

Chapter 3

Recent trends toward increased inequality among future retirees

This chapter finds that the relatively steady increase in real income across birth cohorts at the same ages is stalling for those born since the 1960s. It first shows that although population ageing is a common trend across the world the timing and pace of shifts in the age structure differ widely across countries. It then compares the income levels, the income inequality and the employment rates of different birth cohorts over their life course. The chapter also includes a focus on gender gaps, showing that gender-related labour market gaps have narrowed across cohorts, but that wide differences remain. The last section highlights that risks of higher inequality in old age have increased: old-age support systems will likely need to cope with higher inequalities down the road.

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

Key findings

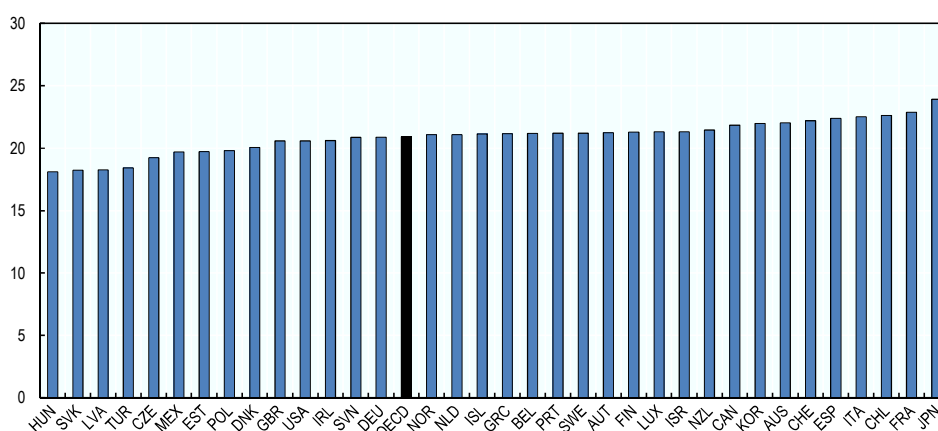
- Population ageing will accelerate sharply in the next three decades, including in some large emerging economies. There are substantial differences in the levels and pace of ageing across countries.
- In most countries, average real incomes are still higher than those of previous generations at the same age. But those born in the 1960s do not have higher incomes than those born in the 1950s.
- Employment at the same ages increased sharply between cohorts born in the 1930s and in the 1950s, especially for the 55+ age group and among women. But it has fallen for those born after 1960.
- Since the mid-1980s, the real income of the 60-64 age group has grown by a cumulative 13% more than the income of people aged 30-34, on average. Poverty risks have shifted from older to younger groups in most countries. However, those older than 75 remain the most vulnerable to poverty risks.
- Income inequality has been rising from one generation to the next at the same age in two-thirds of countries. The increase has been particularly large for younger groups among whom inequality is now already much higher than among today's elderly.

Introduction

Population ageing is not a new phenomenon. Although this is a common trend across the world, the timing and pace of population ageing and of the shifts in age structure differ widely across countries. The increase in the average age of populations stems from gains in life expectancy (one of humanity's greatest achievement) and from declines in fertility rates to below replacement levels. Life expectancy has improved across the OECD over time. However, substantial differences remain from country to country, e.g. in life expectancy at age of 65 (Figure 3.1). Over the period 2010-15, 65-year-old women were expected to live at least 22 more years on average in Korea, Australia, Switzerland, Spain, Italy, Chile, France and Japan, but less than 18½ in Hungary, the Slovak Republic, Latvia and Turkey.¹

Figure 3.1. A 30% gap between the OECD countries with highest and lowest life expectancy at 65

Remaining life expectancy among 65-year-old women in the OECD, 2010-15, in years



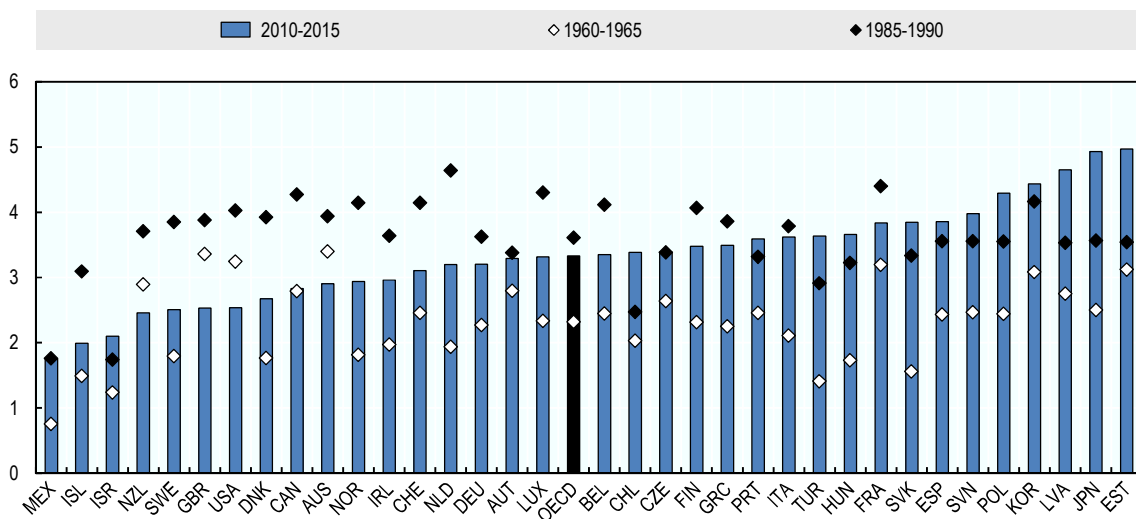
Source: United Nations (2015), *World Population Prospects: The 2015 Revision*, Department of Economic and Social Affairs, Population Division, United Nations, New York.

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Everywhere women enjoy longer remaining life expectancy at 65 – by 3.3 years on average, ranging from about two years in Mexico, Iceland and Israel to approximately five in Japan and Estonia (Figure 3.2). The gender gap saw a sharp, widespread widening between 1960 and the mid-1980s, but has generally levelled out since then. This gender pattern over time has been influenced by the gender dynamics of engaging in behaviours that are risky and bad for health. However, patterns differ from one country to another, and gender differences have continued to widen in more than one-third of OECD countries: Chile, Estonia, Hungary, Israel, Japan, Korea, Latvia, Poland, Portugal, the Slovak Republic, Slovenia, Spain and Turkey.

Figure 3.2. The gender gap in life expectancy at 65 has peaked on average

Differences in remaining life expectancy at 65 between women and men, 1960-2015



Source: United Nations (2015), *World Population Prospects: The 2015 Revision*, Department of Economic and Social Affairs, Population Division, United Nations, New York.

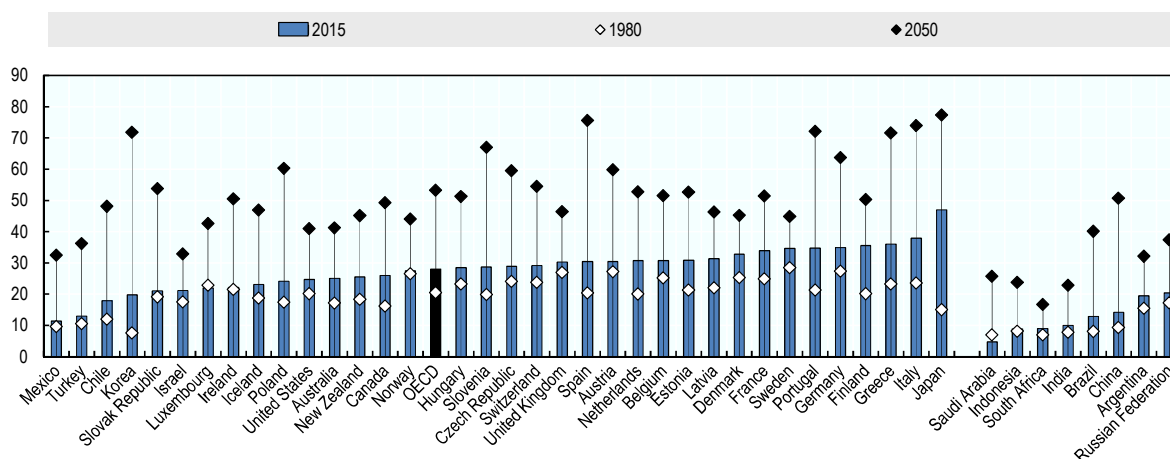
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While a common long-term trend, population ageing differs considerably from country to country in timing, initial levels and pace. One widely used measure of shifts in the composition of populations is the old-age dependency ratio. Because it is based on fixed age boundaries – e.g. the 65-and-overs as a percentage of 20-to-64 year-olds – such a measure captures well the shift in the age structure, but it ignores improved health across cohorts at the same age and so overestimates increases in health-related dependency (see Chapter 5).

Between 1980 and 2015, the average number of people older than 65 for every 100 of working age (20-to-64 years old) rose from 20 to 28 in OECD countries (Figure 3.3). Japan is by far the country which aged the most over the period, with an increase of 32 points. It was followed by Finland with a 15-point rise, while the old-age dependency ratio remained broadly stable in Norway, Ireland, Luxembourg, Mexico and the Slovak Republic. Current projections suggest that population ageing will accelerate steeply, with the old-age ratio almost doubling on average by 2050.

Figure 3.3. Population ageing will accelerate sharply

Number of people older than 65 per 100 people of working age between 20 and 64 years old, 1980-2050



Source: United Nations (2015), *World Population Prospects: The 2015 Revision*, Department of Economic and Social Affairs, Population Division, United Nations, New York.

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By the middle of the century, cross-country patterns of ageing will look very different from today. Although Japan will still be the oldest OECD country, based on this indicator, Korea will undergo the most extreme ageing experience with its old-age dependency ratio projected to increase from 20% to 72%. Greece, Italy, Portugal and Spain will also age fast. As for non-OECD countries, the rate is expected to accelerate sharply in Brazil and China, too.

The near-doubling of the old-age dependency ratio between 2015 and 2050 translates into a year-by-year increase of 1.8%, twice the rate recorded between 1980 and 2015. The rate of increase (in %) of the old-age dependency ratio can better capture some of the important economic implications of population ageing – such as the impact on the long-term growth rate of GDP per capita – than changes in absolute terms (in percentage points).² The only countries that recorded an average annual rise greater than 2% between 1980 and 2015 were Korea (2.8%) and Japan (3.3%), while those projected to do so over the period 2015-50 are:

- Greece, Iceland, the Czech Republic and Portugal with 2.0 to 2.1%;
- Ireland, Slovenia, Spain, Poland and the Slovak Republic with 2.4 to 2.7%;
- Chile, Turkey and Mexico with 2.9 to 3.0%;
- Korea with 3.8%.

A look further ahead to 2075 reveals that Israel is set to be the only OECD country whose old-age dependency ratio, at 0.40, will be lower than Japan's 0.47 in 2015. By 2075, four OECD countries are projected to be much older than their peers: Greece, Portugal, Japan and Korea. Five more, Germany, Spain, Chile, Italy and Poland, are likely to have old-age ratios in excess of 0.65. And even if the ratio is computed to assess the percentage of people aged 70 and older in 2075 versus 65 years and older in 2015 – average life expectancy at 65 is expected to be 5.8 years greater by 2075 – it will still rise by an average of 50% from 0.28 to 0.42.

The next section compares income levels, income inequality and employment by age groups across the countries covered by the Luxembourg Income Study data. The following section focuses on gender gaps. The last section shows that risks of higher inequality in old age have increased.

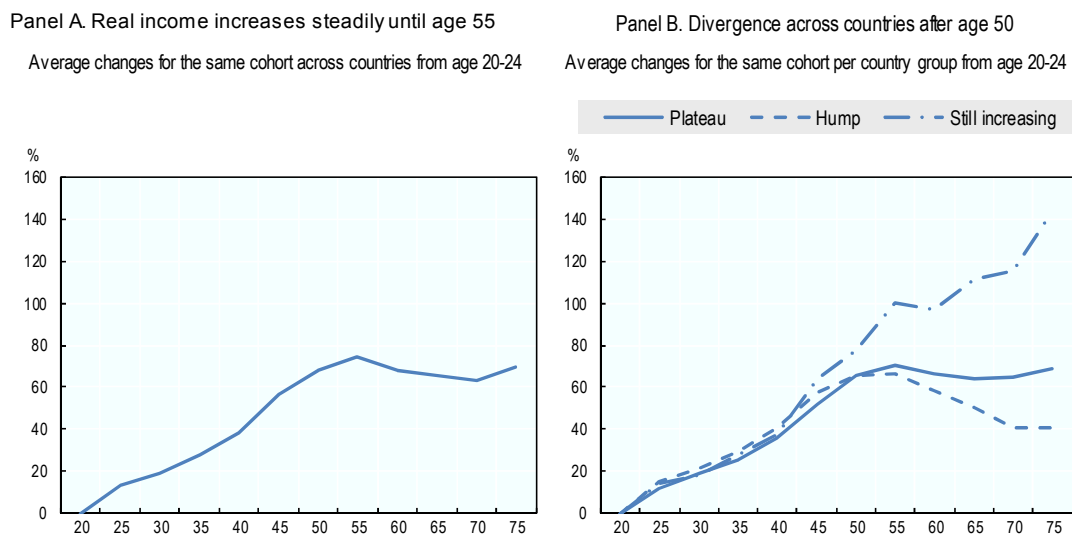
1. Older people have enjoyed big rises in real income compared with previous cohorts

Income rises as people age until about age 55

For the same birth cohorts on average, real disposable income has increased by about 75% between the 20-24 and 55-59 age brackets, and has thereafter tended to plateau at older ages on average across countries (Figure 3.4, Panel A). This is based on income data across birth cohorts at different ages over 1967-2013.³ However, income-age patterns varied widely from country to country, especially in later life. While incomes grew at similar average rates between 20-24 years old and 45-49, they diverged thereafter. Income-age patterns can be divided into three broad groups (Panel B).

- Canada, Finland, Hungary, Israel, Italy, the Netherlands, Norway, Poland, the Slovak Republic and the United Kingdom in the first group (“plateau”) have a similar income pattern at older ages than that of the overall average shown in Panel A, with income more or less plateauing after age 60.
- Real incomes fall by an average of 20% between the 55-59 and 75-79 age brackets (an average drop of 0.9% per ageing years) in the second group (“hump”): Australia, Austria, Belgium, Denmark, Slovenia, Sweden, Switzerland and the United States.
- Real incomes go on rising at a brisk rate of around 2% per year in the last group: the Czech Republic, France, Greece, Ireland, Luxembourg and Spain.

Figure 3.4. Real average incomes within birth cohorts as they age



Note: “Plateau” countries are Canada, Finland, Hungary, Israel, Italy, the Netherlands, Norway, Poland, the Slovak Republic and the United Kingdom. “Hump” countries are Australia, Austria, Belgium, Denmark, Slovenia, Sweden, Switzerland and the United States, “Still increasing” countries are the Czech Republic, France, Greece, Ireland, Luxembourg and Spain.

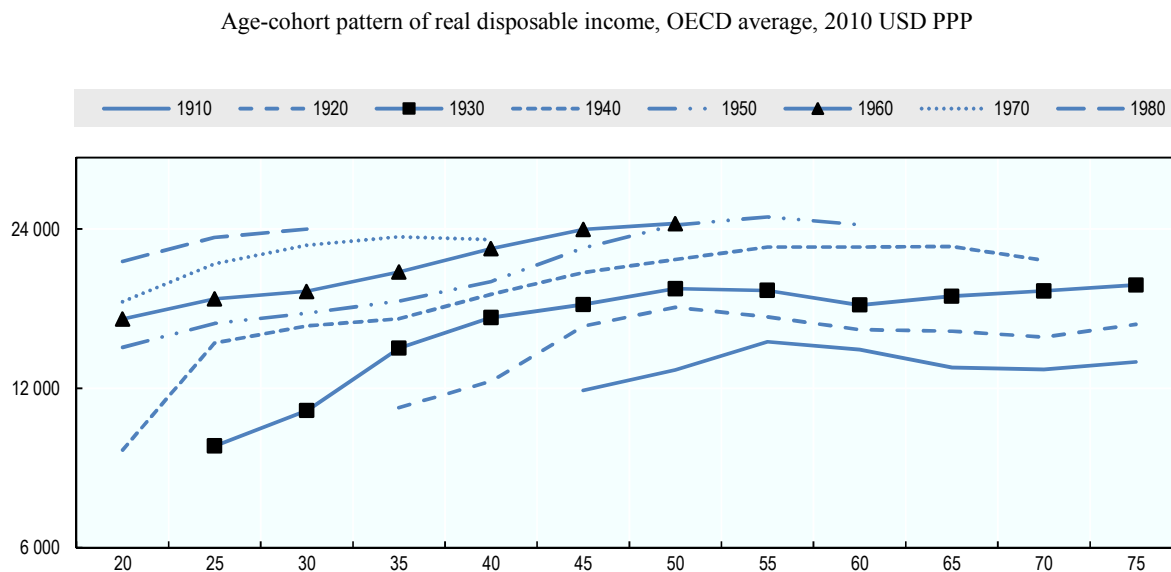
Source: OECD fixed-effects analysis of country, age and birth cohort data from the Luxembourg Income Study (LIS).

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Income gains across cohorts

In addition to changes in the same birth cohorts' incomes as people age, there has been a sharp OECD-wide increase in revenues from one generation to the next at the same age (Figure 3.5). In the 35-39 age group, for example, people born in the 1970s had an average real disposable income that was 62% greater than those born 40 years before (in the 1930s). Likewise, at the age of 60-64, people born in the 1950s had a 70% higher real income than 60-to-64 year-olds born 40 years before.

Figure 3.5. Substantial income gains at the same age across cohorts, at least until recently

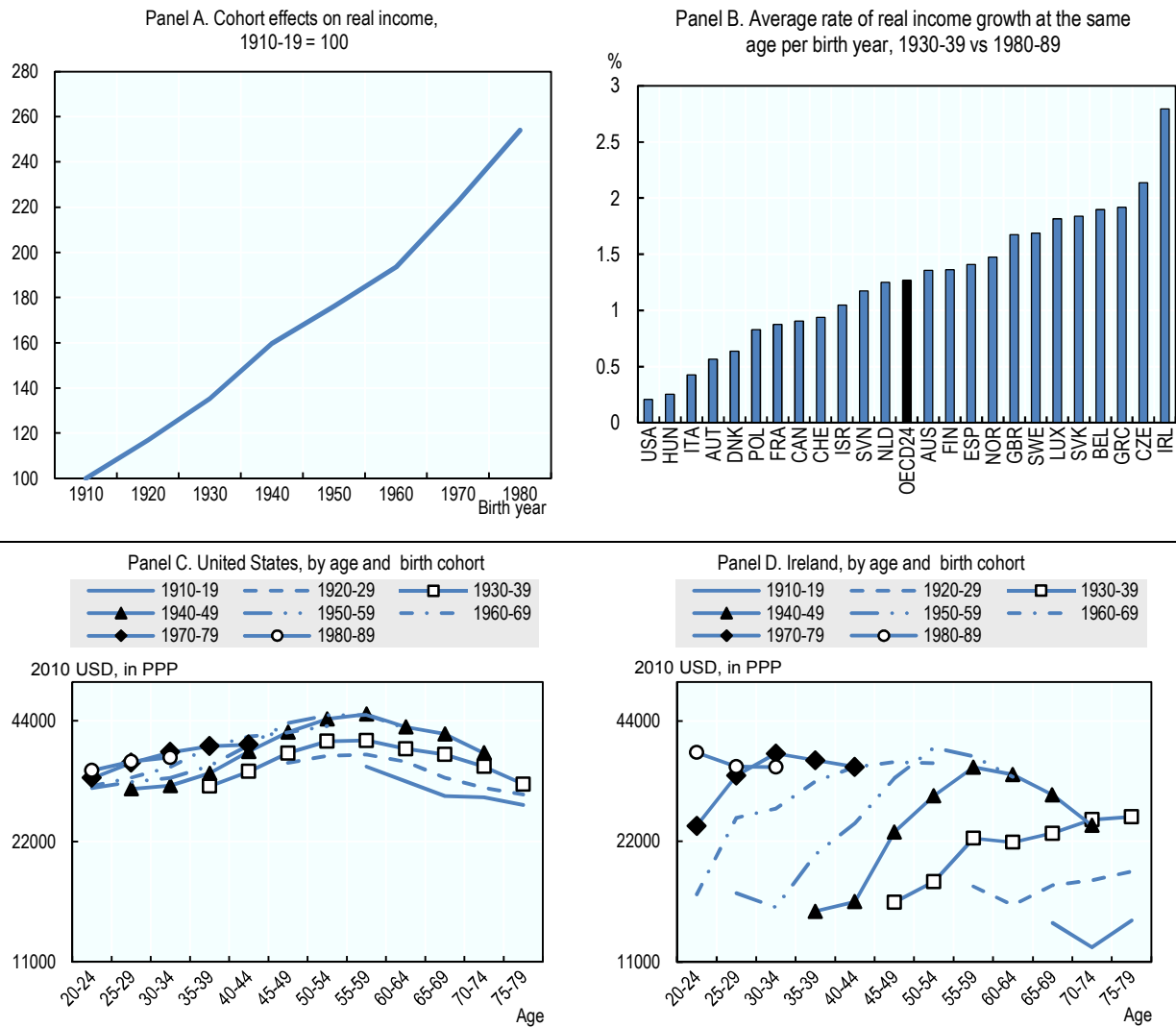


Note. Data are from the Luxembourg Income Study and cover 24 OECD countries. However, due to quality issues, data from Mexico have not been used. To limit the biases from the unbalanced nature of the panel data then obtained, the series shown in the chart are derived for each cohort from specification with country and age fixed effects.

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Real income at the same age has thus grown by an average of 1.3% per birth year from the 1910s to the 1980s across the OECD.⁴ The increase, driven chiefly by economic growth over time, suggests that real income in 1980 was about 2.5 times higher in the same age group born 70 years earlier (Figure 3.6, Panel A). The rise was relatively steady across all birth cohorts. However, differences between countries are wide (Panel B). For people born in the 1930s and half a century later, the average growth rate in real income per birth year at the same age (assuming a similar – although specific to each country – age profile in all cohorts) was 1.3% on average across countries. It was less than 0.5% in the United States, Hungary and Italy, but higher than 2% in the Czech Republic and Ireland. Panels C and D illustrate the cases of the United States and Ireland which, in Panel B, lie at opposite ends of the spectrum.

Figure 3.6. Real income has increased at the same age across birth cohorts



Note: The data cover 24 OECD countries. Due to quality issues, data from Mexico have not been used. To limit the biases from the unbalanced nature of the data illustrated in the panels, the series shown are derived from specifications that include cohort, country and age fixed effects.

Source: Luxembourg Income Study (LIS) data.

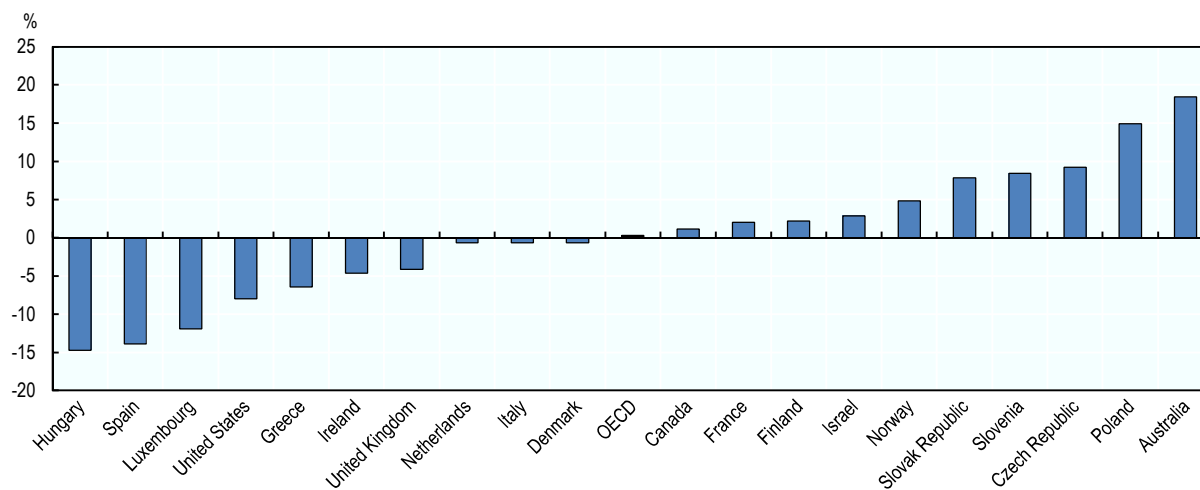
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In recent years, however, economic developments have led to smaller, if any, improvements in income at the same age from one cohort to the next (see Figure 3.5 above, where “lines” are now crossing). Indeed, in their early 30s people born in the 1980s have average incomes similar to those of the 1970s-born. The same applies to 1970s versus 1960s birth cohorts in their early 40s, and so on. The little or no improvements might relate to the impact of the Great Recession, though it is too early to determine whether the difficulties that OECD economies have undergone since 2008 will translate into permanent impacts on the birth cohorts affected.⁵

The recent stalling of average growth in the real income at the same age across cohorts results from varying income trends from one country to another. Examination of

the 50-54 age bracket, for example, reveals that 1960s-born cohorts have an average real income at least 5% higher than 1950s birth cohorts in the Slovak Republic, Slovenia, the Czech Republic, Poland and Australia (Figure 3.7). By contrast, it is more than 5% lower among the 1960s cohorts in Greece, the United States, Luxembourg, Spain and Hungary.

Figure 3.7. Average real income in the 50-54 age bracket, 1960s versus 1950s birth cohorts



Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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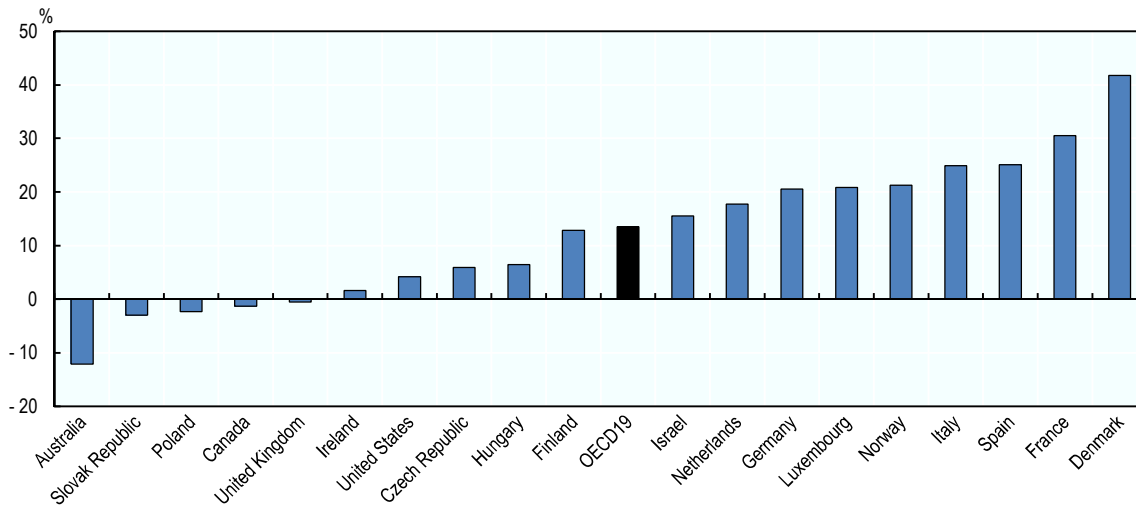
Relative income changes between age groups

The analysis now turns to capturing how shifts may have been to the benefit or detriment of particular age groups from one generation to the next in each country. Doing so reveals that the situation of those who are currently older than 60 years has improved substantially in recent decades in both relative and absolute terms, as they have gained from relatively favourable employment rates and maturing pension systems.

Shifts in income have indeed benefitted older people. For example when focusing on the working age over the three decades from the 1980s to the 2010s, the OECD-wide average income of the 60-64 age group grew by a cumulative 13% more than that of 30-to-34-year-old (Figure 3.8). Only in English-speaking countries the Slovak Republic and Poland did older people not benefit in relative terms, while in Italy, Spain, France and Denmark their gains were very large.

Figure 3.8. Shifts in income have benefited older people of working age

Changes in relative income of 60-64 vs 30-34 between the mid-1980s and the mid-2010s



Source: OECD calculations based on Luxembourg Income Study (LIS) data.

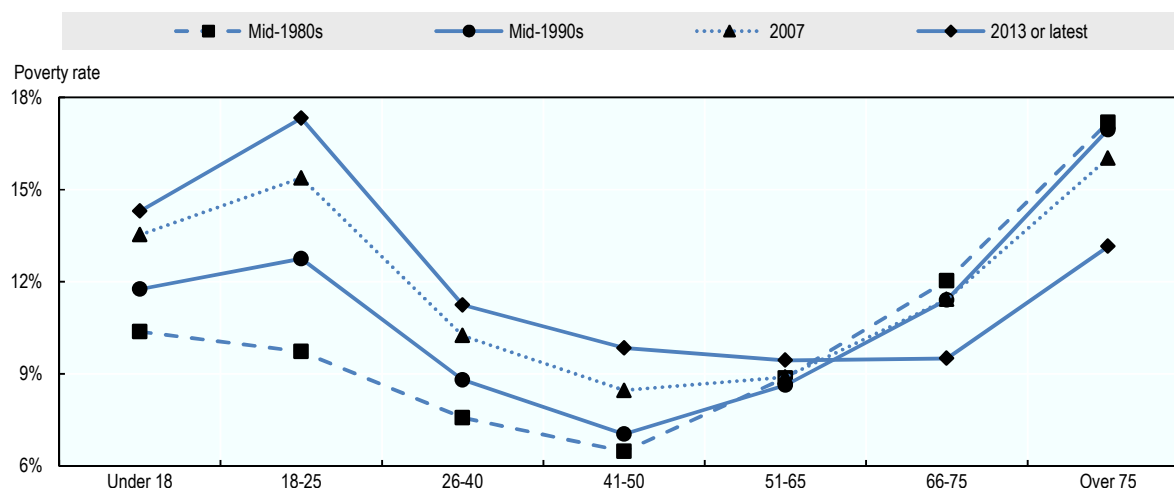
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Improvements in the relative incomes of the older age groups are a mirror image of the dramatic shift in poverty risks to the detriment of the young in most OECD countries (for which data are available) since the mid-1980s (Figure 3.9). This trend has evolved against the background of an overall rise from 9.4% to 12.1% in the OECD average poverty rate (defined as half the median-equivalised income).

Since the mid-1980s, relative poverty rates steadily increased among the under-50s and especially – with an average rise of 7.6 percentage points – among 18-to-25 year-olds. By contrast, old-age relative poverty rates have recently declined, as pensioners have better withstood the negative income shocks of the 2007-08 economic and financial crisis. The shifts in poverty risks from one age group to another occurred in all 18 OECD countries for which historical data that go back far enough are available, with the exception of New Zealand. There were especially marked shifts in Denmark, Greece and Norway (Table 3.1). Nevertheless, poverty rates among the over-75s rose in Israel, New Zealand, Sweden and Turkey from the mid-1980s.

Figure 3.9. On average poverty risks have shifted from the old to the young

Relative poverty rates by age group since the mid-1980s in 18 OECD countries



Note: The graph relates to 18 countries for which data are available (see Table 3.1).

Source: OECD Income Distribution Database (<http://oe.cd/idd>).

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Table 3.1. Poverty risks have shifted from the old to the young in almost all countries

Changes in poverty rates across age groups since the mid-1980s to 2014 or latest year

	Total	0-17	18-25	26-40	41-50	51-65	66-75	76+	Shift (76+ vs 18-25)
Norway	1.3	1.6	20.1	5.4	1.8	-1.4	-8.3	-28.1	-48.2
Greece	2.1	6.5	11.3	6.1	9.2	0.5	-17.4	-19.1	-30.4
Denmark	0.0	0.5	13.3	2.7	0.7	-1.8	-10.2	-16.2	-29.5
Italy	3.2	7.1	6.8	5.9	6.7	-0.9	-9.5	-8.6	-15.5
Netherlands	4.4	7.1	13.1	4.8	3.6	2.6	-0.5	-0.2	-13.3
United Kingdom	3.2	0.9	12.1	1.4	4.9	2.8	0.1	0.4	-11.7
OECD-18	2.6	3.9	7.6	3.7	3.4	0.6	-2.5	-4.0	-11.6
Japan	4.1	5.4	9.2	3.5	4.6	1.1	-5.8	-2.1	-11.3
Luxembourg	2.6	5.0	5.2	3.7	5.0	1.6	-8.1	-5.7	-10.8
United States	-0.5	-4.2	4.0	2.1	1.5	1.0	-3.7	-5.0	-9.0
Mexico	0.7	2.3	1.1	2.5	-2.1	-3.1	7.2	-4.3	-5.4
Germany	3.1	2.2	4.8	4.2	3.3	5.1	0.5	-0.4	-5.3
France	0.4	3.1	4.4	1.9	-0.4	-5.2	0.1	-0.1	-4.5
Canada	-0.1	-1.6	1.3	1.0	3.8	-0.9	-0.6	-3.1	-4.4
Sweden	6.4	6.6	9.2	8.2	3.3	4.2	4.5	5.1	-4.2
Finland	1.4	-0.2	3.9	2.3	2.1	1.2	-2.6	0.2	-3.7
Turkey	2.8	8.2	5.0	1.4	3.3	-2.9	-4.5	1.8	-3.3
Israel	9.0	15.8	5.6	7.9	6.2	2.4	7.1	3.1	-2.6
New Zealand	3.6	4.2	6.2	1.0	3.0	4.2	6.3	9.7	3.5

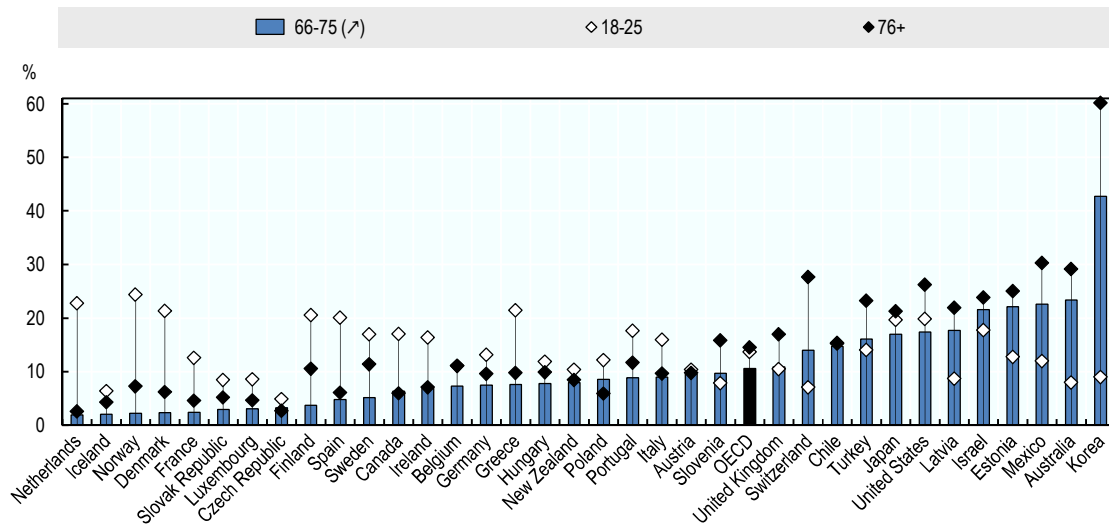
Note: Countries are ranked by the size of the change in the poverty rates of the 76+ and 18-25 age groups (in the column “Change”).

Source: OECD Income Distribution Database (<http://oe.cd/idd>).

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When all OECD countries are considered for the most recent year, the average poverty rate among people over 76-year-old is still the highest at 14.4% – slightly higher than the 18-to-25-year-old’s average rate of 13.9% (Figure 3.10). Poverty among the elderly is a serious concern in some countries. It exceeds 20% in Japan, Latvia, Turkey, Israel, Estonia, the United States, Switzerland, Australia and Mexico and is close to 60% in Korea (Figure 3.10).⁶ Nevertheless, younger age groups are now the most highly exposed to the risk of poverty in the majority of OECD countries.

Figure 3.10. On average across the OECD poverty rates are similar among the 76+ and the 18-25



Note: Poverty rates are defined at half the median-equivalised income. Data refer to 2014 for the Netherlands, Finland, Hungary, the United States, Israel, Mexico, Australia and Korea; to 2012 for New Zealand and Japan; and to 2013 for all other countries. For the OECD average, the poverty rate is 13.9% for the 18-25 and 14.4% for the 76+.

Source: OECD Income Distribution Database (<http://oe.cd/idd>).

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Employment gains at different ages among cohorts born before 1960

Within the same cohorts, employment reaches its peak in middle age. In any given year, it is well established that the age pattern of employment rates – which cuts across different birth cohorts – first rises with age, reaches its peak for workers in the middle age, then declines for older workers. Although there are some differences between cohorts (see Figure 3.12 further below), age-related average employment rates among the same individuals (captured in the aggregate by employment rates within the same cohorts) show a peak when workers reach their 40s.

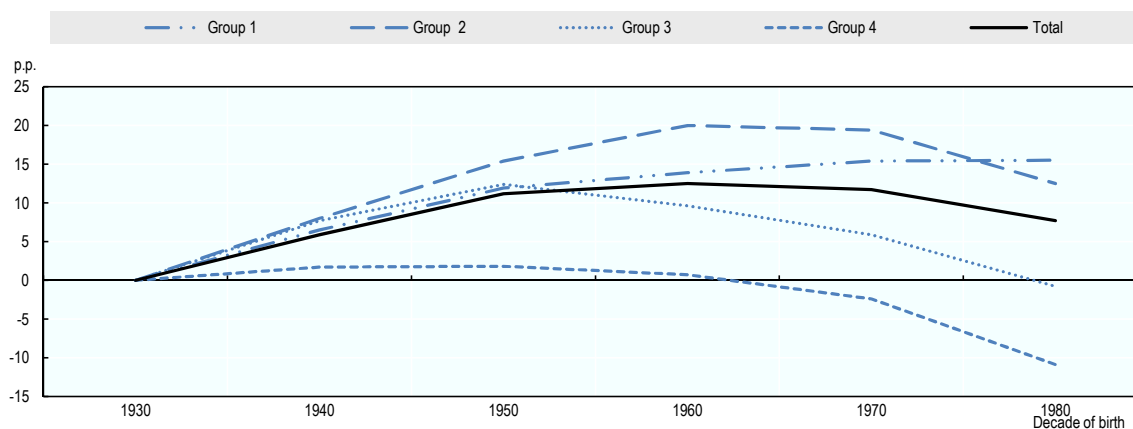
Cohort analysis shows employment rates at the same ages that are much higher – by about 12 percentage points on average – among generations born in the 1950s, 1960s and 1970s than among those born in the 1930s (Figure 3.11). As for the youngest cohorts, born in the 1980s, employment rates are lower – just above those of the generation born 40 years earlier. Of course, the cohort effect among people born in the 1980s is based on their employment situation prior to 2015 – i.e. when they were under 30-35 years old – and is likely to be strongly influenced by the deteriorating economic situation since the mid-2000s. When restricting the analysis to data observed at older ages, employment rates improved markedly across cohorts born before 1960.

The OECD average employment patterns shown in Figure 3.11 for cohorts born in certain decades divides into four groups of countries:

- The first group comprises Australia, Austria, Canada, Germany, Hungary, Israel, Mexico, the Netherlands, Poland and Spain. Improvements in the employment rates of all cohorts are greater than the OECD average and 1980s-born cohorts do as well as those born in the 1970s.
- The second group: Belgium, Italy, Luxembourg, Slovenia and the United States. Increases in in employment from one birth cohort to the next are even steeper up to and including the 1960s- and 1970s-born cohorts – almost 20 percentage points compared to the 1930s. However, almost half of that rise is lost in the employment outcomes of the 1980s-born cohorts.
- The third group: the Czech Republic, Denmark, Finland, France, Norway, the Slovak Republic and Switzerland. Labour outcomes have deteriorated sharply among cohorts born after the 1950s, with 1980s-born workers recording employment levels that are no better than those of workers born 50 years earlier.
- The fourth group is made up of Greece, Ireland, Sweden and the United Kingdom. Changes are the least favourable of the four, with no real improvement since the 1930s. There have been sharp drops in employment among cohorts born after the 1960s and falls of over 10 percentage points among those born after 1980.

Figure 3.11. Employment peaked for the 1960s-born cohorts on average across countries

Changes in average employment rates at the same age compared with those among 1930s-born cohorts



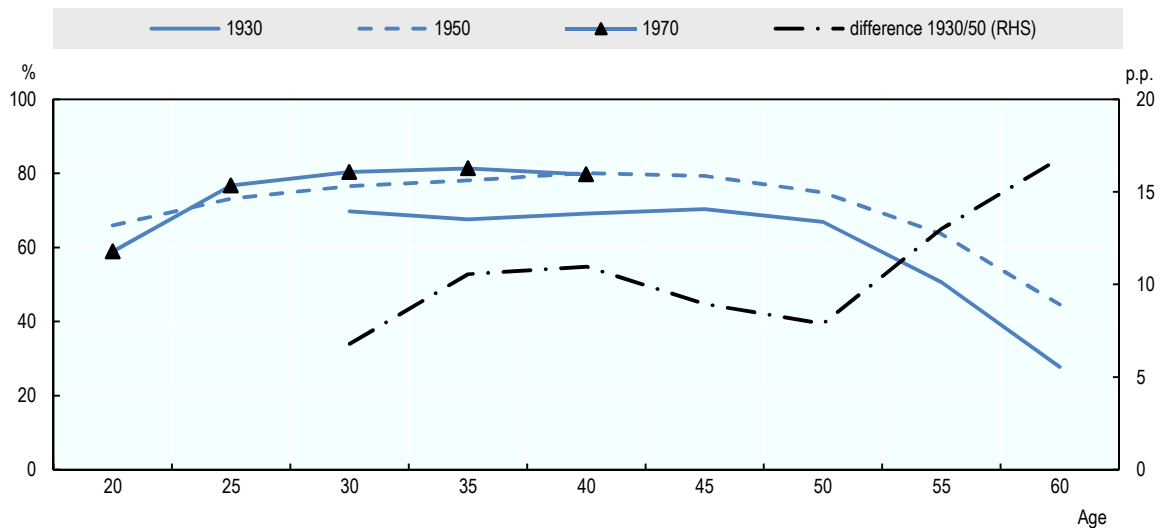
Note: The cohort pattern distinguishes four groups of countries. Data include specifications with cohort and age fixed effects for each country. “Total” denotes the cross-country average. Group 1: Australia, Canada, Germany, Hungary, Israel, Mexico, Netherlands, Poland, Russia, United States. Group 2: Austria, Spain, Italy, Belgium, Luxembourg, Slovenia. Group 3: Czech Republic, Denmark, Finland, France, Norway, Slovak Republic, Switzerland. Group 4: Greece, Ireland, Sweden, United Kingdom.

Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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Improvements in employment rates have been more pronounced in older age groups. Between the 1930s- and 1950s-born generations, employment rates increased by 7 percentage points in the 30-34 age group and, albeit from a lower level, by 17 percentage points among 60-to-64 year-olds (Figure 3.12). Between the 1950s- and 1970s-born generations, however, the improvement in employment is not so clear, with lower rates below the age of 25 and slightly higher ones up to 40 years old. In other words, employment levels at young ages were low for the younger cohorts, possibly due to the expansion of tertiary education.

Figure 3.12. Employment rates by age group in specific cohorts, cross-country averages



Note: The cross-country average employment rates of 30-34 year-olds born in the 1930s was 70%. For people born in the 1950s, it was 77%, an increase of 10% (right-hand y axis). The specification for each cohort is based on country and age fixed effects.

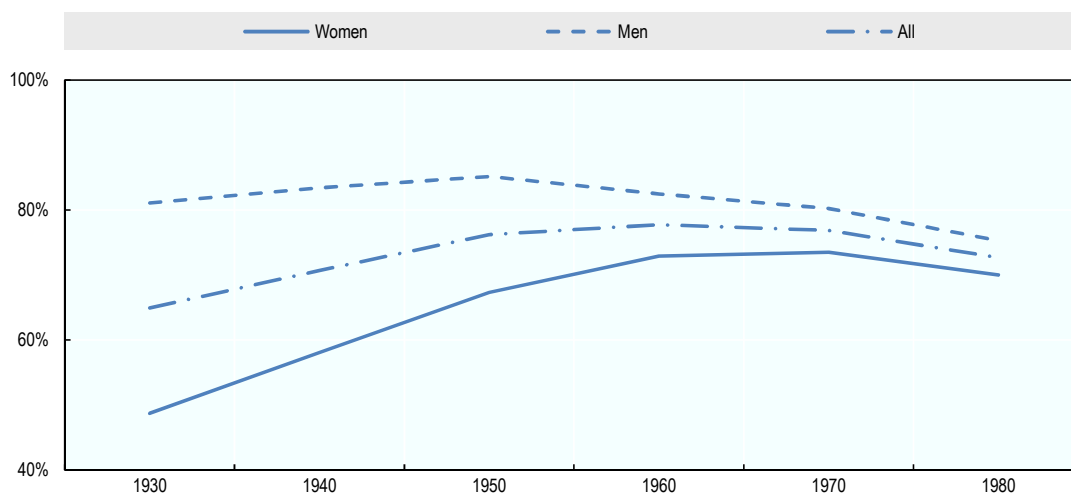
Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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2. Gender gaps have narrowed but are still wide

Gender gaps have narrowed on a number of fronts over recent decades (Olivetti and Petrongolo, 2016). Women's labour market performance in particular has contributed to the rise in employment from one cohort to the next (Figure 3.13 and Figure 1.14 in Chapter 1). Female employment grew fast (from low levels) between the 1930s- and 1960s-born generations, although it did decline slightly for the younger cohorts. At the same time, employment rates of men born after the 1950s have been lower.

These trends have combined to yield a steady narrowing of the gender gap in all age groups, though less so among 30-to-34 year-olds, due to motherhood and unevenly split childcare. The closing of the employment gap is consistent with long-term progress towards gender equality in education in many countries (OECD, 2012). There is some evidence that the climb in women's employment rates has cut overall income inequality despite the wide disparity between highly and poorly educated women (Harkness, 2013; OECD, 2015a). Consequently, given the importance of employment history for income prospects at older ages, increased female labour market participation across cohorts is likely to help reducing future ageing-related income inequality.

Figure 3.13. Cohort effects in employment rates by gender, OECD average

Note: The chart displays the average estimated cohort effects across countries from a specification which for each country includes age and cohort effects. Using the Deaton-Paxson approach to control for period effects has very little impact. To illustrate the narrowing of the employment gender gap, the graph uses the cohort series based on a reference age of 50-54 years old.

Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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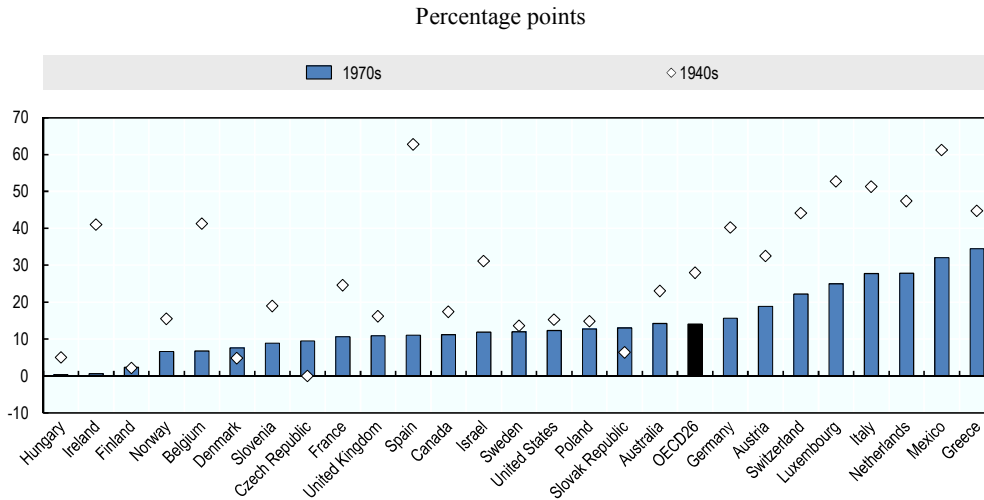
To illustrate the narrowing of the employment gender gap, Figure 3.14 considers the 40-44 age group and shows how the gender gap in countries' employment rates halved on average between the 1940s- and 1970s-born generations. The reduction was greater than 20 percentage points in Belgium, Germany, Ireland, Italy, Luxembourg, Mexico, Spain and Switzerland. In the younger 1970s-born generation, the gap is still far from closed though as it stands at an average 14 percentage points, and remains especially wide in Greece, Mexico, the Netherlands, Italy and Luxembourg. It is negligible in Hungary, Ireland and Finland.

Notwithstanding their improved labour market performance over time, women are still more likely than men to work part-time and take career breaks, which create obstacles to adequate retirement income. A related factor is that women also bear most of the burden of unpaid household chores and are more likely to care for both children and older relatives (Chapter 6). Although wage gaps have also narrowed, full-time female employees' median earnings in 2015 were still about 15% lower than men's, with gaps wider than 20% in Chile, Estonia, Israel, Japan, Korea and Latvia (OECD, 2017). Gender differences are especially pronounced in emerging economies, with low-skilled women from the poorest families typically facing the largest disadvantages relative to men (OECD, 2016).

To sum up, despite unprecedented improvements, substantial gender disparities persist and continue to fuel unequal ageing. The disadvantages which generations of women had to contend with during their working lives have translated into wide annual pension gaps – though lower annual retirement incomes are partly offset by longer retirement as women tend to live longer. On average across 28 OECD countries for which data are available, annual pension payments to the over-65s are about 27% lower for women on average (Figure 3.15).⁷ Differences are especially wide in Germany and the Netherlands, over 40%, while there are lower than 10% only in Estonia, the Slovak

Republic and Denmark. The shift towards pension systems with a stronger link between earnings and pensions has exacerbated the already weak pension position many women find themselves in (OECD, 2015b). On the other hand, rising female participation rates and closing pay gaps have improved the prospects for many women of receiving a pension on par with men.

Figure 3.14. Gender gaps in OECD countries' employment rates among 40-44 year-olds in 1940s versus 1970s birth cohorts

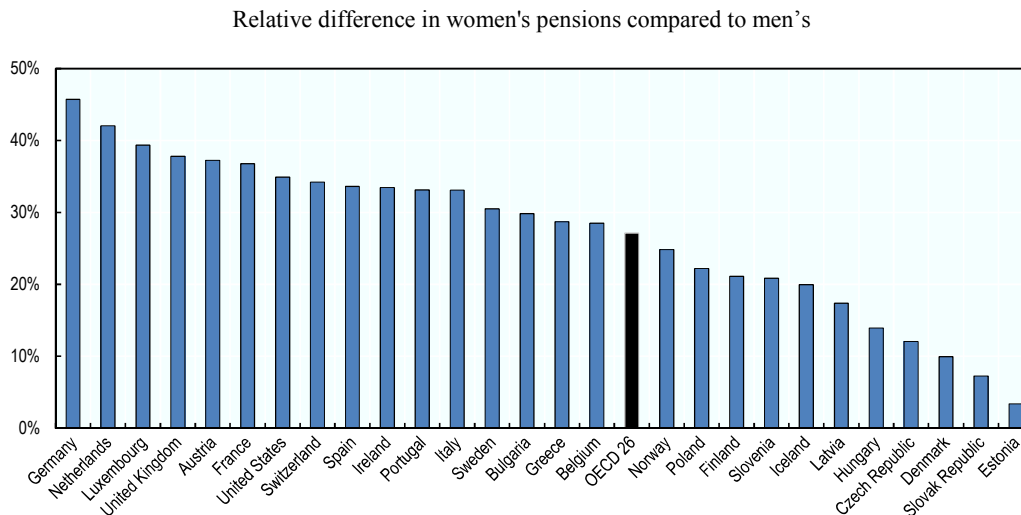


Note: For Sweden and Switzerland, data refer to the 30-34 and 35-39 age groups, respectively. For Austria and Belgium, the gender gap among 1970s-born cohorts is that of the 30-34 age group. For Greece and Slovenia, it is the 40-44 year-old age group in the 1940s cohorts.

Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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Figure 3.15. Gender gap in pensions in OECD countries, 2014 or latest



Note: The gap is computed as the difference in average pensions across genders divided by male's average pensions.

Source: For European countries: EU-SILC 2014 and 2013, for USA EBRI Databook on Employee Benefits Updated 2010.

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3. There is a rising risk of more unequal ageing

Repercussions in old age of inequality at working age

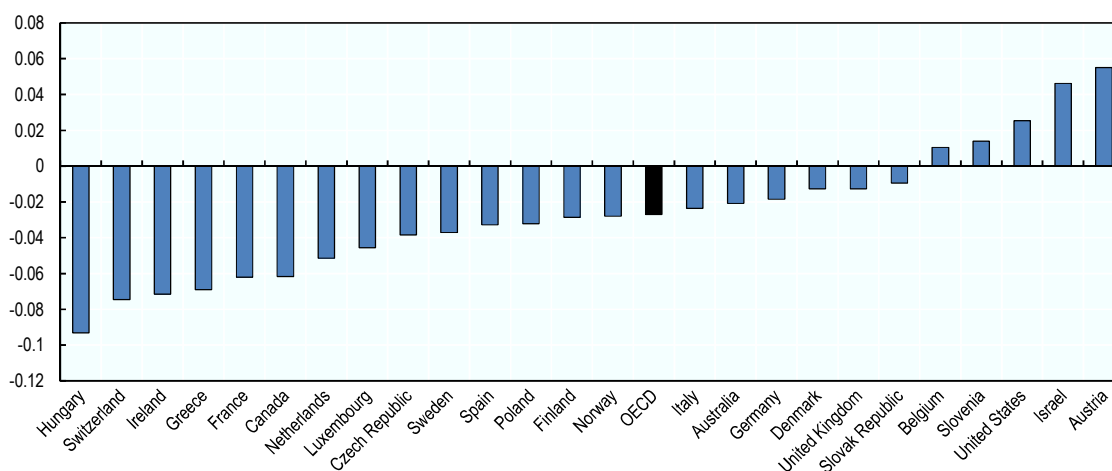
The elderly population of the future will be far more varied than today's. Although they will live longer, more will have undergone long spells of unemployment and low wages, while others will have enjoyed higher, stable earnings. As noted above, income gains have faltered in some countries and new threats to health, such as obesity, are coming to the fore (Chapter 2).

Caution should be exercised when extrapolating the future of the elderly from their current, improved situation. The experience of today's young and middle-aged people could be quite the opposite when they grow old in forthcoming decades. There is a serious risk that ageing will be tough for the poorly educated and, due to the persistent gender gap, particularly tough for poorly educated women. Chapter 4 gives an idea of the extent to which wide income inequality in working life impacts on inequality in retirement incomes. Indeed, old-age support systems will have to cope with significantly higher inequalities, so increasing the need for their redistributive components to play a greater role.

Within any given cohort and country, income inequality – measured by the Gini coefficient, where 0 indicates that everybody has the same income and 1 that all income goes only to one person – typically increases with age up to 55-60 years old, when it generally reaches a peak (see Figure 1.10 in Chapter 1). Thereafter, it tends to fall as the Gini coefficient declines between the ages of 55-59 and 75-79 (within the same cohort) by about 3 percentage points – i.e. an about 10% drop in equality. Income inequality continues to increase substantially with age among the over-60s (among the same birth cohorts on average) only in Austria, Israel and the United States (Figure 3.16). By contrast, inequality declines sharply at older ages in Hungary, Switzerland, Ireland, Greece, France, Canada, Netherlands, Luxembourg, Czech Republic, Sweden, Spain, Poland, Finland, Norway, Italy, Australia, Germany, Denmark, United Kingdom, Slovak Republic, Belgium, Slovenia, United States, Israel, Austria.

Figure 3.16. Income inequality decreases at older ages in most countries

Changes in the Gini coefficient between the 55-59 and 75-79 age groups among the same birth cohorts



Note: Specifications by country include age and cohort fixed effects.

Source: OECD calculations based on Luxembourg Income Study (LIS) data.

Ageing automatically affects income inequality

Given that income inequality evolves with age among the same individuals, demographic changes affects total inequality directly through a composition effect. Inequality changes with shifts in the age structure of the population, even if inequality within each age group remains constant over time (Box 3.1). The advantage of the Theil index, as a measure of inequality, is that it breaks total inequality down into the sum of the inequality (as a weighted average) within age groups (weighted by their share of the population) and of the inequality in average income between five-year age groups. Inequality within age groups accounts for more than 90% of inequality.

If there is an increase in the share of people aged 55 to 65 years old (generally the age group with the highest inequality), then total inequality automatically rises – and vice-versa for the share of over-70s, where inequality is relatively low. However, there may be offsetting effects, as ageing may be associated with increases in the shares of both 55-to-65 year-olds and the over-70s. Between 2015 and 2050, current demographic projections suggest that the automatic effect of ageing on inequality is close to zero on average in the OECD, with changes in equality never exceeding 4% (Box 3.1).

Box 3.1. Impact of demographic changes on income inequality

The Theil index of disposable income is a measure of inequality in the population, similar to the Gini index. It is defined as follows:

$$T \equiv \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \log \left(\frac{y_i}{\bar{y}} \right)$$

where n is the number of individuals, y_i is the income of individual i , and \bar{y} is the average income of the population. The Theil index belongs to a group of inequality measures, generalised entropy indices, which can be broken down into inequality within and between certain groups in the population. It can therefore be used to examine the effect of shifts in the age composition of the population on overall inequality. To that end, it can be re-written as:

$$T = \underbrace{\sum_{j=1}^k s_j T_j}_{\text{within-group inequality}} + \underbrace{\sum_{j=1}^k s_j \log \frac{\bar{y}_j}{\bar{y}}}_{\text{between-group inequality}}$$

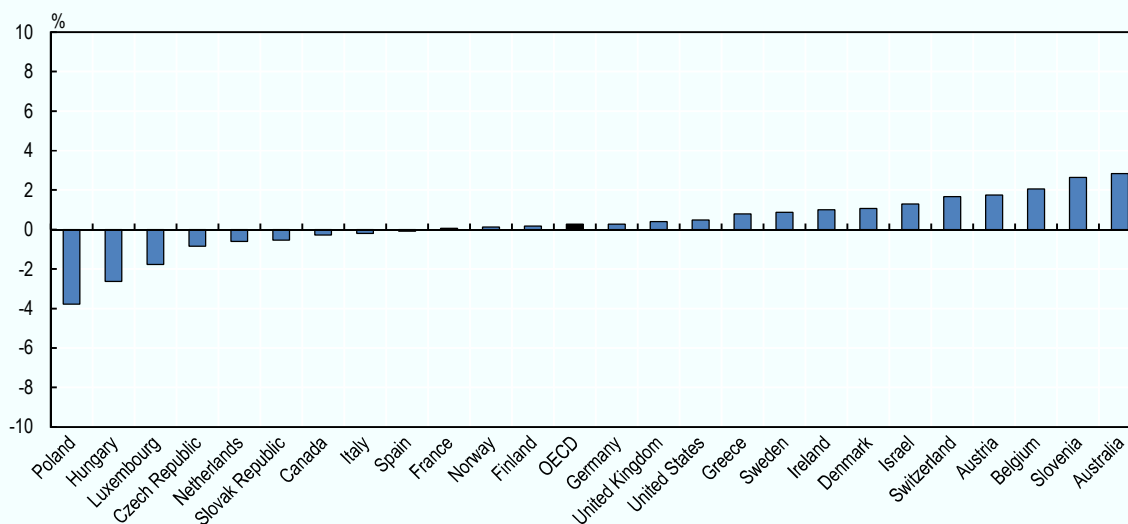
where j indicates the age group of the population, while T_j , \bar{y}_j , and s_j are, respectively, its Theil index, average income, and share in the total income of the population. As for k , is the total number of age groups. A change in the age composition alters the income shares (s_j) of the age groups while both the inequality within (T_j) and average income (\bar{y}_j) of each age group are assumed to remain constant over time.

The age composition effect of demographic changes between 2015 and 2050 on inequality is computed from available data on five-year age groups in 26 OECD countries (see Figure 3.17). The effects are slight, ranging from a 3.8% fall in inequality in Poland to a rise of 2.8% in Australia. In about two-thirds of the OECD countries considered, the magnitude of the effect fails to exceed 1%. Currently, countries like Poland, Hungary and Luxembourg are characterised by a marked drop in inequality at older ages. The large number of baby boomers retiring over the next three decades thus reduces overall inequality. Meanwhile, the shift in the composition of the population is projected to increase overall inequality in countries like Australia, Slovenia and Belgium, where inequality does not fall in old age or does so to a lesser degree.

Box 3.1. Impact of demographic changes on income inequality (*cont.*)

Figure 3.17. How changes in the age composition of populations automatically affect the Theil index of disposable income in selected OECD countries, 2015 and 2050

Change measured as percentage of the 2015 Theil index



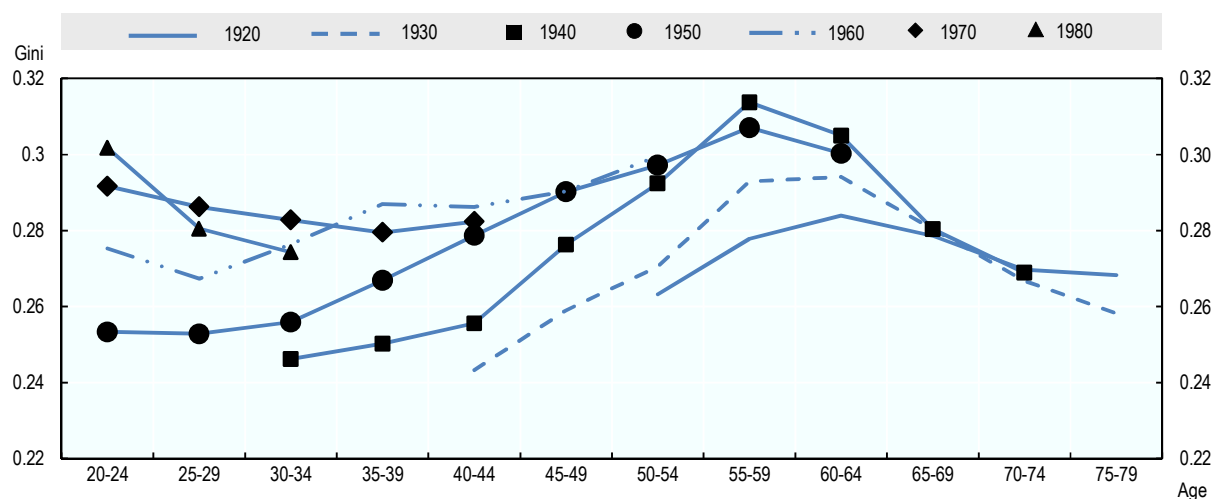
Source: OECD calculations based on United Nations (2015), *World Population Prospects: The 2015 Revision*, Department of Economic and Social Affairs, Population Division, United Nations, New York, Luxembourg Income Study (LIS) data; for details see Geppert, C. (2018), “Age- and Education-related Composition Effects on Measures of Aggregate Inequality”, *OECD Working Papers*, forthcoming.

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Inequality at the same age between birth cohorts is on the rise

Within-cohort income inequality typically rises with age, generally peaking between 55 and 60 years old in OECD countries and declining thereafter (Chapter 1). However, inequality evolves differently from one birth cohort to the next, with the 1940s-born experiencing a particularly pronounced rise and fall in income with age (see the hump corresponding to the 1940s cohort in Figure 3.18). Indeed, for this generation, the Gini index rose substantially from an OECD-wide average of 0.245 among 30-to-34 year-olds to 0.315 when, 25 years later, they reached 55 to 59. The increase was much more gradual among the 1960s cohort (for which data are available only up to 50-54) albeit from a higher level of inequality at younger ages. For the youngest cohorts, the Gini index even declines up to the age of around 35, in contrast to the initial upward sloping segment (of the hump shape) that had prevailed up to and including the 1950s-born cohort.

Figure 3.18. Income Gini index by cohort and age group, OECD-wide averages



Source: OECD calculations based on Luxembourg Income Study (LIS) data.

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Overall, income inequality in the same age groups has climbed steadily in all cohorts born between the 1920s and 1980s, particularly in the younger age groups. To put it more precisely, inequality at the same age rose, on average, in all cohorts:

up to the age of...	between the cohorts born in...
65-69	1920s and 1940s
and 50-54	1940s and 1960s
and 30-34	1960s and 1970s
and 20-24	1970s and 1980s

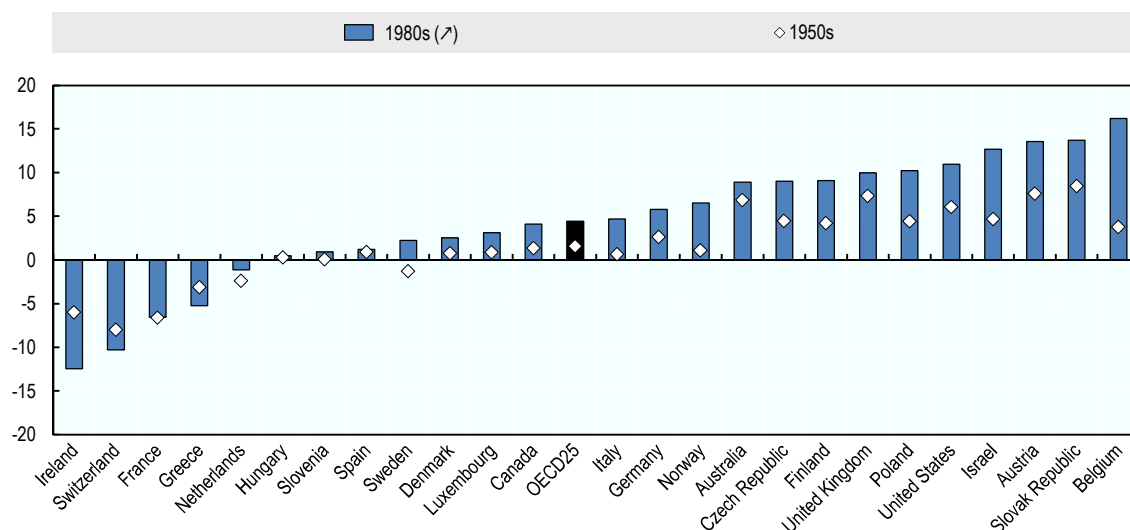
The inference is a very sharp cumulative rise in inequality among the younger age groups. For those born in the 1980s, it is much higher than among their parents at the same age, which in turn was higher than for their parents. If the age patterns of the past prevail among the younger cohorts, they will suffer from great inequality in old age.

The average increase in the Gini coefficient at the same age between generations born in the 1920s and in the 1950s is equal to 1½ percentage points (Figure 3.19) – a rise in inequality of about 6%.⁸ Between the 1950s and 1980s birth cohorts, the Gini index at the same age increased by a further 3 percentage points (or 10%) on average. In other words, at a given age, income inequality climbed by about 0.3% per birth year on average among people born from 1950 onwards.

Behind such OECD averages lie marked differences between countries. The cumulative increase (between the 1920s and 1980s birth cohorts) has been very large – greater than 10 points – in Belgium, the Slovak Republic, Austria, Israel, the United States, Poland, the United Kingdom, Finland, the Czech Republic and Australia. By contrast, inequality at the same age declined between cohorts in Ireland, Switzerland, France and Greece. Overall income inequality at the same ages across cohorts increased in about two-thirds of countries, was more or less stationary in one-sixth, and declined in the remaining sixth.

Figure 3.19. Income inequality at the same age has increased from one generation to the next in most countries

Changes in Gini indices across birth cohorts in percentage points, average across age groups, cohort reference = 1920s



Note: For each country, reported figures are derived from a specification that includes cohort and age fixed effects. Older cohorts tend to be observed at old ages only and younger cohorts at young ages. Due to quality issues, data from Mexico have not been used.

Source: OECD calculations based on Luxembourg Income Study (LIS) data.

StatLink  <http://dx.doi.org/10.1787/888933567274>

In addition to the repercussions on old-age inequality of higher income inequality in working life, analysed in the next chapter, population ageing could heighten the difficulties that the disadvantaged elderly of the future may experience. It would do so through four interrelated factors.

First, as the proportions of older people in populations grow, any disadvantage borne by the elderly (e.g. those resulting from high income inequality during working life) would be magnified at the aggregate level, and at a fast pace in some countries. Second, health differences, both within and between socio-economic groups, tend to grow over the life cycle (Chapter 2), at least up to a certain age, and the growing share of older people is likely to make health-related inequalities more prominent.

Third, population ageing is closely associated with the decline in the share of the working-age population, which will considerably affect the relative supply of productive factors, labour and capital. Workers supply labour while retirees hold substantial amounts of assets. Consequently, a fall in the ratio of workers to retirees turns labour into the scarcer factor of production and capital into the more abundant one – unless working and saving patterns over the life cycle change dramatically. This ageing-related labour scarcity is likely to lead to an increase in income inequality if, as may be expected, physical capital continues to be a stronger complement to highly skilled than to low-skilled labour (Krusell et al., 2000; Ludwig et al., 2012).

Fourth, as ageing tends to exert upward pressure on public spending, public finance is likely to be tight for a prolonged period. OECD (2010) estimated that ageing-related pressures on health care, long-term elder care and pension spending will generate fiscal consolidation needs of 3% of GDP between 2010 and 2025, on average. The pressure on

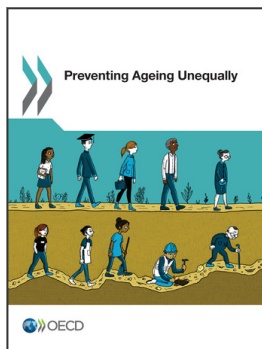
public expenditure has already motivated reforms which have led to lower pensions. Policy makers' leeway for correcting the impact of greater inequality among the elderly or mitigating their deteriorating position might therefore be limited.

Notes

1. These numbers relate to the usual period life expectancy used in most comparative analyses. They therefore reflect the gains in life expectancy that will benefit current cohorts only partially. For a more detailed discussion of the distinction between period and cohort life expectancy, and related data issues, see Chapter 4.
2. The growth rate of GDP per capita is related to the growth rate of labour productivity and the percentage change in dependency ratios (old and young). Moreover, Chapter 2 in the 2015 edition of the OECD's *Pensions at a Glance* shows that the ageing-related financial cost of indexing old-age benefits above prices was closely related to the relative change (as a percentage) in the old-age dependency ratio.
3. The period covered varies from country to country. The data relate to countries in the Luxembourg Income Survey (LIS). Birth cohorts are grouped by the decade of birth, from 1910-19 to 1980-89, while age groups cover five-year periods. The descriptive analysis uses country, age and cohort fixed effects.
4. Because there are not enough data available to measure income in all cohorts and age groups in every country, these results assume that, within each country, there is a common age pattern of real income in all cohorts. Figure 3.5 shows that at least until recently there are no obvious changes in the age pattern across cohorts.
5. When period effects are explicitly controlled for in currently available data – e.g. through the Deaton-Paxson transformation (Deaton and Paxson, 1994) – the age-cohort patterns are basically similar to the unadjusted ones shown. Deaton-Paxson normalisation forces the estimated time effects to be orthogonal to a linear time trend and to add up to zero. Any linear time trend is therefore attributed to cohort and/or age effects, but not to time effects.
6. Measured old-age poverty in Australia and Switzerland is partly attributable to the fact that many pensioners have taken their accumulated pensions as lump sums, which are not counted as current income, rather than converting them into annual income stream.
7. For more on the wide gender gap in pensions, go to the OECD webpage, “New OECD data and analysis revealing the wide gap in pension benefits between men and women” at <http://www.oecd.org/gender/data/newoecdanalysisrevealingthewidegapinpensionbenefitsbetweenmenandwomen.htm>.
8. The percentage increase in the Gini index is estimated by assuming a common age pattern in inequality in all cohorts.

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