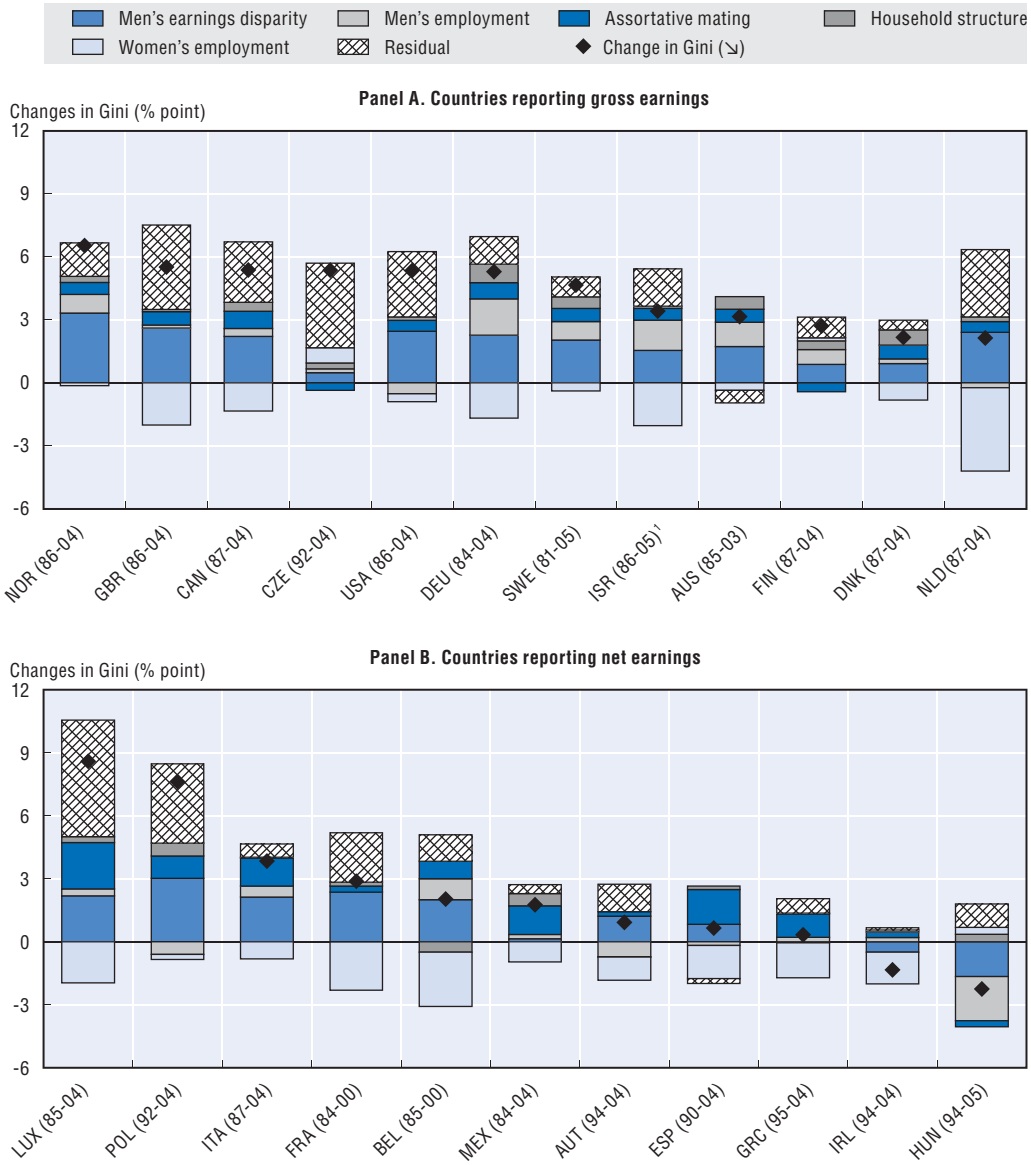
StatLink http://dx.doi.org/10.1787/888932537788

earnings but have not been modelled in the decomposition – these effects will thus appear in the unobserved residuals, to the contrary of the first country panel.

The first three rows of Table 5.1 display the levels and changes of inequality for two alternative summary inequality indicators, the Gini coefficient and the D9/D1 ratio. Decomposition results are presented in the following rows:[17] these numbers show the

amount of change that can be attributed to changes in the explanatory factors, and in parentheses report each factor's contribution to the total change in the household inequality measures. Visual presentations of these contributions to changes in the Gini coefficient are presented in Figure 5.9.

Figure 5.9. **Explaining changes in household earnings inequality: contributions of labour market and demographic factors**



Note: Samples are restricted to the working-age population (25-64 years) living in a household with a working-age head. Equivalent household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536553

Among countries reporting gross earnings, four main findings emerge from the summary presentation in Panel A, Figure 5.9. First, the increase in men's earnings disparities is the main factor driving household earnings inequality, contributing between one third and half to the overall increase. Second, the increase in women's employment had an equalising effect in all countries. Third, the effect of changing men's employment rates had little impact on the trend in household earnings inequality, with the exceptions of Israel, Germany and Australia. Fourth, demographic factors (assortative mating and household structure changes), while contributing positively to increased household earnings inequality, had much more modest effects. These patterns hold for all countries. Finally, the contribution of other factors not captured here ("residuals") is higher in the United Kingdom, the Czech Republic and the United States and lower in the Nordic countries. These results suggest a more modest contribution of demographic relative to labour-market factors and are generally in line with findings from country-specific studies in many respects.[18]

There is more diversity across the sample of countries for which only net earnings estimates are available. Overall changes in household earnings inequality ranged from an increase of over 8 percentage points (Luxembourg) to a 1- to 2-point decrease in Ireland and Hungary (for the specificity of Hungarian results, see Box 5.3). Demographic factors had more of an impact on trends in household earnings inequality than among the panel of countries reporting gross earnings above, in particular in Luxembourg, Mexico, Greece and Spain. Nonetheless, the increase in men's earnings disparities remains the main contributor to household earnings inequality in five of the eleven countries. The rise in women's employment rates had a sizeable equalising effect, especially in France, Belgium and Luxembourg. The extent of unobserved factors impacting overall inequality (the

Box 5.3. **The specificity of decomposition results for Hungary**

Hungary stands out among all countries under study as it has registered a moderate decline in household earnings inequality between 1994 and 2005. The moderate fall in earnings inequality is according to some authors linked to a series of policy reforms in 2002/03 which raised the wages of all public sector employees (approximately 20% of the Hungarian labour force) by 50%. Telegdy (2006) documented that prior to the change the wages of civil servants were lagging behind the salaries earned in the private sector in all occupation groups and at every educational level. The findings above suggest that the changing structure of men's earnings alone has led to a 1.7 percentage point decline in the Gini coefficient of households net earnings during this period, accounting thus for three quarters of the decline.

Moreover, given the fact that the public sector often favours employees from more disadvantaged groups (such as new entrants, women and the elderly), the wage increase may induce higher participation among these groups, and in turn reduce earnings inequality. This is confirmed in the results above in that the increase in men's labour supply further contributed a large part to the decrease in the Gini coefficient.

Finally, despite a tendency toward assortative mating which matches the OECD average, this factor also contributed to decreasing household net earnings inequality. On the other hand, household structure changes drove earnings inequality up, as did changes in the employment rates of women: Hungary is the only country in the sample in which the employment rate of men grew more than that of women (twice as much).

residual) is higher among most of the countries in this sample, as the net earnings include the effect of changes to the tax system.

Robustness analysis

One potential problem of the decomposition technique applied above is that the estimated impacts of explanatory factors rely on assumptions about the *particular order* for the primary decomposition. For instance, the analysis considered household structure last in the decomposition as it assumes that changes in this factor do not affect labour market choices, but that changes in labour market outcomes (*e.g.* women's labour force participation) do affect family formation, *e.g.* by delaying fertility decisions and thus influencing household structures. Similarly, the approach above places women's participation before assortative mating in the decomposition order, assuming that the change in the degree of marital sorting does not have an impact on women's participation decisions. In reality, men's and women's employment rates as well as assortative mating are interdependent.

Although the preceding "primary" order seems a reasonable way to proceed and has been applied in similar types of analyses, it may still over- or underestimate some impacts if there is joint causation in the distribution of factors under examination. For instance, increasing marital sorting might increase (or decrease) the chance of family dissolution and thus have influence on household structures. On the other hand, it can also be argued that it is the change to the household structure that made marital sorting more feasible. To address such possibilities and the sensitivity of the results, estimates from a reverse order decomposition are presented in Tables 5.A1.2 in the Annex 5.A1.[19]

The sensitivity analysis shows that results are robust. The increased dispersion of men's earnings remains the most important factor in accounting for household earnings inequality even when it is considered last in the decomposition. Its quantitative impacts are roughly the same as in the primary order analysis. The impact of the changing household structure is somewhat larger in magnitude, at the expense of assortative mating and women's employment, suggesting that these three factors are likely to be interdependent. Nevertheless, the inequality-reducing effect of rising female employment remained visible in most countries.

5.5. Summary and conclusions

What does the increase in earnings inequality among individuals mean for people living together with others in the same household? A number of factors may contribute, *e.g.* how much other members of the household earn, how much both spouses work, how many households are single-headed, and whether rich men marry high-earning women or not. While these factors may have an impact, the main reasons for rising household earnings inequality are to be found in the labour markets.

Separate analysis of two samples of OECD countries (one reporting estimates of gross earnings, the other net earnings only) shows that in the past two decades, household earnings inequality among working households has increased in all countries except Ireland and Hungary. Its levels vary widely across countries. The Gini coefficients of household gross earnings inequality range from 0.30 in Denmark to 0.43 in Israel, while there were increases of over 5 percentage points in Canada, the Czech Republic, Germany, the United Kingdom, the United States, and Norway. In countries reporting net earnings, Gini coefficients vary from 0.28 in Belgium to 0.47 in Mexico.

The analysis in the chapter looks at the underlying reasons for increasing household earnings inequality and considers the contribution of three labour market factors – changes in men's earnings dispersion, men's employment rates, women's employment rates – and two demographic factors – trends in assortative mating and household structure, on the other.

Male earnings have become more polarised in 20 of the 23 countries. In ten of them, polarisation was due to an increase in real earnings in the top decile combined with a decrease in the bottom decile. Female employment rates have substantially increased since the mid-1980s, especially in countries with low starting levels. The increase exceeds 10 percentage points in 14 out of 23 countries under study, with the strongest increases in the Netherlands, Luxembourg and Spain. In most countries, the rise in employment rates among the wives of men was greater in the top than in the bottom earnings decile.

Increasingly, people are married to spouses with similar earnings levels, known as "assortative mating". This trend was observed in all countries bar the Czech Republic and Finland. On average assortative mating increased by two to 6 percentage points, depending on whether a stricter or broader definition is used. Further, the share of single-headed (*i.e.* single-parent, single unattached, or single with unrelated) households has grown in all OECD countries under study by an average of 5 percentage points.

Decomposition analysis to determine the relative contribution of the different factors to increasing earnings inequality yields three main findings. First, the increase in men's gross earnings disparities is the main factor driving household gross earnings inequality, contributing between one-third and one-half to the overall increase. Second, the increase in women's employment had an equalising effect in all countries. Third, demographic factors (*i.e.* assortative mating and changes in household structure) contributed to greater inequality in gross household earnings, albeit to a much lesser extent. The findings are similar for countries for which only household net earnings estimates are available. Sensitivity analyses confirm that these results are robust.

Notes

1. Their impact on overall income inequality is the topic of Chapter 6.
2. The effects of changing family formation practices have been identified in some case studies as a main culprit for increased household earnings and income inequality (*e.g.* Myles, 2010 for Canada), while other studies attribute marginal explanatory power to this phenomenon (*e.g.* Worner, 2006 for Australia or Schwartz, 2010 for the United States).
3. For 11 of the 23 countries included in the analysis and shown in Panel B of Figure 5.1, only net rather than gross earnings were available. It means that in these countries, the changes in any state redistribution (transfers and taxes) would also be captured here. The chapter does not, however, analyse the role and contribution of tax/transfer policies explicitly. As levels and trends in the distribution of earnings, as well as the contributions of driving factors, will be different for gross than for net earnings, the two groups of countries are discussed separately below.
4. This uses an equivalence scale with the square root of total household size. Note that this indirectly brings in the total household context, *i.e.* children and elderly people sharing the household. The analysis remains restricted to working-age persons but their economic welfare through earnings will be determined not only by the number of other earners and their earnings but also by the number of all other household members.
5. 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.

6. Female wage dispersion is not included in the analytical framework as the evolution of women's wage distribution ties closely to rising women's labour force participation which is one of the labour-market related behavioural changes that is investigated. Because of this correlation, past empirical research similarly did not include women's wage dispersion in such decomposition analyses (*e.g.* Daly and Valletta, 2006).

7. There are other factors that are not considered in the analysis below because of lack of data which may affect trends in the distribution of household earned income. One example is changes in the composition of the workforce driven by international migration. Empirical studies on the impact of migration on wage disparities remain largely inconclusive (see, for example, Borjas *et al.,* 1997; Card, 2005).

8. Summary statistics are reported in Tables 5.A1.1 of the annex.

9. These include full-time and part-time earnings, as well as income from self-employment.

10. Note that the employment rates here refer to the proportion of workers in the working-age population. Workers are defined as persons who receive positive annual earnings regardless of the hours and weeks worked. This is different from the common LFS definition that defines employment as working at least one hour during a brief period (either one week or one day).

11. Increases in female employment rate have been smaller in countries with already high female labour force participation such as the Nordic countries.

12. The parallel growth of both men in employment and unemployment rates in these two economies may be due to increased labour force participation, in particular from inactivity to unemployment.

13. The extent of marital sorting may well reflect a more general pattern of educational (or occupational) homogamy. Therefore, another strand of research on assortative mating uses measures of husbands' and wives' education levels (see, for instance, Worner, 2006).

14. That is, we first create decile categories for men's and women's earnings distributions, separately, for all workers. Then we assign a husband (wife) to earnings decile i if his (her) annual earnings falls into decile i of men's (women's) earnings distribution. This can be presented by cross-tabulations (10x10) showing husbands' and wives' earnings deciles for each year, respectively. The most rudimentary measure of assortative mating therefore is simply the summation of the diagonal elements.

15. These results are in line with findings in other empirical literature and country studies that used educational homogamy (usually 5 categories) as a measure for assortative mating. See, for instance, Halpin and Chan (2002) for the United Kingdom, and Worner (2006) for Australia.

16. The decomposition method is based on Daly and Valletta (2006) and DiNardo *et al.* (1996). It starts by developing a counterfactual earnings distribution keeping driving factors, other than family formation, constant. The difference between this counterfactual earnings distribution and actual earnings inequality then represents a starting point for understanding the role of family formation. The impacts of other factors are then obtained based on the "conditional re-weighting procedure". This technique has been used in recent studies (*e.g.* Chen and Corak, 2008; Daly and Valletta, 2006; Chiquiar and Hanson, 2005) and is similar in spirit to the Oaxaca-Blinder decomposition (Oaxaca, 1973). The decomposition technique applied below is described in detail in Chen *et al.* (2011).

17. The decomposition proceeds according to the primary order of effects as described in Table B2.1 in Chen *et al.* (2011).

18. Daly and Valletta (2006), for instance, found that men's earnings contributed the largest share to the change in equivalent family *income* between 1969 and 1989 in the United States (64%), that rising female labour supply had a moderate equalising effect and changing family structures had a disequalising effect. Pencavel (2006) also drew similar conclusions from United States data for 1968 to 2001, with assortative mating playing a negligible role in accounting for the growth in family earnings inequality over time. For Canada, Lu *et al.* (2011) showed that 22% of the increase in family earnings inequality between 1980 and 2005 was explained by changing men's wage dispersion, while demographic changes played a rather moderate role. Worner (2006) found that 2-6% of the increase in inequality of household weekly gross earnings between 1986 and 2003 in Australia can be attributed to assortative mating, a contribution increasing to 4-7% for a broader definition. By contrast, changing patterns in labour force participation explain roughly one third of the increase in earnings inequality.

19. The derivation of re-weighting functions for reverse-order decomposition is described in Chen *et al.* (2011).

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ANNEX 5.A1

Additional Tables and Figures

Table 5.A1.1. **Labour market and family formation factors impacting on household earnings inequality**

Panel A. Countries reporting gross earnings

	Australia		Canada		Czech Republic		Denmark		Finland		Germany	
	1985	2003	1987	2004	1992	2004	1987	2004	1987	2004	1984	2004
Gini of household equivalent earnings	0.318	0.35	0.335	0.389	0.283	0.336	0.28	0.302	0.295	0.322	0.309	0.353
1. Labour market factors												
Share of males working	0.85	0.8	0.91	0.89	0.85	0.86	0.89	0.86	0.9	0.85	0.9	0.87
Share of females working	0.58	0.64	0.71	0.78	0.72	0.7	0.79	0.82	0.86	0.84	0.55	0.75
Change in annual earnings of men	–2.5%		–4.2%		54.1%		9.1%		27.3%		9.6%	
At the bottom 10%	17.6%		–26.6%		33.3%		–4.6%		14.9%		–39.2%	
At the top 10%	14.1%		14.5%		70.2%		13.4%		30.8%		18.5%	
2. Family formation factors												
Household structure												
% Couple with kids under 18	61.5	51.3	56.2	47.1	61.3	47.5	55.4	49	54.4	47.9	52.5	45.5
% Couple w/o kids under 18	21.3	27.1	23.5	27.4	25.1	35.6	24.3	25.5	24.9	29.1	31.1	31.8
% Single parent	5.5	9.2	6.8	8.4	5.6	6	6.4	8.9	5.3	6.7	4.3	6.9
% Single or other household types	11.7	12.4	13.5	17.1	8	10.9	13.9	16.6	15.4	16.3	12.1	15.8
Assortative mating (all couple households)												
Wives' employment rates												
Husbands earnings in the top decile	0.66	0.64	0.70	0.80	0.81	0.84	0.81	0.91	0.89	0.92	0.47	0.72
Husbands earnings in the bottom decile	0.68	0.70	0.74	0.72	0.72	0.66	0.68	0.78	0.82	0.79	0.63	0.79
% of spouses in the same decile	15.7	17.4	10.8	13.1	16.8	18.2	12.3	15.1	14.3	14.3	10.6	14.6
% of spouses within (+/–2) deciles	40.3	45.6	40.8	47.7	51.3	49.9	45.6	52.2	52.3	49.2	36.0	39.4

	Israel[1]		Netherlands		Norway		Sweden		United Kingdom		United States	
	1986	2005	1987	2004	1986	2004	1981	2005	1986	2004	1986	2004
Gini of household equivalent earnings	0.398	0.432	0.307	0.326	0.256	0.322	0.285	0.331	0.329	0.384	0.367	0.42
1. Labour market factors												
Share of males working	0.83	0.78	0.81	0.86	0.95	0.90	0.94	0.89	0.80	0.81	0.82	0.87
Share of females working	0.48	0.62	0.38	0.70	0.82	0.86	0.86	0.85	0.50	0.69	0.68	0.74
Change in annual earnings of men	–1.9%		11.4%		20.1%		42.9%		44.1%		–1.3%	
At the bottom 10%	–9.5%		–32.7%		–45.1%		12.0%		19.4%		–3.3%	
At the top 10%	20.2%		14.8%		35.3%		60.0%		67.0%		17.8%	
2. Family formation factors												
Household structure												
% Couple with kids under 18	79.4	69.8	60.0	53.1	57.3	51.9	55.5	47.8	58.5	45.9	53.7	50.4
% Couple w/o kids under 18	11.1	17.6	25.5	29.6	21.2	23.8	21.5	23.4	25.0	30.8	22.0	23.1
% Single parent	4.9	5.7	4.5	4.8	8.8	8.9	7.3	9.7	7.4	10.6	11.5	12.7
% Single or other household types	4.6	6.9	10.0	12.5	12.7	15.4	15.8	19.1	9.2	12.7	12.8	13.8
Assortative mating (all couple households)												
Wives' employment rates												
Husbands earnings in the top decile	0.59	0.73	0.35	0.69	0.78	0.87	0.89	0.95	0.52	0.69	0.52	0.64
Husbands earnings in the bottom decile	0.32	0.63	0.33	0.65	0.83	0.80	0.80	0.82	0.49	0.67	0.69	0.71
% of spouses in the same decile	15.4	21.5	14.3	13.9	8.6	12.6	10.4	13.7	20.2	17.5	14.2	12.4
% of spouses within (+/–2) deciles	44.9	51.4	35.5	43.9	39.1	47.8	44.0	50.2	43.2	48.3	42.4	45.5

Table 5.A1.1. **Labour market and family formation factors impacting on household earnings inequality** *(cont.)*

Panel B. Countries reporting net earnings

	Austria		Belgium		France		Greece		Hungary		Ireland	
	1994	2004	1985	2000	1984	2000	1995	2004	1994	2005	1994	2004
Gini of household equivalent earnings	0.325	0.334	0.256	0.278	0.329	0.358	0.343	0.346	0.41	0.387	0.374	0.361
1. Labour market factors												
Share of males working	0.82	0.85	0.80	0.73	0.71	0.85	0.80	0.84	0.62	0.71	0.81	0.80
Share of females working	0.56	0.67	0.41	0.59	0.48	0.70	0.38	0.51	0.54	0.58	0.47	0.62
Change in annual earnings of men	2.4%		27.4%		–2.0%		23.4%		2.0%		34.2%	
At the bottom 10%	8.3%		13.4%		–25.0%		18.0%		20.8%		86.6%	
At the top 10%	18.1%		30.0%		7.6%		20.9%		–16.9%		29.1%	
2. Family formation factors												
Household structure												
% Couple with kids under 18	53.9	48.8	52.2	55.9	59.0	56.5	57.0	51.7	55.9	46.9	70.1	55.2
% Couple w/o kids under 18	29.0	29.9	38.9	27.5	28.7	26.0	29.6	33.7	26.1	31.3	15.4	51.7
% Single parent	5.5	5.6	2.7	6.3	4.1	6.7	3.0	2.7	6.8	6.0	5.4	11.3
% Single or other household types	11.6	15.8	6.2	10.3	8.2	10.8	10.4	11.9	11.2	15.8	9.2	11.8
Assortative mating (all couple households)												
Wives' employment rates												
Husbands earnings in the top decile	0.58	0.69	0.34	0.52	0.44	0.65	0.37	0.46	0.69	0.54	0.30	0.61
Husbands earnings in the bottom decile	0.52	0.72	0.53	0.54	0.49	0.65	0.34	0.46	0.56	0.59	0.43	0.52
% of spouses in the same decile	17.8	18.1	17.8	22.2	23.8	16.2	16.0	17.5	25.3	25.7	18.1	17.6
% of spouses within (+/–2) deciles	45.6	46.0	40.0	49.1	50.6	50.4	43.6	49.0	55.3	55.0	43.9	44.2

	Italy		Luxembourg		Mexico		Poland		Spain	
	1987	2004	1985	2004	1984	2004	1992	2004	1990	2004
Gini of household equivalent earnings	0.325	0.363	0.254	0.34	0.454	0.472	0.331	0.408	0.325	0.331
1. Labour market factors										
Share of males working	0.83	0.82	0.84	0.87	0.93	0.92	0.67	0.78	0.91	0.86
Share of females working	0.38	0.54	0.31	0.62	0.31	0.48	0.48	0.60	0.31	0.59
Change in annual earnings of men	0.7%		72.3%		9.1%		0.6%		8.5%	
At the bottom 10%	–18.5%		16.1%		73.9%		–27.7%		7.6%	
At the top 10%	1.8%		115.0%		24.9%		17.5%		13.4%	
2. Family formation factors										
Household structure										
% Couple with kids under 18	60.3	48.3	60.1	54.2	83.8	70.6	69.9	60.7	68.5	50.2
% Couple w/o kids under 18	30.6	35.0	27.9	30.5	4.1	10.6	17.0	23.6	23.0	36.8
% Single parent	2.4	3.1	4.1	4.0	9.8	14.0	5.2	6.7	3.3	3.3
% Single or other household types	6.7	13.5	7.9	11.4	2.3	4.8	7.9	9.0	5.2	9.7
Assortative mating (all couple households)										
Wives' employment rates										
Husbands earnings in the top decile	0.33	0.63	0.25	0.53	0.20	0.46	0.33	0.54	0.32	0.56
Husbands earnings in the bottom decile	0.43	0.41	0.50	0.71	0.30	0.36	0.33	0.49	0.34	0.60
% of spouses in the same decile	17.0	20.6	12.5	14.5	9.7	11.1	13.8	17.8	15.8	17.2
% of spouses within (+/–2) deciles	45.2	53.8	33.8	44.6	35.1	40.7	40.1	47.3	38.0	46.6

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537826

Table 5.A1.2. **Factors influencing on changes in household earning inequality, robustness test**

Panel A. Countries reporting gross earnings

	Australia (1985, 2003)		Canada (1987, 2004)		Czech Republic (1992, 2004)		Denmark (1987, 2004)		Finland (1987, 2004)		Germany (1984, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.318	4.757	0.335	5.965	0.283	3.669	0.28	4.236	0.295	4.355	0.300	3.725
Recent year	0.350	5.815	0.389	8.222	0.336	4.954	0.302	4.837	0.322	5.38	0.353	6.687
Change	0.032	1.059	0.0538	2.257	0.053	1.285	0.0217	0.601	0.0271	1.025	0.053	2.962
Contribution to change in inequality												
Reverse-order decomposition												
1. Household structure	0.0189	0.855	0.0028	0.376	–0.0036	0.035	0.0095	0.453	0.0052	0.294	0.0133	0.993
	(.600)	(.808)	(.052)	(.167)	(–.067)	(.027)	(.437)	(.754)	(.193)	(.287)	(.251)	(.335)
2. Assortative mating	0.0003	0.088	0.0029	0.147	0.0004	–0.0067	0.0012	0.080	–0.0005	–0.015	0.0015	–0.0127
	(.008)	(.083)	(.054)	(.065)	(.007)	(–.005)	(.057)	(.133)	(–.017)	(–.015)	(.029)	(–.004)
3. Female employment	–0.0037	–0.085	–0.0053	–0.320	0.0036	0.1835	–0.0057	–0.197	0.0021	0.089	–0.0083	–0.591
	(–.116)	(–.080)	(–.099)	(–.142)	(.066)	(.143)	(–.263)	(–.328)	(.079)	(.086)	(–.157)	(–.199)
4. Male employment	0.0033	0.127	0.0014	0.168	0.002	0.1284	0.0026	0.112	0.0026	0.089	0.0051	0.497
	(.104)	(.119)	(.025)	(.074)	(.037)	(.100)	(.121)	(.186)	(.095)	(.087)	(.096)	(.168)
5. Men's earnings dispersion	0.0187	0.292	0.0233	1.138	0.0111	0.0846	0.0094	0.226	0.0079	0.250	0.0283	1.646
	(.593)	(.276)	(.433)	(.504)	(.208)	(.066)	(.435)	(.377)	(.290)	(.243)	(.535)	(.556)
6. Residual	–0.006	–0.219	0.0288	0.749	0.0402	0.861	0.0046	–0.073	0.0098	0.319	0.0131	0.429
	(–.190)	(–.207)	(.535)	(.332)	(.750)	(.670)	(.212)	(–.121)	(.361)	(.311)	(.248)	(.145)

	Israel[1] (1986, 2005)		Netherlands (1987, 2004)		Norway (1986, 2004)		Sweden (1981, 2005)		United Kingdom (1986, 2004)		United States (1986, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.398	7.324	0.305	3.668	0.256	3.242	0.285	4.017	0.329	5.259	0.367	7.229
Recent year	0.432	9.130	0.326	4.831	0.322	5.630	0.331	5.609	0.384	7.255	0.420	7.988
Change	0.034	1.806	0.021	1.163	0.065	2.388	0.047	1.593	0.055	1.996	0.054	0.759
Contribution to change in inequality												
Reverse-order decomposition												
1. Household structure	0.0113	0.741	–0.0018	0.0583	0.0178	1.224	0.0157	1.034	0.0079	0.552	–0.0019	0.0062
	(.331)	(.412)	(–.082)	(.050)	(.273)	(.512)	(.337)	(.649)	(.143)	(.277)	(–.036)	(.008)
2. Assortative mating	0.0014	–0.009	0.0008	0.004	0.002	0.196	0.0011	–0.01	0.0017	0.059	0.0071	0.297
	(.041)	(–.005)	(.039)	(.003)	(.030)	(.082)	(.024)	(–.007)	(.030)	(.030)	(.133)	(.392)
3. Female employment	–0.0171	–0.256	–0.0382	–0.7931	–0.0048	–0.160	–0.0007	–0.056	–0.0172	–0.701	–0.006	–0.310
	(–0.502)	(–.142)	(–1.782)	(–.682)	(–.074)	(–.067)	(–.015)	(–.035)	(–.312)	(–.351)	(–.111)	(–.408)
4. Male employment	0.0053	0.301	–0.0024	–0.2218	0.002	0.097	0.0022	0.094	–0.0001	–0.009	–0.0022	0.0093
	(.157)	(.167)	(–.110)	(–.182)	(.030)	(.041)	(.046)	(.059)	(–.001)	(–.004)	(–.041)	(.012)
5. Men's earnings dispersion	0.0155	0.560	0.0308	1.7343	0.0325	0.670	0.0189	0.35	0.0227	1.295	0.0254	0.570
	(.455)	(.312)	(1.438)	(1.492)	(.497)	(.281)	(.405)	(.220)	(.411)	(.649)	(.474)	(.752)
6. Residual	0.0177	0.460	0.0321	0.3708	0.0159	0.361	0.0095	0.181	0.0402	0.800	0.0311	0.185
	(.518)	(.256)	(1.497)	(.319)	(.243)	(.151)	(.203)	(.113)	(.729)	(.401)	(.580)	(.244)

Table 5.A1.2. **Factors influencing on changes in household earning inequality, robustness test** *(cont.)*

Panel B. Countries reporting net earnings

	Austria (1994, 2004)		Belgium (1985, 2000)		France (1984, 2000)		Greece (1995, 2004)		Hungary (1994, 2005)		Ireland (1994, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.325	4.522	0.256	3.233	0.329	4.639	0.343	5.039	0.41	7.714	0.374	7.653
Recent year	0.334	4.597	0.278	3.439	0.358	5.878	0.346	5	0.387	7.427	0.361	6.632
Change	0.0092	0.075	0.022	0.206	0.0288	1.239	0.0033	–0.039	–0.0225	–0.287	–0.013	–1.021
Contribution to change in inequality												
Reverse-order decomposition												
1. Household structure	–0.0065	–0.365	0.0053	–0.020	0.0039	0.197	0.0102	0.360	–0.0083	–2.540	–0.0022	0.156
	(–.714)	(–4.88)	(.264)	(–.097)	(.135)	(.159)	(3.050)	(–9.10)	(.369)	(8.850)	(.167)	(–.153)
2. Assortative mating	–0.0018	–0.131	–0.0018	0.008	–0.002	–0.004	–0.0056	–0.295	–0.0037	–0.012	0.0025	0.0812
	(–.199)	(–1.75)	(–.088)	(.039)	(–.069)	(–.003)	(–1.66)	(7.520)	(.162)	(.040)	(–.185)	(–.080)
3. Female employment	–0.0052	–0.044	–0.0178	–0.042	–0.0207	–0.448	–0.0046	–0.015	0.0022	–0.031	–0.008	–0.205
	(–.566)	(–.592)	(–.878)	(–.205)	(–.718)	(–.362)	(–1.38)	(.392)	(–.098)	(.107)	(.602)	(.201)
4. Male employment	–0.0007	–0.043	0.0049	0.049	–0.0023	–0.103	0.0007	–0.010	–0.0085	–0.562	0.005	0.218
	(–.071)	(–.574)	(.242)	(.236)	(–.079)	(–.083)	(.216)	(.262)	(.376)	(1.960)	(–.389)	(–.214)
5. Men's earnings dispersion	0.0102	0.059	0.017	–0.113	0.0263	0.811	–0.0044	–0.552	–0.0155	–0.494	–0.012	–0.747
	(1.120)	(.788)	0.841	(–.550)	(.912)	(.655)	(–1.30)	(14.09)	(.686)	(1.720)	(.884)	(.732)
6. Residual	0.0131	0.599	0.0126	0.325	0.0236	0.786	0.0069	0.473	0.0112	3.35	0.001	–0.524
	(1.430)	(8.010)	(.620)	(1.580)	(.820)	(.634)	(2.080)	(–12.1)	(–.495)	(–11.7)	(–.078)	(.513)

	Italy (1987, 2004)		Luxembourg (1985, 2004)		Mexico (1984, 2004)		Poland (1992, 2004)		Spain (1990, 2004)	
	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1	Gini	D9/D1
Early year	0.325	4.155	0.254	3.204	0.454	9.7	0.331	4.962	0.325	4.748
Recent year	0.363	5.19	0.34	5.363	0.472	10.23	0.408	7.497	0.331	5.073
Change	0.0384	1.035	0.0859	2.159	0.0176	0.533	0.0762	2.535	0.0065	0.325
Contribution to change in inequality										
Reverse-order decomposition										
1. Household structure	0.0112	0.524	0.0142	0.446	0.0132	0.607	0.0053	0.357	–0.0006	0.116
	(.293)	(.506)	(.166)	(.206)	(.746)	(1.140)	(.069)	(.141)	(–.090)	(.357)
2. Assortative mating	0.0023	0.038	–0.0111	–0.295	–0.0029	–0.127	0.0097	0.269	–0.0002	–0.046
	(.059)	(.037)	(–.129)	(–.137)	(–.165)	(–.238)	(.128)	(.106)	(–.038)	(–.140)
3. Female employment	–0.0051	–0.172	–0.0055	0.192	0.001	0.0107	–0.0069	–0.163	0.0012	0.212
	(–.133)	(–.166)	(–.064)	(.089)	(.057)	(.020)	(–.090)	(–.064)	(.178)	(.650)
4. Male employment	0.0029	0.178	0.0002	0.000	0.0002	0.248	–0.0013	–0.059	0.0016	0.07
	(.076)	(.172)	(.002)	(.000)	(.009)	(.466)	(–.016)	(–.023)	(.246)	(.215)
5. Men's earnings dispersion	0.0208	0.478	0.0326	1.159	0.0019	–1.263	0.0317	1.29	0.0069	0.196
	(.542)	(.462)	(.380)	(.537)	(.108)	(–2.369)	(.416)	(.509)	(1.060)	(.604)
6. Residual	0.0063	–0.011	0.0555	0.657	0.0043	1.056	0.0378	0.841	–0.0023	–0.223
	(.164)	(–.011)	(.647)	(.304)	(.245)	(1.982)	(.495)	(.332)	(–.355)	(–.686)

Note: Numbers in parentheses show the share of the explained change in the total change.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537807

Figure 5.A1.1. **Working wives' annual earnings by husband's earnings decile, couple households, mid-1980s and mid-2000s**

Panel A. Countries reporting gross earnings

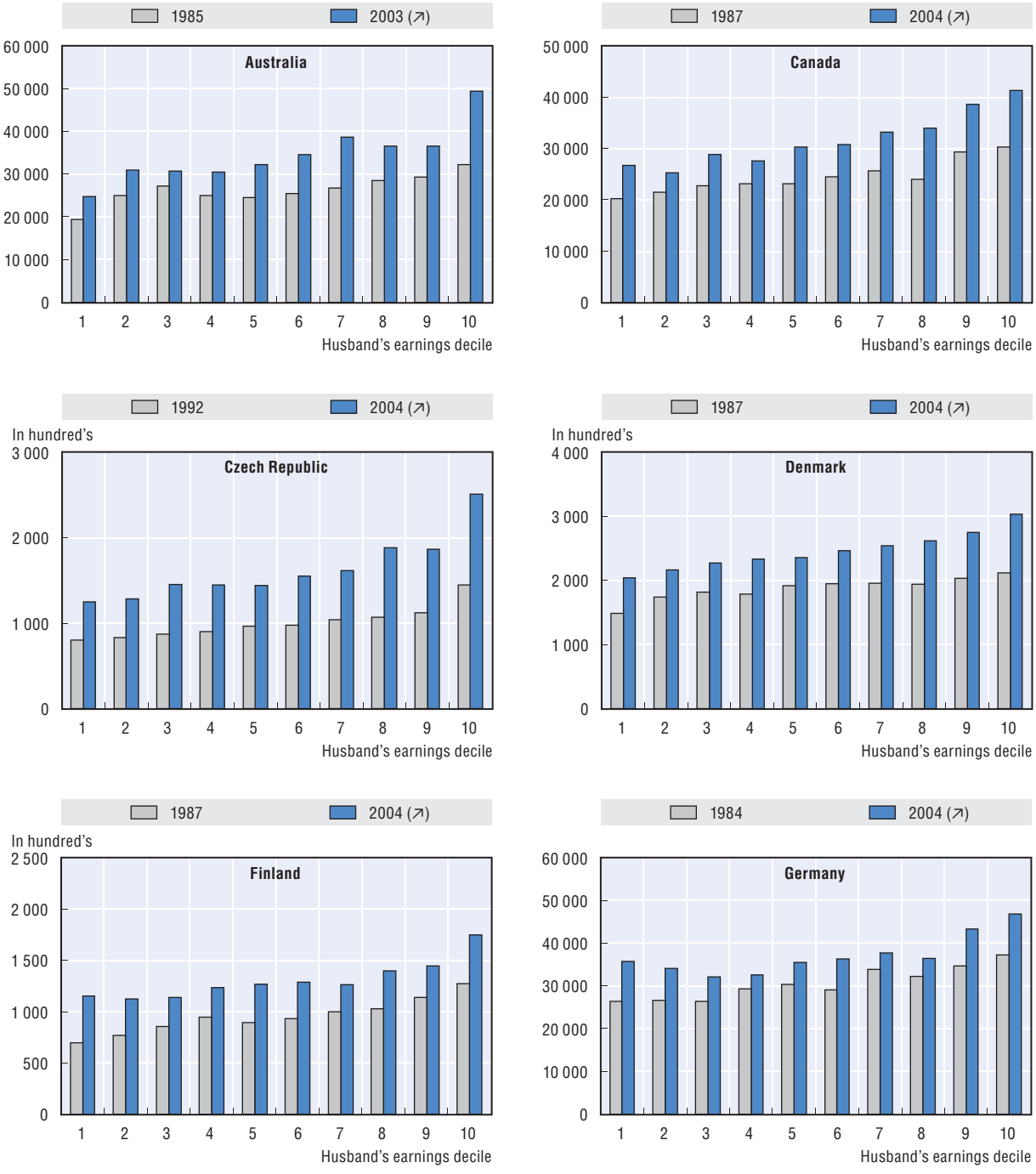


Figure 5.A1.1. **Working wives' annual earnings by husband's earnings decile, couple households, mid-1980s and mid-2000s** *(cont.)*

Panel A. Countries reporting gross earnings

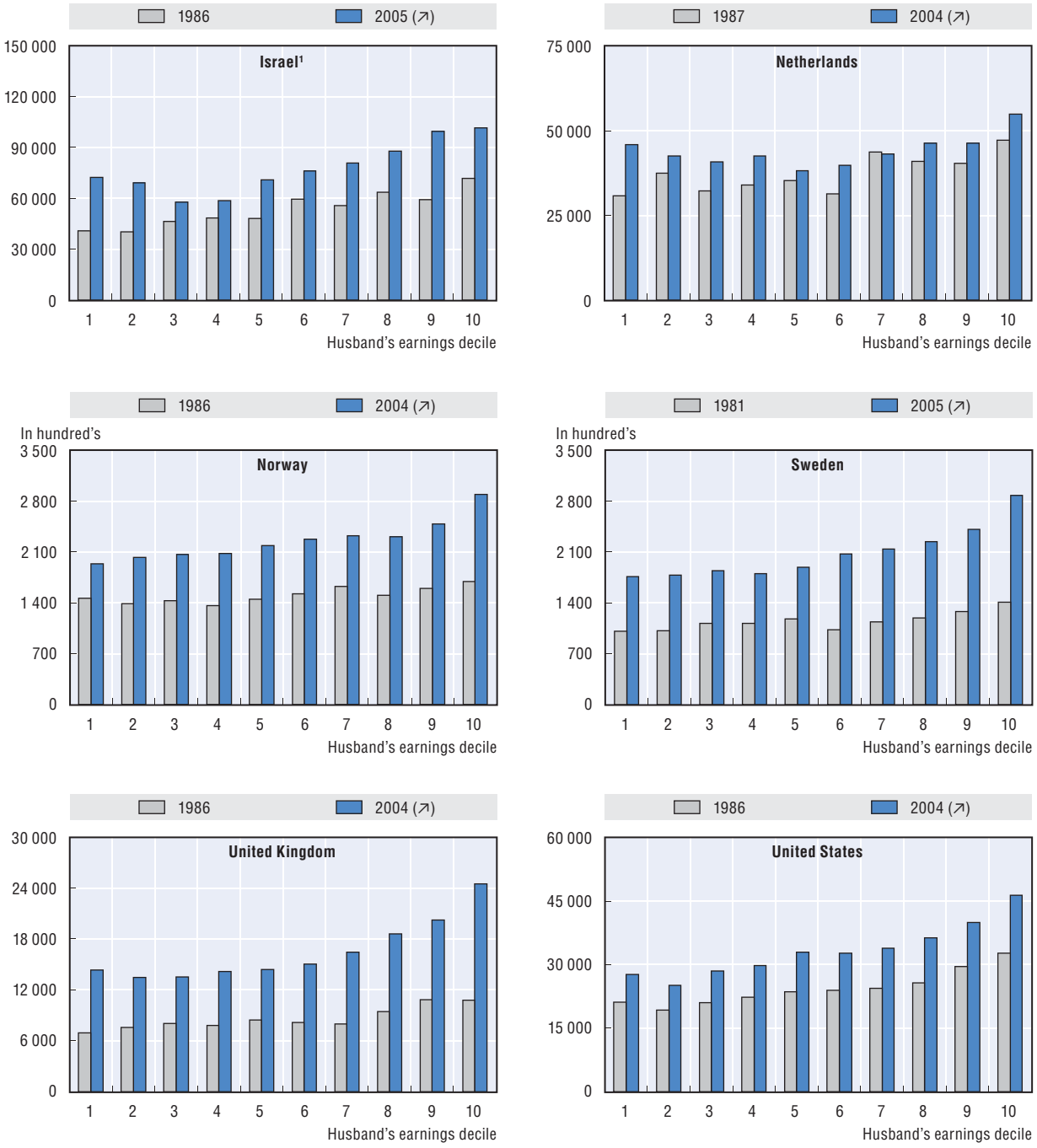


Figure 5.A1.1. **Working wives' annual earnings by husband's earnings decile, couple households, mid-1980s and mid-2000s** *(cont.)*

Panel B. Countries reporting net earnings

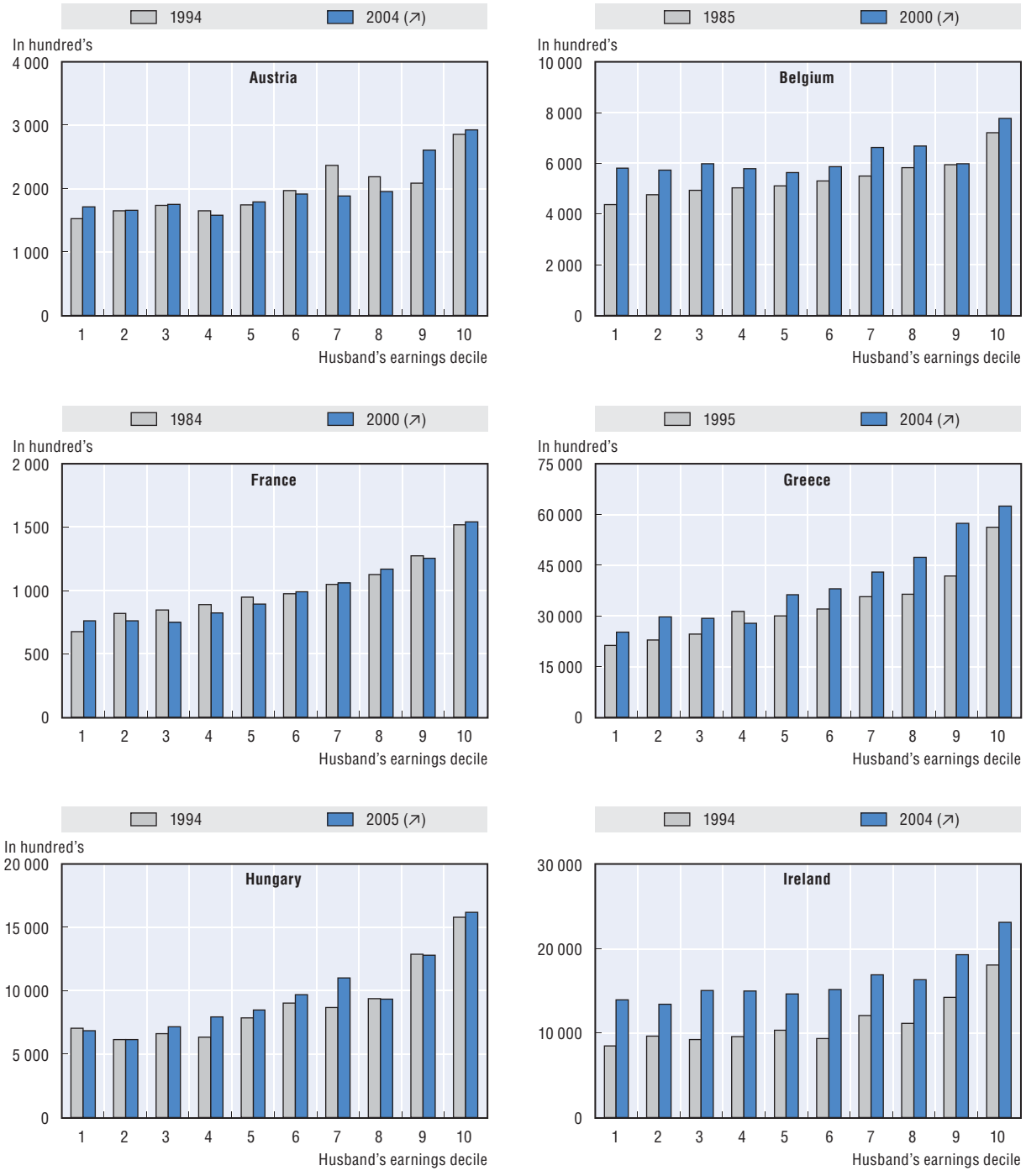
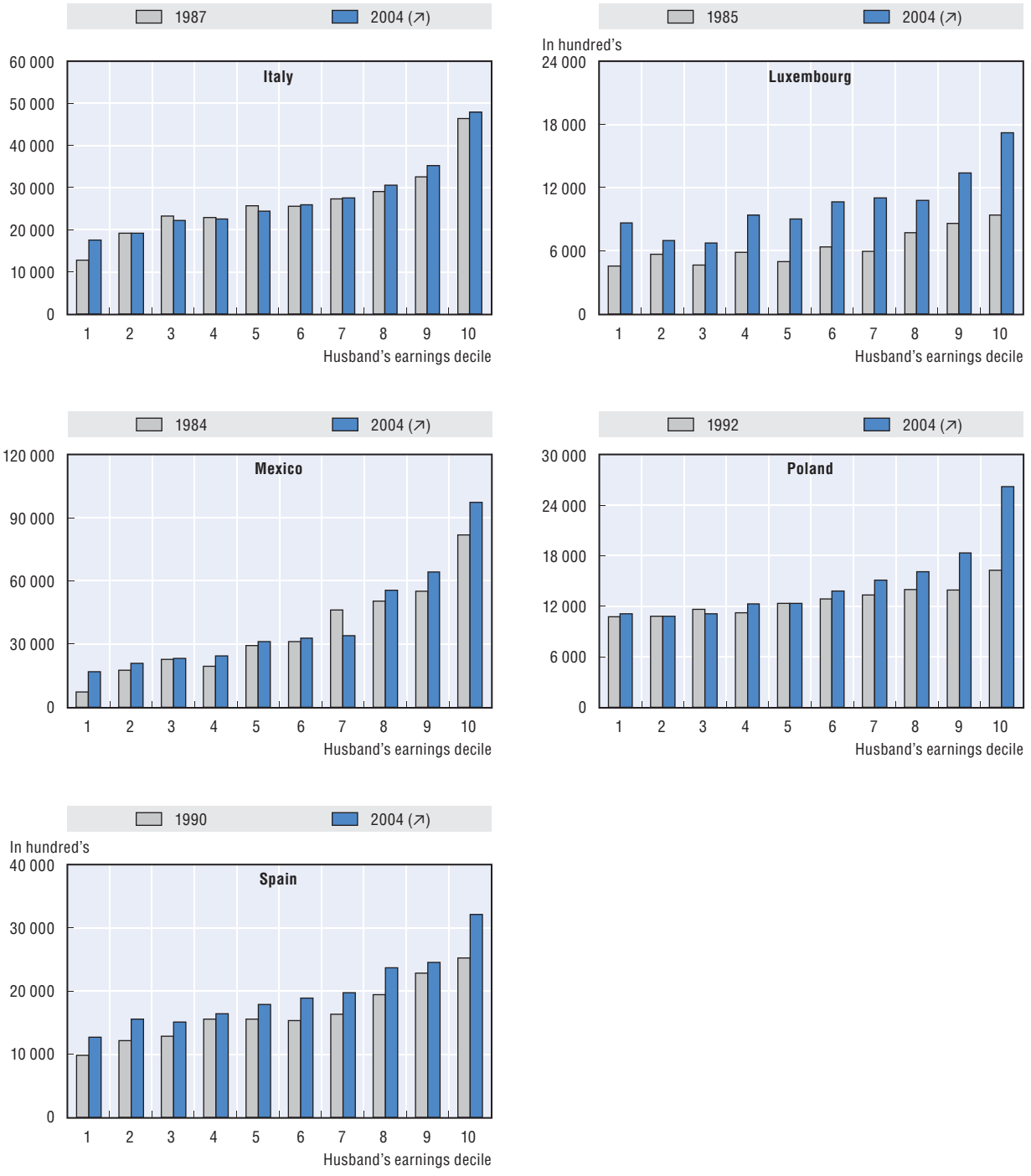


Figure 5.A1.1. **Working wives' annual earnings by husband's earnings decile, couple households, mid-1980s and mid-2000s** *(cont.)*

Panel B. Countries reporting net earnings



Note: Figures refer to couple working-age households (head aged 25-64 years old) with both partners working. Amounts are in national currencies (constant values of 2005).

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536572

Divided We Stand
Why Inequality Keeps Rising

PART II

Chapter 6

From Household Earnings to Disposable Household Income Inequality*

This chapter provides an overview of levels of and trends in household income distribution for the working-age population. It compares the size of the different components which make up total household income across countries and over time: wages and salaries, self-employment income, capital income, and taxes and benefits. The chapter examines the relative contributions of these various income sources to levels of and trends in overall household income inequality. It also identifies whether particular income sources influence overall inequality primarily through changes in their shares in total income or through changes in the way they are distributed.

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6.1. Introduction

The previous chapters consider how personal and household earnings inequality among people of working age has changed. In the end, though, what matters most to people is the disposable income they have in their pockets. This income is derived from labour earnings, other cash sources, and benefits received minus taxes paid and contributions to social security.

How final disposable income is distributed is a prime concern for policy makers. This chapter explores in more detail how household earnings and income inequality are linked. There are various factors and mechanisms at play that may either offset or reinforce earnings inequality (Gottschalk and Danziger, 2005). One example would be that changes in the generosity of government cash tax/transfers and in income not generated through employment (*e.g.* income on capital or private transfers) have consequences for the overall distribution of income in a society.

This chapter begins with an overview of income distribution in OECD countries from the mid-1980s to the mid-2000s, drawing on information from the *OECD Database on Household Income Distribution and Poverty*. It compares the shares in household income of different income sources (such as earnings, capital income, taxes, benefits) across countries and over time. Using micro-level data for 24 OECD countries, the chapter then examines the relative contributions of the various income sources to levels and trends in overall income inequality. Finally, it considers whether and how different income sources influence overall inequality - primarily through changes in their share of total income or through the distribution of their components. It also discusses the effect of marginal increases in various income sources on overall inequality. The changing redistributive role of taxes and transfers is analysed in greater detail in Chapter 7.

The chapter finds the following key features when relating inequality of household earnings and other market income sources to inequality in households' final disposable income.

- Inequality in households' disposable income is lower, and higher with regard to market incomes, although there is much variation from one country to another.
- Disposable income inequality and market income inequality have both increased over the past 30 years. Inequality in disposable income rose more slowly than in market income during the late 1980s and early 1990s, but has grown at a faster rate than market income inequality since then.
- Capital income saw a greater increase in inequality than earnings in three-quarters of OECD countries. Although its contribution to household income inequality is lower than that of earnings, it has increased significantly in the past 20 years.
- Changes in overall household income inequality are also related to changes in the relative importance and distribution of taxes and benefits. Although taxes and benefits reduce the overall level of income inequality, they have become less effective in that respect since the mid-1990s in many OECD countries.

6.2. Inequality: trends in the distribution of market and disposable income

Moving from household earnings to household disposable income involves the inclusion of income from other sources, using the following definitions (based on the work of the Canberra group[1]):

- *Market income*: includes incomes from wages and salaries, self-employment income and cash property income together with occupational and private pensions.
- *Gross income:* is the sum of *market income* and social security cash benefits, private transfers and other cash income. Social security cash benefits include sickness, occupational injury and disease, and disability benefits, state old-age and survivors' pensions, child/family benefits, unemployment compensation benefits, maternity and other family leave benefits, social assistance cash benefits, war veterans' benefits and other social security benefits.
- *Disposable income:* is obtained by subtracting income tax and employees' social security contributions from *gross income*.

Including measures other than wages sometimes leads to measurement errors and comparability problems. Data on self-employment income, for example, are incomplete in some countries and capital income is frequently underestimated (Atkinson and Bourguignon 2000). Data on certain transfer components, such as occupational and private pensions are not available in certain countries, mainly in the early years. Benefits and social security transfers also change over time, with certain countries introducing for instance maternity benefits and social assistance benefits only in the late 1980s or early 1990s.[2]

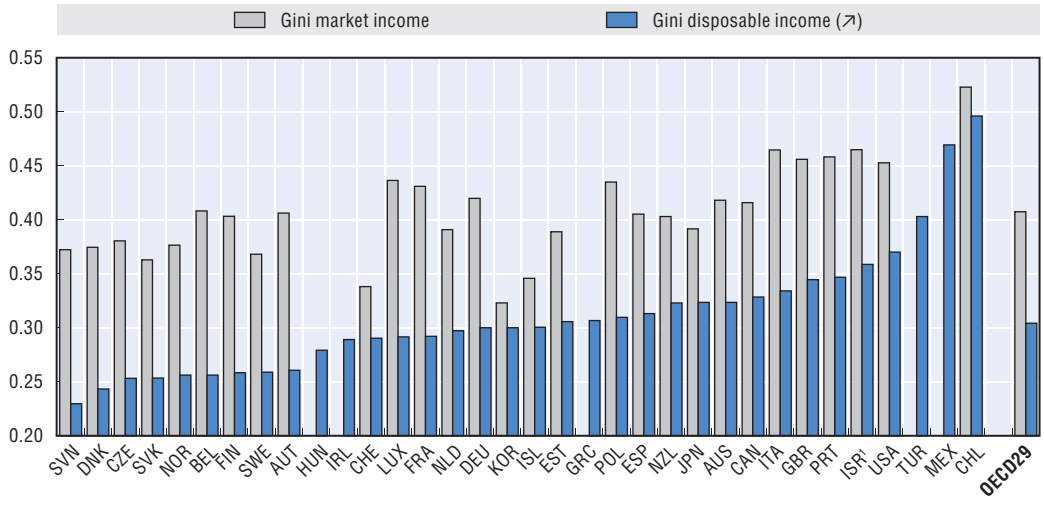
How does the distribution of household income compare across countries?

Figure 6.1 shows a summary measure for inequality, for both disposable income and market income: the Gini coefficient which has a range from zero (when everybody has identical incomes) to 1 (when all income goes to only one person).[3] Increasing values of the Gini coefficient thus indicate higher inequality in the distribution of income. Both income measures are adjusted to reflect differences in household needs depending on the number of persons in the household.[4] Consistent with the focus of the preceding chapters, the analysis refers to persons of working age (18- to 65-years old).[5]

Cross-country differences in disposable income inequality are large. Chile and Mexico record particularly high levels of income inequality, with a Gini coefficient which is more than 50% above the OECD average. Other countries with relatively high income inequality include Israel,[6] the United States and Turkey. At the other end of the spectrum are Denmark and Slovenia with inequality more than a fifth below the OECD average. Lower levels of income inequality are also prevalent in most of the remaining Nordic countries and some continental European countries.

The market income distribution is more unequal than the distribution of disposable income. On average, the Gini coefficient for market income is 0.41 or roughly 25% higher than for disposable income. But market income is less dispersed across OECD countries, suggesting that OECD tax-benefit systems work quite differently to offset market income inequality. The Gini coefficient for market incomes spans less than 20 points (from 0.32 to 0.52), compared to 27 points for disposable income (from 0.23 to 0.50). Chile shows the highest levels of inequality on both measures. Denmark and Sweden have the lowest levels of disposable income inequality but not in terms of market income, which is more

Figure 6.1. **Gini coefficients of inequality of market and disposable incomes, persons of working age, late 2000s**



Note: Late 2000s refer to a year between 2006 and 2009. OECD average excludes Greece, Hungary, Ireland, Mexico and Turkey (no information on market income available). Working age defined as 18- to 65-years old.

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932536591

unequally distributed than, for instance, in Switzerland. Germany and Belgium, too, have market-income inequality levels above-average but taxes and benefits reduce disposable-income inequality to a level below the average.

How has the distribution of household income changed over time?

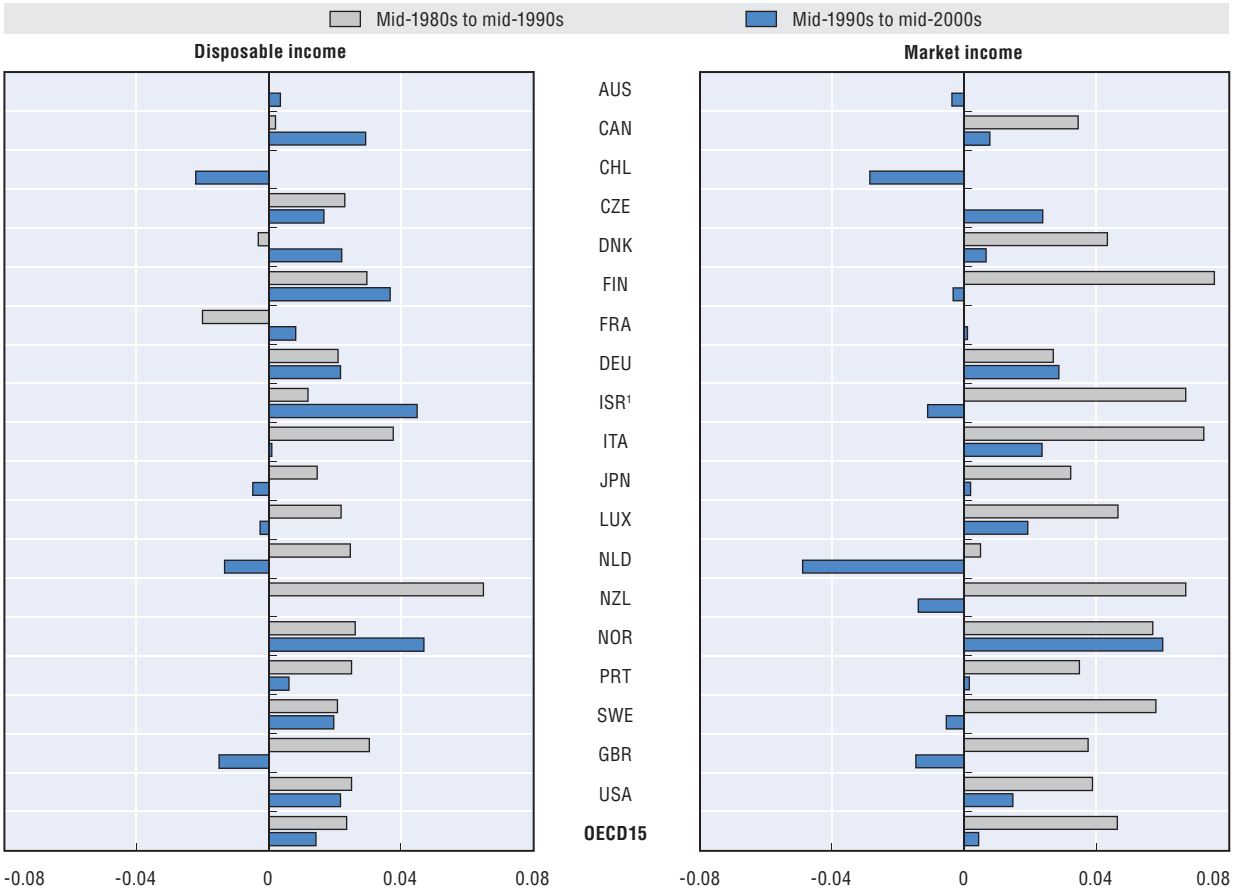
Inequality in disposable income among the working-age population increased in all OECD countries (except France) for which longer-term data between the mid-1980s and the mid-2000s are available (Figure 6.2, left panel). The Gini coefficient increased by around 3.8 percentage points (or 14%) during this period. The Nordic countries (except Denmark), Germany, Israel, New Zealand and the United States saw the largest increases of inequality (by more than 4 points). In France, inequality fell slightly over the same period and there was little change in Japan and the Netherlands.

It is also interesting to look at the evolution of distribution on disposable income by subperiods.[7] In all OECD countries shown here bar Denmark and France, income inequality increased from the mid-1980s to the 1990s. In the following decade, overall inequality continued to increase from the mid-1990s to the mid-2000s, but more diverse patterns across countries resulted in a much lower average increase. The distribution of disposable income contracted, especially in Chile but also in the Netherlands and the United Kingdom, or remained stable (changes below 1 percentage point) in one third of the selected OECD countries. But inequality increased in Israel, Finland and Norway. Canada, which had a stable income distribution up to the mid-1990s, saw a relatively strong increase in the more recent decade, primarily due to changes in the late 1990s.

One important driver of higher disposable income inequality was the rise in market income inequality in all countries, except Chile, France and the Netherlands (right-hand panel in Figure 6.2). The Gini measure of market income inequality increased by larger amounts than the Gini for disposable income, by some 5 percentage points over the whole

Figure 6.2. **Trends in inequality of disposable and market income, working-age population**

Percentage point changes, mid-1980s to mid-2000s



Note: OECD average excludes Australia, Chile, Czech Republic and France (no information on market income for the earlier period available). Mid-80s refer to 1990 for Czech Republic and Portugal, mid-00s refer to 2000 for Portugal. Working age is defined as 18 to 65-years old.

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932536610

period. The Nordic countries (except Denmark), Germany and Israel showed large increases in inequality in both measures of income. On the other hand, Denmark and Luxembourg experienced little change in the distribution of disposable income while the distribution of market income widened.

By far the largest increases in inequality of market income occurred between the mid-1980s and the mid-1990s. In fact, about half of the selected OECD countries showed a decline in the Gini of market income in the more recent decade. Variations in market income inequality across periods partly reflect cyclical patterns of boom and bust, *e.g.* the recession of the late 1980s or the Nordic financial crisis at the beginning of the 1990s.

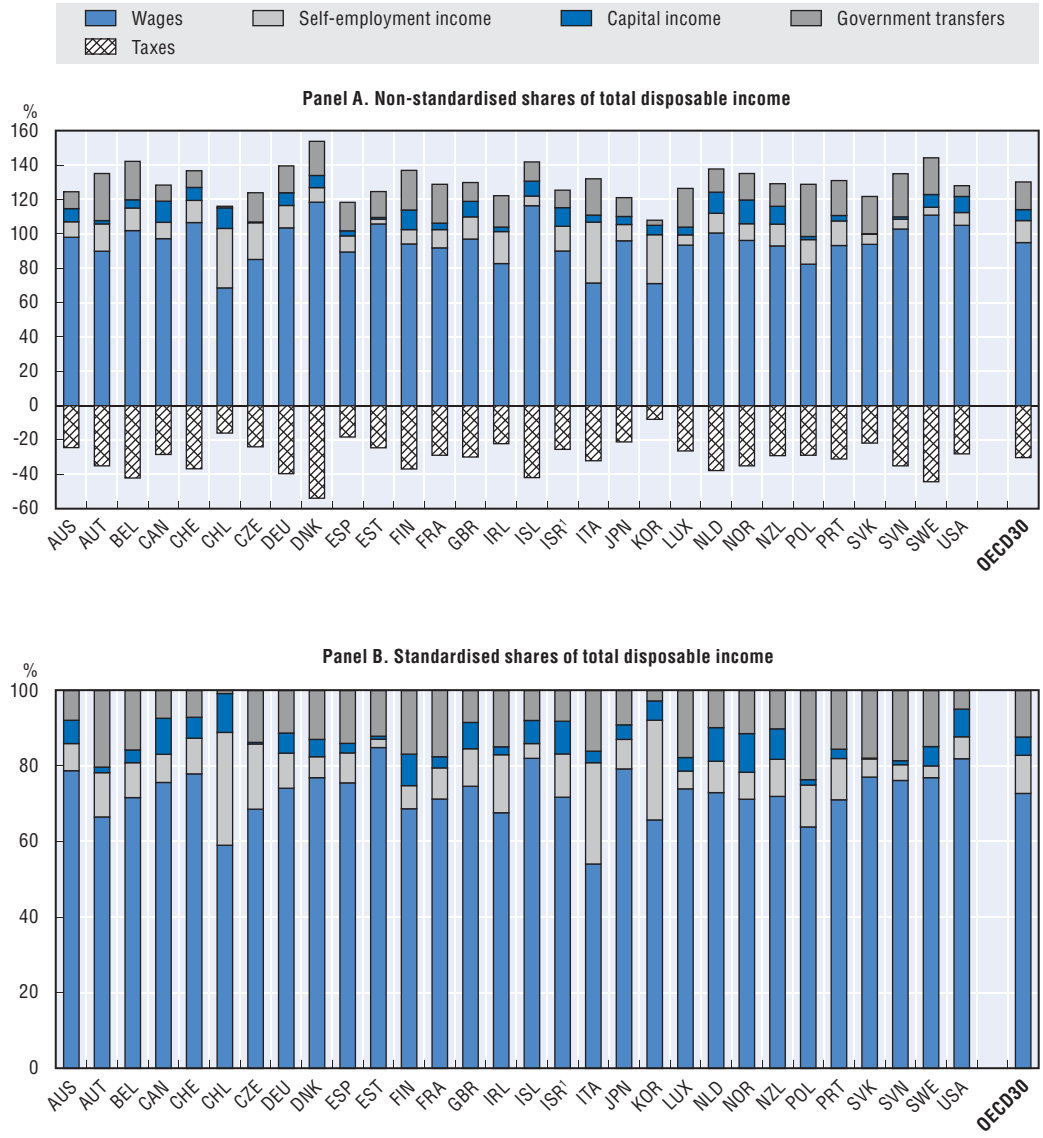
Changes in inequality between these two income concepts also highlight changes in how governments have countered inequality across countries and over time, as the difference between disposable and market income is accounted for by public transfers and income taxes and can be interpreted as first-order effect of redistribution. In the first decade, in most countries taxes and benefits reduced the increase in disposable income

substantively, particularly in Nordic countries. The redistributive effect, however, was less effective in the more recent decade. In Finland, Israel and Sweden, inequality of disposable income even increased despite a contraction in market income inequality.

How important are income components in terms of their share of total income?

Gross wages and salaries, together with income from self-employment make up the largest part of the disposable income of the working-age population, between 97% (Poland) and 127% (Denmark) of disposable net income (Figure 6.3, Panel A).[8] Cross-country

Figure 6.3. **Shares of disposable income components, working-age population, mid-2000s**



Note: Standardised shares in Panel B calculated by applying the average tax rate. OECD30 average excludes Greece, Hungary, Mexico and Turkey (no information on taxes available).

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932536629

differences in tax rates are partly responsible for the relative size of these two components of disposable income. To facilitate comparison across countries, Panel B shows standardised shares.[9] Net wages and self-employment income together now account for 83%, on average, of total income. Korea (92%) has the highest share of these two components, while Poland (75%) has the lowest.

While wages are the largest component of income, income from self-employment is important in many OECD countries. On average, it represents 13% of gross disposable income and 10% when the standardised measure is used. These shares are likely to be higher in reality since income from self-employment is often not fully reported. Bearing this in mind, income from self-employment represents more than 28% of disposable income in Chile, Italy and Korea. In some countries such as Poland and Chile, the agricultural sector is relatively large and so therefore income from self-employment reflects the size in this sector. In Italy, on the other hand, the size of self-employment is also driven by the many small and medium-sized enterprises.

Gross wages and self-employment income taken together have fallen as a share of disposable income in the past two decades in more than half of the countries for which longer-term information is available (Table 6.1). On average, the share fell by close to 3 percentage points between the mid-1980s and the mid-2000s, 1.6 points for wages and 1.3 points for self-employment income. The share of wages decreased mainly in Finland, Germany, Israel and New Zealand, and self-employment income fell mostly in Ireland, Israel, Japan, the Netherlands and Norway.

The decline in the share of wages mostly happened during the earlier period of the mid-1980s to the mid-1990s, with Germany and the United States as notable exceptions. This period was characterised by labour market problems in many countries. In several countries (Finland, Italy, and the United Kingdom) the share of wages fell from the mid-1980s to mid-1990s but increased in the following decade. This was partially driven by high unemployment in the 1980s and early 1990s, which was then followed by employment growth, especially in Finland.

Income from capital and private transfers generally makes up a rather small proportion (around 5 to 8%) of disposable income. The share is negligible in most of the Central and Eastern European countries but more sizeable in Canada, Chile, Finland and Norway. However, shares have increased from even lower levels in more than two-thirds of the selected OECD countries, with the largest increases observed in Norway and Finland. By contrast, in New Zealand, the Netherlands and the United States, where the share of capital income was among the highest in the OECD, the relative importance of capital income has fallen since the 1980s.

Not surprisingly, the importance of social transfers varies strongly across the OECD. In some continental European countries, they represent a quarter or more of the disposable income of people of working age. But they are of marginal importance for the incomes of Chileans and Koreans (less than 3%) and relatively low and less important than capital income in Canada and the United States.

The share of government transfers shows variation over time as well: it increased, on average, by 2.7 percentage points, during the mid-1980s to mid-1990s but fell by almost the same amount in the subsequent decade. Part of this pattern may be attributed to changes in employment and reforms to unemployment benefit schemes: higher employment rates lower the share of income from unemployment benefits, as do specific government

Table 6.1. **Changes in shares of disposable income components in selected OECD countries**

Change in percentage points, mid-1980s to mid-2000s

	Wages and salaries		Self-employment income		Capital income		Government transfers		Taxes	
	Mid-80s to mid-90s	Mid-90s to mid-00s	Mid-80s to mid-90s	Mid-90s to mid-00s	Mid-80s to mid-90s	Mid-90s to mid-00s	Mid-80s to mid-90s	Mid-90s to mid-00s	Mid-80s to mid-90s	Mid-90s to mid-00s
Australia	. .	–0.6	. .	–1.1	. .	1.0	. .	–1.0	. .	–1.7
Canada	–0.4	0.1	2.9	–1.0	0.8	1.2	3.9	–3.5	7.1	–3.2
Chile	. .	4.7	. .	–4.0	. .	–2.6	. .	0.1	. .	–1.8
Czech Republic	. .	–3.6	. .	6.1	. .	–2.4	. .	1.2	. .	1.4
Denmark	1.1	2.3	–2.2	–0.3	0.0	2.4	6.9	–5.2	5.7	–0.8
Finland	–12.5	5.2	0.1	–2.9	2.7	5.6	14.0	–10.7	4.1	–4.6
Germany	3.2	–8.1	0.2	1.8	1.9	0.8	0.1	1.7	5.3	–3.9
Ireland	–0.1	6.1	–1.0	–4.7	–0.8	–0.1	0.0	–5.8	–1.9	–4.4
Israel[2]	–6.7	–2.2	0.2	–5.3	0.9	3.8	1.2	–1.0	–4.5	–4.7
Italy	–2.6	3.0	–0.6	6.7	–0.2	–5.5	5.3	–2.4	1.9	1.7
Japan	–0.6	–0.4	–2.2	–2.7	0.8	–0.1	1.2	3.5	–0.8	0.3
Netherlands	–1.5	0.0	–0.9	–1.7	–0.8	–1.4	–4.0	–4.4	–7.2	–7.4
Norway	–4.2	–3.4	–2.0	–2.8	1.6	5.5	4.2	–0.2	–0.4	–1.0
New Zealand	–5.1	–3.3	1.2	–1.7	–1.7	–0.9	–1.0	3.1	–6.6	–2.9
Portugal	. .	7.1	. .	–3.8	. .	–0.3	. .	–1.7	. .	1.4
Sweden	2.0	4.4	–0.5	1.2	2.3	0.1	5.9	–5.8	9.7	–0.1
United Kingdom	–6.4	3.7	2.1	–2.0	2.1	–1.2	–0.4	–0.2	–2.7	0.3
United States	5.7	–1.0	–1.5	1.2	–1.9	–0.9	0.8	–0.6	3.0	–1.4
OECD14	**–2.0**	**0.5**	**–0.3**	**–1.0**	**0.5**	**0.7**	**2.7**	**–2.3**	**0.9**	**–2.3**

1. Mid-2000s correspond to 2000 in Ireland and Portugal. OECD average excludes Australia, Chile, Czech Republic and Portugal.
2. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932537845

measures to reduce inflows into these schemes and lower the generosity of social transfers (see Chapter 7).

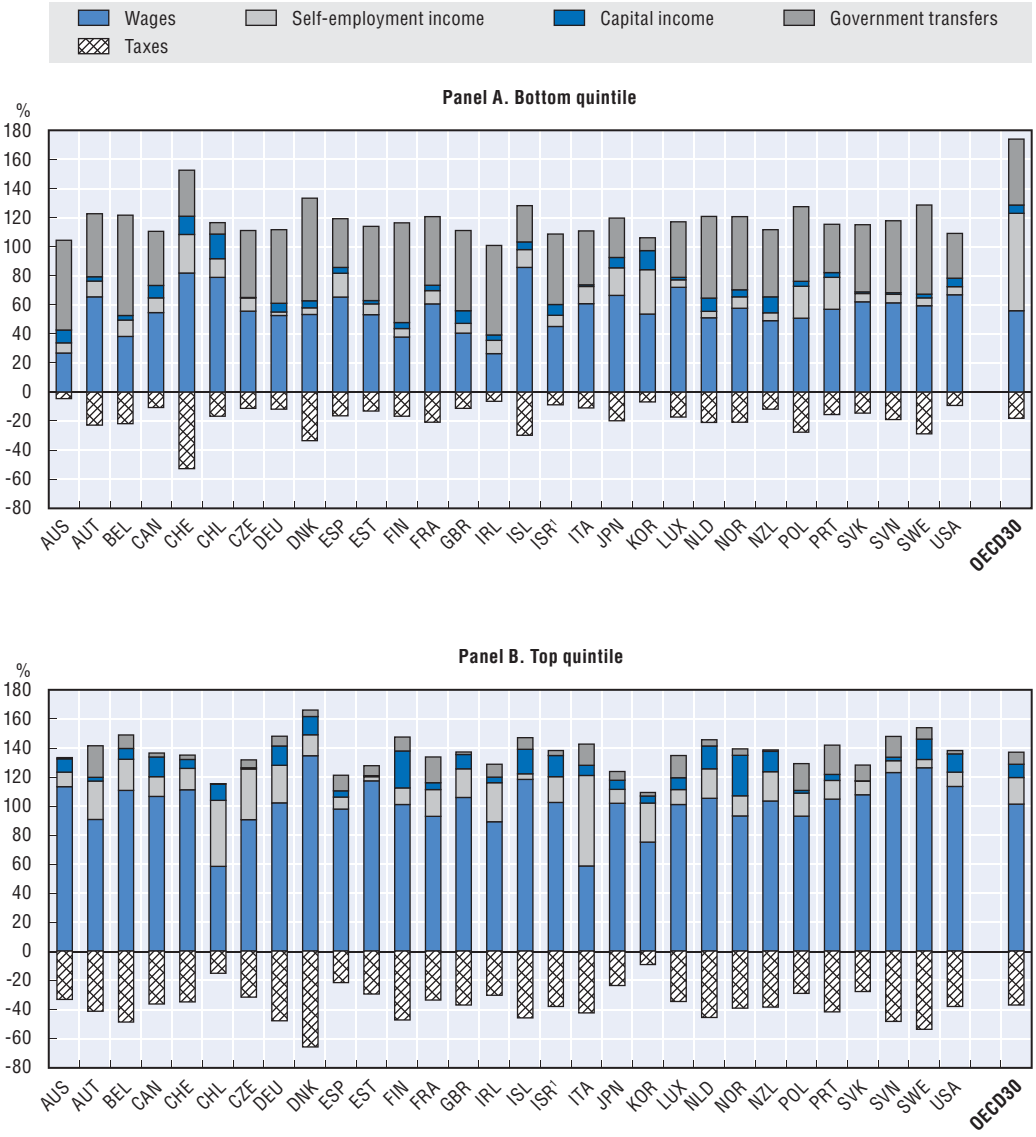
On average, working-age households pay some 30% of their disposable income in income taxes and social security contributions. The share of taxes is highest Denmark, followed by Sweden, Belgium and Iceland (above 40%) and lowest in Chile and Korea (below 16%). Tax shares decreased by about 2 percentage points and this happened entirely during the more recent decade when many countries made reforms to their income taxation schemes (see Chapter 7 and Chapter 9). But trends differ widely between countries. In some countries, the share of taxes actually declined in both periods (Ireland, Israel, the Netherlands, Norway and New Zealand). In most others, tax shares started to decline later on. The only country which saw a constant increase in tax shares is Italy.

In sum, wages constitute by far the largest component of household income among working-age individuals but their share has fallen on average, in particular during the late 1980s and early 1990s. Transfer and tax shares have both fallen but during the more recent decade between the mid-1990s and mid-2000s. Shares of income from capital, savings and private transfers have tended to slightly increase. These patterns and trends of income components have, however, been different for the bottom than for the top of the income distribution.

How are income components allocated across the distribution?

Figure 6.4 shows the shares of the different components of disposable income for the poorest and richest 20% of the income distribution. On average across the OECD, the poorest 20% receive just two-thirds of total disposable income from gross wages and self-employment income, compared with some 120% for the top quintile.[10] In Australia, Finland, Ireland and the United Kingdom, wages and self-employment income even make up less than half of income in the bottom quintile. Being out of employment bears a higher risk of falling at the bottom of the income distribution in these countries. By contrast, on average across countries, 45% of

Figure 6.4. **Shares of income components in lower and higher income groups, mid-2000s**



Note: Bottom and top quintile defined according to disposable income. OECD30 average excludes Greece, Hungary, Mexico and Turkey (no information on taxes available).

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

Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932536648

income in the bottom quintile comes from government transfers, compared to a share of 8% in the top quintile. Social transfers are very large for the bottom quintile in Belgium, Finland and Denmark. Among incomes of the richest 20%, social transfers play a considerable role in Austria, Portugal, Poland and France. Capital incomes have a higher share in the top income quintile than in the bottom quintile, in line with the findings in other studies (Fräßdorf *et al.*, 2008; Piketty and Saez, 2003). The difference in capital shares is particularly pronounced in Germany, Israel and some of the Nordic countries.

Table 6.2 highlights the trends over time. On average across the countries included here, the share of capital incomes increased for richer households and the income composition of poorer households was marked by a decline in earnings shares and an increase in transfer shares. Wages as a share of income have declined for the poorest segment, most strikingly in Finland, Germany and Norway. In the Netherlands, both the share of earnings and the share of social transfers going to the bottom deciles fell; the change in the composition of lower incomes originated from lower taxes. In most countries, such changes in the composition of income are likely to have contributed to growing inequality.

Table 6.2. **Changes in wage, capital and other income shares for poorer and richer income segments**

Change in percentage points, mid-1980s to mid-2000s

	Wages and salaries		Self-employment income		Capital income		Government tansfers		Taxes	
	Bottom quintile	Top quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile
Canada	–1.5	3.7	1.9	3.2	0.0	–0.3	1.9	–0.3	2.4	6.3
Denmark	–9.2	6.2	–9.9	1.8	–3.6	7.7	21.8	–2.4	–0.8	13.3
Finland	–17.6	–15.7	–8.9	–0.4	0.7	21.8	21.3	–1.0	–4.4	–0.7
Germany	–15.2	–9.5	–1.9	3.6	0.2	6.4	10.5	–0.1	–6.5	0.2
Ireland	16.2	5.3	–0.2	–11.1	–0.4	–0.8	–16.2	–0.4	–0.7	–7.0
Israel[1]	1.5	–12.2	–10.5	–7.4	1.4	7.8	7.7	–0.1	0.2	–11.9
Italy	–1.4	–0.7	–6.6	16.6	–4.1	–6.1	1.6	0.0	–10.5	9.8
Japan	–6.5	4.8	–9.7	–7.6	2.0	–0.4	12.3	1.6	–1.9	–1.6
Netherlands	–9.7	2.4	0.6	–6.7	–0.2	–4.0	–8.5	–4.1	–17.8	–12.4
Norway	–15.1	–13.6	–3.5	–7.9	–1.3	19.7	18.1	–0.4	–1.8	–2.1
New Zealand	–11.4	–6.8	1.5	0.3	–1.2	–2.4	3.7	–1.4	–7.4	–10.4
Sweden	–2.4	4.0	–4.1	3.6	–2.0	7.7	15.2	–3.1	6.7	12.2
United Kingdom	4.1	1.1	–3.4	0.5	0.1	0.3	–3.3	–0.8	–2.6	1.0
United States	4.9	7.8	–2.2	–0.3	–2.0	–4.7	0.0	0.2	0.7	3.1
OECD14	**–4.7**	**–1.5**	**–4.1**	**–0.8**	**–0.7**	**3.7**	**6.3**	**–1.0**	**–3.3**	**0.0**

Note: Mid-2000s correspond to 2000 in Ireland.

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

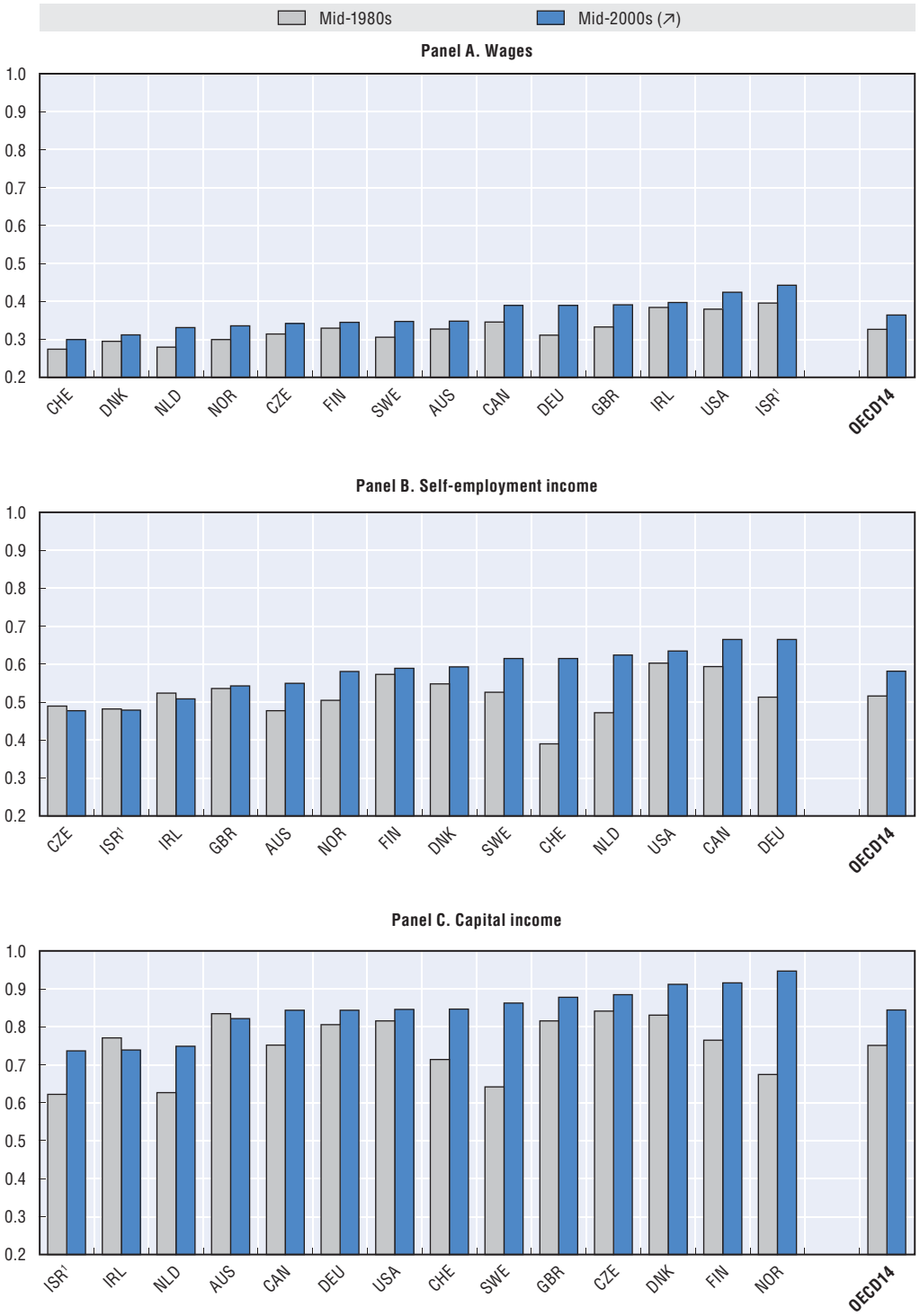
Source: OECD Database on Household Income Distribution and Poverty.

StatLink http://dx.doi.org/10.1787/888932537864

The concentration of components of market income

The OECD data discussed above reveal the relative importance of a given income source in disposable income in terms of its share. However, the contribution of one particular income source to inequality depends not only on its size relative to total income but also on its dispersion. This section looks in more detail how the different components of market income are distributed. The degree of concentration of these components – wages and salaries, self-employment income and capital investment income – is presented in Figure 6.5. Calculations are based on the micro-level data from the Luxembourg Income

Figure 6.5. **Gini coefficients of concentration of market income sources, mid-1980s and mid-2000s**



Note: Mid-1980s refers to 1982 for Switzerland; 1983 for the Netherlands; 1984 for Germany; 1985 for Australia; 1986 for Israel, Norway, United Kingdom, United States; 1987 for Canada, Denmark, Finland, Ireland, Sweden; and 1996 for Czech Republic. Mid-2000s refers to: 2003 for Australia; 2004 for Canada, Czech Republic, Denmark, Finland, Germany, Ireland, the Netherlands, Norway, Switzerland, United Kingdom, United States; 2005 for Israel and Sweden. Countries are ranked in increasing order according to the respective income component in the mid-2000s. Gini coefficients are calculated excluding zeroes, and ranked according to the respective income source.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS). StatLink *http://dx.doi.org/10.1787/888932536667*

Study (LIS), for a subset of 14 countries for which income estimates on a gross basis are available over the period.[11]

Not surprisingly, incomes from self-employment and capital income are more unequally distributed than wages in all OECD countries under review. On average, the Gini coefficient for self-employment income was 0.58 in the mid-2000s and 0.84 for income from capital investment compared with an OECD average of 0.36 for gross wages. Capital income is most unequally distributed in the Nordic countries, the Czech Republic and in the United Kingdom.

On average in OECD countries, all components of market income have become more unequal over the past two decades. Wage inequality has increased in all of the selected OECD countries, but by less than income from self-employment and capital income.[12] Strong increases in the concentration of self-employment income occurred in Switzerland and the Netherlands, while concentration of capital income increased markedly in Norway and Sweden.

6.3. How much of inequality is explained by each of the income sources?

Inequality of disposable income can rise through three different mechanisms: 1) a particular source of income becomes more unequally distributed; 2) the share of one unequally distributed source of income increases; or 3) a particular income source is allocated in a way that disproportionately favours the rich. This section examines first, which of the income components have contributed most to rising income inequality and second, which of the three factors above were most important. It uses a decomposition method[13] described in Box 6.1 and draws on analysis of LIS data for a period of between the mid-1980s and mid-2000s, covering 14 OECD countries. For ten additional countries, income amounts are available only on a net basis (*i.e.* after taxes and contributions). The results for these countries are shown in Annex 6.A1.

Total income is broken down by ten different sources, with taxes and social security contributions being treated as a negative income. Figure 6.6 shows at a glance the inequality decomposition by sources for the latest year available, across 14 OECD countries for which data on gross incomes are available. On average of these countries, there are five sources of income which contribute to rising inequality and four sources which reduce inequality. The first group includes wages, income from self-employment, capital income, occupational pensions and other income sources. The second group covers means-tested and social insurance benefits, income taxes and social security contributions. Private transfers are relatively small and neutral in terms of inequality.

The following sub-sections discuss whether there were any significant changes in the contributions of the different income components to overall inequality over time. Two periods are considered: the decade from the mid-1980s to mid-1990s and the subsequent decade from the mid-1990s to mid-2000. Where significant changes were found, the driving elements – changing shares or changes in dispersion or correlation of the income source to total income – are identified. The detailed decomposition results for all years are presented in Annex Tables 6.A1.2 and 6.A1.3 for countries with gross and net income information, respectively.

Box 6.1. **Decomposing income inequality by sources**

According to Lerman and Yitzhaki (1985), the Gini coefficient for total income, *G*, can be represented as:

$$G = \sum_{k=1}^{k} C_k = \sum S_k G_k R_k \qquad (1)$$

where S_k is the share of source *k* in total income, G_k is the Gini coefficient corresponding to the distribution of income from source *k*, and R_k is the correlation of income from source *k* with the distribution of total income $C_k = \frac{S_k G_k R_k}{G}$ is the relative contribution of source *k* to total income inequality.

Using this income decomposition, it is possible to estimate the effect of small changes in a specific income source on inequality, holding income from all other sources constant. The partial derivative of the Gini coefficient with respect to a percentage change *e* in source *k* is equal to:

$$\frac{\partial G}{\partial e} = S_k(G_k R_k - G) \qquad (2)$$

The influence of any income component upon total income inequality depends on: *i)* how important the income source is with respect to total income; *ii)* how equally or unequally the income source is distributed ; and *iii)* how the income source and the distribution of total income are correlated (Stark *et al.*, 1986). For example, an income source that represents a large share of total will have a large effect on inequality if it is unequally distributed. On the other hand, an income source that is unequally distributed but is not highly correlated with total income will have a small impact on inequality or could contribute negatively to inequality.

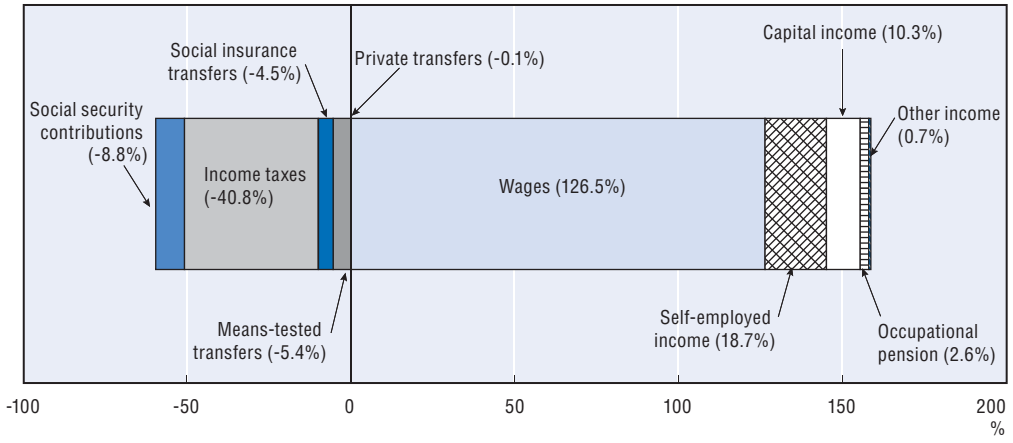
The percentage change in inequality resulting from a small percentage in income from source *k* holding all other factors constant equals the original contribution of source *k* to income inequality minus source *k*'s share of total income:

$$\frac{\partial G / \partial e}{G} = \frac{S_k G_k R_k}{G} - S_k \qquad (3)$$

The percentage change in total income inequality caused by a small change in the income source *k* is equal to its contribution to total income inequality minus its contribution to total income. The sign of the marginal effect depends on the sign of *R* since *S* and *G* are always positive. This means that if the correlation of income from source *k* with the distribution of total income is negative, the marginal effect will be negative. Otherwise, the sign will depend on the sign of $G_k R_k - G$. If the difference is positive, *i.e.* if total income is more equally distributed than income from source *k*, the marginal effect will be negative.

While such decomposition method makes it possible to identify how each income source affects the distribution of household income, there has been criticism with regard to interpretation of the results on taxes and transfers. By definition, the decomposition rule above has a property whereby the contribution of a source to overall income inequality is null if all individuals receive the same amount from the source. This is regarded as not being intuitive as an equally distributed flat-rate transfer which is "added" to an unequally distributed pre-transfer income would be normally be expected to lower inequality. Chapter 7 which looks at the changing role of redistribution of taxes and transfers in detail applies an analytical framework which takes this issue into account.

Figure 6.6. **Decomposition of income inequality by income source, average of 14 OECD countries, mid-2000s**



Note: Working-age population. Income inequality is measured by the Gini coefficient. Total Income refers to disposable household income, adjusted for household size with a square-root equivalence scale.

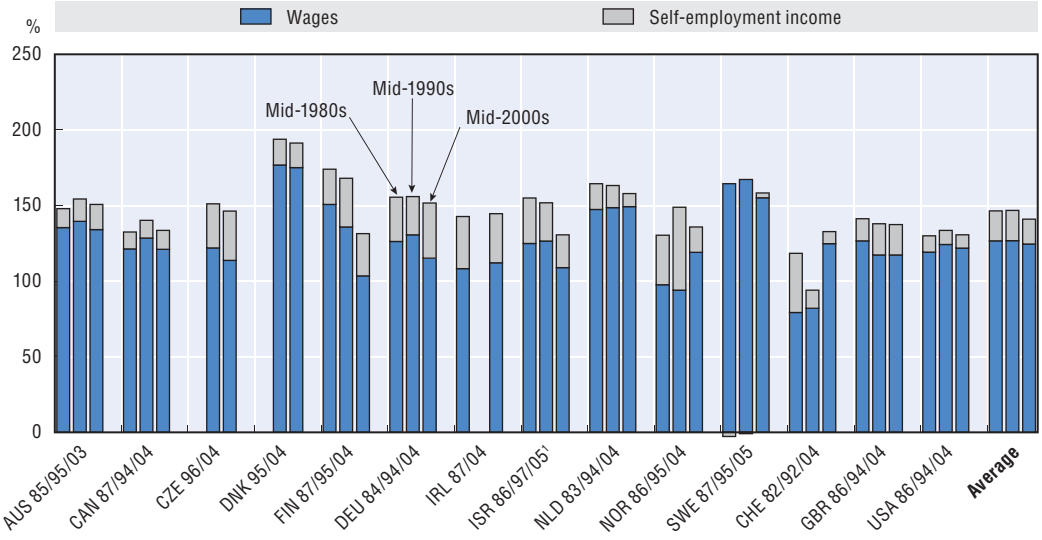
Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536686

Wages and income from self-employment

In all OECD countries under review, wages and self-employment income are the main determinants of inequality levels in disposable income of the working-age population. Together they contribute 145% of disposable income inequality on average across countries where information on gross income was available (Figure 6.7) and 88% for those countries with net income information (see Table 6.A1.3).[14] Wages explain more than 80% of the joint contribution of wages and self-employment income to income inequality. At the same

Figure 6.7. **Contribution of wages and self-employment income to overall inequality, mid-1980s to mid-2000s**



Note: Working-age population. Averages exclude Czech Republic, Denmark and Ireland.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536705

time, income from self-employment contributes more notably to inequality in the Czech Republic, Germany and Ireland, explaining about one third of overall inequality in these countries.

There were no notable changes in the inequality contribution of wages in the period of the mid-1980s to mid-1990s but the contributions tended to decrease in the more recent period. This was particularly the case in Finland, Germany and Israel. There were only two countries where wage income in the mid-2000s explained more of inequality than they did in the mid-1990s, Norway and Switzerland. In all these five countries, changes in the share of wages in income (S_k) were the main responsible for the changed contributions (downwards or upwards), followed by a stronger (weaker) correlation of wages with total income (R_k). Changes in wage dispersion (G_k) did not play a major role (Table 6.A1.2). For the remaining OECD countries – those reporting incomes net of taxes – the contribution of wages to inequality also saw a downward trend and, in most cases, this was a the result of a decline in its relative share to total income, too.

The contribution of self-employment income to inequality levels developed in a similar way: little changes in the first period and a reduction in the second, mainly in Finland, Israel, the Netherlands, Norway and Switzerland. On the other hand, the contribution of self-employment income to inequality became more important in Australia, the Czech Republic and Germany. To the contrary of wages, it is not only or mainly changes in shares which were responsible for the lower contribution, but also decreased correlation between self-employment income and total income (Netherlands, Switzerland) and a lower dispersion of this income source (Finland) (Table 6.A1.2). Among countries reporting net incomes, self-employment income became more important as a contributor to inequality in Hungary, Italy and Luxembourg – in all three countries due to a higher correlation with total household income (Table 6.A1.3).

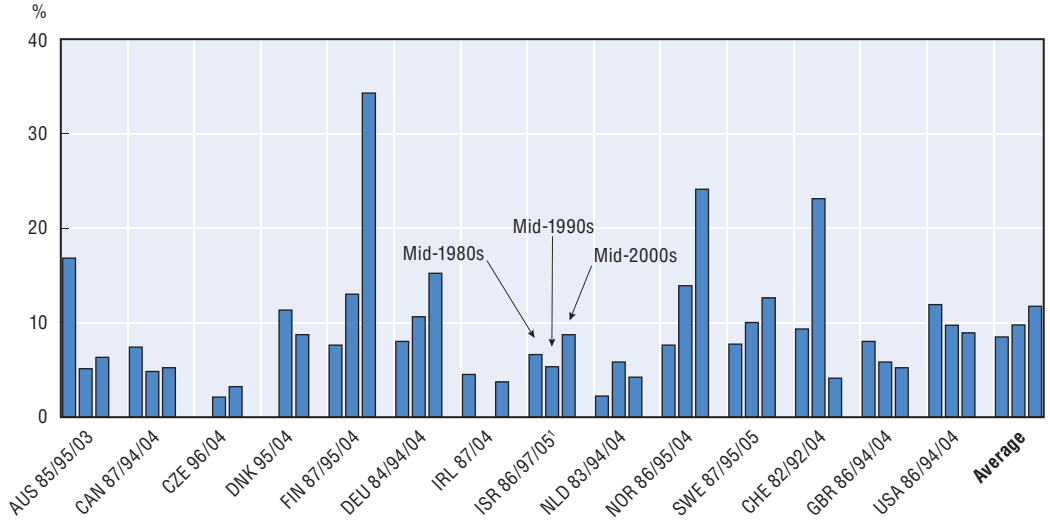
Capital income and occupational pensions

On average, income from capital contributed moderately – about 10% – to income inequality. However, its contribution has steadily increased, by almost 2 percentage point during each sub-period (Figure 6.8). This is mainly due to the developments in the Nordic countries (except Denmark) and Germany. The main factor which drove up the contribution in these countries was an increased factor correlation, *i.e.* capital income went increasingly to richer households, even in cases where its total share did not increase (Sweden) (Table 6.A1.2). On the other hand, the contribution of capital income to total inequality tended to decrease in the English speaking countries. Again, this was driven by a lower factor correlation but also a lower share in total income, and despite the fact that capital income itself became more unequally distributed in some of these countries (see Figure 6.5, Panel C).

The contribution of capital income to total income inequality also increased in countries which report only net incomes (Table 6.A1.3), albeit at a lower rate but notably in Austria, Belgium and France. Again, the key factor at play was a growing correlation between capital income and total income.

Other sources of market income, such as occupational and private pensions generally have a marginal impact on inequality, less than 3% on average (Figure 6.6). But there are some exceptions: in Israel, they contribute roughly 7% to overall inequality and their contribution has been increasing. They are also relatively important in Canada and

Figure 6.8. **Contribution of capital income to overall inequality, mid-1980s to mid-2000s**



Note: Working-age population. Averages exclude Czech Republic, Denmark and Ireland.
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536724

Sweden, with a 5% contribution to inequality. The increasing contributions of occupational pensions to inequality in Canada and Israel were entirely driven by increasing shares in income. In no country do occupational pensions have a negative, *i.e.* inequality-reducing contribution.

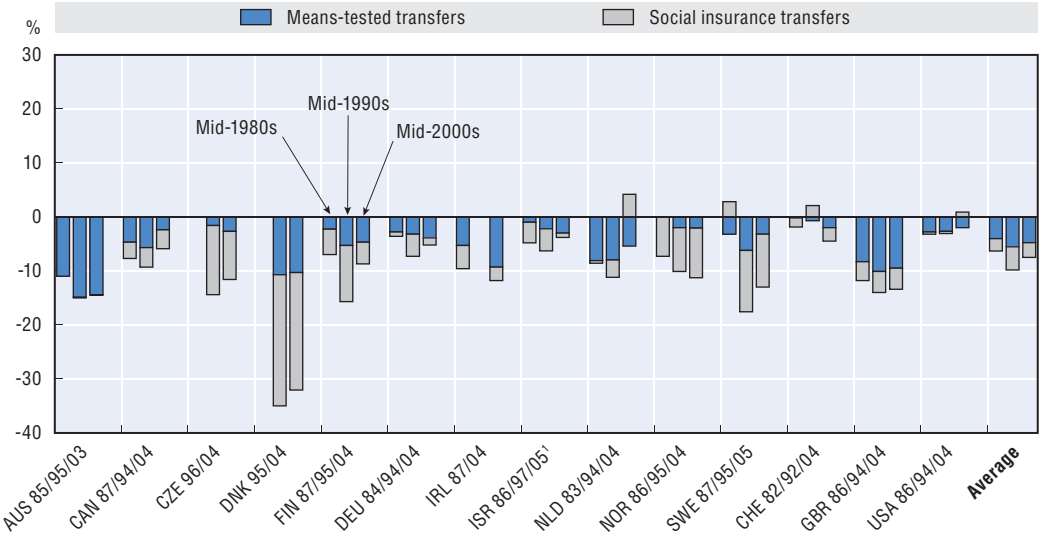
Social transfers

Means-tested transfers and social insurance benefits are an important policy tool in the redistribution of income. Social insurance benefits are related to former incomes and thus, by definition, redistribute much less than means-tested benefits. This is particularly true for pension benefits, which tend to be positively correlated with inequality in the overall income distribution.[15] Therefore, despite its lower share in most countries, the inequality-reducing contribution of means-tested transfers is slightly higher (–5.4%) than that of social insurance benefits (–4.5%) (Figure 6.6). Taking both types of social transfers together, Denmark stands out with the highest contribution to reducing inequality (–30%) (Figure 6.9). The contributions exceed 10% in Australia, the Czech Republic, Ireland, Norway, Sweden and the United Kingdom.

As for changes over time, the general picture is that of growing inequality reduction through social transfers between the mid-1980s and mid-1990s, followed by a decrease of this effect in the subsequent decade. This pattern holds for all countries except Norway and Switzerland, but also for most countries which report only net incomes (Table 6.A1.3). These contrasting developments may be explained by population structure changes (*e.g.* growing unemployment and thus unemployment benefits in the first decade, but a decline thereafter) or by discrete policy changes (*e.g.* changes to benefit rates, eligibility conditions or targeting features) and are discussed in more detail in Chapter 7.

Some first information on driving patterns and elements for the changing roles of social transfers for overall inequality can be obtained from the results of the decomposition

Figure 6.9. **Contribution of social insurance and means-tested transfers to overall inequality, mid-1980s to mid-2000s**



Note: Working-age population. Averages exclude Czech Republic, Denmark and Ireland.
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.
Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).
StatLink http://dx.doi.org/10.1787/888932536743

analysis in Table 6.A1.2. It appears that, in most countries, the growth in inequality reduction of social insurance transfers in the first decade was due to both increases in shares of this income source and a more negative correlation with total income, *i.e.* increased targeting. At the same time, the greater role of means-tested transfers to reducing inequality was almost entirely due to the latter effect of targeting. For the second decade, in which transfers became less inequality-reducing, drivers were more diverse across countries but in some countries the reduced role of means-tested transfers was also due to lower shares of these benefits in income (Australia, Canada, Netherlands and Sweden). The inequality-reducing role of both social transfer types also saw a decline, albeit modestly, in the United States over this period despite of an increase in the share of benefits. This may be party explained by a shift of this source of income towards higher-income groups.

Taxes

Direct taxes, and in particular income taxes, contribute to reducing overall income inequality to a large degree across the countries under study[16] (Figure 6.10). The effect is strongest in the four Nordic countries, Germany and the Netherlands. On average, changes over time in the redistributive contribution of direct taxes were somewhat similar than for social transfers but less pronounced. The strong contribution to decreasing inequality remained broadly at the same level between the mid-1980s and mid-1990s but became slightly weaker in the second decade.

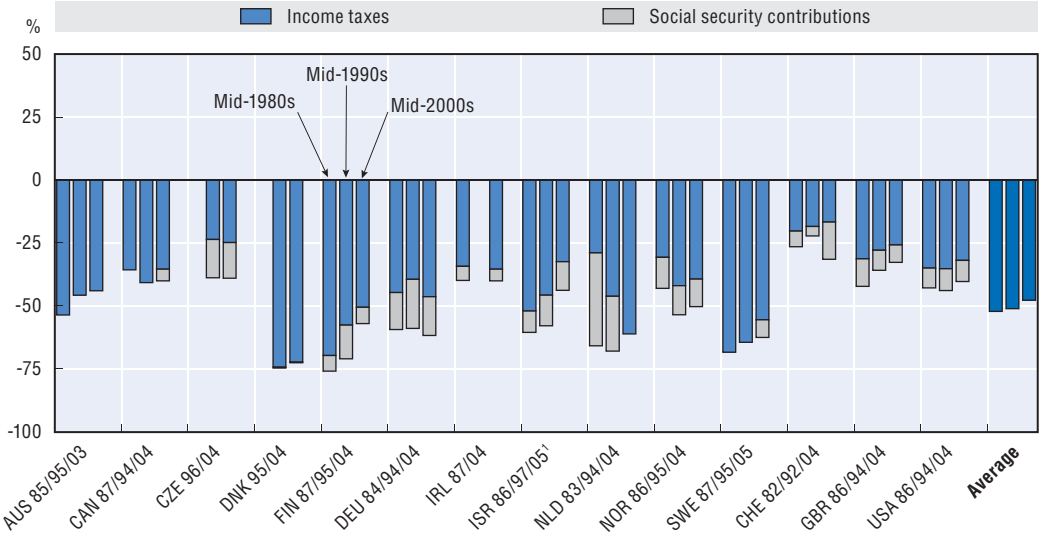
But there were some diversities across countries. In Australia, Finland, Israel, Sweden and the United Kingdom, the equalising effect of direct taxes has weakened continuously over the past 20 years. The decline in the equalising contribution of taxes can reflect changes in the structure of populations and pre-tax earnings, as well as changes in the structure of tax systems. In the United Kingdom, for instance, the removal of the higher-rate tax brackets and reduction in the basic tax rate has been cited as one explanation of the

increase in inequality during the late 1980s (*e.g.* Clark and Leicester, 2004). The relative importance of such mechanisms is analysed and discussed in Chapter 7, for a sub-set of OECD countries.

What has been driving the decline in taxes' contributions to reducing inequality in the group of countries where this happened? Clearly, in almost all countries of this group and in both periods, the key factor was the decline in the share of direct taxes in total income, despite in some cases a higher correlation of taxes with income and a higher (negative) dispersion – which both can be taken as a short-cut for greater progressivity (Finland and Sweden in particular, see Table 6.A1.2). One country stands out: in the United Kingdom, shares of income taxes did not change and the decreasing effect of taxes was entirely due to lesser progressivity, as proxied by a lower correlation of income taxes with total income.

In countries where the equalising contribution of direct taxes increased, this was in general due to all the underlying elements together: an increasing size and a higher progressivity (Canada, the Netherlands and Norway in the earlier period, and Czech Republic, Germany and Switzerland in the later period).

Figure 6.10. **Contribution of income taxes and social security contributions to overall inequality, mid-1980s to mid-2000s**



Note: Working-age population. Averages exclude Czech Republic, Denmark, the Netherlands and Ireland and lump together all direct taxes. For Canada, Sweden (mid-1980s and mid-1990s) and the Netherlands (mid-2000s), social contributions are included in income taxes.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536762

Summing up the changing role of income sources to overall inequality

The above analysis makes it clear that changes in contributions of the different income sources to total inequality differed between the two sub-periods under study, the decade from the mid-1980s to mid-1990s and the subsequent decade. In the earlier period, no noticeable change occurred in the role of wages and self-employment income as well as that of direct taxes. However, the disequalising role of capital income increased during that period (except in the English speaking countries), mainly because of a higher correlation

with total income, *i.e.* capital income went increasingly to richer households. At the same time, the equalising role of social transfers became stronger. In the case of social insurance transfers, this was often driven by higher shares in income, while in the case of means-tested transfers the correlation with total income became weaker, *i.e.* targeting increased.

But in the more recent period, patterns changed. The contribution of wages and self-employment income to total inequality declines, mostly because of lower shares of these income sources. The contribution of capital income continues to increase. At the same time, the role of social transfers inverses, as their equalising contribution becomes weaker. This is due to both lower shares and lower targeting. And the same pattern – less inequality reduction – now occurs for direct taxes, predominantly due to lower tax shares rather than lower progressivity, with the notable exception of the United Kingdom.

6.4. Redistributive effects of marginal increases in individual income components

After analysing the contribution of different income components to overall inequality and the changes over time, it is interesting to look at what would happen to inequality when one income component is increased or reduced relative to other sources of income.[17] This information can be of particular interest for policy makers as it illustrates, for instance, whether an increase in means-tested transfers will have the same impact on overall inequality as a similar increase in social insurance benefits.

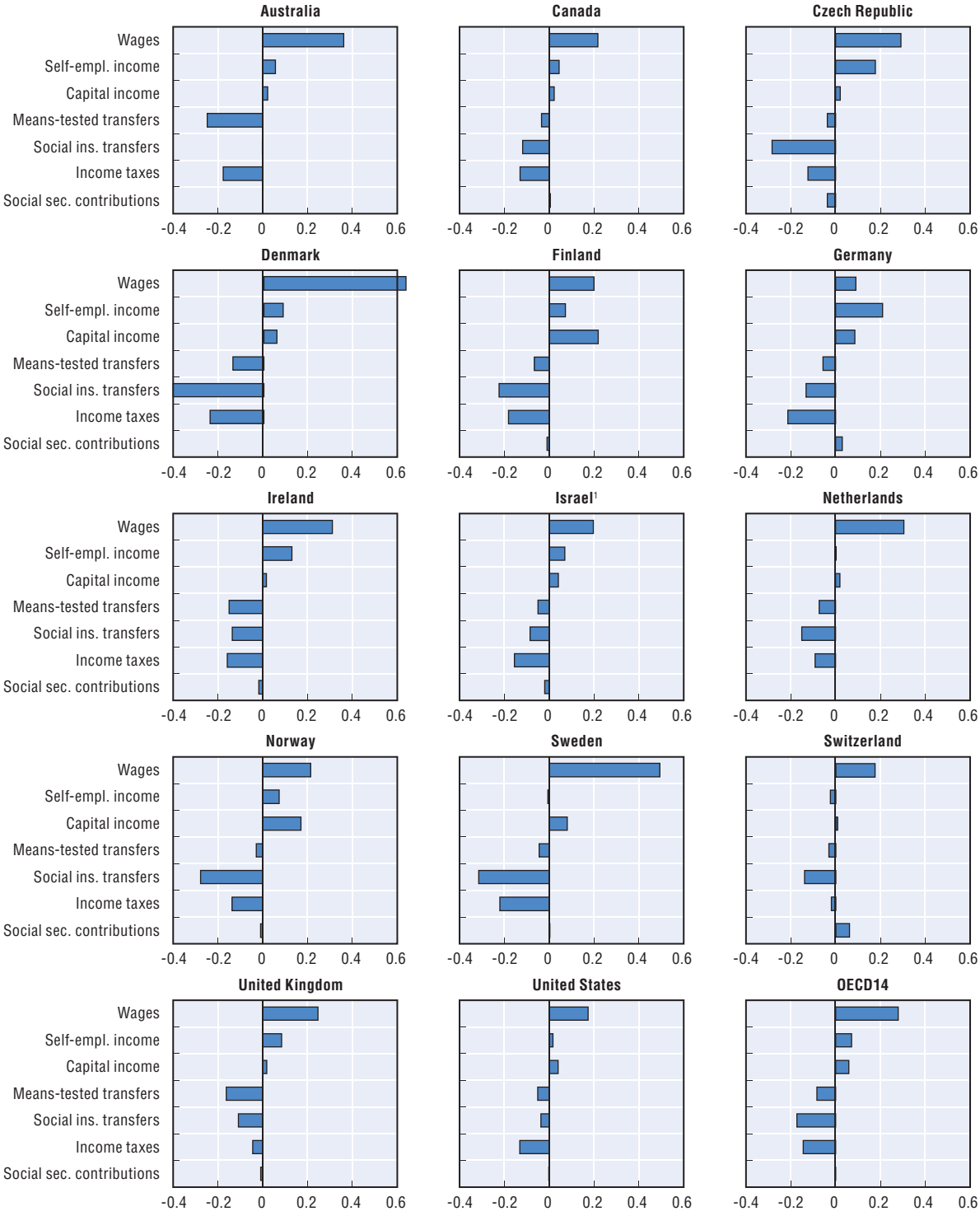
Figure 6.11 shows the percentage change in inequality due to a 1% increase in individual income components for the mid-2000s, for the sample of 14 OECD countries (other years are detailed in Annex Table 6.A1.4). Inequality will increase most if the relative share of wages grows. A 1% increase in wages, holding income from all other sources constant, would widen income inequality by almost 0.3%. Marginal increases in self-employment and capital income would have lower but sizeable effects: 0.07% and 0.06%, respectively.

In a majority of OECD countries, the effects of marginal increases in wages, self-employment and capital income became bigger over the earlier period from the mid-1980s to the mid-1990s. However, between the mid-1990s to mid-2000s, the marginal effects of wages and self-employment income dropped to a larger extent than they increased previously, while the marginal effect of capital income continued increasing.

On average across the 14 OECD countries shown in Figure 6.11, the impact of a marginal increase in social transfers (social insurance and means-tested transfers taken together) results in a decrease of overall inequality by 0.26%. The marginal effects of social transfers vary greatly across countries.[18] Denmark has the largest marginal reduction of inequality, reflecting the overall importance of social transfers in this country. A marginal increase in social insurance benefits would reduce inequality twice as much than a similar increase in means-tested transfers (0.173 versus 0.084). This is driven mostly by the larger relative share in total income of this type of transfers.[19] The marginal effect of means-tested transfers is comparatively higher only in Ireland and the United Kingdom, apart from Australia where no social insurance transfers exist.

Social transfers have become more effective at reducing inequality at the margin during the earlier period but less effective during the more recent decade and that holds for both social insurance and means-tested transfers (Table 6.A1.4). Over the whole period, only the Nordic countries (except Denmark) and Switzerland bucked this trend. On the other hand,

Figure 6.11. **Redistributive effects of marginal increases in individual income components, mid-2000s**



Note: Working-age population.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536781

the marginal effect of social insurance transfers became weaker in many countries, notably in Israel and the Netherlands where this also concerned means-tested transfers.

Taxes (particularly income taxes) also play an important role in redistribution. Figure 6.11 indicates that a 1% rise in income taxes, on average, reduces inequality of household income by about 0.14%. Social security contributions generally exert little redistributive effect, and in some cases, are regressive. In Switzerland and Germany, for instance, an increment in social security contributions would increase income inequality. Over the whole period, taxes have become less effective at reducing inequality at the margin in half of the countries for which tax information is available.

The marginal effect of direct taxes is smaller than the effect of social transfers which is partly explained by the negligible role of social security contributions in reducing inequality at the margin. The marginal impact of taxes on inequality did generally not change during the decade of the mid-1980s to mid-1990s but weakened over the more recent decade, in particular in Canada, Finland, Israel and the Netherlands.

6.5. Summary and conclusions

Inequality in market income among the working-age population is much higher than in disposable income, although both have increased since the mid 1980s. It rose at a much faster pace than disposable income inequality between the mid-1980s and mid-1990s, but has grown at a slower rate since then. The distribution of all components of market income has become more unequal over the past two decades and the share of wages and self-employment income going to the poorest 20% of the population has fallen more sharply than for the top earners.

Wages and self-employment income account for most of the income *inequality levels* in OECD countries. Wages, in particular, are the largest income source for the working-age population and have become increasingly concentrated. Capital income has contributed comparatively little to inequality levels. On the other hand, social transfers and income taxes have helped to curb inequality levels significantly, particularly in the Nordic countries and the Netherlands.

Changes in the size and the distributive patterns of labour earnings explain much but not all *inequality trends*, which were also driven by changes in capital income and in taxes and transfers. With the exception of the English-speaking countries, the contribution of capital income to inequality has grown since the mid-1980s as capital income has increasingly gone to richer households. At the same time, the contribution of wages and self-employment income to total inequality actually declined during the past ten years, mostly because their share of household income has fallen.

Changes in inequality are also related to changes in the relative importance of income taxes and benefits. The contribution of taxes and transfers to reductions in overall inequality decreased in many OECD countries between the mid-1990s and the mid-2000s. Chapter 7 examines the underlying drivers of these changes and to what extent they are related to changes in tax/transfer policies.

Social transfers (both social insurance and means-tested transfers) and income taxes can have a significant impact on household income inequality. Across the OECD countries under study, the average impact of a marginal increase of 1% in social transfers would be a fall in overall inequality of 0.26%. For income taxes the effect would be 0.14%.

Notes

1. An international expert group on household income statistics aimed to address the common conceptual, definitional, and practical problems that national statistical offices are facing in the area of household income distribution statistics (see *www.lisproject.org/links/canberra/finalreport.pdf*).
2. In Spain, for instance, non-contributory benefits were introduced at the beginning of the 1990s with the creation of the new Ministry of Social Affairs.
3. The ranking of countries using the Gini coefficient, as shown in Figure 6.1, should nevertheless be interpreted with caution. It is, for instance, possible for the income distribution to change significantly while the Gini coefficient remains unchanged. For this reason, other more tail-sensitive measures of inequality may yield different results. At the same time, studies comparing different inequality measures including mean log deviation, the coefficient of variation and interdecile ratios and shares suggest that the overall ranking across countries is not greatly affected by the specific choice of inequality indicators (see Table A1.1 and OECD, 2008).
4. Incomes and its subcomponents are adjusted with an equivalence scale equal to the square-root of the household size. This implies that the economic needs of a four-person household are assumed to be equivalent to those of two single-person households (see OECD, 2005).
5. While the unit of observation is the working-age individual, the income concept remains that of household income. Therefore, the household income "attached" to individuals may contain income sources from other household members, such as old-age pensions if there are elderly people living in the household.
6. 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.
7. The analysis confirms the results from previous studies on levels and trends in income inequality (Atkinson, 2000; Smeeding, 2002; OECD, 2008; Tóth and Medgyesi, 2011; Večernik, 2010) but data comparability issues remain cross-country and over time (Atkinson and Brandolini, 2001). Annex Table 6.A1.1 presents a comparative table for Gini coefficients from the *OECD Database on Household Income Distribution and Poverty* and from the Luxembourg Income Study (LIS) for a sub-section of countries. The results are similar for most countries in terms of the level of inequality and the direction of trends.
8. The combined shares could exceed 100% since taxes are treated as negative income.
9. For each of the four positive income sources, the standardised share is calculated by dividing with the average tax rate.
10. As wages and self-employment incomes are recorded in gross values, their share can exceed 100% of net disposable household income.
11. The concepts and methods of the OECD income distribution questionnaires and the LIS data are comparable as both datasets follow the guidelines of the Canberra Experts Group on Household Income Statistics. For comparison, Table 6.A1.1 in the annex shows the Gini coefficients of the working-age population for selected OECD countries from both sources.
12. Capital income witnessed a greater increase in inequality than earnings in 10 of the 14 countries shown in Figure 6.5. When extending the sample with countries for which only net income information is available, this pattern is found in 18 of 24 OECD countries.
13. The decomposition analysis uses the Lerman and Yitzhaki (1985) and Stark *et al.* (1986) decomposition method (see Box 6.1) that makes it possible to determine the impact of a particular income source on total net income inequality represented by the Gini coefficient (for an empirical application of this method, see for instance Garner and Terrell, 2001).
14. The contribution of a given income source to inequality can exceed 100% because there are also sources that contribute negatively. The sum of the contributions from all income sources is 100%.
15. This refers notably to disability and early-retirement pension benefits. Note that, due to the household income definition, some working-age people may also receive a positive amount of old-age pensions if there are elderly people (*e.g.* grandparents) living in the same household.
16. The results also suggest that the effect of direct taxes on overall inequality, at any given year, was stronger than that of social transfers. This finding, however, is linked to the type of decomposition method applied here which analyses the impact on inequality of each component simultaneously and implies that the contribution of a component to overall income inequality is zero if all individuals receive the same amount from the source (see Box 6.1). Therefore, a flat-rate transfer

to every individual would be regarded as distributionally neutral and a strictly earnings-related social insurance transfer would increase inequality. These results may be regarded as not being intuitive as such transfers which are "added" to more unequally distributed pre-transfer incomes would normally be expected to lower inequality. Chapter 7 applies an analytical framework which takes this issue into account.

17. The decomposition method applied in this chapter also allows evaluating the effect of marginal changes in a specific income source on inequality. Equation 3 in Box 6.1 shows that the relative variation of the overall Gini coefficient due to a small change in income for component k is equal to its relative contribution to total inequality minus its contribution to total income.

18. Looking at benefits by type (tables not shown), different country groupings emerge in terms of the inequality-reducing marginal effects. A marginal increase in disability benefits has the strongest effect in reducing inequality in about half of the countries, including northern European countries (with the exception of Finland) and Australia. Raising social-assistance transfers results in the largest marginal reduction in inequality in Germany, Finland, Ireland, Israel, the Netherlands, the United Kingdom and the United States. Finally, in Canada, unemployment benefits have the largest effect in terms of reducing inequality at the margin.

19. From equation 3 in Box 6.1 it follows that differences in the second component (Sk) are driving the marginal results.

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ANNEX 6.A1

Additional Tables

This chapter uses data from the *OECD Database on Household Income Distribution and Poverty* complemented by results based on analyses of the micro-records of the *Luxembourg Income Study* project (LIS). The key features and underlying surveys of the OECD database are documented on the methodological sub-page of the OECD inequality webpage *www.oecd.org/els/social/inequality* under *www.oecd.org/document/2/0,3746,en_2649_33933_45043394_1_1_1_1,00.html* . The key features of the micro data on LIS are documented at the LIS webpage (*www.lisdatacenter.org*). The concepts and methods of both databases are oriented as closely as possible along the guidelines of the Canberra Experts Group on Household Income Statistics (*www.lisproject.org/links/canberra/finalreport.pdf*).

Table 6.A1.1. **Gini coefficients from the *OECD Database on Household Income Distribution and Poverty* and from the LIS dataset**

	Gini coefficients, working-age population, disposable income									
	Mid-1980s		Around 1990		Mid-1990s		Around 2000s		Mid-2000s	
	OECD Questionnaire	LIS	OECD Questionnaire	LIS	OECD Questionnaire	LIS	OECD Questionnaire	LIS	OECD Questionnaire	LIS
Australia		0.290 (1985)			0.301(1995)	0.313 (1995)	0.292 (2000)	0.315 (2001)	0.305 (2004)	0.321 (2003)
Austria	0.225 (1983)				0.233 (1993)	0.298 (1994)	0.246 (1999) |		0.267 (2004)	0.289 (2004)
Belgium		0.231 (1985)			0.281 (1995)	0.265 (1995)	0.284 (2000) |	0.269 (2000)	0.265 (2004)	
Canada	0.291 (1985)	0.297 (1987)	0.287 (1990)	0.283 (1991)	0.293 (1995)	0.297 (1994)	0.326 (2000)	0.319 (2000)	0.322 (2005)	0.310 (2004)
Czech Republic			0.227 (1992)	0.206 (1992)	0.251 (1996)	0.253 (1996)	0.260 (2002)		0.267 (2004)	0.262 (2004)
Denmark	0.209 (1985)	0.224 (1987)	0.215 (1990)	0.213 (1992)	0.206 (1995)	0.209 (1995)	0.219 (2000)		0.228 (2005)	0.223 (2004)
Finland	0.205 (1986)	0.217 (1987)			0.234 (1995)	0.222 (1995)	0.260 (2000)		0.271 (2005)	0.271 (2004)
France	0.300 (1984)	0.316 (1984)	0.290 (1990) |		0.280 (1996)	0.309 (1994)	0.288 (2000)	0.302 (2000)	0.288 (2004)	
Germany	0.246 (1985)	0.255 (1984)	0.250 (1990)	0.249 (1989)	0.267 (1995)	0.260 (1994)	0.262 (2000)	0.269 (2000)	0.288 (2004)	0.303 (2004)
Greece	0.330 (1988)				0.322 (1994)	0.350 (1995)	0.335 (1999)		0.311 (2004)	0.343 (2004)
Hungary			0.266 (1991)	0.279 (1991)	0.297 (1995)	0.339 (1994)	0.296 (2000)	0.298 (1999)	0.300 (2005)	0.307 (2005)
Ireland	0.338 (1987)	0.332 (1987)			0.321 (1994)		0.290 (2000) |		0.305 (2004)	0.325 (2004)
Israel[1]	0.317 (1985)	0.300 (1986)	0.321 (1990)		0.329 (1995)	0.332 (1997)	0.340 (2000)		0.374 (2005)	0.356 (2005)
Italy	0.310 (1984)	0.306 (1986)	0.293 (1991)	0.288 (1991)	0.348 (1995)	0.335 (1995)	0.341 (2000)	0.338 (2000)	0.348 (2004)	0.331 (2004)
Luxembourg	0.239 (1986)	0.227 (1985)			0.261 (1996)	0.237 (1994)	0.262 (2001)	0.262 (2000)	0.259 (2004)	0.272 (2004)
Mexico	0.447 (1984)	0.441 (1984)			0.519 (1994)	0.509 (1994)	0.502 (2000)	0.507 (2000)	0.469 (2004)	0.482 (2004)
Netherlands	0.273 (1985)	0.243 (1987)	0.290 (1990)	0.261 (1991)	0.298 (1995)	0.260 (1994)	0.293 (2000)		0.285 (2005)	0.263 (2004)
Norway	0.211 (1986)	0.210 (1986)			0.237 (1995)	0.238 (1995)	0.260 (2000)	0.249 (2000)	0.284 (2004)	0.247 (2004)
Poland				0.277 (1992)		0.303 (1995)	0.318 (2000) |		0.357 (2004)	0.330 (2004)
Spain	0.302 (1995)		0.270 (1990)	0.306 (1990)	0.278 (1995)	0.360 (1995)	0.274 (2000) |	0.335 (2000)	0.307 (2004)	0.332 (2004)
Sweden	0.195 (1983)	0.203 (1987)	0.205 (1991)		0.216 (1995)	0.215 (1995)	0.242 (2000)	0.243 (2000)	0.236 (2004)	0.233 (2004)
Switzerland		0.311 (1982)		0.300 (1992)			0.276 (2000)	0.268 (2002)	0.270 (2004)	0.254 (2004)
United Kingdom	0.316 (1985)	0.300 (1986)	0.359 (1991)		0.346 (1994)	0.341 (1994)	0.363 (2000)	0.351 (1999)	0.331 (2004)	0.349 (2004)
United States	0.326 (1984)	0.333 (1986)	0.337 (1990)	0.331 (1991)	0.351 (1665)	0.365 (1994)	0.346 (2000)	0.364 (2000)	0.373 (2005)	0.369 (2004)

Note: Income refers to disposable household income adjusted with an equivalence scale of the square root of the household size. Straight lines indicate breaks in data series.

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

Source: OECD Database on Household Income Distribution and Poverty. OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537883

Table 6.A1.2. **Decomposition of (disposable) income inequality by income sources, countries reporting gross incomes**

Panel A. Mid-1980s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Australia					**Canada**					**Czech Republic**					**Denmark**					**Finland**				
Wages		1.36	1.00	0.46	0.86		1.21	0.95	0.45	0.85												1.51	0.98	0.45	0.75
Self-employment income		0.12	0.11	0.92	0.35		0.11	0.09	0.93	0.40												0.23	0.23	0.81	0.27
Capital income		0.17	0.09	0.88	0.63		0.07	0.04	0.89	0.56												0.08	0.03	0.84	0.57
Occupational pensions		0.00	0.02	0.97	–0.05		0.03	0.03	0.97	0.33												0.01	0.08	0.88	0.02
Means-tested transfers		–0.11	0.08	0.74	–0.54		–0.05	0.02	0.87	–0.71												–0.02	0.02	0.89	–0.47
Social insurance transfers		–	–	–	–		–0.03	0.08	0.70	–0.15												–0.05	0.10	0.65	–0.16
Private transfers		0.00	0.01	0.99	–0.26			–	–	–												0.00	0.00	0.99	–0.19
Other income		0.00	0.01	0.98	0.22		0.01	0.01	0.97	0.17												0.01	0.01	0.96	0.30
Income taxes		–0.54	–0.31	–0.54	–0.95		–0.36	–0.23	–0.51	–0.91												–0.70	–0.39	–0.44	–0.88
Social security contributions			–	–	–			–	–	–												–0.06	–0.05	–0.39	–0.64
Total disposable income	0.29					0.30															0.22				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Germany					**Ireland**					**Israel**[1]					**Netherlands**					**Norway**				
Wages		1.26	1.14	0.38	0.75		1.08	0.84	0.56	0.77		1.25	0.96	0.49	0.80		1.47	1.12	0.47	0.72		0.98	1.02	0.33	0.61
Self-employment income		0.29	0.11	0.95	0.71		0.34	0.22	0.88	0.60		0.30	0.20	0.92	0.50		0.17	0.09	0.96	0.50		0.33	0.14	0.88	0.55
Capital income		0.08	0.03	0.84	0.70		0.05	0.03	0.87	0.54		0.07	0.03	0.98	0.71		0.02	0.01	0.99	0.59		0.08	0.04	0.83	0.52
Occupational pensions			–	–	–		0.02	0.02	0.98	0.42		0.03	0.04	0.95	0.25		0.08	0.06	0.97	0.33		0.01	0.01	0.98	0.17
Means-tested transfers		–0.03	0.01	0.95	–0.52		–0.05	0.06	0.80	–0.34		–0.01	0.01	0.98	–0.48		–0.08	0.04	0.95	–0.57		0.00	0.01	0.89	–0.01
Social insurance transfers		–0.01	0.10	0.77	–0.03		–0.04	0.10	0.66	–0.22		–0.04	0.09	0.69	–0.19		–0.01	0.20	0.77	–0.01		–0.07	0.08	0.73	–0.26
Private transfers		–0.01	0.01	0.99	–0.32		0.00	0.00	1.00	0.38		0.01	0.02	0.97	0.15		0.00	0.01	0.99	0.06		0.00	0.01	0.96	–0.04
Other income			–	–	–			0.00	1.00	0.00			–	–	–			–	–	–		0.12	0.04	0.93	0.67
Income taxes		–0.45	–0.23	–0.53	–0.92		–0.34	–0.22	–0.66	–0.80		–0.52	–0.26	–0.66	–0.91		–0.29	–0.18	–0.48	–0.87		–0.31	–0.22	–0.41	–0.72
Social security contributions		–0.15	–0.17	–0.35	–0.62		–0.06	–0.05	–0.58	–0.65		–0.09	–0.07	–0.53	–0.70		–0.37	–0.35	–0.33	–0.81		–0.12	–0.12	–0.29	–0.75
Total disposable income	0.26					0.33					0.30					0.26					0.21				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk					
	Sweden					**Switzerland**					**United Kingdom**					**United States**									
Wages		1.64	1.06	0.40	0.78		0.79	0.96	0.31	0.82		1.27	0.94	0.50	0.80		1.19	1.04	0.45	0.85					
Self-employment income		–0.03	0.13	0.88	–0.05		0.39	0.16	0.91	0.85		0.15	0.10	0.93	0.47		0.11	0.09	0.94	0.43					
Capital income		0.08	0.05	0.77	0.44		0.09	0.06	0.84	0.60		0.08	0.05	0.87	0.57		0.12	0.07	0.88	0.68					
Occupational pensions			–	–	–		0.00	0.00	1.00	–0.22		0.04	0.04	0.95	0.33		0.03	0.03	0.96	0.37					
Means-tested transfers		–0.03	0.01	0.93	–0.52		0.00	0.00	1.00	–0.78		–0.08	0.06	0.85	–0.50		–0.03	0.01	0.94	–0.73					
Social insurance transfers		0.03	0.22	0.64	0.04		–0.02	0.02	0.93	–0.25		–0.04	0.11	0.63	–0.15		0.00	0.04	0.89	–0.04					
Private transfers		–0.01	0.01	0.94	–0.22		0.01	0.02	0.97	0.15		0.01	0.01	0.97	0.20		0.00	0.01	0.97	0.07					
Other income			0.00	0.99	0.17		0.00	0.00	0.99	0.12			0.00	0.93	0.11		0.01	0.01	0.97	0.28					
Income taxes		–0.68	–0.48	–0.35	–0.84		–0.20	–0.15	–0.50	–0.86		–0.31	–0.21	–0.54	–0.84		–0.35	–0.22	–0.59	–0.90					
Social security contributions			–	–	–		–0.06	–0.07	–0.32	–0.89		–0.11	–0.10	–0.48	–0.67		–0.08	–0.08	–0.42	–0.81					
Total disposable income	0.20					0.31					0.30					0.33									

Table 6.A1.2. **Decomposition of (disposable) income inequality by income sources, countries reporting gross incomes** *(cont.)*

Panel B. Mid-1990s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Australia					**Canada**					**Czech Republic**					**Denmark**					**Finland**				
Wages		1.40	0.99	0.49	0.89		1.29	0.97	0.46	0.86		1.22	0.95	0.40	0.80		1.77	1.10	0.42	0.80		1.36	0.92	0.47	0.70
Self-employment income		0.15	0.11	0.94	0.47		0.12	0.08	0.94	0.44		0.29	0.12	0.94	0.66		0.17	0.08	0.94	0.46		0.32	0.18	0.87	0.46
Capital income		0.05	0.04	0.92	0.47		0.05	0.03	0.93	0.53		0.02	0.01	0.98	0.65		0.11	0.04	0.92	0.70		0.13	0.04	0.92	0.72
Occupational pensions		0.01	0.01	0.98	0.25		0.03	0.03	0.96	0.31			–	–	–		0.03	0.02	0.98	0.35		0.05	0.10	0.88	0.12
Means-tested transfers		–0.15	0.11	0.73	–0.59		–0.06	0.03	0.91	–0.66		–0.02	0.01	0.90	–0.40		–0.11	0.04	0.90	–0.69		–0.05	0.02	0.89	–0.59
Social insurance transfers		0.00	0.00	0.99	–0.46		–0.04	0.09	0.68	–0.17		–0.13	0.15	0.66	–0.33		–0.24	0.23	0.63	–0.35		–0.10	0.16	0.54	–0.26
Private transfers		0.00	0.01	0.98	–0.15			–	–	–			–	–	–		–0.01	0.01	0.92	–0.43		0.01	0.01	0.92	0.17
Other income		0.01	0.01	0.99	0.34		0.02	0.02	0.96	0.31			–	–	–		0.02	0.02	0.94	0.35		0.00	0.00	0.98	0.19
Income taxes		–0.46	–0.27	–0.56	–0.96		–0.41	–0.25	–0.52	–0.92		–0.24	–0.12	–0.53	–0.95		–0.74	–0.52	–0.35	–0.86		–0.58	–0.34	–0.42	–0.89
Social security contributions			–	–	–			–	–	–		–0.15	–0.12	–0.41	–0.80		0.00	–0.01	–0.41	–0.62		–0.13	–0.09	–0.40	–0.80
Total disposable income	0.31					0.30					0.253					0.21					0.22				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Germany					**Ireland**					**Israel**[1]					**Netherlands**					**Norway**				
Wages		1.31	1.13	0.39	0.76							1.27	0.98	0.51	0.84		1.48	1.12	0.43	0.79		0.94	0.86	0.42	0.62
Self-employment income		0.25	0.10	0.95	0.72							0.25	0.18	0.90	0.53		0.15	0.07	0.97	0.56		0.55	0.32	0.81	0.51
Capital income		0.11	0.04	0.84	0.76							0.05	0.02	0.96	0.74		0.06	0.03	0.89	0.58		0.14	0.05	0.88	0.73
Occupational pensions		0.00	0.01	0.99	0.23							0.06	0.04	0.95	0.52		0.09	0.06	0.97	0.38		0.01	0.01	0.97	0.15
Means-tested transfers		–0.03	0.02	0.93	–0.54							–0.02	0.01	0.96	–0.72		–0.08	0.04	0.93	–0.60		–0.02	0.01	0.90	–0.40
Social insurance transfers		–0.04	0.11	0.74	–0.13							–0.04	0.09	0.66	–0.22		–0.03	0.16	0.77	–0.07		–0.08	0.11	0.66	–0.28
Private transfers		–0.01	0.01	0.98	–0.25							0.01	0.02	0.97	0.26		0.00	0.01	0.99	0.06		0.00	0.01	0.95	–0.18
Other income			–	–	–								–	–	–		0.01	0.01	0.98	0.44		0.01	0.00	1.00	0.84
Income taxes		–0.39	–0.20	–0.55	–0.92							–0.46	–0.24	–0.69	–0.93		–0.46	–0.26	–0.51	–0.90		–0.42	–0.27	–0.41	–0.89
Social security contributions		–0.20	–0.20	–0.37	–0.69							–0.12	–0.10	–0.44	–0.91		–0.22	–0.23	–0.28	–0.88		–0.12	–0.10	–0.32	–0.86
Total disposable income	0.26										0.33					0.26					0.24				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk					
	Sweden					**Switzerland**					**United Kingdom**					**United States**									
Wages		1.67	1.04	0.42	0.82		0.82	0.83	0.41	0.71		1.17	0.91	0.54	0.81		1.24	1.07	0.47	0.90					
Self-employment income		–0.01	0.05	0.93	–0.04		0.12	0.13	0.91	0.31		0.21	0.13	0.93	0.59		0.09	0.08	0.95	0.46					
Capital income		0.10	0.05	0.84	0.52		0.23	0.11	0.83	0.75		0.06	0.04	0.88	0.63		0.10	0.05	0.90	0.75					
Occupational pensions		0.06	0.03	0.95	0.43		0.04	0.03	0.96	0.43		0.05	0.05	0.94	0.33		0.03	0.03	0.97	0.46					
Means-tested transfers		–0.06	0.03	0.89	–0.50		–0.01	0.01	0.96	–0.22		–0.10	0.07	0.83	–0.63		–0.03	0.02	0.93	–0.66					
Social insurance transfers		–0.11	0.23	0.60	–0.18		0.02	0.06	0.87	0.12		–0.04	0.08	0.70	–0.24		0.00	0.04	0.88	–0.04					
Private transfers		–0.01	0.01	0.94	–0.24		0.00	0.02	0.96	–0.08		0.00	0.01	0.98	0.07		0.00	0.01	0.97	0.10					
Other income			–	–	–		0.00	0.00	0.98	0.18		0.01	0.01	0.99	0.77		0.00	0.00	1.00	0.51					
Income taxes		–0.64	–0.43	–0.35	–0.90		–0.18	–0.13	–0.54	–0.79		–0.28	–0.21	–0.55	–0.81		–0.35	–0.21	–0.64	–0.96					
Social security contributions			–	–	–		–0.04	–0.06	–0.68	–0.28		–0.08	–0.07	–0.55	–0.69		–0.09	–0.08	–0.46	–0.84					
Total disposable income	0.21					0.30					0.34					0.37									

Table 6.A1.2. **Decomposition of (disposable) income inequality by income sources, countries reporting gross incomes** *(cont.)*

Panel C. Mid-2000s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Australia					**Canada**					**Czech Republic**					**Denmark**					**Finland**				
Wages		1.34	0.98	0.50	0.88		1.21	0.99	0.44	0.85		1.14	0.85	0.47	0.74		1.75	1.11	0.42	0.84		1.04	0.83	0.49	0.69
Self-employment income		0.17	0.11	0.94	0.52		0.13	0.08	0.94	0.50		0.33	0.15	0.91	0.62		0.16	0.08	0.95	0.50		0.28	0.21	0.83	0.44
Capital income		0.06	0.04	0.93	0.53		0.05	0.03	0.94	0.57		0.03	0.01	0.98	0.72		0.09	0.03	0.93	0.72		0.34	0.12	0.93	0.81
Occupational pensions		0.01	0.02	0.98	0.22		0.05	0.05	0.94	0.32			–	–	–		0.04	0.02	0.97	0.35		0.00	0.01	0.99	0.15
Means-tested transfers		–0.14	0.10	0.73	–0.61		–0.02	0.01	0.95	–0.71		–0.03	0.01	0.94	–0.68		–0.10	0.04	0.90	–0.72		–0.05	0.02	0.92	–0.72
Social insurance transfers		0.00	0.00	1.00	–0.71		–0.04	0.08	0.68	–0.19		–0.09	0.19	0.62	–0.19		–0.22	0.19	0.66	–0.39		–0.04	0.18	0.63	–0.09
Private transfers		0.00	0.01	0.98	–0.17		0.00	0.01	0.97	–0.17			–	–	–		–0.01	0.01	0.92	–0.40		0.00	0.01	0.91	–0.04
Other income		0.00	0.00	1.00	0.24		0.03	0.02	0.95	0.40		0.01	0.02	0.92	0.18		0.02	0.01	0.83	0.48		0.00	0.00	1.00	0.04
Income taxes		–0.44	–0.26	–0.56	–0.96		–0.35	–0.22	–0.52	–0.93		–0.25	–0.12	–0.56	–0.93		–0.72	–0.48	–0.36	–0.92		–0.51	–0.32	–0.46	–0.91
Social security contributions			–	–	–		–0.05	–0.05	–0.36	–0.75		–0.14	–0.11	–0.47	–0.74		0.00	–0.01	–0.39	–0.63		–0.07	–0.06	–0.45	–0.71
Total disposable income	0.32					0.31					0.26					0.22					0.27				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Germany					**Ireland**					**Israel**[1]					**Netherlands**					**Norway**				
Wages		1.15	1.06	0.45	0.73		1.12	0.81	0.55	0.81		1.09	0.89	0.52	0.83		1.49	1.19	0.38	0.76		1.19	0.98	0.38	0.78
Self-employment income		0.37	0.16	0.93	0.76		0.33	0.19	0.90	0.61		0.22	0.15	0.92	0.57		0.09	0.08	0.95	0.25		0.17	0.09	0.93	0.46
Capital income		0.15	0.07	0.87	0.80		0.04	0.02	0.96	0.58		0.09	0.05	0.94	0.71		0.04	0.02	0.74	0.56		0.24	0.07	0.95	0.87
Occupational pensions		0.01	0.01	0.99	0.35		0.02	0.02	0.98	0.42		0.07	0.05	0.95	0.52			–	–	–		0.01	0.02	0.95	0.18
Means-tested transfers		–0.04	0.02	0.93	–0.67		–0.09	0.02	0.93	–0.67		–0.03	0.02	0.92	–0.63		–0.05	0.02	0.95	–0.68		–0.02	0.01	0.97	–0.71
Social insurance transfers		–0.01	0.12	0.65	–0.05		–0.03	0.06	0.82	–0.63		–0.01	0.08	0.73	–0.05		0.04	0.19	0.79	0.06		–0.09	0.19	0.60	–0.20
Private transfers		–0.01	0.01	0.97	–0.30		0.01	0.11	0.63	–0.11		0.02	0.03	0.95	0.21		0.00	0.01	0.97	0.02		0.00	0.00	0.99	0.35
Other income			–	–	–			0.00	1.00	0.40			–	–	–		0.00	0.00	0.99	0.33		0.00	0.00	0.99	0.52
Income taxes		–0.46	–0.25	–0.62	–0.91		–0.35	–0.20	–0.67	–0.89		–0.32	–0.17	–0.74	–0.93		–0.61	–0.52	–0.36	–0.76		–0.39	–0.26	–0.42	–0.89
Social security contributions		–0.15	–0.18	–0.42	–0.60		–0.05	–0.03	–0.78	–0.68		–0.11	–0.09	–0.49	–0.89			–	–	–		–0.11	–0.10	–0.30	–0.88
Total disposable income	0.30					0.33					0.36					0.23					0.24				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk					
	Sweden					**Switzerland**					**United Kingdom**					**United States**									
Wages		1.55	1.06	0.41	0.84		1.25	1.07	0.38	0.78		1.17	0.93	0.53	0.83		1.22	1.05	0.48	0.90					
Self-employment income		0.03	0.04	0.95	0.20		0.08	0.10	0.92	0.21		0.20	0.12	0.94	0.64		0.09	0.07	0.95	0.48					
Capital income		0.13	0.05	0.91	0.71		0.04	0.03	0.87	0.36		0.05	0.03	0.92	0.59		0.09	0.05	0.91	0.74					
Occupational pensions		0.05	0.03	0.95	0.38		0.00	0.00	1.00	0.22		0.03	0.05	0.94	0.26		0.02	0.02	0.98	0.36					
Means-tested transfers		–0.03	0.01	0.95	–0.65		–0.02	0.01	0.93	–0.58		–0.10	0.07	0.79	–0.62		–0.02	0.03	0.72	–0.34					
Social insurance transfers		–0.10	0.22	0.58	–0.18		–0.03	0.11	0.81	–0.07		–0.04	0.07	0.70	–0.28		0.01	0.05	0.90	0.08					
Private transfers		–0.01	0.01	0.93	–0.45		–0.01	0.02	0.92	–0.11		0.00	0.01	0.97	0.01		0.00	0.01	0.96	0.02					
Other income		0.01	0.00	0.98	0.48		0.00	–	–	–		0.00	0.00	1.00	0.30		0.00	0.00	0.99	0.23					
Income taxes		–0.56	–0.34	–0.41	–0.94		–0.17	–0.15	–0.46	–0.62		–0.26	–0.21	–0.52	–0.82		–0.32	–0.19	–0.67	–0.93					
Social security contributions		–0.07	–0.07	–0.28	–0.80		–0.15	–0.21	–0.24	–0.74		–0.07	–0.06	–0.54	–0.75		–0.08	–0.08	–0.42	–0.90					
Total disposable income	0.23					0.25					0.35					0.37									

Note: Working-age population. Income inequality is measured by the Gini coefficient. Disposable income refers to household income adjusted with an equivalence scale of the square of household size. *Ck* is the relative contribution of source *k* to total income inequality. *Sk* is the share of source *k* in total income, *Gk* is the Gini coefficient of income source *k*, and *Rk* is the correlation of income from source *k* with the distribution of total income. For further definitions see Box 6.1.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537902

Table 6.A1.3. **Decomposition of (disposable) income inequality by income sources, countries reporting net incomes**

Panel A. Mid-1980s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Austria					**Belgium**					**France**					**Greece**					**Hungary**				
Wages							1.06	0.76	0.39	0.83		0.88	0.73	0.47	0.80										
Self-employment income								–	–	–		0.07	0.06	0.95	0.38										
Capital income							0.05	0.02	0.97	0.67		0.03	0.02	0.95	0.47										
Occupational pensions							0.00	0.00	1.00	0.50			–	–	–										
Means-tested transfers							–0.01	0.01	0.99	–0.22		–0.02	0.02	0.84	–0.34										
Social insurance transfers							–0.11	0.21	0.63	–0.18		0.03	0.16	0.75	0.08										
Private transfers							0.00	0.01	0.99	–0.13		0.00	0.00	0.99	–0.02										
Other income								–	–	–		0.01	0.00	0.99	0.38										
Total disposable income						0.23					0.32														
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Italy					**Luxembourg**					**Mexico**					**Poland**					**Spain**				
Wages		0.54	0.60	0.47	0.59		0.72	0.69	0.38	0.62		0.65	0.63	0.60	0.76							0.82	0.70	0.50	0.74
Self-employment income		0.31	0.22	0.84	0.51		0.17	0.09	0.91	0.46		0.24	0.27	0.81	0.50							0.16	0.18	0.85	0.32
Capital income		0.09	0.04	0.85	0.71		0.06	0.02	0.96	0.59		0.05	0.03	0.98	0.75							0.02	0.01	0.99	0.55
Occupational pensions			–	–	–			–	–	–			–	–	–								–	–	–
Means-tested transfers			–	–	–		0.00	0.00	0.99	–0.34			–	–	–								–	–	–
Social insurance transfers		0.06	0.14	0.80	0.17		0.03	0.18	0.69	0.06		0.03	0.02	0.98	0.60							0.00	0.11	0.83	0.01
Private transfers			–	–	–		0.00	0.00	0.99	–0.14		0.03	0.05	0.94	0.30								–	–	–
Other income			–	–	–		0.02	0.01	0.97	0.47			–	–	–								–	–	–
Total disposable income	0.31					0.23					0.44										0.32				

Table 6.A1.3. **Decomposition of (disposable) income inequality by income sources, countries reporting net incomes** *(cont.)*

Panel B. Mid-1990s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Austria					**Belgium**					**France**					**Greece**					**Hungary**				
Wages		0.78	0.67	0.45	0.78		0.80	0.66	0.42	0.76		0.76	0.67	0.47	0.74		0.55	0.50	0.59	0.64		0.93	0.66	0.55	0.88
Self-employment income		0.17	0.09	0.94	0.59		0.19	0.07	0.96	0.72		0.17	0.10	0.94	0.60		0.26	0.29	0.74	0.42		0.05	0.03	0.96	0.63
Capital income		0.03	0.02	0.79	0.43		0.05	0.03	0.90	0.52		0.07	0.04	0.82	0.66		0.09	0.05	0.90	0.63		0.02	0.01	0.98	0.72
Occupational pensions		0.00	0.01	0.99	0.09		0.00	0.00	1.00	0.31			–	–	–		0.01	0.01	0.98	0.42			–	–	–
Means-tested transfers		0.00	0.01	0.95	–0.11		–0.01	0.01	0.98	–0.29		–0.03	0.02	0.85	–0.66		0.00	0.00	0.98	0.09		–0.01	0.01	0.90	–0.25
Social insurance transfers		0.01	0.18	0.65	0.03		–0.09	0.19	0.62	–0.19		0.02	0.16	0.71	0.06		0.09	0.13	0.81	0.30		–0.01	0.27	0.48	–0.02
Private transfers		0.01	0.02	0.95	0.21		0.02	0.02	0.94	0.37		0.00	0.01	0.97	0.08		0.00	0.01	0.97	0.09		0.01	0.01	0.96	0.27
Other income		0.00	0.00	0.89	0.33		0.03	0.02	0.76	0.39		0.00	0.00	1.00	0.43		0.00	0.00	0.91	0.44		0.01	0.01	0.96	0.19
Total disposable income	0.30					0.27					0.31					0.35					0.34				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Italy					**Luxembourg**					**Mexico**					**Poland**					**Spain**				
Wages		0.54	0.56	0.51	0.63		0.83	0.69	0.41	0.70		0.69	0.66	0.64	0.82		0.63	0.52	0.56	0.65		0.77	0.67	0.52	0.79
Self-employment income		0.21	0.17	0.85	0.48		0.14	0.08	0.91	0.45		0.24	0.24	0.84	0.61		0.24	0.14	0.91	0.59		0.19	0.16	0.88	0.51
Capital income		0.13	0.07	0.79	0.75		0.06	0.03	0.91	0.57		0.03	0.02	0.99	0.75		0.01	0.00	0.99	0.61		0.03	0.02	0.92	0.56
Occupational pensions		0.04	0.04	0.95	0.37			0.00	0.99	–0.33			–	–	–			–	–	–		0.00	0.00	0.99	0.47
Means-tested transfers		0.00	0.01	0.98	0.12		–0.02	0.01	0.90	–0.33			–	–	–		0.00	0.01	0.93	–0.07		–0.01	0.01	0.94	–0.42
Social insurance transfers		0.07	0.14	0.80	0.20		–0.02	0.19	0.66	–0.03		0.03	0.04	0.93	0.36		0.08	0.27	0.61	0.15		0.00	0.11	0.79	0.01
Private transfers		0.00	0.01	0.99	0.16		–0.01	0.00	0.99	–0.47		0.01	0.03	0.95	0.21		0.04	0.04	0.87	0.29		0.00	0.01	0.98	–0.03
Other income		0.01	0.01	0.99	0.53			–	–	–		0.00	0.00	0.99	0.70		0.01	0.02	0.96	0.15		0.02	0.02	0.69	0.49
Total disposable income	0.33					0.24					0.51					0.30					0.36				

Table 6.A1.3. **Decomposition of (disposable) income inequality by income sources, countries reporting net incomes** *(cont.)*

Panel C. Mid-2000s

	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Austria					**Belgium**					**France**					**Greece**					**Hungary**				
Wages		0.48	0.57	0.45	0.54		0.75	0.69	0.37	0.78		0.79	0.70	0.45	0.76		0.54	0.53	0.56	0.63		0.60	0.51	0.54	0.67
Self-employment income		0.27	0.13	0.91	0.68		0.23	0.08	0.97	0.80		0.15	0.08	0.95	0.59		0.31	0.27	0.79	0.50		0.26	0.12	0.91	0.74
Capital income		0.06	0.03	0.90	0.74		0.08	0.04	0.92	0.64		0.08	0.04	0.83	0.70		0.07	0.04	0.92	0.62		0.08	0.03	0.97	0.85
Occupational pensions			–	–	–		0.00	0.00	1.00	0.12			–	–	–			–	–	–			–	–	–
Means-tested transfers		–0.01	0.01	0.97	–0.48		–0.01	0.01	0.98	–0.40		–0.05	0.02	0.86	–0.66		0.00	0.00	0.98	–0.21		–0.02	0.02	0.91	–0.40
Social insurance transfers		0.21	0.27	0.66	0.34		–0.11	0.15	0.65	–0.29		0.04	0.15	0.74	0.09		0.07	0.14	0.79	0.22		0.06	0.31	0.53	0.11
Private transfers		–0.01	0.01	0.95	–0.16		0.03	0.02	0.95	0.50		0.00	0.01	0.97	–0.08		0.00	0.01	0.96	–0.10		0.02	0.01	0.99	0.66
Other income		0.00	0.00	1.00	–0.13		0.03	0.02	0.75	0.42		0.00	0.00	0.99	0.10		0.01	0.01	1.00	0.76			–	–	–
Total disposable income	0.29					0.27					0.30					0.34					0.31				
	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk	Gini	Ck	Sk	Gk	Rk
	Italy					**Luxembourg**					**Mexico**					**Poland**					**Spain**				
Wages		0.48	0.57	0.50	0.57		0.65	0.66	0.45	0.69		0.70	0.70	0.58	0.83		0.62	0.54	0.57	0.66		0.84	0.74	0.46	0.82
Self-employment income		0.38	0.22	0.88	0.66		0.22	0.09	0.96	0.80		0.22	0.20	0.87	0.60		0.23	0.15	0.89	0.57		0.06	0.09	0.90	0.26
Capital income		0.05	0.03	0.87	0.69		0.07	0.04	0.93	0.70		0.02	0.01	0.98	0.75		0.01	0.01	0.99	0.63		0.03	0.02	0.95	0.56
Occupational pensions			0.00	0.99	–0.05			–	–	–		0.00	0.00	1.00	0.72			0.00	1.00	–0.38			–	–	–
Means-tested transfers		0.00	0.01	0.98	–0.15		–0.02	0.01	0.95	–0.63		–0.01	0.01	0.91	–0.49		–0.01	0.01	0.97	–0.30		0.00	0.00	0.99	0.44
Social insurance transfers		0.09	0.17	0.78	0.21		0.08	0.19	0.70	0.19		0.05	0.04	0.96	0.55		0.12	0.26	0.67	0.24		0.06	0.14	0.79	0.17
Private transfers		0.00	0.00	0.99	–0.05		0.00	0.01	0.97	–0.15		0.02	0.03	0.94	0.24		0.02	0.03	0.91	0.20		0.00	0.01	0.99	0.01
Other income			0.00	0.99	0.03			0.00	0.99	0.04		0.00	0.00	1.00	0.28		0.01	0.01	0.97	0.43		0.01	0.01	0.99	0.24
Total disposable income	0.33					0.32					0.48					0.33					0.33				

Note: Working-age population. Income inequality is measured by the Gini coefficient. Disposable income refers to household income adjusted with an equivalence scale of the square of household size. *Ck* is the relative contribution of source *k* to total income inequality, *Sk* is the share of source *k* in total income, *Gk* is the Gini coefficient of income source *k*, and *Rk* is the correlation of income from source *k* with the distribution of total income. For further definitions see Box 6.1.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537921

Table 6.A1.4. **Marginal effects of changes in income components**

Panel A. Mid-1980s

	Wages	Self-employment income	Capital income	Occupational pensions	Means-tested transfers	Social insurance transfers	Private transfers	Other income	Income taxes	Social security contributions
Countries reporting gross incomes										
Australia	0.356	0.011	0.080	–0.022	–0.189		–0.004	–0.001	–0.231	
Canada	0.263	0.023	0.030	0.002	–0.070	–0.115		–0.005	–0.128	
Czech Republic										
Denmark										
Finland	0.530	0.000	0.042	–0.075	–0.035	–0.146	–0.003	0.002	–0.309	–0.007
Germany	0.121	0.182	0.045		–0.042	–0.103	–0.012		–0.216	0.024
Ireland	0.245	0.125	0.013	0.004	–0.117	–0.139	0.000	0.000	–0.125	–0.006
Israel[1]	0.291	0.104	0.037	–0.008	–0.016	–0.125	–0.009		–0.258	–0.016
Netherlands	0.353	0.078	0.012	0.016	–0.119	–0.209	–0.004		–0.112	–0.014
Norway	–0.042	0.185	0.039	–0.001	–0.007	–0.153	–0.005	0.080	–0.090	–0.005
Sweden	0.588	–0.160	0.031		–0.045	–0.194	–0.014	0.000	–0.207	
Switzerland	–0.164	0.234	0.036	–0.001	–0.003	–0.041	–0.008	–0.002	–0.056	0.005
United Kingdom	0.324	0.046	0.032	0.001	–0.142	–0.141	–0.005	–0.001	–0.106	–0.008
United States	0.151	0.018	0.053	0.002	–0.041	–0.041	–0.006	–0.001	–0.132	–0.003
Average	0.251	0.071	0.038	–0.008	–0.069	–0.128	–0.006	0.008	–0.164	–0.003
Countries reporting net incomes										
Austria										
Belgium	0.298		0.032	0.001	–0.010	–0.314	–0.007			
France	0.149	0.010	0.008		–0.032	–0.134	–0.003	0.001		
Greece										
Hungary										
Italy	–0.053	0.089	0.043			–0.079				
Luxembourg	0.029	0.079	0.035		–0.004	–0.145	–0.004	0.010		
Mexico	0.016	–0.024	0.021			0.006	–0.019			
Poland										
Spain	0.123	–0.028	0.009			–0.104				
Average	0.094	0.025	0.025	0.001	–0.015	–0.128	–0.008	0.006		

Table 6.A1.4. **Marginal effects of changes in income components** *(cont.)*

Panel B. Mid-1990s

	Wages	Self-employment income	Capital income	Occupational pensions	Means-tested transfers	Social insurance transfers	Private transfers	Other income	Income taxes	Social security contributions
Countries reporting gross incomes										
Australia	0.404	0.042	0.014	–0.003	–0.258		–0.008	0.000	–0.190	
Canada	0.317	0.033	0.019	0.000	–0.085	–0.128		0.000	–0.156	
Czech Republic	0.267	0.171	0.013		–0.026	–0.274			–0.118	–0.033
Denmark	0.673	0.087	0.076	0.011	–0.143	–0.473	–0.012	0.009	–0.228	0.000
Finland	0.445	0.143	0.086	–0.055	–0.075	–0.267	–0.003	0.000	–0.232	–0.042
Germany	0.178	0.158	0.062	–0.001	–0.048	–0.148	–0.014		–0.192	0.005
Ireland										
Israel[1]	0.287	0.078	0.028	0.019	–0.032	–0.136	–0.004		–0.221	–0.020
Netherlands	0.365	0.076	0.029	0.025	–0.117	–0.189	–0.004	0.005	–0.203	0.012
Norway	0.076	0.233	0.088	–0.004	–0.034	–0.188	–0.009	0.004	–0.150	–0.016
Sweden	0.635	–0.058	0.051	0.029	–0.091	–0.342	–0.013		–0.212	
Switzerland	–0.014	–0.008	0.121	0.011	–0.017	–0.037	–0.019	–0.002	–0.056	0.021
United Kingdom	0.261	0.078	0.022	–0.004	–0.166	–0.118	–0.006	0.008	–0.067	–0.008
United States	0.174	0.015	0.045	0.006	–0.043	–0.044	–0.007	0.000	–0.142	–0.004
Average	0.313	0.081	0.050	0.003	–0.087	–0.195	–0.009	0.003	–0.167	–0.009
Countries reporting net incomes										
Austria	0.108	0.080	0.004	–0.001	–0.017	–0.168	–0.006	0.000		
Belgium	0.144	0.117	0.020	0.000	–0.015	–0.276	0.007	0.003		
France	0.089	0.078	0.030		–0.048	–0.143	–0.006	0.000		
Greece	0.046	–0.031	0.033	0.001	–0.002	–0.040	–0.008	0.001		
Hungary	0.273	0.022	0.010		–0.025	–0.273	–0.002	–0.005		
Italy	–0.019	0.038	0.055	0.002	–0.004	–0.070	–0.004	0.003		
Luxembourg	0.141	0.061	0.033	0.000	–0.026	–0.201	–0.008			
Mexico	0.027	–0.001	0.008			–0.014	–0.021	0.001		
Poland	0.110	0.105	0.003		–0.013	–0.187	–0.008	–0.009		
Spain	0.095	0.038	0.010	0.000	–0.025	–0.111	–0.006	–0.001		
Average	0.101	0.051	0.021	0.000	–0.019	–0.148	–0.006	–0.001		

Table 6.A1.4. **Marginal effects of changes in income components** *(cont.)*

Panel C. Mid-2000s

	Wages	Self-employment income	Capital income	Occupational pensions	Means-tested transfers	Social insurance transfers	Private transfers	Other income	Income taxes	Social security contributions
Countries reporting gross incomes										
Australia	0.362	0.057	0.022	–0.007	–0.247	–0.001	–0.009	–0.001	–0.176	
Canada	0.217	0.044	0.022	0.000	–0.035	–0.119	–0.008	0.005	–0.131	0.005
Czech Republic	0.291	0.177	0.020		–0.037	–0.284		–0.006	–0.124	–0.037
Denmark	0.638	0.086	0.058	0.012	–0.139	–0.408	–0.015	0.009	–0.242	0.000
Finland	0.200	0.072	0.219	–0.002	–0.066	–0.224	–0.008	0.000	–0.182	–0.010
Germany	0.090	0.209	0.086	0.001	–0.057	–0.132	–0.013		–0.214	0.030
Ireland	0.311	0.130	0.016	0.005	–0.151	–0.137	0.003	0.000	–0.159	–0.018
Israel[1]	0.196	0.069	0.040	0.019	–0.050	–0.086	–0.011		–0.156	–0.021
Netherlands	0.304	0.002	0.019		–0.073	–0.151	–0.010	0.000	–0.091	
Norway	0.214	0.073	0.170	–0.006	–0.029	–0.277	0.000	0.002	–0.137	–0.010
Sweden	0.494	–0.006	0.081	0.017	–0.045	–0.314	–0.014	0.004	–0.220	0.003
Switzerland	0.176	–0.024	0.008	0.000	–0.030	–0.139	–0.033		–0.019	0.061
United Kingdom	0.246	0.084	0.018	–0.014	–0.163	–0.109	–0.008	0.000	–0.045	–0.009
United States	0.174	0.017	0.040	–0.001	–0.051	–0.037	–0.008	–0.001	–0.131	–0.002
Average	0.280	0.071	0.059	0.002	–0.084	–0.173	–0.010	0.001	–0.145	–0.001
Countries reporting net incomes										
Austria	–0.094	0.143	0.032		–0.009	–0.058	–0.013	–0.001		
Belgium	0.056	0.147	0.045	–0.001	–0.010	–0.254	0.013	0.004		
France	0.090	0.067	0.037		–0.069	–0.116	–0.008	–0.001		
Greece	0.016	0.040	0.029		–0.003	–0.071	–0.016	0.005		
Hungary	0.083	0.140	0.050		–0.034	–0.250	0.011			
Italy	–0.083	0.163	0.024	–0.001	–0.010	–0.085	–0.005	–0.003		
Luxembourg	–0.014	0.130	0.037		–0.034	–0.110	–0.008	–0.001		
Mexico	0.001	0.015	0.008	0.001	–0.011	0.004	–0.018	0.000		
Poland	0.078	0.080	0.003	0.000	–0.015	–0.133	–0.014	0.001		
Spain	0.101	–0.027	0.011		0.001	–0.080	–0.004	–0.002		
Average	0.023	0.090	0.028	0.000	–0.019	–0.115	–0.006	0.000		

Note: Working-age population. Income inequality is measured by the Gini coefficient. Disposable income refers to household income adjusted with an equivalence scale of the square of household size. The values shown indicate by how much a 1% increase in one income component increases or decreases (negative sign) overall inequality, in percentage terms.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537940

PART III

How the Roles of Tax and Transfer Systems Have Changed

PART III

Chapter 7

Changes in Redistribution in OECD Countries Over Two Decades*

This chapter takes stock of tax and transfer redistribution policies in OECD countries over the two decades preceding the global downturn in 2008. It begins by looking at evidence for the inequality-reducing effects of taxes and benefits. It considers trends in aggregate spending and revenues, shows how different components of taxes and benefits have evolved over time, and briefly discusses the influence of cyclical factors on the observed patterns. The chapter then uses household-income data to produce and compare a range of commonly used redistribution and progressivity indicators. Finally, it summarises policy changes and offers a detailed analysis of the role of policy in driving observed redistribution trends.

* This chapter was prepared by Herwig Immervoll who, at the time of writing was a senior economist at the OECD Social Policy Division and is currently a senior economist at the World Bank, and Linda Richardson, policy analyst at the OECD Social Policy Division. This chapter draws on a longer document, available as Immervoll and Richardson (2011).

7.1. Introduction

Have government redistribution policies slowed or accelerated the trend towards greater income disparities, and to what extent? How did policy and economic changes, such as patterns of unemployment, low-wage work and working time, combine to change the redistributive role of the welfare state prior to the onset of the global recession? Did redistribution decline overall, or did the changes mainly affect the type of redistribution taking place, without eroding the overall capacity for reducing inequality? This chapter seeks to answer those questions.

Following common usage of the term, the chapter takes "redistribution" to mean reduction of household income inequality. Tax and benefit payments are said to "redistribute" if they lower inequality, regardless of the extent to which this is achieved through actual or implicit transfers from higher to lower-income groups.[1] As in other parts of this report, changes in the income distribution are analysed here using "snapshots" for individual years. The reference period is the mid-1980s to the mid-2000s.

There exist several recent detailed national studies of redistribution trends (*e.g.* Riihelä *et al*. [2008] for Finland and Adam and Browne [2010] for the United Kingdom). International comparisons tend to focus on specific parts of the tax-benefit system (Heady *et al*., 2001; Wagstaff and van Doorslaer, 2001; Wagstaff *et al*., 1999). Multi-country comparative studies that consider the entire tax-benefit system are rare, and mostly limited to a particular point in time (Immervoll*et al*., 2006).

Point-in-time comparisons are sometimes thought problematic since large institutional differences between countries, notably in terms of the balance between public and private provision or cash transfers *versus* benefits in-kind, make it difficult to interpret country differences in terms of a particular portion of the redistribution system (Blackburn and Bloom, 1994). This is less of an issue when the focus is on comparing *changes* across countries, as overall institutional setups (as well as measurement choices in the underlying data) tend to vary less over time than they do cross-nationally.

This chapter extends and deepens the analysis in OECD (2008), using the OECD's tax-benefit models to show the combined effects of recent policy reforms on different family types and at different points in the earnings and income distribution. It attempts to gauge the effects of taxes and benefits over a longer time period and for as many countries as data permit.[2]

Unlike most existing studies, it explicitly focuses on the non-elderly population (those aged 15-64).[3] Restricting the analysis to the non-elderly avoids some of the problems inherent to comparisons of incomes between people who are at very different stages in their lives. For instance, an essential function of old-age pensions is to redistribute *intertemporally* over the life cycle; a focus on the non-elderly helps in understanding the most important elements of interpersonal redistribution.

It is important to understand the mechanisms that have led to the observed changes in redistribution. A question of considerable policy relevance is to what extent changes can be attributed to direct policy action or to other factors that are not amenable to influence by policy makers. Since tax burdens and benefit entitlements depend on incomes and population characteristics, a given tax-benefit system can become more or less effective at reducing inequalities, even if policy rules remain unchanged. For instance, when unemployment goes up, measured redistribution is likely to increase even with constant benefit amounts per job seeker, simply because more people claim unemployment benefits. Similarly, a progressive income tax will redistribute more if taxable incomes become more dispersed (or very little if everybody earns about the same).

As drivers of distributional outcomes, earnings, labour force participation and family structures are certainly more difficult to control for policymakers than tax-benefit parameters such as tax rates, benefit amounts or entitlement rules. For policy analysis purposes, it is therefore informative to distinguish between changes in redistribution that can be directly attributed to tax-benefit policy reforms (referred to as "direct policy changes" in what follows), and those that have occurred as a result of the evolution of market incomes or population structures (referred to as "income and population changes").

The objective of this chapter is to take stock of tax and transfer redistribution policies in OECD countries and to summarise policy changes in the two decades prior to the onset of the global recession in 2008. The following key findings emerge:

- In most countries, the extent of redistribution - driven by benefits systems - increased overall in the two decades to 2005 although it did not prevent inequality from rising. In fact, market-income inequality grew by twice as much as redistribution.
- From the mid-1980s to 2005, redistribution systems appeared to be more successful at offsetting growing income gaps at the bottom than at the top.
- Benefits had a much stronger impact on inequality than the other main instruments of cash distribution - social contributions or taxes.
- In a number of countries, policy changes resulted in nominally more generous benefit entitlements overall. Benefit recipients in the lowest income groups, however, slipped further down the income distribution as their benefits failed to keep pace with earnings growth.
- The most important benefit-related determining factor in overall distribution, however, was not benefit levels but the number of people entitled to transfers. Receipt of incapacity benefits tended to rise while unemployment benefit receipt fell in a majority of countries in part the consequence of tighter unemployment benefit eligibility rules.
- Income tax reforms did little to ease inequality because the lower income taxes and more progressive taxation have opposite effects on redistribution so partly cancelled each other out.
- Changes in tax burdens and benefit entitlements were mostly regressive between 1995 and 2005, particularly for single individuals and childless families. For families with children, they were less regressive and even progressive in a handful of countries.
- Social security contributions redistributed very little despite their growing importance as a revenue source. They may even have been regressive where contribution ceilings were in place.

- Overall, tax-benefit policies offset some of the large increases in inequality attributable to growing market-income disparities, the main driver of inequality trends between the mid-1980s and the mid-1990s. However, from the mid-1990s to 2005, the reduced redistributive capacity of tax-benefit systems was sometimes the main source of widening household-income gaps.

7.2. Measured changes in redistribution

Taxes and cash benefits are the most direct policy levers for governments to influence distributional outcomes.[4] Their quantitative importance for household economic well-being is summarised in Figure 7.1. Income taxes and social contributions paid by working-age households amount to more than 25% of earned market incomes when averaged across countries. In most countries, average cash benefits received by these households are significantly smaller than average income-tax burdens. Working-age households are thus net taxpayers on average. These taxes go towards financing other public expenditures, such as publicly provided services, current transfers to the elderly and own future pension entitlements.

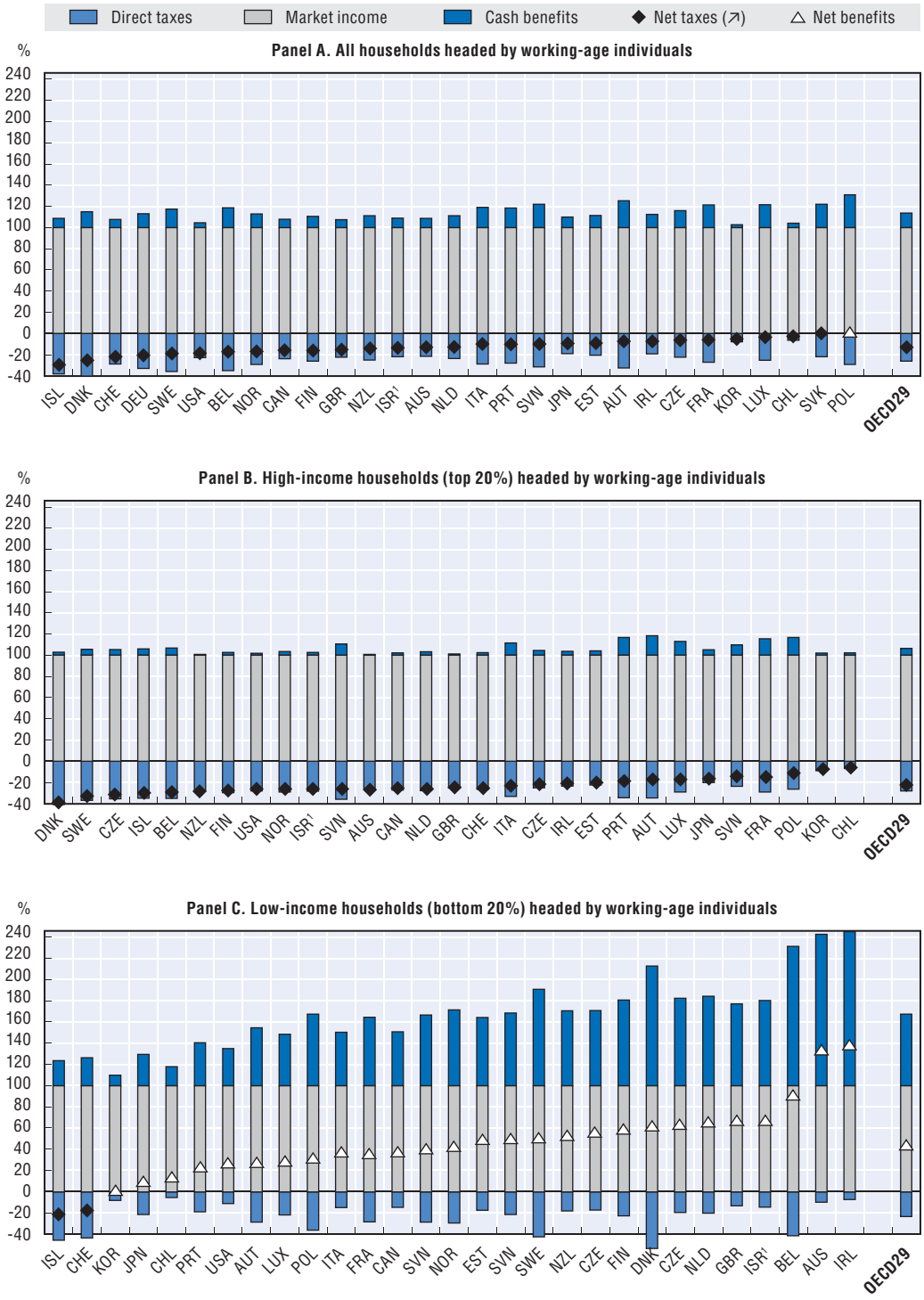
The extent of interpersonal redistribution is evident from looking at how much is paid and received by different income groups. The poorest 20% are net benefit recipients in almost all countries, with cash transfers adding up to around two thirds of market income on average. For the richest 20%, benefits represent only 6% of market incomes on average and the rich also face higher tax burdens. Relative to market income (labour and capital income taken together), cash benefits differ much more across income groups than taxes and are therefore the main drivers of redistribution from rich to poor. However, even if tax payments are less redistributive directly, they finance transfers and thus serve a crucial redistributive role.

The size of the redistribution system: aggregate expenditures and revenues

Social expenditure levels have increased markedly in most countries over the past decades. Across 29 countries with data for all three periods, the average expenditure-to-GDP ratio grew from 17.0% of GDP in 1985 to 19.3% in 1995 and 20.1% in 2005 (Annex Table 7.A1.1).[5] The only countries with significantly declining public social spending ratios (more than 4 points) are Ireland and the Netherlands. However, almost all countries devoted *declining* shares of total spending to cash benefits that mostly benefit children and working-age individuals.[6] On average the share of these "non-elderly" benefits declined from 26.5% in 1985 to 21.4% in 2005.[7] Despite growing overall public social expenditure, this drop is sufficiently large to translate into a significant reduction of "non-elderly" benefit expenditure relative to GDP on average (from 4.9 to 4.5% across 29 countries). Between the mid-1980s and the mid-1990s, however, sizable reductions were only observed in a few countries (Belgium, France, Ireland, Netherlands) while the majority of countries recorded increases. Most of the drop in "non-elderly" benefit expenditures thus occurred since the mid-1990s, when most OECD countries recovered from an economic downturn, and spending on cyclical income-support measures was high (and GDP low) as a result.

A closer inspection of the time profile of social expenditure levels help shed light on the relative roles of cyclical and structural factors. Immervoll and Richardson (2011) show that, relative to GDP, total social spending goes up significantly during contractions and that spending increases can be large during and after deep recessions, such as in Finland or Sweden in the early 1990s, or in Korea in 1998. However, spending on "non-elderly" cash

Figure 7.1. **Overall amounts of taxes paid and benefits received in the mid-2000s**



Note: Countries are ranked by the impact of the redistribution system on household income, *i.e.*, by net taxes (taxes *minus* benefits).

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

Source: Calculations from the *OECD Database on Household Income Distribution and Poverty* (*www.oecd.org/els/social/inequality*).

StatLink http://dx.doi.org/10.1787/888932536800

Table 7.1. **Tax revenues: trends and components**

	1985						1995						2005					
	Total % of GDP	Taxes on personal income					Total % of GDP	Taxes on personal income					Total % of GDP	Taxes on personal income				
		% of GDP	Share of total revenue					% of GDP	Share of total revenue					% of GDP	Share of total revenue			
			Total	Income tax	Social contributions	Unallocated			Total	Income tax	Social contributions	Unallocated			Total	Income tax	Social contributions	Unallocated
Australia	28.3	12.8	45.2	45.2	0.0	0.0	28.8	11.7	40.6	40.6	0.0	0.0	30.8	12.2	39.7	39.7	0.0	0.0
Austria	40.8	15.9	38.9	22.9	15.9	0.0	41.4	16.6	40.2	20.9	18.3	1.1	42.3	17.2	40.7	22.0	18.2	0.6
Belgium	44.4	21.6	48.7	35.6	13.1	0.0	43.6	19.9	45.7	32.6	13.1	0.0	44.7	19.1	42.6	30.5	12.1	0.0
Canada	32.5	13.1	40.4	35.2	4.8	0.3	35.6	15.4	43.4	37.5	5.4	0.4	33.4	14.3	42.7	35.6	6.5	0.7
Czech Republic	40.4	3.6	8.9	8.9	0.0	0.0	37.5	10.2	27.2	12.8	14.4	0.0	37.6	10.4	27.7	12.2	15.5	0.0
Denmark	46.1	24.7	53.5	50.7	1.7	1.1	48.8	28.1	57.6	53.8	2.2	1.6	50.8	27.1	53.4	49.0	2.1	2.3
Finland	39.7	16.9	42.7	37.4	5.3	0.0	45.7	18.4	40.3	31.1	9.2	0.0	44.0	16.5	37.6	30.7	6.9	0.0
France	42.8	11.5	26.8	11.5	15.3	0.0	42.9	12.0	28.0	11.4	16.6	0.0	43.9	13.2	30.0	18.0	12.0	0.0
Germany	36.1	16.7	46.3	28.7	17.6	0.0	37.2	17.5	47.1	27.5	19.6	0.0	34.8	15.3	44.0	23.3	20.7	0.0
Greece	25.5	8.5	33.4	13.9	15.8	3.7	28.9	9.1	31.6	12.0	17.6	2.0	31.4	10.7	34.1	14.6	19.3	0.2
Hungary	45.2	10.4	23.0	14.8	6.9	1.3	41.3	9.6	23.2	16.1	6.8	0.2	37.3	9.2	24.5	18.0	6.3	0.3
Iceland	28.2	5.5	19.7	19.5	0.2	0.0	31.2	9.8	31.5	31.1	0.3	0.0	40.6	17.0	41.8	34.8	0.0	7.0
Ireland	34.7	12.7	36.6	31.3	5.3	0.0	32.5	11.8	36.2	30.7	5.6	0.0	30.4	10.0	33.1	27.3	5.8	0.0
Italy	33.6	12.5	37.1	26.7	9.9	0.4	40.1	14.9	37.1	26.0	10.7	0.3	40.8	14.1	34.5	25.5	9.4	–0.4
Japan	27.4	10.8	39.6	24.7	14.8	0.0	26.8	10.7	39.8	22.4	17.5	0.0	27.4	10.5	38.4	18.3	20.1	0.0
Korea	15.7	2.2	14.2	13.4	0.0	0.8	18.6	4.0	21.3	19.2	2.0	0.2	23.9	6.1	25.4	13.3	12.1	0.0
Luxembourg	39.4	15.3	38.9	25.6	13.4	0.0	37.1	13.3	35.9	21.7	14.2	0.0	37.6	13.0	34.7	19.0	15.7	0.0
Mexico	15.5	2.9	18.6	0.0	0.0	18.6	15.2	3.6	23.5	0.0	0.0	23.5	18.1	4.1	22.5	0.0	0.0	22.5
Netherlands	42.4	19.5	45.9	19.4	26.5	0.0	41.5	22.5	54.1	18.9	35.2	0.0	38.5	15.9	41.2	18.0	23.2	0.0
New Zealand	31.3	19.0	60.8	60.5	0.0	0.3	36.6	17.3	47.2	45.0	0.0	2.2	37.4	16.3	43.6	41.1	0.0	2.6
Norway	42.6	12.3	28.9	22.5	6.4	0.0	40.9	14.5	35.6	25.9	9.7	0.0	43.5	13.2	30.3	22.2	8.1	0.0
Poland	34.9	7.1	20.2	20.2	0.0	0.0	36.2	8.3	22.9	22.9	0.0	0.0	33.0	11.3	34.3	11.9	22.4	0.0
Portugal	25.2	6.0	23.8	0.0	10.7	13.1	32.1	9.1	28.4	17.3	11.1	0.0	34.7	9.4	27.2	15.6	11.6	0.0
Slovak Republic	. .	. .	. .	. .	. .	. .	36.7	10.0	27.3	11.8	14.2	1.3	31.4	8.4	26.8	8.4	18.0	0.4
Spain	27.6	8.2	29.7	19.4	10.1	0.1	32.1	11.2	34.8	23.6	11.2	0.1	35.7	9.7	27.2	17.9	9.0	0.3
Sweden	47.4	18.9	39.9	38.7	1.1	0.0	47.5	17.8	37.4	33.5	4.0	0.0	49.5	18.5	37.4	31.6	6.0	–0.1
Switzerland	25.5	13.2	51.7	39.2	12.4	0.0	27.7	14.1	51.0	36.3	14.7	0.0	29.2	14.2	48.8	35.7	13.1	0.0
Turkey	11.5	3.8	33.5	27.5	6.0	0.0	16.8	4.6	27.4	21.6	5.8	0.0	24.3	6.5	26.9	14.7	12.2	0.0
United Kingdom	37.0	12.9	34.8	26.0	8.9	–0.2	34.0	12.6	36.9	28.8	8.1	0.0	35.8	13.5	37.6	29.1	8.5	0.0
United States	25.6	12.6	49.3	37.8	11.5	0.0	27.9	13.3	47.9	35.8	12.1	0.0	27.5	12.9	47.0	35.1	11.9	0.0
Unweighted average	***33.3***	***12.1***	***35.5***	***26.1***	***8.1***	***1.4***	***34.7***	***13.2***	***37.0***	***26.1***	***9.8***	***1.1***	***35.8***	***13.2***	***36.2***	***24.3***	***10.6***	***1.2***

Note: Social contributions refer to the amounts paid by households only.
Source: OECD revenue statistics.

StatLink http://dx.doi.org/10.1787/888932537959

benefits is less cyclical. In about one third of OECD countries, changes in other categories of social spending, including "old-age", "health" and "active labour market programmes", account for a quantitatively bigger share of cyclical increases in social spending (Austria, Belgium, Canada, Chile, Israel,[8] Italy, Japan, Korea, Norway, Poland, Portugal). In a number of countries, government spending on cash transfers to working-age individuals and families has remained more or less constant over the entire period (Austria, the Czech Republic, France, Germany, Greece, Japan, Korea, Portugal, Spain), despite sometimes sizable trend increases in total spending-to-GDP ratios.

A similar comparison can be made on the revenue side. Even if it is not possible to approximate the share of taxes that are paid by "non-elderly" households only, Table 7.1 shows that, like social expenditures, total government revenues have also increased on average across OECD countries (from 33% in the mid 1980s to 36% in 2005). But, unlike in the case of social expenditures, the shares of the total that are typically accounted for in redistribution studies, have gone up as well (from just under 35.5% of total revenues in 1985 to just over 36% in 2005). Some direct taxes are much more progressive than others. It is therefore important to distinguish the trends for personal income tax (PIT) which generally employ progressive tax schedules from social contributions which can be regressive, consuming a bigger part of the incomes of low-to-middle income earners than of higher-income groups.

A closer inspection of annual revenue statistics since the mid-1980s indicates that PIT revenues are significantly more volatile over the period while, because of their flat or regressive rate structure, SSC revenues vary much less over the economic cycle. PIT account for over a quarter of all revenues. The 20-year period up to 2005 has seen its share fall somewhat, but since total government revenues have gone up, PIT revenues as a percentage of GDP have remained constant on average across countries (at 8.7%). In contrast, the share of the less progressive, and possibly regressive, social security contributions (SSC) has increased by more than 2 percentage points, from 8.1% of GDP in 1985 to 10.6% in 2005.[9] Overall, these revenue trends do not point clearly at either more or less redistribution through direct taxes in most countries.

Three main other categories of government revenue – indirect taxes, wealth and property taxes, as well as business taxes – are not accounted for in the assessments of income inequality and redistribution below. It is nevertheless interesting to speculate what aggregate trends in these non-income related taxes imply for the relative tax burdens of different income groups. OECD revenue statistics data show that, among these other taxes, those that tend to be disproportionally borne by higher-income groups (*e.g.*, wealth and property taxes) became less important. Perhaps contrary to common perception, indirect taxes, which consume a greater part of income for lower-income groups, have declined as a share of total tax revenues (from 34% in 1985 to 32% in 2005), despite a significant increase in revenues from value-added taxes (OECD, 2007c). Finally, and unlike contributions paid by employees, payroll taxes and social contributions paid by employers have tended to decline slightly between 1985 and 2005.

Changes in the extent of redistribution: evidence from household income data

Redistribution in the tax-benefit systems as a whole

Chapter 6 has indicated that market incomes of working-age individuals have become more unequal in most OECD countries. Tables 7.2 and 7.3 show inequality trends for

market incomes (Gm, including any private transfers) and disposable incomes (Gd, market incomes plus cash benefits minus income taxes) and confirm these findings in more detail.[10] Over the periods considered, market incomes in "working-age" households have become more unequal everywhere except in the Netherlands and Switzerland.[11] In most cases, market-income inequality increased more strongly during the first half of the two decades. In addition, most of the countries with data going back further have seen large increases in market-income Gini coefficients before the mid-1980s. Only the data for West Germany show a greater increase in market-income inequalities during the more recent period of the mid-1990s to mid-2000s.

Table 7.2. **Redistribution: general country trend**

Inequality before and after taxes and transfers[1]
Countries with full tax and benefit information for mid-1980s, mid-1990s and mid-2000s[2]

		Market income		Disposable income	Redistribution			
		Gm	*Change, % of base period*	Gd	Gm-Gd	% of Gm [4]/[1]	*Change, % of base-period Gm*	[6]/[2]
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
12-country average	*mid-1980s*	36.2		26.7	9.5	26.4		
	mid-1990s	39.2	*8.2*	27.4	11.7	29.9	*6*	*73*
	mid-2000s	39.8	*9.8*	28.3	11.4	28.7	*5*	*53*

Gm = Gini coefficient of inequality of market income.
Gd = Gini coefficient of inequality of disposable income.

1. Households headed by a working-age individual (15-64, except in Sweden where 25 was chosen as the age cut-off in order to minimise the impact of a change in the definition of a household that occurred in the mid-1990s). Gini values (*G*) are shown in percent. All measures are based on equivalised household income using the square-root equivalence scale. Standard LIS practice was followed for top- and bottom-coding (see *www.lisdatacenter.org*).
2. Australia, Canada, Denmark, Finland, West Germany, Israel (Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*), Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537978

Using the data reported in Table 7.3 (column 2), averaging across years, and extrapolating trends for countries where available data cover only a short period, it can be shown that inequality of market income has, on average, increased by 16% over a ten-year period across the countries shown. This is a very substantial increase over a relatively short period of time and the same order of magnitude as the reduction in inequality among the non-elderly population that is achieved by the entire tax-benefit system in some countries (*e.g.*, Switzerland or the United States). Market-income inequality has been the main driver of inequality trends in disposable incomes,[12] but redistribution policies had a substantial effect as well, especially since the mid-1990s.

The difference between the Gini values for market incomes and disposable incomes is a measure of the overall redistributive effect of taxes and transfers (column 4 in Tables 7.2 and 7.3). Between the mid-1980s and the mid-1990s, redistribution systems compensated nearly three quarters of the increase in market-income inequality (column 7). The upwards trend in market-income inequality then continued after the mid-1990s, but at a much slower pace. Yet, inequality of household disposable income (column 3) rose more quickly in the second decade. Although the rise in market-income inequality slowed significantly, government redistribution became less effective at offsetting growing inequalities. In

Table 7.3. **Redistribution trends: detailed results by country**

Inequality before and after taxes and transfers

		Standard Gini						
		Market income		Disposable income	Redistribution			
		Gm	Change, % of base period	Gd	Gm-Gd	% of Gm [4]/[1]	Change, % of base-period Gm	Compensation ratio ([6]/[2])
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
Australia	1981	0.37		0.28	0.09	24		
	1985	0.39	*5*	0.29	0.10	26	*3*	*68*
	1989	0.40	*8*	0.30	0.10	24	*2*	*30*
	1995	0.43	*17*	0.30	0.13	29	*11*	*63*
	2001	0.44	*19*	0.31	0.13	29	*11*	*56*
	2003	0.42	*15*	0.30	0.12	28	*9*	*57*
Canada	1981[1]	0.34		0.28	0.06	19		
	1987[1]	0.37	*7*	0.29	0.08	22	*5*	*63*
	1991[1]	0.39	*13*	0.29	0.10	26	*10*	*81*
	1994[1]	0.40	*16*	0.29	0.11	27	*13*	*77*
	1997[1]	0.39	*14*	0.29	0.10	25	*9*	*68*
	1998[2]	0.42	*21*	0.31	0.10	25	*12*	*55*
	2000[2]	0.41	*19*	0.32	0.09	22	*7*	*39*
	2004[2]	0.41	*19*	0.32	0.09	22	*7*	*36*
Czech Republic	1992	0.34		0.20	0.13	40	*0*	
	1996	0.36	*8*	0.26	0.11	30	*–8*	*–94*
	2004	0.41	*21*	0.27	0.14	33	*1*	*3*
Denmark	1987	0.33		0.23	0.10	30		
	1992	0.37	*11*	0.22	0.14	39	*13*	*126*
	1995	0.36	*9*	0.20	0.16	44	*18*	*195*
	2000	0.35	*7*	0.21	0.14	40	*13*	*197*
	2004	0.36	*9*	0.22	0.14	40	*14*	*151*
Finland	1987	0.30		0.20	0.10	34		
	1991	0.31	*2*	0.20	0.11	35	*2*	*95*
	1995	0.37	*23*	0.21	0.16	43	*19*	*80*
	2000	0.39	*31*	0.24	0.15	39	*17*	*56*
	2004	0.39	*31*	0.24	0.15	38	*16*	*50*
Germany	1994	0.37		0.27	0.10	27		
	2000	0.38	*4*	0.26	0.12	31	*5*	*139*
	2004	0.40	*9*	0.28	0.12	31	*7*	*78*
Western Germany	1981[1]	0.30		0.23	0.07	23		
	1984[2]	0.35	*17*	0.26	0.10	27	*9*	*50*
	1989[2]	0.34	*11*	0.25	0.09	26	*5*	*48*
	1994[2]	0.36	*19*	0.27	0.09	24	*6*	*32*
	2000[2]	0.37	*23*	0.27	0.11	29	*12*	*52*
	2004[2]	0.39	*28*	0.28	0.11	29	*14*	*50*
Israel*	1979	0.38		0.29	0.09	24		
	1986	0.43	*13*	0.30	0.13	30	*9*	*74*
	1992	0.42	*11*	0.30	0.12	29	*8*	*78*
	1997	0.46	*20*	0.33	0.13	28	*9*	*48*
	2001	0.49	*29*	0.34	0.15	30	*15*	*52*
	2005	0.48	*26*	0.37	0.11	23	*5*	*18*
Netherlands	1983	0.41		0.28	0.13	32		
	1987	0.40	*–3*	0.26	0.14	35	*3*	*–103*
	1991	0.36	*–12*	0.26	0.10	27	*–8*	*62*
	1994	0.39	*–7*	0.26	0.13	33	*–1*	*8*
	1999	0.33	*–22*	0.23	0.10	30	*–8*	*39*

Table 7.3. **Redistribution trends: detailed results by country** *(cont.)*

Inequality before and after taxes and transfers

		Standard Gini						
		Market income		Disposable income	Redistribution			
		Gm	Change, % of base period	Gd	Gm-Gd	% of Gm [4]/[1]	Change, % of base-period Gm	Compensation ratio ([6]/[2])
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
Norway	1979	0.29		0.21	0.08	28		
	1986	0.28	*–5*	0.22	0.06	22	*–7*	*157*
	1991	0.32	*9*	0.23	0.09	30	*4*	*46*
	1995	0.32	*10*	0.22	0.10	32	*7*	*72*
	2000	0.35	*18*	0.25	0.10	29	*6*	*34*
	2004	0.38	*29*	0.25	0.13	33	*15*	*51*
Poland	1999	0.42		0.29	0.13	31		
	2004	0.47	*12*	0.33	0.14	29	*2*	*19*
Sweden	1981[1]	0.30		0.19	0.12	38		
	1987[1]	0.31	*3*	0.19	0.12	39	*2*	*54*
	1992[1]	0.35	*16*	0.20	0.15	43	*11*	*70*
	1995[1]	0.37	*23*	0.20	0.18	48	*20*	*87*
	2000[2]	0.37	*24*	0.24	0.14	37	*7*	*30*
	2005[2]	0.37	*21*	0.22	0.15	40	*10*	*46*
Switzerland	1982[1]	0.33		0.30	0.03	8		
	1992[2]	0.33	*0*	0.30	0.03	8	*0*	*–17*
	2000	0.32	*–4*	0.28	0.04	13	*4*	*–101*
	2002	0.32	*–3*	0.27	0.05	17	*8*	*–271*
	2004	0.31	*–5*	0.26	0.06	18	*8*	*–167*
United Kingdom (GB only)	1979[1]	0.33		0.26	0.08	23		
	1986[1]	0.43	*28*	0.30	0.13	30	*15*	*52*
	1991[2]	0.43	*29*	0.33	0.10	24	*7*	*26*
	1994[2]	0.46	*38*	0.34	0.12	27	*13*	*35*
	1995[1]	0.46	*39*	0.35	0.12	25	*12*	*31*
	1999[2]	0.46	*37*	0.35	0.11	24	*10*	*28*
	2004[2]	0.45	*35*	0.35	0.11	23	*8*	*24*
United States	1979	0.37		0.30	0.07	20		
	1986	0.41	*9*	0.34	0.07	18	*–1*	*–7*
	1991	0.41	*9*	0.34	0.07	18	*0*	*–3*
	1994	0.45	*20*	0.37	0.08	18	*2*	*9*
	1997	0.45	*20*	0.37	0.08	17	*0*	*1*
	2000	0.44	*18*	0.37	0.08	17	*1*	*3*
	2004	0.45	*21*	0.37	0.08	18	*2*	*9*

Note: See notes to Table 7.2. In case of a statistical break in the series, the superscripts next to the year correspond to different data sources.

Gm = Gini coefficient of inequality of market income.

Gd = Gini coefficient of inequality of disposable income.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932537997

absolute terms, redistribution weakened (column 4) despite a continuing widening of the market-income distribution (column 1). Over the two decades as a whole, market-income inequality rose by about twice as much as redistribution (column 7). Taxes and transfers now lower inequality by about 29% (column 5); more than in the mid-1980s, but less than in the mid-1990s.

Country-specific results are presented in Table 7.3. Tax-benefit systems in the Nordic countries, the Czech Republic and Poland achieve the greatest reduction in inequality, lowering the Gini value by 13 points or more in the mid-2000s, while the smallest redistributive effect is seen in Switzerland, the United States and Canada (less than 9 points). The country results for the decade from the mid-1980s to the mid-1990s demonstrate that it is possible for tax-benefit systems to be quite effective at stabilising inequality even during periods of rapidly growing market-income disparities. The extent of inequality cushioning was strongest in Canada, Denmark, Finland and Sweden, where trends towards more extensive government redistribution offset more than 70% of the rise in market-income inequality up until the mid-1990s.

In line with the country average, redistribution in these countries has become less effective at countering growing earnings gaps since then. For instance, in Finland, greater equalisation through taxes and benefits offset more than three quarters of the 23% increase in market-income inequality up until 1995, but by 2004, this has dropped to 50%. In a majority of countries, redistribution has *declined* since the mid-1990s – in absolute terms (column 4) and often more strongly as a percentage of the market-income Gini (column 5).

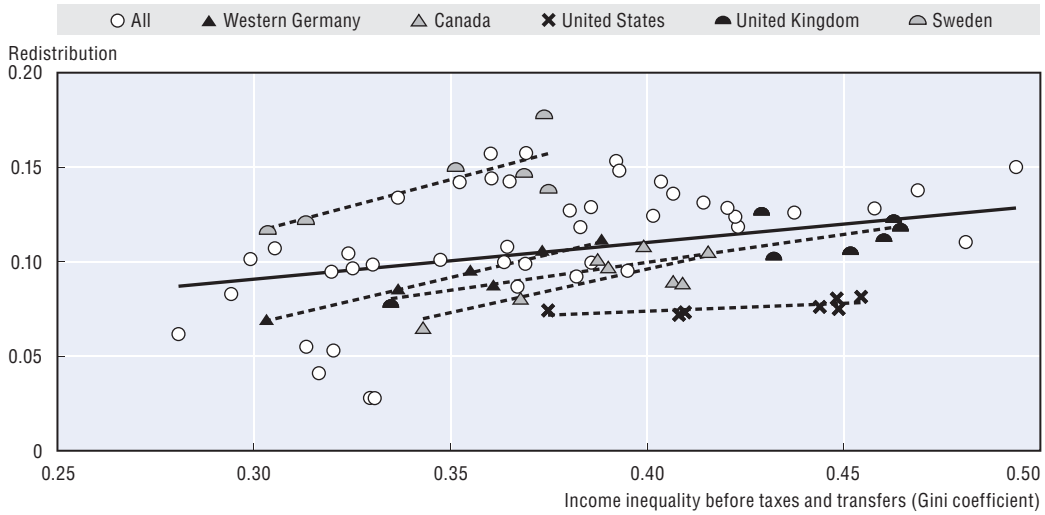
By contrast, in Germany, where unemployment was high in the mid-90s and in the mid-2000s, the tax-benefit system became more redistributive. The same is true in Norway, although the accelerating growth in market-income inequality nevertheless resulted in a less equal distribution of disposable income. In the United States, the Gini coefficient for market incomes rose by eight points between the late 1970s and the mid-2000s, but redistribution increased only very slightly, offsetting less than one tenth of this increase (column 7). Israel and the United Kingdom are two other countries where only a small part of the increase in market-income inequality has been compensated over the period as a whole.

Due to data limitations, English-speaking countries and Northern Europe are overrepresented in the data discussed so far. Data for ten additional countries are available only on an after-tax basis. Without accounting for taxes, the broad result of rising inequalities despite more government redistribution holds for these countries as well. Only in Austria have benefits become sufficiently redistributive to more than offset the greater inequality in after-tax incomes between the mid-1990s and mid-2000s.

One would expect a positive link between levels of market-income inequality and redistribution even in the absence of any conscious policy effort to counter inequality trends (Musgrave and Thin, 1948; Dardoni and Lambert, 2002): because of the progressivity built into tax-benefit systems, a more dispersed market-income distribution (*e.g.*, due to higher unemployment) "automatically" strengthens the equalising effect of an unchanged policy configuration. For instance, it is interesting to note the very strong increase in total redistribution during the first Thatcher government in the United Kingdom (Table 7.3), which cannot be explained by policy reforms.

Figure 7.2 plots redistribution coefficients (from column 4 in Table 7.3) against market-income inequality and illustrates the mostly positive correlation between the two, both within countries (dashed regression lines) and across all observations (solid line). The scatter plot suggests, however, that this link is stronger in some countries than in others. The flat trend line for the United States is, for instance, consistent with relatively weak automatic inequality-dampening properties of the US tax-benefit system.

Figure 7.2. **Redistribution tends to be higher when incomes are more unequal**



Note: See notes to Table 7.2. Redistribution is the absolute difference between the Gini coefficients before and after taxes and transfers. The data points refer to all observations available for all countries included in Table 7.3.

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536819

The sometimes sizable departures from the average correlation suggest that policy interventions have played an important role, in addition to the automatic "brake" that progressive tax-benefit systems have put on inequality trends. The data in Table 7.3 illustrate episodes in a number of countries where reductions in the redistributive capacity of taxes and benefits have sometimes occurred in parallel with increasing market-income inequality (Australia 1985-89, the Czech Republic 1992-96, Finland 1995-2004, Israel 1997-2005, United Kingdom 1986-95, and United States 1979-86 and 1994-97). In these cases, policy reforms have accelerated the trend towards greater income inequality. In a few cases, redistribution has declined by a sufficient margin to push up inequality after taxes and benefits despite a fall in the market-income Gini (Denmark 1995-2000, Israel 2001-05, Norway 1979-86, and the United Kingdom 1994-2004).

Did changes in redistribution affect mainly households with higher or lower incomes?

At the bottom of the income distribution, changes in inequality are driven to a large extent by joblessness and the labour-market situation of low-skilled workers, as well as the availability and generosity of social benefits. At the top, capital incomes and tax policy are more important. In order to gauge how redistribution systems have responded to changes at both ends of the distribution, it is useful to calculate alternative Gini and redistribution measures that put more weight on the situation of low-income groups.[13] Such measures are reported in Table 7.4, alongside a second set of measures that place more weight on high-income groups.

Results show that redistribution systems in most countries were somewhat more successful at offsetting growing income gaps at the bottom than at the top. For instance, in Germany, the tax-benefit system compensated almost 82% of rising income inequalities between 1994 and 2004 when more weight is put on low-income groups ("compensation ratio" in column 3), compared with 73% when income gaps at the top receive more weight. One notable implication of this result is that benefits (which are

Table 7.4. **A higher degree of redistribution at the bottom than at the top of the income distribution**[1]

		More weight on low incomes (S-Gini, v=3)[3]			More weight on high incomes (S-Gini, v=1.5)[3]		
		Change in market-income inequality[2]	Change in redistribution[2]	*Compensation ratio [2]/[1]*	Change in market-income inequality[2]	Change in redistribution[2]	*Compensation ratio [5]/[4]*
		[1]	[2]	[3]	[4]	[5]	[6]
Australia	1981	–	–	–	–	–	–
	1985	4	3	*73*	7	5	*65*
	1989	6	2	*29*	10	3	*30*
	1995	15	10	*71*	19	11	*57*
	2001	16	10	*62*	22	11	*50*
	2003	13	8	*63*	18	9	*51*
Canada	1981[1]	–	–	–	–	–	–
	1987[1]	6	4	*68*	8	5	*59*
	1991[1]	11	10	*86*	15	12	*77*
	1994[1]	15	12	*80*	18	13	*75*
	1997[1]	13	9	*72*	15	10	*66*
	1998[2]	18	10	*59*	25	13	*52*
	2000[2]	14	6	*42*	24	9	*36*
	2004[2]	15	6	*38*	24	8	*34*
Czech Republic	1992	–	–	–	–	–	–
	1996	6	–10	*–166*	10	–6	*–56*
	2004	17	–2	*–11*	24	3	*13*
Denmark	1987	–	–	–	–	–	–
	1992	10	12	*116*	10	14	*133*
	1995	8	16	*196*	9	19	*201*
	2000	6	12	*210*	8	15	*190*
	2004	8	12	*152*	10	15	*152*
Finland	1987	–	–	–	–	–	–
	1991	2	2	*100*	2	2	*92*
	1995	22	19	*88*	24	18	*73*
	2000	29	19	*63*	33	16	*49*
	2004	29	16	*56*	34	15	*45*
Germany	1994	–	–	–	–	–	–
	2000	3	5	*152*	4	5	*127*
	2004	8	6	*82*	9	7	*73*
Western Germany	1981[1]	–	–	–	–	–	–
	1984[2]	16	8	*50*	19	10	*50*
	1989[2]	9	5	*48*	13	7	*49*
	1994[2]	18	6	*31*	20	6	*32*
	2000[2]	21	11	*53*	25	13	*51*
	2004[2]	26	13	*51*	30	14	*47*
Israel[4]	1979	–	–	–	–	–	–
	1986	11	8	*72*	15	11	*77*
	1992	10	8	*78*	11	9	*81*
	1997	17	8	*45*	22	11	*50*
	2001	26	13	*51*	32	17	*52*
	2005	23	3	*13*	28	6	*22*
Netherlands	1983	–	–	–	–	–	–
	1987	–2	3	*–127*	–3	3	*–95*
	1991	–11	–6	*56*	–13	–9	*69*
	1994	–5	–1	*13*	–8	0	*3*
	1999	–20	–8	*39*	–22	–9	*39*

Table 7.4. **A higher degree of redistribution at the bottom than at the top of the income distribution**[1] *(cont.)*

		More weight on low incomes (S-Gini, v=3)[3]			More weight on high incomes (S-Gini, v=1.5)[3]		
		Change in market-income inequality[2]	Change in redistribution[2]	*Compensation ratio [2]/[1]*	Change in market-income inequality[2]	Change in redistribution[2]	*Compensation ratio [5]/[4]*
		[1]	[2]	[3]	[4]	[5]	[6]
Norway	1979	–	–	–	–	–	–
	1986	–4	–6	*151*	–5	–8	*155*
	1991	8	4	*52*	10	4	*39*
	1995	9	8	*83*	12	7	*59*
	2000	14	6	*39*	23	6	*28*
	2004	25	14	*55*	33	15	*45*
Poland	1999	–	–	–	–	–	–
	2004	9	1	*13*	13	3	*22*
Sweden	1981[1]	–	–	–	–	–	–
	1987[1]	2	1	*55*	4	2	*49*
	1992[1]	15	12	*81*	16	10	*59*
	1995[1]	21	21	*98*	25	19	*78*
	2000[2]	19	7	*37*	29	8	*27*
	2005[2]	18	10	*53*	25	11	*42*
Switzerland	1982[1]	–	–	–	–	–	–
	1992[2]	4	–1	*–36*	–3	1	*–28*
	2000[3]	0	5	*–3583*	–8	3	*–40*
	2002[3]	2	8	*524*	–7	7	*–95*
	2004[3]	1	10	*759*	–11	7	*–59*
United Kingdom (GB only)	1979[1]	–	–	–	–	–	–
	1986[1]	26	14	*53*	29	15	*50*
	1991[1]	26	7	*29*	32	7	*23*
	1994[2]	34	14	*41*	43	13	*30*
	1995[1]	35	12	*34*	43	12	*28*
	1999[2]	32	10	*31*	43	11	*26*
	2004[2]	30	9	*29*	40	8	*19*
United States	1979	–	–	–	–	–	–
	1986	7	–1	*–8*	10	–1	*–6*
	1991	8	0	*0*	10	–1	*–6*
	1994	16	1	*7*	23	2	*10*
	1997	14	0	*0*	26	0	*2*
	2000	12	0	*–3*	25	1	*4*
	2004	15	1	*6*	28	2	*9*

Note: Inequality measures that put greater weight on high-income groups need to be interpreted with care as a higher weight exacerbates measurement issues arising from the limited quality of higher-income data drawn from survey sources. These indicators are also more sensitive to the commonly used approach of top coding high incomes at ten times the median.
The first column of the table (change in market-income inequality) corresponds to column 2 in Table 7.3; the second column (change in redistribution) corresponds to column 6 in Table 7.3; and the third column (compensation ratio) corresponds to column 7 in Table 7.3.

1. See notes to Table 7.2.
2. Changes in the percentage of market-income inequality and in redistribution with regard to the base period.
3. S-Gini indicators are a generalised version of the Gini which allows for an "inequality aversion" parameter v (Donaldson and Weymark, 1980; Yitzhaki, 1983). A parameter v=2 corresponds to the standard Gini.
4. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932538016

more important for low-income groups) tended to be more responsive to growing inequalities than were taxes (which account for a greater part of incomes in the middle and at the top of the distribution).

Unlike in most other countries, tax-benefit systems in the Czech Republic, Israel, Poland and the United States were relatively less effective at countering growing disparities in the lower part of the income distribution. In these countries, redistribution offset only a relatively small part of the sizable increase in the market-income Gini, and an even smaller part when greater weight is attached to low-income households (13% in Israel and Poland, 6% in the United States, diminished redistribution in the Czech Republic). A possible explanation for this result is that benefits in these countries provide a lesser degree of income protection than in other countries, and that tax policy is therefore a relatively more important driver of inequality outcomes.

A closer look at the role of different parts of the redistribution system

How have the redistributive effects of the different parts of the tax-benefit system changed? Figure 7.3 compares the equalising effects at different stages of the redistribution process, with changes over time shown separately for benefits, social contributions and income taxes. "Benefits" include important tax credits that are akin to cash transfers (such as employment-conditional "in-work" tax credits in the United States and the United Kingdom). "Social contributions" include only that part that is formally paid by households while employer contributions and payroll taxes are not considered. To gauge what drove changes in redistribution, Figure 7.3 also shows changes in both the size and the progressivity of each of the three redistribution instruments. Box 7.1 explains how these indicators were calculated.

Over the whole period, benefits have become *more* important for reducing inequalities in most of the 15 countries studied (top graph of Figure 7.3, Panel A). But since the mid-1990s, benefits became less effective at reducing inequality in half of the countries. Where the redistributive effect of benefits increased strongly, the trend was largely driven by growing average benefit amounts (Finland, Germany, Norway, and Switzerland). This can be seen from the middle graph of Figure 7.3, Panel A, which expresses the size of benefits in terms of a "tax rate" measure (and therefore shows negative values for benefits, see Box 7.1).

The degree of benefit progressivity has changed less in most countries (bottom graph of Figure 7.3, Panel A). In general, where benefits did become more or less targeted towards the poor since the mid-1980s, this did not change the overall trend in redistribution that would result from trends in average benefit rates alone. That said, benefits in the United Kingdom did, however, become less redistributive despite being now more tightly targeted towards the poor. The opposite holds for Germany. The relatively small change in benefit progressivity, and its limited impact on the redistribution properties of cash transfers over a 20-year period, means that benefit size has been the main driver of the redistributive effect of transfers.[14] This also indicates the potential difficulties of maintaining redistribution in a context of declining budgets for social spending.

The orders of magnitude in Figures 7.3, Panels A-C show that benefits have a stronger impact on inequality than social contributions or taxes, despite the bigger size indicator for direct taxes and, hence, their bigger average impact on household incomes. Indeed, the maximum change in redistribution is less than 2 points for taxes and contributions (in

Box 7.1. **Measuring redistribution achieved by individual parts of the tax-transfer system**

Accounting for the integration of individual measures into the overall tax-benefit system

In principle, the redistributive effect of individual parts of the tax-benefit system can be measured in the same way as for all taxes and transfers taken together. For instance, to calculate the redistributive effect of taxes, one could calculate a Gini value of market incomes *minus* taxes and subtract it from the Gini value of market incomes. Likewise, the equalising effect of benefits could be determined by comparing Gini values for net-of-tax incomes on one hand, and net-of-tax incomes *plus* benefits (disposable income) on the other.

Applying this approach in practice is not straightforward, however. The reason is that benefits and taxes interact with each other in different ways across countries. The sequence used for the Gini comparisons of the different tax/benefit elements can make a significant difference for the results. For instance, when benefits are taxable, many benefit recipients with zero market incomes will have positive tax burdens which can make the tax appear regressive. Likewise, determining the redistributive power of benefits based on comparing market incomes and market incomes *plus* benefits can provide a misleading picture if benefit amounts depend largely on after-tax incomes (as is the case when benefits are comprehensively means-tested).

Because the appropriate sequence will depend on the structure of the specific tax-benefit system, choosing an arbitrary sequence, as is sometimes done, is especially problematic in a cross-country context. To address these problems, the measurement approach that is chosen here reflects, as far as possible, the actual legal sequence that is implicit in each country's tax-benefit system:

- In countries where *taxes payable on benefits are quantitatively important* (and tax burdens therefore depend on benefits), the redistributive effect of taxes is assessed against market income *plus* benefits (*i.e.*, by comparing market incomes *plus* benefits *minus* taxes to market income *plus* benefits). Likewise, the redistributive power of benefits is determined by comparing Ginis of market incomes and market incomes *plus* benefits. This approach is used for Canada, Denmark, Finland, Netherlands, Norway, Poland, Sweden, Switzerland and the United Kingdom.
- In countries where *taxes payable on benefits are quantitatively not very important* or where, because of *means testing*, taxes payable on market incomes affect benefit entitlements, the redistributive effect of benefits is assessed against net-of-tax incomes (market income *minus* taxes), *i.e.*, by comparing market incomes *plus* benefits *minus* taxes with net-of-tax income. The redistributive power of taxes is determined by comparing Ginis of market incomes and net-of-tax incomes. This approach is used for Australia, the Czech Republic, Germany, Israel and the United States.
- The redistributive effect of social security contributions is assessed against before-tax incomes, while the redistribution achieved by income taxes is determined relative to before-tax incomes *minus* social contributions.

The chosen measurement approach is particularly suitable for evaluating redistribution *changes* for each of the three types of government programme. Because the ranking of households differs between the baselines used for calculating redistributive effects of the different tax/benefit components, it is, however, not a formal decomposition approach (*i.e.*, the redistributive effect of benefits, social contributions and taxes does not precisely sum up to the overall redistributive effect shown in Figure 7.2). For similar reasons, indicator levels are also not strictly comparable across the three categories.

Box 7.1. **Measuring redistribution achieved by individual parts of the tax-transfer system** *(cont.)*

Progressivity and size of a tax or benefit

Progressivity is measured using the Kakwani indicator (Kakwani, 1977), which is the concentration coefficient of the tax (or benefit) *minus* the Gini coefficient of pre-tax (or pre-benefit) income and quantifies the departure of the distribution of a tax or benefit payment from proportionality. A tax or benefit that is distributed in proportion to pre-tax (or pre-benefit) income has zero progressivity and no redistributive effect whatever the size of the tax or benefit. The Kakwani indicator ranges from *plus* 1 (maximum progressivity) to *minus* 2 (maximum regressivity). Note that, in the case of benefits, there is an important difference between a technically correct use of these terms, and frequently used language that refer to inequality-reducing transfers as "progressive". In a technical sense, benefits are normally regressive as social transfers tend to decline at higher income levels. For a given size of the redistribution instrument, the more regressive a benefit, and the more progressive a tax, the bigger is its equalising effect.

The *size* of the tax-benefit instrument is measured as the effective tax rate (or benefit rate): all taxes paid (or benefits received) by the household, divided by the household's pre-tax (or pre-benefit) income, averaged over all households. For benefits, the size indicator is negative (which, in combination with a negative progressivity indicator, results in positive redistribution).

Israel), compared with more than 5 points for benefits (in Finland, Norway, Sweden and Switzerland).

The size of social contributions has increased in just over half the countries shown in Figure 7.3 (Panel B). Due to the frequent use of upper contribution limits and the flat payment schedule below those limits, they are slightly regressive on average (but particularly so in Poland). With contribution burdens approximately proportional to incomes, even sizable changes in the overall contribution burden change the redistributive effect by a relatively small amount (top graph of Panel B). Overall rate structures have essentially remained the same over the period. Where progressivity did change (Finland, Poland), contributions rates are low, so that the redistributive effect of these changes is negligible.

Figure 7.3, Panel C, shows that, in view of the size of average income-tax rates – 20% or higher in about half the countries shown – the extent of inequality reduction is remarkably small when compared to benefits. Despite a flattening of rate structures, income taxes have nonetheless become somewhat more progressive in most countries – consistent with the trend towards greater market-income inequalities, which, in itself, would increase taxation at the top end. Reforms that have broadened the tax base may also have resulted in some tax-burden increases for higher-income groups. Effective income-tax rates faced by all "non-elderly" households, on average, have, however, declined in most countries. Those two trends (somewhat higher progressivity but reduced size) have had opposite effects on the redistributive capacity of income taxes so have partly cancelled each other out. Exceptions to this pattern are Australia and Finland, where both progressivity and average tax rates declined, and Demark (early period) and Germany (later period), where the income tax became significantly more redistributive. In Switzerland and the United Kingdom, reduced progressivity has cut the (already low) redistributive effect of income tax approximately in half.

Figure 7.3. **Drivers of redistribution: progressivity and size of transfers and taxes**

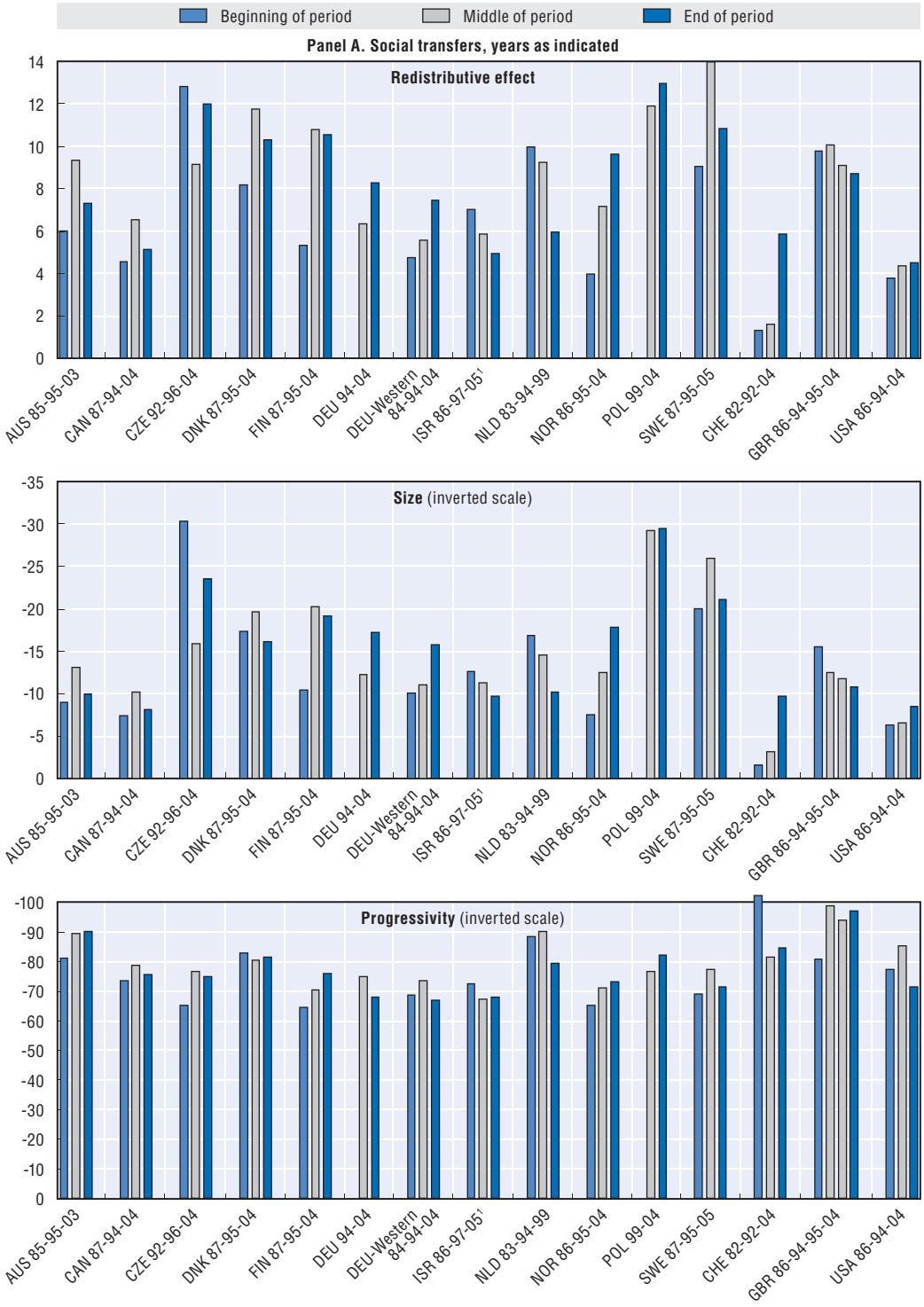


Figure 7.3. **Drivers of redistribution: progressivity and size of transfers and taxes** *(cont.)*

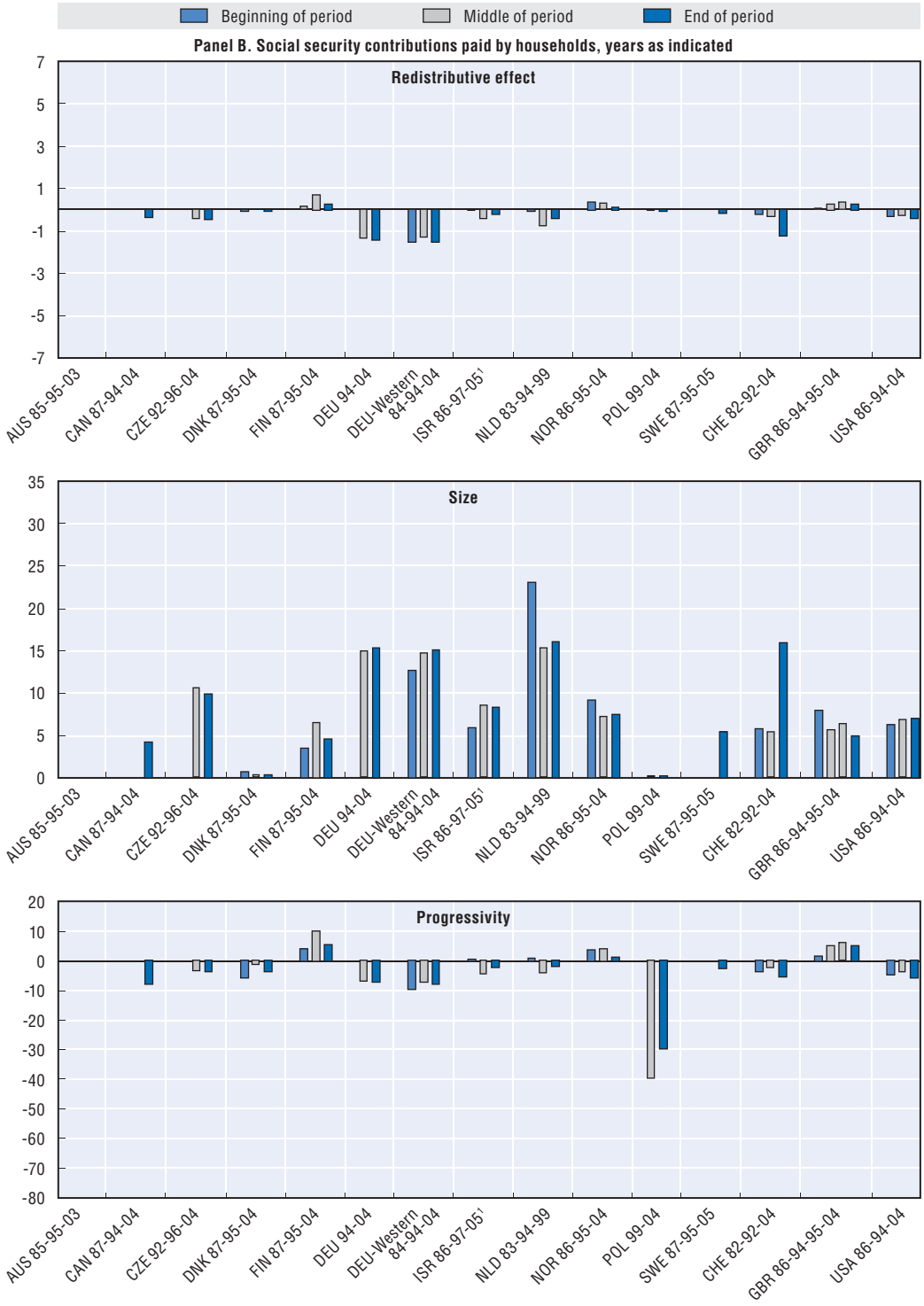
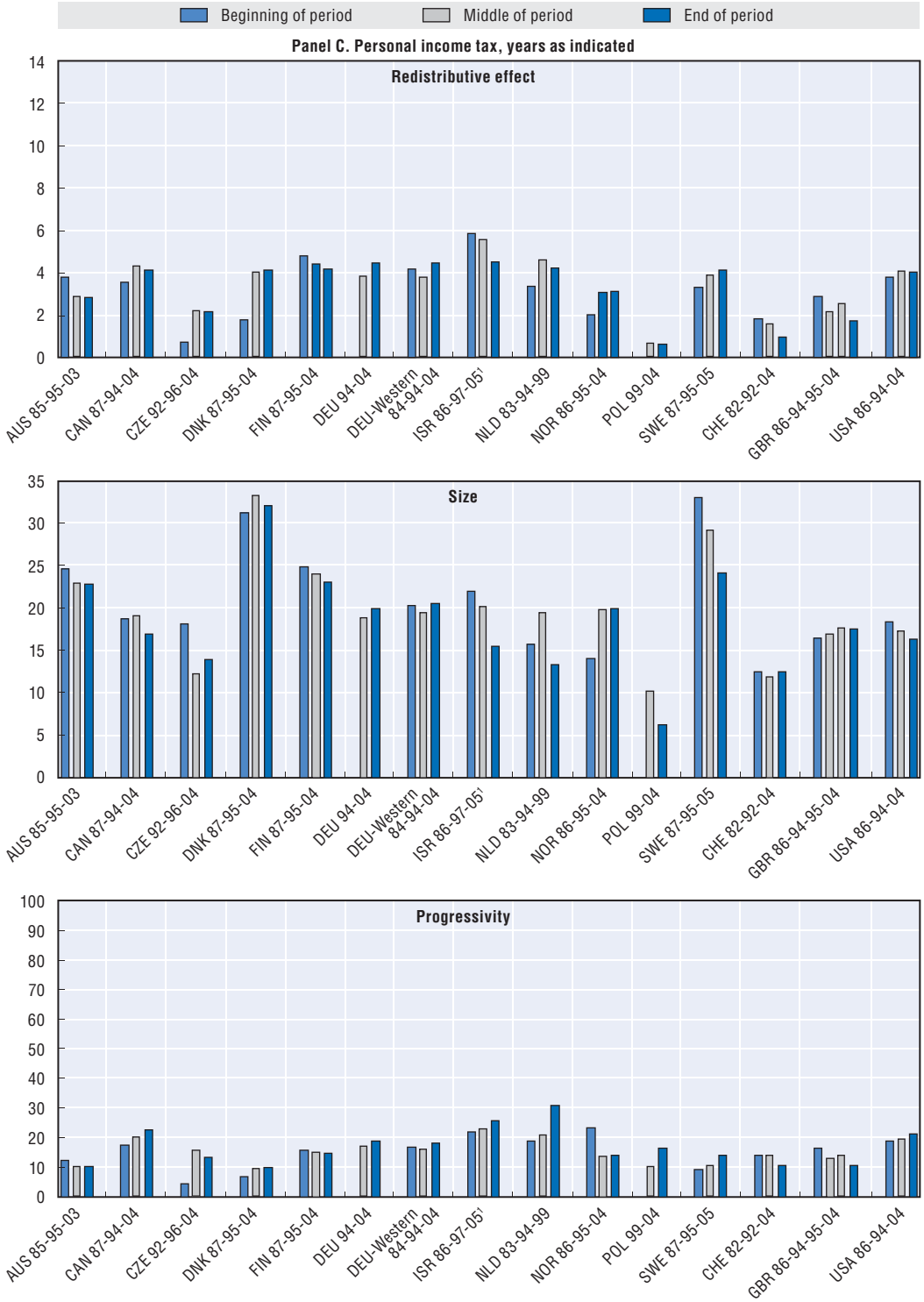


Figure 7.3. **Drivers of redistribution: progressivity and size of transfers and taxes** *(cont.)*



Note: See Box 7.1 and Table 7.3 for definitions, measurement choices and statistical breaks in the series. The redistributive effect is the difference between the Gini coefficients before and after the respective tax or benefit. "Size" is the average ratio of the respective tax (or negative benefit) over pre-tax/benefit income. Progressivity is the Kakwani measure for the respective tax or benefit.

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

Source: OECD Secretariat calculations from the Luxembourg Income Study (LIS).

StatLink http://dx.doi.org/10.1787/888932536838

7.3. The role of policy reforms

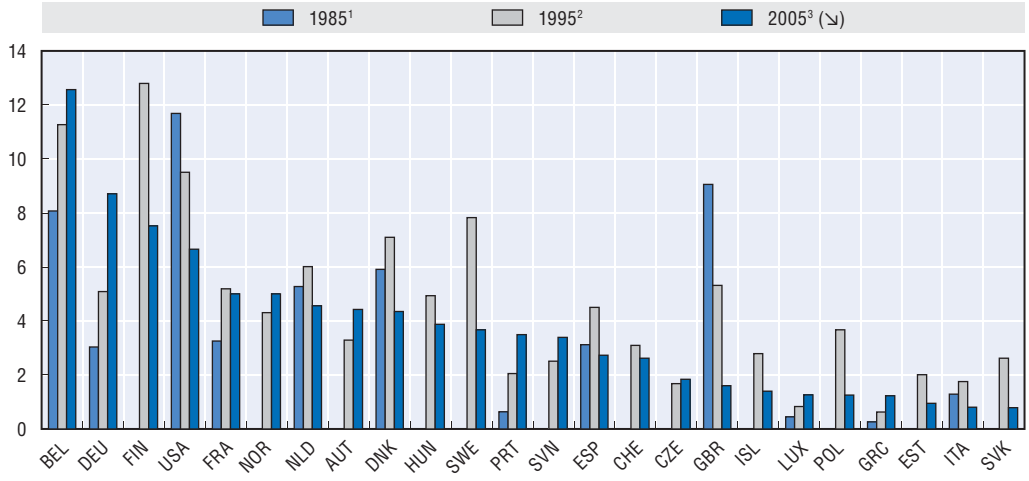
Looking at inequality before and after accounting for taxes and benefits does not allow separating the effects of policy initiatives on the one hand, and changes in market-income inequality (*e.g.*, because of changing employment patterns) on the other. This section attempts to shed more light on the role of specific policy changes.

The reach of benefit systems: more or less encompassing?

Out-of-work benefits, such as unemployment benefits, provide support to people who may otherwise have very low incomes or no income at all. This is the primary reason why the benefit system in its entirety is more redistributive than direct taxes. Unfortunately, detailed benefit recipiency data for all relevant out-of-work benefits are currently not available.[15] However, labour force surveys (LFS) provide useful evidence on the number of people receiving unemployment benefits and their labour-force status. Figure 7.4 shows that unemployment benefit recipiency rates often changed considerably. Rates of benefit receipt rose strongly in Belgium, Germany and Portugal and fell in Italy, United Kingdom and, since the mid-1990s, in Spain, the United States, and in most Nordic countries (not in Norway).

Figure 7.4. **Unemployment benefit recipiency**

Percentage of working-age population



1. Portugal: 1986, Spain: 1987, United States: 1992.
2. Hungary and Switzerland: 1996, the Czech Republic, Estonia, Poland: 1997, Slovak Republic: 1998.
3. Netherlands: 1999, Spain: 2004.

Source: European Labour Force Surveys and US Current Population Survey. For definitions and limitations see Immervoll *et al.* (2004).

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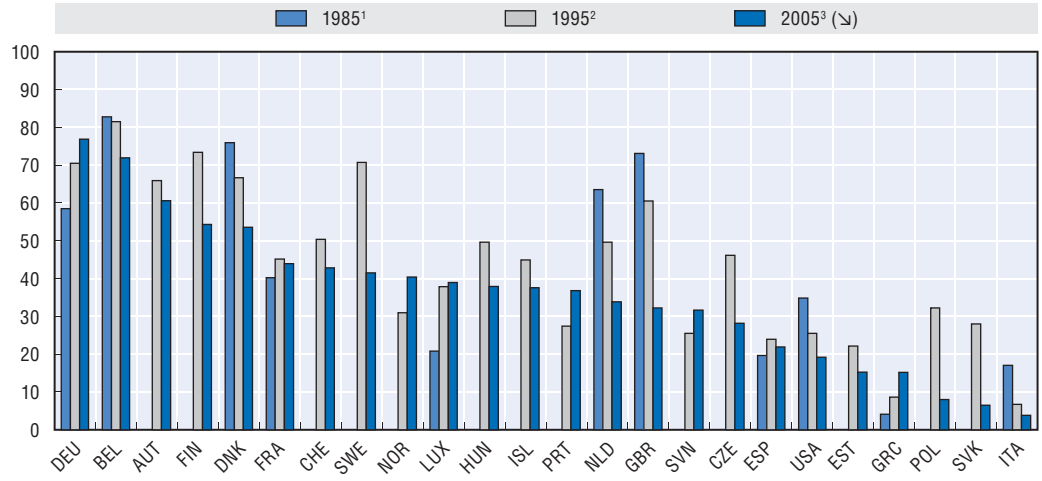
Two important determining factors of these trends are the extent and patterns of unemployment. But in addition, changing eligibility rules, including the enforcement of job-search conditions and other behavioural requirements, also affect recipiency rates. Figure 7.5 indicates that the shares of unemployed reporting benefit receipt have dropped in two thirds of the countries shown, while only a few recorded significant increases. While such changes in recorded benefit accessibility and coverage can result from a changing composition of the unemployed pool (*e.g.*, higher shares of young unemployed), further

Figure 7.5. **Unemployment benefit coverage**

Percentage of ILO unemployed



1. Portugal: 1986, Spain: 1987, United States: 1992.
2. Hungary and Switzerland: 1996, the Czech Republic, Estonia, Poland: 1997, Slovak Republic: 1998.
3. Netherlands: 1999, Spain: 2004.

Source: European Labour Force Surveys and US Current Population Survey. For definitions and limitations see Immervoll *et al.* (2004).

StatLink http://dx.doi.org/10.1787/888932536876

analysis shows that coverage has generally moved in the same direction for those with and without prior work experience (data not shown). Likewise, a changing incidence of long-term unemployment also cannot explain a pattern of declining benefit coverage: between the mid-1990s and the mid-2000s, the proportion of long-term unemployment *fell* significantly in most countries (OECD, 2010).

More likely driving factors of declining coverage rates during this period are short and/or less continuous work histories, as well as, in some but not all countries, increasing shares of temporary employment and other types of non-standard work (OECD 2010). Such workers may be excluded from benefit receipt by law (*e.g.*, the self-employed in most countries, including the so-called "falsely" self-employed) or *de facto* because they are less likely to meet contribution requirements or satisfy other relevant eligibility criteria (*e.g.*, temporary or part-time workers).[16] The summary of policy trends in the next section examines whether policies have adapted to these changes (*e.g.*, by making it easier for non-standard workers to qualify for benefits).

Key features of redistribution systems and major policy changes in selected countries

Table 7.5 summarises in a qualitative way some of the main policy changes between the mid-1980s and the mid-2000s for ten OECD countries. Because the above analysis identified benefits as the main drivers of changes in redistribution, the summary table focuses on the benefit side. In an attempt to highlight the distributional consequences of policy changes, benefit provisions that were made less generous are shown in blue, while grey shaded cells indicate changes that tend to result in higher entitlements.[17] Policy changes for the earlier period of the mid-1980s to mid-1990s and the later period of the mid-1990s to mid-2000s are identified separately.

Table 7.5. **Main changes in generosity of four benefit programmes, mid-1980s to mid-2000s**

	A. Unemployment insurance					
	Maximum benefit	Maximum duration	Payment rate	Eligibility[1]	Benefit withdrawal[2]	Other[3]
Australia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Austria	85-95	85-95	85-05			95-05
Czech Republic[4]	95-05		95-05		95-05	
Finland		85-95	85-95-05	95-05	95-05	85-95-05
France		85-95-05		85-05	85-95	95-05
Germany			85-95			85-95
Italy	85-95 95-05	95-05	85-95-05			
Japan	85-95-05	95-05	85-05			
United Kingdom	95-05	95-05	95-05	95-05		
United States	85-95 95-05		85-95-05			
	B. Unemployment assistance					
Australia	95-05				85-95	
Austria	85-95					95-05
Czech Republic[4]	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Finland	85-95-05				85-95 95-05	85-95-05
France		85-95				
Germany[5]	95-05			95-05	95-05	
Italy	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Japan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom	95-05					
United States	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	C. Social assistance					
Australia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Austria		n.a.	n.a.	n.a.		
Czech Republic[4]	95-05	n.a.	n.a.	n.a.		
Finland	95-05	n.a.	n.a.	n.a.	95-05	
France	95-05	n.a.	n.a.	n.a.	95-05	
Germany[5]	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Italy	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Japan	95-05	n.a.	n.a.	n.a.		
United Kingdom	95-05	n.a.	n.a.	n.a.		85-95
United States		n.a.	n.a.	n.a.		
	D. Family benefits					
Australia	85-95-05	n.a.	n.a.		95-05	
Austria		n.a.	n.a.	85-95		
Czech Republic[3]	95-05	n.a.	n.a.			
Finland		n.a.	n.a.			95-05
France	95-05	n.a.	n.a.	85-95		
Germany	95-05	n.a.	n.a.	95-05		95-05
Italy	85-95-05	n.a.	n.a.			
Japan	95-05	n.a.	n.a.	85-05		
United Kingdom	95-05	n.a.	n.a.			
United States	95-05	n.a.	n.a.			

n.a. = not applicable.

1. Employment and contribution conditions for UI and UA, age limits for family benefits
2. Permitted employment/earnings, income disregards and/or benefit withdrawal rates
3. Additional benefit provisions, mainly extra allowances for family members
4. Information only available for 1995 and 2005
5. Unemployment assistance has been merged with social assistance in 2005.

Source: Adapted from Immervoll and Richardson (2011).

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Most countries reduced benefit levels of unemployment insurance, either through discrete policy changes, or by not fully adjusting ("indexing") benefits in line with in-work earnings (Panel A, unemployment insurance). Initial eligibility conditions have also become more demanding in at least three countries, while none appear to have lowered the barriers to access the benefit system. Some countries raised benefit durations and ceilings – in two of them the rise in the first period was followed by a reduction in the second.

For jobseekers not qualifying for insurance benefits, benefit amounts tend to be lower and, because they are means-tested, more targeted to low-income families. Unemployment assistance benefits (Panel B, unemployment assistance) are sometimes only available as follow-up support (Austria, France in 1985 and Germany prior to 2005). In other cases, they may also be payable to jobseekers who do not qualify for insurance benefits in the first place (Finland, France, United Kingdom). In Australia, they are the only form of unemployment benefit. Compared with unemployment insurance, changes since the mid-1980s to unemployment assistance rules were fewer and smaller. Benefit amounts tended to become less generous, while employment or contribution requirements (where they exist) changed little. A major exception is Germany, where unemployment and social assistance for jobseekers were merged into one single programme in 2005. For long-term unemployed with relatively high previous earnings, this resulted in substantially lower benefit amounts. While the benefit can now be received by jobless people without any employment record, this has not made benefits more accessible or generous as these individuals had access to social assistance (paid at comparable rates) before the reform.

Social assistance provisions (Panel C, social assistance) have remained largely unchanged, although benefit levels in a number of countries have not kept up with earnings growth. This concerned the benefit amounts of recipients but also of other dependent family members. However, social assistance programmes are often administered at a regional or local level, resulting in considerable variation in legal rules or guidelines that are difficult to capture in these summary tables.[18] Even where there are legal entitlements, budgetary pressures can make access more difficult in practice and, hence, depress effective take-up rates (*e.g.*, if administrative staff are unable to provide timely service when faced with a steep increase in the number of claims).[19]

Column 5 ("benefit withdrawal") in Panels A through C show that means-tests and rules on permissible work activities for benefit recipients were often made more employment-friendly. Across the three different types of out-of-work support, benefit phase-out rates were frequently reduced, or greater portions of earnings disregarded in the means-test. These changes are not only significant for their effects on work incentives. By extending the benefit withdrawal range higher up the earnings distribution, these reforms strengthen redistribution by reducing net income differentials and, hence, inequality, in some parts of the distribution. At the same time, such reforms could also weaken the financial payoff from increasing earnings further, giving rise to the possibility of so-called "low-income traps" for some recipients. Similar issues can arise for employment-conditional in-work benefits although these transfers are generally more effective at accentuating the income difference between working and not working.[20]

Unlike the three out-of-work benefits above, family benefits (Panel D, family benefits) have become significantly more generous since the mid-1980s in most countries. In Australia, Germany and Japan, benefit amounts per child have risen more strongly than earnings levels,

while the United Kingdom and United States have introduced new child-related tax credits. But while the UK credit also benefits families on the lowest incomes (it is refundable and not counted as income in relevant means-tests), the US credit does not (it is counted as income in means-tests and is only partially refundable). Re-balancing support in favour of families with more children (who are more likely to face low incomes and relative income poverty) tends to make family benefits more redistributive (Austria, Italy). A few countries have increased the maximum age limit for child-related benefit payments and one country (Japan) reduced the limit between 1985 and 1995 (the limit was subsequently raised again though not to its original level).

Personal income taxes (PIT) are the most thoroughly documented element of redistribution policy reforms (Hagemann *et al.*, 1988; Pechman, 1987, 1988; OECD, 1986, 1993, 1995). The most important trends identified in these studies include a flattening of rate schedules and a move towards individual taxation.[21] For a given revenue, less progressive tax schedules unambiguously reduce the redistributive power of income taxes. In particular, lower rates at the top will widen the net income distribution, unless the reform is accompanied by measures that broaden the tax base to an extent that prevents average tax payments for rich families from falling. Reductions in top rates were steepest in Japan, Italy, the United Kingdom and France (Immervoll and Richardson, 2010, see also Chapter 9). The flattening of schedules mostly concerned higher income ranges (Australia, Austria, Finland, France, Germany, Japan, the United Kingdom and the United States). In the Czech Republic (1995-2005) the tax schedule flattened only at very high income levels (in excess of 500% of the average wage). Failure of tax thresholds to keep pace with wage growth has effectively compressed the tax schedule (making it steeper) at low-to-moderate income levels (*e.g.*, Australia and the United States).

While a reduced differential between top and bottom rates makes income taxes less progressive over some income ranges, this does not necessarily render the PIT less redistributive as a whole if a larger number of low-income families is exempt from income taxes altogether (*e.g.*, by widening the zero-rate bracket as in Austria, or by increasing the tax-free allowance as in Italy) (Keen *et al.*, 2000). This is one reason why the progressivity measures reported for most countries above (Figure 7.3, Panel C) did not show a more noticeable fall between the mid-1980s and the mid-2000s. Another reason is that pre-tax income inequality rose substantially in most countries, pushing up the gap between income-tax burdens faced by different income groups. To some extent, this offset the more generous tax treatment of richer households resulting from flatter tax schedules.

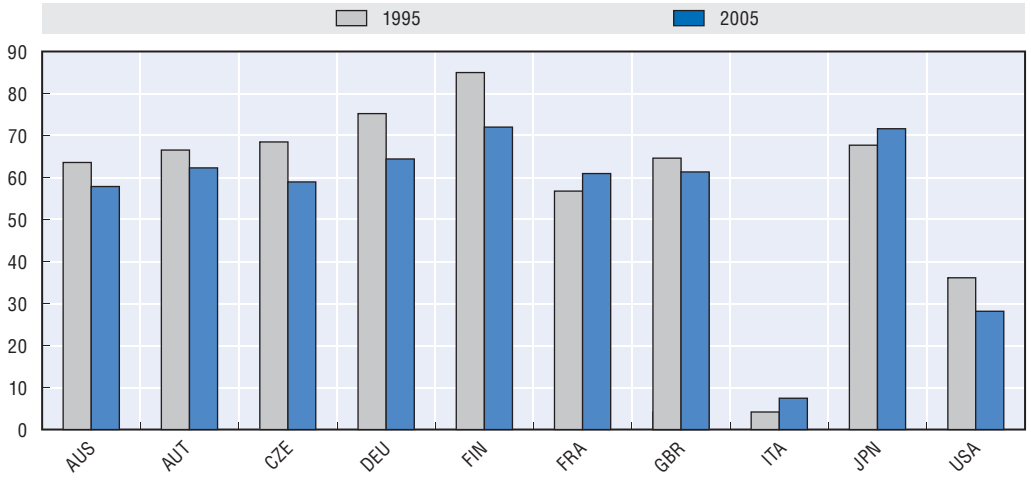
Social contributions can be as sizable as income taxes but they do not have a large effect on cross-sectional inequality. Moreover, apart from level changes, relevant rules have changed little over the time period.[22]

Generosity of support for the unemployed

While there was a tendency toward reducing the generosity of unemployment benefits across the OECD countries studied, in six of the eight countries where unemployment benefits appear to have tightened at least one element of unemployment benefits became more generous. In France, for example, the maximum benefit duration in the unemployment insurance programme was reduced while time-dependent reductions in payment rates were abandoned. Similarly, reductions in the value of benefit ceilings occurred in the two countries (Italy and the United States) where statutory benefit replacement rates were made more generous.

Net replacement rates (NRR) are a useful way of quantifying the combined effects of these changes. These indicators express the net incomes of unemployed people relative to those in work. Reductions of NRR points to incomes of the unemployed falling behind relative to those in work. Figure 7.6 provides a strong indication of reduced cash support for the unemployed between 1995 and 2005: seven of the ten countries recorded declining NRRs. The largest falls were recorded in countries where, relative to average earnings, the generosity of both unemployment benefits (unemployment insurance – UI – and unemployment assistance – UA) and social assistance (SA) were reduced: Finland (UI,

Figure 7.6. **Net replacement rates of unemployment support**
Average over a long unemployment spell (60 months of unemployment), in percentage



Note: Unweighted average of NRRs in each month of a long unemployment spell (60 months), at two levels of previous earnings (67% and 100% of average full-time wages) and for four stylised family types (single persons, lone parents, one-earner couples with and without children). Calculations consider cash incomes as well as income taxes and mandatory social security contributions paid by employees. Minimum-income transfers and or housing-related benefits are available as income top-ups as applicable. Any behavioural requirements (such as active job-search) are assumed to be met. Net replacement rates are evaluated for a prime-age worker (aged 40) with a "long" and uninterrupted employment record. See OECD (2007a) for full details.

Source: OECD tax-benefit models (*www.oecd.org/els/social/workincentives*).

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UA and SA), Germany (SA and merging of UA and SA) and the Czech Republic (UI and SA). Finland and Germany saw the biggest reductions in net replacement rates. A decomposition of these changes (not reported) shows that in Germany, and to a lesser extent Finland, effective tax burdens on employment incomes were reduced at the same time, which further widened the gap between incomes in-work and out-of-work.

Changes for the unemployed in most countries tended to be less damaging (or, sometimes, more beneficial) for families with children. This is shown in Table 7.6 (Panel A). In Australia, Japan and the United Kingdom, increased out-of-work support for lone parents is evident. In contrast, NRRs for families with children fell more strongly in the Czech Republic, Italy and the United States. Germany and the United States are the only countries where NRRs fell more for lone parent families than for couples with children.

The largest relative income drop was generally faced by long-term unemployed jobseekers who mostly rely on unemployment assistance or social assistance for income

support (Table 7.6, Panel B). Two exceptions are Italy (where long-term unemployed already had little or no cash support in 1995) and Japan (where the duration of unemployment insurance benefits was extended). Importantly, these results are for jobseekers who were entitled to unemployment insurance benefits in the first place. However, because non-standard workers and others with limited or interrupted employment records often have no access to unemployment insurance, NRR trends for these groups will often have been similar to those of the long-term unemployed. In view of the fall in unemployment-benefit coverage rates documented above, minimum-income support for those with no or little other income is likely to have become a more central driver of overall redistribution trends. Income changes for this group are considered in the next section.

Table 7.6. **Net replacement rates of unemployment support**

Panel A. By family type, in percentage

	No children				Two children				Average	
	Single person		One-earner married couple		Lone parent		One-earner married couple			
	1995	2005	1995	2005	1995	2005	1995	2005	1995	2005
Australia	47	40	72	62	58	59	77	71	64	58
Austria	56	51	63	58	70	67	77	72	67	62
Czech Republic	44	39	74	61	70	64	86	72	68	59
Finland	72	57	90	73	82	73	96	84	85	72
France	48	51	53	57	61	66	65	70	57	61
Germany	61	50	73	59	85	74	82	75	75	64
Italy	4	7	4	7	4	8	5	8	4	8
Japan	49	52	67	72	74	80	80	83	68	72
United Kingdom	56	49	67	58	63	65	73	72	65	61
United States	16	13	23	18	52	38	55	44	36	28

Panel B. By unemployment duration, in percentage

	First year		Second and third year		Fourth and fifth year		Average	
	1995	2005	1995	2005	1995	2005	1995	2005
Australia	64	58	64	58	64	58	64	58
Austria	68	64	66	62	66	62	67	62
Czech Republic	70	61	68	58	68	58	68	59
Finland	87	76	85	72	84	70	85	72
France	74	72	54	62	51	54	57	61
Germany	76	69	75	65	75	62	75	64
Italy	21	38	0	0	0	0	4	8
Japan	70	73	67	71	67	71	68	72
United Kingdom	65	61	65	61	65	61	65	61
United States	51	42	32	25	32	25	36	28

1. See note to Figure 7.6

Source: OECD tax-benefit models (*www.oecd.org/els/workincentives*).

StatLink http://dx.doi.org/10.1787/888932538054

Gainers and losers of tax-benefit reforms across the earnings distribution

A way to identify the relative contribution of policy changes and trends in market-income inequality on redistribution would be to calculate tax burdens and benefit entitlements for representative samples of households for different periods. Box 7.2 provides an illustration of such an approach for the United States. Unfortunately, an equivalent analysis is currently not feasible for a larger group of countries as the required microsimulation models are not readily available, or do not cover the time-period of interest. This section therefore applies a less data-intensive approach, which calculates the effect of policy changes on a range of different *model families*, using the OECD's tax-benefit models. While this method does not account for differences in population structure and earnings inequality across countries, it can isolate the effect of policy reforms for selected families and earnings levels. It thus permits identifying "gainers" and "losers" of policy reforms. The advantage of the simulation is that it can hold "everything else" constant (unemployment levels, market-income inequality, household composition, etc.), and focuses on the role of policy changes alone. For instance, it can show whether families at the bottom, middle and top of the income distribution are now better or worse off than they would have been with *unchanged* policies.

In a progressive tax-benefit system, rising nominal earnings levels result in lower net benefits (benefits minus taxes) unless all relevant policy parameters (such as benefit amounts, income limits or tax-band limits) are adjusted for income growth. This leads to "automatic" changes in redistribution mechanisms, if no policy action is taken (OECD, 2008b). In the context of income taxes, the mechanism of automatically increasing revenues is often referred to as "fiscal drag". For simplicity, this term will be used below to refer to changes in either tax or benefit amounts that result from changing earnings levels if tax-benefit systems are kept nominally "frozen". In discussing changes in tax burdens and benefit entitlements, this section distinguishes between the effects of *legislative* policy initiatives on one hand, and the impact of changing earning levels (*fiscal-drag*) on the other. The sum of these two components yields the total "actual" change.[23]

The reasons for distinguishing between policy and fiscal-drag effects is two-fold. First, if average nominal earnings grow quickly, the effect on total government revenue and expenditure can be substantial.[24] One interesting question is to what extent governments rely on the fiscal-drag effect as a way of increasing revenues, or reducing benefit expenditure. Second, fiscal-drag effects can have important distributional implications. For instance, a failure to adjust benefit levels as earnings increase can cause low-income families, who rely on government benefits for much of their income, to drop further down in the income distribution.

The analysis below uses a graphical format to summarise income changes resulting from fiscal drag and discrete policy changes. Figure 7.A1.1 displays changes in net transfers (benefits minus taxes) between 1995 and 2005 as a percentage of household disposable income, for the earnings range of 0% to 200% of the average wage. It decomposes the overall change into a "legislative policy" effect and "fiscal drag" effect, the latter broken down by an inflation and by a real earnings growth effect. A policy change that increases, or decreases, everyone's disposable income by the same proportion has no impact on the income distribution (horizontal line). Downwards (upwards) sloping lines are indicative of progressive (regressive) changes and would tend to cause a narrowing (widening) of the

Box 7.2. **Isolating the direct effect of policy reforms: an illustration for the United States**

Showing the direct effects of policy reforms on measured redistribution requires holding everything else constant. To do this, a redistribution measure is derived which uses the same population and distribution of market incomes before the reform (at time t_0) and after the reform (at time t_1). Such a measure can be calculated using microsimulation models as these models can apply policy rules from different years to the same population.

A tax-benefit function d represents the rules and structure of the tax-benefit system (*e.g.*, benefit eligibility conditions and marginal tax, contribution and benefit withdrawal rates) and a vector p accounts for all monetary parameters (*e.g.*, tax-band limits, tax credits, contribution ceilings, benefit amounts). The distribution of after-tax income can then be represented by $d_i\ (p_j,\ y_k)$ for structural policy rules of year i, tax-benefit parameters of year j and nominal incomes of year k. In addition, one can nominally adjust monetary tax-benefit parameters p (or, equivalently, nominal incomes y) by an uprating factor α (*e.g.*, to index benefit amounts and tax threshold to price levels). In this way, the counterfactual situation $d_{t+1}(p_{t+1},\ \alpha_{t+1}y_t)$ represents after-tax incomes obtained by applying tax rules and parameters of year t+1 on year t household data with incomes nominally adjusted to year t+1. If I is the inequality index of interest, then the change between initial and final period is $\Delta I = I\ [d_{t+1}(\ p_{t+1},\ y_{t+1})] - I[d_t(\ p_t\ ,\ y_t\ )]$. Following Bargain and Callan (2010) and Bargain *et al.* (2011), this change can be decomposed into contributions of changing policy ("direct policy effect") and changing populations ("other effect", *i.e.*, the underlying distribution of pre-tax-benefit incomes):

$$\Delta I = I\ [\ d_{t+1}\ (\ p_{t+1},\ y_{t+1}\ )] - I\ [\ d_t\ (\ \alpha_{t+1}p_t,\ y_{t+1}\ )]\ \textbf{(direct policy effect)}$$
$$+ I\ [\ d_t\ (\ \alpha_{t+1}p_t,\ y_{t+1})] - I\ [\ d_t\ (\alpha_{t+1}p_t,\ \alpha_{t+1}y_t\ )]\ \textbf{(other effect)}$$

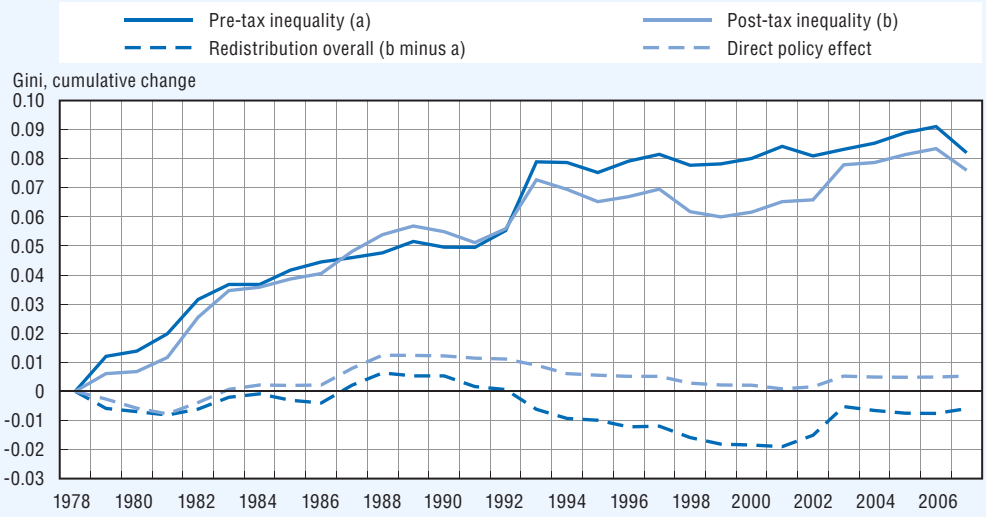
The illustration for the United States is described in more detail in Bargain *et al.* (2011) and uses NBER's TAXSIM model. This model does not simulate benefits and the study is therefore limited to the tax side only. The figure below shows that pre-tax inequality (which includes benefits) has risen substantially. The rise was particularly notable between 1978 and 1992. The Gini coefficient has increased by some 8 points (or 24%) over the period as a whole. In line with the results reported earlier in Figure 7.2, a comparison between pre- and after-tax distributions shows a small increase in redistribution through the tax system, meaning that the tax system has slightly slowed the growth in after-tax inequality.*

However, the decomposition reveals that most of the increase in redistribution did not result directly from tax policy reforms but was a consequence of the changing distribution of pre-tax incomes. While the cumulative effect of reforms was small, there are some significant policy effects for individual subperiods. Interestingly, their patterns appear to be roughly in line with popular perceptions regarding the political cycle, with disequalising (equalising) effects observed for policy changes implemented during Republican (Democrat) administrations, 1981-1993 and 2001-08 for the former, and 1978-1981 and 1993-2001 for the latter. There were significant differences between results for the lower and upper parts of the distribution (not reported). Policy reforms enacted in the early and mid 1990s reduced income gaps at the bottom to below their 1978 value. By contrast, no equalising effects of policies can be discerned for the upper part of the distribution. For the period as a whole, tax policy changes appear to have slightly exacerbated trends towards widening income gaps at the top.

* The inequality cushioning effect was, however, much less effective in the upper half of the distribution (about 20% of the increase in the pre-tax P90/P50 ratio) than below the median (about 50% of the increase in P50/P10). This suggests limited success of the income-tax system at moderating growing inequalities at the top of the distribution, as well as considerable effectiveness of the earned income tax credit (EITC) at strengthening redistribution at the bottom.

Box 7.2. **Isolating the direct effect of policy reforms: an illustration for the United States** *(cont.)*

Inequality before and after tax in the United States: total redistribution and direct policy effect



Note: Households with at least one working-age adult (15-64). Incomes are equivalised using the square-root scale.
Source: Bargain *et al.* (2011).

StatLink http://dx.doi.org/10.1787/888932536914

income distribution, at least within the segment of the population represented in the particular graph.[25] All calculations relate to families who do not receive unemployment benefits that depend on a previous employment history. Instead, and subject to relevant income limits, they may be entitled to means-tested assistance benefits.

Single individuals

The changes in tax burdens and benefit entitlements for single individuals (Figure 7.A1.1, Panel A), coupled with fiscal drag effects, were mostly "regressive" over the 1995-2005 period; among the countries shown, Italy and Japan were the only ones where changes appear to have strengthened redistribution. In many other countries, policy changes (combined, where they exist, with automatic adjustments such as inflation indexing) resulted in more generous benefit entitlements in *nominal* terms. But benefit recipients nevertheless mostly lost ground in the income distribution as minimum-income and cash housing support did not keep pace with earnings growth.[26] Recipients of minimum-income benefits have often seen a considerable worsening of their income position, even relative to people on unemployment support, whose relative incomes declined as well. On the upper end of the income spectrum, tax policy was largely successful at preventing fiscal-drag related tax increases: single higher-income earners frequently saw lower tax burdens in 2005 than in 1995.

Families with children

Patterns of income changes are more complex for families with children (Figure 7.A1.1, Panels B and C). Tax and benefit changes between 1995 and 2005 appeared less "regressive" (or more "progressive") than for single people. In general, earnings growth and inflation have a much greater influence on the workings of the redistribution system when children are present. But although sizable fiscal-drag effects mean that low-income families can face big losses if governments "do nothing" to adjust benefit rules, a few countries (*e.g.*, Australia, United Kingdom) were remarkably successful at protecting low-income families with children from losing ground relative to higher-income groups. Where legislative policy changes were less pro-poor (*e.g.*, Finland, United States), the erosion of benefits due to inflation and real earnings growth did, however, result in sizable losses at the bottom.

Consequences of policy reforms for people's position in the income distribution

By combining the calculated net incomes in 1995 and 2005 with household income data, it is possible to indicate whether particular families experienced gains or losses and what these income changes meant for their position in the overall income distribution. Figure 7.A1.2 shows how much a family had to earn under 2005 and 1995 policies in order to reach different decile groups of the income distribution, plotted on the y-axis. The vertical dashed lines correspond to the earnings decile points in each country. In Australia, for instance, a single person with full-time earnings at half the average wage would be located at the first earnings decile which would put her into the fourth decile of the income distribution.

The spread of income distributions, and the positions of the various family types in them, differ markedly between countries. In the Czech Republic and the United States, full-time earnings around the 10th earnings percentile put a single-person household in the second decile group of the household income distribution, while in Australia, Finland, Italy, Japan and the United Kingdom, full-time work at the same point in the earnings distribution secures a place above the lowest third of the overall income distribution. At the other end of the earnings spectrum, a single paid at the 80th earnings percentile is among the richest (in terms of net income) 20% of households in Australia, Austria, Germany, Japan and the United Kingdom. In the United States, however, someone with earnings among the highest 20% of full-time earners, and no other incomes, only makes it into the top 40% of the household income distribution.

The effects of policy changes between 1995 and 2005 can be seen from the difference between the solid and dashed lines and mirror those shown earlier in Figure 7.A1.1. A net loss is indicated by a solid line that is below (to the right of) the dashed line. This means that the earnings needed to achieve a given position in the income distribution under 2005 tax-benefit rules are higher than they would have been under the (wage-indexed) 1995 system. This is what generally occurred for single low-wage earners. For instance, in the United States, single individuals earning around 30% of the average wage (roughly the level of the federal minimum wage in 2005) would have had to work almost one third longer (or earn one third more per hour) in order to make up for the additional net tax burdens (or the lost net benefit). The additional earnings needed to compensate for lower net benefits at the bottom are even larger in Australia, both because benefit reductions are sizable and because relatively high benefit withdrawal rates mean that the payoff from earning more is limited.

On the other hand, are several examples of net gains for families with children. The most sizable gains are shown for lone-parent and two-parent families in Australia, Italy and Germany. More generous benefits in Germany lift many two-parent families, and some lone-parents, almost a full decile further up in the income distribution, , although gains were smaller for (the large number of) low-paid lone parents.

7.4. Summary and conclusions

Between the mid-1980s and the mid-2000s the benefit system drove changes in overall redistribution and tax reforms did little to reduce inequality. From the mid-1990s, tax-benefit systems grew less effective at reducing inequality.

In the context of rising market-income inequality, tax-benefit systems became more redistributive. Although they did not stop income inequality from rising (market-income inequality grew by twice as much as redistribution), they were able to offset more than half of the rise in market-income inequality up until the mid-1990s in countries such as Australia, Canada, Finland and Sweden. From that time, however, the share that tax-benefit systems offset fell in most countries. In high-inequality countries like the United States, Israel, and the United Kingdom, taxes and benefits compensated only a relatively small part (one fifth or less) of the increase in market-income inequality over the period as a whole.

While growing market-income disparities were the main driver of inequality trends between the mid-1980s and mid-1990s, reduced redistribution was sometimes the main source of widening household-income gaps in the ten years that followed. In fact, income inequality after counting benefits and taxes increased *at a faster rate* after the mid-1990s than in the decade before.

Across countries, cash support for working-age individuals and their families grew in real terms but accounted for a declining share of total social spending (from a country average of 27% in 1985 to 21% in 2005). Countries which achieved large increases in the redistributive effect of benefits did so mainly through growing average benefit amounts, while the degree of benefit targeting ("progressivity") changed less. The relatively small change in benefit progressivity and its limited impact on the redistribution properties of cash transfers highlights the importance of spending levels for inequality outcomes. It also suggests considerable scope for strengthening existing targeting mechanisms (*e.g.* by preventing low-income job seekers from going without support).

The most important benefit-related determining factor in overall distribution, however, was not benefit levels but the number of people entitled to transfers. While receipt of incapacity benefits tended to rise, unemployment benefit receipt fell in a majority of countries. Tighter eligibility rules played a role, as did the sizeable increase in the proportion of non-standard workers. People entitled to unemployment benefits nevertheless saw their benefit generosity drop from the mid-1990s in seven out of ten OECD countries studied here. Large falls were recorded in countries where the generosity of more than one element in the overall support package was reduced (*e.g.* Germany, the Czech Republic and Finland).

Progressive personal income taxes declined as a share of overall revenues. Despite a flattening of rate structures, they nevertheless became more progressive in about one-half of the countries - consistent with the strong trend towards greater market-income inequalities, which, in itself, magnifies tax-burden differences between high-income and low-income taxpayers. Effective income-tax rates faced by all non-elderly households on average declined in most countries. The two trends (greater progressivity but reduced size)

had opposite effects on the redistributive capacity of income taxes. They therefore partly cancelled each other out and produced relatively small changes in overall redistribution.

In summary, changes in tax burdens and benefit entitlements appeared mostly regressive over the 1995-2005 period for single individuals and childless families in particular. Changes for families with children appeared less "regressive" (or more "progressive" in a few countries). In a number of countries, policy changes resulted in more generous benefit entitlements in nominal terms. But benefit recipients nevertheless mostly lost ground in the income distribution as benefits for the lowest-income groups did not keep pace with earnings growth. At the other end of the income spectrum, tax policy resulted in gains or in comparatively smaller losses.

What lessons for future redistribution policies?

Large, persistent losses in low-income groups following recessions underline the importance of well-targeted income-support policies during economic slumps, as well as during recoveries. Redistribution strategies based on government transfers alone would be neither an effective nor a financially sustainable way of restoring incomes at the bottom. A key challenge for policy is therefore to facilitate and encourage employment and earnings growth that benefit low-income groups in particular.

The relative stability of higher incomes, as well as their longer-term trends, are important to bear in mind in policy debates that seek to define a response to growing inequalities. They are also relevant in the context of planning fiscal consolidation strategies. It may therefore be necessary to critically review whether existing tax provisions should be adapted in light of equity considerations and current revenue requirements, in particular where those with high or very high incomes have benefited from declining overall tax burdens.

Redistribution systems were generally effective at slowing trends towards widening income gaps which were due to falling incomes at the bottom. Tax-benefit systems, however, were less successful at offsetting growing inequality in the upper parts of the distribution, which became a more powerful driver of inequality trends in some countries. Redistribution systems will need to adapt to these new challenges.

Notes

1. This definition does not necessarily correspond to the usage of the term in everyday language. When used in a non-technical context, there is generally a presumption that tax-benefit systems reduce inequalities by transferring resources to those in greater economic need (*i.e.*, by taxing people and using the revenue to finance transfers). However, public policies alter income inequality even when no interpersonal transfer takes place. For instance, a progressive tax reduces inequality by itself, even if the proceeds are not used to finance transfers, while a lump-sum tax increases it.
2. Earlier studies that compare changes over time between countries have not considered more recent changes, look at changes over a relatively short period of time, or cover only a few countries (*e.g.*, Bargain and Callan, 2010; Atkinson, 2004; Jäntti, 1997; Fritzell, 1993).
3. Fritzell (1993) studies trends both for the entire population, and for households headed by non-elderly individuals. Jesuit and Mahler (2004) document trends in overall measures of redistribution for the 25-59 age-group but those results do not show what drove the observed trends (for instance, changes are not shown separately for taxes and benefits, and do not distinguish between changes in the progressivity and the size of redistribution instruments).
4. Of course, government policies alter household incomes not only directly (through taxes and transfers), but also indirectly (by creating incentives and constraints for household behaviour). To the extent that the existence of taxes and benefits causes changes in market prices and household

behaviour, redistribution policies have an influence on pre-tax and benefit market incomes (and economic welfare) which is not captured by looking at the amounts of taxes and benefits alone. Such indirect (or "second-round") distributional consequences of tax and transfer policies are considered in a separate OECD study (OECD, 2011).

5. Three caveats need to be made. First, relating public social spending to GDP is not ideal. However, for countries where data are available, they show that long-term trends are similar if expenditure levels are expressed as a percentage of household income, rather than GDP. Second, the data refer to public social spending and exclude private mandatory spending. In some OECD countries, the latter constitutes a more important and rising share of total social spending. In Chile, for instance, private mandatory spending amounted to 0.4% of GDP in the mid-1980s but to 1.4% of GDP in 2005. Third, the coverage of social spending shown may be limited as programmes and services are often provided, and/or co-financed, by local governments. This leads to large gaps in measurement of spending notably in federal states such as Canada.

6. There is only an approximate correspondence between transfers paid to "elderly" and "non-elderly" age groups and the functional classification used in the OECD social expenditure data. A considerable share of spending on old-age benefits is received by those drawing retirement benefits before they reach the age of 65. At the same time, a part of expenditures in the categories "incapacity related", "housing" or "other social policy areas" may provide income support to the elderly.

7. The decline is somewhat smaller, but still substantial, when early retirement benefits are included.

8. 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.

9. In roughly one third of OECD countries covered in the historical series of the OECD Revenue Statistics, mandatory SSC now account for a similar or higher share of total revenue than the PIT (Czech Republic, Germany, Greece, Japan, Korea, Luxembourg, Mexico, Netherland, Poland, Slovak Republic, and Turkey). Mandatory SSC are much lower than income-tax revenues in Canada and the Nordic countries, while they do not exist in Australia and New Zealand.

10. The Gini measures reported in Chapter 6 refer to working-age individuals and are somewhat different from the ones shown here which refer to individuals in working-age households and thus include children living in the same household as observations in their own right.

11. In Switzerland the subsequent equalising effect on the distribution of disposable income was further strengthened by a trend towards more redistribution.

12. Market-income inequality has also been the main determinant of differences *across* countries. For instance, in the early-mid 2000s, the English-speaking countries, Israel and Poland ranked highest in terms of the inequality indicators of both market and disposable income. That countries with the highest market-income inequality are also those with the highest inequality in disposable income is notable as it contrasts with findings from studies that include the elderly population (*e.g.*, Jesuit and Mahler, 2004).

13. This can be interpreted as choosing a social welfare function that attaches greater importance to the situation of low-income households (see Duclos, 2000).

14. Note that this refers to all cash transfers taken together. Separating out benefits for younger people (Immervoll and Richardson, 2011) shows that benefit rates for the 15-54 year-olds are lower than for the 54-64 year-olds in all countries and much lower in some (Czech Republic, Finland, Poland, Switzerland). This reflects the generosity of disability and early-retirement payments relative to unemployment and family benefits. As a result, the overall finding of a declining redistributive capacity of tax-benefit policies has mainly affected those aged below 55.

15. Measuring the number of individuals receiving out-of-work benefits raises a number of conceptual issues (such as determining the appropriate reference time period and avoiding double-counting, or measuring benefit receipt at the household level see, *e.g.*, Carcillo and Grubb, 2006; Immervoll *et al.*, 2004).

16. Initial employment or contribution requirements for entitlement to unemployment insurance benefits are strictest in the Slovak Republic, Turkey and the United Kingdom, followed by Belgium, Poland and Spain, as well as Austria, the Czech Republic, Denmark, Germany, Italy, Sweden and Switzerland. On the other end of the spectrum, with contribution and employment requirements with six months or less, are Canada, France, Greece, Iceland, Japan, Korea, Netherlands, Norway and the United States. There are no employment or contribution conditions for (means-tested) unemployment benefits in Australia and New Zealand. Benefit rules may however stipulate other

conditions which may preclude access to unemployment insurance for part-time workers, such as minimum requirements on previous earnings.

17. As a general rule, increases/decreases are indicated if the change exceeded 10%. A full and detailed account of the changes in policy parameters is given in Immervoll and Richardson (2011). The paper also lists tax-policy changes since the mid-1980s.

18. Regional or local authorities may also provide supplementary programmes on top of those which are nationally co-ordinated (*e.g.*, General Assistance in US States, see Gallagher *et al.*, 1999). Also, benefit offices and caseworkers sometimes have considerable room for discretion (*e.g.*, by awarding support in special circumstances).

19. For understanding the changing role of SA in government redistribution, it would therefore be particularly important to gauge benefit-claiming behaviour and patterns. Unfortunately, while high-quality data exist for some of the more centralised programmes (*e.g.*, for the US Food Stamp programme, see USDA, 2010), comparable information on SA benefit recipiency patterns is currently not available across countries.

20. Since the mid-1980s, support for low-wage workers has been expanded substantially in the United States (Earned Income Tax Credit) and the United Kingdom (Family Credit, later Working Families Tax Credit, now Working Credit), especially for families with children (both FC and WFTC were only available to families with children). While many other OECD countries have introduced some form of in-work benefit in recent years, their sizes and their redistributive impact are currently small so they are not covered here (see Immervoll and Pearson, 2009).

21. The choice between the different assessment units is relevant for a number of – partially competing – policy objectives. Rosen (1977) has shown that an income tax cannot be progressive and also achieve both horizontal equity with respect to family income (same tax burden for families with the same total income) and marriage neutrality (same tax burden regardless of marital status). However, as long as income taxes are progressive, and ignoring employment gains and behavioural effects, assessing taxes based on family incomes is superior in terms of reducing the inequality of income as measured in this study.

22. A table with summaries of 2005 social security contribution schedules (and also of other benefits and taxes considered in this section) is available in OECD (2007a) and through *www.oecd.org/els/social/workincentives*.

23. For a formal decomposition, see OECD (2008b).

24. For instance, Immervoll (2005) calculates that at moderate rates of nominal earnings growth, the additional revenue generated by fiscal drag over a four-year period can sum to about one third of total annual receipts if the income-tax schedule is fairly progressive.

25. Very highly "progressive" changes that change the ranking of families can also increase inequality. For instance, if family A with initial income of 95 benefits from an additional transfer of 15, while family B with initial income of 100 receives no increase, then the income gap between the two is doubled.

26. In the case of single individuals in receipt of minimum income benefits the results for Germany over low earnings range between 1995 and 2005 at the bottom end of the earnings distribution are primarily driven by the reduction in housing supplements for recipients of social assistance/unemployment assistance recipients. In Germany, housing benefit rules are different for recipients of assistance benefits (housing supplement) and for other housing-benefit claimants (standard housing benefit). Information on the limits that authorities use in assessing reasonable housing costs for the purpose of calculating housing supplements is not available for 1995. The results are therefore based on the simplifying assumption that these ceilings are the same proportion of standard housing benefits in 2005 and in 1995.

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ANNEX 7.A1

Additional Tables and Figures

Table 7.A1.1. **Public social expenditure: trends and components**

	1985									1995									2005								
	Total	Cash support for the non-elderly							Early retirement	Total	Cash support for the non-elderly							Early retirement	Total	Cash support for the non-elderly							Early retirement
			Share of total spending									Share of total spending									Share of total spending						
	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Oth er social policy areas	Housing	Share of total sp ending	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Other social policy areas	Housing	Share of total spending	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Other social policy areas	Housing	Share of total spending
Australia	12.1	3.5	29.1	8.3	8.8	9.8	0.4	1.9	0.0	16.2	5.5	34.1	12.3	13.1	7.3	0.2	1.2	0.0	16.5	4.7	28.4	11.0	12.8	3.3	0.1	1.3	0.0
Austria	23.7	6.4	26.8	11.3	10.4	3.9	0.6	0.6	4.6	26.6	6.9	25.9	10.3	9.9	4.8	0.6	0.3	3.7	27.4	6.1	22.3	8.3	8.7	4.2	0.7	0.4	3.4
Belgium	26.0	9.6	36.8	13.8	9.5	12.5	1.0	0.0	0.0	26.3	8.0	30.5	8.2	7.9	12.3	2.1	0.0	0.0	26.5	7.3	27.4	7.3	6.3	12.6	1.1	0.3	0.0
Canada	17.0	3.8	22.5	6.0	3.5	10.9	0.0	2.0	0.0	18.9	4.0	21.1	6.2	4.2	6.8	1.8	2.1	0.0	17.0	3.0	17.5	5.4	5.2	3.7	1.5	1.7	0.0
Chile	12.3	1.6	13.1	6.1	6.5	0.5	0.0	0.0	20.7	11.4	1.2	10.3	6.4	3.8	0.1	0.0	0.0	14.0	11.2	1.0	8.8	5.2	3.5	0.1	0.0	0.0	11.0
Czech Republic	16.0	4.8	30.1	14.8	15.3	0.0	0.1	0.0	2.0	18.2	4.6	25.2	12.4	10.3	2.0	0.3	0.2	0.0	19.5	4.3	21.8	11.5	6.0	3.2	0.4	0.7	1.2
Denmark	23.2	9.2	39.6	12.3	3.8	18.3	3.3	2.0	2.5	28.9	10.9	37.7	9.6	6.4	15.3	3.8	2.6	3.0	27.2	8.9	32.7	11.2	5.7	10.4	2.8	2.6	1.4
Estonia	. .	. .	. .	. .	. .	. .	. .	. .	. .	14.1	3.3	23.5	9.9	10.8	0.9	1.7	0.1	0.0	13.2	3.3	25.0	12.4	10.9	0.8	0.8	0.1	7.8
Finland	22.6	6.6	29.3	15.7	6.4	5.7	0.7	0.8	0.0	30.9	11.8	38.4	14.0	8.7	12.7	1.5	1.5	1.5	26.1	7.1	27.2	11.2	6.1	7.7	1.1	1.1	2.7
France	26.0	7.7	29.4	8.9	9.0	8.9	0.0	2.6	0.2	28.5	6.0	21.1	5.8	5.4	5.7	1.0	3.2	0.0	29.0	5.9	20.4	5.8	4.8	5.9	1.2	2.8	0.0
Germany	22.5	4.3	19.2	7.3	5.6	4.2	1.6	0.6	3.4	26.8	5.2	19.4	6.8	5.1	5.8	0.7	1.0	2.5	27.2	5.4	20.0	5.4	4.9	6.9	0.5	2.3	2.7
Greece	16.0	2.4	15.2	11.4	1.9	1.9	0.0	0.0	0.0	17.3	2.3	13.1	4.6	4.4	2.3	0.0	1.8	12.9	21.0	2.3	10.8	4.1	3.4	1.9	0.0	1.4	12.4
Hungary	. .	. .	. .	. .	. .	. .	. .	. .	. .	21.3	5.9	27.5	11.2	9.4	3.8	0.2	2.8	1.4	22.8	5.6	24.6	11.3	8.3	2.5	0.2	2.3	3.9
Iceland	13.7	3.2	23.4	5.6	12.6	2.1	3.0	0.0	0.0	15.2	3.9	25.9	7.6	9.7	4.7	3.5	0.4	0.0	16.3	3.9	23.9	10.1	7.7	1.9	3.0	1.3	0.0
Ireland	21.3	8.4	39.3	12.2	6.4	15.7	0.8	4.3	2.7	15.7	5.6	35.9	9.5	10.2	11.5	1.7	3.0	3.3	15.8	5.3	33.3	9.5	14.0	5.7	2.2	2.0	4.1
Israel[1]	. .	. .	. .	. .	. .	. .	. .	. .	. .	16.7	4.7	27.9	8.7	10.2	2.9	6.0	0.1	0.0	16.5	4.3	26.4	12.8	6.1	2.2	5.3	0.0	0.0
Italy	20.8	4.1	19.5	9.4	3.8	6.2	0.0	0.0	0.1	19.9	2.9	14.3	8.8	2.0	3.5	0.0	0.0	0.0	25.0	2.8	11.0	6.7	2.3	2.0	0.0	0.1	0.0
Japan	11.2	1.4	12.6	4.9	2.1	3.7	2.0	0.0	0.0	14.3	1.5	10.3	4.0	1.5	3.6	1.2	0.0	0.0	18.6	1.5	8.2	3.1	1.9	1.8	1.4	0.0	0.0
Korea	2.8	0.4	14.8	9.5	0.0	0.0	5.3	0.0	0.0	3.2	0.4	12.3	9.1	0.1	0.0	3.0	0.0	0.0	6.4	1.0	15.4	6.2	0.2	3.1	5.9	0.0	0.0
Luxembourg	20.2	6.2	30.7	19.0	6.6	4.0	1.1	0.0	0.0	20.8	5.8	28.0	13.8	10.6	2.4	1.0	0.1	0.0	23.0	6.8	29.5	9.9	13.3	4.2	1.4	0.7	6.0
Mexico	1.7	0.0	2.2	1.3	0.0	0.0	1.0	0.0	0.0	4.3	0.5	10.9	1.2	0.0	0.0	9.8	0.0	1.0	6.8	1.0	15.3	0.8	4.9	0.0	9.5	0.0	0.8
Netherlands	25.3	11.8	46.6	21.7	6.8	13.1	3.7	1.2	0.4	23.8	9.6	40.4	20.3	4.1	11.9	2.5	1.7	0.0	20.7	6.4	30.7	15.9	3.1	7.6	2.5	1.6	0.2
New Zealand	17.7	4.8	27.0	8.7	12.9	3.5	1.4	0.6	0.0	18.7	6.5	34.8	14.2	10.5	6.1	0.8	3.2	0.0	18.1	5.8	31.9	15.5	10.4	2.4	0.7	2.9	0.0
Norway	17.8	5.8	32.7	18.7	7.4	2.7	3.1	0.8	0.0	23.3	7.6	32.4	15.6	9.5	4.6	1.9	0.8	0.1	21.7	6.2	28.5	16.6	7.3	2.5	1.4	0.7	0.7
Poland	14.9	4.8	32.3	21.0	11.3	0.0	0.0	0.0	0.0	22.6	8.1	35.7	23.8	4.7	7.2	0.0	0.0	0.3	21.3	4.3	20.4	12.7	4.0	2.5	1.2	0.0	9.8
Portugal	10.1	2.9	29.2	20.2	6.0	2.7	0.3	0.0	0.0	16.5	3.8	23.3	13.9	3.7	5.5	0.1	0.0	0.7	22.9	4.2	18.4	9.3	3.1	5.1	0.8	0.0	1.1
Slovak Republic	. .	. .	. .	. .	. .	. .	. .	. .	. .	18.8	5.5	29.4	10.1	12.5	2.3	4.4	0.0	0.0	16.3	3.6	22.0	7.9	9.4	1.7	2.9	0.0	0.0
Slovenia	. .	. .	. .	. .	. .	. .	. .	. .	. .	22.4	5.0	22.3	11.5	5.7	3.9	1.2	0.0	9.5	21.9	4.7	21.3	10.0	6.2	2.7	2.4	0.0	11.3
Spain	17.8	5.4	30.5	13.7	1.3	15.4	0.0	0.1	0.0	21.4	6.1	28.7	11.3	1.3	14.8	0.2	1.1	2.1	21.4	5.1	23.8	10.9	2.1	10.3	0.4	0.0	2.5
Sweden	29.5	8.0	27.0	14.0	6.0	2.9	1.9	2.2	0.3	32.0	9.6	29.9	11.3	6.1	7.1	1.9	3.4	0.4	29.1	7.2	24.9	12.6	5.2	4.1	1.2	1.8	0.4
Switzerland	14.7	4.0	27.2	14.3	6.6	1.7	4.6	0.0	0.0	17.5	4.5	25.9	10.9	5.9	6.1	2.8	0.3	0.0	20.2	5.0	24.8	12.2	5.1	4.6	2.7	0.2	0.0

Table 7.A1.1. **Public social expenditure: trends and components** *(cont.)*

	1985									1995								2005							
	Total	Cash support for the non-elderly							Early retirement	Total	Cash support for the non-elderly						Early retirement	Total	Cash support for the non-elderly						Early retirement
			Share of total spending									Share of total spending									Share of total spending						
	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Oth er social policy areas	Housing	Share of total sp ending	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Other social policy areas	Housing	Share of total spending	% of GDP	% of GDP	Total	Incapacity related	Family	Unemployment	Other social policy areas	Housing	Share of total spending
Turkey	3.1	0.9	29.2	2.7	16.9	9.1	0.5	0.0	0.0	5.6	1.0	17.7	2.1	4.4	9.0	2.2	0.0	0.0	9.9	0.2	2.0	1.4	0.1	0.5	0.0	0.0	0.0
United Kingdom	19.4	7.4	38.1	6.9	9.3	10.5	4.8	6.6	0.0	19.9	7.1	35.7	13.2	9.2	4.3	0.0	9.0	0.0	20.6	5.9	28.8	9.4	10.6	1.2	0.8	6.9	0.0
United States	13.1	2.1	16.0	7.6	2.8	3.0	2.5	0.0	0.0	15.4	2.4	15.5	7.6	2.0	2.2	3.6	0.0	0.0	15.8	2.2	13.9	8.0	0.8	1.7	3.4	0.0	0.0
Unweighted average	*17.0*	*4.9*	*26.5*	*11.3*	*6.9*	*6.0*	*1.5*	*0.9*	*1.3*	*19.3*	*5.3*	*25.3*	*10.2*	*6.0*	*6.2*	*1.7*	*1.3*	*1.6*	*20.1*	*4.5*	*21.4*	*8.9*	*5.6*	*4.2*	*1.7*	*1.1*	*2.1*

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

Source: OECD Social Expenditure Database (www.oecd.org/els/social/expenditure).

StatLink http://dx.doi.org/10.1787/888932538073

Figure 7.A1.1. **Gains and losses in net transfers, percentage of disposable income, 1995-2005: policy changes and fiscal-drag**[1]

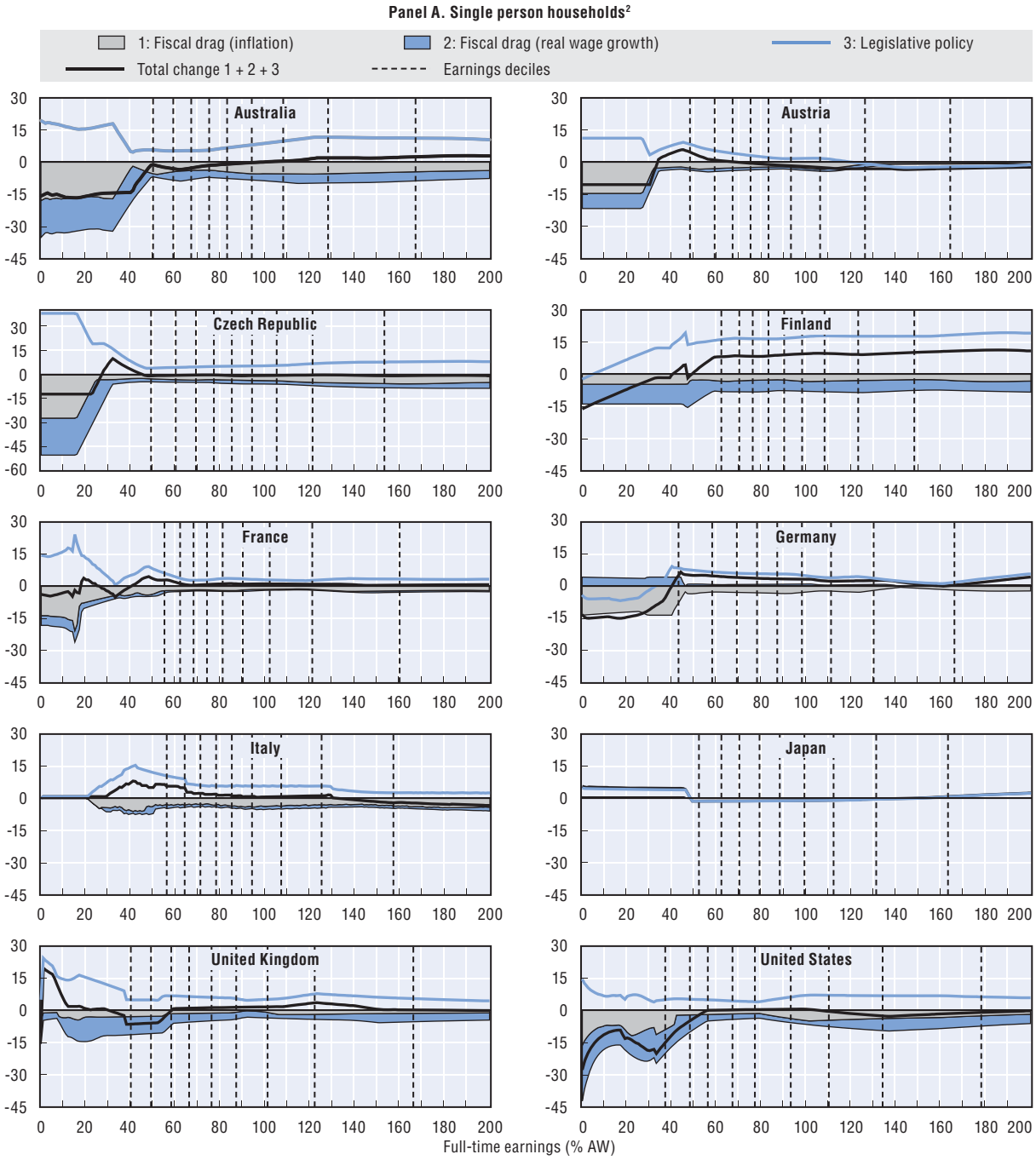


Figure 7.A1.1. **Gains and losses in net transfers, percentage of disposable income, 1995-2005: policy changes and fiscal-drag**[1] *(cont.)*

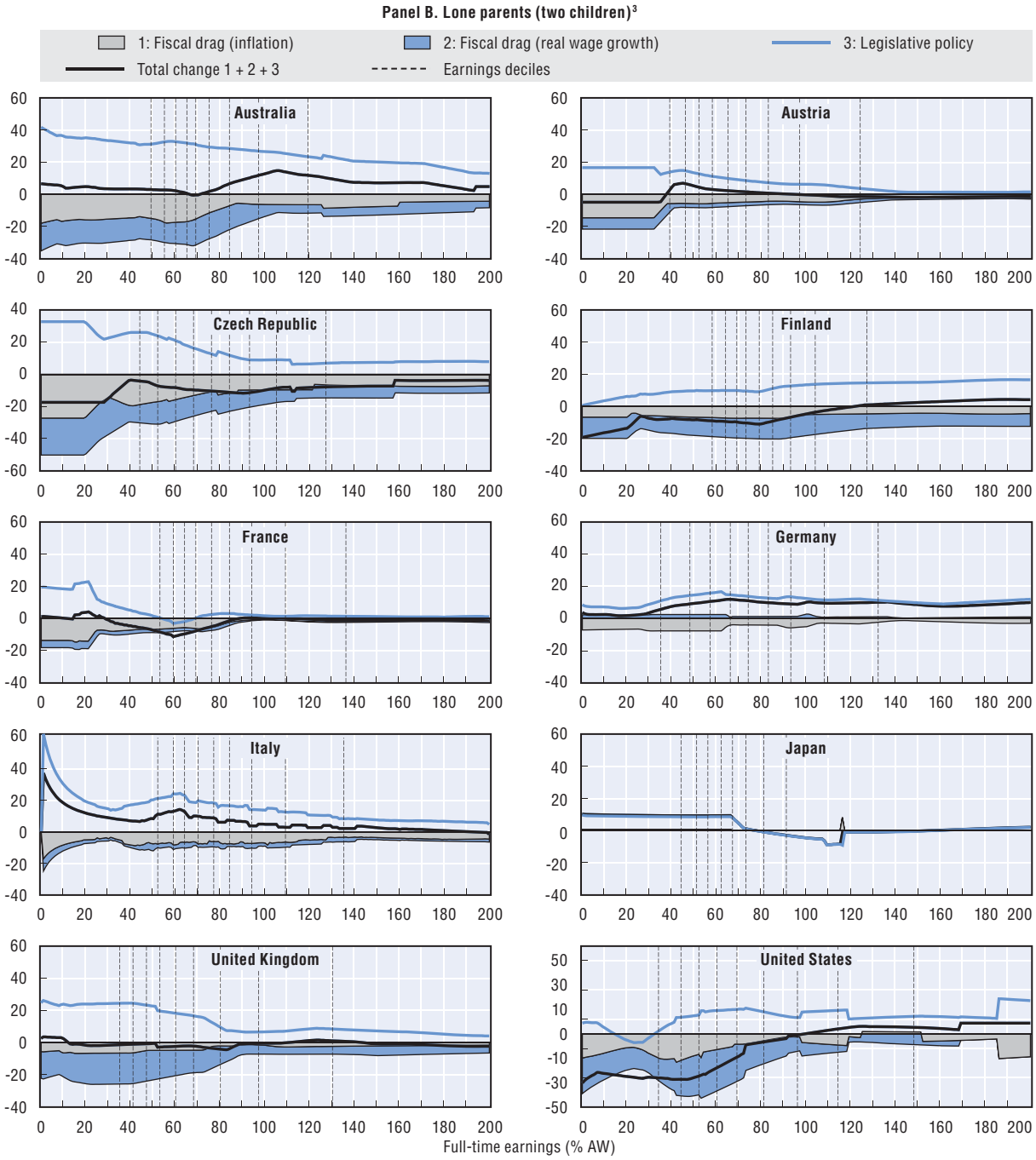
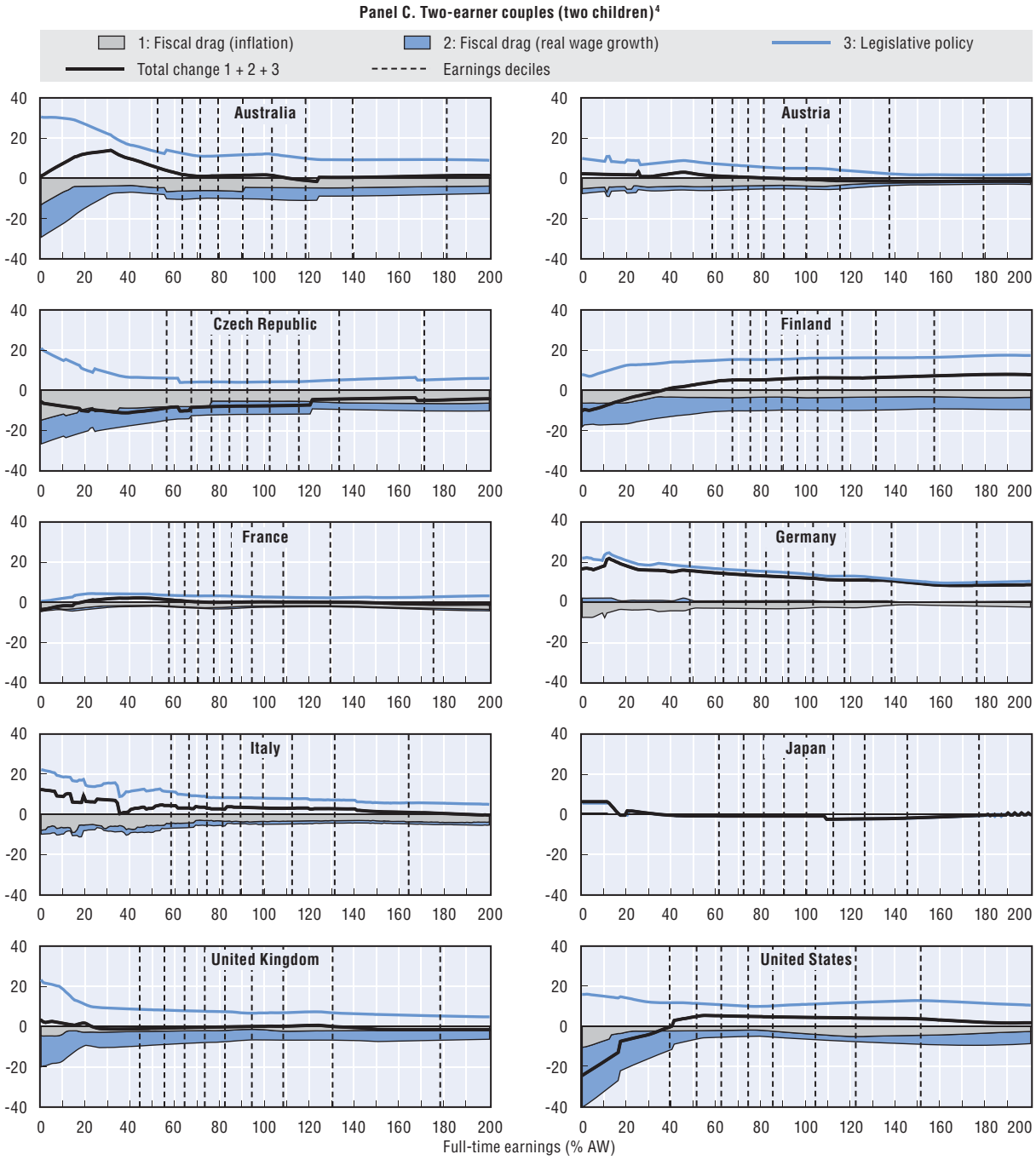


Figure 7.A1.1. **Gains and losses in net transfers, percentage of disposable income, 1995-2005: policy changes and fiscal-drag**[1] *(cont.)*



1. Income changes are measured relative to the income the household would have had if the 2005 tax-benefit system was a fully wage-indexed version of the 1995 system. Families are assumed not to receive unemployment benefits that depend on previous employment histories. Instead, and subject to relevant income limits, they may be entitled to means-tested assistance benefits.
2. Earnings deciles relate to the entire earnings distribution (men *and* women).
3. Earnings deciles relate to the earnings distribution of *women* only.
4. Earnings deciles relate to the earnings distribution of *men* only. The woman's earnings are held fixed at the median of the earnings distribution of *women* only.

Source: OECD tax-benefit models (*www.oecd.org/els/social/workincentives*).

StatLink http://dx.doi.org/10.1787/888932536933

Figure 7.A1.2. **Position in the income distribution under different policy scenarios**[1]

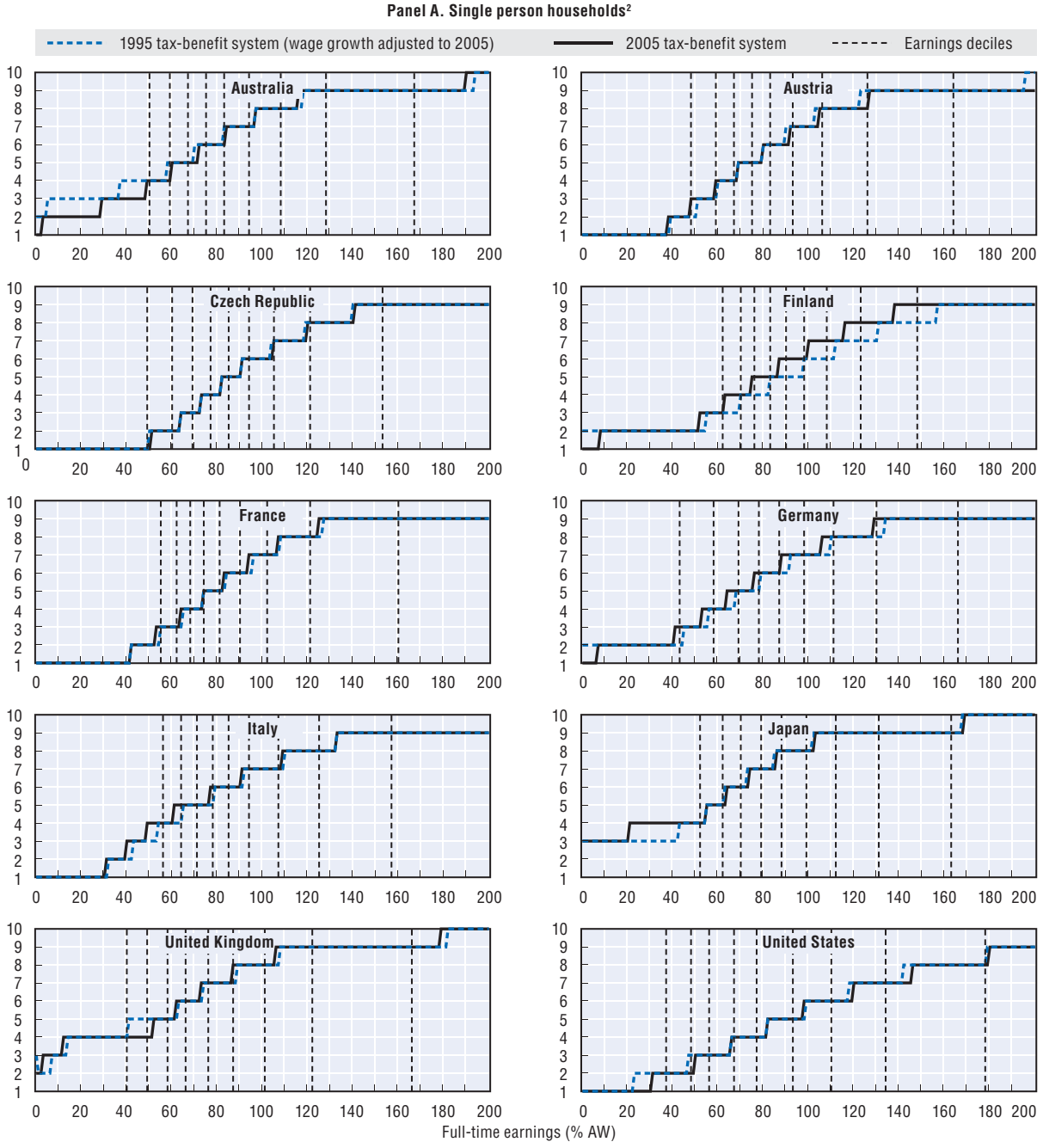


Figure 7.A1.2. **Position in the income distribution under different policy scenarios**[1] *(cont.)*

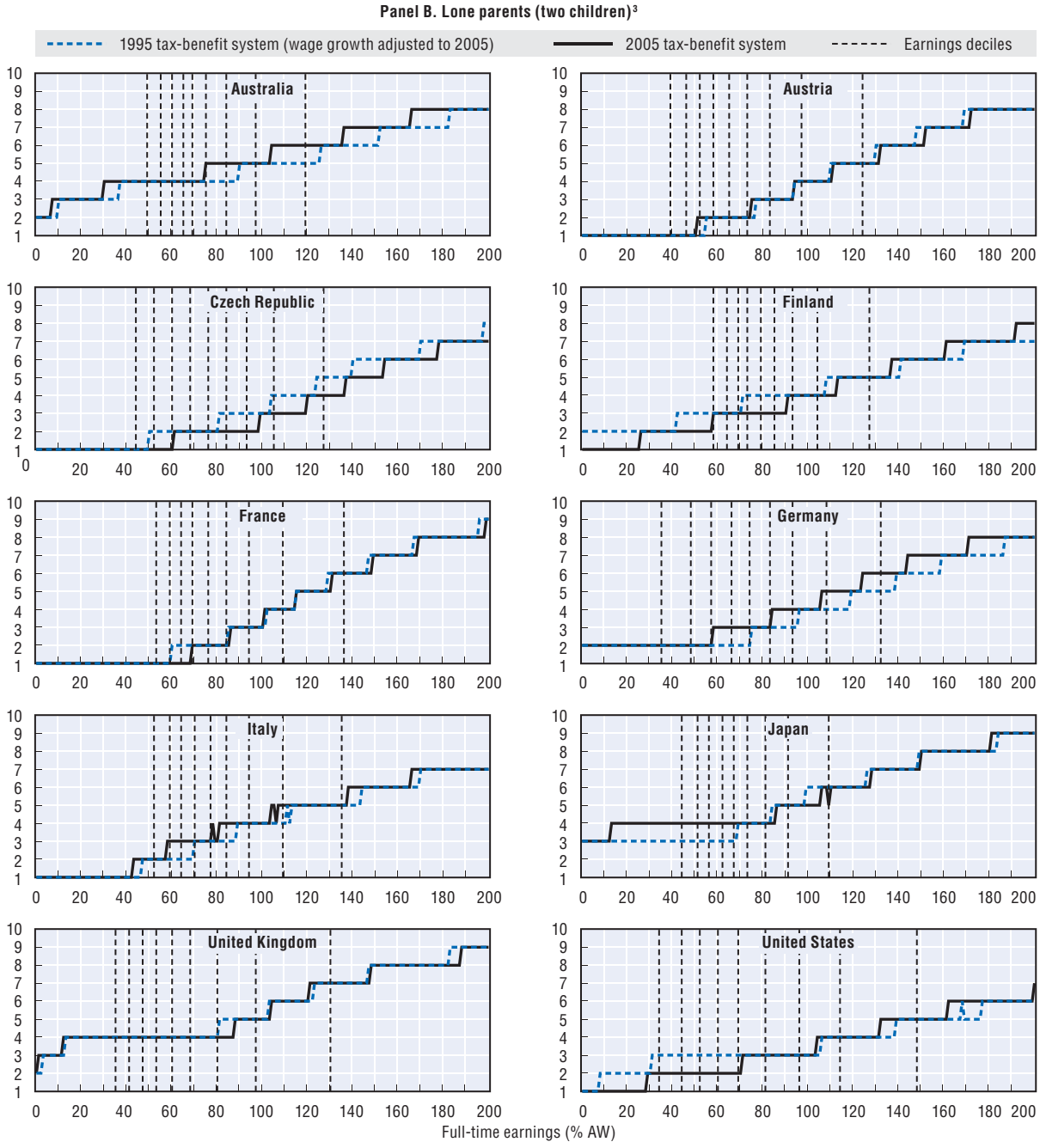
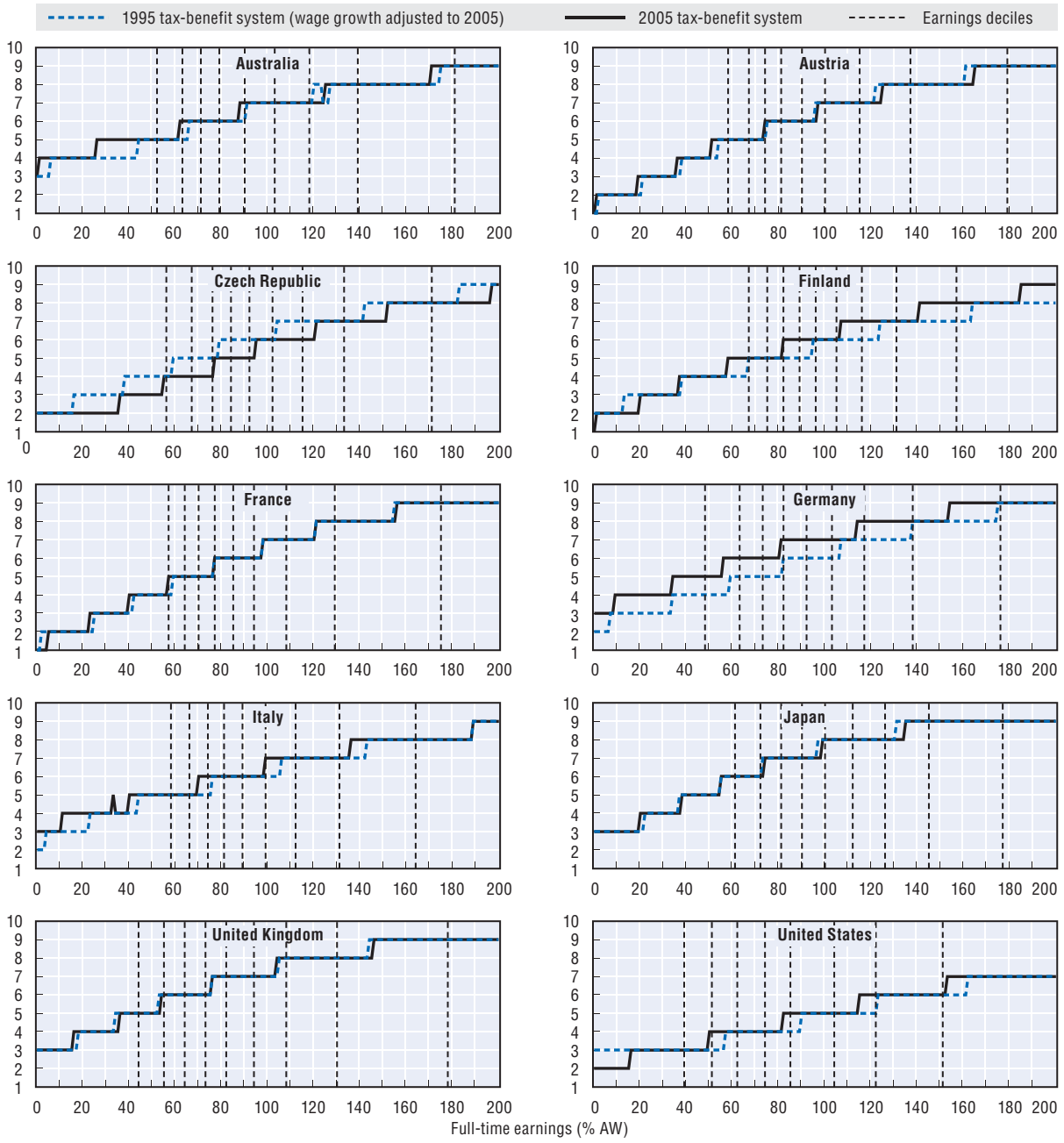


Figure 7.A1.2. **Position in the income distribution under different policy scenarios**[1] *(cont.)*

Panel C. Two-earner couples (two children)[4]



1. Deciles of household disposable income (equivalised using the square-root scale) are for the total population in the mid-2000s. The 1995 series shows where the household would be located in the income distribution if the 2005 tax-benefit system was a fully wage-indexed version of the 1995 system. Families are assumed not to receive unemployment benefits that depend on previous employment histories. Instead, and subject to relevant income limits, they may be entitled to means-tested assistance benefits.
2. Earnings deciles relate to the entire earnings distribution (men *and* women).
3. Earnings deciles relate to the earnings distribution of *women* only.
4. Earnings deciles relate to the earnings distribution of *men* only. The woman's earnings are held fixed at the median of the earnings distribution of *women* only.

Source: OECD tax-benefit models (*www.oecd.org/els/social/workincentives*).

StatLink http://dx.doi.org/10.1787/888932536952

PART III

Chapter 8

The Distributive Impact of Publicly Provided Services*

This chapter examines how the income distribution in countries changes when it includes the value of publicly provided services in disposable household income. The chapter considers five types of public services, which it begins by overviewing and defining. It provides estimates for the income-increasing effect for households of in-kind benefits from public services. The chapter goes on to look at the empirical results for the services' overall distributive effects. It then does the same for the five major services taken separately. Finally, before drawing its conclusions, the chapter explores whether and how the redistributive effect of services changed between the early and late 2000s.

* This chapter was prepared by Michael Förster, OECD Social Policy Division and Gerlinde Verbist, University of Antwerp. It draws on a longer document, available as Verbist, Förster and Vaalavuo (2011). This work benefitted from a joint co-funded project with the European Commission.

8.1. Introduction

So far, this report has looked at the reasons for growing inequality in personal and household cash income. But such focus excludes other factors which are important for households' well-being and consumption, particularly government activities that influence household well-being through in-kind services, such as health, education, and other services.[1] Publicly provided services also affect the *distribution* of resources across households, a question that has prompted a growing body of literature in recent years (Marical *et al.*, 2006 and 2008; OECD, 2008a; Sutherland and Tsakloglou, 2009; Tsakloglou *et al.*, 2009; and Vaalavuo, 2010).

Two main factors make it very important to include publicly provided services in policy interpretation.[2] First, some countries rely more on in-kind benefits than on cash transfers. When, for instance, country "A" heavily subsidises education and country "B" relies primarily on private schools funded by fees, the difference in policy approach does not show up in traditional income distribution statistics, even though the financial implications for households in the two countries differ considerably. Second, because taxes reduce households' income it is important to account for the benefits of the services funded through taxes.

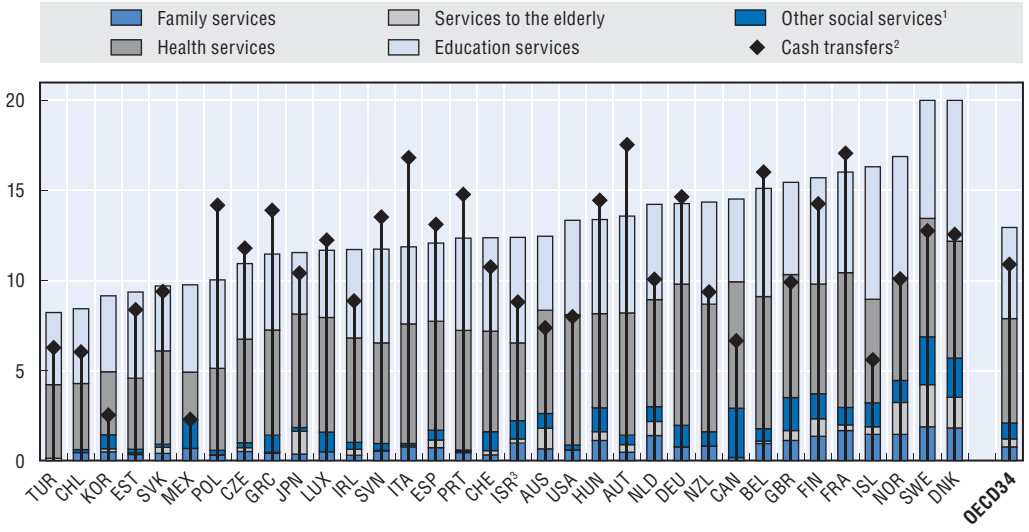
There are wide variations across countries in volumes of publicly-provided services – health, education and family services as well as social services for elderly, survivors, disabled persons, unemployed and those in respect of housing and social assistance (Figure 8.1).[3] In the most recent available year, such services account for about 13% of GDP on average across the 34 OECD countries, ranging from close to 8% in Turkey and Chile to 20% in Denmark and Sweden. On average, health care and education services account for 5 to 6 percentage points each. The remaining 2% are made up mainly of childcare and elderly care services, the latter being particularly important in the Nordic countries, Australia, and Japan where they exceed 1% of GDP.

On average, expenditure on publicly provided services in the OECD area is greater than on cash transfers, which amount to an average 11% share of GDP. Countries such as Mexico, Korea, Iceland and Canada spend much more on services than on cash transfers while many EU countries, especially Austria, Italy and Poland, have a far stronger focus on cash transfers.

How does inequality change once publicly provided services are taken into account? In a first analysis, OECD (2008a) found for a year around 2000 that education, health care and social housing significantly lowered income inequality in 17 OECD countries. But public services typically reduced inequality less than cash transfers were able to do. Another finding was that differences between countries in inequality were somewhat lower once public services were taken into account than when comparing cash incomes only.

This chapter goes beyond these preliminary analyses in several ways. First, it includes ten additional OECD countries and up-dates the estimates to the late 2000s, thus revealing changes in the distributive impact of services since the early 2000s. Second, in addition to

Figure 8.1. **Public expenditure for in-kind and cash transfers, in percentage of GDP, 2007**



Note: Countries are ranked in increasing order of total expenditure on all social services. Data on education services for Greece, Luxembourg and Turkey refer to 2005.

1. Other social services include services to survivors, disabled persons, unemployed, as well as those in respect of housing and social assistance (estimates of social housing are, however, not included).
2. Cash transfers to the elderly, survivors, disabled persons, families, unemployed, as well as those in respect of social assistance.
3. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

Source: OECD Social Expenditure Database, OECD Education Database.

StatLink http://dx.doi.org/10.1787/888932536971

education, health and social housing, it considers additional in-kind services, in particular childcare and care for the elderly, and examines the distributive impact of specific policies on specific groups of the population. Third, it analyses the effects on low-income households and poverty specifically. Finally, the chapter also reports some estimates based on alternative and recently developed methods to impute services into household income.

The empirical results in this study refer to 2007 for Australia and the European countries and to 2004 for Canada, Mexico and the United States. Also presented are some comparisons with results for previous years around 2000. The analyses were carried out on micro data from EU-SILC, LIS and HILDA, as well as other available OECD data. The key findings to emerge are:

- Spending on publicly provided services accounts for an average of about 13% of GDP across OECD countries - slightly more than expenditure on cash transfers.
- Most Nordic and English-speaking countries, Korea, and Mexico spend considerably more on "in-kind" transfers than on cash transfers.
- Broadening income to account for in-kind benefits increases households' economic resources by as much as 30% and 40% (in the Nordic countries, France, and Hungary), so impacting on inequality and poverty. In fact, publicly provided services benefits help reduce income inequality by between one-fifth and one-third depending on how inequality is measured.
- Although the prime objective of social services is not redistribution, but the provision of education, healthcare, and acceptable living standards for all, they have important direct

and indirect redistributive effects – particularly among population groups particularly exposed to poverty risks.

- Different services have different redistributive effects. Education and health contribute by far the most to reducing inequality. Social housing, childcare, and care for the elderly have less overall impact, though they make a great difference to beneficiaries.
- Although the redistributive impact of public services was stable on average throughout the 2000s, it grew stronger in countries where the share of services in household income increased more significantly.

8.2. Defining public social services

The focus here is on public *social* expenditures,[4] which are social spending flows controlled by the general government (*i.e.* different levels of government and social security funds), thus excluding pure public goods like national defence and justice.[5] Public education and health care expenditures are by far the two major categories of this kind of expenditures, as illustrated in Figure 8.1.

In all OECD countries except Estonia, Iceland, Israel,[6] Korea, Mexico and Turkey, public *health* care services form the most important category of public services to households (see Figure 8.1). On average, public spending on health care services amounts to around 6% of GDP, constituting the largest part of total health spending of around 9% of GDP (*OECD Health Data*). Total health spending is by far highest in the United States, with more than half accounted for by private health spending. Among European countries, France, Germany, Austria and Belgium are the countries with the highest levels of overall spending on health care (in excess of 10%), whereas Estonia, Poland and the Czech Republic spend the least (below 7%). Differences across countries are also substantial when only public expenditures are considered, ranging from 2.6% (Mexico) to almost 8% (Germany and France).

Public investment in *education* is also considerable. The highest education expenditures of more than 6% of GDP are found in the Nordic countries and in Belgium. Lower levels are found in the Slovak Republic, Japan and Luxembourg.[7] In all countries, primary to below-tertiary education make up by far the largest share of public education expenditures (OECD, 2010) while tertiary education accounts for little over 1% in most countries.

While cash housing benefits are generally included in household disposable income, the effect of *social housing* is not accounted for. This may provide a misleading picture of the impact of overall housing policies on inequality and poverty, as some countries use different policies to help households meet their housing expenses (Gardiner *et al.*, 1995; Whitehead and Scanlon, 2007). Unfortunately, no internationally comparative estimates of the relative level of social housing as a share of GDP are available. The scale of social housing and the conditions of access vary considerably across countries, with relatively high shares (almost 20% of total housing) in the Czech Republic, the United Kingdom, Denmark, France and the Netherlands (CECODHAS; Whitehead and Scanlon, 2007). In the Netherlands and Sweden, access to social housing is not explicitly linked to individuals' resources, while Belgium and Germany, for example, means-test access to social housing (Andrews *et al.*, 2011; Whitehead and Scanlon, 2007).

Services to families refer largely to early childhood education and care (ECEC). Access to affordable childcare is one of the key elements of strategies to reconcile work and family

life, promote equal opportunities and combat social exclusion (Matsaganis and Verbist, 2009; OECD, 2011a). Limited and unequal access to childcare services perpetuates social inequalities, whereas investment in early education can protect children from further social disadvantage and contribute to more equality. With 1% or more of GDP, these services are important in all Nordic countries, as well as in France, Hungary and the United Kingdom (see Figure 8.1). Pre-primary education is a more important category than childcare in most countries (*OECD Family Database*). In countries with high enrolment rates in formal care for under 3 year olds, public spending on childcare is accordingly high. This is notably the case in the Nordic countries, France and the United Kingdom.

Box 8.1. **Other services: public transport subsidies and public utilities**

Apart from the public social services discussed above, other policy domains of public services have a specific social aim, as they involve interpersonal redistribution and may affect the standard of living of households and individuals. Major examples are subsidies for public transportation, as well as support for energy costs and other utilities.

Subsidies on public transport basically have an economic efficiency rationale (Parry and Small, 2009). This means that economies of scale imply that the marginal cost of supplying mobility is less than the average cost. Moreover, by stimulating the use of public transport private car use and related negative externalities may be reduced. But apart from this efficiency rationale, social arguments play a role, namely that these subsidies intend to make mobility more affordable, especially to low-income groups.

Most research on the effect of public transport subsidies has focused on the economic efficiency reasons, thereby largely ignoring distributive aspects. The latter can be direct, by reducing the financial cost of mobility or indirect, by increasing the labour market opportunities of the beneficiaries. Most of existing research is on urban public transport. A number of studies investigate the pro-poorness of public transport subsidies. These studies deal in general with a confined geographical area, such as large cities. Recent research includes Asensio *et al.* (2003), Carruthers *et al.* (2005) and Estupiñán *et al.* (2007). Fearnley (2006) and Jones (2008) are among the rare studies that provide national estimates, both for the United Kingdom. They find that public transport subsidies appear to make the poorest better off, though there is variation by mode of transportation (*e.g.* bus travel subsidies turned out be more pro-poor than those for rail transport) as well as by geographical location.

Apart from public transport, also utilities like energy and communication services are provided by the government to the public at below-market prices, or entail provisions for low-income or other target groups. Nolan and Russel (2001) for instance investigate the distributive effect of the so-called “free schemes” (for electricity/gas, TV license, telephone rental, and free travel) and the Medical Card in Ireland and find that these free schemes are more beneficial to the lower income groups, hence reducing inequality and relative poverty (the latter by about one fifth). The possible redistributive impact of benefits that are associated specifically with energy provisions is likely to become an important policy issue in the future, given the importance of climate change and evolutions of energy prices. Many national programmes to subsidise energy use have broadly two aims: first, to ensure affordable energy (electricity, gas, fuel) for low-income and other vulnerable groups; second, and more recently, to stimulate the use of renewable energy sources.

Elderly care has emerged as a major social policy concern in OECD countries more recently, (Österle, 2002; OECD, 2005b and 2011b; Da Roit *et al.*, 2007; European Commission, 2006; Pavolini and Ranci, 2008). The proportion of GDP spent on long-term care is estimated to at least double and possibly triple by 2050 (OECD, 20011b; Comas-Herrera *et al.*, 2006). More than two-thirds of the people aged over 70 years are expected to need help in performing at least one or two daily routines (Eurofound, 2006; WHO, 2008). Public expenditures on services for the elderly vary between 0.1% of GDP in Estonia and 2.5% in the Netherlands (Huber *et al.*, 2009). The variation in expenditure levels is substantially greater than for other public spending, such as health care (see also Jensen, 2008). According to estimates by the European Union (European Commission, 2006), public spending on long-term care will increase by around 1 percentage point between 2004 and 2050 in most member states, and by over 2 percentage points in Finland, Sweden and Slovenia due to their more developed formal care system.

8.3. The overall distributive impact of publicly provided services on the distribution of income

Including publicly provided services in the analysis of inequality raises a number of conceptual and methodological issues since the value of government services needs to be incorporated into individual household incomes and "extended income" needs to be estimated. (see *e.g.* Marical *et al.*, 2006; Garfinkel *et al.*, 2006; OECD, 2008a; Aaberge *et al.*, 2010a; Paulus *et al.*, 2010; Verbist *et al.*, 2011) These questions relate to the value of public services and the allocation of this value to individuals and households but also to the degree to which needs should be factored in. They are discussed in Annex 8.A1, and need to be kept in mind when interpreting the results in this chapter. The methodological choices for allocating services in this chapter are summarised in Box 8.2.

Taking into account the value of the five types of in-kind benefits described above would increase household disposable cash income by as much as 29% on average in the OECD, or from USD 21 500 to USD 27 600, in purchasing power parities (Figure 8.2). For comparison, the share of cash transfers (including old-age and survivor's benefits) amounts to 23% of disposable income. There are only a few countries (Austria, Germany, Poland) where the value of cash transfers compared to disposable income is higher than that of services (in line with the results on the public spending shares in GDP depicted in Figure 8.1 above).

The income-increasing effect of services is highest in the Scandinavian countries and Hungary (35% or more) and lower in Australia and Greece (around 20%). Health care and education (excluding pre-primary education) are by far the most important components. In most countries, the imputed value of health care is higher than that of education; exceptions are Canada, Denmark, Ireland, Mexico, Norway and Poland, where education forms the largest category. The services for early childhood education and childcare increase household income on average by 2% but by more than 3% in Denmark, Finland, Hungary and Sweden. Long-term elderly care services raise incomes by 1% and are highest in the four Nordic countries and the Netherlands. In three countries, social housing increases household income by more than 1%, namely in the Czech Republic (1.2%), in Ireland (1.6%) and in the United Kingdom (2.5%) compared to an average of 0.4%.

Overall, in-kind benefits are quite evenly distributed over the different income groups, with only a very slight orientation towards lower incomes (Verbist *et al.*, 2011). This pattern

Box 8.2. **Allocating in-kind benefits to individuals and households**

How services affect the income distribution depends on their size, as well as to which extent they are targeted to lower-income groups and on the position of potential beneficiaries of these services in the distribution before services are factored in. Methodological choices of how to "individualise" services matter a lot.

In general, two approaches to calculate such estimates can be distinguished: the "actual consumption approach" which allocates the value of public services to the individuals that are actually using the service; and the "insurance value approach" which allocates an equal amount of a service to everybody sharing the same characteristics such as age, gender etc. This is based on the assumption that all individuals with similar characteristics benefit from a service knowing that, in case if need, they would have access to it. In this chapter, estimates for three of the five services analysed are based on the actual consumption approach: education, early childhood education and care (ECEC) and social housing, while the remaining two (health and elderly care) are based on the insurance value approach.

Household income surveys include only limited information on the extent to which individuals and households benefit from services and the individual use of services therefore has to be partially estimated. Such estimates can lead to under- or overestimation of redistributive effects. For instance, in the case of education services, no distinction can be made for enrolment in publicly or privately funded education institutions; neither can special programmes for pupils from low-income families be taken into account (*e.g.* free school meals). For ECEC, reduction in user fees which are often tied to parents' incomes cannot be taken into account; furthermore, possible differences in subsidies between family day care and centre-based day care are not available from the data. For health and elderly care, only differences in age and gender are accounted for the allocation of these services to individuals and elements in these programmes which are targeted toward poorer income groups are not accounted for in this type of imputation. Therefore, the analyses presented below in Section 8.3 can only provide a rough estimate and guideline for the redistributive impact of publicly provided services on the distribution of household incomes.

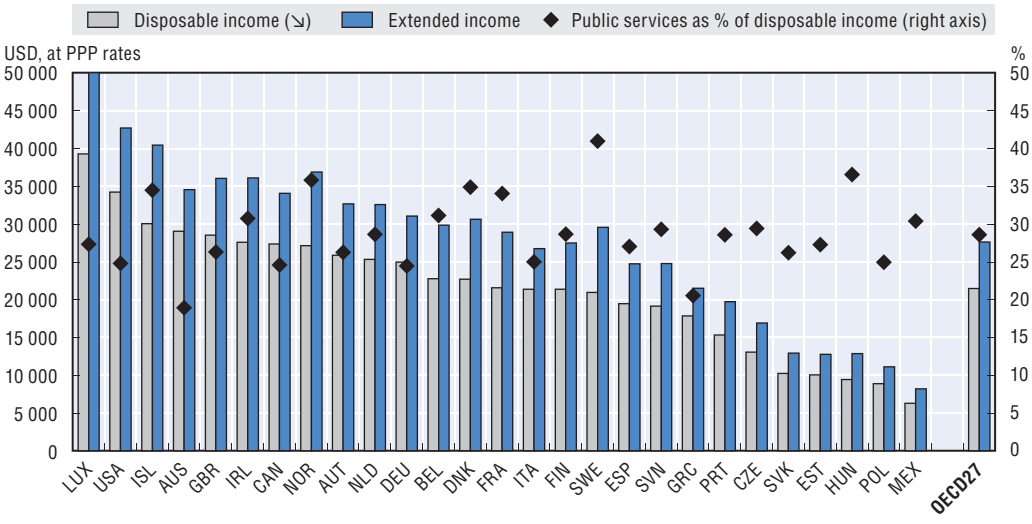
is strikingly similar across countries. Only in the Nordic countries, the Netherlands and the United Kingdom, in-kind benefits are somewhat more targeted to the lower income groups.

Benefits of equal size will, *ceteris paribus*, translate into larger proportional increases in the incomes of poorer households. A first step is therefore to analyse the increase in household income resulting from imputation of services by income groups. Income quintiles are built on the basis of equivalent disposable household income, *before* accounting for in-kind services, with Q1 representing the poorest 20% and Q5 the richest 20%.

All types of public services considered here account for a much higher share of disposable income among lower-income than among higher-income households: 76% of disposable income for the poorest 20% and only 14% for the top 20% (Table 8.1). In relative terms, services from social housing and elderly care are the most targeted to low-income households.

Given the large shares of in-kind services in disposable income, especially for poorer groups, it is interesting to see how the income distribution changes once services are taken into account. Before considering services, income inequality as measured by the Gini

Figure 8.2. **Income-increasing effect of in-kind benefits from public services, 2007**



Note: Income data for each country are adjusted for inflation (when they refer to a year different from 2007) and then converted into USD based on PPP rates for actual consumption in 2007. This exchange rate expresses the costs of a standard basket of consumer goods and services purchased on the market or provided for free (or at subsidised rates) by the public sector in different countries.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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Table 8.1. **Income-increasing effect of in-kind benefits from public services by quintile, OECD27 average, 2007**

Percentage

	Q1	Q2	Q3	Q4	Q5	Total
Education	30.6	18.5	14.2	10.4	5.6	11.8
Health care	34.9	22.2	15.8	11.8	7.2	13.9
Social housing	1.8	0.7	0.4	0.2	0.1	0.4
ECEC	4.5	3.0	2.4	1.5	0.8	1.8
Elderly care	4.0	1.9	0.7	0.4	0.2	0.9
Total	**75.8**	**46.4**	**33.5**	**24.3**	**13.7**	**28.8**

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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coefficient is high (around 0.37) in Portugal and the United States and highest in Mexico (0.47), and comparatively low (0.25 and below) in Slovenia, Sweden, Norway and Denmark (see Table 8.2, column 2). But when services are included the Gini coefficient falls by roughly around one fifth, on average, from 0.30 to 0.24. Reduction rates range from 16% to 24% and are thus more uniform across countries than inequality reduction achieved through cash transfers and taxes (see Chapter 7).

Table 8.2 also shows estimates for additional inequality indicators, the interquintile share ratio S80/S20 and the P90/P10 interdecile ratio. The effect of including public services in the income concept is more pronounced with these two measures compared to the Gini coefficient: the P90/P10 ratio declines by one fourth and the S80/S20 ratio drops even by almost one third.

Table 8.2. **Summary inequality indicators for cash income and extended income (imputing total public services), 2007**

	Gini			S80/S20			P90/P10		
	Cash	Extended income	% Δ	Cash	Extended income	% Δ	Cash	Extended income	% Δ
Australia	0.312	0.260	–17%	5.35	3.81	–29%	4.45	3.21	–28%
Austria	0.267	0.219	–18%	3.92	3.04	–23%	3.26	2.57	–21%
Belgium	0.264	0.209	–21%	3.97	2.88	–27%	3.37	2.49	–26%
Canada	0.319	0.259	–19%	5.40	3.78	–30%	4.38	3.07	–30%
Czech Republic	0.261	0.207	–21%	3.66	2.80	–24%	3.07	2.39	–22%
Denmark	0.250	0.194	–22%	3.68	2.69	–27%	2.88	2.21	–23%
Estonia	0.338	0.280	–17%	5.82	4.21	–28%	4.51	3.55	–21%
Finland	0.266	0.218	–18%	3.83	3.00	–22%	3.13	2.53	–19%
France	0.264	0.209	–21%	3.83	2.84	–26%	3.19	2.47	–22%
Germany	0.300	0.249	–17%	4.88	3.57	–27%	3.80	2.89	–24%
Greece	0.342	0.288	–16%	6.05	4.22	–30%	4.77	3.45	–28%
Hungary	0.262	0.201	–23%	3.79	2.76	–27%	3.14	2.35	–25%
Iceland	0.291	0.227	–22%	4.21	3.08	–27%	3.23	2.43	–25%
Ireland	0.317	0.242	–24%	5.00	3.36	–33%	4.00	2.83	–29%
Italy	0.320	0.262	–18%	5.53	3.77	–32%	4.32	3.10	–28%
Luxembourg	0.275	0.220	–20%	4.01	3.02	–25%	3.38	2.61	–23%
Mexico	0.475	0.375	–21%	12.20	6.21	–49%	8.54	4.60	–46%
Netherlands	0.272	0.220	–19%	4.00	3.00	–25%	3.04	2.44	–20%
Norway	0.242	0.193	–20%	3.74	2.79	–25%	3.02	2.38	–21%
Poland	0.317	0.259	–18%	5.17	3.71	–28%	4.25	3.12	–26%
Portugal	0.370	0.291	–21%	6.61	4.20	–36%	5.29	3.46	–35%
Slovak Republic	0.251	0.204	–19%	3.59	2.79	–22%	2.99	2.41	–19%
Slovenia	0.236	0.196	–17%	3.40	2.75	–19%	2.96	2.47	–17%
Spain	0.310	0.248	–20%	5.33	3.54	–34%	4.38	3.04	–31%
Sweden	0.237	0.181	–23%	3.46	2.59	–25%	2.83	2.26	–20%
United Kingdom	0.330	0.252	–24%	5.59	3.53	–37%	4.38	2.84	–35%
United States	0.372	0.303	–18%	7.78	4.76	–39%	5.85	3.72	–36%
OECD27	**0.298**	**0.239**	**–20%**	**4.95**	**3.43**	**–29%**	**3.94**	**2.85**	**–26%**

Note: The Gini coefficient ranges from zero (when everybody has identical incomes) to 1 (when all income goes to only one person). S80/S20 is the interquintile share ratio, *i.e.* the sum of income going to the top 20% divided by the share going to the bottom 20%. P90/P10 is the decile ratio, *i.e.* the ratio of the income of the person at the 9th decile to the person at the 1st decile.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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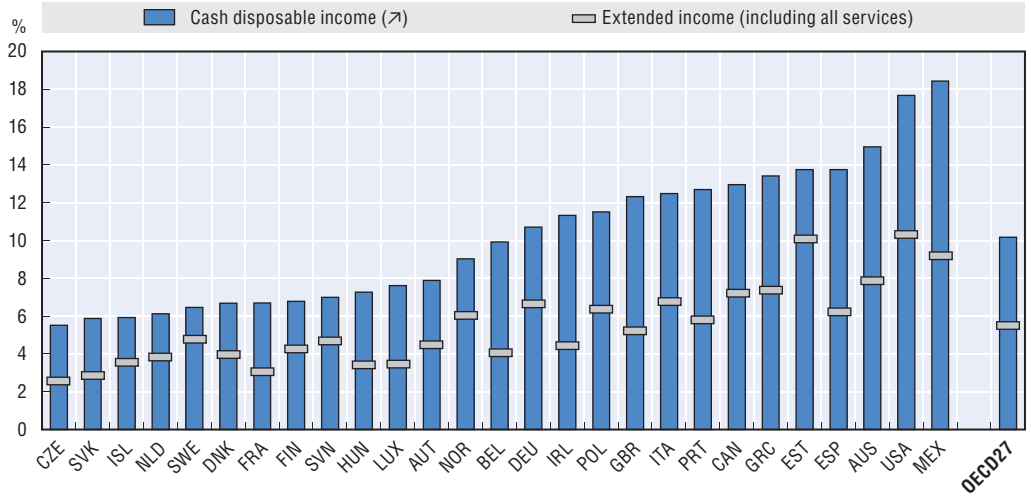
There is no systematic relation between initial levels of cash income inequality and the degree of inequality reduction through in-kind benefits, although some high-inequality countries strongly reduce inequality through in-kind benefits. The United Kingdom and, according to the additional inequality measures, the United States, Mexico and Portugal achieve higher reduction rates while the low-inequality country Slovenia records lower ones. The variation in inequality levels across OECD countries (as measured by the coefficient of variation) is not reduced when taking account of publicly provided services – but only when estimates are based on the Gini coefficient. Using alternative more tail-sensitive inequality measures, however, reduces cross-country dispersion. These results are in line with Garfinkel *et al.* (2006) who find for ten OECD countries in the

late 1990s, that cross-country differences in inequality at the bottom of the income distribution are reduced following inclusion of in-kind benefits.

How do public services affect relative poverty? Figure 8.3 compares poverty rates for cash disposable income with poverty rates for extended income (*i.e.* including the monetary value of public services).[8] A "floating" poverty threshold is used where the poverty line is set at 50% of median equivalent cash income and at 50% of median equivalent extended income in order to illustrate the impact (see Verbist *et al.*, 2011). Before accounting for services, overall poverty rates are high in Mexico and the United States, and low in most Nordic countries, the Netherlands and the Czech and Slovak Republics. Overall, the poverty rate decreases from 10% to 5%. In Belgium, Ireland and the United Kingdom, poverty is reduced by close to 60%, and by about 27% in Estonia and Sweden. Poverty levels for disposable income vary between 6% and 18% and levels for extended income vary between 3% and 10%.

Figure 8.3. **Income poverty rates before and after including total of public services (floating poverty line), 2007**



Note: Poverty thresholds set at 50% of median cash disposable income and 50% of median extended income, respectively.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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8.4. The distributive impact of particular public services

Inequality and poverty reduction are of course not the prime aims of education, health and other in-kind services. But it is important to look at the potential impact of in-kind services on the income distribution starting from the current level and distribution of these benefits and the current composition of the poor population. For instance, an increase in spending on compulsory education will reduce overall poverty more in countries where poverty is high among families with young children and where participation in compulsory education is high. The sections below therefore consider the impact of the different services separately.

Education

Imputing the value of public education services based on actual use of these services increases household income by some 12% on average. This increase is larger for Mexico, Denmark, Norway and Canada – 15% or more, whereas in Australia, Germany, Greece, Italy and the United Kingdom it is below 10%. Table 8.3 shows that this increase in disposable income is far more important for lower than for higher incomes, and this is the case in all countries. On average, imputing all education expenditures would increase disposable income of the poorest 20% by almost a third. In Mexico and the United States, this increase exceeds 40%. The increase for the income middle classes is some 14%, while the increase in the top quintile is much more limited, with an average of about 6%.

Table 8.3. **Income-increasing effect of benefits from public education services by quintile, OECD27 average, 2007**

Percentage

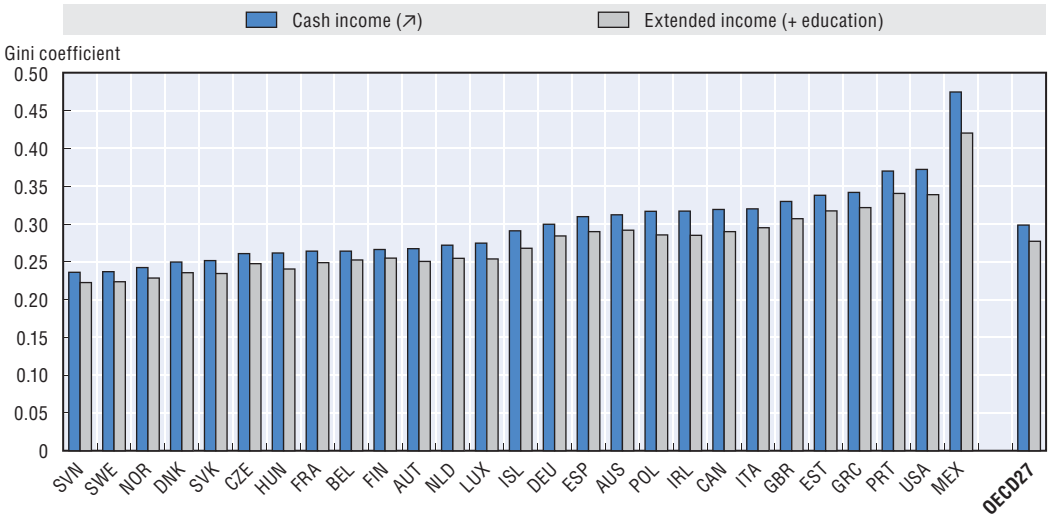
	Q1	Q2	Q3	Q4	Q5	**Total**
Australia	19	14	10	6	2	**7**
Austria	26	17	13	9	5	**11**
Belgium	23	17	14	11	7	**12**
Canada	45	23	16	13	7	**15**
Czech Republic	23	14	13	10	6	**11**
Denmark	35	20	18	15	7	**15**
Estonia	29	20	16	12	6	**12**
Finland	22	20	14	11	7	**12**
France	30	18	14	11	6	**13**
Germany	21	13	11	8	4	**9**
Greece	27	12	9	7	3	**8**
Hungary	37	22	16	13	7	**15**
Iceland	28	20	18	12	7	**14**
Ireland	36	26	19	11	7	**15**
Italy	34	17	11	8	4	**10**
Luxembourg	28	18	12	9	4	**11**
Mexico	74	37	24	16	7	**17**
Netherlands	28	17	14	10	5	**11**
Norway	35	18	17	14	7	**15**
Poland	40	21	14	9	5	**12**
Portugal	35	20	15	9	5	**11**
Slovak Republic	21	15	13	10	5	**10**
Slovenia	23	18	16	12	7	**13**
Spain	31	16	11	8	6	**10**
Sweden	28	19	17	12	6	**13**
United Kingdom	25	15	11	7	3	**8**
United States	45	22	14	10	4	**11**
OECD27	**31**	**19**	**14**	**11**	**6**	**12**

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

StatLink http://dx.doi.org/10.1787/888932538130

Given this pattern, inequality falls when public education services are considered in the income concept, on average from 0.30 to 0.28 (or by 7%), with a relatively low decline in Belgium and Finland and more substantial reductions in Mexico, Ireland and Poland (Figure 8.4).

Figure 8.4. **Gini coefficient before and after inclusion of public education services**



Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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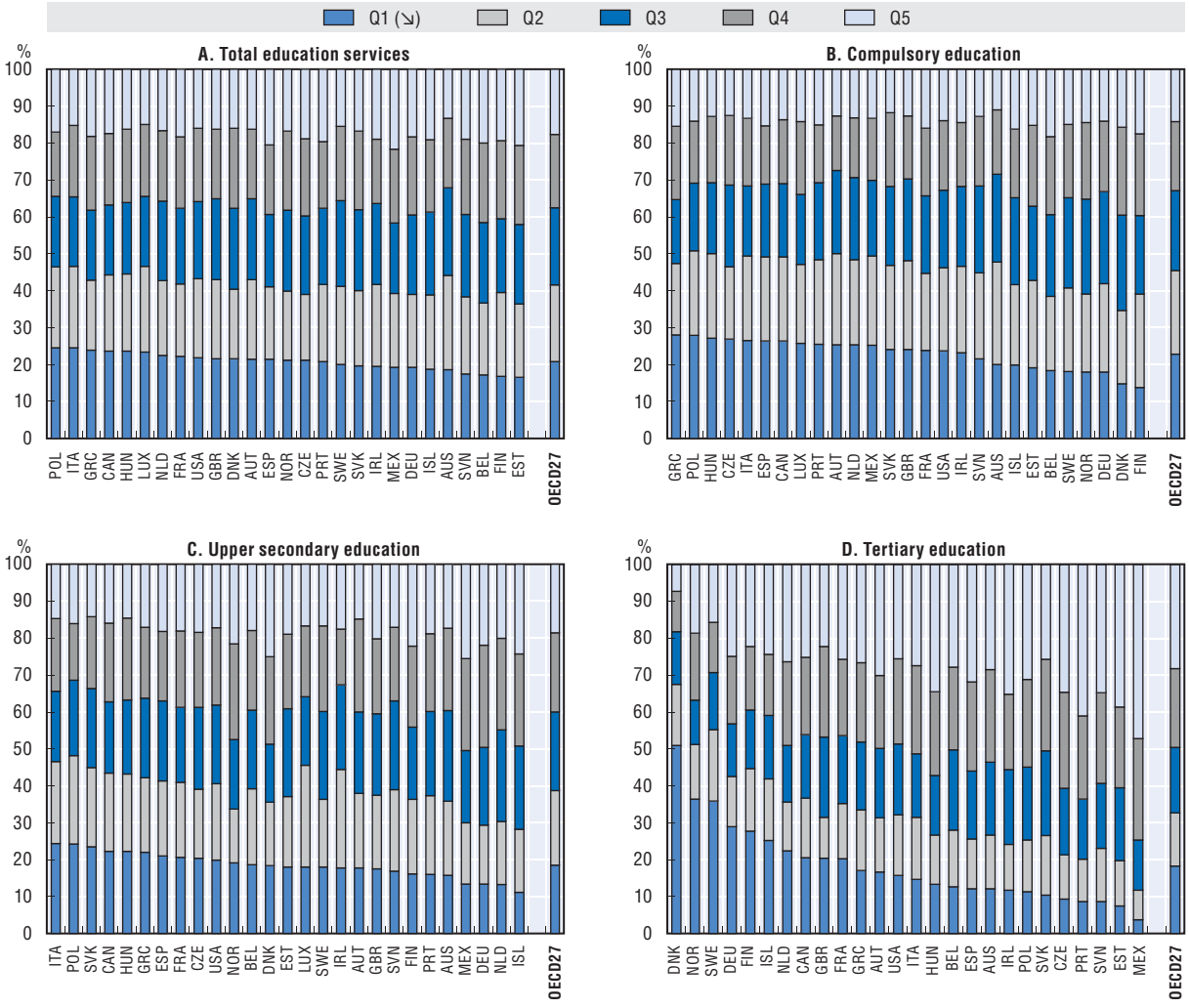
Total education expenditures tend to be allocated slightly more to lower incomes than to the top groups (Figure 8.5, Panel A): the first quintile receives on average 21% of all education expenditures, compared to 18% in the fifth quintile. In Slovenia, Belgium, Finland, and Estonia they are somewhat less oriented towards the bottom quintile (with shares of 17%), whereas in countries like Poland, Italy, Greece, Canada and Hungary a higher share of total education expenditures is going to the bottom quintile (24-25%). The redistributive impact is, however, likely to be different for different levels of education. Compulsory education can be expected to be more redistributive than higher education, since the former is supposed to benefit equally all school-age children, while tertiary education service has been shown to often be regressive (*e.g.* OECD, 2008a).

Compulsory education is indeed slightly more oriented towards low income groups: on average, the bottom quintile receives 23% of expenditures of this education category, compared to only 14% for the top quintile (Figure 8.5, Panel B). This pattern is strongest in Greece and Poland (with a Q1 share of 28%). In the Nordic countries and in Germany the distribution of compulsory education is more middle-class biased, with significantly less than 20% of expenditures going to both the bottom and the top quintile.

The distribution of upper-secondary education tends to be similar to that of compulsory education (Figure 8.5, Panel C). In general, these expenditures are distributed rather equally. Countries in which less than 15% of expenditures go to the bottom quintile are Iceland, Germany, Mexico and the Netherlands (11-13%).

The pattern of the allocation of tertiary education services is quite different (Figure 8.5, Panel D). The OECD-average indicates a regressive pattern, with close to 30% of tertiary education expenditures going to the top quintile of the income distribution. This, however, hides considerable cross-country variation. The regressive pattern is most pronounced in Estonia and Mexico where the poorest 20% receive less than 8% of tertiary education spending while, in the Nordic countries and Germany, this group accounts for 25 to 51% of tertiary education services. In these countries, many students live away from

Figure 8.5. **Distribution of education services over income quintiles, 2007**



Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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their parents and are thus classified as a separate household and, due to low incomes, are often concentrated in the poorest 20% of the population.

Health care services

Previous research found that health care significantly reduces income inequality (see Marical *et al.*, 2006 and 2008 for an overview). A main reason is that health care spending is concentrated on the elderly who, in general, have below-average cash incomes (Gardiner *et al.*, 1995). Smeeding *et al.* (2008) report results for seven OECD countries that confirm these findings.

Imputing the value of health care services increases disposable income by some 14% on average, ranging from 11% in Poland, Australia and the Netherlands to 17% in Belgium, France and Sweden. This increase is much more pronounced for the lower income groups (with 35% on average for the OECD) and decreases as incomes grow (Table 8.4). This pattern

is especially strong in the United Kingdom, the United States, Mexico, Portugal and Spain where health care increases disposable income in the bottom quintile by over 40%, but only by 5 to 7% for the top quintile.

Table 8.4. **Income-increasing effect of benefits from public health care services by quintile, 2007**

Percentage

	Q1	Q2	Q3	Q4	Q5	Total
Australia	37	17	12	9	5	**11**
Austria	30	20	15	12	8	**14**
Belgium	41	26	17	13	9	**17**
Canada	30	20	14	11	6	**12**
Czech Republic	31	27	18	14	8	**16**
Denmark	30	19	13	11	7	**13**
Estonia	35	25	16	11	6	**13**
Finland	27	18	13	9	6	**12**
France	37	26	20	15	10	**18**
Germany	34	22	16	12	7	**14**
Greece	35	20	14	10	5	**12**
Hungary	29	23	19	15	9	**16**
Iceland	34	23	18	14	9	**16**
Ireland	37	23	17	12	7	**14**
Italy	34	20	15	10	6	**12**
Luxembourg	28	23	17	12	8	**14**
Mexico	61	28	19	12	5	**13**
Netherlands	24	17	12	10	6	**11**
Norway	31	22	15	12	8	**14**
Poland	25	17	13	10	5	**11**
Portugal	50	28	20	14	7	**16**
Slovak Republic	30	22	16	13	8	**15**
Slovenia	28	18	15	12	8	**14**
Spain	41	23	15	11	7	**14**
Sweden	35	25	18	14	10	**17**
United Kingdom	44	24	15	10	5	**13**
United States	46	23	15	11	6	**13**
OECD27	**35**	**22**	**16**	**12**	**7**	**14**

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

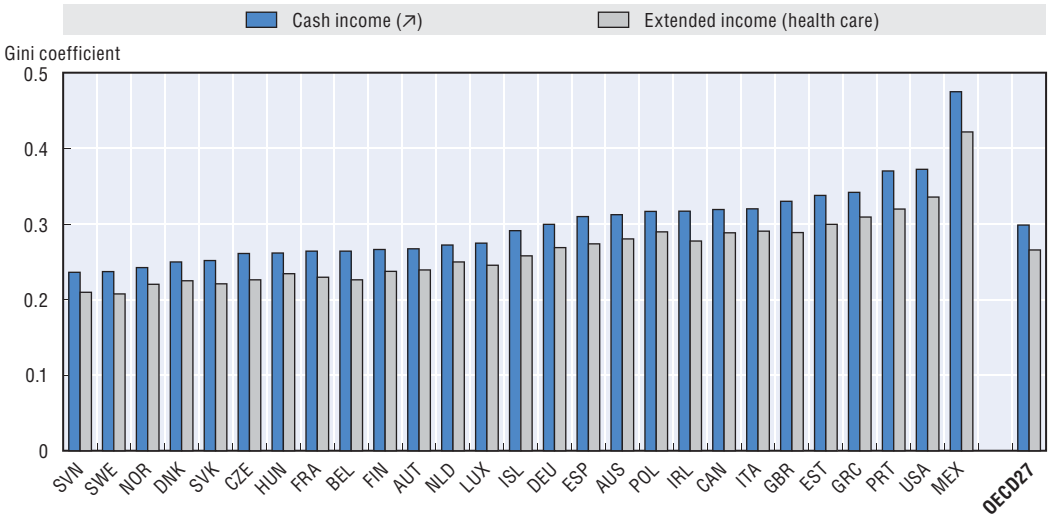
StatLink http://dx.doi.org/10.1787/888932538149

The Gini coefficient of income inequality drops considerably when public health care services are included in the income concept. On average, it falls from 0.30 to 0.27 (or by 11%), with relatively low decreases in Norway, the Netherlands, Poland and Italy, and more important reductions in Belgium and Portugal (Figure 8.6). The inequality-reducing effect of health care services is thus higher than that of education services, except in Canada, Italy, Mexico, Poland and the United States where health and education reduce inequality by approximately the same degree.

Social housing

Previous studies (*e.g.* Gardiner *et al.*, 2005; Saunders and Siminski, 2005) suggest that social housing is probably the category of government services that benefit the poor the most. However, its overall redistributive impact will be smaller than for health care and education because of the much lower amounts of spending. Social housing represents on

Figure 8.6. **Gini coefficient before and after inclusion of public health care services**



Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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average merely half a per cent of disposable income (Table 8.5).[9] Nevertheless it is an important service for the beneficiaries. If the analysis is confined to reduced rent tenants, social housing would increase their disposable income by 9% on average, with much higher shares in the United Kingdom and Ireland (more than 14%). But elsewhere too (Belgium, Spain, Hungary and Italy), social housing represents more than 10% of disposable income for social renters. In general and by design, the income-increasing effect of social housing is largely confined to the lower-income quintiles – notable exceptions are the Czech Republic, Finland, Iceland, Norway and Sweden.

In countries where social housing plays an important role (more than 10% of household income overall), it is highly targeted to low-income households. For instance, in the United Kingdom 36% of individuals in the bottom quintile live in social housing, compared to less than 2% of the top quintile. But in other countries, 5-10 % of persons in the top quintile live in social housing (Verbist *et al*., 2011). It may be surprising that social housing is still present in the top quintile, even when eligibility criteria include income ceilings. But often income ceilings apply at the moment of entry and social renters may meanwhile improve their income position over time without being obliged to move to other housing.

Figure 8.7 confirms that targeting of social housing differs across countries. On average, the share of overall social housing expenditures going to the bottom quintile is 37%, while that going to the top quintile is around 9%. However, the share going to the bottom quintile exceeds 50% in Belgium, the Slovak Republic and Ireland, and is only around 20% in Austria, the Czech Republic and Greece.

The effect of social housing spending on overall inequality is rather limited. Most summary inequality indicators are reduced by less than one percent. Notable exceptions are Ireland and the United Kingdom, with reductions of around 4%, which is closely linked to the size of the imputed benefit in these countries.

Table 8.5. **Income-increasing effect of social housing, all individuals and reduced rent tenants by quintile, 2007**

Percentage

	All individuals	Reduced rent tenants					
		Q1	Q2	Q3	Q4	Q5	**Total**
Austria	0.3	10	7	5	5	3	**5**
Belgium	0.6	20	10	6	5	2	**12**
Czech Republic	1.2	10	9	8	7	6	**8**
Estonia	0.1	17	15	6	10	3	**10**
Finland	0.6	7	5	4	4	3	**5**
France	0.9	13	9	6	5	1	**7**
Germany	0.2	10	6	4	3	3	**5**
Greece	0.0	13	8	6	5	1	**4**
Hungary	0.4	24	13	16	11	7	**14**
Iceland	0.3	8	7	8	4	5	**7**
Ireland	1.6	38	21	14	11	6	**22**
Italy	0.3	29	17	12	7	4	**14**
Luxembourg	0.1	12	8	6	3	1	**5**
Norway	0.2	9	8	7	6	6	**8**
Poland	0.1	11	8	4	5	4	**6**
Portugal	0.4	13	10	6	4	3	**7**
Slovak Republic	0.0	9	4	3	1	1	**4**
Slovenia	0.0	6	3	4	2	2	**3**
Spain	0.2	29	12	9	6	4	**11**
Sweden	0.0	5	2	2	2	2	**3**
United Kingdom	2.5	41	23	19	9	7	**24**
OECD21	**0.5**	**16**	**10**	**7**	**6**	**4**	**9**

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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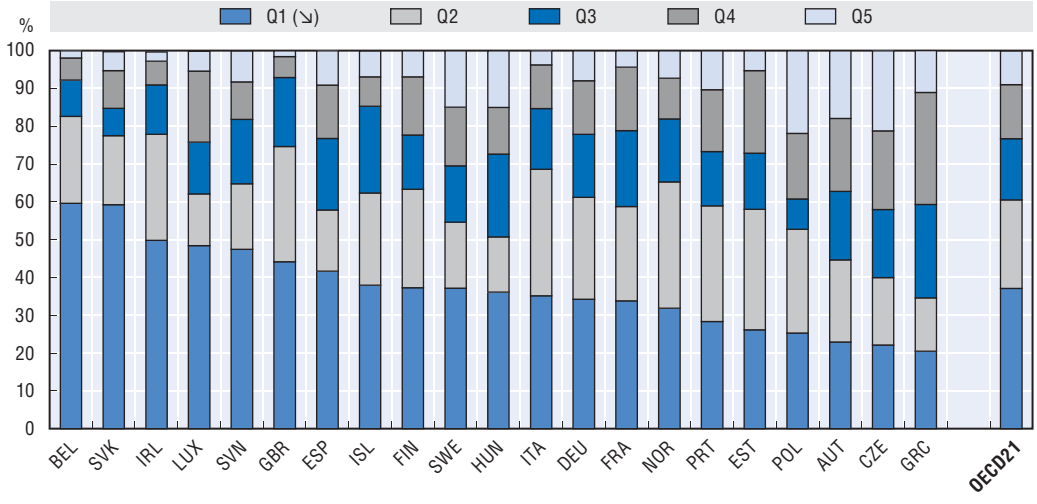
Figure 8.7. **Distribution of in-kind benefits from social housing by income quintiles, 2007**



Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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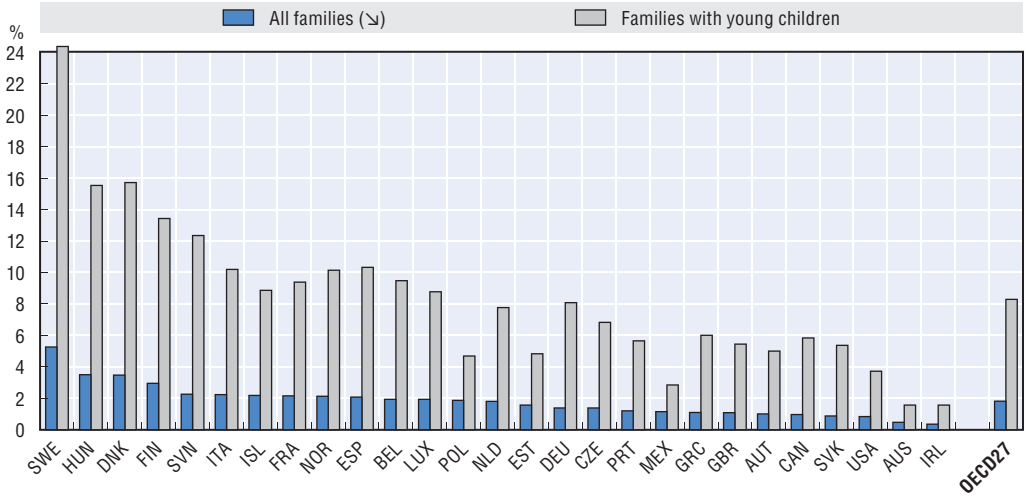
Early childhood education and care (ECEC) services

The few studies that analyse the distributive effect of childcare subsidies show that they reduce inequality, with large variation across countries (Matsaganis and Verbist, 2009, for five OECD countries). For the total population, these services represent between 1% and 2% of income in most countries, but 3% or more in Sweden, Hungary, Denmark and Finland (Figure 8.8). When only families with young children are considered, the average share of ECEC services in household income increases to 8%, again with much higher shares in Hungary, Denmark and especially Sweden.

Figure 8.8. **Income-increasing effect from ECEC services, 2007**



Note: ECEC = Early childhood education and care.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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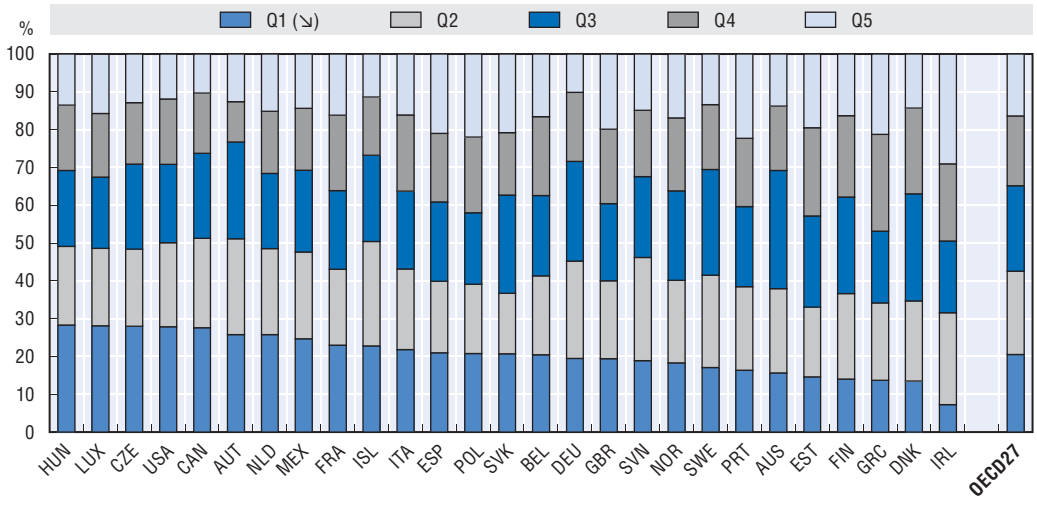
The distribution of ECEC services over income groups varies greatly over countries (Figure 8.9). In Hungary, Luxembourg, the Czech Republic, the United States and Canada, ECEC services tend to go much more to poorer groups: the first quintile receives almost 30% and the top quintile less than 15%. The opposite, *i.e.* a rather regressive distribution is observed in Estonia, Finland, Greece, Denmark and Ireland, where the lowest quintile receives less than 15% of all ECEC services. These patterns reflect the distribution of ECEC beneficiaries over quintiles, resulting either from the demographic structure (*i.e.* more or less young children in the quintile), or from differential use of ECEC services.

To explore such distinction between demographic patterns and differential use, it is useful to study the composition ECEC users by income groups: are poorer or richer households more likely to enrol their young children in public care services? The answer is provided in Table 8.6 and may be surprising at first glance: in most countries, children in higher and top income households are more likely to be enrolled in public childcare than those in lower-income households. This difference is particularly stark in Poland, Ireland and the Slovak Republic. Only Canada, the Czech Republic, Estonia and Germany have relatively more children from low-income households enrolled in ECEC. Overall, more than two out of three children are enrolled in public childcare in Belgium, Denmark, Iceland, the

Figure 8.9. **Distribution of ECEC in-kind benefits over quintiles**



Note: ECEC = Early childhood education and care.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries. StatLink http://dx.doi.org/10.1787/888932537123

Table 8.6. **Percentage of young children enrolled in ECEC services, by income quintile**

Percentage

	Q1	Q2	Q3	Q4	Q5	**Total**
Australia	33.0	35.0	50.8	39.3	42.4	**40.1**
Austria	38.1	44.7	46.6	42.8	47.7	**43.2**
Belgium	54.2	69.9	71.6	75.7	79.0	**69.2**
Canada	30.9	32.9	29.2	27.5	26.3	**29.8**
Czech Republic	44.1	45.6	46.9	40.0	40.7	**43.8**
Denmark	80.1	80.4	86.0	86.8	84.6	**83.8**
Estonia	56.1	48.0	54.2	53.3	48.4	**52.0**
Finland	42.2	45.2	55.2	69.5	66.1	**54.0**
France	63.4	56.9	63.4	63.2	70.8	**63.0**
Germany	65.8	59.9	67.9	61.0	57.1	**62.8**
Greece	33.2	37.6	38.1	50.8	43.8	**40.7**
Hungary	53.0	52.2	54.9	57.2	55.7	**54.2**
Iceland	59.3	70.4	67.4	74.6	66.8	**66.8**
Ireland	15.1	26.7	31.5	31.4	43.0	**28.9**
Italy	55.3	57.4	57.4	57.4	68.9	**58.5**
Luxembourg	52.2	63.3	64.3	63.3	75.6	**61.6**
Mexico	15.2	15.9	16.2	15.5	16.1	**15.8**
Netherlands	66.2	64.8	66.8	69.1	85.5	**69.4**
Norway	48.6	57.2	60.2	58.9	67.6	**57.5**
Poland	17.4	17.2	20.6	24.5	31.5	**21.8**
Portugal	46.5	45.3	54.8	68.1	68.3	**56.2**
Slovak Republic	29.3	33.4	56.1	42.4	64.8	**43.2**
Slovenia	56.2	64.1	62.0	57.7	62.7	**60.4**
Spain	64.7	66.4	66.9	68.0	72.7	**67.6**
Sweden	70.6	70.6	72.6	70.0	69.6	**70.9**
United Kingdom	33.7	38.8	45.7	52.2	53.1	**43.0**
United States	29.6	27.7	29.5	28.8	28.5	**28.9**
OECD27	**46.4**	**49.2**	**53.2**	**53.7**	**56.9**	**51.4**

Note: Young children are defined as children below 6 years of age. ECEC = Early childhood education and care.

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries. StatLink http://dx.doi.org/10.1787/888932538187

Netherlands, Spain and Sweden. ECEC enrolment rates are lowest (below one third) in Canada, Ireland, Mexico, Poland and the United States.

ECEC services imputed into household income represent a higher share of disposable income for poorer than for richer households (Verbist *et al.*, 2011). This pattern is most pronounced in Hungary, Iceland, Luxembourg, Sweden and Spain. In some of these countries, these in-kind benefits even amount to around 10% of disposable income in the bottom quintile. The share in the top quintile is much more limited, being around 1% in the majority of the countries. As a consequence, in all countries inequality as measured by Gini coefficient decreases when including ECEC services in the income concept. On average, this decrease is small with some 1.2%. Reductions are strongest in Hungary, Iceland and Luxembourg.[10]

While this effect seems low with regard to the overall population, redistribution through childcare services is much stronger when the focus is on children and, furthermore, beneficiaries. Förster and Verbist (2011) show that the reduction in overall income poverty is negligible when ECEC services are accounted for (less than 1%, for an average of 27 OECD countries). However, poverty among young children reduces by one quarter and poverty among children enrolled in childcare is more than halved.

Long-term elderly care services

In-kind benefits for elderly people fall into two broad categories: first, home-help services, *e.g.* providing assistance to elderly living outside residential care centres for carrying out their daily tasks, and second, day care services (provision of residential care in an institution, costs of operating homes for the elderly, service flats, sheltered homes, etc.). This second category can include both nursing homes, which provide nursing and personal care to persons that face restrictions in their activities of daily living, as well as institutions that are not designed specifically for people with extra care needs.

A great deal of variation can be found between countries in the use of elderly care services. In Norway, for instance, 62% of the oldest age group (85+) are using home care services while only 7% do so in Estonia (80+). The use of institutional care varies from 4% in Estonia and 8% in Spain to 34% in Denmark and 40% in Iceland (Vaalavuo, 2011).

Elderly care services represent less than 0.5% of disposable income in Germany, Estonia, Italy and Slovenia but more than 2% in the Nordic countries and the Netherlands (Table 8.7, last column).[11] Even though these services benefit only a marginal proportion of the entire population, their redistributive impact can be significant, given the high levels of spending per person. The Nordic countries report the highest levels, which corresponds with their relatively high budget for this public service. For countries where a split between home care and residential care is available, residential care is in general more important.

Elderly care in-kind benefits are quite important (increasing income by more than 10%) for the poorest 20% in Denmark, Iceland, the Netherlands, Norway and Sweden. For the other countries, the share for the bottom quintile is more modest, reflecting the lower general spending level. On the other hand, nowhere except in the Netherlands do long-term care in-kind benefits play a role for the top income groups. For instance, in Norway and Sweden, long-term care in-kind benefits would increase incomes among the bottom quintile by more than one fifth but less than 1% among the top quintile.

In most countries, elderly care expenditures are allocated more towards the bottom of the income distribution. In the Nordic countries the bottom quintile receives even 40-50% of these services. The only exception is Hungary where spending in this category is more

Table 8.7. **Income-increasing effect of long-term care in-kind benefits by quintile, 2007**

Percentage

	Q1	Q2	Q3	Q4	Q5	Total
Denmark	15.4	6.4	1.8	1.1	0.6	**3.2**
Estonia	0.9	0.5	0.2	0.1	0.0	**0.2**
Finland	5.4	2.5	1.2	0.5	0.2	**1.3**
France	1.6	1.1	0.5	0.3	0.2	**0.6**
Germany	0.8	0.5	0.3	0.2	0.1	**0.3**
Hungary	2.4	2.6	2.0	1.3	0.6	**1.5**
Iceland	13.9	5.0	1.5	0.9	0.4	**2.6**
Italy	0.4	0.2	0.2	0.1	0.0	**0.1**
Netherlands	15.5	9.5	3.6	2.7	1.2	**4.5**
Norway	20.7	9.1	2.8	1.4	0.5	**4.3**
Slovenia	0.3	0.1	0.1	0.1	0.0	**0.1**
Spain	2.5	1.3	0.7	0.4	0.2	**0.6**
Sweden	23.5	11.2	3.0	1.5	0.7	**5.1**
United Kingdom	4.8	2.3	0.93	0.4	0.2	**1.0**
OECD14	**7.7**	**3.7**	**1.3**	**0.8**	**0.4**	**1.8**

Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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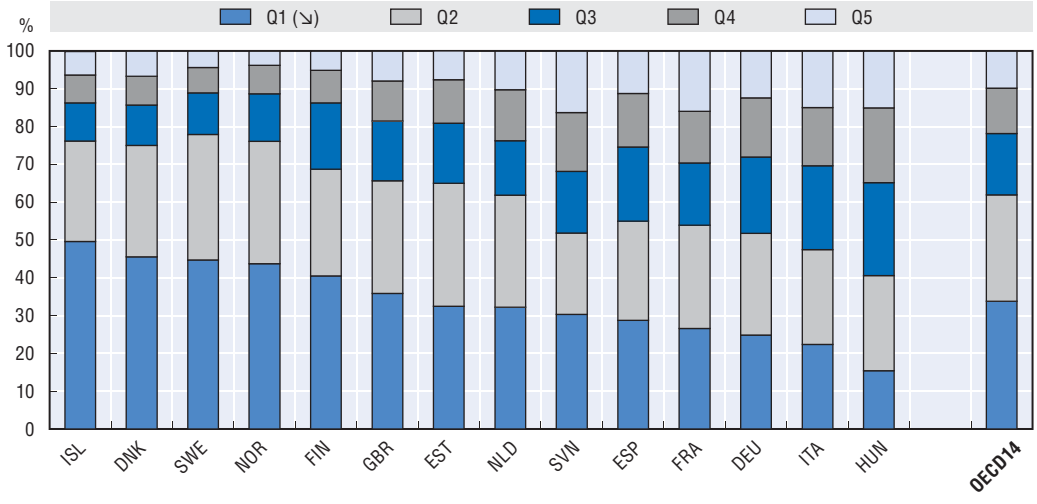
regressive. Overall, inequality reduction through elderly long-term care services is between 2% and 5% in the Nordic countries, the Netherlands and the United Kingdom and thus has a stronger redistributive effect than childcare in these countries. In the other countries, the redistributive effect is negligible (below 1%).

Figure 8.10. **Distribution of elderly care expenditures over income quintiles**



Source: OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

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8.5. The distributive impact of public services over time

How has the impact of public services evolved over time? For a subset of 17 OECD countries the distributive impact of public services can be compared over time with the earlier estimates presented in OECD (2008a) which referred to a year around 2000. As only health care, education and social housing were considered in OECD (2008a), the comparison is limited to these three policy domains. For reasons of consistency, the total of education comprises also pre-primary education.

In general, the inequality impact of public services has remained remarkably stable: on average across the OECD countries studied here, the Gini coefficient decreases by almost one fifth in both years (Table 8.8). In one third of countries, inequality reduction has increased by more than 2 percentage points (Belgium, Canada, Spain, Finland, United Kingdom, Ireland). In another third, the redistributive impact has, however, fallen (Austria, Germany, Denmark, Italy, the Netherlands and Sweden) and in the remaining third, changes were below two points.

Table 8.8. **Impact of total services on inequality (Gini coefficients), 2000 and 2007**

Gini	2000			2007[1]		
	Cash	Extended income	% Δ	Cash	Extended income	% Δ
Australia	0.315	0.258	–18%	0.312	0.261	–16%
Austria	0.248	0.198	–20%	0.267	0.219	–18%
Belgium	0.284	0.235	–17%	0.264	0.209	–21%
Canada	0.302	0.254	–16%	0.319	0.259	–19%
Denmark	0.216	0.168	–22%	0.250	0.207	–17%
Finland	0.246	0.211	–14%	0.266	0.223	–16%
France	0.272	0.215	–21%	0.264	0.210	–21%
Germany	0.258	0.210	–19%	0.300	0.253	–16%
Greece	0.327	0.275	–16%	0.342	0.288	–16%
Ireland	0.297	0.240	–19%	0.317	0.242	–24%
Italy	0.295	0.224	–24%	0.320	0.261	–18%
Netherlands	0.259	0.205	–21%	0.272	0.227	–16%
Portugal	0.362	0.279	–23%	0.370	0.291	–21%
Spain	0.343	0.282	–18%	0.310	0.250	–19%
Sweden	0.249	0.193	–23%	0.237	0.192	–19%
United Kingdom	0.310	0.248	–20%	0.330	0.254	–23%
United States	0.368	0.299	–19%	0.372	0.303	–18%
OECD17	**0.291**	**0.235**	**–19%**	**0.301**	**0.244**	**–19%**

1. 2004 for Canada and the United States.

Source: OECD (2008a); OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries. Results for an alternative, more tail sensitive inequality measure are presented in Table 8.A2.2 in Annex 8.A2).

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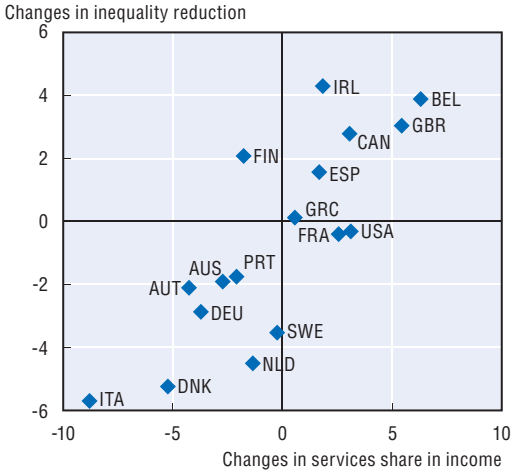
There is a strong link between changes in the relative size of health, education and housing services (expressed as share of disposable income) and changes in the effectiveness of these services to reduce inequality across countries (Figure 8.11). Belgium and the United Kingdom are two countries which combine a considerable increase in spending with a large extent of inequality reduction. On the other side of the spectrum, Italy and Denmark record a fall in inequality reduction alongside a decreasing size of services. The only notable exception to this pattern is Finland where inequality was reduced more despite a slight reduction in the size of services.

Figure 8.11. **Association between trends in size of public services and changes in inequality reduction, 2000-2007**



Note: Percentage point changes in the share of in-kind benefits of services in disposable income, and of the percentage reduction in inequality (Gini coefficient), respectively.

Source: OECD (2008a); OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services and national survey data for non-EU countries.

StatLink http://dx.doi.org/10.1787/888932537161

8.6. Summary and conclusions

On average, spending on publicly provided services accounts for about 13% of GDP across OECD countries, slightly more than the spending on cash transfers. However, there is considerable variation. In most of the Nordic countries, Australia, Canada, Mexico, the Netherlands, Ireland, the United Kingdom and the United States, spending on "in-kind" transfers is considerably higher than cash transfer expenditures. On the contrary, cash transfers are more dominant than in-kind services in Austria, Italy and Poland. On average, the bulk of these services is made up of healthcare and education, some 5% to 6% of GDP each. Childcare, services for the elderly, and social housing account for the remaining 2%.

Broadening the income concept to account for in-kind benefits considerably increases households' economic resources and impacts on inequality and poverty outcomes. If all social public services were imputed in disposable cash income, households' resources would increase by close to 30% on average. The increase exceeds 40% in Sweden and 33% in Denmark, Norway, Iceland, as well as in France and Hungary. In a typical OECD country, the average annual household income would be close to USD 28 000, rather than USD 22 000 in purchasing power parities when in-kind benefits are included.

Publicly provided service benefits also contribute to reducing income inequality. Depending on the indicator, in-kind benefits as a whole reduce income inequality by between one-fifth (on the basis of the Gini coefficient) and one-third (using alternative inequality measures, which give more weight to the bottom and the top of the income distribution). The United Kingdom and, according to other inequality measures, the United States, Portugal and Mexico record higher reduction rates, while Slovenia records lower ones.

Redistribution and poverty reduction effects differ between service categories. Because of their sheer size, benefits from total education and health have by far the largest inequality reduction potential. The lower budgets for social housing results in a much

more modest impact. However, for beneficiaries (social renters) the service can make a big difference, especially as it is targeted more on low-income groups. The same is true for childcare services and long-term elderly care: the overall effects are small, but provide important support for the groups concerned. Overall income poverty, for instance, hardly drops when childcare services are accounted for, but poverty among young children falls by one quarter and poverty among children enrolled in childcare is more than halved.

Over the 2000s, the redistributive impact of public services remained remarkably stable overall. However, the impact was stronger in countries where the share of services in household income increased significantly (by more than four percentage points), while it weakened in those countries where this share decreased.

These findings suggest that publicly provided services fulfil an important direct redistributive role in OECD societies. These effects are also substantial in some of the OECD countries which record higher inequality levels on the basis of disposable household income only. More importantly, redistributive effects are stronger among specific population groups at higher risk of poverty.

There are additional indirect redistributive effects of public social services which do not show up in the static first-order analyses presented here. In a dynamic perspective, for instance public childcare provision has a potential for secondary redistributive effects as childcare allows both parents to work and hence helps increase family income. If such an increase is coupled with a greater use of childcare by children from lower-income households, the result could be considerable inequality reduction among households with children.

Notes

1. Other flows neglected in the standard framework but not considered in this chapter are services provided by firms as well as other non-market resources such as time and home production that contribute to households' living standards and their capacity to attend to their needs. A discussion of the value of home production based on time use surveys can be found in Miranda (2011).
2. A growing number of government studies in OECD countries include the effect of services in their regular reports on the distributional impact of policies. An example is the United Kingdom's Spending Review carried out by HM treasury, see *www.hm-treasury.gov.uk/spend_sr2010_impact_households.htm*.
3. The social expenditure data discussed here refer to public social spending and exclude private mandatory spending. In some OECD countries, the latter constitutes a more important and rising share of total social spending, *e.g.* in Chile. Furthermore, the coverage of social spending shown may be limited as programmes and services are often provided, and/or co-financed, by local governments. This leads to gaps in measurement of spending notably in federal states such as Canada.
4. Social expenditure are defined as "the provision by public and private institutions of benefits to, and financial contributions targeted at, households and individuals in order to provide support during circumstances which adversely affect their welfare, provided that the provision of the benefits and financial contributions constitutes neither a direct payment for a particular good or service nor an individual contract or transfer." (Adema and Ladaique, 2009)
5. Though part of these expenditures may have an explicit social aim and can be attributed to a specific individual beneficiary, as for instance in the case of free legal support.
6. 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.
7. The spending level in Luxembourg does not include tertiary education.

8. The results are illustrative and should not be interpreted as "actual" poverty reductions. Adding in-kind services changes the income distribution and the composition of the population at the bottom end. Poverty outcomes will be determined to a large extent by the interaction between the characteristics of in-kind beneficiaries and those of the initially poor population. Moreover, it raises the question of which poverty threshold should be used (calculated on the basis of cash or extended income) and whether this poverty threshold adequately reflects the needs associated with the publicly-provided services included in the income concept (Radner, 1997).
9. Due to data constraints, estimates for social housing are available only for 21 OECD countries.
10. Though these are not the countries where the enrolment of low-income children is the highest, they have the highest shares of beneficiaries of ECEC services in low-income households: the bottom 20% in Hungary and Luxembourg, and the bottom 40% in Iceland.
11. Due to data constraints, estimates for long-term care are available only for 14 OECD countries.

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ANNEX 8.A1

How to Account for Publicly Provided Services in Household Income: Conceptual and Methodological Issues

How to value public services and allocate those to individuals and households?

This chapter applies the standard way to estimate the monetary value of public services, namely to use a production cost approach (see Aaberge and Langørgen, 2006; Marical *et al.*, 2008; Smeeding *et al.*, 1993). This means that the transfer to the beneficiaries is assumed to equal the average cost of providing or producing these public services. In other words, one dollar spent on services in assumed to equal one dollar worth to households or individuals. It is important to note that this approach neglects differences within and across countries in the quality and efficiency in the provision of these services. Moreover, this approach does not necessarily reflect the user's value of the service, as the public service cannot (easily) be exchanged for other goods.

A second issue is how to allocate these benefits across the population. In the literature two approaches have been distinguished, namely the "actual consumption approach" and the "insurance value approach" (see *e.g.* Marical *et al.*, 2008). The actual consumption approach allocates the value of public services to the individuals that are actually using the service. For most services, the actual consumption approach will be the most appropriate, if actual beneficiaries can be identified. In some cases an insurance value approach may be applicable or even preferable. Such an approach imputes the "insurance value" of coverage to each person based on specific characteristics (such as age, sex, socio-economic position). For instance, in much of the literature the actual consumption approach is considered to be less appropriate in the case of health care, as it ignores the greater needs that are associated with being ill. Hence, the insurance value approach is preferred. Table 8.A1.1 summarises which of the two approaches are proposed for nine different service categories. Verbist *et al.* (2011) provide the detailed approaches which have been followed for the five services included in the analysis of this chapter.

The beneficiaries of public education services are the pupils and students that are currently using these services. In principle, all individuals of compulsory school age benefit from education, which makes the approach to allocate public expenditure based on age for this group *a priori* justifiable. Information on actual participation in different types of education is available in the databases used for individuals aged 16 or older. For younger individuals, age is used to determine participation. No distinction can be made in the

Table 8.A1.1. **Allocation methods applied for different public services**

Public service	Allocation method	Beneficiaries
Education	AC	Pupils and students
Health care	IV	All individuals covered by public health
Social housing	AC	Residents of social housing unit
Early childhood education and care (ECEC)	AC	Young children in public childcare and pre-primary education
Long-term elderly care	IV	All elderly people covered by the system
Incapacity-related	AC	Individuals that suffer from incapacity and use related publicly provided services
Active labour market programmes (ALMPs)	AC	Individuals participating in ALMPs
Public transport	AC	Passengers of public transport
Public utilities, *e.g.* energy, communication	AC	Users of public utilities

AC = Actual consumption; IV = Insurance value.

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surveys between participation in publicly or privately funded education institutions, nor between general and technical secondary education, nor between Type A and Type B tertiary education. Each pupil or student is assigned a public education transfer that equals the cost of producing these services in the corresponding level of education and expressed on a 'per student' basis. For tertiary education, direct expenditures for research and development activities are excluded.

The imputation of ECEC transfers is based on the real use of these services by an hourly basis in order to allow for differences in the intensity of use (number of hours). Amounts per user of pre-primary education are derived from the OECD Education Database, whereas the amounts for childcare come from various national sources (Vaalavuo, 2011). The differentiation between public and private services is not available in the data used here. Consequently, in some cases public money is allocated to people purchasing a private service. This does not introduce much bias in most countries, as private services are rare or almost entirely subsidised by the state. But in some countries like the United Kingdom and France, where many parents pay for private childcare and are partly reimbursed through the tax system, this might lead to double counting of the benefits. Pre-primary education is free in all countries studied but in kindergartens, crèches and other forms of day care, there are often user fees applied and these cannot be taken into account in the imputation. As fees are income dependent in almost all OECD countries (see OECD, 2007), this means that the results underestimate the distributive effect of ECEC subsidies.

An actual consumption approach is also used for allocating the benefits of social housing. The opportunity cost approach is used to estimate the value of the benefit (Frick *et al.*, 2010). Using information from those households living in the private (non-subsidised) rental market, a rental value for all property of tenants in the social rental sector is estimated. It is based on a hedonic regression estimation of the logarithm of rent actually paid by main tenants on the private housing market (so excluding social housing and any other reduced rent payments), correcting for selection bias when appropriate.

For health care services, the insurance-value approach is applied, based on health expenditures per age group as a percentage of GDP per capita – so-called “age profiles”. Multiplying these percentages with GDP per capita of the corresponding year provides an estimate of the insurance value of health care services for each individual. As only differences in age and gender are considered, this approach underestimates the equalising effect of public health care services in countries where these are targeted to low-income

households (*e.g.* Medicaid in the United States). Even in health care systems with broad or universal coverage, some elements are targeted towards low-income groups (*e.g.* reduced out-of-pocket payments for hospitalisation, doctor visits etc.) and these are not accounted for in this type of imputation.[1]

A similar approach is applied for publicly funded elderly care for the five Nordic countries, Estonia, France, Germany, Hungary, Italy, the Netherlands, Slovenia, Spain and the United Kingdom. Using the proportions of users by age group (see Vaalavuo, 2011), the amount of public spending per individual in each age group is derived.

Adjusting for differences in needs

What equivalence scale should be applied for in-kind benefits?

In distributional studies, it is common practice to correct household income with an equivalence scale to take account of economies of scale: the needs of a household grow with each additional member, but not in a proportional way (OECD, 2005a). Following standard practice, the equivalence scale used in this chapter for adjusting household disposable income is the square root of household size.[2] But when non-cash income components are included, this may give rise to what Radner (1997) has called the "consistency" problem: some types of non-cash income may have needs associated with them that are unmeasured in usual equivalence scales. The question is particularly relevant in the case of poverty analysis, as inclusion of non-cash incomes can represent considerable relative changes in income to low-income households. Consider two single-person households with each USD 1 000 cash income. Person A is ill and receives public health care worth USD 200, whereas person B is healthy and needs no health care. Consequently, person A could be said to have 20% more needs than B because of differences in health care needs, and his equivalence scale should be 1.2 compared to 1 for B.

Even though the problem is recognised in the literature, the standard approach in most empirical studies is to apply the same equivalence scale for both cash and extended income. Garfinkel *et al.* (2006) defend this approach because "on the one hand, in-kind benefits do not exhibit economies of scale, which implies they should be divided by household size rather than the square of the household size. On the other hand, in-kind benefits are not shared equally by all family members, which suggests that they should be added to equivalent cash income on an individual basis. (…) Thus our use of the same equivalence scale for both cash and in-kind expenditures is a reasonable middle-of-the-road solution".

Table 8.A1.2 illustrates these three options for a "typical" poor household consisting of two adults and two children aged 8 and 13.[3] The disposable cash household income is USD 40 000. Applying the standard OECD equivalence scale, which is the square root of household size, this is converted to USD 20 000 of equivalent income attached to each individual (column 1). The child of 8 years is enrolled in primary school (value estimated as USD 3 000), whereas the 13-year-old is in lower secondary education (value USD 5 000). The corresponding amounts for extended income (i.e. cash income plus in-kind benefits) using the three alternative options are presented in columns 2 through 4.

The amounts of extended income can differ considerably, depending on the option that is chosen. Moreover, this will also affect how poverty outcomes are assessed. Using a floating poverty line, all members of this household are counted as non-poor after imputation of education expenditures, using a cash income equivalence scale (column 2)

Table 8.A1.2. **Imputation of education services in household income for a typical low-income family with two children, example with three alternatives**

	Equivalised cash income, before taking account of services (1)	Extended income (cash income + education services)		
		In-kind benefits equivalised with same equivalence scale as cash income (2)	In-kind benefits expressed on per capita basis (3)	In-kind benefits non-equivalised and only attributed to individual beneficiary (4)
Adult 1	20 000	24 000	22 000	20 000
Adult 2	20 000	24 000	22 000	20 000
Child 8 year	20 000	24 000	22 000	23 000
Child 13 year	20 000	24 000	22 000	25 000
Fixed poverty line: 50% of median cash income	21 000	21 000	21 000	21 000
Poverty outcomes	All family members poor	No family member poor	No family member poor	Adult family members poor, children not poor
Floating poverty line: 50% of extended income	21 000	22 900	22 100	22 000
Poverty outcomes	All family members poor	No family member poor	All family members poor	Adult family members poor, children not poor

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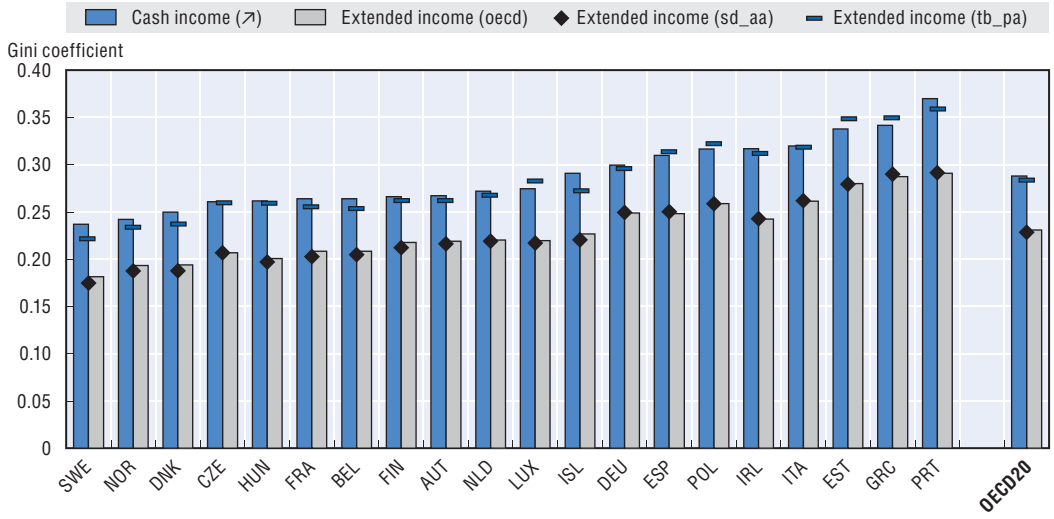
but all family members are poor using a per-capita basis (column 3). When in-kind benefits are attributed to the individual user only, then the two adults remain poor (column 4).

There are two strands of recent work that each proposes an alternative solution to the problem of appropriate equivalence scales for in-kind benefits (Aaberge *et al.* 2010a and 2010b; Paulus *et al.* 2010). Both approaches rely on actual government spending on public services, though their methodology is considerably different. The core piece of the methodology of Aaberge *et al.* is the construction of a joint equivalence scale for extended income, defined as the weighted average of scales for cash and non-cash income. This joint scale implies that "individuals who are unequal with respect to needs for public services are given unequal weights in the needs adjustment". The second approach presented in Paulus *et al.* (2010) uses as basic point of departure that the equivalence scale used to measure inequality of disposable income is conditional on the existence of free public services. If the value of these public services is included in the income concept, then the equivalence scale should also be adapted. They propose a *fixed cost approach*, "assuming that the needs of the recipients of these services are equal to a specific sum of money. For example, we could assume that the per capita amounts spent by the state for age-specific population groups on public education and public health care depict accurately the corresponding needs of these groups. Then the recalculation of equivalence scale is straightforward." They then assume that the needs of the recipients of these services are the same across all countries (by using the average of per capita spending amounts), they recalculate the equivalence scale and test the sensitivity on inequality outcomes of this adaptation of the equivalence scale.

Verbist *et al.* (2011) present and discuss both these novel approaches in detail for the European OECD countries. Below, these approaches are applied empirically in order to test the sensitivity of the results for applying alternative equivalence scales. Figure 8.A1.1 shows the Gini coefficients for cash and extended income, with three equivalence scales for this last income concept. On average, when using the theoretically based approach

presented by Aaberge *et al.* (2010), inequality decreases in a way that is very similar to the considerable drop that occurs when using the standard equivalence scale for extended income. This is the case for all countries. The approach proposed by Paulus *et al.* (2010), on the contrary, yields inequality outcomes that hardly change on average when moving from cash to extended income. For Estonia and Southern European countries, inequality levels even increase somewhat (due to their lower spending levels), whereas in the Nordic countries inequality tends to decrease, which follows from their relatively high spending levels.

Figure 8.A1.1. **Gini coefficient before and after inclusion of all types of public services, comparing three equivalence scales for extended income**



Note: Countries are ranked in increasing order of Gini of cash income. OECD = modified OECD scale; tb_pa = sensitivity test for different spending levels (Paulus *et al.*, 2010); sd_aa = theoretically-based equivalence scale (Aaberge *et al.*, 2010).

Source: OECD (2008a); OECD Secretariat's computations from OECD/EU database on the distributional impact of in-kind services.

StatLink http://dx.doi.org/10.1787/888932537180

Notes

1. Note that using an actual consumption approach for health expenditures, the distributive effect of health care expenditures has been estimated to be considerably lower than using the insurance-value approach (OECD, 2008a for eight European OECD countries).
2. See OECD (2005a) (*www.oecd.org/dataoecd/61/52/35411111.pdf*) for further explanations and specifications.
3. The illustrative values shown in Table 8.A1.2 are derived from the empirical data used in this study.

ANNEX 8.A2

Additional Tables and Figures

Table 8.A2.1. **Inequality indicators and percentage change when taking into account different services**

	Gini						S80/S20						P90/P10					
	Cash	plus education	plus health care	plus social housing	plus ECEC	plus LTC	Cash	plus education	plus health care	plus social housing	plus ECEC	plus LTC	Cash	plus education	plus health care	plus social housing	plus ECEC	plus LTC
		(%)						(%)						(%)				
Australia	0.312	–6.6	–10.3		–0.4		5.35	–10.2	–21.5		–0.7		4.45	–7.8	–21.0		–0.4	
Austria	0.267	–6.3	–10.5	–0.3	–1.4		3.92	–6.6	–14.7	–0.3	–1.5		3.26	–7.0	–15.3	–0.4	–1.5	
Belgium	0.264	–4.4	–14.3	–1.5	–1.5		3.97	–5.1	–20.1	–2.7	–2.4		3.37	–3.5	–19.8	–3.4	–1.7	
Canada	0.319	–9.1	–9.6		–1.2		5.40	–15.5	–17.0		–2.4		4.38	–15.8	–15.2		–2.0	
Czech Republic	0.261	–5.1	–13.3	–0.8	–1.6		3.66	–6.2	–15.3	–1.2	–2.2		3.07	–5.5	–15.5	–1.8	–2.7	
Denmark	0.250	–5.7	–10.0	0.0	–1.1	–5.0	3.68	–7.5	–14.5		–1.3	–5.8	2.88	–2.2	–14.1	0.0	–0.6	–6.8
Estonia	0.338	–6.0	–11.3	–0.1	–1.0	–0.3	5.82	–8.1	–20.9	–0.3	–1.8	–0.8	4.51	–1.4	–18.8	0.1	–0.8	–1.1
Finland	0.266	–4.3	–10.8	–1.1	–1.0	–2.5	3.83	–3.1	–14.5	–1.9	–0.3	–3.9	3.13	0.1	–14.3	–2.2	–0.4	–4.8
France	0.264	–5.8	–13.0	–1.1	–1.8	–0.8	3.83	–7.1	–17.5	–1.8	–2.5	–1.1	3.19	–5.3	–14.5	–1.7	–1.5	–0.8
Germany	0.300	–5.1	–10.4	–0.3	–1.2	0.1	4.88	–8.7	–18.7	–0.7	–2.0	–0.7	3.80	–6.6	–16.0	–0.6	–1.4	–0.6
Greece	0.342	–5.9	–9.6	0.0	–0.5		6.05	–12.5	–20.4	–0.1	–1.3		4.77	–10.9	–19.9	–0.2	–1.0	
Hungary	0.262	–8.2	–10.5	–0.5	–2.8	–1.3	3.79	–9.8	–13.2	–0.9	–4.3	–1.2	3.14	–8.4	–11.2	–1.0	–5.3	–1.5
Iceland	0.291	–7.9	–11.4	–0.5	–2.5	–3.1	4.21	–9.0	–15.8	–1.0	–3.6	–4.0	3.23	–7.1	–14.2	–1.0	–4.1	–5.4
Ireland	0.317	–10.1	–12.5	–3.4	–0.1		5.00	–11.9	–20.4	–7.0	0.0		4.00	–8.4	–19.3	–7.8	0.4	
Italy	0.320	–7.8	–9.2	–0.5	–1.5	0.0	5.53	–14.2	–19.4	–1.0	–3.2	–0.4	4.32	–10.5	–18.3	–1.1	–2.0	
Luxembourg	0.275	–7.6	–10.7	–0.3	–2.3		4.01	–9.3	–13.7	–0.5	–4.0		3.38	–7.8	–12.9	–0.4	–3.8	
Mexico	0.475	–11.5	–11.2		–1.3		12.20	–30.3	–33.9		–4.6		8.54	–29.4	–31.0		–3.3	
Netherlands	0.272	–6.4	–8.1	0.0	–1.8	–2.9	4.00	–9.2	–13.4		–2.7	–2.8	3.04	–3.9	–10.7	0.0	–2.9	–1.3
Norway	0.242	–5.8	–9.1	–0.4	–1.1	–4.6	3.74	–9.2	–13.0	–0.6	–1.4	–4.9	3.02	–4.7	–12.5	–0.5	–1.0	–5.6
Poland	0.317	–9.9	–8.6	–0.1	–1.1		5.17	–16.2	–15.3	–0.1	–2.1		4.25	–15.6	–14.3	–0.1	–2.0	
Portugal	0.370	–8.0	–13.6	–0.5	–0.9		6.61	–13.6	–26.5	–1.3	–1.7		5.29	–11.4	–22.3	–1.6	–2.5	
Slovak Republic	0.251	–6.7	–12.1	0.0	–0.6		3.59	–8.0	–15.1	–0.1	–1.0		2.99	–6.6	–14.4	–0.2	–0.9	
Slovenia	0.236	–5.8	–11.3	–0.1	–0.9	–0.1	3.40	–5.3	–14.3	–0.2	–0.9	–0.2	2.96	–2.6	–12.4	0.0	0.2	–0.2
Spain	0.310	–6.4	–11.6	–0.4	–1.4	–0.8	5.33	–11.7	–22.7	–1.0	–3.1	–2.2	4.38	–7.8	–21.3	–0.7	–1.1	–3.1
Sweden	0.237	–5.6	–12.4	–0.1	–1.5	–4.2	3.46	–6.2	–15.8	–0.1	–0.9	–3.9	2.83	–2.4	–13.4	0.0	1.2	–2.1
United Kingdom	0.330	–7.0	–12.5	–4.6	–0.7	–1.6	5.59	–11.2	–22.8	–8.9	–1.3	–3.6	4.38	–9.4	–20.7	–8.8	–1.1	–3.7
United States	0.372	–9.0	–9.8		–0.9		7.78	–19.7	–26.1		–3.2		5.85	–18.3	–24.4		–3.1	
OECD27	**0.298**	**–7.0**	**–11.0**	**–0.8**	**–1.2**	**–1.8**	**4.95**	**–10.6**	**–18.4**	**–1.6**	**–2.3**	**–2.4**	**3.94**	**–8.2**	**–17.0**	**–1.7**	**–1.8**	**–2.6**

Source: Computations from OECD/EU database on the distributional impact of in-kind services.

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Table 8.A2.2. **Changes in inequality reduction through services, S80/S20, 2000 and 2007**

S80/S20	2000			2007[1]		
	Cash	Extended income	% Δ	Cash	Extended income	% Δ
Australia	5.17	3.69	–28.6%	5.35	3.83	–28.5%
Austria	3.65	2.78	–23.8%	3.92	3.04	–22.5%
Belgium	4.14	3.21	–22.7%	3.97	2.88	–27.4%
Canada	4.88	3.68	–24.6%	5.40	3.78	–29.9%
Denmark	3.10	2.35	–24.1%	3.68	2.83	–23.1%
Finland	3.56	2.94	–17.3%	3.83	3.08	–19.6%
France	4.06	2.96	–27.2%	3.83	2.86	–25.4%
Germany	3.71	2.87	–22.6%	4.88	3.63	–25.6%
Greece	5.67	4.08	–28.0%	6.05	4.22	–30.3%
Ireland	4.88	3.45	–29.4%	5.00	3.36	–32.7%
Italy	4.85	3.16	–34.8%	5.53	3.76	–32.0%
Netherlands	3.73	2.79	–25.3%	4.00	3.09	–22.8%
Portugal	6.47	3.98	–38.5%	6.61	4.20	–36.4%
Spain	5.99	4.12	–31.3%	5.33	3.59	–32.7%
Sweden	3.58	2.65	–26.0%	3.46	2.68	–22.7%
United Kingdom	5.02	3.47	–31.0%	5.59	3.56	–36.3%
United States	7.14	4.55	–36.2%	7.78	4.76	–38.9%
OECD17	**4.68**	**3.34**	**–27.7%**	**4.95**	**3.48**	**–28.6%**

1. 2004 for Canada and the United States.

Source: Computations from OECD/EU database on the distributional impact of in-kind services.

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PART III

Chapter 9

Trends in Top Incomes and Their Tax Policy Implications*

This chapter uses data derived from tax returns to analyse trends in the share of pre-tax personal income going to top income recipients. It begins with a discussion of its data sources, explaining why it has taken tax returns rather than household survey data. It then sets out the statistics behind the trends in top incomes during the three decades to 2008. In the following section it seeks to explain the top income trends, before considering their implications for tax policy. The last section concludes..

* This chapter was prepared by Stephen Matthews, OECD Centre for Tax Policy and Administration. It makes extensive use of data from The World Top Incomes Database prepared by Fecundo Alvaredo, Tony Atkinson, Thomas Piketty, Emmanuel Saez and various collaborators (and available at *http://g-mond.parisschoolofeconomics.eu/topincomes/*), supplemented in some cases by data from member countries. The charts were prepared by Michael Sharratt and the text builds on papers prepared by Professor Christopher Heady on top income shares and tax policy for the Working Party on Tax Policy and Statistics. The chapter also benefitted from the comments of country delegates to that Working Party.

9.1. Introduction

There are a number of reasons for looking at developments in top incomes, particularly the top percentile group of the income distribution, on the basis of tax return data.

One important reason is that data indicate that not only were there big changes in the share of top incomes in total incomes in some countries in the three decades previous to 2008, but that these changes may have had a significant impact on overall measures of income distribution. For instance, Atkinson, Piketty and Saez (2009) note that the 14 percentage point increase in the share of the top percentile group in the United States between 1976 and 2006 would produce a rise of 8.4% in the overall Gini coefficient for pre-tax incomes.

Another reason is that data based on income information on tax returns can provide a fuller, more accurate picture of the top of the income distribution than the data from household surveys that is normally used to analyse trends in inequality.

It is also important to bear in mind that the main drivers of trends in top incomes may differ from those determining trends in the rest of the income distribution. Furthermore, the availability of long series for data based on tax returns permits a correspondingly long-term perspective on trends in income distribution (or at any rate on the shares of top income recipients).

The chapter presents data on the share of top incomes in total pre-tax incomes and then looks at the drivers of these trends, including measurement issues, as well as the rapid growth in the remuneration of top executives and finance professionals.

The following key findings emerge:

- There was a rise in the share of top-income recipients in total gross income in the three decades from 1980 in all countries. It was most marked in the United States though other English-speaking countries (Australia, Canada, Ireland and the United Kingdom) also saw strong upward trends.
- Incomes grew more concentrated even within the group of top income earners. In the United States, for instance, the share of the top 0.1% in total pre-tax income quadrupled in the 30 years to 2008.
- Increases in top incomes were generated chiefly by income from employment and business. A contributory factor was the more global market for talent and performance-related pay which particularly benefitted top executives and finance professionals in the 1990s and 2000s.
- Behavioural responses to reductions in marginal tax rates were also significant, while top rates for personal income tax fell by up to 30% in the late 2000s.
- The sustained rise in the share of top-income recipients in total income is a sign that their capacity to pay tax has increased. However, the responsiveness of income to

marginal tax rates needs to be taken into consideration in the design of appropriate tax reform.

- Tax reforms that increase average tax rates without raising marginal rates (*e.g.* by scaling back tax reliefs) could enable greater redistribution without unduly blunting incentives, although there may have to be trade-offs between equity and economic efficiency.

9.2. Data on top incomes

Statistics based on data from personal income tax returns typically show the numbers of taxpayers in a number of given income ranges and their total income. Over the past ten years or so there has been an intensive programme of work led by Atkinson, Piketty, Saez and various associates to relate these figures to information on the incomes of the population as a whole in order to derive estimates of the share of top income recipients in total income. This work involved a number of steps (Atkinson and Piketty, 2007):

1. *Control total for population*. The number of taxpayers filing tax returns has to be related to the size of the total (adult) population in order to calculate income shares in relation to the total (not just the taxpaying) population. Allowance also has to be made for the fact that in some countries couples are often required to file joint tax returns rather than being separately assessed on an individual basis.
2. *Control total for income*. The incomes of those filing tax returns (often a small minority in the early days of income tax) need to be related to total household income. This can require a substantial amount of imputation of the incomes of non-taxpayers (and taxpayers whose tax liabilities are deducted at source and do not have to file tax returns) using, for instance, estimates based on national accounts aggregate figures. In more recent years the rise in the proportion of individuals that have to file tax returns makes this less of a problem.
3. *Interpolation*. As the original statistics are often for the numbers of income taxpayers in each income range, some method of interpolation is needed in order to be able to calculate the shares of, say, the top 1.0% or 0.1%. The standard statistical approach is to assume a Pareto distribution. A range of values for the exponent of the formula may fit the facts, though in most cases interpolation methods seem unlikely to be a major source of error.

Atkinson, Piketty, Saez and their collaborators have applied such statistical procedures to the income tax data for some 22 countries to derive estimates of the distribution of income over runs of years of up to a century or more. These include 17 OECD countries (Australia, Canada, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.) The present chapter is based on their work, with additional information (particularly for later years) supplied by OECD member countries themselves.

Income data derived from tax returns have a number of strengths, but also have limitations. The latter are described in more detail in Annex 9.A1. They can have significant implications not only for cross-country comparisons at any given point in time, but also for the interpretation of trends over time. Nevertheless the advantages of tax return data are substantial:

1. Tax data should cover all high income recipients. It can provide "census" rather than sample data; and, where samples have been used, they are often large, with a comprehensive sample frame (with over-sampling of high income recipients) that do not

suffer from the high non-response rates of survey data. High income recipients tend to be less willing than average to respond to household surveys of the type which were used in the preceding chapters. This is especially important given the wide range of income levels in the top income groups (*e.g.* the average income of the top 0.01% may be many times the average income of the top 1%.)

2. The tax authorities audit the income information provided by taxpayers and impose penalties for under-declaration of income. There are thus incentives for taxpayers to supply correct information.
3. Data are often available for long runs of years. This is an important consideration given that the income distribution tends to show secular trends.
4. Similar methodologies can be applied to income tax data for different countries to derive broadly comparable data series.

Comparability of data on top incomes

Considerable care is needed in comparing top income shares between countries and over time in a single country. Measurement issues include cross-country differences (and changes over time) in the concept of income that is measured; the availability of data for income measures including capital gains; the extent of tax planning and tax evasion; and the definition of the tax unit. It seems likely that the variations in these factors will be greater between countries than within a country over time, especially if the time period is fairly short and includes few significant changes in the tax law. For this reason, the emphasis in this chapter is on the evolution of top income shares within countries rather than comparisons across countries, although there will also be comparisons in the *changes* in top tax shares between countries.

This is a substantial list of limitations. In many cases, though, the direction of any bias is evident and, with further work on tax-return income data, its extent can probably be estimated too. Economists and other analysts have used household survey data for many years and thereby built up a reasonably full picture of their strengths and weaknesses. Use of tax return data is more recent and, with time and further analysis, the magnitude of biases and how best to adjust for them are likely to become better known. This could *inter alia* increase their international comparability.

9.3. Trends in the share of top incomes

Introduction

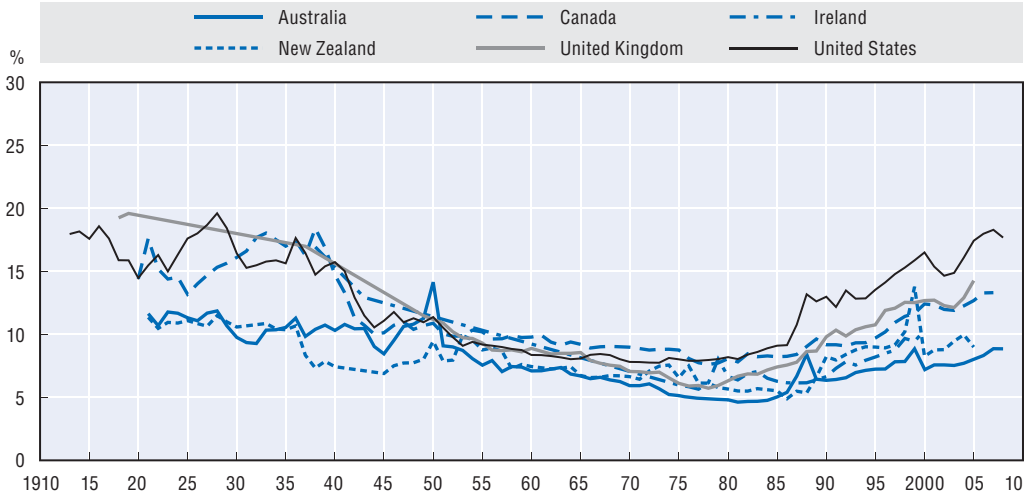
This section discusses trends in the share of the top percentile group in total income in 17 OECD countries for which data are available. Annex 9.A2 provides further data on the top 10% and the top 0.1% group. The characteristics of the top income recipients are then discussed, notably the type of income they receive (salaries, business income, capital income, capital gains) and their occupation. Finally, the section considers the information based on panel data that is available for a handful of countries on the mobility of taxpayers in and out of the top income groups.

Trends

Data for the share of the top percentile group in total income are set out in Figures 9.1 and 9.2. For the reasons discussed above the concepts of income are not strictly comparable, but the chosen measures are as wide as possible (but excluding capital gains).

These data come from the data appendix to Atkinson, Piketty and Saez (2009),[1] with additional information from OECD country delegates in some cases. The information all comes from tax records, apart from the data for Finland.

Figure 9.1. **Top 1% income share, 1910-2008**



Source: Alvaredo *et al.* (2011). Country delegate information: Australia (2000-2008) and Canada (1970-2007).

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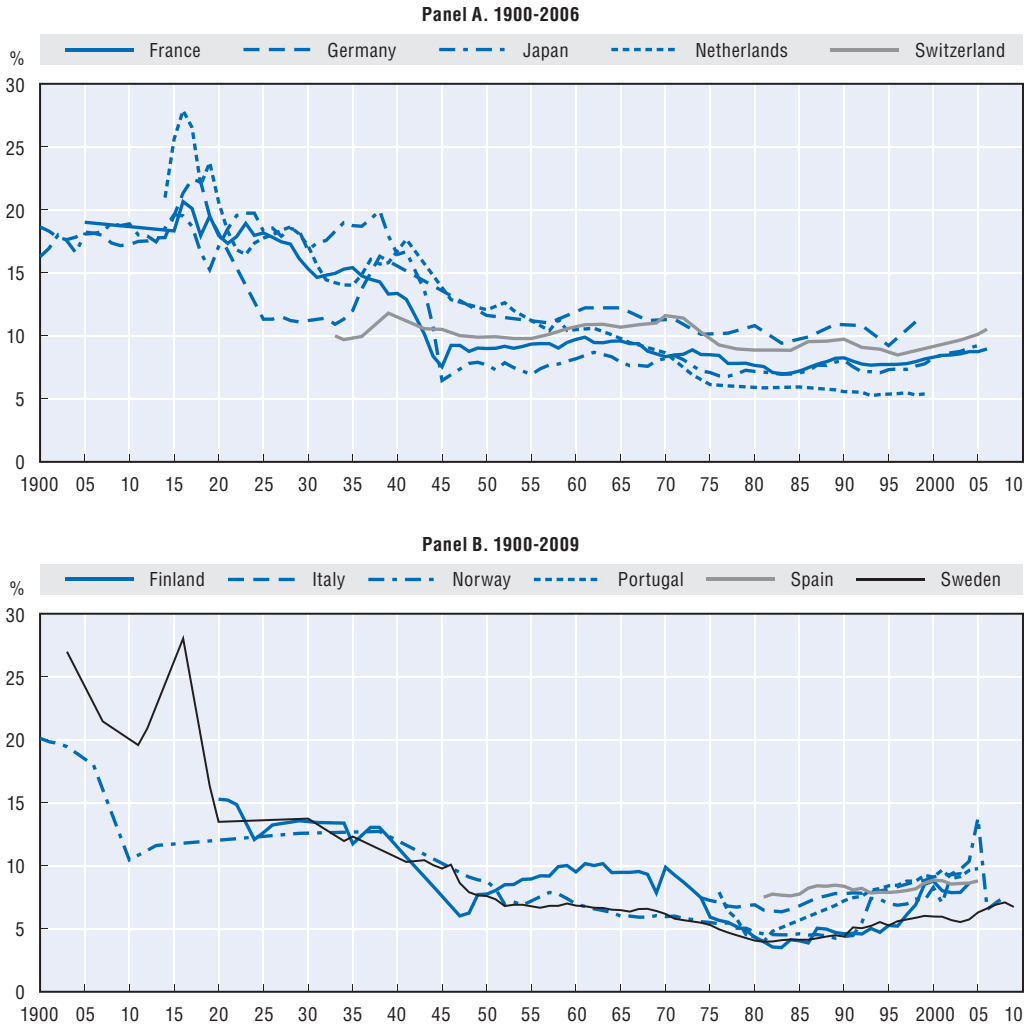
Figure 9.1 shows the shares of the top percentile group in pre-tax income for the English speaking countries from 1910 to 2008 (or the latest available year). The data show considerable year to year variability, but also shows a clear downward trend in the share for all six countries, followed by a substantial increase starting in the late1970s or 1980s. In the case of the United States, the share of the top 1% in 2007 had almost reached the same levels as before the First World War.

Figure 9.2 shows the top percentile group's share for France, Germany, Japan, the Netherlands and Switzerland (Panel A). These countries also show a marked reduction in the first half of the twentieth century, but there is not the clear increase from the late 1970s onwards shown by the countries in Figure 9.1. Japan and France both show a slight increase while the Netherlands and Switzerland show a slight continuing decline and Germany shows no trend at all.

Figure 9.2, Panel B, shows the top percentile group's share for Finland, Italy, Norway, Portugal, Spain and Sweden. Again, there are declines in the first half of the twentieth century, followed by an increase, with the size of the increase lying somewhere between the countries in Figure 9.1 and those in Figure 9.2, Panel A. Spain only has data from 1981 and shows a small increase in the top 1% share since then. Denmark is not shown but its data started in 1990 and show a similar modest increase.

Thus the share of top income recipients in total income in OECD countries was generally very high before the First World War. There was then a large secular decline in their share which was particularly sharp during the World War II period. The drop particularly reflected a decline in capital (rather than labour) incomes. Capital incomes tended to decline in the inter-war period and then fell sharply during the Second World War.

Figure 9.2. **Top 1% income share, 1900-2009**



Source: Alvaredo *et al.* (2011). Roine and Woldenström (2008): Sweden (2007-2009). Country delegate information: Switzerland (1970-2006) and Norway (1991-2008).

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Top income shares tended to remain broadly unchanged or decline further in the 1950s and 1960s, despite the long period of high growth rates in most OECD countries. From the 1980s onward the share of top income recipients has recovered strongly in the United States and, to a lesser degree, other English-speaking countries. This has been associated more with a rise in the incomes of the "working rich" (*e.g.* the remuneration of top executives) rather than a recovery of capital incomes. More recently, Continental European countries have also seen a (generally much more muted) rise in the share of top incomes.

Table 9.1 shows in more detail developments in the share of the top percentile group since 1970. Most OECD countries have experienced an upward trend in the share of the top 1% that started in the 1980s after a period of substantial decline. The exceptions are Germany,[2] the Netherlands and Switzerland, which have only shown evidence of increasing shares of the top 1% more recently. In addition, there was wide variation in the strength of the upward trends that were observed, with the United States showing particularly large increases.

Table 9.1. **Share of top 1% in selected years**

	1970	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008
Australia	5.9	4.8	6.3	7.2	7.6	7.6	7.5	7.7	8.0	8.3	8.9	8.8
Belgium	. .	7.0	6.3	7.0	6.7	7.3	7.2	7.6	7.5	7.7	. .	. .
Canada	9.0	8.1	9.2	12.4	12.3	12.0	11.9	12.3	12.7	13.3	13.3	
Denmark	. .	5.2	5.1	6.6	6.3	5.8	6.3	6.6	6.3	7.1	7.4	6.5
Finland	9.9	4.3	4.6	8.8	8.0	7.9	7.9	8.6	. .	. .	. .	. .
France	8.3	7.6	8.2	8.3	8.4	8.5	8.6	8.7	8.7	8.9	. .	. .
Germany	11.3	10.8	10.9	11.1	. .	. .	. .	. .	. .	. .	. .	. .
Ireland	. .	6.7	6.6	10.3	. .	. .	. .	. .	. .	. .	. .	. .
Italy	. .	6.9	7.8	9.1	9.3	9.3	9.4	9.0	9.1	9.4	9.5	9.4
Japan	8.2	7.2	8.1	8.2	8.5	8.7	8.8	9.0	9.2	. .	. .	. .
Netherlands	8.6	5.9	5.6	. .	. .	. .	5.2	5.5	5.6	. .	. .	. .
New Zealand	6.6	5.7	8.2	8.3	8.8	8.8	9.5	10.0	9.0	. .	. .	. .
Norway	6.0	4.7	4.4	8.3	7.0	9.4	9.7	10.3	13.8	6.5	7.1	7.5
Portugal	. .	4.3	7.2	9.1	9.7	9.0	9.1	9.6	9.8	. .	. .	. .
Spain	. .	7.5	8.4	8.8	8.8	8.5	8.6	8.6	8.8	. .	. .	. .
Sweden	6.2	4.1	4.4	6.0	6.0	5.7	5.5	5.7	6.3	6.6	6.9	7.1
Switzerland	11.6	8.8	9.7	. .	. .	. .	9.6	9.9	10.1	10.5	. .	. .
United Kingdom	7.1	. .	9.8	12.7	12.7	12.3	12.1	12.9	14.3	. .	. .	. .
United States	7.8	8.2	13.0	16.5	15.4	14.6	14.9	16.1	17.4	18.0	18.3	17.7

Note: The data in the first four columns relate to the nearest available year.
Source: Alvaredo *et al.* (2011). Country delegate information: Australia (2000-2008), Canada (1970-2007), Italy (2005-2008), Netherlands (2003-2005), Norway (1991-2008) and Switzerland (1970-2006); Roine and Waldenström (2008): Sweden (2007-2008).

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The top percentile group experienced a bigger proportionate increase in its share than the top decile group in the period since 1990 in all countries but Japan – see Figure 9.A2.4 in Annex 9.A2. This phenomenon was particularly strong in Australia, Canada, the United Kingdom and the United States, but relatively modest in Belgium, France, the Netherlands, New Zealand and Switzerland. Within the top percentile group, the top 0.1% has tended to see the largest (proportionate) increase in their share of total pre-tax incomes. This has particularly been the case in the United States and, to a lesser degree, Canada and the United Kingdom as the charts in Annex 9.A2 illustrate – see Figure 9.A2.3 in particular.

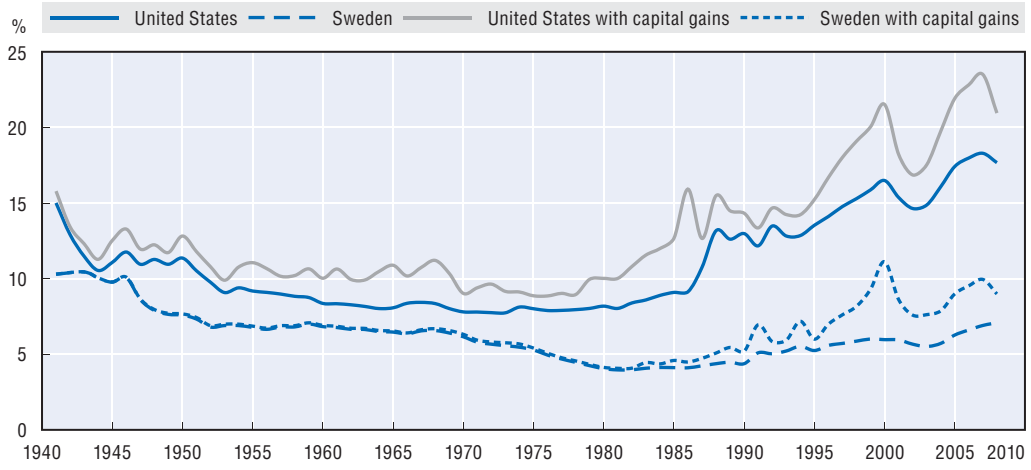
In the countries for which data are available, top income shares continued to rise during the economic expansion to 2007, but then fell back in 2008 with the start of the financial crisis and drop in stock markets. These developments point up a difficulty in interpreting data for the 2000s: what movements should be regarded as cyclical and perhaps therefore temporary? Interpretation of trends can also be clouded by other temporary factors such as the announcement of a tax reform that affects when income is declared for tax purposes – see, for instance, the spike for Norway 2004-06.

Further information on changes in income shares of different fractile groups is set out in the charts in Annex 9.A2. While all the caveats about international comparisons made above have to be borne in mind, they perhaps apply less strongly to *changes* in shares. Even so, changes in tax regimes may affect the measurement of income (as with the "income shifting" in the United States after the 1986 reforms) differently in different countries. That said, the scale of the rise in the share of the top 0.1% in the United States stands out as being substantially larger than the rise in the corresponding share in other countries.

The sources of income of top income recipients

Figure 9.3 shows the series for the top 1% of income recipients with and without realised capital gains for the United States and Sweden. It shows that the inclusion of capital gains increases the share of the top 1%. It also magnifies the increase in the share over the recent past. A similar pattern can be seen for three other countries for which there are such data available: Canada, Spain and Finland (Atkinson *et al.*, 2009). However, for Australia (2000-08) and Norway (1993-2008) income including capital gains did not grow faster than income excluding capital gains, reflecting in part the fall in equity prices in the final year. There is, generally, more year-to-year variation in the time series for income including gains, reflecting not only stock market fluctuations but also timing effects from changes in tax rates on gains that encourage their realisation to be brought forward or postponed.

Figure 9.3. **Effect of capital gains on share of top percentile, 1940-2008**



Source: Sweden: Roine and Waldenström (2008); United States: Alvaredo *et al.* (2011).

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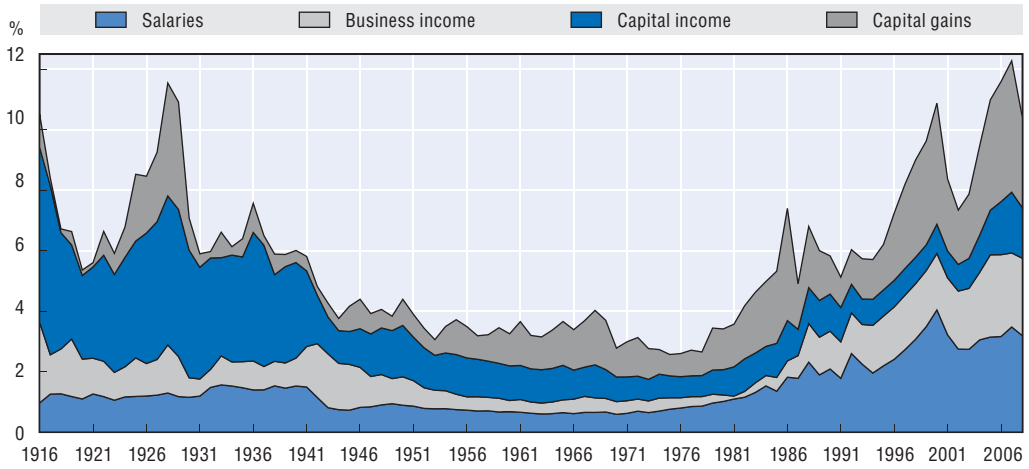
Turning to the shares of different income sources excluding capital gains, Piketty and Saez (2007) found for the United States that employment income, as well as self-employment income and closely-held business income that largely reflects employment income, now account for the vast majority of the incomes of top income recipients; and have also grown as a share of that income in recent decades, as shown in Figure 9.4. (It is worth noting that the realisation of stock options by corporate executives in the United States is treated as wage income.)[3] Although data of this sort are not available for all countries, a similar shift in the composition of top incomes from capital income to earnings occurred in France (Piketty, 2003), Japan (Moriguchi and Saez, 2008), the Netherlands (Salverda and Atkinson, 2007), Canada (Saez and Veall, 2005), Italy (Alvaredo, 2010) and Spain (Atkinson *et al.*, 2009).

However, some countries have had a somewhat different experience. In Sweden (Roine and Waldenström, 2008), the wage share rose between 1945 and 1978 but has fallen back since. In Finland (Jäntti *et al.*, 2010), the share of capital income rose strongly after the mid-1990s. (This might in part reflect the adoption of dual income tax regimes in Scandinavian countries.) In Australia (Atkinson and Leigh, 2007), the share of salaries was almost unchanged over the last twenty years of the 20th century.

Figure 9.4. **Top 0.1% income share and composition, United States, 1916-2008**



Note: The figure displays the top 0.1% income share and its composition. Top 0.1% defined by market income including realised capital gains.

Source: Alvaredo *et al.* (2011).

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In the United States since 1987 much of the growth of business income among top income recipients can be attributed to the increased use of "pass-through" entities after the 1986 reforms, in order to take advantage of lower rates of personal income tax relative to the combined effects (under a classical corporate income tax regime) of tax at the corporate level and on dividends (and gains).

Employment income was the main force between the income growth of the top 1% in the United Kingdom (Atkinson, 2007b), while data in Alvaredo and Saez (2010) suggest that this is also true of the top 0.1% and 0.01% in Spain but it is business income that is most important for the top 10% and 1%. Also, Dell (2007) shows that wages and salaries grew as a percentage of the income of all top income groups in Germany between 1992 and 1998, and this trend is confirmed up to 2003 by Bach *et al.* (2007).

In addition to looking at the evolution of income sources over time for the top income groups, it is worth noting the pattern of income sources across income groups. The general picture is that capital gains, capital income and business income make up a larger share of higher income groups within each country. However, there are exceptions, such as in Canada where capital gains are less important for the top 0.01% than for the top 0.1% and the labour income share is higher for the top 0.1% and 0.01% than it is for the top 1%.

Occupations

Data on occupation of taxpayers are available for some countries. Table 9.2 underlines the importance of executives, managers and professionals in the top 0.1% group in the United States (Bakija *et al.*, 2010). The same paper also points up a sharp rise in the importance of financial professionals (up from 11% of the top 0.1% group in 1979 to 18% in 2004) and estimates that 70% of the rise in the share of the top 0.1% group between 1979 and 2005 went to executives, managers, supervisors and financial professionals.

Table 9.2. **Percentage of primary taxpayers in the top 0.1% of the income distribution (including capital gains) that are in each occupation, United States, 2004**

Occupation	%
Executives, managers, supervisors (non-finance)	41
Financial professions (including management)	18
Not working	6
Lawyers, real estate	11
Medical	4
Other	20

Source: Bakija *et al.* (2010).

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Corresponding figures for the top 0.1% of the distribution in Australia in 2008 show 36% of them are managers, 20% professionals and 34% retired or without employment. Data for the United Kingdom suggests a picture similar to the United States with regard to high incomes in the financial sector. Table 9.3 illustrates the extent to which high-earning managers and professionals are concentrated in certain sectors.

Table 9.3. **Taxpayers analysed by industry, United Kingdom, 2007-08**

Industry	All taxpayers	Top 1%
Financial intermediation	3.2	21.2
Real estate, renting and business activities	13.0	28.5
Other	83.8	50.3

Source: Survey of Personal Incomes 2007-08.

StatLink http://dx.doi.org/10.1787/888932538358

Other characteristics

A few countries produce breakdowns by sex. In the case of Australia, Canada and Norway about 80% of the top percentile of income recipients are men. This ratio has been declining slowly over time. In Sweden this ratio is substantially lower at about 55%.

Data on age distribution of top income groups are available for Australia, Canada, Norway, Sweden and the United States. The data show a similar age profile for all countries – top income recipients are most likely to be in their 40s or 50s. In Australia, Canada and the United States, the modal age-group in the top 10% and 1% were in their 40s, but in the top 0.01% they were in their 50s.

For the most part the tax data sources that provide information on gross incomes do not also collect information of wealth, as it is not needed to administer the personal income tax regime. There may be data from estate or inheritance tax returns from which wealth estimates can be derived, or information may be collected via household income surveys, but it is not linked systematically to income tax data. This might be an area worth studying further in due course, as the relationship between income and wealth concentration may not be straightforward. For instance, the large increase in the share of top income recipients in the United States does not appear to date to have been accompanied by increased wealth concentration – see, for instance, Kopczuk and Saez (2004). Edlund and Kopczuk (2009) argue that there may have been a reduction in inter-generation wealth transfers ("dynastic wealth") broadly matched with a rise in self-made

wealth (*i.e.* wealth accumulated by the successful entrepreneurs, top executives and professionals that account for a large part of the increased share of top income recipients in the United States).

Income mobility

Most of the available income data derived from tax returns are cross-sectional. They show snapshots of the distribution of income at successive points in time). It is of considerable interest, though, to know whether, say, the top percentile group is always made up of the same people, or whether there is significant mobility in and out of this group. Indeed, it can be argued that there would be less concern about income inequality if there were a high degree of income mobility, allowing more people to enjoy the benefit of high incomes. On this view the policy implications of trends in income inequality would depend on the extent of the opportunity for upward mobility.

A significant amount of mobility can be expected from such factors as the relationship between earnings and age (rising as work skills are developed, then falling at retirement), periods when individuals drop out of the labour markets to have and care for children, the effects of illness and unemployment, retirement decisions and the impact of fluctuations in stock markets on income from capital. Some mobility is thus a natural feature of most economies.

Table 9.4 looks at turnover in the top percentile group from year to year. It shows data on the proportion of tax units who left the top income group (which can only occur if their relative income has fallen) for Australia, Canada, Norway, and the United States. In all four countries, there was higher turnover in higher income groups, with the Australian turnover rates in 2008 being around 30% for the top 10%, around 40% for the top 1% and around 67% for the top 0.01% and the corresponding numbers for the United States being 18%, 30% and 71%. Overall, although the turnover rates vary, there was no clear time trend, with some tendency toward increased turnover in Norway and the United States (in the case of the top 1%).

Table 9.4. **Turnover rates for the top 1% (exits compared with previous year)**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Australia	. .	. .	. .	. .	. .	. .	. .	38.6	37.8	36.9	36.1	35.6	35.5	37.1	38.7
Canada	30.1	30.3	31.1	30.6	30.4	29.5	30.8	31.1	29.9	28.4	27.7	28.1	28.4	28.9	. .
Norway	29.8	28.8	29.2	30.1	31.5	32.3	34.1	35.7	35.9	35.9	35.3	39.0	56.1	36.3	36.7
United States	23.7	22.7	23.1	24.3	27.2	27.4	28.3	27.4	26.3	26.2	25.6	26.5	25.7	26.4	27.2

Source: Data provided by OECD country delegates.

StatLink http://dx.doi.org/10.1787/888932538377

Given the dependence of an individual's income at any one point in time on age and particular life events that (s)he happens to be experiencing, one might ideally want to look at lifetime income and analyse whether lifetime incomes have become more unequal, or not. Panel data mostly do not follow the same individuals over a sufficiently long period of years to enable such a lifetime perspective. Some studies do, though, exist. For instance, a paper by Bradbury and Katz (2002) using the US Panel Survey of Income Dynamics for instance, suggests significant mobility across income quintiles over the 1970s, 1980s and the 1990s, but with a small decline in the extent of relative mobility in the 1990s.

The United States Internal Revenue Service has collected data over a large sample of taxpayers for more recent years including over-sampling of high income recipients. This provides more representative data of such taxpayers than survey data. The data are for taxpayers rather than the total adult population, though the fact that some 90% of working age adults file returns suggests that the difference may not be too material.

The data cover taxpayers over 25 (to avoid counting transitions from school or college to work as mobility). The primary and secondary taxpayers where a couple file jointly are followed (*e.g.* in the event of a divorce) and income is adjusted for family size (by dividing by the square root of the number of members of the household). Results for taxpayers who filed returns in both 1996 and 2005 are reported in Auten and Gee (2009). Their main findings are:

1. Taxpayers who filed returns in 1996 on average had moved up the distribution of the total taxpaying population of 2005, reflecting the entry of a new cohort of 25-34 year olds and immigrants with below average incomes.
2. If the potential for this source of upward movement in the income distribution is removed from the data by looking only at the same group of taxpayers who filed returns in both 1996 and 2005, the statistics still show considerable income mobility. For instance, over 60% of taxpayers in the top percentile in 1996 had dropped down the distribution by 2005.
3. In terms of real incomes (adjusted for family size) the median income of taxpayers in the panel in both years rose 23% and two-thirds of taxpayers experienced an increase. However, the median income of those in the top percentile in 1996 had declined by some 30% by 2005.

Table 9.5 provides further statistical analysis of changes in the relative and absolute incomes of the top percentile group in 1996, further illustrating the transience of the composition of membership of this group. Nevertheless, looking at the very top of the distribution (the top 0.01%, or some 12 000 US taxpayers) while less than a quarter remained in this group by 2005, 80% stayed in the top percentile group. Perhaps in contrast to expectations, the real incomes of 60% of those in the very top group in 1996 had decreased by more than 50% by 2005. Less than 40% of the top percentile group in 1996 remained in this group in 2005.

Auten and Gee (2009) go on to compare the degree of relative income mobility over the 1996-2006 period with the previous decade (1987-1995) and find virtually no change in relative mobility. The only significant difference between the two periods was a decline in downward mobility for those in the top income quintile but below the top 1% in the initial year. The results indicate that larger changes in absolute incomes were sufficient to offset wider income gaps and keep relative mobility unchanged. They also find that changes in mobility of after-tax incomes are similar to those in pre-tax incomes.

Saez and Veall (2005) found similar results for Canada using a panel of longitudinal data going back to 1982. Income mobility (looking at one, two and three year periods) has been broadly unchanged over time, with, if anything, a slight tendency to decline over time.

Conclusions

This section has pointed up the remarkable increase in the share of top income recipients in total income over the past three decades in the United States, but also noted that there is a continuing significant level of turnover from one year to the next and one

Table 9.5. **Income mobility of the top percentile group of United States taxpayers, 1996-2005**

Income mobility relative to total taxpayer population				
2005	1996 income group			All income groups
Income percentile	Top 0.01 %	0.01-0.1 %	0.1-1.0 %	
Top 0.01 %	23	3	0.3	0.01
0.01 – 0.1 %	32	21	5.6	0.1
0.1 – 1 %	27	38	31	1
1 – 5 %	11	20	34	4.3
5 – 10 %	0.2	3	9	5.5
15 – 20 %	0.5	5	7	11
Below top 20	6	10	15	18.1
All	100	100	100	100
Changes in real incomes adjusted for family size				
% change	1996 income group			All income groups
Real income	Top 0.01 %	0.01-0.1 %	0.1-1.0 %	
Fall more than 50 %	60	53	41	8.1
Fall 25 – 50 %	9	11	15	9.7
Fall up to 25 %	6	8	11	14.6
Rise up to 25 %	5	6	8	17.1
Rise 25 – 50 %	3	4	6	14.8
Rise 50 – 100 %	5	6	6	16.9
Rise over 100 %	12	12	13	18.9
Total	100	100	100	100

Source: Auten and Gee (2009) from IRS Statistics of Income.

StatLink http://dx.doi.org/10.1787/888932538396

decade to the next in the individual taxpayers who make up the top income groups. Other countries have seen smaller increases in the shares of top income recipients in total income. These increases have been largest in a number of other English-speaking countries (Australia, Canada, Ireland and the United Kingdom) than elsewhere; and the increases have been much more modest in some Continental European countries (France, the Netherlands).

Importantly for the discussion of the explanation of these trends in the next section, the greater part of these increases in top incomes are attributable to rising labour and business, not capital income. Most data are available for the United States and the United Kingdom and they show that it is the rising incomes of executives and (finance) professionals that account for much of the rising share of top income recipients. Data for the United States, Canada and a handful of other countries suggest that mobility into and out of the top income fractiles has been broadly stable, or decreased slightly.

9.4. Explanations of the trends in top incomes

Introduction

There are two major trends in the top income data. The first is a decline of top income shares that took place over the first three-quarters of the last century. The second is the increase in top income shares of all but a few OECD countries over the last few decades.

Atkinson, Piketty and Saez (2009) suggest that the initial decline of top income shares was probably due to a combination of factors:

- The destruction of capital during the two world wars, plus the effects of wartime inflation and controls over prices and rents.
- The equalisation of earned income during the Second World War, at least partly as a result of wartime wage controls.
- The loss of wealth in the financial crisis of the 1930s.
- The large extension of progressive income taxation and taxation of inheritances which made it more difficult for the rich to maintain their wealth.

Turning to the more recent increases in top income shares, countries have differed substantially in the timing and extent of their increase in top incomes. Any overall explanation of the trends must allow for different factors acting in different countries and/or for the response of different economies to common factors being different because of differences in economic structures. That said, the story underlying the big increases in top income shares in many countries is primarily about employment (and business) income. This is particularly the case in the United States (where the biggest rise in the share of "top incomes" has occurred, as described in the previous section.

Analysis of causes in trends in the distribution of income is in any case likely to be contentious, especially given the scale of the increase in the share of top incomes in some countries in recent years. The role of tax cuts had been particularly controversial. Does the rise in top incomes share reflect a real response to improved incentives through increased effort, entrepreneurship, etc.? Does a significant part of the rise in the chosen measure of income simply reflect income-shifting and other tax planning responses to tax changes? Or are there drivers that are unrelated to tax changes that have increased the share of top incomes irrespective of what happened to tax regimes and rates?

At this stage, it is only possible to discuss different factors that could form part of an overall explanation without any conclusion about their relative importance. The factors, which will be discussed in turn, are:

1. The substantial reduction in top rates of personal income tax.
2. The effects of "supply and demand" factors such as increased international trade, globalisation and skill-biased technical change on the relative wages of skilled and unskilled workers, including on the incomes of "stars".
3. Changes in the way that labour markets function, notably the erosion of pay norms.
4. Factors influencing the remuneration of top executives and finance professionals, *e.g.* performance-related pay, stock markets and corporate governance

The effects of reductions in tax rates

There are a number of ways in which lower tax rates could lead to increases in top income shares, including: *i*) changes that have little effect on the "real" economy such as tax planning that leads to more income taking the form of personal income (and less as, say, corporate income) or a reduction in tax evasion, *ii*) an increase in work effort and entrepreneurship, and *iii*) an increased ability of high earners to accumulate wealth. Distinguishing between the first two of these effects can be difficult, while the third cannot readily be measured directly.

Evasion

In the case of tax evasion, lower tax rates in principle reduce the financial benefits of such behaviour, *i.e.* the amount of tax saved. Inevitably, though, there is little direct evidence on the scale of evasion – at best only its "shadow" can be observed. And the scale of evasion will depend on other factors such as perceptions of the risk of detection, the financial penalty and social stigma if tax fraud is detected, the availability of (third party) information to the tax authorities to verify taxpayers' information, and other factors. Overall, tax authorities judge the scale of tax evasion (and more aggressive forms of tax avoidance) to be significant and perhaps to have grown (perhaps assisted by globalisation) notwithstanding the effects of lower statutory tax rates. This has been a driver of the moves under OECD auspices to improve exchange of information for tax purposes. The latest information on the OECD's work on this is contained in the "Istanbul Communiqué" (*www.oecd.org/dataoecd/18/25/46026232.pdf*).

Elasticities of taxable income

Meghir and Phillips (2010) provide a comprehensive recent review of the literature on the effects of tax on labour supply. Much of this work has focused on people of average or below-average incomes. However, some has dealt with people on high incomes. There are two particular difficulties in analysing the effect of income tax on high income individuals. First, the main variation in their work is not their labour market participation or their recorded hours of work; it is the effort that they put into their work. This means that there is little to be learnt from looking at how their hours of work respond to taxes, and it is necessary to look at the income they earn instead. Second, high income workers find it easier than most to avoid tax on their income; so there is a difficulty in using taxable income as measure of effort and one should look at a broad measure of gross income, as well as taxable income – as discussed further in Section 9.5 below.

Because of the first difficulty, the behavioural effects of a change in tax rates are obtained by estimating equations that try to explain changes in income by changes in marginal tax rates. In fact, the equations typically use the share of income retained (1 – marginal tax rate) instead of the actual marginal tax rate. The key parameter that is estimated is the elasticity of income with respect to the share of income retained, which is a positive number.

Meghir and Phillips provide a table of results from a number of studies, but the study that they regard as best is Gruber and Saez (2000), which uses data from the United States from 1979 to 1990 and so analyses the effects of the 1981 and 1986 tax changes. For the population as whole, they estimate elasticities for two different income concepts: *i)* a "broad income" definition that includes items of income that are untaxed, and *ii)* a narrower taxable income (which takes off the deductions that taxpayers claim in preparing their tax returns). The elasticity with respect to broad income is 0.12 and the elasticity with respect to taxable income is 0.4. They also estimate elasticities of taxable income separately for high income and low income individuals. For the high income, it is 0.57 and for the low income it is 0.18.

In addition, their results for taxpayers with incomes in 1979 above USD 100 000 suggest that while their elasticity of broad income is slightly higher than for the population as a whole (0.17 compared with 0.12), their elasticity of taxable income is substantially

higher (0.57). In other words, people on higher incomes engage in more tax planning (as a proportion of their income) and this tax planning responds to marginal tax rates.[4]

A particularly pervasive form of tax planning has been through shifting of business income into a form in which it is more lightly taxed, *e.g.* through the adoption of a business form that exploits differences between personal and corporate income tax rates. This might make it financially attractive either to incorporate or to use a "pass-through" entity, depending on the specific circumstances. In the United States the use of "pass-through" arrangements has grown massively since the 1986 tax reform brought personal tax rates below those on corporations: about half of business income is now in pass-through form compared with about a quarter in the early 1980s (Department of the Treasury, 2007, Chart 3.1)

Another piece of empirical work, by Atkinson and Leigh (2010), also finds significant effects of tax changes on top incomes. It analyses and compares top income shares for Australia, Canada, New Zealand, the United Kingdom and the United States. Using these data as a panel from 1970 to 2000, they estimated the relationship between the shares of the top 1% in these countries and the marginal tax rates, using country fixed effects to control for (constant) differences between countries and year fixed effects to capture non-tax factors that affect these shares (which are assumed to have the same effect in each of these countries). They conclude that the changes in tax rates over this period can account for between one third and one half of the increase in the shares of the top 1% in these countries.

Thus, as top marginal tax rates have fallen over the last 30-40 years, income shifting and other forms of tax planning could be part of an explanation of the increased share of reported top incomes and of the fact that the highest income groups have experienced the greatest increase. However, the nature of the data means that the differences in taxable income elasticities cannot be used to estimate precise distinctions between "tax planning", evasion or "real" behavioural effects.

That said, there is evidence that there are real responses (such as increased work effort and entrepreneurship) to tax rate changes and not just changes to reporting of income for tax purposes. The study by Gruber and Saez (2002) for the United States, for instance, shows that broad income (*i.e.* a measure of income less subject to tax planning effects) does respond to changes in the marginal tax rate and suggests that this effect is higher for people in higher income groups. However, the continued rise in the shares of top income recipients in the United States after top personal tax rates were increased in 1993 suggests that other (non-tax) factors have also been important.

Increased wealth accumulation

The fact that marginal rates of income tax have fallen in OECD countries over recent years (and in many countries taxes on property and inheritances have also fallen) implies that top income groups are able to keep a higher proportion of their income. This means that it is easier for rich people to accumulate wealth, and this could lead to increases in their capital income in the future.

It is hard to tell whether this process has yet contributed to the observed increase in top income shares since 1970, especially as in most countries for which data were available, the increase in the share of top incomes is associated with a increases in labour income, rather than capital income. However, the Netherlands, Sweden and the United States saw some

increase in the share in capital income in total income at the top of the income distribution in the 2000s and capital gains have become a more important part of the income of top income groups in most of the countries for which data are available.

The effects of globalisation and skill-biased technical progress

One of the most popular explanations of the general increase in inequality is that the greater participation of low-wage economies in international trade has reduced the world prices of goods that are relatively intensive in low-skilled labour. Another is that technical change over the last few decades, particularly the widespread use of computer technology, has been skill-biased in the sense that it has increased the relative demand for skilled labour. This, it is argued, has increased the relative wages of skilled to unskilled workers. As this explanation works through the same mechanism – relative wages – as the international trade explanation, it can be difficult to distinguish the two empirically. This issue is discussed at length and analysed in Part I of this study above.

However, even if this is a partial explanation of the increase in the income of the top decile point relative to the rest of the population, it may not provide much explanation of trends within the top decile group, notably the increased concentration within this group in many countries. The top 10% group of income recipients is unlikely to include many unskilled workers, so theories that seek to explain skilled/unskilled relative wages cannot explain the redistribution that has taken place within this group.

Other (perhaps more subtle) changes may have increased skill premiums within the top decile group. The idea that "stars" – people who are regarded as the very best in their profession, even if it is not in entertainment or sport – have their earnings determined in a particular way has a long history in labour economics. The basic idea is that employers of "stars" are not simply interested in the absolute quality of the workers they hire but also their relative quality. In other words, they want to hire the best workers. This can be observed in the entertainment industry, where there is a large difference in incomes between the most popular entertainers and those that are just a little bit behind them in terms of ability.

Atkinson (2008) argues that the improvements in information technology and the growth of trade has meant that the market for "stars" has become global. Employers do not just want the best person in their country; they want the best person in the world. This means that the demand for these stars around the world is focussed on a smaller number of "global stars", whose earnings have increased enormously compared to "national stars". This is an interesting theory with some empirical support, and may provide some explanation of why the incomes of the top 0.1% or even the top 0.01% have increased more rapidly than top income recipients as a whole, especially when taken together with the changes in performance-related pay for tax incentives discussed below.

International linkages between labour markets may in some cases be more extensive than the market for "stars". For instance, very high-skilled Canadians have the option of going to work in the United States, especially after 1995 when the North American Free Trade Area (NAFTA) allowed highly skilled workers to get US work visas more easily. Saez and Veall (2005) see such mobility as having a significant causal influence on the increased share of top income recipients in Canada. They note that the there is less need to pay high salaries in Canada to retain francophone Canadians and that there has indeed been a more

modest rise in the top shares in Quebec. The mobility of high-skilled workers could also be a factor in explaining trends in other countries such as New Zealand.

Changes in labour markets

There have been substantial changes in labour market policies and institutions over the past 30 years or so, including declines in unionisation, a reduced role for collective bargaining, and variations in minimum wages and social security safety-nets in relation to average wages (discussed in Part I above). Many of these are unlikely to have much direct effect on top incomes. Nevertheless, there are two factors that deserve particular attention: the growing use of performance-related pay and changes in pay norms. The former is considered further in the next section, the latter in the next paragraph.

The idea that pay norms affect wage differentials has a long history in labour economics, even though it is not compatible with simple competitive theory. As noted above, wage compression during the Second World War is likely to have been one of the factors that reduced the share of top earners in the middle of the last century. Atkinson (2008) argues that pay norms that used to limit wage differentials have been eroded over the past few decades and lays out a model in which the way in which norms are determined could result in there being two distinct equilibria: one with modest wage differentials and the other with more substantial differentials. Atkinson argues that this can explain some of the large increases in the incomes of top salary earners.

Remuneration of top executives and finance professionals: performance-related pay, stock markets and corporate governance

This section focuses primarily on experience in the United States where the particularly large increases in the shares of top income recipients and the important part played by the remuneration of top executives (and finance professionals) has naturally attracted attention. There is evidence from the labour economics literature that increases in earnings inequality have been "fractal" in nature – almost regardless of how a group is defined (including by occupation) earnings inequality has increased within that group (*e.g.* see the survey by Levy and Murnane, 1992). This is also evident in the data on the incomes (by occupation) in the top income groups. Large divergences in the growth of incomes of people in the same profession suggests that they are not just being affected by common trends but also that mechanisms are at work that accentuate differences. One such mechanism has been the growth of performance-related pay.

Lemieux, MacLeod and Parent (2007) analysed data for the United States and showed that the spread of performance-related pay can explain about a quarter of the growth in the variance of male wages between the late 1970s and early 1980s. They claim that it accounts for nearly all of the growth in wage dispersion in the top 20% of labour incomes. As increasing top labour incomes have been a major component of the increase in the top income shares, it appears that this could be a substantial explanation of recent trends. Performance-related pay has grown particularly strongly in the United States but it is spreading to other countries, partly in an attempt to attract internationally mobile workers.

The form of remuneration can perhaps be regarded as to some degree a proximate cause. It prompts questions about what factors have driven businesses to change their remuneration policies in this way. Implicitly, there is a presumption that there must be increased competition for highly skilled executives and finance professionals, but what

lies behind this? Similarly, given that the performance element in remuneration has often taken the form of stock options, is this an effective way of aligning the interests of (top) employees and shareholders and thus of improving incentives to make businesses more efficient and profitable? Or is it, in effect, a sign that managerial discretion has enabled managers to siphon off more profits? Related corporate governance issues are the processes through which top executives and finance professionals have seen much faster growth in their incomes than average pay rates: are boards of directors sufficiently rigorous about setting the remuneration of their executive colleagues, for instance?

One consequence of the gearing of top executives' pay to equity prices through remuneration in the form of stock and stock options, is that the share of top income recipients in total income is likely to be more closely correlated with equity prices than in the past. This is indeed consistent with such facts as the dips in the share of top income recipients after the stock market peaks of 2000 and 2007. This is particularly the case for measures of income that include gains (see Figure 9.3 above).

Conclusions

While some of the increase in the share of top income recipients of total pre-tax incomes can be explained in terms of changes in the reporting of income for tax purposes, notably in the United States, this is only part of the explanation. Countries have differed in the timing and scales of their tax reductions and the extent to which income-shifting (leading to more income being reported) is practicable or worthwhile. Even in the United States the surge in the share of top income recipients continued when top marginal tax rates were raised.

Among non-tax factors, competition for top executives and finance professionals appears to have played a significant role in raising the shares of top income recipients, at least in the countries that have seen the biggest increases in top income shares such as the United States, Canada and the United Kingdom.[5]

9.5. Tax policy implications

Introduction

In some countries top income recipients are now quantitatively very important for government tax revenues. In the United States the top percentile group of taxpayers paid 40% and the top 5% paid 60% of federal income tax in 2005 (IRS data reported in Mudry and Bryan, 2009). Similar distributions occur in other countries, although to a less marked degree. For instance, in the United Kingdom the top 1% of taxpayers paid some 24% of personal income tax in 2006-07 (HMRC Statistics).

Where the share of top income recipients' share of gross personal incomes has risen, it may be worth considering whether taxes could (or should) be increased for these taxpayers in order to take advantage of the apparent increase in their "ability to pay" to raise more tax revenues; and also to make the distribution of after-tax income less unequal. Accordingly, this section looks first at the extent to which top income recipients are already taxed and at how post-tax income shares compare with the pre-tax shares considered so far in this chapter. It then reviews how top marginal rates of personal income tax have evolved over the past 30 years.

The desirability of increasing the average tax burden on top income recipients depends on a number of factors, including the reasons for the increase in their share of

pre-tax incomes, value judgements about how socially undesirable inequality is, how an increase in average tax rates is achieved and on an assessment of the economic harm that might result. This section considers the pros and cons of raising marginal personal income tax rates, and includes a brief review of the evidence on taxable income elasticities (particularly for the United States). It then looks at other options for raising additional tax revenues from high income recipients such as reducing the value of tax reliefs and tax expenditures, changes in the treatment of capital gains, and increased taxation of property.

The effects of taxes on top income recipients

The data presented and analysed so far in this chapter have been for pre-tax incomes. If the personal income tax (PIT) regime is progressive (*i.e.*, average tax rates rise with income) the share of top income recipients in post-PIT income will be smaller. Personal income tax schedules are in general designed with ability to pay (as well as economic efficiency) in mind and the practice of exempting a large initial slice of income from tax means that the average tax rate rises with income. This is often combined with some rise in the marginal tax rate applied to successive income bands. Table 9.6 shows the extent to which average personal income tax burdens rise with income in the United States, France and the United Kingdom. For all three countries there is a marked degree of progressivity within the top percentile group (with some variation from country to country).

Table 9.6. **International comparison of average PIT rates**

	United States (2004)	France (2005)	United Kingdom (2000)
Full population	11.5	3.8	15.0
Percentile 0 – 90	5.4	1.8	9.7
90 – 95	11.6	4.5	15.8
95 – 99	16.4	7.0	21.7
99 – 99.5	21.4	11.6	27.7
99.5 – 99.9	23.8	16.4	30.5
99.9 – 99.99	25.1	22.3	33.2
99.99 – 100	26.2	28.8	34.5

PIT = Personal income tax.

Source: Piketty and Saez (2006).

StatLink http://dx.doi.org/10.1787/888932538415

Average tax rates applied to the top percentile group of income recipients in other countries are generally higher than in the United States, as Table 9.7 indicates (figures are for PIT only) and suggests that over the past decade average effective PIT rates on the top percentile group have tended to fall.

However, looking at the effects of PIT alone gives an incomplete picture of the potential redistributive effects of direct taxes. Social Security Contributions tend to be much less progressive if not regressive (see Chapter 7). Indeed, there is often a ceiling on contributions, so that they effectively become a lump sum tax for top earners (and are thus regressive at these income levels).[6] On the other hand, wealth taxes levied on the fortunes of the very rich could be very progressive and should in principle be considered alongside PIT in assessing the progressiveness of a tax regime.

Table 9.7. **Average personal income tax burdens on top percentile group**

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008
Australia	. .	33.1	39.7	39.2	39.6	40.0	39.9	39.0	37.2	37.9
Belgium	38.6	41.5	41.5	37.9	36.3	35.5	35.8	35.3	. .	. .
Canada	38.3	39.7	35.9	35.3	35.4	35.3	35.6	35.5	35.0	. .
Denmark	59.5	47.2	48.3	48.3	47.8	46.1	46.5	44.2	46.9	43.8
Italy	. .	. .	. .	. .	. .	35.9	35.1	35.5	36.6	36.4
Netherlands	. .	. .	. .	. .	32.0	32.9	33.8	. .	. .	. .
Norway	26.2	29.9	33.7	21.2	20.0	20.7	17.5	39.4	39.2	33.5
Sweden	32.5	37.4	38.2	36.6	36.4	37.3	37.4	35.7	33.5	32.3
United States	25.3	36.6	32.4	30.5	28.1	28.9	29.9	30.2	30.5	27.5

Note: The data in the first column for Norway and Sweden relates to 1993 data.
Source: Data provided by OECD country delegates.

StatLink http://dx.doi.org/10.1787/888932538434

Overall, the share of top income recipients in post-tax income is smaller than their shares of pre-tax income. This is the case even where (as in Piketty and Saez, 2006), allowance is made for other direct taxes, *e.g.* payroll taxes, estate duties and corporate taxes, as well as PIT. Their estimates for the United States for 2004 (which are on such a basis) are set out in Table 9.8 below.

Table 9.8. **Shares of pre- and post-tax income in the United States, 2004**

	Pre-tax income share	Post-tax income share
Percentile 0-90	53.75	57.28
90-95	11.29	11.07
95-99	15.28	14.51
99-99.5	4.11	3.69
99.5-99.9	6.63	5.8
99.9-99.99	5.46	4.69
99.99-100	3.48	2.96

Source: Piketty and Saez (2006).

StatLink http://dx.doi.org/10.1787/888932538453

Top marginal income tax rates

While the overall PIT structure in a country will affect how much tax top income recipients pay, the top marginal rate of tax is likely to be particularly significant for them. Table 9.9 summarises the history of top rates in major OECD countries over the past 30 years.

There has thus been a marked fall in top marginal PIT rates.[7] In some countries much of this reduction occurred in the 1980s (Australia, Canada, Italy, Japan, the United Kingdom and the United States), but in some countries (*e.g.* France and Germany) governments made more modest and gradual reductions. It is worth noting that those countries that made the bigger and earlier cuts also saw bigger rises in the shares of top incomes, though (as discussed above) the scale of the causal relationship remains unclear.

Average tax burdens are naturally below top marginal tax rates, reflecting not only the standard personal allowances and lower rate tax bands, but also other tax reliefs and tax expenditures (*e.g.* for mortgage interest relief, saving in pension funds and charitable deductions).

Table 9.9. **Top marginal rates of central governments personal income tax (%)**

	1981	1990	2000	2010
Australia	60	47	47	45
Canada	43	29	29	29
France	60	57	53	40
Germany	56	53	51	45
Italy	72	50	49	43
Japan	75	50	37	40
United Kingdom	60	40	40	50
United States	70	28	40	35

Source: OECD, data from country delegates.

StatLink http://dx.doi.org/10.1787/888932538472

Effects of raising marginal personal tax rates

Two key issues when looking at the redistributive effects of an increase in marginal tax rates are whether this directly increases progressivity and how much additional revenue would be raised.[8] The key parameter for estimating the additional revenue is the elasticity of tax revenue to changes in the marginal tax rate faced by those on top incomes. This parameter is also key to estimating the distortionary effect (efficiency reduction) of any tax change, as it captures both the reduction in work effort and the increase in the diversion of resources to (socially wasteful) tax avoidance and evasion (on the assumption that people chose their level of these activities in order to maximise their personal utility).[9]

Estimates of the elasticity of taxable income are obtained by estimating equations that try to explain changes in taxable income by changes in marginal tax rates. Estimation is a difficult task as tax rates are to some degree endogenous. This is why researchers have focused on episodes such as an (unexpected) tax reform that produces an exogenous change in marginal tax rates. It is also important to control for a range of other factors that can also give rise to spurious results. Unsurprisingly, there have been wide variations in estimated elasticities (Saez *et al.*, 2010).

Gruber and Saez (2000) estimate for the US elasticities with respect to the tax rate of 0.12 for "broad income" and 0.4 for taxable income, with an estimate for the latter of 0.57 for high income recipients and 0.18 for low income recipients.

In order to obtain some intuition about what these numbers mean, consider a marginal tax rate of 50%, which is increased to 51%, the proportionate reductions in income would be:

- For broad income (elasticity = 0.12), 0.24%.
- For taxable income (elasticity = 0.4), 0.8%
- For high income people (elasticity = 0.57), 1.14%
- For low income people (elasticity = 0.18), 0.36%

In the case of a high income individual, the additional tax paid would be slightly less than half the amount had there been no behavioural response, if the higher rate of tax applied to the entire person's income. If, however, the higher tax rate applied to only half the person's income (*e.g.* because of increasing marginal tax rates), no additional tax would be paid.

These estimates suggest that increasing marginal tax rates on high income individuals would reduce their taxable income substantially, and so may collect little or no

extra revenue which could be redistributed to people on lower incomes. In addition, the comparison between elasticities for the broad income and the taxable income suggest that there could also be significant "real" effects.

However, elasticity estimates for different time periods and different countries may differ:

- Countries differ considerably in their estimated elasticity of taxable income. For example, Saez *et al.* (2010) report a study of Denmark that concluded that the elasticity there is substantially lower than that found in other countries. Holmlund and Söderstrom (2007) estimate an elasticity of 0.29 for top income recipients for Sweden. However, Brewer, Saez and Shephard (2010) report a range of elasticities for the United Kingdom, depending on the controls used, of between 0.46 and 0.73 for the period 1962-2002.
- Saez, Slemrod and Giertz (2010) compare studies from the United States for different time periods and conclude that as the 1986 tax reforms reduced the availability of tax deductions and exemptions, the elasticity will have fallen. Tax elasticities thus depend on the scope that tax law gives for tax planning.
- Estimates of the effects of a change in PIT rates on receipts should ideally make allowance for the effect on other tax bases due to income-shifting and timing effects (*e.g.* higher PIT rates may mean some increase in receipts from taxes on capital gains or corporate income), but often this is not practicable. This may mean that estimates may overstate the net overall reduction in tax payments that results from tax planning, and hence understate the net receipts from increasing tax rates.
- There may be variations in the extent to which the incomes of top earners include an element of economic rent, the taxation of which would have little effect on effort. Some argue, for instance, that the remuneration of top executives and financial sector professionals includes a significant element of economic rent.
- International mobility of high income individuals may be more of an issue for some countries than others. For instance, the responsiveness of top income recipients in English-speaking countries to differences in after-tax pay compared with the United States may be greater than for other top income recipients. Such international mobility would also imply that the location-specific element of any economic rent in the earnings of top executives and financial sector professionals might be relatively small in practice.

These considerations suggest that countries need to undertake a thorough analysis before considering the advantages and disadvantages of increasing top marginal tax rates.

Raising average tax rates by reducing tax expenditures

Concerns about the effects of raising (top) marginal PIT rates also point up the desirability of seeking to reduce the scope of tax planning and avoidance opportunities. Measures that achieve a higher average rate of tax on top income recipients without also raising their marginal rate would enable more redistribution, with less unwanted distortion of labour supply and "effort". An example of the type of reform that could achieve this would be imposing restrictions on the amount of relief that can be claimed for mortgage interest or charitable donations. For instance, relief could be provided at less than the top marginal tax rate, or the maximum tax saving (in dollar terms) could be capped. Such restrictions are likely to bear more heavily on high income than middle/ low income taxpayers. Thus it should be possible to increase average tax rates on top income recipients (*i.e.* the rate most pertinent to revenue raising and redistribution) while not

raising marginal rates for most of those affected (*i.e.* the rates most pertinent to economic distortions). OECD (2010a) provides further discussion of "Choosing a Broad-base Low-rate Approach to Taxation".

Taxation of capital income

Notwithstanding the important part played by the increase in employment and business income in driving the growth in the share of top income recipients in many countries, the top fractile groups continue to have proportionately more capital income than the rest of the population. Increased taxation of capital income could thus in principle raise additional revenues and have a significant redistributive effect. However, there could also be substantive behavioural effects that could be damaging not just to the size of the total "cake" but also to its future growth. The effects of increased taxation on aggregate saving is, though, difficult to determine in theory (as the income and substitution effects of reducing the effective net of tax rate of return may go in opposite directions) and in practice (given the many other determinants of aggregate saving).

The large literature on the effects of taxation of capital income is summarised in Attanasio and Wakefield (2010), who conclude that the behavioural response is small. On the other hand, there is an argument that, because the tax distortion of savings compounds over time, income from capital should not be taxed. This argument holds even if the behavioural effect is small, provided it is not actually zero. Banks and Diamond (2010) analyse this argument in detail and conclude that it only applies in very restrictive circumstances. They conclude that capital income should be taxed but are agnostic about the appropriate rate.

These uncertainties about the behavioural effects of taxing capital income suggest, particularly in a small open economy, some caution with regard to options to raise tax rates on capital income across the piece. However, there is rather more evidence that significant distortive effects can arise from treating different sources of capital income differently, *e.g.* effectively exempting (or even subsidising) the return on owner occupied housing tends to divert saving and investment away from other activities that may be more growth-oriented.

The issue is, though, how to design and implement a more rational and neutral regime. One approach with significant support in the economics literature would be to introduce some form of "expenditure" tax in which only capital income in excess of a "normal" rate of return would be taxed, as proposed in the recent Mirrlees review report, *Tax by Design* (2010). Whatever the potential advantages of such a regime on economic efficiency grounds, it would tend to make already-wealthy people even better off through taxing their capital income more lightly. For this to be socially acceptable, much more rigorous taxation of capital transfers not only on death but also inter vivos would almost certainly be needed. Giving savers some form of "Rate of Return Allowance" would, though, permit progressive taxation of capital income in excess of this allowance. By contrast dual income tax regimes – another approach to rationalising the tax treatment of capital income – have (in the forms that have been adopted to date) applied a proportional tax regime to capital income (while continuing to tax labour income under a progressive rate structure).

A more practicable approach, in the short term at any rate, might be to scale back tax reliefs and tax expenditures for capital income that benefit high income recipients

disproportionately. Tax reliefs to encourage saving for retirement or owner occupation of dwellings were often designed primarily with people of more modest means in mind, but, if uncapped, can provide large tax savings to high income recipients. The arguments set out above for seeking to raise more revenues from top income recipients by raising their average tax rate without raising marginal rates apply as strongly to capital as employment income. It is desirable therefore to evaluate the costs and benefits of these tax breaks accordingly.

Capital gains

This section looks first at two areas where the treatment of remuneration as gains for tax purposes (rather than ordinary income) may particularly favour the top executives, finance professionals and entrepreneurs who account for a large proportion of the increased share of top income recipients in total income (especially in countries like the United States) – the tax treatment of "carried interest" arrangements and of stock options.

In the former case, individuals may benefit from "carried interest" arrangements where they may have a relatively small equity stake in a business or collective investment vehicle that they run, but, if successful, they may stand to gain rewards that are highly geared to the overall return; and which are then taxed as capital gains, and hence at a rate that is generally below their marginal income tax rate. The benefits from such arrangements (*e.g.* the sharpening of incentives for managers to maximise profits) would appear to accrue to the parties involved, so there is no obvious "market failure" or externalities argument to justify a tax subsidy. It would seem reasonable, therefore, to treat this (relatively unusual) form of remuneration in the same way as ordinary income. Similar considerations apply where a significant part of the remuneration of top executives takes the form of stock options and the benefit is taxed as a capital gain rather than ordinary income. In both cases treating the remuneration as ordinary income rather than capital gains would look to be more equitable and would ensure that top income recipients pay a higher average tax rate.

A wider reform option that would constrain the opportunities to reduce tax liabilities by arbitraging between capital gains and ordinary income, not only with regard to employment income but also capital income, would be to align the tax rates that apply to income and gains more closely. Differences in tax rates on different types of income (*e.g.* interest compared with capital gains) are at the heart of many income-shifting tax planning and more aggressive avoidance opportunities. In a world where asset prices can readily be established in broad secondary markets, the case for aligning the taxation of ordinary income and gains would be strong. In reality the pros and cons are more complex and the evidence is less clear cut. (For a fuller discussion, see OECD, 2006.)

The personal/corporate income tax boundary

As earlier sections of this chapter have noted, some of the increase in the share of top income recipients can be attributed in some countries (notably the United States) to the increased use of pass-through entities (particularly S-corporations and limited liability partnerships in the United States) rather than the previously standard corporate form; and more business income therefore being reported as personal income in order to benefit from a lower tax rate. In some other countries the tax incentive has worked the other way and incorporation has been favoured. Other tax planning opportunities may arise in countries where the use of trusts is part of the legal framework and capital income within a trust

benefits from a concessionary tax rate. Closer alignment of the rates at which business and capital income are taxed, whatever the legal form, could potentially raise more tax revenues from the well-advised, high income taxpayers who take advantage of these tax planning opportunities; and also reduce the incentives to devote time and resources to tax planning.

Taxation of wealth and capital transfers

In this chapter we have focused on the distribution of income, notably trends in the shares of top income recipients, rather than the distribution of wealth. It has not been possible to explore such issues as the accumulation of wealth from income, or the role of inter-generational transfers in perpetuating inequality in income. Taxation of wealth and estates/inheritances in any case raises wider issues, such as whether concentration of wealth has harmful effects on society, *e.g.* through its effects on the balance of political power and influence in a country. It is also one of the most controversial areas of tax policy. For the purposes of the present chapter it can simply be noted that there are good economic arguments for maintaining progressive taxation of the estates of the very rich and for reducing the extent to which tax planning can make it a "voluntary" tax for such individuals – see for instance, Auerbach (2006). Possible approaches to reforming the taxation of wealth and wealth transfers are discussed in Boadway, Chamberlain and Emmerson (2010).

Property taxes

Residential property is generally taxed at lower effective rates than other categories of consumption and other forms of capital income in most OECD countries. In particular, the imputed rent from owner occupation is generally not subject to tax. The associated distortion of consumption and investment decisions are likely to harm not only economic welfare but also growth prospects (OECD, 2010b). Reform of the taxation of residential property is thus desirable for a variety of reasons. This could in principle be part of a comprehensive reform to achieve a more neutral tax regime for saving and investment (whether on the basis of comprehensive income tax or expenditure tax à la Mirrlees). In practice a more piecemeal approach might be a more practicable option, *e.g.* bringing the tax base for taxes on residential property more into line with market values. Reducing the extent to which residential property is a tax shelter would increase the amount of tax paid by top income recipients. This would be *a fortiori* the case if it were possible to apply a progressive rate structure to its return. The political and practical obstacles to taxing the return on (owner occupied) residential property at progressive rates appear, though, to be significant, with no current country examples within the OECD area.

High net worth individuals: evasion and aggressive avoidance

Top income recipients often either have the means to get tax planning advice on reducing their tax liabilities, or the opportunity to "under-declare" income (*e.g.* by treating consumption as a business expense, or keeping income offshore). A wide range of tax planning activities is quite lawful. In principle governments could make them less attractive or practicable by more closely aligning the tax rates that apply to different types of income (thus reducing arbitrage and sheltering opportunities) or making such arbitrage harder by putting regulatory obstacles in the way. Other tax avoidance schemes may be more artificial and contrived, with little underlying commercial substance. OECD countries

have developed a range of countermeasures including changes in the way tax legislation is drafted, the use of targeted or general anti-avoidance rules, requirements for the developers of tax avoidance schemes to disclose their existence to the tax authorities, more systematic use of third party information, the threat of retrospective legislation and the development of specialised tax units to handle high net worth individuals.

Economic analysis of tax evasion has tended to be based on a model where taxpayers behave rationally and their utility depends only on income (so there is no moral dimension to their behaviour). In a simple model on these lines tax evasion is a function of the tax rate (and hence the potential amount of tax saved, if successful), the risk of detection and the penalty to be paid if detected. Such a model tends to over-predict the amount of evasion. It also suggests a trade-off between the penalty rate and deploying resources to increase the risk of detection that is unlikely to be socially acceptable, *i.e.* that cutting administrative resources can be offset by a high penalty rate when evasion is detected. There is likely to be limits to the level of penalties that is acceptable, as very high penalties for the handful of evaders who get caught would be perceived as unfair if many people are able to evade tax scot free.

These considerations point to putting the focus on seeking to change the moral climate so that tax fraud becomes more socially unacceptable, plus more effective deployment of administrative resources to increase the (actual and perceived) rates of detection of evasion. In this regard, collection of information to enable taxpayers' declarations to be verified is invaluable and the OECD's work on the exchange of information for tax purposes is particularly important in reducing the chances of successful evasion by keeping income and wealth offshore.

9.6. Summary and conclusions

There was remarkable increase in the share of top income recipients in total income over the three decades to 2008 in the United States. Other countries saw smaller increases in the shares of top income recipients in total income, the biggest of which were in English-speaking countries (Australia, Canada, Ireland and the United Kingdom), while in continental European countries (*e.g.* France, the Netherlands) they remained modest.

Increases in top incomes were generated chiefly from employment and business, not capital. Most available data (from the United States and the UK) showed that the rising incomes of executives and finance professionals accounted for much of the rising share of top income recipients, at least in the countries that saw the biggest increases in top income shares.

While changes in the reporting of income for tax purposes, notably in the United States, also accounted for some of the increase of top income recipients' share of total pre-tax incomes, they did so only in part. Countries have differed in the timing and scales of their tax reductions and the extent to which income shifting (leading to more income being reported) is practicable or worthwhile. Behavioural responses to the improved incentives for effort, investment and enterprise from reductions in marginal tax rates also played a significant part.

Top rates of personal income tax, which were in the order of 60-70% in major OECD countries, fell to around 40% on average by the late 2000s. However, the surge in the share of top income recipients continued in the United States even after top marginal tax rates were raised in the 1990s.

The sustained rise in the share of top income recipients in total income is a sign that their "ability to pay" tax may have increased, which suggests there is potential for increasing the amount of tax that top income recipients pay. Economic analyses based on the effects of past cuts in top marginal tax rates (mainly for the United States) suggest that taxable income elasticities are quite high for top earners and in some countries top tax rates may be fairly close to their revenue maximising levels. Trade-offs between equity and economic efficiency must therefore be taken seriously. Tax reforms that increase the average rate of tax paid by top income recipients without raising their marginal rates may be an attractive solution. Possibilities include:

- Aligning the taxation of owner-occupied residential property more closely with actual market values and returns; and perhaps also applying a progressive rate structure to those returns.
- Abolishing or scaling back a wide range of tax expenditures which tend to benefit high income recipients disproportionately.

Such reforms would by very much in line with those recommended by the OECD work on tax and growth. Other tax policy options that might be considered include taxing as ordinary income all remuneration, including fringe benefits, carried interest arrangements, and stock options. There should also perhaps be closer alignment between the tax treatment of capital gains and ordinary income. On the administrative side, policies to improve compliance are likely to bear particularly on top income recipients.

Measures focused on raising average effective tax rates on top incomes without raising top marginal rates should not be harmful to economic welfare and the potential for economic growth. However, there may be limits to such a strategy as top income recipients tend to be more geographically mobile than most citizens. They are thus more likely to change their country of residence in response to higher tax rates on income and wealth. They may also have more opportunity to keep income offshore and not declare it to the tax authorities. The OECD work to develop the exchange of information for tax purposes addresses this issue.

Notes

1. *http://g-mond.parisschoolofeconomics.eu/topincomes*.
2. The upturn in top income shares in Germany is not included in the data set but is shown by Bach *et al.* (2007) using a slightly different approach.
3. Even for the top 0.01% of income recipients in the United States in 2005, salary income and business income (*i.e.* self-employment income, partnership income and S-corporation income) accounted for 80% of income excluding capital gains and 64% including gains, compared with 61% and 46% respectively in 1979. See Bakja *et al.* (2010).
4. The difference between broad income and taxable income does not entirely escape tax. For example pension contributions will typically reduce current taxable income but will increase taxable income when the pension is finally received. Also, income that accumulates in companies will be subject to corporate tax.
5. This phenomenon does not appear yet to have been much investigated in other countries.
6. However, depending on the strength of the relationship in a country between contributions paid and benefits received, social security contributions may be less regressive when considered in the perspective of an individual's lifetime.
7. Note that these are central government rates and in some countries there have been increases in tax rates at subcentral levels. For instance, Saez and Veall (2005) estimate that after the initial reduction in the early 1980s the marginal tax rate in Canada (more specifically Ontario) including

provincial tax for the top 0.1% of the distribution remained broadly unchanged at around 50% for the rest of the 1980s and 1990s.

8. The additional revenues generated could be redistributed to people with lower incomes through tax cuts, income-related tax credits or public expenditure on benefits.

9. This reasoning was originally developed by Feldstein (1995). However, it has been recently challenged by Chetty (2009), who argues that this overstates the social cost of tax planning because some individuals overestimate the costs of tax planning and some of those costs represent transfers to tax planners rather than the use of scarce resources. This would reduce the distortionary cost of increasing marginal tax rates.

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ANNEX 9.A1

Characteristics and Limitations of Income Data from Tax Returns

Section 9.2 above set out the considerable strengths of tax return data as a source of information for analysing trends in top incomes. It also noted a number of limitations to the comparability of such data over time and across countries. This annex describes in more detail some of the points that users of data from tax returns need to bear in mind in analysing and interpreting the data.

Nature and characteristics of data from income tax returns

Given that the income data are derived from tax returns, there is a risk that they could be significantly affected by under-declaration of income. Moreover, the extent of such under-reporting can vary across taxpayers. For instance, detailed audit of tax returns might suggest that the overall "tax gap" (between actual tax paid and what should have been paid if income had been correctly stated) might be of the order of 10% of personal tax income revenues, but the "gap" may be small for employees whose employer deducts tax at source and provides income information directly to the tax authorities, but over 50% for farmers and the self-employed (where little third party information may be available for verification purposes) – see, for instance, Slemrod (2007). The extent of under-declaration of incomes may also vary across countries, reflecting for instance cultural mores with regard to tax compliance and the rigour with which the tax authorities administer the tax regime.

The tax authorities generally only collect information on income that is potentially taxable. This can result in significant exclusions (*e.g.* the imputed rent from owner occupation is not now taxed in most OECD countries) and breaks in time series (*e.g.* at the point in time when such imputed rent ceased to be taxed). Differences in tax regime can thus lead to differences in the concept of "income" used in different countries.

The tax unit varies between countries. In some countries it is the individual, while in others couples are required to file jointly. Thus the following countries operate a tax regime based on individual taxation: Australia, Canada, Italy, Japan, New Zealand (from 1953), Spain and the United Kingdom (from 1990). The following have joint filing: France, Germany, Ireland, Netherlands, Portugal and Switzerland. And some countries allow a degree of discretion to the taxpayer, including Finland, Norway and Sweden. A number of countries have changed the tax unit over time, generally in the direction of moving from joint to individual taxation.

Estimating the incomes of the "non-filing" population may be only approximate, *e.g.* because of differences in the income concepts used for income tax purposes and those used in estimating other incomes.

Capital gains are likely to be more important for top income groups than the rest of the population, but data on gains may not be collected with the same regularity and on the same basis as for ordinary income. Moreover, data are for realised gains and losses (rather than accruals) and realisations tend to vary with asset price cycles. Realised gains can also be quite "lumpy". An individual may have a large amount of gains one year when (s)he sells a business that has been built-up over a period of years, but then much smaller gains in subsequent years. As a result the composition of, say, the top percentile group may vary more from year to year when shares are based on income including gains rather than on income excluding gains. On the other hand, capital gains are often taxed more favourably than income. This may enable the rich and well advised to arrange for a substantial part of their income to take the form of asset appreciation. Ignoring gains thus may mean missing significant developments at the top of the income distribution.

Other tax planning and tax avoidance activities can also affect the amount of income declared on tax returns. For instance, it may be possible not only to defer income taxation by sheltering wealth in trusts or in a closely-held company, but also to pay a lower rate of taxation. For instance, New Zealand has found that differences between the top marginal income tax rate and the effective tax rate of income from trusts have had a significant impact on the use of trusts. Tax planning strategies for high earning employees can also included "salary sacrifice" in order to take more of their remuneration in the form of employer-provided fringe benefits that are taxed at a lower rate (if at all).

Changes in tax rates and tax reliefs can have a significant impact on the amount of income and the form of income declared to the tax authorities. This may reflect not only changes in tax planning strategies or in the amounts of evasion, but also changes in "real" behaviour such as increases in labour supply and entrepreneurial effort. These factors are discussed further in section 4 of the chapter (on explaining trends in top incomes).

The concept of income

The data collected are generally for incomes before tax. However, the precise definition of gross income varies from country to country; and may well differ substantially from economic definitions of comprehensive income such as Haig-Simons (*i.e.* consumption plus change in net wealth).

Broad income measures can be obtained by adding back deductible and exempt items to taxable income. For example, the United States has a concept of "cash income" that includes realised capital gains (net of capital losses) and such tax exempt items as bond interest, social security benefits and non-taxable distributions from pensions and retirement savings.

Even where capital gains are included in measures of "broad" income, the measure differs from a comprehensive measure of income as they are recorded not on an accruals but on a realisations basis; and may not be recorded at all where a country has no tax on capital gains or it is assessed separately. Other significant differences from comprehensive income are the exclusion of the imputed rent on owner occupied housing and the build up of pension entitlements and other savings in pension funds, trusts and closely-held

companies. Fringe benefits such as employer provided health insurance may also be excluded.

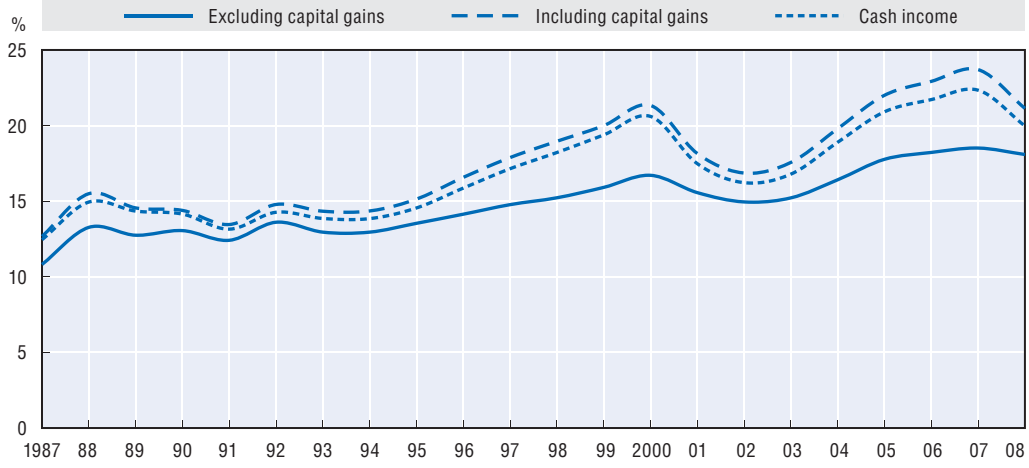
While the items mentioned in the previous paragraph imply that broad income falls short of comprehensive income, inflation can lead to overstatement (and other distortions) of measured income in relation to a comprehensive Haig-Simons concept, notably through the effects on nominal interest rates. In the case of savers, inflation is likely to boost their nominal interest receipts and this will be reflected in higher gross income. But this overstates their real income. (Strictly there should also be adjustments for the effects of inflation on interest paid on borrowing, but the "broad income" measure does not allow for interest paid, as a comprehensive income measure should in principle do.[1])

Differences between measured and a Haig-Simons measures of comprehensive income are likely to be more significant for top income recipients because they tend to have greater wealth and hence also more capital income and gains (that are more susceptible to measurement difficulties than, for instance, wage income). These differences could thus have a material effect on the share of total income going to top income recipients and its evolution over time. This is especially true in periods in which tax rates and/or the tax base change, as these changes can alter the incentives to hold wealth in one form rather than another, and result in a switch between assets whose returns are included in the "broad income" measure and assets (such as owner occupied housing) whose returns are excluded.

Comparing different income measures

Figure 9.A1.1 shows the evolution of the share of the top 1% of tax units (*i.e.* individuals and couples) in the United States since 1987, using three different income measures.[2] The lowest line represents taxable income excluding capital gains ("broad income"), the highest line represents taxable income including realised capital gains and the middle line represents cash income which also adds in some non-taxable income (and thus is in principle wider than "broad income").

Figure 9.A1.1. **Share of top 1% of income recipients in the United States under alternative income definitions**



Source: Data provided by OECD country delegates.

StatLink http://dx.doi.org/10.1787/888932537275

In order to interpret the graph correctly, it is important to note that widening the income definition increases the average incomes of people outside the top group as well as people within it. Thus, the difference between the lines for income with and without realised capital gains reflects the difference in the shares of capital gains in the income of the top group and the population as a whole. In other words, realised capital gains are a more important component of the income of those on high earnings. This also explains why the wider cash income measure is lower than the measure including capital gains: many of the additional income components to obtain the cash income measure, particularly social benefits, accrue more to those outside the top income group.

Capital gains

The comparison between the income measures with and without capital gains (see Figure 9.3) shows how important capital gains can be, particularly with regard to the evolution of income shares over time, with realised capital gains increasing particularly strongly in response to the economic cycle, notably the peaks that occurred in the years 2000 and 2007. As many countries tax capital gains at lower rates than other capital income, or not at all, tax planning through investments in assets that yield relatively large capital gains can be attractive.

The extent of the relative tax privilege given to capital gains and the scope to exploit it varies between countries and is one of the factors limiting the international comparability of data on top income shares. This cannot be overcome either by using measures that exclude gains (as gains may be more important in some countries than others) or measures that include them (as there are no data on gains for many countries).

In addition, as Figure 9.A1.1 illustrates, capital gains realisations tend to be concentrated at the peaks of economic cycles. As these realisations can be very large in comparison to other income sources (as when a business in sold), this can move people temporarily into a top income group, thus overstating the real mobility into and out of top income groups. For instance in the United States, there have been surges in capital gains realisations immediately preceding expected increases in capital gains taxes, particularly as a result of the 1986 tax reforms (Saez *et al.*, 2010). These effects produce an imperfect picture of the pattern of accrued capital gains.

Tax planning

Another form of tax planning is to adopt the business form with the most favourable tax treatment. Once again, the 1986 tax reforms in the United States provide an example: these reforms reduced the top rate of personal income tax relative to the combined burden of the corporate income tax and personal tax on dividends/ gains; and this resulted in a shift of income from the corporate tax base to the personal tax base (Saez *et al.*, 2010). This produced an increase in reported personal incomes without any change in true underlying income, and so distorted the personal taxable income data.

The tax unit

Married couples are regarded as a single tax unit in some countries, such as France (where the tax unit also includes children) and the United States. Atkinson (2007a) points out that the effect of moving from joint taxation of couples to individual taxation depends on the joint distribution of incomes of the two partners: if all rich people are single or have

partners with zero income, the share of the top X% will increase; but if rich people all have partners with the same income, the share is reduced. In this connection, it is interesting that Atkinson (2007b) shows that the shift from joint to separate taxation in the United Kingdom led to an increase in top income shares, but this does not imply that the same will be true in other countries.

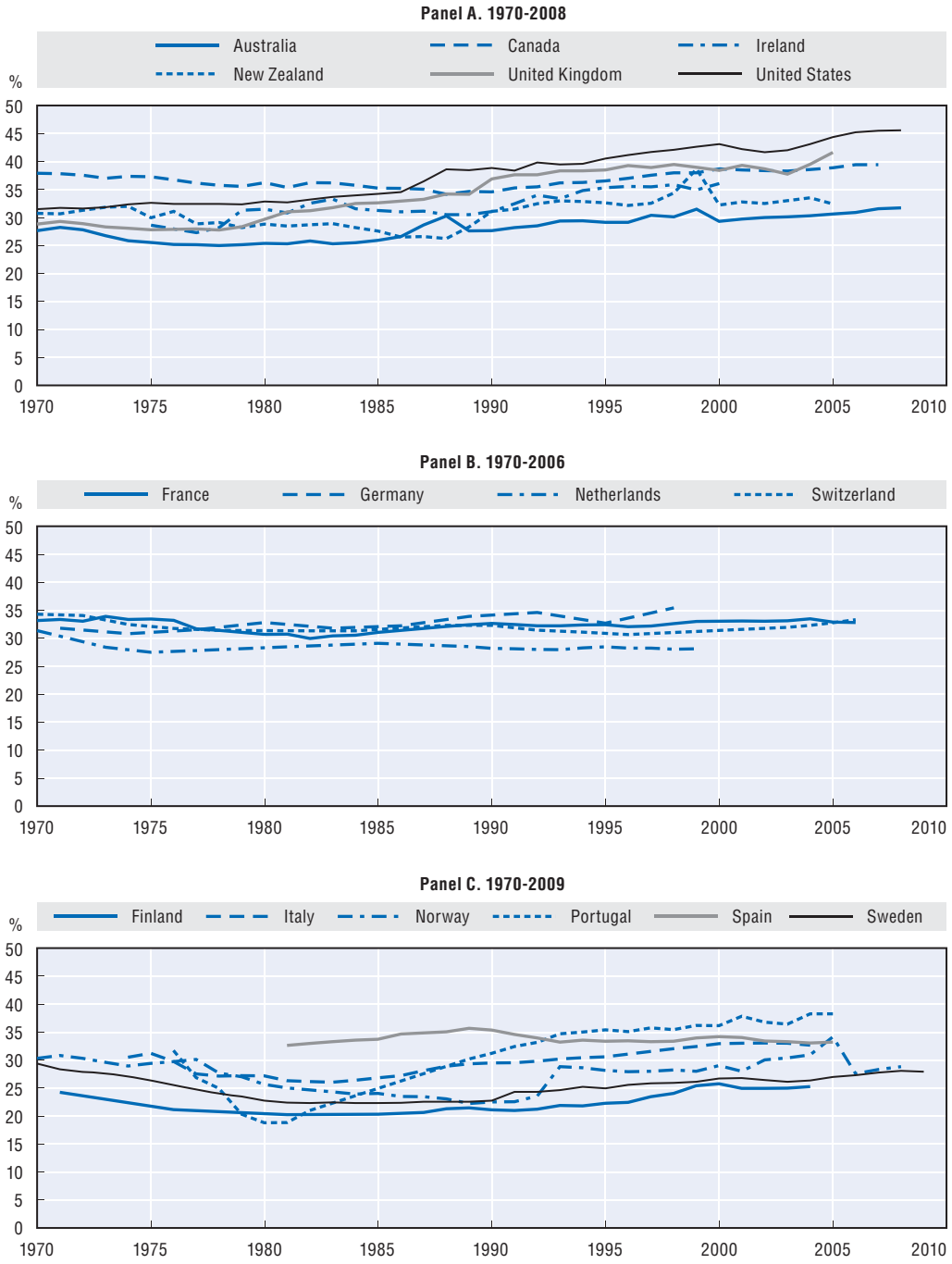
Notes

1. Most countries measure income as including interest received but do not deduct interest paid. Denmark appears to be an exception.
2. Note that the different measures refer to slightly different groups of tax units because each measure is obtained from considering the top 1% according to the corresponding income measure.

ANNEX 9.A2

Additional Data and Figures

Figure 9.A2.1. **Top 10% income share**



Source: Alvaredo *et al.* (2011); Roine and Waldenström (2008): Sweden (2007-2009). Country delegate information: Australia (2000-2008), Canada (1970-2007), Switzerland (1970-2006), Norway (1991-2008) and Sweden (1992-2008).

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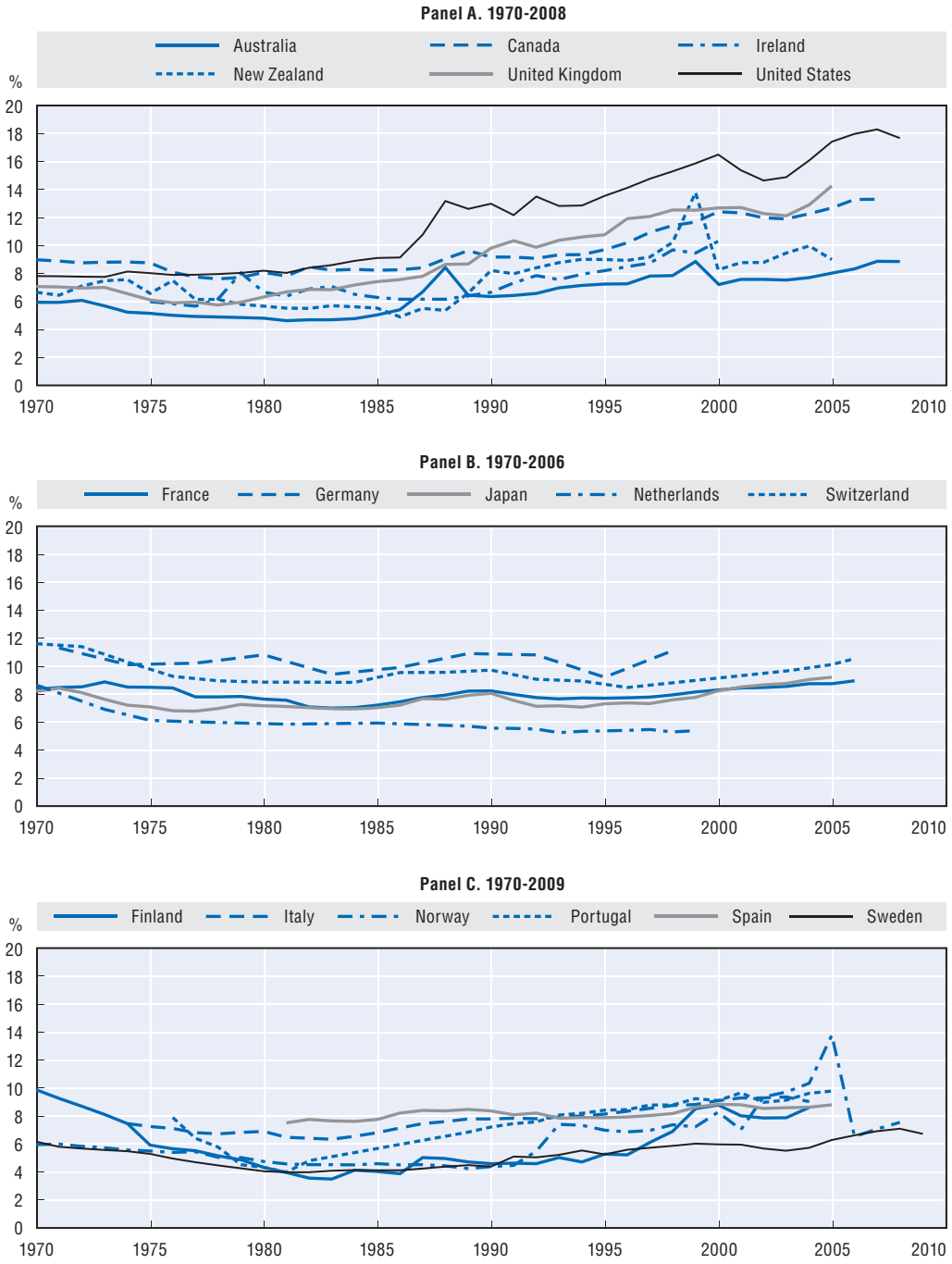
Figure 9.A2.2. **Top 1% income share**



Source: Alvaredo *et al.* (2011); Roine and Waldenström (2008): Sweden (2007-2009). Country delegate information: Australia (2000-2008), Canada (1970-2007), Switzerland (1970-2006), Norway (1991-2008).

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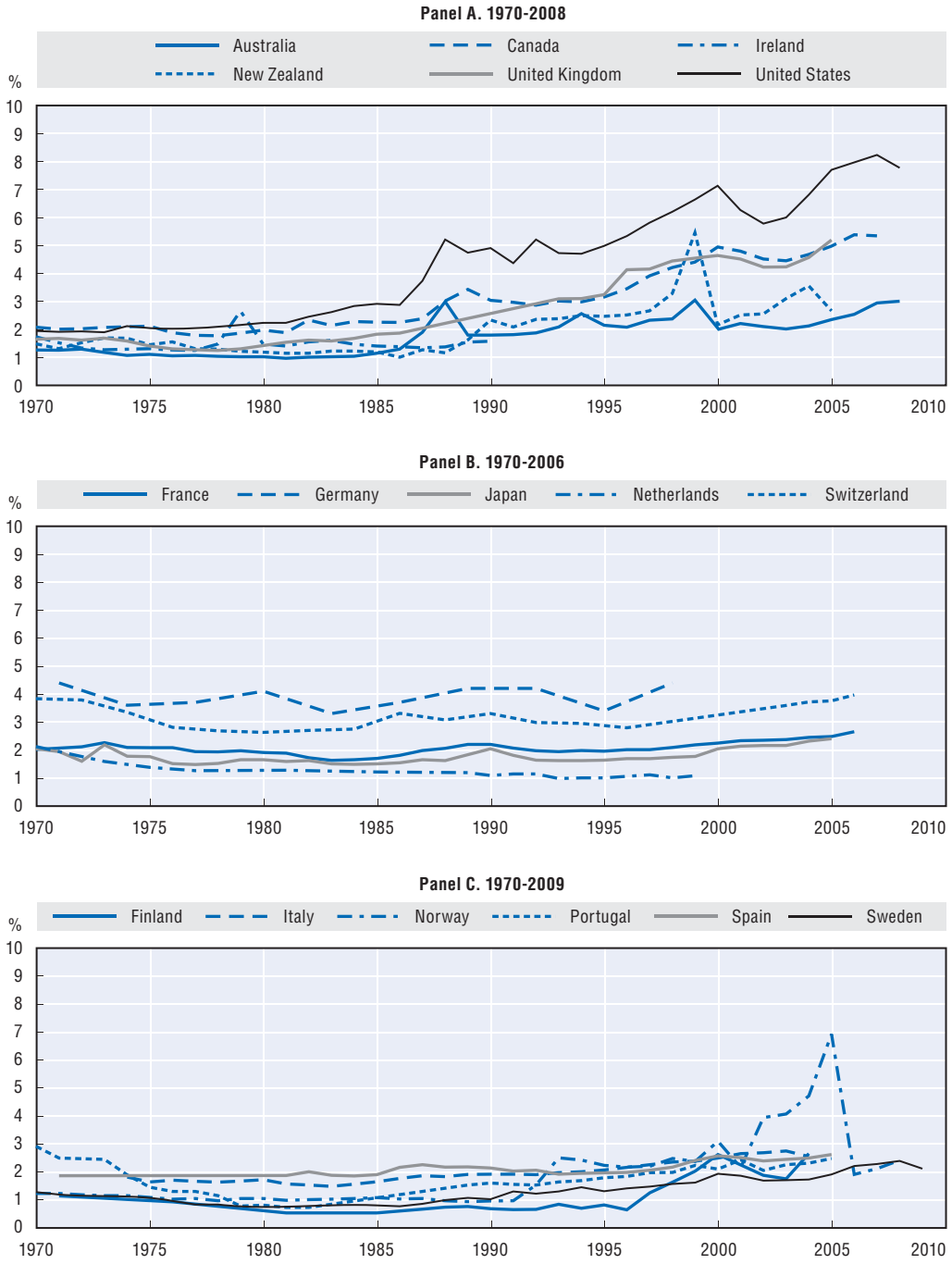
Figure 9.A2.3. **Top 0.1% income share**



Source: Alvaredo *et al.* (2011); Roine and Waldenström (2008): Sweden (2007-2009). Country delegate information: Australia (2000-2008), Canada (1970-2007), Switzerland (1970-2006), Norway (1991-2008).

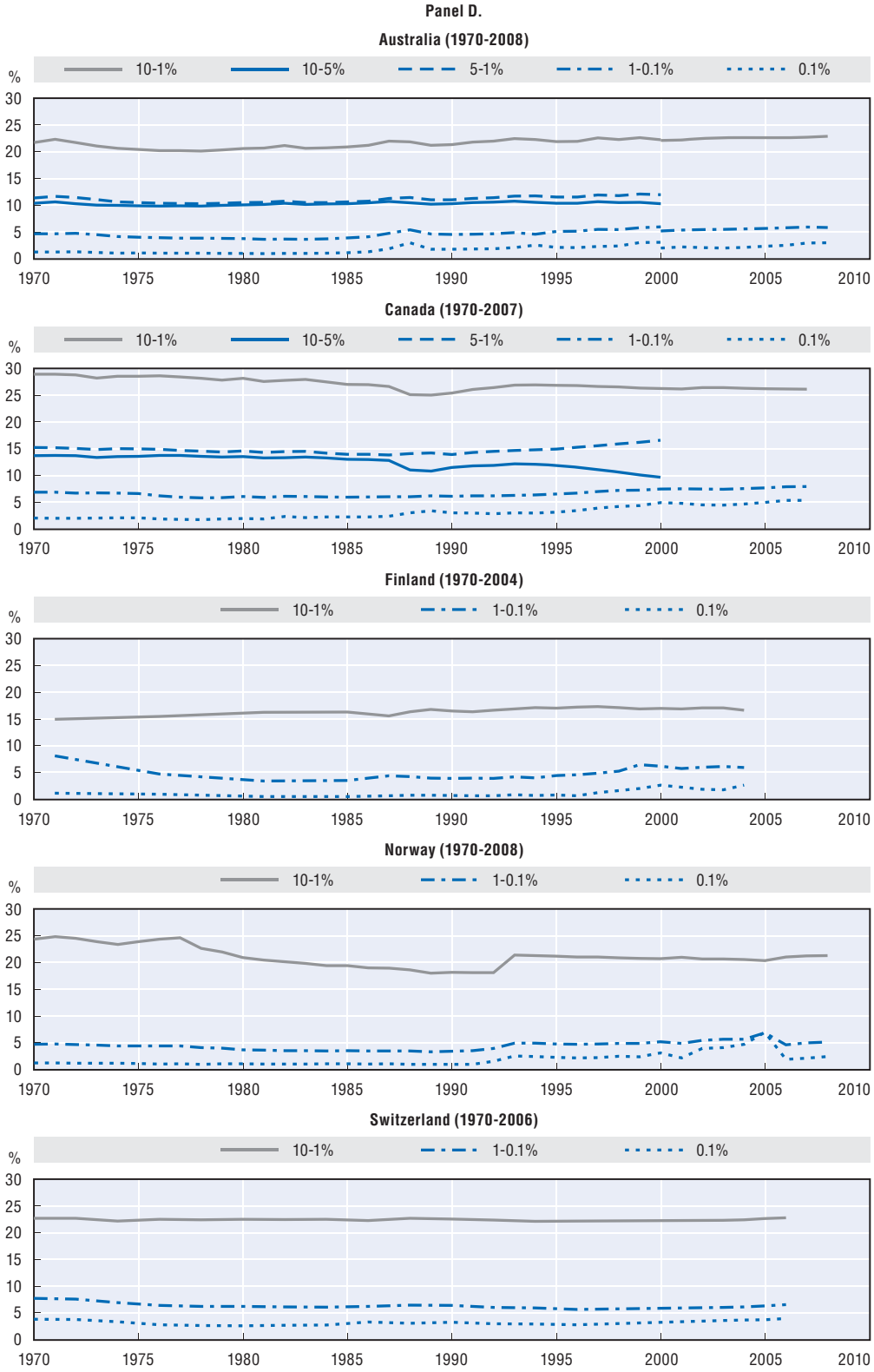
StatLink http://dx.doi.org/10.1787/888932537332

Figure 9.A2.4. **Shares of gross income by fractile group**

Figure 9.A2.4. **Shares of gross income by fractile group** *(cont.)*

Figure 9.A2.4. **Shares of gross income by fractile group** *(cont.)*

Figure 9.A2.4. **Shares of gross income by fractile group** *(cont.)*



Source: Australia – 1970-2000: Alvaredo *et al.* (2011); 2000-2008: country delegate information. Canada – 1970-1984: Alvaredo *et al.* (2011); 1985-2007: country delegate information. Finland and France – Alvaredo *et al.* (2011). Sweden – 1970-1991: Alvaredo *et al.* (2011); 1992-2008: country delegate information, 2007-2009: Roine and Waldenström (2008). Switzerland: Country delegate information. United Kingdom and United States: Alvaredo *et al.* (2011).

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(81 2011 11 1 P) ISBN 978-92-64-11163-9 – No. 58933 2011

Divided We Stand

WHY INEQUALITY KEEPS RISING

Contents

Please cite this publication as:
OECD (2011), *Divided We Stand: Why Inequality Keeps Rising*, OECD Publishing.
http://dx.doi.org/10.1787/9789264119536-en

OECD*publishing*
www.oecd.org/publishing

ISBN 978-92-64-11163-9
81 2011 11 1 P