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Chapter 3

How incomplete careers affect pension entitlements

This chapter assesses the impact of shorter, more fragmented careers on the pension entitlements from mandatory schemes taking into account all pension components including pension credits and other redistributive mechanisms in pension systems. The analysis focuses on delayed labour market entry and career interruptions related to childcare and unemployment.

The analysis shows that with slightly more than a 1% drop in old-age pension for every year without a job on average, pension systems play a key role in offsetting the potential losses in retirement income due to delayed or interrupted employment. In the absence of any redistribution, the pension would fall by 2-2.5% based on the economic assumptions used in the OECD model. Pension credits and other redistributive components of pension systems while not being able to fully offset the contribution gaps related to delayed or interrupted employment, are therefore effective instrument to boost earnings-related pensions. The effects vary widely across countries and depend on the periods covered, the pensionable earnings used during these periods, and the provision of other redistributive tools in pension systems.

The results also highlight that pension systems are not typically designed to offset all kinds of income shocks which affect individual life courses. The increasing diversity of work paths requires a more comprehensive and integrated approach to the challenges faced by individuals through effective labour market, education, family and pension policies.

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.

3.1. Introduction

Retirement income is mainly a product of the past. It depends on job and earnings histories and on the pension rules in place at the time entitlements accrued, but also during retirement itself. On top of the various features of social protection systems, key determinants of retirement incomes are the extent to which men and women participated in the paid labour market; their earnings, and the duration of their working lives.

Unlike their parents' generation, many of today's workers face growing job insecurity and the need to continuously update their skills. The standard employment relationship has given way to more flexible, but often more precarious, arrangements, such as part-time work, fixed-term contracts and various forms of self-employment. Working mothers in particular often use such arrangements, as they seek to juggle work and family responsibilities. In most households across the OECD, both spouses are likely to work and, in some, both may well take career breaks to care for their children that translate into earnings losses and lower pensions. Unemployment, one of the great life-course risks that affect individuals and households, may also account for losses of earnings.

The financial consequences of life events for retirement income may be eased or amplified by a complex mix of factors. For example, some recent pension reforms that have tightened the link between contributions paid and pensions received have also shifted much of the burden of labour market risk to individuals. At a time of persistently high unemployment in many countries, de-standardisation of employment arrangements, and less and less steady lifelong careers, such reforms may result in lower pension entitlements, at least for those failing to remain employed. In earnings-related pension systems (when pensions depends on contributions paid into the system), career interruptions typically mean lost contributions and lower retirement incomes.

This chapter assesses the impact of shorter and more fragmented careers on mandatory public and private pension entitlements of future retirees modelled with the OECD pension models (see Chapter 5 in this volume) taking into account pension credits (i.e. ways to continue building pension entitlements during periods of limited or no pension contribution) and other redistributive mechanisms in pension systems. The analysis focuses particularly on delayed labour market entry and career interruptions related to childcare and unemployment. Although the chapter discusses the issues of careers shortened by early exit, analysis of their impact on future pension entitlements is beyond its scope and will be the subject of later work.

The chapter is organised as follows. After a summary of key findings, it sets the scene for understanding contribution gaps, looking at evidence of how periods of care, unemployment, and delayed labour entry vary across cohorts and age groups in OECD countries. Section 3.3 presents theory and evidence on the effects of career interruptions and delayed entry, while Section 3.4 briefly describes some of the pension components that may mitigate the effect of lost contributions on pension entitlements. Section 3.5 describes pension credits and Section 3.6 presents the estimates of the impact of interrupted and shorter careers on the pension entitlements of future cohorts of retirees. Section 3.7 discusses the results in the light of the current pension reforms and of other policies that affect the length of working lives. Finally, Section 3.8 draws some policy implications and summarises the main challenges ahead.

Key findings

- Residence-based basic pensions and contributory schemes based on relatively short contribution periods mitigate the effect of contribution gaps. Benefit calculation formulae based on highly redistributive pension schemes or on best years of earnings also help to provide adequate retirement incomes in case of incomplete careers. The referencing periods that apply in OECD countries (for the private sector at least) are long enough to avoid incentives for excessive wage increases at the end of the career.
- Pension credits in earnings-related pension systems boost the pension entitlements of people with interrupted work histories, but not enough in general to fully offset their contribution shortfalls. The effects vary widely across countries and depend on the periods covered, the pensionable earnings used during these periods, and the provision of other redistributive tools in pension systems.
- Pension credits for unemployment typically cover the periods during which unemployment benefits are paid. Credits for periods of childcare typically cover periods up to specific ages of the children. To benefit from these credits people need to have contributed some minimum period into the system and they are generally provided up to specific earnings threshold. The effects of pension credits vary with earnings due to such instruments as credit ceilings or flat-rate contributions: they are most useful to lower earners, and for employment breaks of limited duration (at least for childcare).
- In some countries, people whose careers are interrupted by unemployment or care will not be able to retire on the same terms as full-career workers. They will need to retire later or otherwise brace themselves to be heavily penalised.
- With slightly more than a 1% drop in old-age pension for every year without a job on average, pension systems play a key role in offsetting the potential losses in retirement income due to interrupted employment. In the absence of any redistribution, the pension would fall by 2-2.5% based on the economic assumptions used in the OECD model.
- Delaying entry into the labour market by five years for an average-wage worker implies a pension gap of 6% relative to full-career workers on average across countries. At one end of the spectrum, with 15% pension losses lie Chile and Mexico, which have no offsetting mechanisms built into their pension system in that case. Austria, Estonia, Hungary, Israel, Korea, Norway, the Slovak Republic and Sweden also have drops greater than 10%. At the opposite end, France and Luxembourg record 3% and 6% gains, respectively, as, given pension rules in these countries, people have to retire four and five years later to be entitled to a pension without penalty following delayed entry. Of course, if delayed entry is due to upgrading human capital, e.g. through higher education, it is likely to increase pension entitlements overall by improving wage prospects.
- An average-wage earning woman with two young children who interrupts her career for five years to care for her children would lose 4% of pension income relative to the full-career case on average across OECD countries. The average gap increases to 11% after a ten-year break. Pension benefits drop slightly less for half-average-wage earners, by 3% after five-year break on average, while for workers on twice the average wage pensions drop more, i.e. by 5%. The largest declines are recorded in Germany, Iceland, Israel, Italy, Mexico and Portugal for the average-wage earner, while pensions are not affected by a five-year care break in about one third of OECD countries.
- Unemployment periods generate similar albeit slightly larger reductions in pension entitlements than childcare breaks on average.

Policy messages

- In the absence of mechanisms to counteract, at least to some extent, the impact of employment breaks, earnings-related pension systems make people pay for breaks in their employment

histories when they retire. Inequalities may be widened in old age by some current developments in pension systems – such as the development of individual private pensions and the trend towards closer links between individual benefits and contributions in public pension systems.

- Employment breaks and shorter careers more generally raise important policy issues. Policy makers should seek to cushion the effects of involuntary unemployment that account for substantial pension losses, and possibly to reduce drastically the impact of relatively short childcare breaks on pension benefits. At the same time, over-generous benefits paid during long absences may lure workers away from the labour market, so entailing substantial losses of contributions and human capital, and eventually prove too costly for the state. Striking the right balance between length of leave from work and benefit entitlements is a fundamental issue that policy makers should address to ensure that people go back to work but do not lose out too much from long interruptions.
- Pension credits are effective instruments to offset the effects of career interruptions and to minimise old-age poverty.
- The majority of OECD countries which had credits for periods of higher education are phasing them out. These mechanisms are generally regressive as they tend to reward people with higher lifetime earnings. Recent labour market developments, such as the strong rise of unemployment, especially for younger workers, and of precarious forms of employment, highlight the need to overcome some of the limitations of pension systems that link pension entitlements closely to contributions.
- Pension plans are not typically designed to offset all kinds of income inequalities in old age which result from individual life course experiences. There must be a more comprehensive and integrated approach to the challenges faced by individuals with precarious incomes and stop-go career paths through effective labour market, education, family and pension policies.

3.2. Setting the scene for an understanding of contribution gaps

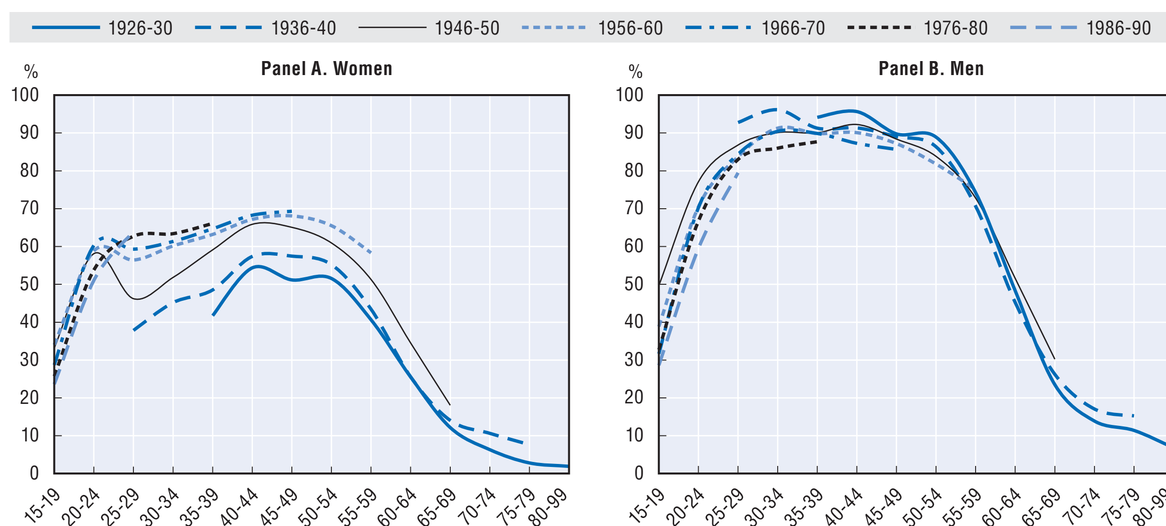
Career paths across genders, age groups, and cohorts: A general overview

Among the factors that shape retirement incomes, labour market experience is critical. Women's employment rates have progressively risen relative to those of older cohorts', while the trend has been the opposite among men, albeit on a much lower scale (Figure 3.1). For both men and women, employment rates have, in recent years, declined at young ages and risen among older workers. Yet, employment gender gaps generally remain substantial (see more on this below).

The age of entry into the labour market and later life events (such as childbirth and childcare) influence retirement incomes, depending on the pension system, through the potential length of paid-employment periods. Dismissals and the termination of fixed-term contracts are the main reasons for labour market exits among 25-to-49 year-olds in OECD countries – 63% among men and 47% for women (Figure 3.2). There is a particularly wide gender disparity when it comes to care – one-quarter of women, but just 4% of men, who leave work do so to care for a close relative.

Differences between countries are wide. For example, fixed-term jobs that come to an end account for nearly half of all exits in the 25-to-49 age group in Finland, France, Italy, Spain, and Turkey, but much less in Denmark among men and the United Kingdom among women. Dismissals and redundancies underlie 40% or more of men's exits in the Czech Republic, Greece, Hungary, Ireland, Italy, Portugal, and the Slovak Republic but relatively few in Austria, Belgium, Denmark, Spain and Switzerland. Between one-fifth and one-half of exits among women, but very few among men, are related to care giving in Austria, the Czech Republic, Germany, Poland, the Slovak Republic, Switzerland, and the United Kingdom. Finally, in Austria, Belgium, Denmark, and the Netherlands, 15% or more of men and women quit work because of illness and disability, but less than 3% in Greece and Italy.

Figure 3.1. **Employment rates by birth cohort and age group, OECD average**



Note: Each curve illustrates the employment rate (y axis) for each birth cohort at different ages (indicated on the x axis). For example, the thin line (black) curve in the left-hand panel indicates that women born between the years 1946 and 1950 had labour market participation rates of 60% between the age 20-24, falling to 46% between the age 25-29 and rising to around 65% between the age 40-44 on average in the OECD.

Source: OECD calculations based on *OECD Employment and Labour Market Statistics*, *www.oecd-ilibrary.org/employment/data/oecd-employment-and-labour-market-statistics_lfs-data-en* as in D'Addio, A.C. (2015), "Explaining the Gender Pension Gap in OECD Countries: Socio-economic Determinants and Pension Rules That Matter", unpublished manuscript.

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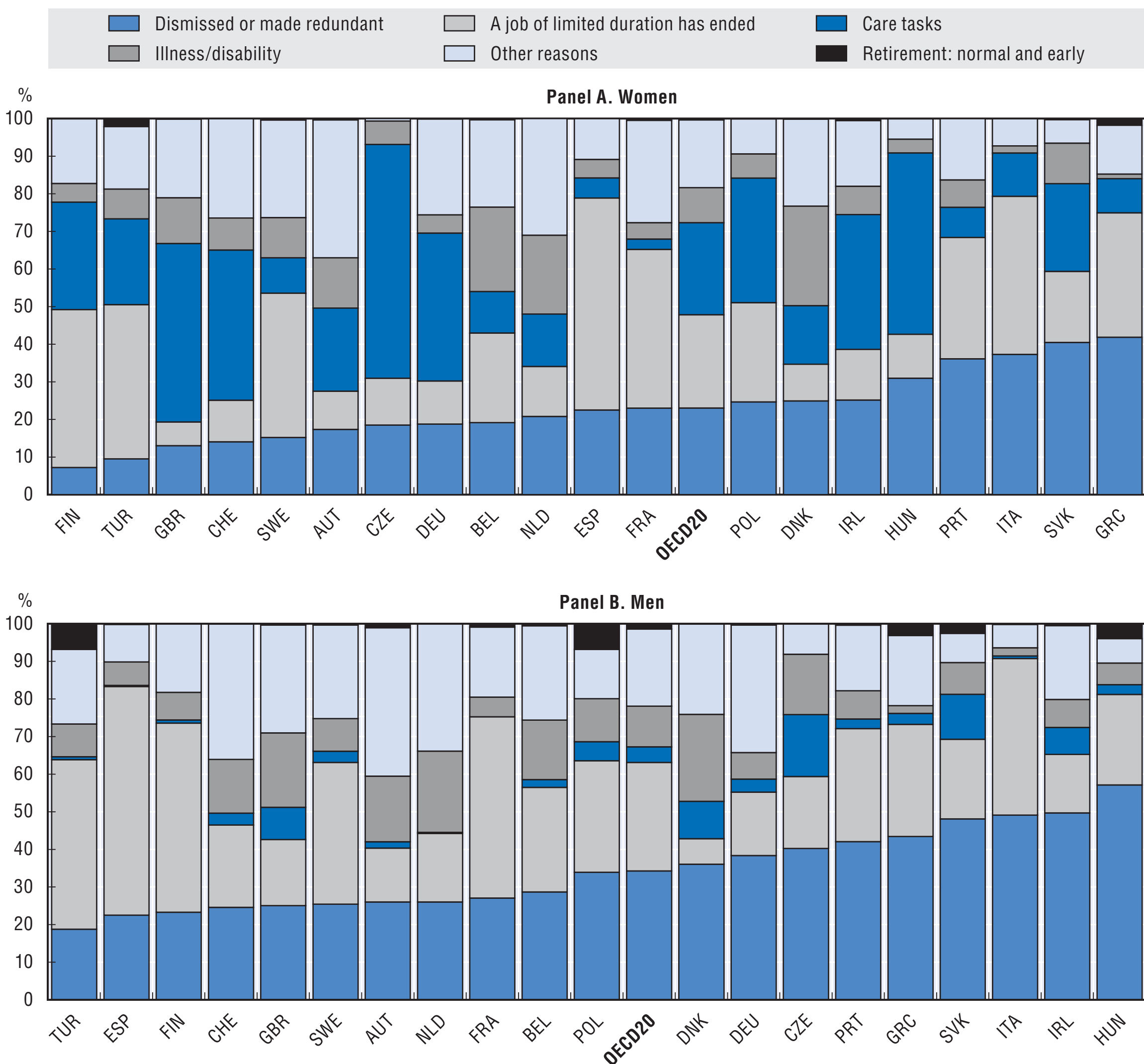
Shorter, fragmented, and precarious contribution histories can result in lower pension entitlements and coverage and thus have profound long-term effects. The length and timing of career breaks may be reasons for losses of retirement benefits in countries where pension levels are determined not only by total contributions made but also by their sequence, as happens with fully-funded defined-contribution pensions, where contributions made early will accrue more interest over time than those made later due to compounded interests. Moreover, the timing of involuntary career breaks may affect their length – when workers lose their jobs during a recession, for example, they may be out of work for longer than in good economic conditions. The accumulation of pension rights may also be affected by age-specific unemployment benefit rules as older workers usually receive more generous unemployment benefits than younger ones.[1]

Age of entry

In 2013, the estimated average age of entry into the labour market stood at 21.9 years among men and 23.5 for women in 21 OECD countries (Figure 3.3). The gender gap in the age of entry was wider than two years in the Czech Republic, Hungary, Italy, Poland and the Slovak Republic while it was relatively narrow in Finland, Portugal, Spain and Sweden, for example. The gender gap also varies across countries: more than four years separate the United Kingdom and Italy in terms of the average age of labour market entry for both men and women.

Differences in the age of labour market entry are driven by factors such as education systems, training opportunities, and labour market conditions. Most OECD countries have seen sharp rises in numbers of students and the length of time they stay in education over time – the average length of schooling increased by more than eight months on average in the OECD area between 2004 and 2012 (OECD, 2014a). While the nature of jobs tends now to require higher skills and standards of education, the demand for education might also have increased because it increasingly acts as a screening device helping people with better education levels find a job more quickly.

Figure 3.2. **Reasons for exiting the labour market, men and women, aged 25-49, 2014**



Source: OECD calculations based on data extracted from the European Union Labour Force Survey 2014 (EU-LFS).

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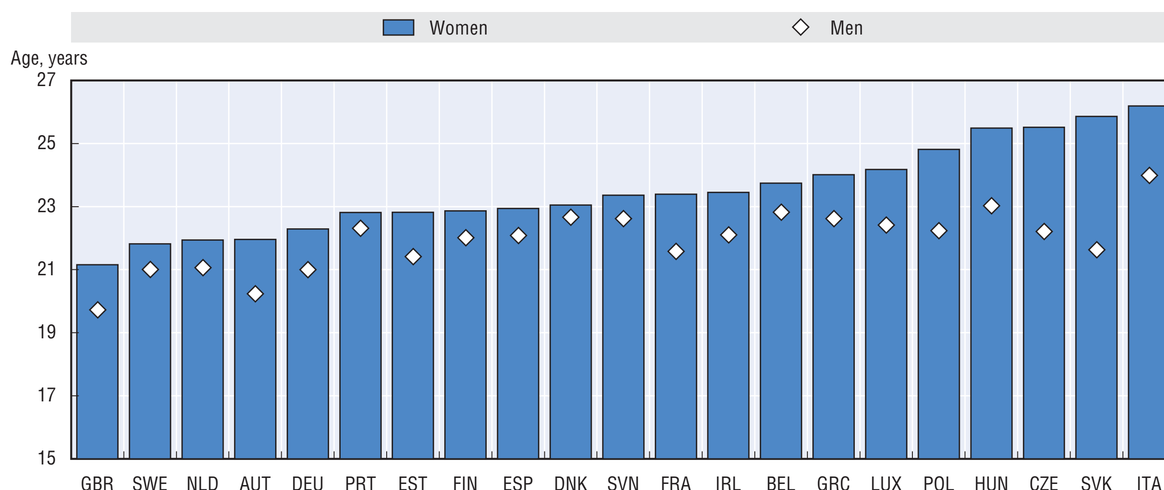
People entering the labour market in periods of recession feel the pinch of unemployment most sharply. They face scarce employment opportunities and, as a result, part-time employment and inactivity are widespread (Carcillo et al., 2015). The rates of young people who are neither in employment nor in education or training (NEETs) in countries worst hit by the crisis are very high. In Greece, Ireland, Italy, and Spain at least 20% of 16-29 year-olds are NEETs, while rates are also high in Turkey (35%), Israel (28%), Mexico (23%) and Chile (22%). As individual long-term career prospects are largely determined in the first ten years of the working life (OECD, 2015c), NEET periods may adversely affect old-age pensions, too.

Career interruptions related to unemployment and care

Unemployment

Overall unemployment looks likely to remain very high in 2016 in many OECD countries (OECD, 2015b). While young people have been strongly affected by employment losses, older workers have been less so, in part as a result of recent pension reforms, which made early retirement routes more difficult to access and less attractive. Nevertheless, once they lose their jobs, older people face severe

Figure 3.3. **Age of labour market entry in selected OECD countries, 2013**



Source: Based on estimations by the EPC Working Group on Ageing Population and Sustainability (AWG), European Union.

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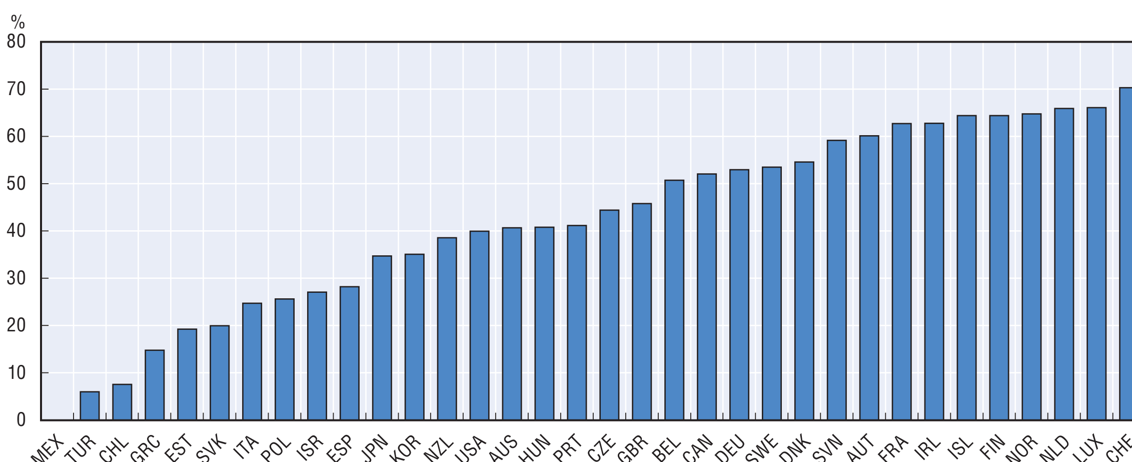
difficulties to find work again and often remain long-term unemployed (OECD, 2014b, c, d; 2015a, b). Unemployment spells longer than one year, on average, were observed in about a quarter of OECD countries (Belgium, the Czech Republic, Estonia, Greece, Hungary, Ireland, Italy, Poland and Slovenia) in 2010, while they lasted less than six months in Canada, Israel, Japan, Korea and Mexico (OECD, 2014f).

Effective unemployment insurance may partly alleviate unemployment's direct impact on income (Figure 3.4). Longer coverage and higher income replacement can also ease its effect on pension entitlements, although they might also reduce the incentive to work. The periods over which unemployment insurance benefits are paid vary substantially from one country to another, from

Figure 3.4. **The effectiveness of unemployment insurance provisions, OECD countries**

Percentage of previous net earnings averaged across household types, 2010



Note: Effective unemployment insurance is defined as the coverage rate of unemployment insurance (UI) times its average net replacement rate among UI recipients plus the coverage rate of unemployment assistance (UA) times its net average replacement rate among UA recipients plus the share of those not covered by unemployment benefits [or the ratio of the number of social assistance (SA) recipients to the number of unemployed if this is lower] times the SA replacement rate. Average replacement rates among recipients of UI and UA take account of family benefits, housing benefits and social assistance if eligible.

1. Replacement rates for Chile represent 2011 figures.

Source: OECD (2014), *OECD Employment Outlook 2014*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/empl_outlook-2014-en*.

StatLink http://dx.doi.org/10.1787/888933300447

between just a few weeks in Japan to a very long period in Belgium (unemployment benefits are paid without any duration limit). According to the aggregate measure in Figure 3.4, Chile, Estonia, Greece, Mexico, the Slovak Republic and Turkey offer the scantiest unemployment insurance, while Finland, Iceland, Luxembourg, the Netherlands, Norway and Switzerland afford the greatest protection.

Specific features of women's careers: Employment and children

The employment gap between men and women has, on average, more than halved since the early 1970s in the OECD. Nearly 58% of women aged 15 to 64 were employed in the OECD in 2013, compared to 40% in 1960. By contrast, male employment rates declined by 10 percentage points on average over the same period (Figure 3.5, Panel A). Nevertheless, female employment rates were still 15 percentage points below men's in 2013 (Panel B).

Part-time jobs are also far more widespread among women than men. In all countries, the share of female part-timers in total employment is substantially higher than among their male peers. On average in OECD countries, 5% of men and about 22% of women aged 25-54 work part-time. Very high

Figure 3.5. **Employment rates among men and women**

Women — Men

Panel A. Trend in employment rates of men and women, OECD average, 1960-2013

Men — Women

Panel B. Employment rates of men and women, aged 15-64, 2013

Source: Data extracted from *OECD Employment and Labour Market Statistics*, *www.oecd-ilibrary.org/employment/data/oecd-employment-and-labour-market-statistics_lfs-data-en*.

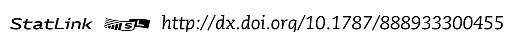

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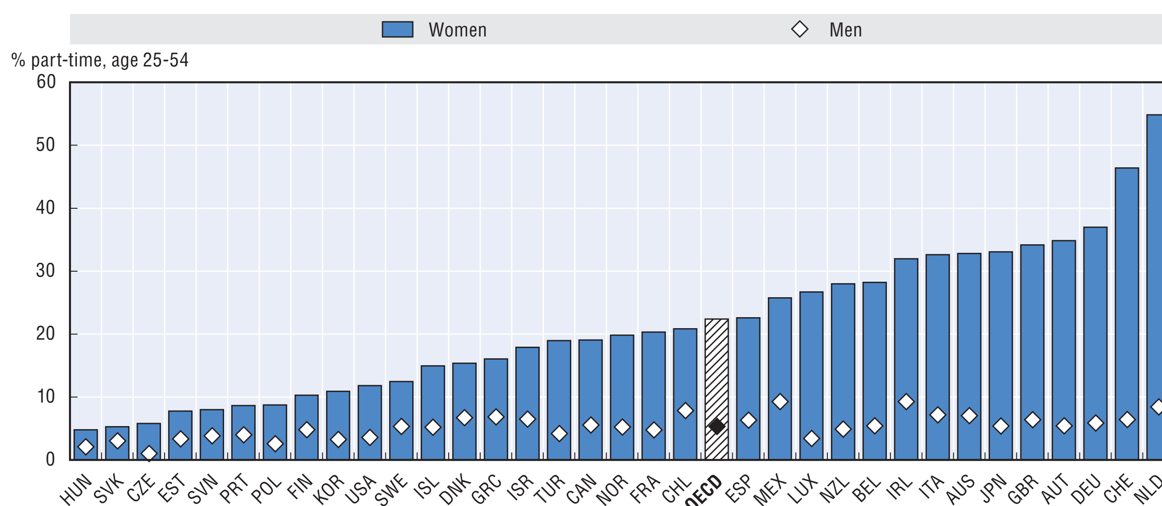
Figure 3.6. **Incidence of part-time employment by gender, 2013**



Note: Part-time employment refers to persons who usually work less than 30 hours per week in their main job. The indicator shows the proportion of part-time employees in the total employed workforce. It is also called the incidence of part-time employment.

Source: *OECD Family Database*, *www.oecd.org/els/family/database.htm* and *OECD Employment and Labour Market Statistics*, *www.oecd-ilibrary.org/employment/data/oecd-employment-and-labour-market-statistics_lfs-data-en*.

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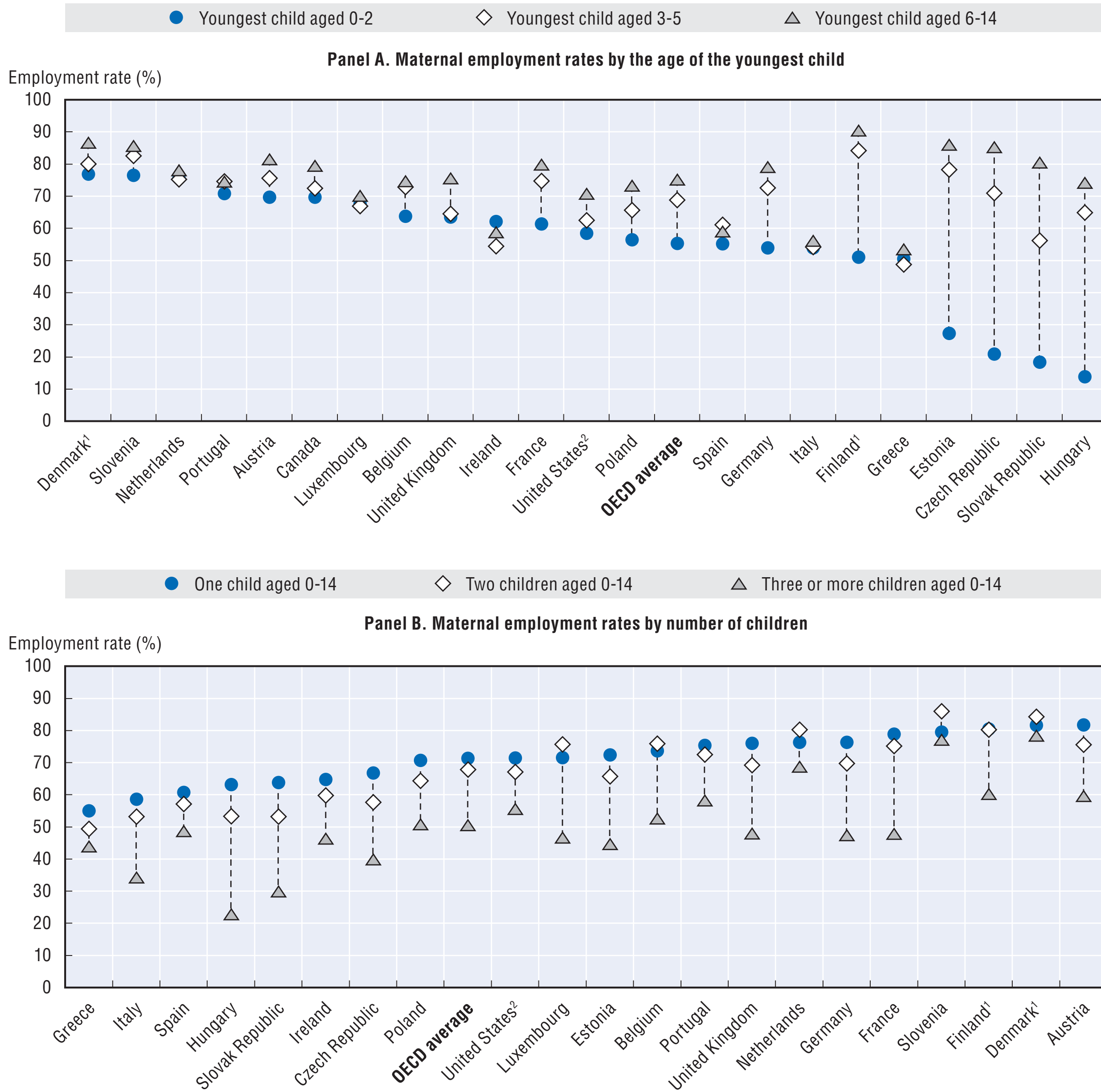
shares of female part-timers are to be found in Australia, Austria, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Switzerland and the United Kingdom (Figure 3.6). By contrast, female part-timers account for no more than 5% of women's employment in the Czech Republic, Hungary and the Slovak Republic, but less than 3% for men in those countries.

Women also have shorter effective working lives than men in all OECD countries. Women aged 65 and over in 2008-09 worked 13 years less than men on average in the 13 OECD countries covered by the SHARELIFE survey[2] (D'Addio, 2009 and 2015). According to Eurostat, 18-year-old women today still have an expected working life expectancy of three years less than men's. Moreover, women typically earn less than men – the difference between the median wages of full-time male and female employees was 14% on average in the OECD in 2012, ranging from 6% in New Zealand to 37% in Korea. Those disparities translate into lower old-age pensions – women's average mandatory pension benefits being 28% lower than men's in 2011 in 25 OECD countries (D'Addio, 2015).[3]

One key factor in the reduced female labour supply is the presence of children in the household. The average employment rate among mothers aged 25 to 54 with at least one child under 15 living at home is 8 percentage points lower than the overall employment rate of childless women in that age group (68% compared to 76% in 2013), according to the *OECD Family Database*. In some OECD countries (e.g. the Czech Republic, Estonia, Hungary, and the Slovak Republic), the employment rates of mothers with a child under three years of age are also very low. The average OECD-wide employment rate is 55%, rising to 69% when the youngest child is between 3 and 5 years old, and 75% when between 6 and 14 years (Figure 3.7, Panel A). Generally speaking, mothers' average employment rates decline as the number of children they have rises – from about 71% for one child to 51% for three (Panel B). In the Czech Republic, Hungary, Italy and the Slovak Republic, the employment rates of mothers with at least three children are very low.

Family policies are important to help parents balance work and family life. When childcare is unaffordable, of low-quality, or difficult to access, parents may opt for atypical work schedules and mothers in particular may drift away from the labour market as they care for their children at home.

Figure 3.7. **Maternal employment rates by the age of the youngest child and by the number of children, 2014**



1. Data for Denmark and Finland refer to 2012.
2. Data for the United States are for women with a child under 18, and the age groups used in Panel A are 0-2, 3-5 and 6-17.
Source: OECD Family Database, *www.oecd.org/els/family/database.htm.*

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The design of some maternity leave provisions can actually harm their career prospects and financial security. Very long leaves, for example, can foster disconnect from employment, so diminishing work and earnings prospects.

Since the early 1980s, most OECD countries have relied on combinations of different types of leaves. Statutory paid maternity leave exists everywhere in the OECD except in the United States. In general, maternity benefit is proportional to previous earnings and is often paid at full rate with pension entitlements maintained. The length of parental leave, the size of benefits and the legal enforcement of leave policies, however, vary widely across OECD countries (Figure 3.8). Consequently, pension credits relating to those provisions also vary widely from country to country.

Figure 3.8. **The duration and benefit entitlements of parental and home care leave in OECD countries, 2014**

Paid leave available to mothers | Paid leave reserved for fathers

Panel A. Duration of paid parental and home care leave available to mothers[1] and fathers[2] in weeks, 2014

Panel B. Average payment rate[3] across weeks of paid parental and home care leave (%), 2014

1. Information on paid parental and home care leave available to mothers refers to weeks of parental leave and subsequent periods of home care leave to care for young children (sometimes under a different name, for example, "childcare leave" or "child raising leave", or the *Complément de Libre Choix d'Activité* in France) that are available to mothers.
2. Information on paid parental and home care leave reserved for fathers refers to "father quotas" or periods of parental or home care leave that can be used only by the father and cannot be transferred to the mother, and any weeks of sharable leave that must be taken by the father in order for the family to qualify for "bonus" weeks of parental leave.
3. Payments rates reflect the proportion of previous gross earnings that are replaced over the weeks of parental and home care leave by the associated benefit(s). If benefits cover more than one period of leave at different payment rates then a weighted average is calculated from the length of each period. The recipient is assumed to live in a dual-earner family with a partner on 100% of average wages and with no other dependents. In other words, recipients are assumed to be having their first child.

Source: *OECD Family Database*, *www.oecd.org/els/family/database.htm*.

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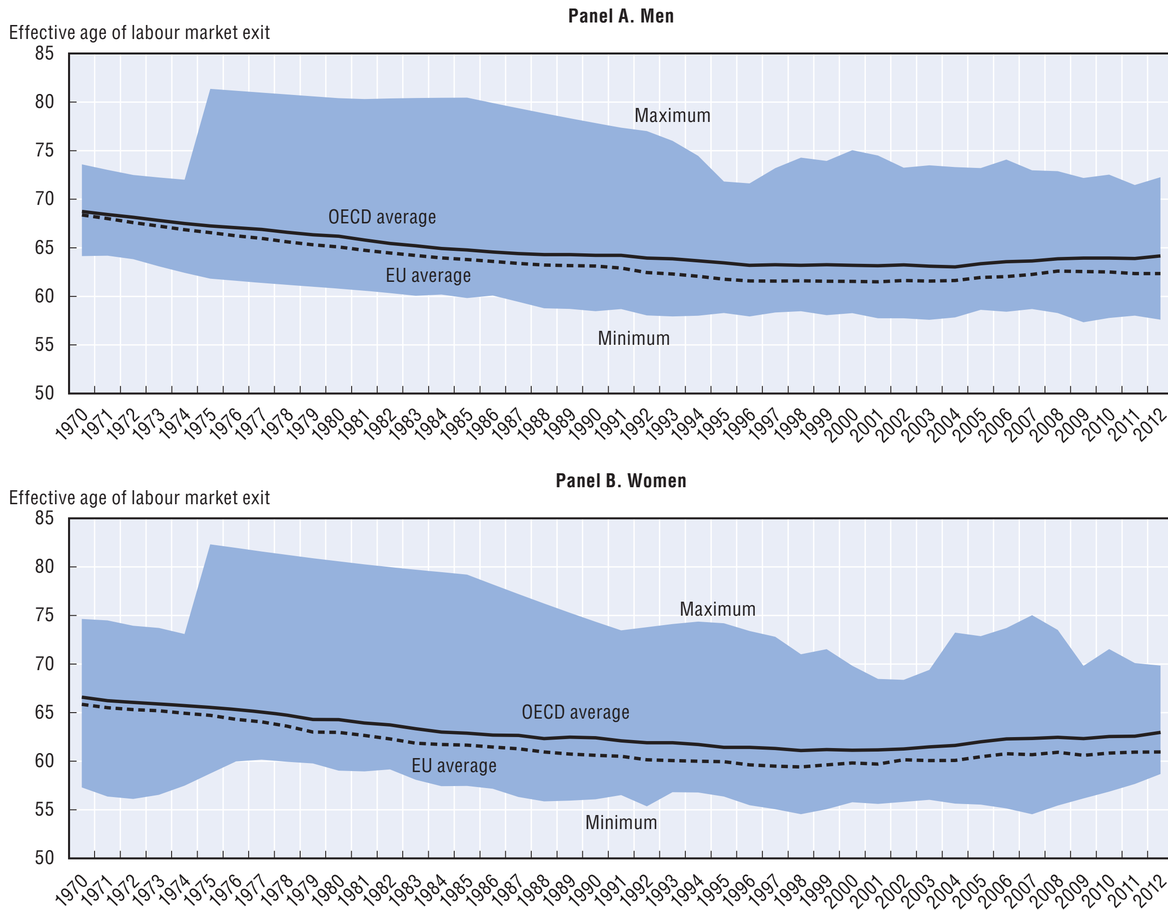
One factor behind women's shorter working lives is care for both children and elderly relatives. Close to two-thirds of family carers in the OECD are women (OECD, 2011; and 2013c; OECD, 2015). For example, 48% of the mothers and less than 1% of the fathers of a child aged less than 1 were on parental leave in 2011 in 18 OECD countries on average. The majority of long-term care paid workers are women, who are also most often informal carers: 61% on average in 17 OECD countries among all informal carers aged 50 and over (OECD, 2015d). This proportion ranges from a high of 71% in Slovenia to a low of 55% in Sweden. As populations age, care-giving needs look set to increase steeply in coming decades, a trend that could see a rise in informal care which would curtail carers' retirement income (see D'Addio, 2015).

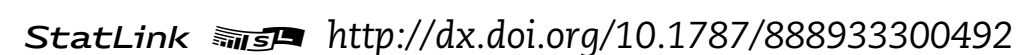
Age of labour market exit

Policies to promote longer working lives – through later retirement ages and early-retirement restrictions, for example – have emerged in most OECD countries, and were instrumental in the recent slight rise in the effective age of labour market exit from its low in the early 2000s (Figure 3.9).[4]

Figure 3.9. **Trends in the average effective age of labour market exit, OECD and EU average**



Source: OECD estimates based on the results of national labour force surveys, the European Union Labour Force Survey (EU-LFS) and, for earlier years in some countries, national censuses. *OECD Employment and Labour Market Statistics, www.oecd-ilibrary.org/employment/data/oecd-employment-and-labour-market-statistics_lfs-data-en.*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Yet, for employment opportunities for the elderly to exist in practice it is not sufficient to tighten early retirement options, to raise retirement ages, to lengthen contribution periods and to change parameters and rules in order to raise marginal returns to work longer. Job retention at older ages is much more common than hiring (OECD, 2015a; 2014b, c, d; 2013); thus, for many, unemployment late in working life spells labour market exit.

Early retirement accounted for nearly 19% and 22% of women's and men's labour market exits, respectively, in the 55-to-64 year-old age group on average across countries. In Austria, Denmark, the Netherlands, Poland, the Slovak Republic, Switzerland, and the United Kingdom, more than one-third of men who left the labour market in 2013 did so through early retirement. Other non-EU OECD countries also allow the early drawing down of pension benefits. In Australia, it is currently possible from the age of 55. In Mexico, workers may retire from age 60 with a 5% penalty for each year of anticipation; future retirees will be able to retire early if they have contributed for at least

1 250 weeks (about 24 years) and the accrued capital in their account allows them to buy a life annuity that is at least 30% higher than the minimum guaranteed pension. In Chile, workers who have paid into a defined contribution scheme may also draw a pension early, but only as long as the capital accumulated in the account is sufficient to finance a pension equal to 80% of the minimum pension with a replacement rate of at least 70% (relative to earnings in the ten years prior to drawing the pension).

The data suggest that, apart from retirement – be it early or at the statutory age – people who exit the labour market between the ages of 55 and 64 take a number of involuntary paths out, such as dismissals, redundancy, illness and disability (Figure 3.10). Family caring duties are behind only 4% of women's exits on average, although shares are 7% or more in Germany, Ireland, and the United Kingdom.

Figure 3.10. **Labour market exit paths among men and women, aged 55-64**

Retirement | Care tasks | A job of limited duration has ended | Dismissed or made redundant | Early retirement | Illness/disability | Other reasons

Panel A. Men

% of exits in 2013 related to..., men, age 55-64

NLD ESP CHE DNK GBR SWE POL IRL PRT AUT DEU FIN **OECD20** BEL SVK HUN TUR CZE ITA FRA GRC

Panel B. Women

% of exits in 2013 related to..., women, age 55-64

NLD DNK ESP SWE TUR IRL PRT CHE DEU GBR FIN BEL POL **OECD20** AUT ITA HUN FRA SVK GRC CZE

Source: OECD calculations based on the results of national labour force surveys, the European Union Labour Force Survey 2014 (EU-LFS).

StatLink http://dx.doi.org/10.1787/888933300505

3.3. How scattered careers affect pensions: Theory and practice

Delayed labour market entry and employment breaks affect retirement incomes in various ways:

- Taking time out of paid employment, together with shorter working lives, typically entails wage and, by the same token, contribution losses.
- Short, interrupted careers lead to losses of human capital with repercussions over time.[5]

Understanding why labour market entry is delayed is essential to assessing its total impact on earnings and pensions. If it is for the purposes of higher education and the acquisition of better qualifications or professional experience, it may eventually spell higher wages and pensions. If, by contrast, it is for reasons of unemployment and inactivity, human capital might depreciate having an adverse effect on retirement incomes.

The time at which people begin work and higher education affects labour market outcomes. Holmlund et al. (2006) report, for example, that putting off university entry by two years in Sweden is associated with considerable drops in lifetime earnings – about 40-50% of annual earnings at the age of 40.[6] Career breaks, too, depreciate human capital, resulting in lower lifetime earnings (Mincer and Polachek, 1974, 1978; Polachek, 2007; Braga, 2014). Workers can recover income and pension losses related to career breaks if they are able to work long enough afterwards. However, how much ground they can make up is generally determined by when the career break occurs and how long it lasts.

Women's lower wages are partly attributable to career interruptions to care for children.[7] The longer the break and the earlier it comes, the larger the wage losses are.[8] Like interruptions for childcare, unemployment produces persistent earnings losses, too.[9] And unemployment early in a worker's career might also have a scarring effect, jeopardising young workers' future labour market possibilities, though evidence to that effect is mixed (see Arulampalam et al., 2001 for a survey of scarring effects).

The limited empirical findings available from studies that assess the impact of career interruptions on pensions suggest that breaks attributable to unemployment and care cause substantial losses in retirement income. For example, Geyer and Steiner (2010) report that the higher frequency of unemployment and of precarity over the working life lie behind substantial increases in the shares of people with retirement income below the single pensioner's subsistence level in East Germany – from about 4 to more than 30 percentage points among men, and from 25 to 50 points among women (Potrafke, 2011). De Freitas et al. (2011) found that the generous pension credits almost offset the effects of career breaks that total up to five years in EU countries on average. Along similar lines, Brugiavini et al. (2012) suggest that the design of family policies and pensions is a very important factor in cancelling out the substantial losses that may arise in the European countries covered by the SHARELIFE survey (referring to the year 2010/11) when parents break off their careers to care for their children.

The policy implications are important. Purpose-built schemes may be called for to soften the blow to lifetime income from contribution gaps caused by involuntary career breaks or delayed labour market entry. Long voluntary breaks from paid employment unless they are taken to further career prospects, through training or further education, should be limited. Assessing the extent to which pension credits cushion the impact of these contribution gaps is the focus of the following section.

3.4. Pension systems components that can mitigate the adverse effects of interrupted careers

Pension system design may or may not ease the impact that periods of time away from paid work could have on retirement incomes. Plans that do not depend on previous contribution histories, for example, such as basic residence-related or universal pension schemes, may cushion the impact. And nearly all OECD countries do have first-tier redistributive schemes, albeit of varying scope

(Chapter 2). However, first-tier programmes that predicate full benefits on a minimum number of contribution years may make it difficult for people with long career-breaks or shorter working lives to qualify for the benefit, especially if the (minimum) required contribution period is long, as it is in countries like the Czech Republic, Ireland and Japan – although other targeted benefits may kick in at that point and act as safety nets.

Conversely, the effect of contribution gaps on pension entitlements is unlikely to be alleviated in systems, which link contributions more tightly to benefits – such as private DC schemes and public notional defined contribution (NDC) or points systems without redistributive provisions. For example, Italy's move towards an NDC scheme was accompanied by the abolition of the minimum pension. More generally, where pension systems determine pensionable earnings from whole career earnings, pension benefits are more affected by shorter or fragmented working lives.

However, for many women who leave paid work in middle age to care for elderly relatives and for workers who lose their jobs late in their careers, the outcome does not have to be lower pensions. Most mandatory public earnings-related pension schemes provide special pension credits to care for children, for periods of unemployment or even in some case for periods of education. Insuring against labour market risks, allowing workers to care for children and other frail relatives, minimising poverty among the elderly, and affording them a decent income are some of the important reasons behind pension credits.

In recent years, reforms have modified pension credits, with some countries curbing their generosity, and others increasing it. Since 2014, Austria, for example, has substantially cut back on the types of events its pension credits once covered. Only military or civilian service (up to 30 months), time out of the workplace to raise children (up to four years per child) and some periods of unemployment now qualify for pension credits. In particular, it is no longer possible to purchase contributions for periods of school and university studies. Belgium has introduced a distinction between time out of work for "particular reasons", such as raising or educating children, or "without reason". Since 2012, only 12 months may be credited for calculating pensions in the event of "breaks without reason", while as much as 36 months may qualify for pension credits for parents who drop out of employment to raise their children. France's 2011 and 2014 reforms have made it easier for young people to get partial or total credit for periods of higher education or apprenticeship that should not exceed 12 quarters, and have made it less costly for young workers to pay back missing contributions. In general, however, credits for periods of higher education are being phased out. These credits are potentially regressive because they reward people that will likely have higher earnings relative to those with lower education, and their elimination generates public savings.

3.5. Pension credits to plug the contribution gap

Main characteristics of pension credits

Credits may raise pension entitlements in two ways that are not mutually exclusive. First, they lengthen the duration of the insurance period, which in a contributory pension plan typically yields a better income on withdrawal. Second, they can increase the pension benefit directly, with the quantitative effect depending on individuals' earnings and contributions paid into the system during employment drop-out periods.

Explicit credit mechanisms to plug the contribution gaps exist in the majority of (public) earnings related pension systems of OECD countries (Table 3.1), though not in Australia, Israel, Mexico, the Netherlands, New Zealand and the United States. In addition, Chile, Estonia, Ireland, Korea, Turkey and the United Kingdom do not have credits for unemployment while they have credits for childcare. The opposite applies in Iceland. Portugal and Slovenia, which have explicit pension credits for unemployment periods, grant credits for childcare-related periods only in case of part-time employment, which then qualify as full-time contribution periods. Employment breaks are irrelevant

Table 3.1. **Explicit credits in earnings-related pension systems for unemployment and childcare**

	Childcare		Unemployment			Childcare		Unemployment	
	Explicit	Implicit	Explicit	Implicit		Explicit	Implicit	Explicit	Implicit
Australia	..	√	..	√	Israel	..		..	
Austria	√		√		Italy	√		√	
Belgium	√		√		Japan	√		√	
Canada	√		√		Korea	√		..	√
Switzerland	√	√	√	√	Luxembourg	√		√	
Chile	√		..		Mexico	..	√	..	√
Czech Republic	√		√		Netherlands	..	√	..	√
Germany	√		√		Norway	√		√	
Denmark	√		√		New Zealand	..	√	..	√
Estonia	√		..	√	Poland	√		√	
Spain	√		√		Portugal	pt		√	
Finland	√		√		Slovak Republic	√		√	
France	√		√		Slovenia	pt		√	
Greece	√		√		Sweden	√		√	
Hungary	√		√		Turkey	√		..	
Ireland	√		..	√	United Kingdom	√		..	√
Iceland	..	√	√		United States	..	√	..	√

Note: The abbreviations denote: √ = Explicit pension credits exist in the earnings-related pension system; .. = Not available in the earnings-related pension scheme; Implicit refers to mechanisms not explicitly designed to cover periods of interruptions but that implicitly exert that same function either thanks to pension rules or first-tier components; pt = Credit only exists for part-time workers.

Source: Based on information received by national country delegates and from the "Country profiles" in Chapter 11.

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in non-contributory schemes (like that of New Zealand, Canada or the Netherlands' basic pension), and are implicitly ruled out in some pension plan designs. For example, the United States' maximum pension rate requires only 35 years of contribution, so any years out of work in excess of that duration may not affect public retirement income. As for Canada, first-tier schemes (the means-tested Guaranteed Income Supplement – GIS, and Old Age Security – OAS) help mitigate the retirement income losses experienced by certain low-income groups due to frequent interruptions in their careers; these schemes exclude time spent outside the labour force or with low earnings while caring for children under the age of seven from the averaging period to determine the reference wage used to calculate the amount of earnings-related public pension.

Pension credits are seldom a feature of privately run personal or occupational pension schemes. Exceptions are the Swedish and the Danish occupational pensions (ITP and ATP, respectively). The mandatory DC programmes in Estonia and Sweden also provide pension credits during childcare absences. France's public mandatory occupational pension plans provide credit for career interruptions related to unemployment and a 10%-increase in retirement benefits only for parents with at least three children. In voluntary private pension schemes, savers may buy extra accrual periods by paying voluntary contributions into the system; for example, Germany introduced such a practice in 2005, and the government makes a deposit at the end of the year in one parent's individual private pension account.

How effective credits are in offsetting interruptions in employment depends on the length of leave, the pensionable earnings base, and the ways in which those parameters count towards pension entitlements (see Table 3.A1.1 for childcare and Table 3.A1.2 for unemployment in Annex 3.A1).

Periods covered by pension credits

Credits for childcare typically cover career breaks until children reach a certain age. They are generally less generous for longer breaks and for older children. Many OECD countries credit time spent caring for very young children (usually up to 3 or 4 years old) as insured periods and consider it as paid employment. By contrast, extended periods of leave to raise older children (usually aged between 6 and 16) are typically taken into account only to determine eligibility for early retirement and the minimum pension. Some countries (the Czech Republic, Greece, Hungary and Luxembourg) factor childcare into assessments of eligibility, but disregard them when computing the earnings base.

Only France, Germany, Italy, and the United Kingdom (up to an earnings threshold) grant some of the pension credits regardless of whether parents stop working or not. A condition to benefit from these credits is to have at least one dependent child. For example, in France the public pension system (i.e. the *régime général*) awards mothers (since January 2004) and fathers (since January 2010) one year of insurance after the birth or adoption of a child (*Majoration de durée d'assurance* or MDA). An additional quarter is awarded at the child's birthday every year after birth or adoption up to a maximum of eight quarters per child in total which matter only for people who do not record full-contribution histories. In some countries (including France and Italy), pension credits also become more generous as the number of children increases. In France, for example, increases are granted to parents of three and more children by the public pension scheme (which adds to the MDA) and by the two main occupational plans – ARRCO for employees and AGIRCC for managerial staff. The country chapters at the end of this report provide detailed descriptions of all crediting mechanisms and methods.

The recipient of childcare credits is either the mother or the father – usually mothers as credits are closely related to the actual take-up of parental leave, though fathers are coming increasingly to the fore in countries like Denmark and Sweden. This is also the case in countries having introduced father-specific parental leave entitlements or redesigned payments systems to reduce financial disincentives for take up by fathers.[10] Luxembourg pays a flat-rate old-age allowance to people who contributed too little to benefit from credits, so most recipients are women. In Chile, out of the 24 weeks of parental leave, the first 18 are exclusively for mothers, while fathers may take it up from the 19th to the 24th week, which then counts towards their pension entitlement.

As a general principle, the person receiving the credit should be the one interrupting his or her career. Some exceptions, however, exist particularly when the credit does not generate additional gains – e.g. when full-time stay-at-home parents are the main carers. Some countries, e.g. Norway, therefore allow households to choose. In Greece, fathers can use the credit when it makes no difference to mothers' pension entitlements. As for Germany, credits for children born in 1992 or later can be taken up by either employed or unemployed parents, or shared between them. Sweden has a flexible system under which the parent with the lowest income receives the credit, unless both parents choose otherwise.

When it comes to the unemployed, credit is generally limited to periods of benefit recipiency, which in some countries depend on the age of the beneficiary. In other countries, only *tranches* of periods out of work count towards pensions, while in others still the credit varies according to age or family status. For example, in Belgium, only involuntary and end-of-career unemployment benefit – the so-called bridging pension – counts towards retirement pensions. In France, unemployment without benefit can be credited for a period of up to one year – or five years for some categories of unemployed. In Spain, the credit takes also into account the family status of the unemployed.

Credits for late-career unemployment are generally more generous as they are intended to ensure practically unchanged pensions, which makes them a *de facto* early-retirement pathway. Austria provides an unemployment bridging benefit that enables workers to leave the labour market early, although it will be totally phased out by the end of 2015. Belgium, too, grants a bridging pension

to the over-59s until they reach retirement age, while Spain credits unemployment assistance for over-55s only, with the government paying in contributions for their old-age pension until they reach retirement age. As for Denmark, it links unemployment insurance to a voluntary early-retirement scheme which grants special early-retirement benefits to people between the age of 60 (set to gradually rise to 62 between 2014 and 2017) and the normal pension age (which is 65 but is due to be raised to 67). To qualify for this benefit, individuals must have paid into the unemployment insurance fund for at least 30 years and have made voluntary early-retirement contributions during that time.

In Finland, it is possible to retire on old-age pension from the age of 62 (rising to 63 for people born after 1958) after a period of long-term unemployment in both the national and earnings-related pension systems with no actuarial reductions for early retirement. If 59-year-olds lose their job, they will receive unemployment benefit until they are 65, although their pension entitlement accrues only up to the age of 63 if they opt for the old-age pension at that age. For workers aged at least 57 who have paid into national insurance for 35 years, their unemployment contributions are extended for up to two years so that they can qualify for retirement pension. The value of unemployment benefits (both insurance and assistance payments) is factored into the calculation of pension benefits. In the Czech Republic, the duration of unemployment insurance is five months up to the age of 50, eight months from 50 to 55, and 11 months for the over-55s. In addition, one year of unemployment without benefits before the age of 55, and up to three years thereafter, are also credited for pensions. In both cases, the unemployment period used to calculate the pension entitlement is shortened by 20%.

Pensionable earnings base of pension credits

There are wide cross-country differences when it comes to the pensionable earnings on which credit is based. For childcare-related leaves, Belgium, Finland, Japan, Luxembourg and Sweden take earnings immediately prior to parental leave, while others – such as the Slovak Republic – average earnings over the 24 months before leave. Some countries, however, use a flat-rate amount to compute the credit. In Austria, for instance, credits are based on a notional pensionable salary, which amounted to EUR 1 650 per month in 2014. In Finland, periods that exceed the 10-to-11 months of parental leave and last until the child is 3 years old are credited on the basis of a flat-rate salary of EUR 707 per month (2014).

Another group of countries (which include Hungary and the United Kingdom) choose care-related benefits or the minimum wage as reference earnings. Poland also took the minimum wage, but since 2012 pensionable earnings have been benchmarked at 60% of the average wage earned in the previous 12 months. In France, parents who do not work in order to care for their children (or who, when they do work, earn less than specific threshold amounts and are eligible for special family benefits) are affiliated to a mandatory old-age insurance (*Allocation vieillesse parents au foyer*) which uses the minimum wage as pensionable earnings.

Contributions based on reference earnings are notionally paid (i.e. contributions during the breaks are paid by the State and mainly financed through the general budget or specific public reserve funds as if the individual was working) during career breaks in most of the countries that grant credits for childcare. Examples are Austria, Poland, the Slovak Republic, and Sweden. In some countries, e.g. Norway, credits are granted only up to an earnings threshold, while in others, such as Denmark and Estonia, the insured pay a share of contributions.

Where information on funding sources is available, it appears to show that pension credits are financed primarily out of general taxes In Austria, both the separate Family Allowances Equalisation Fund (FLAF), which depends on federal income taxation, and the public budget are responsible for funding childcare credits. In France, a public fund (*Fond de solidarité vieillesse*) financed through various earmarked taxes, such as taxes on alcohol, was the main funding source until it registered a deficit in 2009. Since then transfers from the family benefits provider (*Caisse nationale d'allocations*

familiales) mainly cover the cost of childcare credits for pensions. The German federal government pays contributions for child-raising periods – tax-funded – on a flat-rate basis into the pension insurance. In the Slovak Republic, the government pays contributions on behalf of people caring for children up to age 6. The amount is equivalent to 20% of 60% of an assessment base (average monthly wage). In other countries (such as Denmark, Hungary and Sweden), however, mandatory contributions are at least in part to be paid by the beneficiary.

Such mechanisms are also expensive. France, for example, spent more than 0.75% of GDP on childcare-related pension credits in 2011 (*Commission pour l'avenir des retraites*, 2013). In Sweden, pension contributions paid by the state to enable parents to break their careers to raise their children accounted for about 2.5% of all contributions in 2012. As for Germany, the cost of the three points per child was estimated at nearly 6% of all contributions made in 2012. In Austria, the cost of pension credits related to childcare unemployment accounted for 0.3% and 0.4% of GDP, respectively, in 2014.

As for unemployment, the pensionable earnings are either the earnings up to job loss, a percentage of those earnings, or the benefit received during the break in employment. However, there are countries where the age of the unemployed and the length of time they were out of work determine different rules. In Belgium, for example, rules are different for the under- and over-59s, with credits for unemployment being based on the "minimum annual credit" – i.e. EUR 22 189 per annum in 2014 – up to a person's 59th birthday. Thereafter, the reference income is the last wage.

3.6. Simulating pension entitlements for shorter and interrupted careers

Assumptions for childcare, unemployment, and delayed entry

The pension entitlements simulated here assume that men and women enter the labour market in 2014 and have either shorter or interrupted careers caused by late entry into employment or periods of unemployment or childcare during their working lives.

The OECD baseline full-career simulation model assumes labour market entry at the age of 20. In the simulation examined here for delayed entry, the individual enters employment five years later, at the age of 25. For career interruptions, workers are assumed to embark on their careers as full-time employees at 20, and to stop working during a break of up to ten years either between the ages of 30 and 40 to care for their children or between 35 and 45 because they are unemployed; they are then assumed to resume full-time work until normal retirement age. When it comes to childcare, the simulations also assume that a woman has two children born when the mother is 30 and 32, respectively. For purposes of simplification, the results are those of single individuals and not couples.

The simulations are based on parameters and rules set out in Chapter 11. The computed pension entitlements reflect the projected pension income governed by legislation enacted in 2014, which provides for the changes to the pension system to be gradually ushered in. For each country, mandatory and quasi-mandatory first- and second-tier schemes for private-sector employees are modelled – they encompass all compulsory public and private and wide-coverage occupational pension schemes. The model also projects resource-tested benefits for which retired people may be eligible.

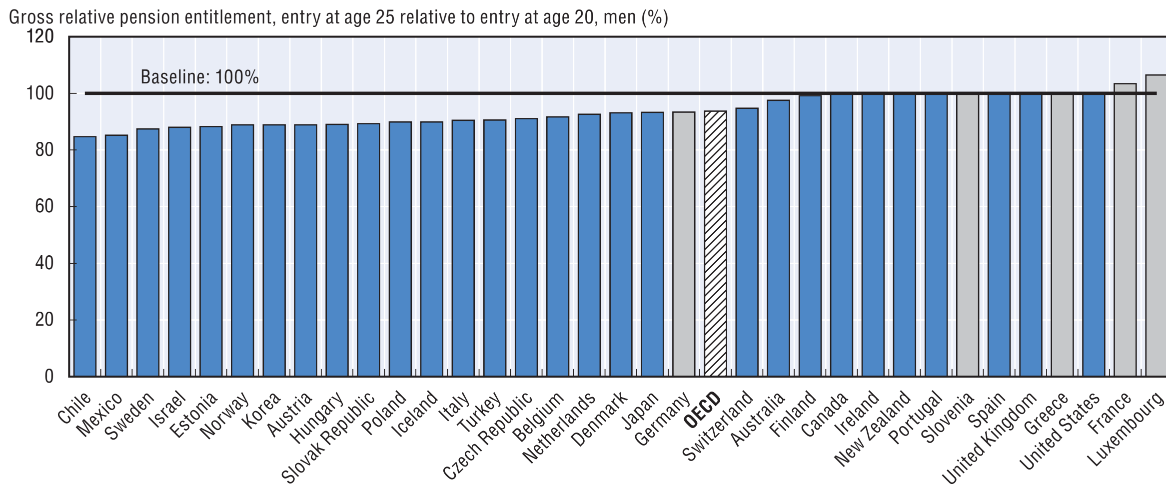
Delayed entry simulation results

In countries where the pensionable age is 65, the OECD model assumes that labour market entry at the age 20 results in a 45-year-long career. In countries with lower (higher) pensionable ages, full careers are shorter (longer): the later retirement ages in the Czech Republic, Denmark, Greece, Iceland, Ireland, Italy, Norway, the United Kingdom and the United States suggest working careers that are at least 47 years long. In reality, careers tend to be shorter than the full-career baseline assumption. Indeed, there are workers who do not begin gainful employment until after they are 20 (as Figure 3.3 illustrated), and many spend time out of paid employment for various reasons. And early retirement is still common in some OECD countries.

In countries where pension benefits are more tightly tied to years of contributions, delayed entry might directly lower pension entitlements. In most OECD countries, contribution periods shorter than 40 years will not be enough for retirees to claim a full pension in earnings-related pension schemes. In France, for example, age cohorts currently embarking on their careers at 20 might be entitled to full-rate pensions after a full career by the age of 63. By contrast, those who take up their first job at 25 would have to work until they are 67 to be able to claim a pension that is penalty-free yet prorated to the contribution period, which would then be one year shorter than in the baseline model. In Belgium, where the statutory pension age is 65 and a full-length contribution history is 45 years, entry at the age of 25 and retirement at the standard age would mean proportionally lower pension entitlements. However, if delayed entrants extend their retirement age, they may be entitled to a higher pension (see below).

Figure 3.11 compares the gross pension entitlement for average-income workers who started work at 20 and those who delayed their labour market entry until they were 25. The pension gap in the OECD area is 7% on average, but this average hides wide cross-country differences. At one end of the spectrum, with about 85% of the baseline full-career entitlements, lie Chile and Mexico, where the 85% ratio results from the actuarial fairness rules built into the DC scheme if the same retirement age is maintained and the economic assumptions of OECD model hold. At the opposite end of the range with 103% and 106% come France and Luxembourg, respectively, where such a late entry also delays the full-pension retirement age by four and five years. Germany, Greece and Slovenia are the three other OECD countries where delaying labour market entry requires working at an older age to be entitled to a full pension given the contribution-period rules.

Figure 3.11. **Estimates of prospective pension entitlements for delayed entry at the age of 25 and exit at national retirement age compared to baseline, average-wage worker**



Note: Gross pension entitlements are computed for average-wage workers according to whether workers enter the labour market at age 25 or 20. Countries in light grey are countries where delayed entry delays retirement. Because of the changes introduced by recent pension reforms future retirees with five-year shorter contribution histories will need to work longer to obtain a full pension relative to current retirees. The pension entitlements are forward-looking and assume that pension rules of the year 2014 will apply throughout the career until workers reach the standard pension age in their country. Legislated rules that will be implemented gradually over the long-term are also included in the modelling.

Source: Estimates from the OECD pension models. See Chapter 6 and Chapter 11 in this report.

StatLink http://dx.doi.org/10.1787/888933300511

Austria, Estonia, Hungary, Israel, Korea, Norway, the Slovak Republic and Sweden have also rates below 90%. In Canada, Ireland, New Zealand, Portugal, Spain, the United Kingdom and the United States, the pension entitlements are not affected by late entry. In Ireland and New Zealand, the reason is that benefits are based on flat-rate pensions, while workers in the United Kingdom and the

United States reach the maximum pension after 35 years, in Spain after 37, in Canada after 39 and in Portugal after 40 years. Five years less of contributions does not therefore change pension benefit levels, unless the earliest working years are highly paid enough to be included in the averaging period. In short, delayed entry adversely affects pension entitlements in most OECD countries, translating into lower pension benefits unless workers work longer. The only other option open to delayed entrants to maintain retirement income is to save more over their working lives.

The impact of career breaks on pension entitlements

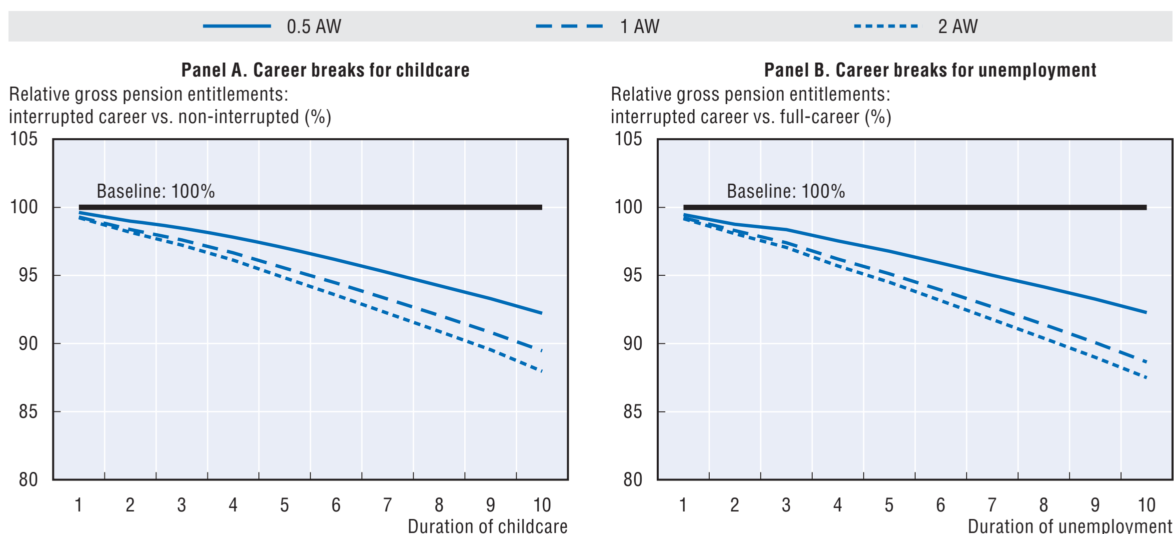
How different is the pension entitlement of a person who has a history of career breaks and might have been granted credits from that of a baseline retiree who has worked a full, uninterrupted career? To what extent do credits affect the pension entitlements of people who have experienced career interruptions? This section seeks to answer those questions.

Overall picture

Figure 3.12 illustrates the impact of career breaks for childcare (Panel A) and unemployment (Panel B) on average in the OECD at different earnings levels. Panel A depicts the ratio between the gross pension level of a woman who has interrupted her career between the age of 30 and 40 to care for two children and that of a woman who, having two children, has not stopped working. Panel B illustrates the gross pension level of someone who has been unemployed between the age of 35 and 45 relative to that of someone who has worked uninterrupted from the age of entry into the labour market to normal statutory pension age.

Figure 3.12. **Impact of career breaks for childcare and unemployment on future pension entitlements at different earnings levels, OECD average**

As a percentage of baseline gross pension



Note: The baseline denotes normalisation to full career. AW is the average wage worker concept used by the OECD. 0.5 AW denotes half of the AW ("low earnings"), and 2 denotes twice the AW ("high earnings"). For childcare, the models assume that after labour market entry at age 20, a woman with two children aged 2 and 4 interrupts her career for up to ten years between the age of 30 and 40 and then resumes full-time employment up to the national retirement age. For unemployment, the model assumes entry at age 20 and unemployment for up to ten years between the age of 35 and 45 and then resumes full-time employment up to the national retirement age. The indicators illustrated are: in Panel A the ratio between the pension entitlement of someone who interrupts the careers for childcare and someone with two children who work a full career without interruption; and, in Panel B, the ratio between the pension entitlement of someone who interrupts the careers for unemployment and someone who work a full career without interruption. The pension entitlements are forward-looking and assume that pension rules of the year 2014 will apply throughout the career until workers reach the standard pension age in their country. Legislated rules that will be implemented gradually over the long-term are also included in the modelling.

Source: Estimates from the OECD pension models. See Chapter 6 and Chapter 11 in this report.

StatLink *http://dx.doi.org/10.1787/888933300521*

The gross pension of a woman who earns the average wage and interrupts her career for five years to care for two young children would drop by 4% on average in the OECD area relative to a woman with two children who has not interrupted her career. The gap increases to an average of 11% after a ten-year break. The pension drops slightly less when earnings are lower – by 3% after a five-year break and 8% after a ten-year break. Shortfalls at higher earnings levels are larger as the childcare break lengthens –averaging 5% after five years and 12% after ten years away from the workplace.

Unemployment gives rise to slightly larger shortfalls in pension entitlements than childcare as earnings increase and the employment break lengthens. For an average-wage worker who is unemployed for three years – and after returns to work at the average wage – the pension gap with an unbroken career is 3% on average. It reaches 5% after five years out of work and 11% after ten years. Among low-wage earners, the decline in pension entitlements is 2% after a three-year unemployment break to reach 8% after a ten-year break in the OECD on average. Among the high-earners, the decline is 3% after a three-year break to reach 13% after a break of ten years.

While the figures point to drops in old-age pensions of about 1% for every year without a job on average across countries, they also show that pension systems play a key role in offsetting the losses in old-age pensions attributable to interrupted employment. Indeed, the 1% drop per missed contribution year is substantially below the actuarially fair adjustment: in the absence of any redistribution, the pension loss would be at around 2 to 2.5% per missed contribution year, depending on the workers' age at the time of the break, and based on the economic assumptions used in the OECD model.

Country-specific simulation results for children and childcare

Comparison of the pension entitlements of women who have children and have not interrupted their careers with those of full-career childless women yields an estimate of the advantage of being a mother, in a few countries, when it comes to pension entitlements. Conversely, for women with two children, comparing the pension entitlements when careers are interrupted to care for the children with those of full-career mothers produces an estimate of the cost of career breaks.

Having two children increases the pensions of women who do not interrupt their careers in Germany and Italy only. In Germany, the higher pension stems from the credit of one pension point per year granted until the child, born after 1992, turns three on the basis of a benchmark wage equal to average earnings. This translates into an increase in pension entitlement of less than 1% at average wage (for children born before 1992 only one pension point in total is credited following the 2013 reform). Moreover, parents who work when their youngest child is under 10 receive a bonus of between 0.33 and 1 point per year, depending on their earnings. Under Italy's NDC system, mothers convert their notional capital into a pension annuity at a more favourable rate upon retirement. For one or two children the more generous conversion rate amounts to granting benefits as if the mother's retirement age is increased by one year, and by two years for three or more children. The effect is a pension increase of around 3.3% for mothers of one or two children, and around 6.6% when they have three or more children.[11]

The gross pension rates of mothers who take time out of employment and those who take none is illustrated in Figure 3.13 at different earnings levels and for breaks from work of five and ten years respectively. In Ireland, New Zealand, Spain, the United Kingdom and the United States, pensions are not affected by breaks whatever the earnings. In Ireland the reason is that career breaks to care for children under 12 are considered insured periods up to a maximum of 20 years, provided that the carer does not earn above a certain threshold (EUR 38 per week in the Homemaker's scheme). Those breaks are therefore excluded from the averaging periods used to compute pension entitlements. In Spain, too, the three years that mothers may spend looking after their children count as insured

Figure 3.13. **The gross pension entitlements of low-, average-, and high-earning mothers who interrupt their careers for five and ten years versus those of their peers with unbroken careers**

1 AW ◇ 0.5 AW △ 2 AW

Panel A. Five-year interruption

Panel B. Ten-year interruption

Note: AW is the average-wage worker concept used by the OECD. 0.5 AW denotes half of the AW ("low earnings"), and 2 denotes twice the AW ("high earnings"). The models assume that after labour market entry at age 20, a woman with two children aged 2 and 4 interrupts her career for up to ten years between the age of 30 and 40 and then resumes full-time employment up to the national retirement age. The indicator illustrated is the ratio between the pension entitlement of this woman and that of a woman with 2 children who work a full-career without interruption (i.e. the baseline in the figure). The pension entitlements are forward-looking and assume that pension rules of the year 2014 will apply throughout the career until workers reach the standard pension age in their country. Legislated rules that will be implemented gradually over the long-term are also included in the modelling.

Source: Estimates from the OECD pension models. See Chapter 6 and Chapter 11 in this report.

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periods; as only 37 years are needed for a full pension, this credit allows a complete offset of the effect of the childcare employment break on pensions. In New Zealand, the public pension is simply residence-based, so any period spent out of the labour market does not change the benefits.

In Austria, Finland, Hungary, Iceland, Israel, Italy, Mexico, Portugal, Sweden and Turkey, contribution gaps can make a substantial dent in retirement income, especially if the childcare period lengthens. In some of these countries crediting mechanisms for childcare do not exist (such as in Iceland, Israel, Portugal and Mexico). In the other countries where they do exist they better cover short interruptions and/or low-earners. In some countries, there are also private DC schemes that

generally do not grant credits, which imply that childcare-related absences mean both lost contributions and retirement income. In Estonia, the state pays employer contributions for up to three years, so any career interruption that is longer also mean higher contribution gaps and lower pensions. Mexico has no arrangements for childcare-specific credits, so the pension gap is substantial. However, low-wage earners will receive the minimum pension only, even full-career workers, provided that they have contributed for at least 24 years, so that the care break does not affect retirement income.

In five countries, France, Germany, Greece, Luxembourg and Slovenia, employment breaks imply that workers have to retire later to be entitled to a pension without penalty due the rules governing required contribution periods. In Slovenia, for example, a worker who enters paid employment at 20 but takes ten years out of work will have contributed for less than 40 years at age 60, and will therefore have to work until 65 to be able to retire without penalty.

In most countries, lost contributions eat further into future retirement income as childcare leave lengthens. In Belgium, the Czech Republic, Luxembourg, Poland, and the Slovak Republic, for example, the gap in pension entitlements is small when interruptions in employment are in their first few years. It widens thereafter, but varies from one country to another, as different crediting rules apply to pensionable earnings and to the lengths of career interruptions (see Section 3.4). Poland, for example, grants pension credits for up to 36 months per child. With two children, the effect on entitlements is well cushioned for the first six years of leave from the workplace, after which contribution gaps begin to bite.

Earnings, too, are a factor in the way career breaks determine pensions. In countries where the earnings immediately prior to the take-up of childcare leave are pensionable (such as Belgium, Finland, Japan and Sweden), the impact of career breaks on pensions is more evenly spread over the earnings scale. In others, where the government pays the contributions of employees taking a career break, and credits are based on pensionable earnings that are lower than the salary earned, they are of little effect to offset contribution gaps for high earners. Austria, for example, provides credits for care at a flat rate so that their effectiveness in maintaining retirement income levels lessens as the break lengthens.

Australia, Austria, Chile, Denmark, France, Iceland Mexico, the Netherlands, Norway and the Slovak Republic cushion the impact of five-year childcare-related employment breaks on the pensions of low earners relatively better than on those of high-earning women. High earners are less affected in Canada due to the exclusion of the childcare-related employment breaks from the contributory period in calculating pension benefits. For high earners some studies suggest that, beyond pension entitlements, pension system design could affect women's childbearing decisions – even though any link between earnings and the total fertility rate lacks robustness.[12] Career prospects, the availability of childcare services, and foregone earnings losses may be more compelling reasons for deciding for or against having children than old-age benefits.

Country-specific simulation results for unemployment-related career breaks

The indicator used here is the long-term gross pension entitlement, at different earnings levels, of someone whose career was interrupted by unemployment at the age of 35 from a period of one to ten years. The benchmark is a full-career entitlement (Figure 3.14). It is assumed that when the unemployed worker finds a job again, relative pay is the same as in their old position – e.g. an average-wage worker becoming unemployed finds a few years later a job at the then average wage. In other words, any earnings scarring effect is assumed away, so that the impact of the career break on the worker's pension may actually be higher than the one estimated here.

Figure 3.14. **The gross pension entitlements of low-, average-, and high-earning workers with unemployment-related career breaks versus workers with unbroken careers**

1 AW   0.5 AW   2 AW

Panel A. Three-year break for unemployment

Relative gross pension entitlement (%)

Baseline: 100%

Chile, Turkey, Hungary, Estonia, Iceland, Mexico, Italy, Israel, Austria, Portugal, Netherlands, Japan, Poland, Finland, Slovak Republic, Switzerland, Korea, Sweden, **OECD**, Belgium, Greece, Denmark, Australia, Germany, Czech Republic, Slovenia, Canada, Ireland, New Zealand, Spain, United Kingdom, United States, Norway, Luxembourg, France

Panel B. Five-year break for unemployment

Relative gross pension entitlement (%)

Baseline: 100%

Chile, Turkey, Hungary, Iceland, Estonia, Mexico, Italy, Portugal, Israel, Austria, Poland, Finland, Netherlands, Japan, Switzerland, Korea, Slovak Republic, Belgium, Sweden, **OECD**, Germany, Denmark, Greece, Luxembourg, Australia, Czech Republic, Canada, Ireland, New Zealand, Spain, United Kingdom, United States, Slovenia, Norway, France

Note: AW is the average-wage worker concept used by the OECD. 0.5 AW denotes half of the AW ("low earnings"), and 2 denotes twice the AW ("high earnings"). The model assumes entry at age 20 and unemployment for up to ten years between the ages of 35 and 45 years and then resumes full-time employment up to the national retirement age. The indicator illustrated is the ratio between the pension entitlement of someone who interrupts the careers because of unemployment and someone who work a full career without interruption (i.e. the baseline in the figure). The pension entitlements are forward-looking and assume that pension rules of the year 2014 will apply throughout the career until workers reach the standard pension age in their country. Legislated rules that will be implemented gradually over the long-term are also included in the modelling. Data are ranked according to the estimates for average-wage workers.

Source: Estimates from the OECD pension models. See Chapter 6 and Chapter 11 in this report.

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For the average-wage worker, pension shortfalls relative to someone with a full, unbroken career varies widely across countries. They are generally larger for longer duration and for high-earners. In Chile, Hungary and Turkey, the pension loss after a five-year unemployment break is larger than 10%. On the other hand, in some countries, pension rules can offset the fallout from spells of unemployment. This applies for example in Canada, Ireland, Norway, Spain, the United Kingdom and the United States. The Netherlands' residence-based basic pension affords some protection against unemployment, while the occupational pension is sharply reduced by unemployment breaks. In New Zealand, periods of unemployment do not affect the basic pension but, as for childcare-related

breaks, they may seriously affect the voluntary private pension entitlement, which is not taken into account in the simulations. This also applies to other countries with substantial voluntary private pension component such as Canada, Ireland, the United Kingdom and the United States.

There are countries which afford the low-paid better protection against long-term unemployment than average earners, because minimum pension and resource-tested schemes play a crucial role in some of them – Australia, Chile, Denmark, Germany, Iceland, Mexico and the Slovak Republic. In Germany, unemployment credits for long-term joblessness are effectively flat-rated based on average earnings, thus protecting low earners relatively better than people on average pay. Low-earners' pensions in Australia are also little affected by unemployment thanks to basic and resource-tested benefits.

Where there is no pension credit provision – in Chile, Estonia, Israel, Korea, Mexico and Turkey, for example – pension losses are more substantial for average-wage earners with effects felt most keenly in countries whose compulsory pension programmes link pensions and earnings closely – e.g. Chile and Mexico – and at higher earnings levels. In five countries (France, Germany, Greece, Luxembourg and Slovenia), periods of unemployment imply retiring later due the required contribution rules. In France only, this generates higher pension benefits (Figure 3.14) because pensions of full career workers who retire earlier are indexed to prices. However, the interrupted-career worker will receive pension benefits over a shorter period due to a later retirement age, inducing a lower pension wealth overall.

3.7. Putting the results in a policy perspective: Pension credits and other measures towards less fragmented careers

Many recent pension reforms have striven to balance retirement-income adequacy and financial sustainability. With the aim of making pension systems more sustainable, countries have typically implemented reforms that reduce the generosity of public pensions systems. They have done so by, for example, tightening the link between pension benefits and contributions paid, and widely sought to move away from the traditional defined-benefit pensions, thus shifting labour- and financial-market risks onto insured individuals. It was to that end that Sweden, Italy, Norway, Poland, and Greece (with its auxiliary funds) replaced DB by NDC schemes, that other countries reduced the size of their public DB schemes, and that most strengthened the role of private pensions, as in Mexico, Chile, Australia and Norway.

As longer working lives may help achieve both financial sustainability and retirement income adequacy, most governments have put great effort into closing down early-retirement schemes, raising retirement ages, lengthening contributory periods, tightening job-search requirements for older workers, reducing the scope of pension schemes for arduous work, restricting disability benefits to those "genuinely" sick and unable to work, and so on. Table 1.A1.1 at the end of Chapter 1 reports the measures OECD countries have taken to extend working lives since September 2013 (see also OECD, 2014f). However, both labour demand and labour supply factors have a bearing on the effective age of exit from the labour market (OECD, 2006; 2013; 2014b, c, d, e; 2015a).

Governments have also changed the parameters of pension systems to raise the marginal returns from working longer, thereby encouraging working at older ages. Across the OECD area, people might need to work longer to retire on unchanged pension benefits, which is consistent with changes induced by life expectancy gains. Many countries have also extended the period over which earnings are measured in a way that will reduce pension benefits, taking the average over the lifetime instead of the average of the best years or final earnings which are usually higher. While changes in pensionable earnings may affect workers differently, depending on how earnings evolve over a career, anyone with longer career breaks or part-time periods, typically women, will be at a disadvantage.

To limit the negative impact of these recent measures on certain groups, such as women and the unemployed, many OECD countries have developed pension credits and other redistributive mechanisms since the 1990s. The recent global economic crisis, however, has prompted fiscal consolidation measures and proposals to make pension credits less generous.

Even though pension policies can mitigate some labour market problems, they cannot fix them all. A much wider policy perspective is needed. In addition to redistributive mechanisms which soften the blow to pensions from low earnings and interrupted careers paths *ex post*, a wide range of social policies seek to narrow different types of inequality and, thereby, their effect on pension entitlements. By its very nature, longer schooling delays labour market entry. But because it helps provide education and skills, it also boosts employment and wages over the long term. Family policies are intended to help parents strike a work-life balance, thus helping to brighten parents' labour market prospects, and those of carers in general.

Bringing young people into the labour market should be a primary concern in OECD countries. Beyond compulsory school-age statutes, economic and labour-market-related conditions play an important role for demand of education, too. For example, policies to ensure better matches between employment opportunities and skills acquired at school, to improve the availability and dissemination of information, to provide career advice and guidance, and to ease the transition from school to work all play a crucial part in plugging the contribution gaps related to delayed entries into the labour market as young people struggle to find their first job.

Career interruptions to care for children may be influenced by a wide range of policies designed to help people balance family and workplace obligations more easily – a theme the OECD addresses in its many reports (OECD, 2007, 2011, 2012). Family-friendly policies have in recent years become a top priority in most OECD countries – women who want to work and have children should be able to do so. The ample provision of good-quality childcare at affordable costs and after-school activities, leave arrangements that enable care duties to be shared evenly within families (e.g. take-it-or-lose-it parental leave for fathers) are just some ways of preventing parents, especially mothers, from leaving paid employment for too long or getting stuck in part-time jobs. Tax provisions that foster a second-earner labour supply would also be a welcome move.

Policies to cut the length of unemployment by helping labour markets function more efficiently and matching people, skills and jobs are essential. The first step is good training and education programmes that groom young people for the job market and help workers stay up-to-date and suitably skilled. Indeed, activation, lifelong learning, and proper unemployment benefit coverage are associated with better labour market performance. Policies that improve occupational mobility and offer stronger incentives to seek and accept jobs are an important part of the effort to reduce the incidence and length of unemployment (OECD, 2014f). Tax and benefit measures (such as active labour market programmes and lower marginal tax rates for people on low income) could also wean people off welfare benefits, so helping to shorten the length of unemployment. Policies that boost geographical mobility, encourage entrepreneurship and innovation, and enhance aggregate demand can also help to fight unemployment and thereby reduce its long-term consequences on earnings.

3.8. Policy implications and challenges ahead

Life-cycle income profiles are more diverse nowadays than ever before. Longer schooling, wider skill-based pay differentials, more complex patterns of partnership, lower fertility rates, greater employment opportunities for women, longer average life expectancy, rising unemployment and flexiwork all contribute to shaping different lifetime earnings histories. Workers increasingly combine their work with activities like caring, leisure, and learning, while having to contend with unstable career paths.

Two important policy concerns for the adequacy of retirement income emerge from all of the above: on one hand, the "sandwich pressure" of work and caregiving for children or elderly relatives, and on the other, unemployment. The resulting shorter, interrupted careers often mean lower retirement incomes. Therefore, in the absence of mechanisms helping to counteract the impact of employment breaks on pension entitlements current developments in pension systems, such as the drift towards DC and tighter links between benefits and contributions, may negatively affect income adequacy in retirement and heighten the risk of poverty in old age.

Many OECD countries assist people who interrupt their careers to raise children or because they have lost their job. The estimates presented in this chapter show the extent to which mechanisms like pension credits can soften the blow of career breaks to their retirement incomes. The results suggest that they are effective ways to cushion the shock of relatively short career breaks, especially at low earnings levels where they trigger other redistributive mechanisms into action. Pension credits are somewhat less effective for high earnings – particularly when employment breaks lengthen. They might become even more relevant in countries where there is a tight link between contributions paid and pension received in both private and compulsory public schemes.

Pension credits achieve, at least partially, some of their goals such as – when it comes to childcare career breaks – rewarding a vital social activity and limiting gender inequality. In particular, pension credits remain valuable tools where the scarcity of childcare services is an obstacle to mothers resuming paid employment (whether full-time or part-time), and where the incidence of unemployment and precarity are high. Moreover, by helping people to qualify for old-age pension, the pension credits contribute also to reducing old-age poverty and to enhancing retirement-income adequacy.

However, pension credits are only one part of the equation when it comes to income redistribution and poverty among the elderly. Better interactions between public and private pension schemes with some elements of clawbacks (i.e. when first-tier benefits are gradually withdrawn based on other sources of income), such as in Canada, Chile, Denmark and Iceland, may help. Basic or targeted pension schemes and other redistributive elements of pension systems in many countries may also be useful for protecting the pensions of the most vulnerable (Chapter 2). But fiscal costs and work incentives need also to be kept in mind, as trade-offs may have unintended consequences, especially when the mechanisms in place offer rights without obligations. For example, over-generous flat-rate benefits for care-related career breaks may weaken the second earner's connection to labour market.

While later retirement ages and longer contributory periods are important measures towards a more sustainable pension system, the ultimate goal should be to bring about longer, fuller working lives based on individuals' preferences. The design of social protection institutions should take into account today's complex realities and look beyond solutions based on traditional instruments. Solutions should seek ways to offer them greater choice in dividing their time between work, care, leisure and learning in a flexible manner. Policies based on a better use of time and money are essential, in fact, as they help balance domestic care responsibilities with the obligations of the workplace. For example, even though fathers' take-up of leave has improved in some countries, women are still the main carers, even in countries where fathers have an individual or household entitlement. The level of income replaced during career breaks, together with flexibility, are important pre-conditions for promoting the shift in men's behaviour. Moreover, while opting for periods of part-time work could also enhance work-family integration, in many countries, they tend to reduce career advancement or even generate downward mobility, which also impact negatively on the accrual of pension entitlements.

Such an agenda seeks to boost the opportunities for all to stay longer in paid employment. If this does not happen, the most vulnerable people, who have often precarious lifetime contribution histories, might come to increasingly depend on social assistance and other safety nets in retirement. Such an outcome would cancel out some of the savings obtained by recent pension reforms in public earnings-related schemes. It will also mean additional public expenditure in countries having private defined-contribution pension plans. Financial sustainability would be improved in parts of the pension system, but not in the retirement-income provision as a whole.

As always, prevention is better than cure. Policy makers should seek to transform periods of lost contributions and unused human capital into times during which people build and sustain their human capital. Well-designed social policies in these areas may enhance the capacity of individuals, families, and communities to cope with life events and attendant risks, and help societies advance towards a range of social and economic objectives. They may also improve employment opportunities across all age groups, and so contribute to effectively longer and fuller working lives.

Even when pension systems are able to absorb some of the shocks generated by different career and earnings paths, they are not – however well designed they may be – typically intended to address inequalities between men and women or parents and the childless in the labour market. This is probably as it should be. Actions to narrow labour market inequalities in the family and other social structures go far beyond pension policies and involve many social and labour market policy interventions and legislation which should be coherent over the life cycle and across age groups. Coherence must run through unemployment schemes for older workers, early retirement and old age pension systems, invalidity schemes, and policies to stimulate flexible working conditions and life-long learning.

As people are increasingly free to construct their own biographies, they become more responsible for their life courses. A challenge in that respect is to better prepare them to take responsibility for their employability, social insurance, and financial planning. Schools, employers, and unions can play an important role in helping people build the necessary financial competencies and life and work skills. There may also be greater awareness among voters of the fundamental trade-offs in social policy, thereby enhancing the quality of the political debate and policy making.

In a world characterised by growing complexity and heterogeneity, the limitations of modern pension systems need to be identified and addressed. Against that background, a fundamental policy question is how to improve the designs of current pension systems to make them better suited to modern life-course realities. There is no clear-cut answer. All OECD countries have pension systems with mechanisms that redistribute some resources from the better-off to the worse-off. But an issue that should be raised is whether redistribution happens at the right stages in the life course, and whether existing programmes adequately cover risks and periods of need. Concrete responses may eventually contribute to more balanced, equitable ageing.

Notes

1. For example, older worker are still exempted from the requirement to actively seek work and are no longer expected to take up a new job in some OECD countries (including Belgium, Germany, and the United Kingdom). Some countries also have special rules governing unemployment at the outset of a career. In France, older unemployed aged 50 years and more may benefit from unemployment insurance for 36 months, instead of 24 months for those aged below 50. Moreover the decree dated 15 July 2015 has re-established the equivalent retirement allowance (AER), intended for jobseekers who have not reached retirement age but have contributed the number of quarters required for a full pension. Austria, for example, requires just 26 weeks of insured employment for the under-25s years of age rather than 52.
2. SHARELIFE was the third wave of data collection in the Share survey on life histories of people aged 50 and over. For more, go to *www.share-project.org/sharelife/*. Countries covered were Austria, Belgium, the Czech Republic, Denmark, France Germany, Greece, Italy, Switzerland, the Netherlands, Poland, Spain, and Sweden.

3. Countries included in the average are Austria, Belgium, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States (2010).
4. Early retirement schemes were actually phased out (in Denmark, Greece, Hungary, Italy and Poland) or access was tightened by raising the age or lengthening the minimum contribution periods required for early retirement (as in Austria, Belgium, France, the Netherlands, Portugal, Slovenia and Spain). Some countries have also increased penalties for early retirement (Greece and Italy) to bring them closer to actuarial principles. (See also D'Addio, 2009, 2015; D'Addio and von Nordheim, 2014.)
5. In accordance with the human capital framework, education is seen as an investment good that yields additional dividends, such as higher lifetime earnings (Becker, 1975; 1985; Mincer, 1974; Ben-Porath, 1967). From an individual standpoint, the concentration of human capital investment at an early age offers the brightest prospects. The acquisition of additional human capital also reduces both the risk and duration of unemployment (Nickell, 1979; Mincer 1991; D'Addio 1998, 2000; Kettunen, 1997; Riddel and Song, 2011).
6. Ahituv (2000) reported that in Israel each year of delayed entry into the labour market reduces lifetime earnings by between 1.6 and 4.4% depending on individuals' educational attainment. Velfaerdskommissionen (2006) reported that entering the labour market one year earlier in Denmark translates into increases of about 2% in lifetime disposable income.
7. They would explain 17% of the gender wage gap in Denmark (Meilland, 2001), 27% in France (Meurs and Ponthieux, 2000), 14% in the United Kingdom (Chambaz, 2003) and 19% in Germany (Beblo et al., 2003, 2009; Dupuy et al., 2009). Light and Ureta (1995) found that 12% of the gender-wage gap is explained by differences in the timing of childbirth (Albrecht et al., 1999; and Kunze, 2002). See also Blau and Kahn (1995) and Datta Gupta and Smith (2002) and Phillips et al. (2001).
8. Mothers' labour market participation rates are negatively affected by childbirth, particularly in the first year after birth. The magnitude of the effect increases with the number of children (Joshi et al., 1996; Gornick et al., 1997; Falzone, 2000; Kaufman and Uhlenberg, 2000; Kenjoh, 2003). Gornick et al. (1997) find an employment penalty related to the presence of children in half of the 14 OECD countries analysed i.e. Australia, Canada, Germany, the Netherlands, Norway, the United States and the United Kingdom. The largest effect is reported for the United Kingdom. See also De Henau et al. (2006, 2008) and Maron and Meulders (2008).
9. See Fallick (1996); Kletzer (1989, 1998); Couch and Placzek (2010) and Cooper (2014). Davis and von Wachter (2011) reported that workers displaced during recessions might experience earnings losses of roughly 19%, which is much higher compared to workers displaced during non-recession years. Greenstone and Looney (2011) suggest that two years following their job loss, the average earnings declined by 48% relative to their average pre-job earnings.
10. In Iceland, following the introduction in 2001 of a three-month father-specific entitlement to paid parental leave. the proportion of leave days taken by fathers has increased to around one third from less than 5% (Eydal and Gíslason, 2014). Similarly, in Germany, reform in 2007 of the parental leave payment scheme has been followed by a tenfold increase in the proportion of fathers claiming parental leave allowance, from around 3.5% in 2006 to just over 32% by 2013 (Destatis, 2015).
11. In France, a quarter of insurance is awarded on the child's birthday every year after birth or adoption up to a maximum of eight quarters per child. Concretely, two years maximum are credited for each child aged less than 16. However, these quarters matter only for people who do not record full-contribution histories.
12. The literature observes that the disincentive to have children is greater when the pension system is earnings-related rather than flat-rated. For an analysis of how different types of pension systems may influence childbearing decisions see for example Nishimura and Zhang (1992, 1995); Cigno (1993); Cigno et al. (2003); Rosati (1996); Cigno and Rosati (1996); Billari and Galasso (2009, 2014).

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ANNEX 3.A1

Main rules of pension credits related to childcare and unemployment

Table 3.A1.1. **Main rules of pension credits related to childcare**

	Length covered	Pensionable earnings	Extra bonus/allowances
Australia	Covered only in the first-tier.		
Austria	Four years with a max. of five years for multiple births. If the birth of the 2nd child occurs within this time, a new period of 4 or 5 years starts.	Pensionable earnings (PE) are a flat rate amount: EUR 1 649.84 in 2014.	
Belgium	36 months max. over the career.	PE are the earnings prior to the break.	
Canada	Up to seven years per child are excluded from the averaging period.	The leave period is excluded from the average period used to determine pensionable earnings, assuming it is advantageous to do so.	
Chile	24 weeks of parental leave count as insured periods.	The basis for the 10% contributions (i.e. the PE) is the average salary three months before the break.	Each woman who has had a child born alive receives a voucher at age 65 which is equivalent to 10% of 18 months min. wages at the time of birth+ the average net rate of returns on the balance of the DC account form birth until retirement.
Czech Republic	Four years count as insurance period, not increased for higher number of children.	The leave period is excluded from the average period used to determine pensionable earnings.	
Denmark	In the occupational ATP pension: beyond the maternity/paternity leave, the parental leave of 32 weeks is considered as insured period.	Two times the rate of the ATP contributions are paid: one-third by the beneficiary and two-thirds by the government/municipality.	
Estonia	Three years.	State pays employer contributions on 20% of min. wage (EUR 355 in 2014) in the first-tier pension scheme. Paid contributions for the DC scheme are 4% of the national average wage (EUR 921 in 2014).	
Finland	Parental leave of 260 day/6 days per week (i.e. 10-11 months); after this period up to the three years of the child.	During the first 3 months (this period may vary according to agreements between partners) of leave during which the carer receives the salary, pensionable earnings is [(pay × 0.17) + wage]. For the periods exceeding the first 3 months up to the end of the paid parental leave, the pensionable earning is [earnings prior to birth, i.e. the salary on which the maternity benefit is based, × 1.17]. Both these amounts accrue to 1.5% for pensions. Beyond these periods, if a parent takes care of children the pensionable earnings are computed on a flat rate amount of EUR 706.87/month in 2014. Contributions are paid by the state during this period.	

Table 3.A1.1. **Main rules of pension credits related to childcare** *(cont.)*

	Length covered	Pensionable earnings	Extra bonus/allowances
France	For each child: four quarters to the mothers for maternity; four quarters for education to the mother or the father (MDA). An alternative leave, which cannot be cumulated with the previous, is the increase in the insurance period for parental leave up to a maximum of three years of the child (MDA parental leave). These periods increase the insurance periods. Moreover, people on low earnings, that have a limited professional activity and receive family benefits, receive the pension for parents at home (AVPF). The length covered in the case of two children aged 2 and 4 is five years at most (three years per children up to the third birth of the youngest child). The MDA and the AVPF increase the insurance period only in the general insurance scheme.	The pensionable earnings for the credits which increase the insurance periods (MDA) is the average earnings of the best 25 years determined thus on retirement. For the AVPF is the minimum wage on which 20% of contributions are paid.	Parents of three or more children receive a bonus of 10% in each pension regime.
Germany	1) Parents of children born after 1992 receive one point for one child aged below 4. 2) Parents that continue working up the age of 10 of the child. 3) Parents that have at least two children below 10 irrespective of their labour market status.	1) Receive one pension point each year based on average earnings. 2) Receive in addition of the normal point amount based on their salary, a 0.33 additional point based on average earnings but the total accrual cannot exceed 1 point. 3) Receive a 0.33 per year. In "2" and "3" the 0.33 point is based on average wage.	
Greece	1st child: 1 year/300 day; 2nd child: two years; with a max. of five years for children. This duration increase the insurance period.	Average lifetime earnings.	
Hungary	After pregnancy confinement benefit, carers can benefit of: 1) Childcare fee period for a max. of 84 weeks provided as long as the insurance period of the parents lasts, up to the age of two years of the child. In case of twins the eligibility period is extended by one year. 2) Child home care allowance for a max. of three years of the child (aged under 10 for children with disabilities). In case of twins the allowance is paid until the children reach the compulsory schooling age. 3) Child raising support between the age of 3 and 8 of the child in case of a family raising at least three children, until the youngest child reaches the age of 8 years.	1) During "childcare fee" periods pensionable earnings amount at 70% of the previous daily gross average earnings (HUF 142 000 in 2014). 2) During child home care allowance, PE is HUF 28 500. 3) When receiving the child raising support, the PE is the minimum old-age pensions. The admitted childcare periods (points "2" and "3") are credited as a lifetime PE, if it is favourable for the beneficiary; Hungary factors admitted childcare periods into assessment of eligibility and service years, but disregards them when computing the earnings base.	The beneficiary has to pay mandatory contribution of 10% on the benefit she receives.
Iceland	Covered only in the first-tier.		
Ireland	Caring for children under 12 years of age, within a maximum of 20 years are disregarded (Homemaker scheme).	For the State Pension (contributory), the homemaker scheme allows to disregard these period from the yearly average contributions (48 weeks a year).	
Israel	Covered only in the first-tier.		
Italy	The different transformation coefficient implies that one year is credited for one or two children and two years for three more children.	Mothers receive a more generous transformation coefficient: up to two children it is equivalent to the coefficient to the effective age of retirement +1, while for three and more children it is the transformation coefficient applied to the effective age +2 years.	
Japan	Three years per child, until the youngest child is three.	The pensionable earnings are the earnings prior to the break. For periods beyond three years per child and when income are below certain thresholds the same rule as for unemployment (see Table 3.A1.2) are applied.	
Korea	Parental leave granted for periods between 12 and 50 months (50 months max. with 2 children).	Only if voluntary contributions are paid.	
Luxembourg	1) Six months of parental leave full-time or 12 month part-time. 2) Baby years: two years credited for each child below 4, with a max. of four years. 3) Non-contributory periods caring for child below age 8.	1) Pensionable earnings is EUR 1 778. 2) During the BY the PE is the earnings prior to the break. 3) No PE.	A monthly allowance is paid to carers who do not qualify for the BY. It amounted to EUR 109 per child in 2014.
Mexico	Covered only in the first-tier.		
Netherlands	Covered only in the first-tier.		
New Zealand	Covered only in the first-tier.		
Norway	Up to six years of age.	Pensionable earnings is 4.5 times the base amount.	
Poland	1) 26 weeks (*urlop rodzicielski*). 2) Max. of three years per child.	1) 80% of the average wage during the first year. 2) 75% to 60% of average wage depending on the length of the break.	

Table 3.A1.1. **Main rules of pension credits related to childcare** *(cont.)*

	Length covered	Pensionable earnings	Extra bonus/allowances
Portugal	Covered in the first-tier/part-time workers for childcare covered.		Part-time considered as full-time.
Slovak Republic	Six years.	60% of the average wage two years before the break. State pays contributions.	
Slovenia	Only cover people working part-time to raise a child.		
Spain	Three years.	Average salary during the six months preceding the break.	Part-time considered as full-time.
Sweden	A. Child below 5 years. B. Parental benefit 480 days.	A. In this case three alternatives exist: 1) If 0 < income during childcare < previous earnings, PE is the earnings before; 2) People who were not working prior to childbirth or had very low income: PE is 75% of average wage; 3) Income does not change relative to before the interruption: PE is 1 BA. B. 80% of previous earnings up to 10 BA; the last 90 days at SEK 180/day. Total contributions are paid for both the NDC and the premium pension by the State. For ITP employers contribute generally for the first 13 months.	
Switzerland	Up to 16 years of age of the child; nothing in the occupational.	PE is three times the minimum pension of the year when the caring parent retires.	
Turkey	Max. two years.	the beneficiary should pay contributions.	
United Kingdom	Until the child is 12.	PE is the child benefit which counts towards the basic SP and the S2P.	
United States	Offset by pension rules if the career is 35 years.		

Note: PE = Pensionable earnings; BY = Baby years; BA = Base amount.
Source: Compiled with information received by national country delegates and contained in the "Country profiles" in Chapter 11 of this volume.

Table 3.A1.2. Main rules of pension credits related to unemployment

	Length covered	Pensionable earnings
Australia	Only with first-tier pension components; ER: Not available.	Only if voluntary contributions.
Austria	Any eligible person qualifies (at least) for 20 weeks of unemployment benefit and after that period for 54 weeks of unemployment assistance (re-application possible – therefore practically for an unlimited time).	For all insured born after 1954, the assessment base for pension is 70% (respectively 92% of 70% in case of unemployment assistance) of the daily entitlement to unemployment benefit.
Belgium	The entire period of (involuntary) unemployment.	The pensionable earnings are the benefits paid over unemployment. Rules differ according to the age of the unemployed person. In general for people less than 59, there are three distinct phases over which unemployment benefits decline passing from a % of lost earnings (within a celing) to flat rate amount per day.
Canada	Up to 17% of the contributory period may be excluded when calculating average earnings in the earnings-related scheme for a variety a reasons, such as unemployment, to determine pension benefit.	
Chile	Not available.	Only if voluntary contributions.
Czech Republic	The duration of unemployment insurance entitlement varies with age: five months up to age 50, eight months from 50 to 55 and 11 months for over 55s. Unemployment period without benefits for a max. of one year before the age of 55 is also credited. As a general rule only 80% of the total unemployment duration over the career is considered. For example only four years will be counted for pensions in case of five-year unemployment duration over the career.	This period is excluded from the average period to determine pensionable earnings.
Denmark	In the occupational ATP pension: the duration covered by unemployment insurance or unemployment assistance.	During unemployment insurance: two times the rate of the ATP contributions are paid by government/municipality; during the: unemployment assistance period 1/3 by the beneficiary and 2/3 by the government/municipality.
Estonia	Only first tier; ER: Not available.	
Finland	Periods of unemployment during which benefits are paid before the age of 63 (insurance benefits are paid for 500 days ca 23 months, with average 21.5 days per month). If an unemployed person reaches age 59 before the 500 days have accrued (age 60 for persons born in 1955 or after), earnings-related unemployment can be paid until age 65. Individuals receiving allowance after 500 days are entitled to choose claiming old-age pension from age 63. After the period with earnings-related unemployment benefits, flat rate or income-tested (under various conditions) unemployment assistance could be claimed but the period under these benefits are not credited for the pension entitlement.	Pensionable earnings are 75% of the earnings on which the unemployment benefit is based.
France	Each completed 50 days attributes one quarter of contributions for pensions, with a maximum of four quarters per year and two years in total. These periods do not enter into the calculation of the average reference wage based on the 25 best years of earnings and therefore not into the pension calculation. In addition people benefit of four quarters for unemployment which is not insured.	For periods covered by unemployment benefit: the PE is a "daily reference wage" which is the last wage (on a year basis). Pension points accrue on the basis of this wage also in the occupational pension scheme.
Germany	1) Arbeitlosengeld I: 6-24 months. 2) Arbeitlosengeld II.	1) Unemployment benefits amounting to 80% of previous gross earnings (contibutions are paid by the scheme). 2) Means-tested benefit (no contributions paid for pensions).
Greece	Not > 300 days.	Unemployment benefit.
Hungary	Max. 90 days of Jobseeker benefits (one day is paid for every ten days of previous insurance).	Pension contributions are paid by the benefit recipient. The PE is the unemployment benefits or the earnings when they are more favourable.
Iceland	Periods of unemployment insurance.	PE is the unemployment benefit, contributions are paid by the scheme.
Ireland	Not available.	
Israel	Not available.	ER: only if voluntary contributions.
Italy	1) Restructuration following business distress: 12-24 months. 2) Involuntary unemployment: 8 months if age < 50; 12 months if age between 50 and 55; 14 months if age > 55.	1) PE is equivalent to 80% of the last salary, but there are ceilings. In 2014 the maximum net benefit was of EUR 913.14 per month for workers with a working salary up EUR 25 176.48 per year and of EUR 1 097.51 for higher earners. 2) A. if the average salary below EUR 1 192.98, the PE is 75% of the monthly average salary in the last two years before the dismissal; B. 75% of EUR 1 192.98 in 2014 and 25% of the difference between the monthly average salary and the threshold of EUR 1 165.58. The allowance declines by 15% after six months and by a further 15% after 12 months.
Japan		Contribution schedule varies according to earnings: < JPY 570 000 are exempted from contributions but entitled to half of basic pension; < JPY 780 000 pay one-fourth of contributions and are entitled to five-eights of basic pensions; < JPY 1 180 000 pay half of contributions and are entitled to three-quarters of basic pension; < JPY 1 580 000 pay three-quarters of contributions and are entitled to seven-eights of basic pension.

Table 3.A1.2. **Main rules of pension credits related to unemployment** *(cont.)*

	Length covered	Pensionable earnings
Korea	First-tier pension; ER: Not available.	Only voluntary contributions.
Luxembourg	Insured periods of unemployment count are considered as periods of employment for pension	Unemployment benefit is the PE. Contributions are paid for 1/3 by the beneficiary and 2/3 by the State.
Mexico	covered only in the first-tier	Only if voluntary contribution.
Netherlands	covered only in the first-tier	Only if voluntary contribution.
New Zealand	covered only in the first-tier	
Norway	Insured periods of unemployment are considered as periods of employment for pension.	Pensionable earnings: 7.1 BA.
Poland	Periods in receipt of UB (vary according to local labour market conditions and previous duration of unemployment and family status).	The PE is the unemployment benefit on which the government pays the contributions.
Portugal	Periods in receipt of UB.	PE is the pay in the six months before the second month of the start of the unemployment period.
Slovak Republic	Not available.	Only if unemployed pays voluntary contributions.
Slovenia	Periods in receipt of UB (duration depending on age and previous working history).	PE is the UB and contributions are paid by the State.
Spain	Periods in receipt of UB; unemployment assistance only count for people aged 55 and over.	PE is average salary during the 6 months preceding the break. Individual need to pays the contributions.
Sweden	Periods in receipt of unemployment insurance or assistance.	The State pays the employer contribution. PE is as follows: 1) First 200 days it is 80% of previous earnings. 2) Between 201 and 300 days it is 70% of previous earnings (with children this period is extended by 150 days). The benefit considered PE varies between SEK 320 and SEK 680.
Switzerland	For the public pension: 90-640 days; for the occupational pension: not available.	The unemployment scheme pays 80% of the previous earnings which is then the PE. For people on very low income the minimum contribution is paid often by the municipality. In the other case individuals pays the contribution into the public scheme.
Turkey	ER: Not available.	Contributions are mandatory but do not count for pensions.
United Kingdom	Periods of unemployment on insurance or assistance benefits are considered as employment only for the basic state pension.	National insurance contributions are paid on the benefit received who are credited for pensions.
United States	Offset by pension rules if the career is 35 years.	

Note: BA = Base amount; ER = Earnings-related pension scheme; PE = Pensionable earnings.
Source: Compiled with information received by national country delegates and contained in the "Country profiles" in Chapter 11 of this report.

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