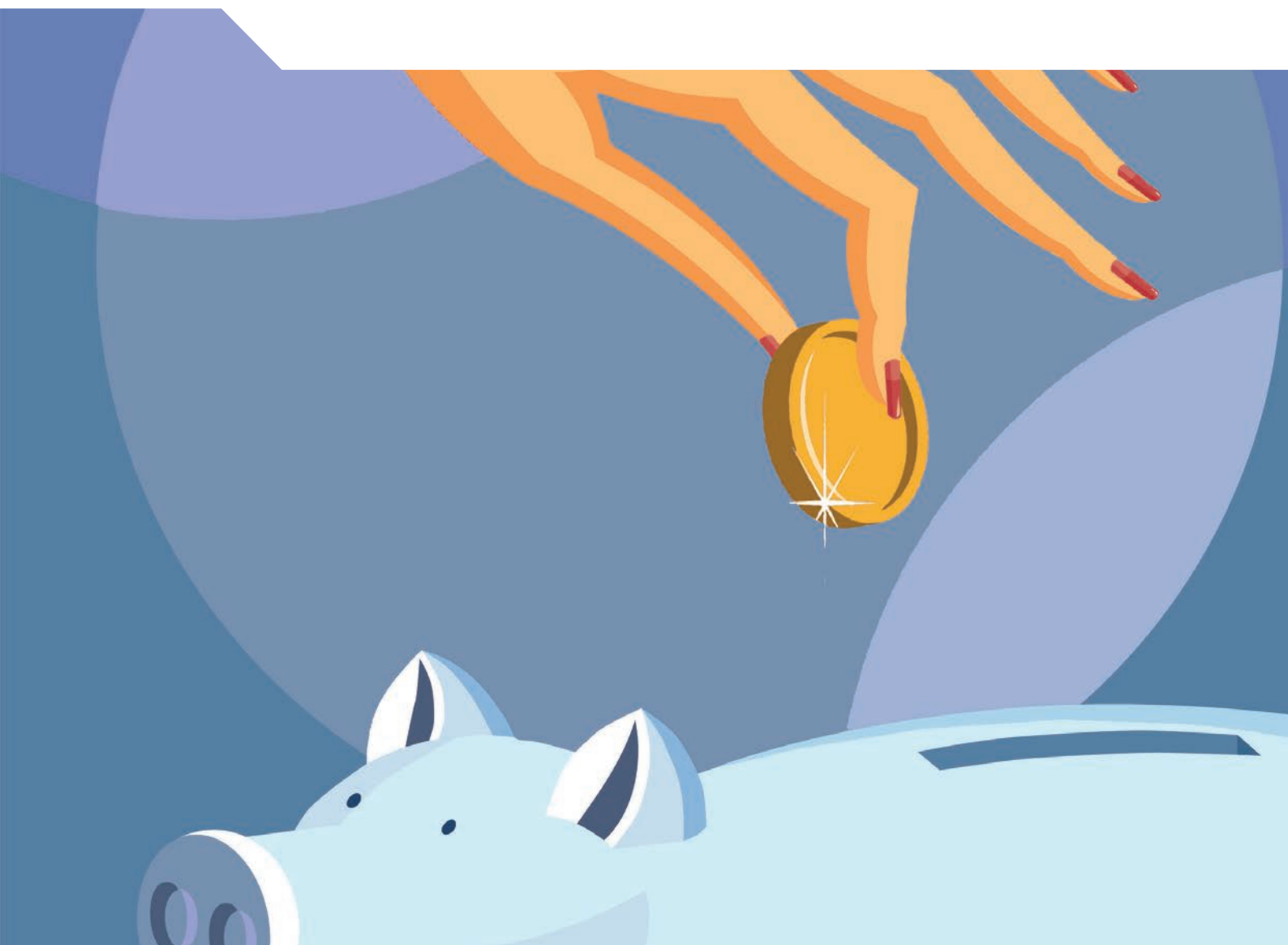




Pensions at a Glance 2019

OECD AND G20 INDICATORS



OECD Pensions at a Glance

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Please cite this publication as:

OECD (2019), *Pensions at a Glance 2019: OECD and G20 Indicators*, OECD Publishing, Paris,
<https://doi.org/10.1787/b6d3dcfc-en>.

ISBN 978-92-64-78791-9 (print)
ISBN 978-92-64-87610-1 (pdf)
ISBN 978-92-64-95084-9 (HTML)
ISBN 978-92-64-93983-7 (epub)

OECD Pensions at a Glance
ISSN 1995-4026 (print)
ISSN 1999-1363 (online)

Corrigenda to publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

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Foreword

This eighth edition of *Pensions at a Glance* provides a range of indicators for comparing pension policies and their outcomes between OECD countries. The indicators are also, where possible, provided for the other major economies that are members of the G20. Three special chapters provide a deeper analysis of recent pension reforms (Chapter 1) and pension systems within OECD countries for individuals in non-standard forms of work (Chapters 2 and 3).

This report was prepared under the general supervision of Gabriela Ramos, OECD Chief of Staff and Sherpa to the G20. It is the joint work of staff in both the Pensions Team of the Social Policy Division of the OECD Directorate for Employment, Labour and Social Affairs and of the Insurance, Private Pensions and Financial Markets Division of the OECD Directorate for Financial and Enterprise Affairs. National officials – particularly delegates to the OECD Working Party on Social Policy and members of the OECD pension expert group – provided invaluable input to the report.

Chapter 1 on “Recent pension reforms” was written by Boele Bonthuis and Tomoko Onoda. Chapter 2 entitled “Non-standard forms of work and pensions” was written by Maciej Lis, Marius Lüske and Tomoko Onoda. Chapter 3 entitled “Are funded pensions well designed to adapt to non-standard forms of work?” was written by Stéphanie Payet and Pablo Antolin thanks to the financial support of the European Commission and Principal International Group. Chapters 4 to 8 were written and the indicators therein computed by Christian Geppert and Andrew Reilly, while Chapter 9 was written by Romain Despalins, Stéphanie Payet and Pablo Antolin, who also computed the related indicators. Hervé Boulhol led the team and was responsible for revising and enhancing these chapters. Maxime Ladaique provided extensive support for tables and figures. Lauren Thwaites prepared the manuscript for publication. Fatima Perez provided technical assistance.

We are grateful to many national officials including ELSAC Delegates and to colleagues in the OECD Secretariat for their useful comments, notably Andrea Garnero, Herwig Immervoll, Marguerita Lane, Horacio Levy, Mark Pearson, Monika Queisser and Stefano Scarpetta (ELS), Anna Milanez (CTP) and Stéphanie Payet (DAF). The OECD gratefully acknowledges the financial support from the European Union, which co-financed this project with the OECD.

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Editorial – Pensions for non-standard workers

The world of work is changing. Mega trends, such as digitalisation, globalisation, and demographic and climate change are transforming our economies and societies. Many new opportunities for growth and development are emerging, but also some clear challenges with increasing numbers of people with unstable working conditions, often in temporary or part-time jobs, and with low and intermittent earnings. New technologies make it easier and cheaper to offer and find work on-line, and platforms have seen an exponential growth in recent years, even if they still account for a small share of employment across the OECD. Overall, non-standard employment, including self-employment, accounts for more than one in three jobs in OECD countries. Non-standard workers are a very diverse group, but on average, they earn less on an hourly and especially yearly basis. For example, a median full-time self-employed person earns 16% less than a full-time employee, on average across the OECD.

What does this mean for workers' social protection? Most social protection systems were built on the premise of stable, linear careers, often with only one employer, and thus are ill equipped to provide adequate income security for non-standard workers. Many of them, be it in self-employment, short-term, gig, platform or click work, risk falling through the cracks.

These developments challenge all branches of social protection, but one stands out in particular due to its long-term impact: the provision of old-age security. For pensions, the future of work is now. Many countries have tightened the links between contributions and pension benefits and thus, to reach an adequate pension, contributions have to start early and continue for the whole career. Countries have long recognised this; they have therefore made membership in pension systems mandatory for most workers and are encouraging participation in voluntary occupational and personal pension plans.

But as always, the devil is in the detail. Workers on fixed-term contracts should in theory be covered, as most countries align rules with those for standard workers. The problem is largely about the level of expected benefits given their patchier and generally lower contributions. However, in some countries, for some specific groups, reduced or no pension contributions are required for self-employed workers, temporary agency workers, young workers, seasonal workers, apprentices and/or trainees.

Ensuring pension coverage for the self-employed is much more difficult. Without a formalised employment relationship, it is not clear on what basis pension contributions should be levied. For employees, contributions are often based on the gross wage, but this does not correspond to any category of a self-employed worker's earnings. Also, it is very difficult, if not impossible, to distinguish between labour and capital income. Still, most OECD countries require the self-employed to contribute to their mandatory pension systems. Why then is pension coverage still a challenge?

Even if as affiliates of a pension system, the self-employed often pay lower contribution rates than employees with similar earnings. The self-employed also have more control over determining the contribution base, which often results in lower amounts going to pensions. Combined with lower earnings and the closer links between contributions and benefits, this

means that many self-employed workers can expect significantly lower pensions than standard employees.

In some cases, lowering the contribution burden for the self-employed is intentional and pursued to reach other policy objectives, such as promoting entrepreneurship or raising take-home income of groups such as farmers or artists. Simulations in this edition of *Pensions at a Glance* compare the rules for self-employed workers with those for dependent workers, both earning the average wage. Even assuming contributions during a full career the self-employed end up with 79% of the pension benefit dependent employees would receive from mandatory schemes, on average across the OECD.

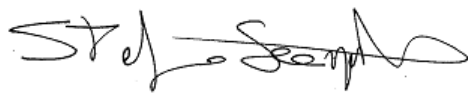
In occupational pensions, too, non-standard workers are at a disadvantage: they are often excluded from company schemes, vesting periods penalise workers who switch jobs frequently and pension rights acquired in one employment relationship are often not fully portable when a worker moves to another job. The self-employed obviously do not have access to employer schemes and can only rely on old-age safety nets and their own retirement savings.

To solve the pension dilemma for non-standard workers a comprehensive approach is needed. Taking a life course perspective is key: it starts by improving earnings prospects, career stability and advancement, which in turn enables people to build pension entitlements. Both mandatory and voluntary pension schemes should aim to treat the self-employed in similar ways as dependent employees and align the rules of participation. If policy seeks to provide more favourable contribution conditions to certain groups of workers, this should not come at the expense of lower entitlements; instead, pension contributions could be subsidised from other sources, at least for low earners.

Earlier this year, in its 2019 edition of the *Employment Outlook* fully devoted to the Future of Work, the OECD called for a *Transition Agenda for a Future that Works for All* – a whole-of-government approach that targets interventions on those who need it most. Such an agenda adopts a life course approach, covering education and skills, public employment services, social protection and family policies, but also labour market regulation, taxation and even housing, transport, competition law and industrial policy.

All of these measures will help workers earn not only better incomes but also higher pension entitlements. In the OECD's 2018 survey *Risks that Matter* we asked people in 21 countries about their biggest concerns for the future. On average, roughly 82% of respondents aged 55 to 70 list finances in old age among their top-three long-term concerns. But many younger people also picked this as a top concern.

Governments should heed this call and act now to improve pension prospects for all workers as part of the *Transition Agenda*. Policies to build inclusive and well-coordinated systems of contributory and non-contributory, public, occupational and personal private pensions will help ensure well-being for all in old age. Some creativity and new solutions will be required to address the specific situation of non-standard workers. This edition of *Pensions at a Glance* contributes to the debate by setting out a series of measures that can serve to meet this objective.



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Executive summary

This edition of *Pensions at a Glance* reviews and analyses the pension measures legislated in OECD countries between September 2017 and September 2019. As in past editions, a comprehensive selection of pension policy indicators is included for all OECD and G20 countries. Moreover, this edition provides an in-depth review of different approaches to organising pensions for non-standard workers.

Vigilance is needed not to jeopardise the progress achieved to make pensions more sustainable

Pressure persists to maintain adequate and financially sustainable levels of pensions as population ageing is accelerating in most OECD countries. In 1980, there were 2 people older than 65 years for every 10 people of working age in the OECD. That number will have increased to slightly over 3 in 2020, and is projected to reach almost 6 by 2060. The working-age population, measured using fixed age thresholds, is projected to decrease by more than one-third by 2060 in several countries.

Several measures legislated since September 2017 have rolled back previous reforms. Recent reforms have loosened age requirements to receive a pension, increased benefits and expanded coverage. Contribution rates were changed in Hungary, Iceland and Lithuania; old-age safety nets and minimum pensions increased in Austria, France, Italy, Mexico and Slovenia as well as benefits for low earners in Germany, while Spain suspended measures (sustainability factor and revalorisation index) to deal with financial pressures due to ageing. Only Estonia has raised the retirement age. By contrast, Italy, the Netherlands and the Slovak Republic expanded early-retirement options or limited previously announced increases in the retirement age.

With improving economic conditions, financial pressure to reform pension systems has eased and it is understandable that some countries want to soften unpopular measures introduced in a crisis context. However, while financial pressures on pension systems were exacerbated by the crisis, they often also reflected structural weaknesses. Backtracking on reforms that address long-term needs may leave pension systems less resilient to economic shocks in the future and unprepared to face population ageing.

Based on currently legislated measures, slightly more than half of OECD countries are increasing the retirement age, from 63.8 years currently to 65.9 years on average by about 2060. This represents half of expected gains in life expectancy at age 65 over the same period, implying that by themselves, these changes will be insufficient to stabilise the balance between working life and retirement.

Taking into account recent reforms, future net replacement rates from mandatory schemes for full-career average-wage workers equal 59% on average, ranging from close to

30% in Lithuania, Mexico and the United Kingdom to 90% or more in Austria, Italy, Luxembourg, Portugal and Turkey. Replacement rates based on full careers are projected to fall over the next decades in most OECD countries.

Why does non-standard work raise pension concerns?

Non-standard workers are a very diverse group, including part-time and temporary employees as well as the self-employed, which account for more than one-third of employment in OECD countries overall. The development of new forms of work might weaken the income prospects of future generations of retirees.

The self-employed generally pay lower pension contributions than employees with the same taxable income. They contribute in a similar way as employees in only ten OECD countries. A high degree of discretion in setting the contribution base, no requirement to participate in earnings-related schemes, reduced incentives to contribute to voluntary schemes and lower nominal contribution rates are the most important factors explaining lower pension contributions. This can have severe consequences for the pension benefits of the self-employed today and in the future, and for the overall capacity to finance adequate pensions.

Upon retirement, former self-employed people tend to have lower public pensions than former employees, and non-standard workers in general have more limited access to funded pension arrangements. Across the OECD, based on mandatory contributions, self-employed workers will receive an old-age pension that is 20 percent below the benefit of former dependent employees having the same taxable income over the working life.

Many countries can take steps to improve the pension outcomes of non-standard workers

Reforms of pension systems that mitigate disparities between standard and non-standard workers in terms of coverage, contributions and entitlements would ensure fairer protection, reduce inequalities, pool risks as broadly as possible and facilitate labour mobility across job types.

Setting minimum earnings requirements for pensions at sufficiently low levels would remove some barriers that temporary and part-time workers face in meeting pension eligibility conditions. The need for equal treatment of all labour income implies not excluding temporary work contracts, irrespective of their duration, from mandatory pension protection and abolishing any minimum tenure or vesting periods for acquiring pension entitlements.

Fully including all non-standard workers in mandatory pensions in the same way as standard workers limits the financial incentives employers and workers might have to misuse non-standard employment. Ensuring the portability of pension rights and assets helps individuals who are changing jobs to keep saving in the same arrangement, or to transfer their vested rights. Limiting leakages from the funded pension system originating from job changes and early-withdrawal possibilities would improve coverage and old-age security. Moreover, voluntary occupational schemes and auto-enrolment schemes should be available for all contract types through default plans in countries where they are available for dependent workers.

The reasons to mandate pensions for dependent employees equally apply to the self-employed. Aligning pension rules across all forms of work means equalising total - the

sum of employee and employer - contribution rates for all workers. In particular, the large degree of flexibility in defining the contribution base for the self-employed tends to lead to low contributions. However, formally limiting such flexibility might not be sufficient to prevent low levels of contributions and appropriate compliance measures might be needed. If lower mandatory pension contributions for the self-employed are used as an instrument to promote self-employment or to support those in low-earning activities, resulting lower entitlements should be avoided by topping up the lower implied contributions through subsidies, at least for low earners.

Chapter 1

Recent pension reforms

This chapter looks at pension reforms in OECD countries over the past two years (between September 2017 and September 2019). Pension reforms have lost momentum with both improving economic conditions and increasing political pressure in some countries not to implement previously decided measures. Over the last two years, most pension reforms focused on loosening age requirements to receive a pension, increasing pension benefits including first-tier pensions, expanding pension coverage or encouraging private savings. Some recent major policy actions have also consisted of partially reversing previous reforms.

Introduction

Population ageing is accelerating in OECD countries. Over the last 40 years the number of people older than 65 years per 100 people of working age (20-64 years) increased from 20 to 31. By 2060, it will likely have almost doubled to 58. In particular, population ageing is expected to be very fast in Greece, Korea, Poland, Portugal, the Slovak Republic, Slovenia and Spain, while Japan and Italy will remain among the countries with the oldest populations.

Rapid ageing puts continuous pressure on pension systems. The legacy of the great financial crisis leaves many countries with high public debt and therefore limited room for manoeuvre. In addition, risks of increasing old-age inequality (OECD, 2017^[1]), the development of non-standards forms of work (Chapters 2 and 3) and the low-growth and low-interest-rate environment present new challenges for already stretched pension systems. Low interest rates actually generate both new challenges and opportunities. Low government bond rates sharply reduce the cost of public debt, especially when they are lower than GDP growth rates (Blanchard, 2019^[2]), which has been the case in many OECD countries in recent years. At the same time, low interest rates limit the returns on assets from funded pension plans and increase discounted liabilities, potentially lowering future pensions from funded defined contribution schemes and threatening the solvency of funded defined benefit schemes (Rouzet et al., 2019^[3]). Low interest rates might also reflect low-growth prospects, potentially influenced by ageing itself, in which pension systems regardless of their form will struggle to deliver adequate and financially sustainable pensions.

Dealing with the challenges of ageing societies might involve increasing contributions, which could lead to lower net wages and higher unemployment, and/or cutting pension promises. Against this background, working longer is crucial to maintaining pension adequacy and financial sustainability. However, raising the retirement age has often proved to be among the more contentious pension reforms.

In the wake of the global financial crisis, many countries had taken measures to improve the financial sustainability of their pension system. Over the last two years, most pension reforms focused on loosening age requirements to receive a pension, increasing pension benefits including first-tier pensions, expanding pension coverage or encouraging private savings.

Despite the persistent needs to adjust to demographic changes, risks are mounting that countries will not deliver on adopted reforms. Pension reforms have lost momentum with both improving economic conditions and increasing political pressure not to implement previously decided measures. Some recent major policy actions have consisted of partially reversing previous reforms. With improving economic conditions, it might make sense to soften measures decided to improve short-term financial balances. However, short-term difficulties often highlight structural weaknesses. Backtracking might then raise concerns if it means not implementing reforms that actually address long-term needs such as those driven by demographic changes.

The Slovak Republic decided to abolish the link between the retirement age and life expectancy, reversing the 2012 reform and instead committing to raising the retirement age to 64, which will be reached through discretionary increases. Italy eased early-retirement conditions and suspended the link between the retirement age and life expectancy for some workers until 2026. Spain suspended the adjustment mechanism for indexation of pensions in payments, which is based on total contributions, the number of pensioners and the financial balance of pensions and of the Social Security system, in 2018 and 2019. It also suspended until 2023 the sustainability factor (meant to ensure financial sustainability), which from 2019 would have adjusted initial pensions when retiring to improvements in life expectancy. In the Netherlands, the statutory retirement age was temporarily frozen and a law to revise the link between the retirement age and life expectancy is expected to be presented to parliament soon. Looking back over the last 4 years, similar reform reversals happened in Canada, the Czech Republic and Poland.

Key findings

The main recent pension policy measures in OECD countries include:

- limiting the increase in the retirement age or expanding early-retirement options (Italy, the Netherlands and the Slovak Republic);
- raising the retirement age (Estonia);
- enhancing work incentives (Belgium, Canada and Denmark);
- increasing the level or expanding the coverage of first-tier pensions, the first layer of old-age social protection (Austria, France, Italy, Mexico and Slovenia);
- increasing benefits while reducing contributions for low earners (Germany);
- suspending the adjustment of pension benefits with demographic changes (Spain);
- bringing public-sector pension benefits more in line with private-sector benefits (Norway);
- changing the contribution rates (Hungary, Iceland and Lithuania) or expanding contribution options (New Zealand);
- expanding the coverage of mandatory pensions (Chile) or developing auto-enrolment schemes (Lithuania and Poland); and,
- changing tax rules for pensioners (Sweden).

Other findings:

- Those aged over 65 currently receive less than 70% of the economy-wide average disposable income in Estonia and Korea, but slightly more than 100% in Israel, France and Luxembourg. On average in the OECD, the 65+ receive 87% of the income of the total population.
- The relative poverty rate for those older than 65 – defined as having income below half the national median equivalised household income – is slightly higher than for the population as a whole (13.5% versus 11.8%) for the OECD on average. The old-age poverty rate is lower than 4% in Denmark, France, Iceland and the Netherlands, while it is larger than 20% in Australia, Estonia, Korea, Latvia, Lithuania, Mexico and the United States.
- A little over half of all OECD countries will raise the retirement age. On average across the OECD countries, the normal retirement age will increase by 1.9 years by about 2060 for men from 64.2 years currently to 66.1 years based on current legislation. This represents

almost half of expected gains in life expectancy at 65 over the period and compares to an average increase in the normal retirement age of about 1.5 years over the last 15 years.

- In 2018, the normal retirement age – eligibility age to a full pension from all components after a full career from age 22 - for men was 51 in Turkey whereas in Iceland, Italy and Norway it was 67 for both men and women. Given current legislation, the future normal retirement age will range from 62 in Greece, Luxembourg, Slovenia and Turkey to 71 or more in Denmark, Estonia, Italy and the Netherlands.
- The gender gap in retirement ages, which existed in 18 countries among individuals born in 1940, is being eliminated, except in Hungary, Israel, Poland and Switzerland.
- The share of adult life spent in retirement is still increasing in the vast majority of OECD countries. The cohort entering the labour market about today is expected to spend 33.6% of adult life in retirement compared with 32.0% for the cohort retiring on average today.
- Future net replacement rates from mandatory schemes for full-career average-wage workers equal 59% on average, ranging from close to 30% in Lithuania, Mexico and the United Kingdom to 90% or more in Austria, Italy, Luxembourg, Portugal and Turkey at the normal retirement age.
- In countries with significant coverage for voluntary pensions – Belgium, Canada, Germany, Ireland, Japan, New Zealand, the United Kingdom and the United States – being covered by a voluntary pension boosts future net replacement rates by 26 percentage points on average for average earners contributing during their whole career and by about 10 percentage points when contributing from age 45 only, based on the modelling assumptions used in the OECD projections.
- Average-wage workers who experience a 5-year unemployment spell during their career face a pension reduction of 6.3% in mandatory schemes on average in the OECD compared to the full-career scenario. The loss exceeds 10% in Australia, Chile, Estonia, Iceland, Latvia, Korea, Mexico, Poland, the Slovak Republic and Turkey. In Spain and the United States, a 5-year career break does not influence pension benefits, as full benefits in the earnings-related scheme are reached after 38.5 and 35 years of contributions, respectively.
- Replacement rates after a full career are projected to fall by about 6 percentage points on average (i.e. by slightly more than 10%) between those who retired about 15 years ago and those recently entering the labour market. They will fall in about 60% of OECD countries, increase in about 30% of them and be roughly stable in the remaining 10%.

The rest of the chapter is organised as follows: the second section sets the scene by providing some key indicators on population ageing. The third section details the most recent pension reforms and the fourth section focuses on the long-term trends in pension reforms.

Population ageing: demographic trends, income and employment

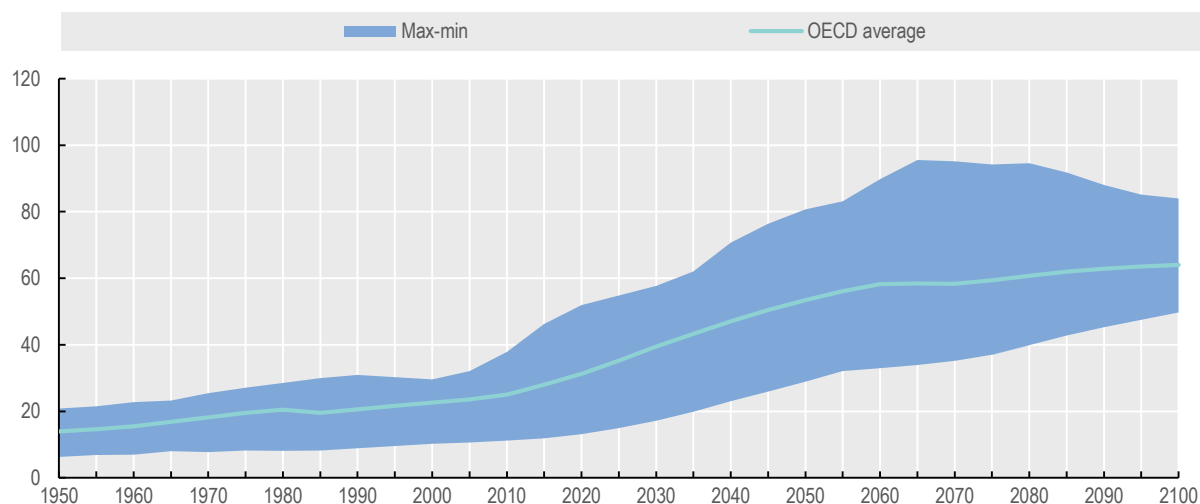
Population ageing

Population ageing is accelerating. Over the last 40 years, the old-age to working-age ratio – the number of people older than 65 years per 100 people of working age (20 to 64 years) – has increased by a little more than 50% in the OECD on average, from 20 in 1980 to 31 in 2020 (Figure 1.1). Over the next 40 years, it will almost double to a projected 58 in 2060. This rapid rise in the old-age to working-age ratio results from people living on average far longer and having fewer babies. A striking feature of the below chart is the growing

dispersion of projected old-age to working-age ratios among OECD countries in the first half of the 21st century: while populations are getting older in all OECD countries, differences in the pace of ageing across countries are resulting in diverging population structures.

Figure 1.1. The rise in the old-age to working-age ratio is accelerating

Number of people older than 65 years per 100 people of working age (20-64), 1950-2100



Note: The centre line is the OECD average old-age to working-age ratio. The shaded area indicates the range between the country with the lowest old-age to working-age ratio and the country with the highest old-age to working-age ratio.

Source: United Nations World Population Prospects: The 2019 Revision.

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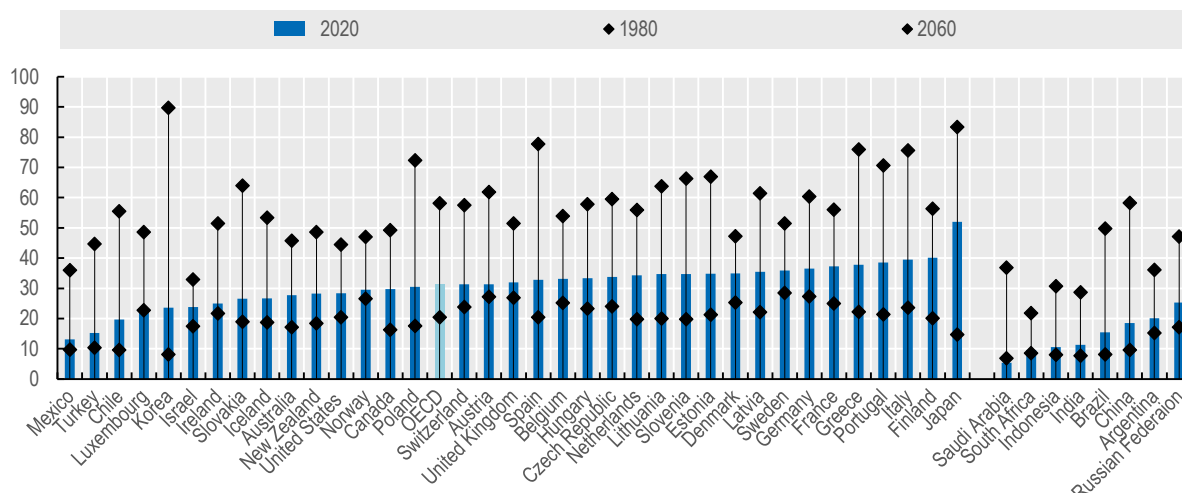
Denmark, Finland and Sweden, which currently have relatively high old-age to working-age ratios, will have below average ones in 2060 (Figure 1.2). On the other hand, in Korea and Poland the population is currently younger than average – based on this indicator – but will rapidly age and these two countries will end up having above average old-age ratios. Based on changes by 2060, Greece, Korea, Poland, Portugal, the Slovak Republic, Slovenia and Spain will age at the fastest pace, while Japan and Italy will remain among the countries with the oldest populations.¹ Among non-OECD G20 countries, the pace of population ageing is faster in Brazil, China and Saudi Arabia than the OECD average, but they have currently younger populations.

The projected working-age population (20-64) will decrease by 10% in the OECD on average by 2060, i.e. by 0.26% per year. It will fall by 35% or more in Greece, Japan, Korea, Latvia, Lithuania and Poland, and increase by more than 20% in Australia, Israel and Mexico (Figure 1.3). This will have a significant impact on the financing of pay-as-you-go (PAYGO) systems as it is closely related to their internal rates of return. Even funded pension systems might be negatively affected by rapidly declining working-age populations through its effect on labour supply, in turn potentially lowering output growth and equilibrium interest rates.

The improvement in remaining life expectancy at age 65 will slow a little. It increased from 13.7 years in 1960 to 15.9 years in 1990 before accelerating to 19.8 years in 2020 in the OECD on average (Figure 1.4). It is expected to rise further to 22.6 years in 2050. Differences in life expectancy between countries are and will remain substantial. In Hungary (having

Figure 1.2. The average old-age to working-age ratio will almost double in the next 40 years

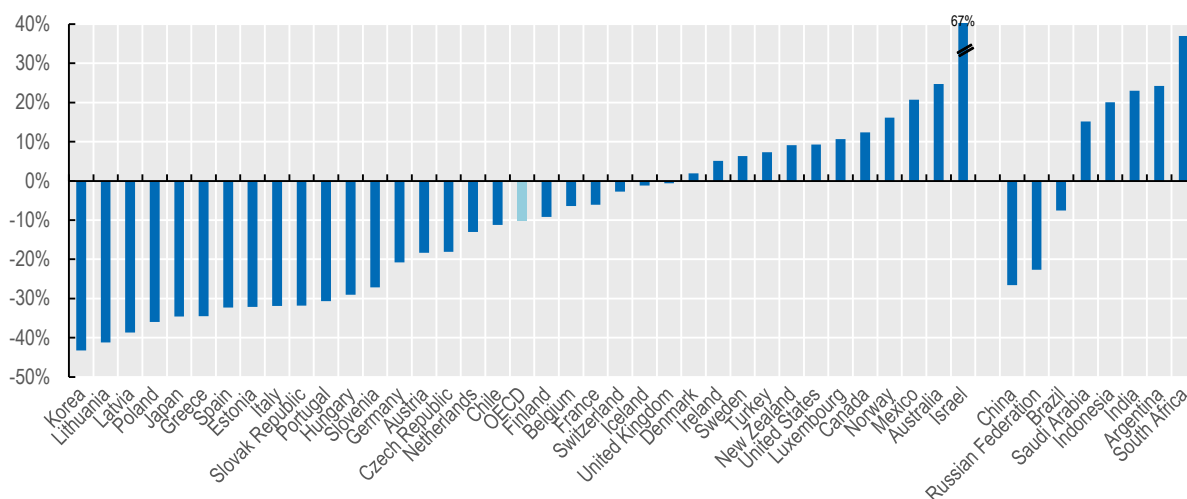
Number of people older than 65 years per 100 people of working age (20-64), 1980-2060



Source: United Nations World Population Prospects: The 2019 Revision.

StatLink <https://doi.org/10.1787/888934040509>**Figure 1.3. The working-age population will decline in a large number of OECD countries**

Change in the working age population (20-64), 2020-2060



Source: United Nations World Population Prospects: The 2019 Revision.

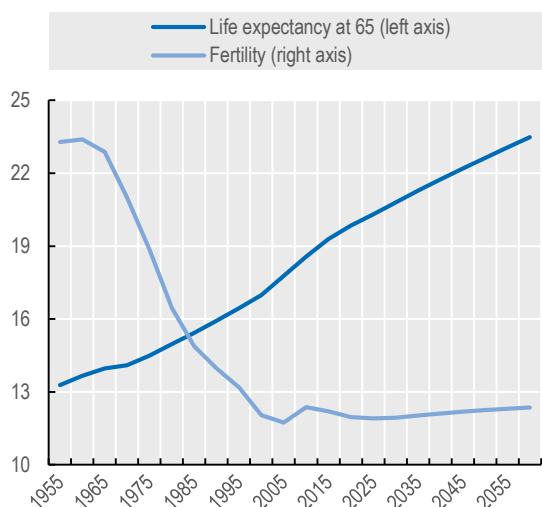
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the lowest life expectancy) remaining life expectancy at age 65 is currently 17.2 years while in Japan (having the highest life expectancy) it is 22.4 years. The range of remaining life expectancies at 65 among OECD countries is expected to stay constant over time, with Latvia at 19.8 years and Japan at 25.0 years in 2050.

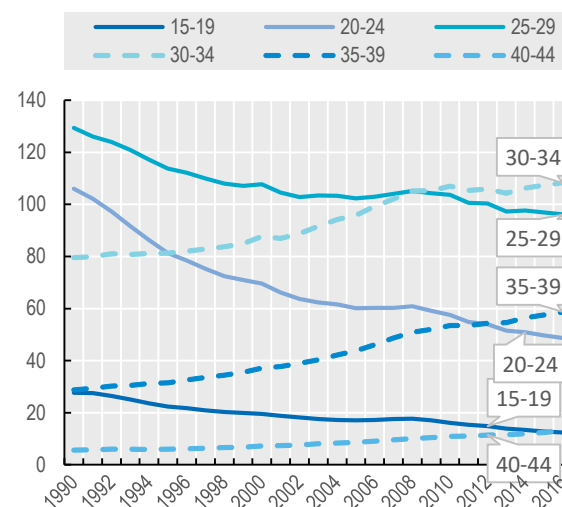
Fertility sharply fell from 3.2 children per woman aged 15 to 49 in 1955 to 1.6 in 2005 on average (Figure 1.4, Panel A). Since the early 2000s it has remained rather constant with average fertility rates currently at 1.7. Most of the initial drop can be attributed to lower infant mortality and rising opportunity cost of having children, which, in turn, can be linked to women's increasing financial incentives for working and building a career (OECD, 2017^[4]).

Figure 1.4. **Projected life expectancy at age 65 keeps increasing while fertility remains low**

A. Remaining life expectancy at age 65, in years and total fertility rates per woman, OECD average



B. Fertility rates by age group, births per 1000 women, OECD average



Source: United Nations World Population Prospects: The 2019 Revision. Source: OECD Family Database.

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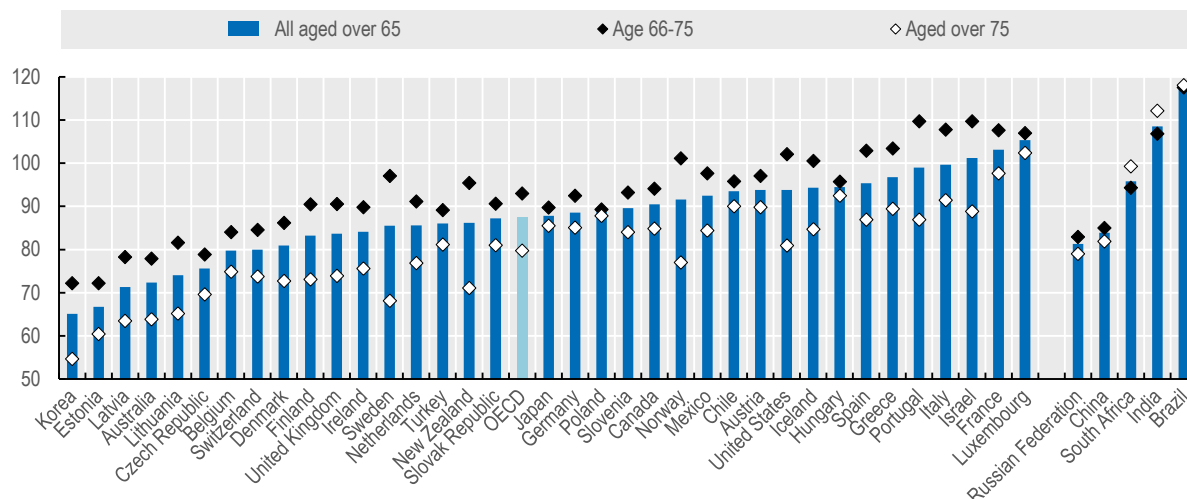
Women are also having babies later in life on average and female employment rates have risen substantially (OECD, 2017^[4]). Fertility rates of women aged below 30 have roughly halved since 1990 while fertility rates of women in their 30s have increased significantly (Panel B). However, the former effect outweighs the latter. Overall, women aged 30-34 now give birth more often than those aged 25-29, and those aged 35-39 more often than the 20-24 age group. While low overall fertility can put pressure on the financial sustainability of pension systems, falling fertility rates at very young ages, rising female education levels and rising female employment rates are major accomplishments, which improve women's well-being and reduce their old-age poverty risks (see next subsection).

Old-age income

On average among OECD countries, people older than 65 have a disposable income equal to 87% of the total population. It is less than 70% of the economy-wide average in Estonia and Korea, but slightly more than 100% in France, Israel and Luxembourg (Figure 1.5). Moreover, income drops further with age in old age, and those older than 75 have a significantly lower income than the 66-75 in all OECD countries, with an average difference of 14 percentage points. In most non-OECD G20 countries it is the other way around, old-age income rises slightly with older ages, except in China and the Russian Federation.

Women's pensions are lower than men's (Lis and Bonthuis, 2019^[5]). Older women often had short careers and lower wages than men's, resulting in low benefit entitlements. In the EU-28, women's average pensions were 25% lower than the average pension for men in 2015 (Figure 1.6). The gender gap stood at over 40% in Germany, Luxembourg and the Netherlands and below 10% in Denmark, Estonia and the Slovak Republic. This also translates into a disproportionate share of poor elderly people being women (Table 7.2 in Chapter 7). On the one hand, with recent moves towards tighter links between labour

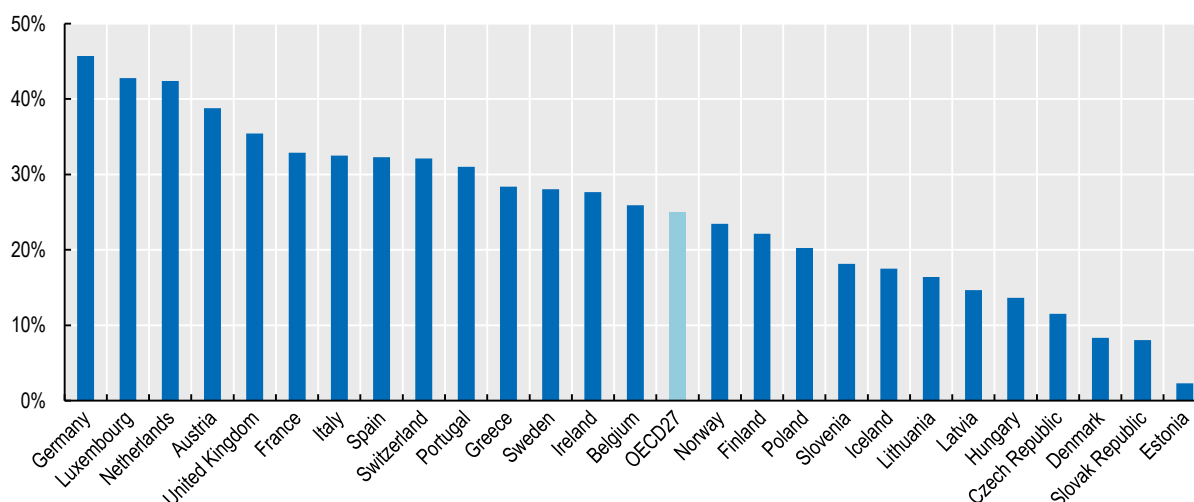
Figure 1.5. Disposable incomes of older people
Incomes of people aged over 65, % of total population incomes



Note: 2016 or latest available year. All income from employment, self-employment, capital and public transfers are included. Incomes are measured on a household basis and equivalised with the square root equivalence scale to adjust for differences in household size. Source: Table 7.1, OECD Income Distribution Database.

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Figure 1.6. The gender pension gap is large



Note: gender gap in pensions calculated for persons at age of 65 and more using the following formula: $1 - \text{women's average pension} / \text{men's average pension}$. It includes persons who obtain old-age benefit (public or private), survival pension or disability benefit. Data for Iceland cover 2014.

Source: EU-SILC, 2016, version: March 2018.

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income and pensions in many countries (see Section 4), the gender pension gap might remain persistently high. On the other hand, women's improved labour market positions will contribute to lowering that gap.

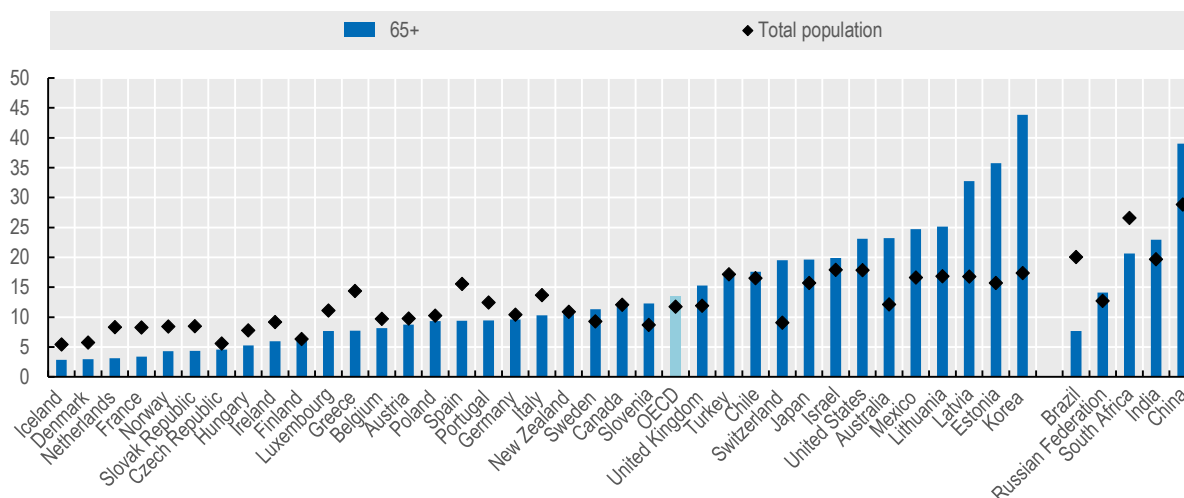
Poverty risks have shifted from older to younger groups in most OECD countries since the mid-1990s (Table 7.3 in Chapter 7). Some indicators such as the European Commission

(2018_[6])'s at-risk-of-poverty-or-social-exclusion indicator even show that poverty among older age groups is lower than poverty among the working-age population in the EU.² However, the relative old-age (65+) poverty rate defined as having income below half the national median equivalised household income is still higher among the 65+ than for the population as a whole, at 13.5% vs 11.8% (Figure 1.7) as the old-age poverty rate is very high in some countries. More than one in five people above 65 are relatively poor in Australia, Estonia, Korea, Latvia, Lithuania, Mexico and the United States.³ For non-OECD G20 countries this is also the case in China, India and South Africa. Conversely, less than 4% of the 65+ live in relative poverty in Denmark, France, Iceland and the Netherlands.

Older age groups (75+) still have significantly higher poverty rates (Table 7.2 in Chapter 7). There are several reasons for this. First, a larger share of the 75+ age group is female: women's lower pensions than those of men combine with higher life expectancy. Second, in some countries pension systems are still maturing, meaning that currently not all older people have been covered during their entire working lives. And third, pension benefits are often price-indexed, meaning that they are likely to fall relative to wages.

Figure 1.7. **Poverty rates among older age groups and the total population**

Relative poverty rates, %, 2016



Note: Relative poverty is defined as an income below half the national median equivalised household income.

Source: Table 7.2.

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Employment of older workers

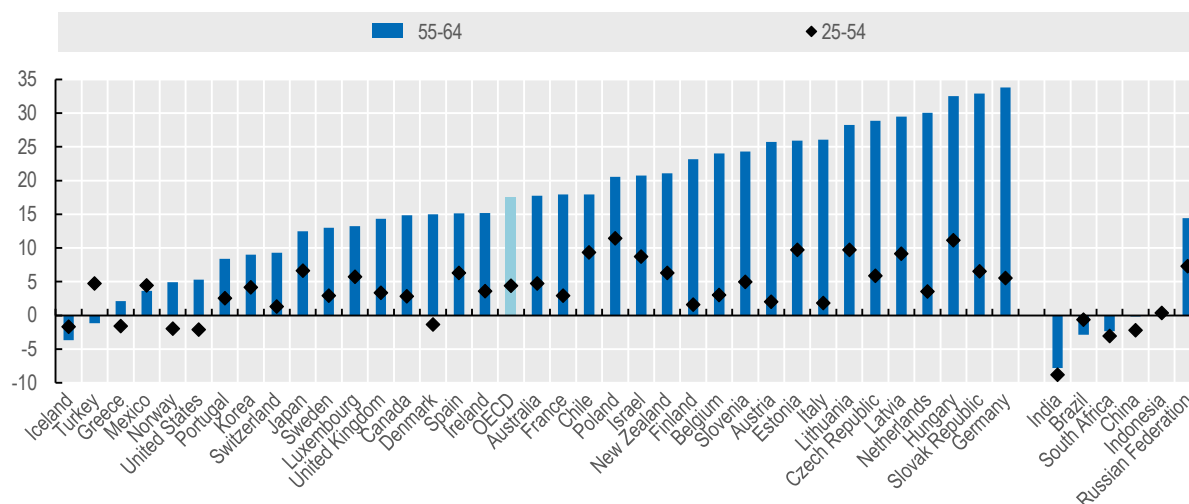
Since 2000, labour market participation among older individuals has increased significantly while unemployment among this group has remained low in most OECD countries. This is a major achievement. The employment rate among individuals aged 55 to 64 grew by more than 17 percentage points, from 43.9% in 2000 to 61.5% in 2018, on average in the OECD, while in emerging economies it increased much less (Figure 1.8). The increase has been substantial, larger than 28 percentage points, in the Czech Republic, Germany, Hungary, Latvia, Lithuania, the Netherlands and the Slovak Republic. During the same period, the employment rate among people aged between 25 and 54 increased by far less – from 76.8% to 81.2%. Older workers are therefore catching up, although employment falls very sharply after age 60 in many countries – more than 22 p.p. between the 55-59 and

60-64 age groups on average and more than 40 p.p. in Austria, France, the Slovak Republic and Slovenia (Figure 6.6 in Chapter 6).

On average, 55-64 year-olds at all levels of educational attainment have experienced a marked increase in employment between 2000-2017, with those with a medium level of education doing better on average than those with low or high levels of education (Figure 1.9). In terms of changes in employment rates, low-educated older workers have lagged significantly behind their high-educated peers in Belgium, Italy, Korea, Lithuania, Poland, Slovenia and Turkey, while it is the opposite in Australia, Denmark, Luxembourg and Mexico.

Figure 1.8. Growth of employment rates of older workers has been strong

Change in employment rates, 2000-2018, percentage points

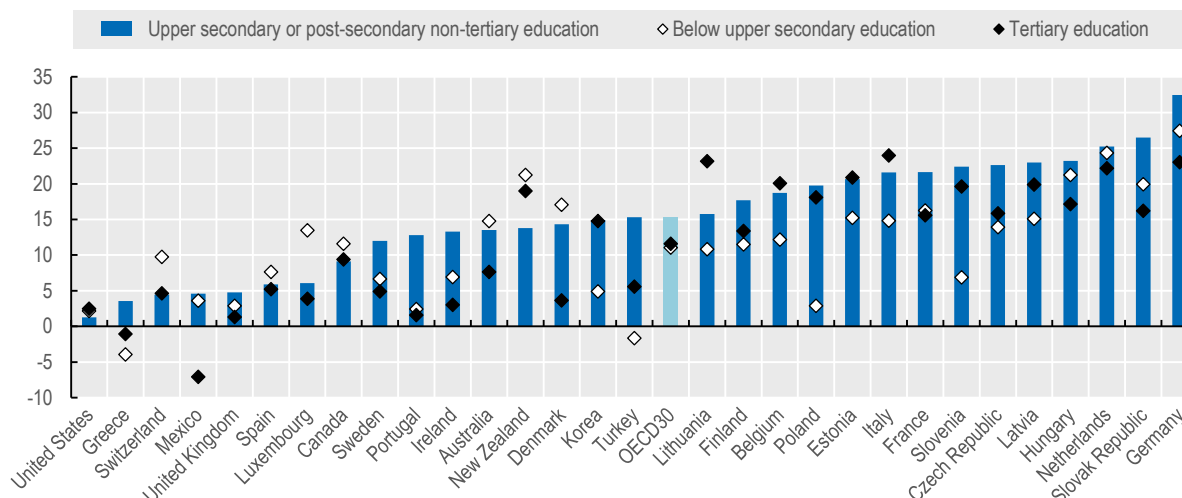


Source: OECD.Stats database, Labour Force Survey by gender and age.

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Figure 1.9. Growth of employment rates of older workers by education level

Change in employment rates, 2000-2017, percentage points



Source: OECD.Stats database, Labour Force Survey.

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Pension reforms over the last two years

Pension reforms in OECD countries have slowed since the large wave of reforms following the economic and financial crisis. Several measures legislated between September 2017 and September 2019 have even rolled back previous reforms which had aimed at improving the financial sustainability of the pension system.

Overview of recent reforms

Overall, most pension reforms over the last two years focused on loosening age requirements to receive a pension, increasing pension benefits including first-tier pensions, expanding pension coverage or encouraging private savings. The main recent reforms in OECD countries include:

- limiting the increase in the retirement age or expanding early-retirement options (Italy, the Netherlands and the Slovak Republic);
- raising the retirement age (Estonia);
- enhancing work incentives (Belgium, Canada and Denmark);
- increasing the level or expanding the coverage of first-tier pensions, the first layer of old-age social protection (Austria, France, Mexico and Slovenia);
- increasing benefits while reducing contributions for low earners (Germany);
- suspending the adjustment of pension benefits with demographic changes (Spain);
- bringing public sector pension benefits more in line with private sector benefits (Norway);
- changing the contribution rates (Hungary, Iceland and Lithuania) or expanding contribution options (New Zealand);
- expanding the coverage of mandatory pensions (Chile) or developing auto-enrolment schemes (Lithuania and Poland); and,
- changing tax rules for pensioners (Sweden).

The annex provides more details about the measures enacted country by country.

Retirement ages and work incentives

Over the last 2 years, Estonia, the Netherlands and the Slovak Republic decided to change the statutory retirement age. Estonia is the only country that raised it, from 63 and 4 months currently to 65 in 2026, and then linking it to life expectancy.

By contrast, the Slovak Republic, which had passed a law in 2012 to start linking the retirement age to life expectancy in 2017, decided to abolish the link, instead committing to raising the retirement age to 64, which will be reached through discretionary increases. In Italy, the 2019 reform introduced the so-called “quota 100” until 2021, i.e. the possibility to retire from age 62 with 38 years of contributions. Combining work and pensions is possible but subject to a labour-income ceiling, which limits work incentives of pension recipients.

In the Netherlands unions and employers struck a deal in June 2019 to reform the pension system, temporarily halting the increase of the retirement age. This means that until 2021 the retirement age will remain 66 years and 4 months. After that its increase will resume, reaching 67 years in 2024 instead of 2021. However, the increase would be slower after 2024, but this part of the deal still needs to pass parliament. More precisely, the link between the retirement age and life expectancy would be limited to an 8-month rather than a one-year increase per year of life-expectancy gains at age 65. In Sweden, the age at which

employers can terminate the contracts of older workers according to the Employment Protection Act – the so-called mandatory retirement age – will be raised from age 67 to 68 in 2020 and 69 in 2023. The government has also presented a plan to encourage later retirement, by introducing a recommended retirement age. The recommended retirement age will be linked to the average life expectancy at age 65 and serve as a benchmark for deciding when to retire in order to receive an adequate level of pension. The recommended retirement age will be calculated yearly starting from 2020. In addition, the government has also proposed raising the minimum retirement age for earnings-related pensions from 61 to 62 in 2020 and 63 in 2023, and to then link it to the recommended retirement age, indirectly linking it to life expectancy. From 2026, all other ages in the old-age social security system are also to be linked similarly to the recommended retirement age, which is projected to be close to 67.

Among G20 countries, Russia has raised the statutory retirement age. It will increase by one year every year starting in 2019, from age 60 to 65 for men and from age 55 to 60 for women. The new law also allows men with at least 42 years of contributions and women with at least 37 years of contributions to retire with a full pension 2 years before the statutory retirement age (but not earlier than age 60 for men or age 55 for women). In Brazil, a pension reform passed a final vote in the Senate in October 2019. The reform seeks to increase the pension contribution rate, reduce pension benefits for some workers and establish a minimum age of retirement of 65 for men and 62 for women.⁴

Some countries boosted incentives to work longer or extended flexible retirement options. Belgium abolished the maximum limit of accrual years. Previously no accrual occurred after 45 years of contributions. Canada increased the earnings exemption for the income-tested component of their first-tier benefit (GIS), to allow low-income seniors to work without reducing their entitlement. Denmark decided to grant a one-off lump sum of DKK 30,000 (7% of the average wage) if someone is employed for a minimum of 1560 hours during 12 months after reaching the statutory retirement age, which is currently 67 years. Estonia expanded flexible retirement options, allowing combining pensions and labour income three years before the legal retirement age.⁵ It is also possible to take out only half a pension, which makes later pension payments higher compared to taking the full pension.

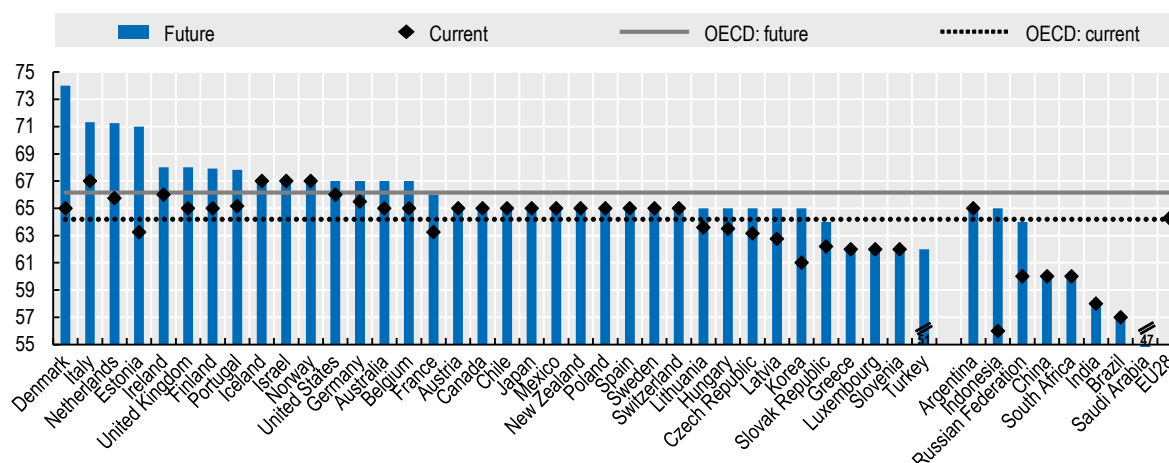
Raising the statutory retirement age is typically one key measure to enhance financial sustainability without lowering pensions despite improvements in longevity. Depending on the design of each system, it can even increase retirement income relative to past earnings, or at least limit its decrease. In defined benefit (DB) systems, for example, higher retirement ages lead to more contributions and tend to lower pension expenditure by shortening retirement periods. At the same time, prolonging working lives typically enables people to accrue additional pension entitlements, raising benefits.

Normal retirement ages – the age at which individuals are eligible for retirement benefits from all pension components without penalties, assuming a full career from age 22 – differ significantly among OECD countries. In 2018, the normal retirement age was 51 for men and 48 for women in Turkey whereas it was 67 in Iceland, Italy and Norway for both men and women (Figure 1.10 and Figure 4.4). Given current legislation, the future normal retirement age (for men) will range from 62 in Greece, Luxembourg, Slovenia and Turkey to 74 in Denmark.⁶ On average across OECD countries, it will increase from 64.2 in 2018 to 66.1 in the future – i.e. for someone having entered the labour market in 2018 and therefore retiring after 2060 (Figure 4.6 in Chapter 4). Over the same period, life expectancy at 65 is expected to grow by 4.1 years.

The normal retirement age for people entering the labour market now is set to increase by more than 5 years, in Denmark, Estonia and the Netherlands (and Turkey but from a low level) compared to individuals retiring now (Figure 1.10). Meanwhile, sixteen OECD countries have not passed legislation that will increase the normal retirement age. Based on current legislations, the future normal retirement age is below 65 years only in Greece, Luxembourg, the Slovak Republic, Slovenia and Turkey. Moreover, all non-OECD G20 countries will have retirement ages of 65 years and below. In Saudi Arabia the normal retirement age will be as low as 47 years.

Figure 1.10. **The normal retirement age is rising in many OECD countries**

Normal retirement age for men entering the labour market at age 22 with a full career



Note: The normal retirement age is calculated for a man with a full career from age 22. Future refers to the year in which someone is eligible for full retirement benefits from all mandatory components, without reduction, assuming labour market entry at age 22 in 2018; this year differs by country. The current retirement age for Italy does not reflect the “quota 100” since that was introduced in 2019. In Brazil, a pension reform passed a final vote in the Senate in October 2019 (see endnote 4).

Source: Figure 4.6.

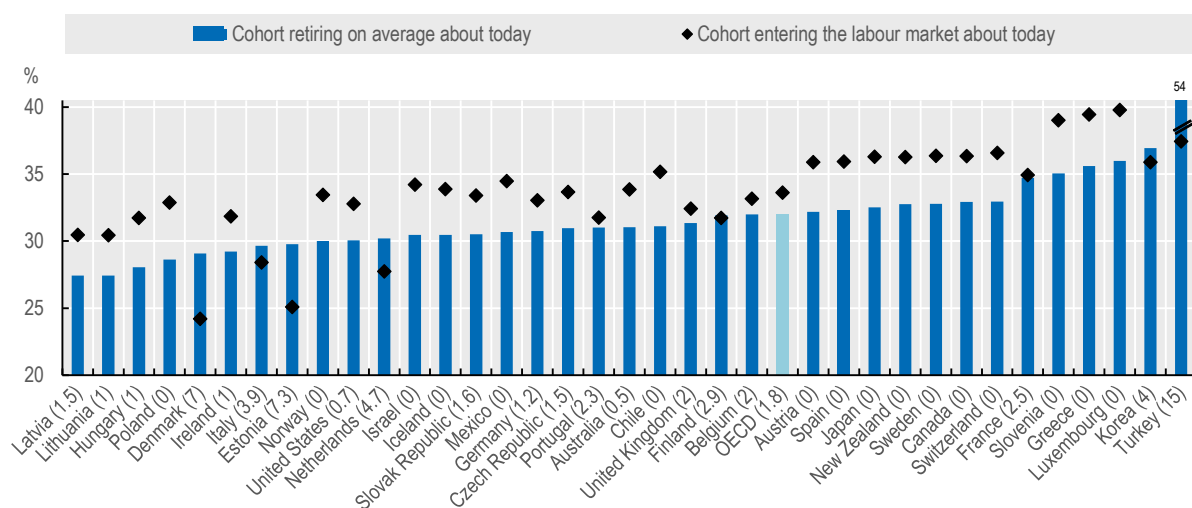
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Taking a long-run perspective, retirement ages followed a slow downward trend from the middle of the 20th century, reached a trough in the mid-1990s and have been drifting upward since then, recovering their 1950 level only recently. In the meantime (i.e. since the middle of the 20th century) period life expectancy at age 65 increased by about 6½ years on average, resulting in pressure on pension finances. For men with a full, uninterrupted career born in 1940 and those born in 1956 (who retire about now), the OECD average normal retirement age has increased by 1.3 years (OECD, 2019^[7]), implying that those who are born one year later have a normal retirement age which is 1 month higher.

In half of OECD countries, the normal retirement age has been the same for men and women, at least for people born since 1940. In the 18 countries where there was a gender difference, 6 have already eliminated it and 7 are in the process of eliminating it (Austria, the Czech Republic, Italy, Japan, Lithuania, Slovenia and the United Kingdom). Only Hungary, Israel, Poland, Switzerland and Turkey will maintain a lower retirement age for women now entering the labour market, based on current legislations, although Turkey will phase out the gender difference for those entering the labour market in 2028 (Chapter 4).⁷

Even with rising retirement ages, the time spent in retirement as a share of adult life is expected to increase in the vast majority of OECD countries. The cohort entering the labour market about today is expected to spend 33.6% of adult life in retirement compared with 32.0% for the cohort retiring on average today (Figure 1.11). The only countries in which the share of time spent in retirement is expected to decrease based on current legislation are Denmark, Estonia, Finland, Italy, Korea, the Netherlands and Turkey. In all other countries the retirement length increases by 3.1 percentage points on average, representing about 10% of the share spent in retirement.

Figure 1.11. Length of the retirement period as a share of adult lifetime



Note: The length of the retirement period is measured as expected remaining life years after the normal retirement age while the length of adult life is measured from age 20 and conditional to surviving until the retirement age. For future periods, this relies on cohort-specific medium mortality projections by the UN, starting from base year 2015. Figure in brackets refers to increase in retirement age to get a full pension.

Reading Note: For Austria, for example, the expected share of adult life spent in retirement for someone retiring today is 31.6%. This is computed as follows: at 65 (the normal retirement age of Austria) life expectancy is 20.8 years. Conditional to surviving until 65 this would constitute 31.6% of adult life since age 20. $(20.8 / (20.8 + 65 - 20)) * 100 = 31.6$.

Source: OECD calculations based on UN WPP – The 2019 Revision.

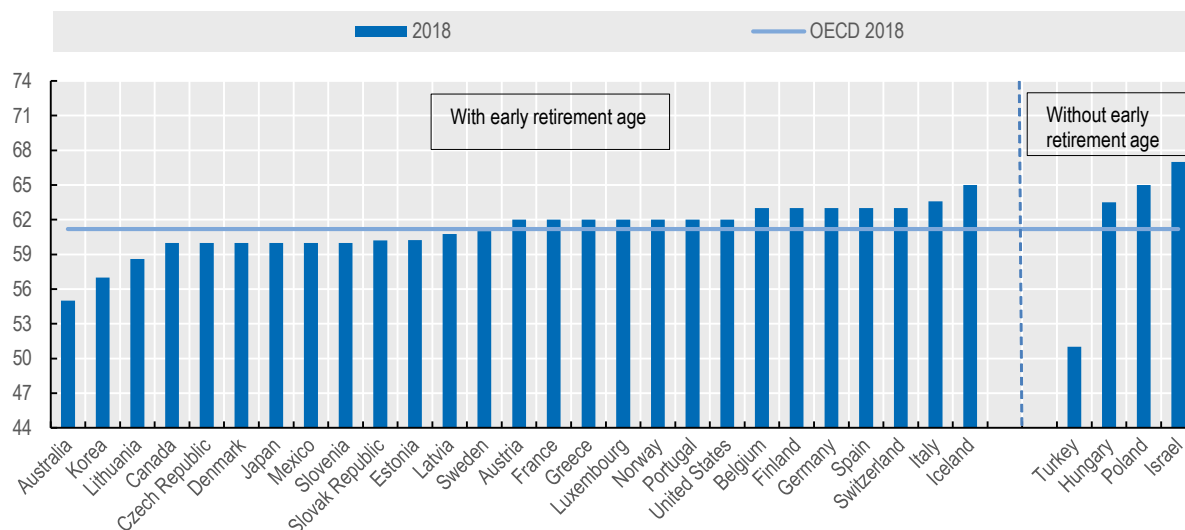
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Reforming early retirement options also significantly influences effective retirement ages. For someone entering the labour market at age 22 the early retirement age was 61.2 years in 2018 on average among the 31 OECD countries that have a specific minimum retirement age for mandatory earnings-related pensions (Figure 1.12). Twenty-seven countries had an early retirement age lower than the normal retirement age. Tightening eligibility conditions for early retirement either by increasing the minimum retirement ages or by making early retirement more penalising has been one major pension policy trend over the last decades. Early retirement ages have been rising by a little over one year between 2004 and 2018.

Over the last two years, two countries, Italy and Portugal, have eased early-retirement conditions.⁸ In 2019, Italy suspended until 2026 the automatic links with life expectancy of both career-length eligibility conditions for early retirement (42.8 and 41.8 years for men and women, respectively), and the statutory retirement ages for some workers only, including those in arduous occupations. In addition, the reform introduced the “quota 100” (see above) and the so-called “women’s option” which allows women to retire at age 58 with

Figure 1.12. **Early retirement ages are slowly rising in some countries**

Early retirement age for earnings related scheme, men



Note: Early retirement ages for earnings-related schemes describe the earliest age at which the receipt of a pension (potentially with penalties) is possible, assuming labour market entry at age 22 and an uninterrupted career. Early retirement in Chile and the Netherlands is in principle possible from any age. In Chile the pension should be higher than 80% of the PMAS (31% of the average wage) and more than 70% of the average wage of the last 10 years of work. In the Netherlands the earliest retirement age differs by sector. In Mexico the earnings-related component can be taken at any time if the annuity received is 30% higher than the minimum pension and if 1250 weeks of contributions are made, otherwise the earliest age is 60. Ireland, New Zealand and the United Kingdom only have a basic pension and do not have mandatory earnings-related pensions. In Belgium, France, Italy, Luxembourg and Portugal retirement is possible at lower ages for very long careers. In Belgium a private sector worker can retire at age 60 with 43 years of contributions, in France at 60 with 42 years of contributions, in Italy at 62 with 42 years of contributions, in Luxembourg at age 60 with 40 years of contributions and in Portugal at age 60 with 40 years of contributions. All these cases imply labour market entry ages well before 22.

Source: Table 4.4.

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35 years of contributions if they fully switch to the NDC (notional or non-financial defined contribution) benefit calculation.⁹ These measures partially and temporarily reversed the 2011 reforms that substantially tightened conditions to access pensions (see Section 4).

Portugal expanded the eligibility of penalty-free early retirement from age 60 to individuals with long career who began contributory employment at age 16 or younger and have at least 46 years of contributions while the statutory retirement age is 66 years and 4 months. France and Germany adopted similar measures previously (OECD, 2017^[11]). In addition, from 2019, the sustainability factor which specifically and heavily penalises early retirement in Portugal – beyond the normal penalty for early retirement of 0.5% per month of early retirement – will not be applied for workers aged 60 or more and having a contribution record of at least 40 years at age 60.

First-tier pensions

Mexico reformed its old-age safety net by introducing a new universal pension programme (Programa Pensión para el Bienestar de las Personas Adultas Mayores) for those aged 68 or older. The programme replaces the targeted old-age social assistance programme for those aged 65 or above who do not receive a contributory pension above MXN 1,092 (Programa Pensión para Adultos Mayores, PPAM). Those aged 65-67 who have been receiving the PPAM pension will automatically receive the new universal pension. Compared with PPAM, the benefit level was substantially increased, by almost 120% and is

no longer means-tested against pension income. The objective is to expand the eligible part of the population, reaching 8.5 million people in 2019 against 5.5 million people in 2018 with PPAM. However, the increase in the benefit level and the elimination of the means-testing comes with the increase in the eligibility age.

In 2019, Italy introduced the so-called citizen's pension on top of the existing safety-net benefits for older people. This new safety-net level comes at EUR 630 (24.2% of the average wage compared to 18.8% previously, i.e. a large increase of almost 30%) for a single person. In France, from April 2018 to January 2020, the old-age safety net (ASPA) will be increasing by about 12.5% in nominal terms. Austria decided to introduce a top-up for long contribution periods (generally referred to in OECD wording as a minimum pension scheme except that the Austrian scheme is means-tested). Single insured persons with 30 (40) years of contribution will receive at least EUR 1.080 (1.315), i.e. 29% (36%) of the gross average wage. Couples will receive a higher top-up. Slovenia introduced a new minimum pension level for workers with a full career (40 years). The benefit was EUR 516 per month (31.5% of the average wage) in 2018 compared to EUR 216 per month (13.2% of the average wage) for workers with a 15-year history.

Pension benefits from earnings-related schemes

A few countries decided to adjust benefit levels in earnings-related schemes. In Spain, measures decided in the 2013 reform to ensure the financial sustainability of the system were suspended. The Revalorisation Pensions Index (IRP), which indexed pensions in payments since 2014 based on the financial balance of pensions and of the Social Security system, was suspended. Pensions in payment were increased in line with the CPI at 1.6% in both 2018 and 2019 while they would have only increased by 0.25% had the IRP formula been applied. The sustainability factor, which was supposed to start being applied in January 2019 to adjust initial pensions based on changes in life expectancy, was suspended until 2023. In addition, the replacement rate for survivor pensions was raised from 52% to 60% of the deceased's pension for beneficiaries aged 65 or older. A commission will determine how to proceed with both the sustainability factor beyond 2023 and the new indexation mechanism.

Germany took measures in favour of low earners. It lowered the effective contribution rates for low earners, by increasing the ceiling of monthly earnings, from 21 to 32% of gross average wages (EUR 850 to EUR 1300), below which reduced contributions apply. At the same time, the reduced contributions generate full pension entitlements compared with partial entitlements before. In France, social partners agreed to rules for the indexation of the value and cost of points until 2033 within the mandatory occupational scheme. The point cost used to determine the number of points acquired by contributions will be indexed to wage growth, while the point value which directly determines the benefit levels will be indexed to price inflation until 2022 and to wage growth minus 1.16 percentage points between 2023 and 2033.

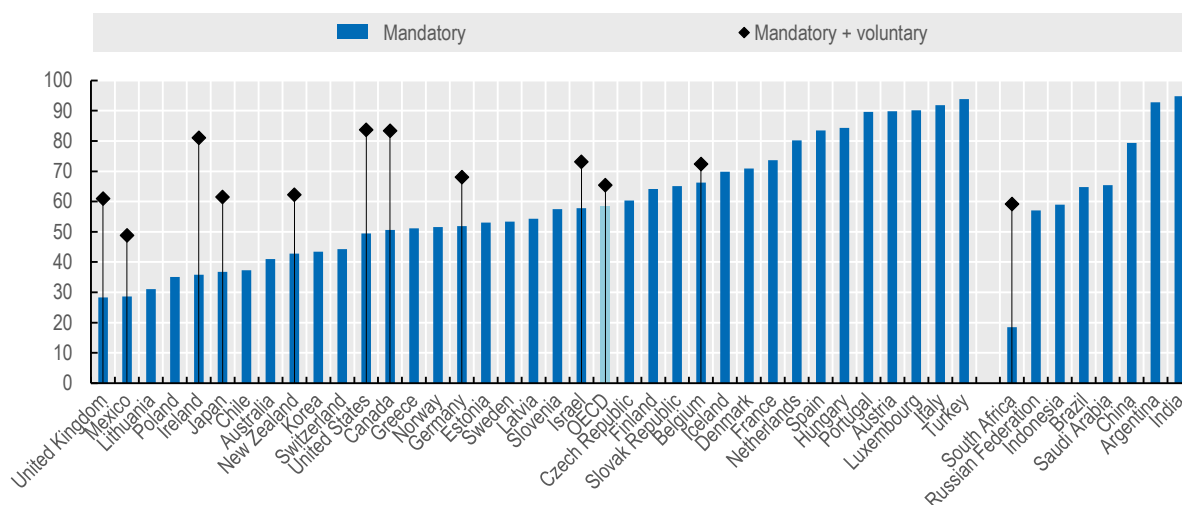
Norway now better aligns pensions for public-sector workers with the rules applying to the private sector. Norway applied a new rule to the Contractual Early Retirement Schemes (AFP) for public-sector employees born from 1963. The AFP in the public sector, which had been a subsidised early-retirement scheme for those aged between 62 and 66, was changed into a lifelong supplement to the old age pension, in line with the private sector.¹⁰ In addition the public-sector pensions will be based on life-time earnings instead of last earnings and of achieving a full pension after 30 years of contributions. Over the last decades, OECD countries have been closing down special regimes, and, for example,

schemes covering public-sector and private-sector workers are fully integrated or will progressively be in Israel, Japan, New Zealand and Southern European countries (OECD, 2016^[8]).

Future theoretical replacement rates are computed by the OECD in order to distinguish key output of pension systems across countries. One main indicator is the net replacement rate for the best-case scenario assuming a full career starting at age 22 in 2018 until reaching the country-specific normal retirement age. The normal pensionable age is defined as the age at which individuals can first withdraw their full pension benefits, i.e. without actuarial reductions or penalties. This theoretical replacement rate is equal to the pension benefit at the retirement age as a percentage of the last earnings.

Looking ahead, pension replacement rates display a large dispersion across countries. Figure 1.13 shows theoretical net pension replacement rates across OECD and G20 countries for an average-wage worker. Net replacement rates from mandatory schemes are on average 59% and range from close to 30% in Lithuania, Mexico and the United Kingdom to 90% or more in Austria, Italy, Luxembourg, Portugal and Turkey at the normal retirement age. Based on standard OECD assumptions used for pension projections (Chapter 5), future net replacement rates will be low even for the best case - under 40% - also in Chile, Ireland, Japan and Poland. Among countries with significant coverage from voluntary private pensions – Belgium, Canada, Germany, Ireland, Japan, New Zealand, the United Kingdom and the United States – contributing to a voluntary pension for the whole career boosts future replacement rates for average earners by 26 percentage points on average based on the modelling assumptions used in the OECD projections (see Chapter 5 for more detail). Contributing to voluntary pensions from age 45 would increase them by about 10 percentage points on average.

Figure 1.13. **Future net replacement rates for full-career average-wage workers**



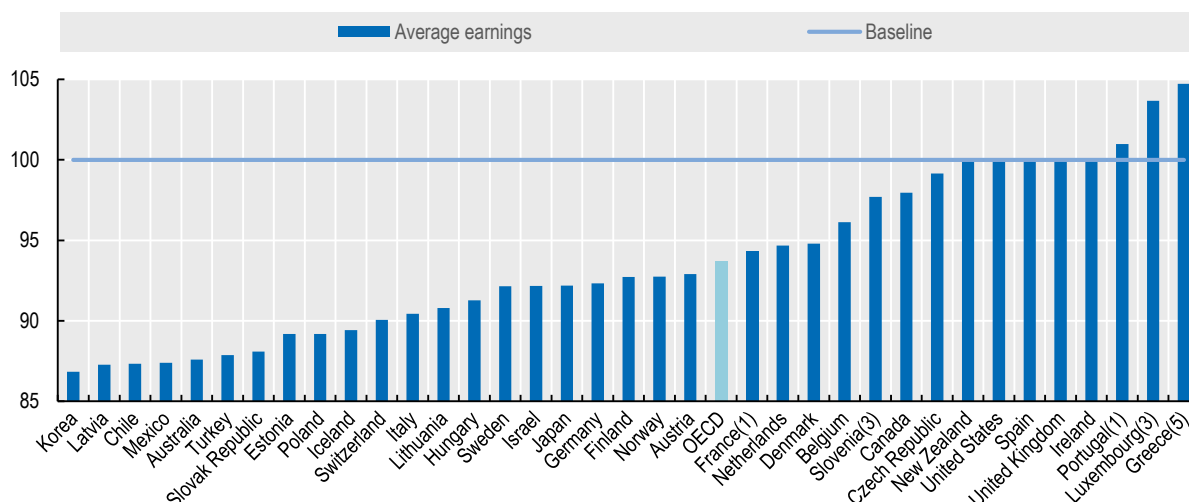
Note: OECD calculations based on the pension model. Pension entitlements are based on current legislation in OECD countries. The values of all pension system parameters reflect the situation in 2018 and onwards. The calculations show the pension benefits of a worker who enters the system that year at age 22 and retires after a full career. The baseline results are shown for single individuals. See Chapter 5 for details.

Source: Table 5.6.

StatLink <https://doi.org/10.1787/888934040718>

Interrupted careers usually lead to lower pensions, but entitlements are not equally sensitive to career breaks across the OECD. Average-wage workers who experience a 5-year unemployment spell during their career face a pension reduction of 6.3% in mandatory schemes compared to the full-career scenario discussed above on average in the OECD (Figure 1.14). A one-to-one relation between earnings and entitlements would imply the impact to be around 13% (Chapter 5). This means that instruments such as pension credits for periods of unemployment cushion slightly more than half of the impact of the employment shock on pension benefits on average. The loss exceeds 10% in Australia, Chile, Estonia, Iceland, Latvia, Korea, Mexico, Poland, the Slovak Republic and Turkey. Conversely, in Ireland, New Zealand and the United Kingdom, there is no impact of such career breaks on pensions from mandatory schemes, which only include a basic pension in these countries.¹¹ In Spain and the United States, a 5-year career break does not influence pension benefits either, as full benefits in the earnings-related scheme are reached after 38.5 and 35 years of contributions, respectively.

Figure 1.14. Career breaks significantly lower pension entitlements in most countries
Gross pension entitlements from mandatory pensions of an average earner with 5-year unemployment break relative to a full-career worker, %



Note: Figure in brackets refers to increase in retirement age to get a full pension given the career break. See chapter 5 for details.
Source: OECD pension models.

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Contributions

Contribution rates have been raised in Iceland and Switzerland over the past two years. Iceland increased the contribution rate paid by employers in mandatory occupational pensions from 8% to 11.5%. Switzerland increased the contribution rates of public pensions (AVS) by 0.3 points. In addition, government subsidies to its financing were increased from 19.6% to 20.2% of total revenues.

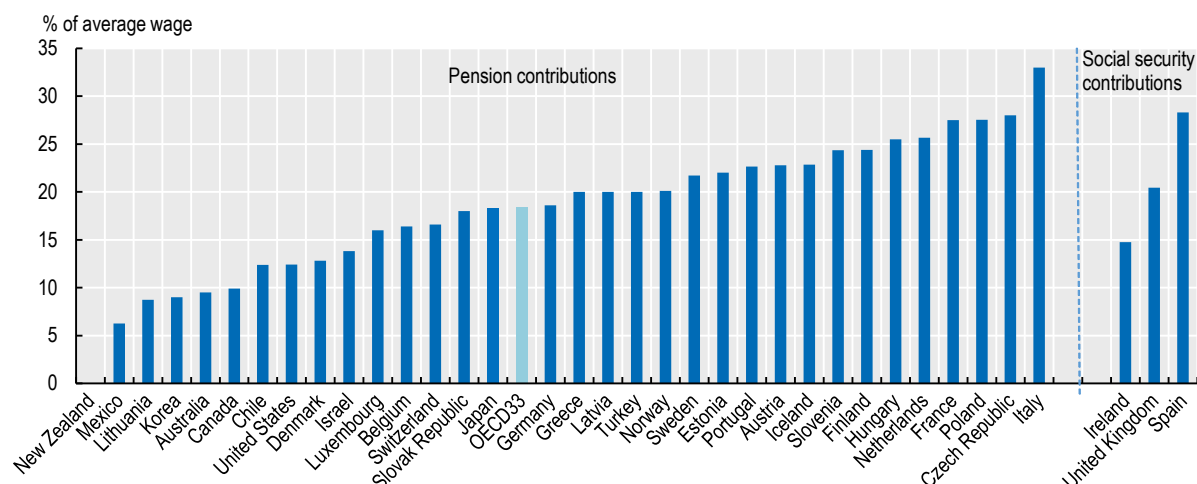
On the other hand, Hungary gradually reduced the pension contribution rate paid by employers from 15.75% in January 2018 to 12.29% in July 2019. Lithuania has shifted social security contributions from the employer to the employee. The employer's contribution rate was reduced from 31% percent of monthly payroll to 1.5% percent, and the employee contribution rate rose from 9% of monthly earnings to 19.5%, while the remaining shortfall

will be financed by taxes. At the same time the earnings ceiling is slowly lowered from 10 times the average wage in 2019, to 7 times in 2020 and to 5 times from 2021. Germany set new minimum and maximum pension contribution rates. The total contribution rates cannot rise above 20% or fall below 18.6% through 2025, while before the maximum contribution rate was 20% until 2020 and 22% from 2020 to 2030.

Mandatory pension contribution rates differ widely among OECD countries. New Zealand finances its basic pension through taxes and therefore the mandatory pension contribution rate is zero. At the average wage, in 2018, total effective pension contribution rates equal 18.1% on average in the OECD (Figure 1.15). Contribution rates are the lowest, below 10%, in Australia, Canada, Korea, Lithuania and Mexico while the Czech Republic, France, Italy and Poland have contribution rates of 27% or higher. Spain also has high contribution rates, but these contributions extend beyond pensions and cover all social security schemes except unemployment insurance.

Figure 1.15. Pension contribution rates differ widely among countries

Total effective mandatory and quasi-mandatory pension contribution rates for dependent workers, at the average wage, 2018



Note: In Austria, the Czech Republic, Denmark, Finland, Germany, Iceland, Italy, Luxembourg, Poland, Slovenia and the United States contribution rate also finances disability or invalidity benefits.

Source: Tables 8.1 and 8.2 in Chapter 8.

StatLink <https://doi.org/10.1787/888934040756>

As for voluntary pension plans, New Zealand expanded the choice of contribution rates for KiwiSaver. From April 2019, people may choose a contribution rate of 6% or 10%, adding to the existing options of 3%, 4% and 8%. Similarly, Norway introduced a new scheme with stronger incentives for retirement savings by allowing individuals to pay more contributions while receiving an income tax deduction.

In Estonia a plan has been presented to parliament in August 2019 to replace mandatory private pensions by auto-enrolment schemes. If a participant opts out of the private pension plan, the employer's contributions will go to the PAYGO points scheme, generating a higher total value of accumulated points, while the employee will keep his or her contributions. This means that in that case net wages will increase while both total mandatory contribution rates and total pension entitlements will be lower. On opting out

someone can ask to be paid all the previously accumulated assets of the private pension plan as a lump sum.¹²

Coverage

Over the last two years, only Chile expanded the coverage of mandatory earnings-related pension schemes. Between 2012 and 2018, Chile has tried to include the self-employed through auto-enrolment into the scheme that is mandatory for employees, but the majority of them opted out. Hence, since 2019 pension contributions have been made compulsory for the self-employed who issue invoices, except for older workers and low-income earners (Chapter 2).

The coverage of voluntary schemes was expanded in Belgium, Germany, Lithuania, Luxembourg, New Zealand, Norway, Poland and Turkey. In Belgium and Luxembourg, the extension applies to the self-employed. In Belgium, a new private pension was introduced for the self-employed in 2018 on top of the two that have existed based on a relatively low ceiling on pensionable earnings. Participants will receive a 30% tax credit on their contributions, with no explicit ceiling. A similar option is provided for employees who do not have access to an occupational pension provided by their employer. In Luxembourg, access to voluntary pension schemes previously only available to dependent employees has been extended to the self-employed with similar conditions to employees.

From 2018, Germany allowed employers to offer defined contribution plans without guaranteed minimum retirement benefit if employees agree as part of the collective bargaining process. New Zealand allowed people aged over 65 to join the voluntary saving scheme (KiwiSaver) from 2019, while Turkey extended automatic enrolment of private pensions (introduced in 2017) to smaller employers (with 5-99 employees). Poland introduced a new defined contribution occupational pension plan with auto-enrolment, which will fill part of the gap that emerged after the multi-pillar pension system was dismantled in 2014. Employers that do not already provide a voluntary scheme to their employees are required to offer such a plan. Lithuania transformed the previously voluntary funded pension scheme, introduced in 2004, into an auto-enrolment scheme for employees younger than 40 years.¹³

Finally, in July 2019 the European Union established a voluntary retirement savings programme (the Pan-European Personal Pension Product) in order to boost retirement savings and strengthen capital markets across the EU. The programme allows EU residents to participate in individual accounts that are governed by the same basic rules and are portable across all member countries.

Others

Two countries changed the tax rules for pensioners. In 2019, Sweden extended the earned-income tax-credit threshold to pensions from SEK 17000 to SEK 98000 (between about 45% and 260% of the gross average wage). In 2018, France raised an income tax (CSG) rate applying to pensioners from 6.6% to 8.3% - the normal rate applying to wages increased from 7.5% to 9.2% - while deciding in 2019 to exempt about 30% of retirees with the lowest income.

In September 2018 the Swedish Pension Agency tightened the regulations for pension funds administering the mandatory earnings-related funded part of the system (PPM funds). The new regulations require, among other things, at least SEK 500 million of funds outside the PPM and a minimum of 3 years of relevant experience. The funds that do not

meet the new requirements were to be removed from the PPM platform. As a result, in January 2019, 553 funds remained available while 269 were deregistered. Furthermore, the investment rules for the four main pension buffer funds were eased.¹⁴ In private pensions in Turkey, in order to spur competition and raise performance among asset management companies, a 40% cap has been introduced on the portion of a pension company's portfolio that an asset management company can manage.

To reduce administrative costs for pension providers, the Netherlands introduced new pension rules in occupational schemes that allow pension providers to automatically transfer total entitlements of certain participants, who have limited pension entitlements, to the new pension provider in case of a change of employer and pension provider. In addition, a large overhaul of the occupational pension system is planned to be introduced by 2022. A deal between unions, employer organisations and the government has been struck in June 2019 aiming to: introduce more defined contribution (DC) elements in the occupational pension system (i.e. pension entitlements will be more sensitive to pension funds' returns), limit the increase in the retirement age while maintaining the link to life expectancy; and, introduce special rules for people in arduous jobs.

The French government created the High Commission for Pension Reform in September 2017. Its mission is to prepare the reform introducing a universal pension points system (Boulhol, 2019^[9]). The High Commission published its recommendations for the implementation of the new pension system in July 2019. The proposed system would constitute a major overhaul of the French pension landscape, which is highly fragmented. It would be based on common rules for contributions and the calculation of pension entitlements, would drastically simplify the current system while reducing the sensitivity of financial balances to trends in labour productivity. Concertation with the main stakeholders is continuing to prepare the legislative phase, with the objective of having a law voted in 2020.

Mounting pressure to backtrack and not deliver on previous reforms

Among the most salient pension policies over the last two years are reforms backtracking and not implementing previously legislated policies. These include measures decided by Italy, the Netherlands, the Slovak Republic and Spain to alter automatic adjustments to life expectancy or other demographic changes. More precisely, as discussed above, Italy introduced the “quota 100” measure, facilitated early retirement and suspended automatic links. The Slovak Republic has stopped the link between the retirement age and life expectancy in 2019 and put a cap at 64 years on the former instead, while Spain suspended the automatic adjustments affecting the initial pension at retirement and indexation of pensions in payment. The Netherlands deferred the increase in the retirement age in the medium term and plans to opt for a slower link in the long term. The new link would avoid that all life expectancy gains translate into increases in the retirement age. In Denmark too, discussions to revise the link between the retirement age and life expectancy are ongoing. However, neither Denmark nor the Netherlands plan to completely abolish the link.

Over the last four years, Canada, the Czech Republic and Poland also decided to reverse previously adopted reforms (OECD, 2017^[10]). Canada chose not to implement the planned increase to age 67 for the basic pension and the old-age safety net, while the Czech Republic decided to no longer increase the pension age beyond 65. Poland reversed the planned increase to 67, with retirement ages dropping back to 65 for men and 60 for women.

During and right after the economic crisis, improving public finances was at the centre stage. For example, between 2011 and 2014, most pension measures in European countries consisted in the containment of pension spending and the prolonging of working life through raising the retirement age or tightening early-retirement rules. When the economic situation improves, public finance pressure eases and there might be no or less need to maintain measures dictated by short-term difficulties. Of course, the situation is not always that simple as in some cases short-term difficulties are an impetus for needed long-term reforms. In some countries, tensions generated by the global financial crisis actually exacerbated and highlighted structural weaknesses.

Not implementing legislated measures might raise serious concerns when the initial reforms are meant to address issues related to long-term developments. Ageing trends are a prime example of a long-term phenomenon, which are not only here to stay but as shown in Section 2 have started to accelerate in many countries. To face this challenge, many measures were taken to improve financial sustainability. That is, backtracking might threaten macroeconomic stability. In these instances, not implementing the corresponding reforms generates a need for alternative measures, as there are indeed different ways to ensure financial sustainability. Increasing retirement ages is always unpopular, for reasons that everyone understands well. Some recent backlashes have arisen because applying the agreed rules is raising discontent. However, to simplify the matter, in PAYGO pensions, dealing with increasing longevity requires working longer, lowering pension benefits, raising financial resources or a mix of these; each alternative typically receives limited public support.

The backlash against passed reforms also potentially reflects reform fatigue or changing political landscapes. The sometimes strong impact of measures tightening social programmes and the dramatic rise of anti-establishment parties have further contributed to the growing opposition against fiscal discipline and the related pension reforms, which in turn alters the political equilibrium and could destabilise the compromise that supported pension reforms in earlier stages. Pension policy is always at risk of being used as a tool for short-term political gain, leading to a demand for an increase of pension benefits or a reversal of previous reforms (Natali, 2018^[11]).

However, there should be a long-term strategy to secure retirement income. Governments have to take steps constantly and steadily to ensure that pension policies deliver secured retirement incomes in financially sustainable and economically efficient ways irrespective of the economic and political conditions.

In particular, opposition against automatic adjustment mechanisms has been on the rise. Demographic, economic and financial trends affect the financial sustainability of standard PAYGO pensions and the solvency of funded DB schemes. They require recurrent discretionary adjustments, which hurt confidence in the pension system and are politically costly. While pension systems cannot be put on autopilot, linking some parameters to key variables can drastically reduce the need for repeated measures. Moreover, automatic rules help resist the temptation to make decisions that might be popular but ultimately unsustainable, such as lowering the retirement age from not a particularly high level while life expectancy increases.

As an example, the link to life expectancy provides a predictable rule for adjusting future benefits at a given age or for raising the retirement age as longevity increases. Also, while life expectancy trends are predictable they are subject to some uncertainty, and such rules are attractive because their effects are conditional on actual demographic changes.

One main criticism usually made against automatic adjustment mechanisms is that they would be anti-democratic: they would prevent future governments from adopting different measures according to their popular mandate than the one implied by the automatic rules that are in place. This is a limited interpretation of the objective of automatic adjustment mechanisms. If a government has the political capital to do so, it can always change the rules in order for them to better fit its political agenda. In addition, subjecting pension decisions to frequent policy changes could also result in very low benefits in times of budgetary pressure, making the adjustment path more erratic and potentially amplifying the magnitude of economic cycles.

Long-term trends in pension reforms

Over the last 50 years, pension rules have changed in all OECD countries. Countries have moved to improve financial sustainability given the challenges triggered by population ageing. Some reforms were systemic, changing the whole nature of a system, while others were parametric. Pension systems have become more individualised with pension benefits becoming more tightly linked to earnings. The reforms may cause marked differences in pension eligibility and benefit levels across generations.

From defined benefits to defined contributions

Pension systems in the past were dominated by PAYGO DB schemes where pension benefits typically depend on the number of years of contributions, rates at which pension entitlements accrue (accrual rates) and a measure of individual earnings (reference wage). Especially in the second half of the 20th century, OECD countries established or extended PAYGO DB schemes. At the time, population growth was fast and the economy developed quickly, both of which increase internal rates of return of PAYGO systems. One attractive feature of PAYGO pension systems is that they allow for providing pension benefits to older people who did not contribute.

In a number of OECD countries, including Canada, Denmark, the Netherlands, Switzerland, the United Kingdom and the United States, funded occupational pensions built up over time in addition to PAYGO schemes. With the exception of Denmark, these schemes were also DB, or as in Switzerland had elements of DB schemes incorporated in DC plans.

Over the last decades, however, there had been a paradigm shift from DB to DC schemes, as a way of dealing with the financial sustainability issues of PAYGO pensions, especially given population ageing. Chile in 1981 and Mexico in 1997 replaced their public PAYGO DB schemes by private funded mandatory DC schemes. More recently, as a complement to their public pension schemes, Estonia, Hungary, Poland, the Slovak Republic and Sweden introduced mandatory private funded DC schemes or raised the contribution rates that fund them. In the Netherlands, consecutive adjustments of pension rules have rendered the funded DB scheme more of a hybrid DB-DC system; as discussed in the preceding section there are far-reaching plans to further individualise accounts.¹⁵ In other countries, like the United States, the share of DB plans among occupational pensions has slowly declined in favour of more DC plans (OECD, 2016^[8]).

However, more recently, some countries, like Poland and Hungary, abolished their mandatory funded DC pension schemes, while the Slovak Republic has switched between mandatory funded DC pension, auto-enrolment and voluntary pensions (currently it can be decided before age 35 whether one-third of mandatory contributions go to the points or funded DC scheme). Starting from a PAYGO system, building up a funded component

involves high transition costs (Boulhol and Lüske, 2019^[12]). Pension funding needs to be sufficiently high not only to pay current pensions within the PAYGO scheme, but also to accumulate new entitlements through savings in the funded component. Especially in times of public finance pressure, such transition costs can become problematic as neither current workers nor current retirees can carry such a high financial burden without major sacrifice while the governments' capacity to finance the transition through higher debt levels may be limited. While diversifying the sources of financing pensions remains a key argument supporting multi-pillar systems, the current context of low long-term yields might call for revisiting the trade-offs between PAYGO and funded components (Boulhol and Lüske, 2019^[12]).

Akin to the switch to funded DC plans, in the 1990s, Italy, Latvia, Poland and Sweden radically reformed their public PAYGO pension system, shifting from defined benefit (DB) to notional (non-financial) defined contribution (NDC). Norway did so in 2011. The move to NDC has been part of the trend towards more individualised pension benefits. The core of the NDC design mimics funded DC schemes with strong links between individual lifetime contributions and benefits. Moreover, incentives to work longer with increasing longevity are embedded in the schemes: for given accumulated contributions, rising life expectancy reduces pensions at any given age.

Tightening the link between earnings and benefits

Some countries have also tightened the link between earnings and benefits within their PAYGO DB schemes. For example, Estonia, Lithuania and the Slovak Republic switched from traditional DB to points systems, in which benefits are proportional to lifetime contributions. As discussed above, France plans to introduce a universal points system, while in Belgium the government made plans to investigate the implementation of separate points schemes for private-sector workers, public sector-workers and the self-employed.

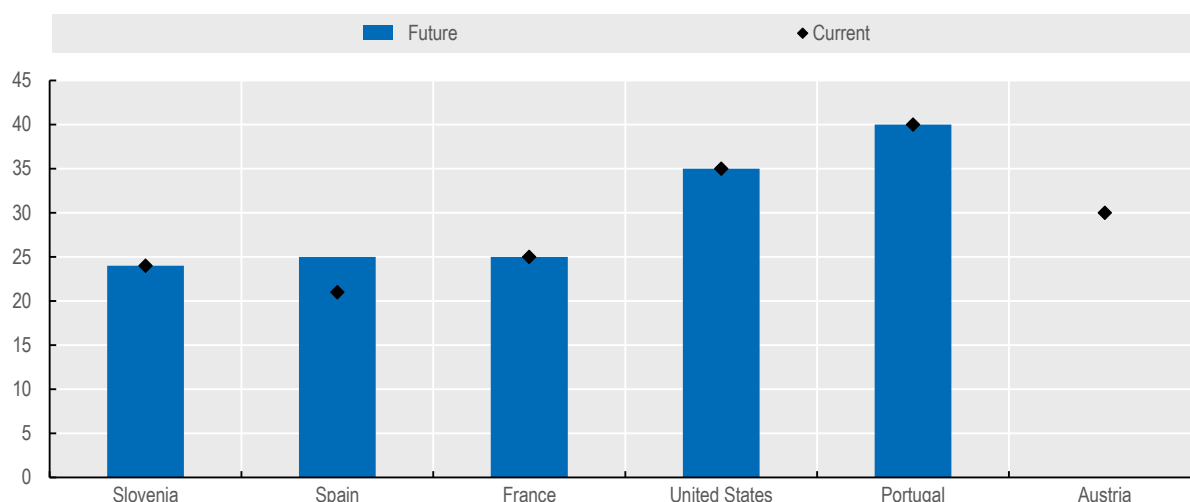
One additional factor that greatly influences the link between lifetime earnings and pensions is the measure of individual earnings used in the benefit formula. The exact way this reference wage depends on the past earnings of individuals varies among countries; while a generic DB scheme uses lifetime average earnings, with past earnings uprated in line with the average-wage growth, other measures could be used such as a the last or best years of earnings. Some countries including Austria, Finland, France, Hungary, Portugal and Spain lengthened the reference earnings periods. Currently most countries use lifetime earnings for calculating pension benefit, with only Austria, France, Slovenia, Spain and the United States, and Portugal to a lesser extent, not taking into account the whole career – although Austria will do so progressively from the cohort born in 1955 (Figure 1.16).¹⁶

Automatic adjustment mechanisms

Automatic adjustment mechanisms, in which pension system parameters are automatically adjusted to changes in various indicators such as life expectancy, other demographic ratios or funding balances, have become part of a standard toolset in pension policies. Automatic adjustment mechanisms are present in half of OECD countries (Table 1.1). In some cases, they do not cover all the components of a pension system. Hence, their overall significance in a given country depends on the structure of the pension system (last column in the table).

Figure 1.16. **Only a few countries do not currently take into account the whole career for the reference wage of private-sector workers**

Number of years used to compute the reference wage



Note: In Austria, the contribution base will steadily increase and reach 40 years for the 1954 birth cohorts while for generations born from 1955 it will be the whole lifetime.

Source: Pensions at a Glance country profiles.

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Funded defined contribution schemes

Funded defined contribution (FDC) schemes automatically transfer to pensioners the risk of the impact of changes in longevity across generations as accumulated pension investments have to cover longer average retirement periods at a given retirement age. These schemes thus include built-in automatic adjustments of pension levels to life expectancy. When pension entitlements are annuitised longer lives mean more expensive annuities, and therefore lower monthly benefits even if individual longevity risks are still shared among all recipients. In the case of lump-sum payments all individual longevity risk is born by the individual. With longer lives, these lump sums have to finance consumption over a period which length is longer on average and uncertain individually.

Nine OECD countries have mandatory FDC schemes (Table 1.1, column 1). While financial sustainability is typically ensured in funded DC schemes, pension adequacy might be at risk without further automatic adjustments. The level of benefits is likely to fall gradually if people are allowed to retire at the same age unless workers choose by themselves to postpone retirement. In addition, many people tend to retire as early as possible and might make mistakes in assessing their future financial needs, especially in times when lives become longer. Hence, even in FDC schemes, either the minimum retirement age or pension contributions should be linked to life expectancy to help achieve adequate pensions over time.

Notional defined contribution schemes

While NDC schemes are PAYGO, the computation of pensions are very similar to the pricing of annuities in funded DC plans, which generates an automatic link between benefits and life expectancy. NDC schemes typically do not allow withdrawing pension entitlements in the form of lump sums. Italy, Latvia, Norway, Poland and Sweden are the five OECD countries with NDC schemes, thus incorporating this automatic link (Table 1.1,

Table 1.1. **Automatic adjustments in mandatory schemes, OECD countries**

	Funded defined contribution scheme (1)	Notional defined contribution scheme (2)	Benefits linked to life expectancy in DB or points (3)	Benefits linked to financial balance, demographic ratios or wage bill (4)	Retirement age linked to life expectancy (5)	Share of replacement rate affected by automatic link ¹ (6)
Australia	●					99.8%
Austria						
Belgium						
Canada						
Chile	●					100%
Czech Republic						
Denmark	●				●	100%
Estonia	●			●	●	100%
Finland			●		●	100%
France						
Germany				●		100%
Greece						
Hungary						
Iceland						
Ireland						
Israel	●					71.4%
Italy		●			● ²	100%
Japan			●	●		100%
Korea						
Latvia	●	●				100%
Lithuania				●		100%
Luxembourg				●		83.3%
Mexico	●					100%
Netherlands				●	●	100%
New Zealand						
Norway	●	●				100%
Poland		●				100%
Portugal			3		●	100%
Slovak Republic	4					
Slovenia						
Spain			● ⁵	●		100%
Sweden	●	●		●		100%
Switzerland						
Turkey						
United Kingdom						
United States						
Number of countries	9	5	3	8	6	Average: 51.5%

Note: 1. For average-wage earner under the best-case scenario. 2. Measure suspended until 2026 for some occupations. 3. Portugal has a sustainability factor but it only applies to early retirement. 4. The Slovak Republic has switched between mandatory funded DC pension, auto-enrolment and voluntary pensions (currently it can be decided before age 35 whether one-third of mandatory contributions go to the points or funded DC scheme). 5. Measure suspended until 2023 or until a new decision is made.
Source: Pensions at a Glance country profiles.

column 2).¹⁷ However, these countries differ in terms of the chosen notional interest rate used to uprate entitlements. If the notional interest rate does not account for long-term trends in the number of contributors, as in Sweden, an additional balancing mechanism might be needed to ensure financial sustainability (see below).

Linking benefits to life expectancy in defined benefit schemes

Relatively recently, Finland, Japan and Spain have introduced sustainability factors in their DB pensions (Table 1.1, column 3) to ensure financial sustainability and in some cases to prevent a large drop in pension levels. These sustainability factors are automatic adjustment mechanisms, linking pension benefits to life expectancy (OECD, 2017^[10]). In Finland and Spain this only affects initial benefits while in Japan it also affects pensions in payment. Portugal also has a sustainability factor, but it only applies to early retirement (OECD, 2019^[13]).

In Finland, since 2010 the initial level (at retirement) of PAYGO earnings-related pensions has been adjusted to take into account changes in life expectancy at age 62. The life expectancy coefficient lowers initial pensions by the ratio of average life expectancy at 62 in 2005-2009 to average life expectancy at 62 in the 5 years prior to retirement. The life expectancy coefficient was 0.957 in 2019, and is projected to be equal to 0.867 in 2064 (the year in which someone entering the labour market now will be allowed to retire).

In Spain the sustainability factor was supposed to adjust new pension benefits by a factor based on life expectancy at the age of retirement, measured two years prior to retirement, divided life expectancy at the same age in 2012. This measure was planned to go into force in 2019. However, it has been suspended until 2023. A commission will determine how to proceed with the sustainability factor beyond 2023.

In Japan, the adjustment mechanism of pension benefits, introduced in 2004, is based on changes in both the number of contributors and life expectancy, called macroeconomic indexation. The sustainability factor is the sum of two components: a life-expectancy index (currently -0.3%) and the average change in the number of contributors over the past 3 years (0.1% in 2019). However, this adjustment mechanism is not applied at times of negative inflation. Hence, a catch-up system was introduced in 2018, which carries over downward benefit revisions in years of negative inflation to later years. In 2019, as both price and wage increased, the macroeconomic indexation was applied, and in addition the unrealised benefit reduction in the previous year was reflected through the carryover mechanism.¹⁸

Linking benefits to the financial balance, demographic ratios or the wage bill

In Estonia, Germany, Japan (as explained above), Lithuania, Luxembourg, the Netherlands, Spain and Sweden, benefits are linked to the financial balance of the pension system, to demographic ratios or the wage bill. All pensioners, and not just new pensioners, are affected.

In Germany the sustainability factor measures the change in the number of contributors relative to the number of pensioners.¹⁹ It has been in place since 2005 and is used to index the pension point value (Table 1.1, column 4). The sustainability factor in 2018 was positive, increasing pensions by 0.3%. From 2020 it is projected to be negative with an average reduction of pensions by 0.5% per year until 2032.²⁰ However, benefits cannot be reduced in nominal terms as a result of the adjustments. In that case, the downward adjustment from the sustainability factor is only applied if other factors in the pension point value (such as wage growth) are positive. Unapplied negative adjustments are, however, carried over to later years as it happened in the past. In Lithuania both the value of the pension point and of the basic pension are linked to changes in the wage bill. If the wage bill falls in nominal terms (which will cause a drop in contributions) the indexation of

pension benefits and entitlements does not apply. In Estonia, the value of the pension point is also linked to contribution revenues.

In Sweden, there is also an automatic adjustment of pensions to the balance ratio of the NDC scheme as the embedded automatic link to life expectancy is not enough in itself (Boulhol, 2019^[9]). The Swedish Pensions Agency calculates a balance ratio dividing notional assets (the assets of the buffer fund plus contribution revenues) by liabilities (accrued notional pension entitlements and pensions in payment). If a deficit is identified a brake is activated, reducing the notional interest rate below the wage growth rate in order to help restore solvency by both limiting accumulation in notional accounts and reducing indexation of pensions in payments.²¹ When rebalancing is achieved, any surplus can be used to boost the interest and indexation rates during a catch-up phase. Sweden experienced some difficulties in applying the brake rule during the Great Recession, and revised it to avoid sharp adjustments. Overall, while the Swedish mechanism was put to the test, it proved resilient to such a huge economic shock, only requiring a small adjustment, with its broad principles remaining largely unchallenged.

In the Netherlands a similar mechanism is in place for funded defined-benefit schemes. The uprating of pension entitlements and indexation of pensions in payment are directly linked to the funding ratio. In case of persistent underfunding even pension benefit levels are directly linked to the funding ratio. A pension fund can decide to increase pension benefits and past pension entitlements in nominal terms only if it has a funding ratio of more than 110%.²² Funding ratios below 110% lead to a freeze in pension benefits and pension entitlements. Funding ratios below 104.2% for more than 5 years lead to cuts in entitlements and benefits. The funding ratio in that case should be brought back to 104.2%, with associated cuts being spread up to 10 years. In Luxembourg pensions in payment are typically indexed to both prices and wages. However, indexation is limited to prices if the share of annual expenditure divided by the contribution base exceeds 24%.²³ In Spain, the Revalorisation Pensions Index (IRP), which indexed pensions in payments since 2014, based on total contributions, the number of pensioners the financial balance of the Social Security system, was suspended. Pensions in payment were increased in line with CPI inflation at 1.6% in both 2018 and 2019 while they would have only increased by 0.25% had the IRP formula been applied.

Linking the retirement age to life expectancy

Rather than increasing retirement ages according to a predetermined schedule, as is done in some countries, some other countries have gone further and linked retirement ages to life expectancy. This is the case in Denmark, Estonia, Finland, Italy, the Netherlands and Portugal (Table 1.1, column 5). Greece also linked its statutory retirement age to life expectancy. However, it will still be possible to claim a full pension (i.e. without penalty) at any age with 40 years of contribution, implying the normal retirement age projected by the OECD is fixed at 62. Italy and the Slovak Republic had linked their retirement ages to life expectancy but recently backtracked on those reforms with the Slovak Republic abolishing the link altogether and Italy temporarily suspending it for some occupations.

The exact way countries link their retirement age to life expectancy differs. Denmark, Estonia, Italy and the Netherlands link their retirement age one-to-one to life expectancy, meaning that a one-year increase in life expectancy at 65 (60 for Denmark) leads to a one-year increase in the retirement age.²⁴ This might be needed to ensure financial sustainability, but it basically implies that all additional expected life years are spent

working, while the length of the retirement period is constant: this leads to a steady decline in number of years in retirement relative to those spent working. Italy suspended until 2026 the automatic links with life expectancy of both career-length eligibility conditions for early retirement (42.8 and 41.8 years for men and women, respectively), and the statutory retirement ages for some workers only, including those in arduous occupations. In Denmark parliament has to vote every 5 years to uphold this link.

In Finland and Portugal the statutory retirement age increases with two-thirds of life expectancy at 65; Sweden plans to implement a similar link. In Finland, this is done with the expressed goal of keeping the ratio of expected time in retirement to time spent working constant. In addition in Portugal, someone with more than 40 years of contributions can retire 4 months earlier for each year over 40 years of contributions. This implies that only half of life expectancy gains are reflected in the normal retirement age (OECD, 2019^[13]).

Not all links to life expectancy are by themselves ensuring the financial sustainability of PAYGO DB systems of course. First, for example, working-age population growth driven by past fertility rates matter irrespective of longevity. Second, in most countries additional years of work also mean additional pension entitlements. Yet, in DB schemes, these additional entitlements are typically not actuarially neutral, implying that in the long term increasing the retirement age tends to generate net savings for the pension provider. As long as the pensioner-to-contributor ratio stays constant, a stable replacement rate can be financed by a stable contribution rate in a sustainable way. However, not raising the retirement age in line with improvements in life expectancy tends to lead to a deterioration of the financial balances due to the increase in that ratio, unless lower replacement rates or higher contribution rates offset the impact of demographic changes.

In addition, inequality in life expectancy raises complex issues for pension policy. It is important here to distinguish static and dynamic considerations. A generic pension system without obvious redistributive features (e.g. a simple DB system based on a given accrual rate or a funded DC system with annuitisation based on common mortality tables) might look neutral but is actually regressive: people with higher incomes tend to have longer lives and therefore to benefit from higher pensions for a longer time; this is financed in part by those who die early, who tend to be those with lower lifetime income. This effect is potentially large given the level of socio-economic differences in life expectancy (OECD, 2017^[1]). It implies that inequality in life expectancy strengthens the case for redistributive components within pensions systems.

The same mechanism means that increasing the retirement age is by itself regressive: as low-income workers tend to have shorter lives, a one-year increase in the retirement age represents a larger proportional cut in their total pension benefits paid during retirement than it does for higher-income people. OECD (2017^[1]) shows that this effect is likely to be quantitatively small.

However, linking the retirement age to life expectancy is a policy that mainly aims at responding to overall longevity gains. Broadly shared longevity gains with unchanged retirement ages is progressive based on the same argument: they tend to benefit those with shorter expected lives relatively more. In that sense, increasing the retirement age to accompany well-shared life-expectancy gains goes towards restoring neutrality (OECD, 2017^[1]).

One important question for the relevance of linking the retirement age to life expectancy relates therefore to how socio-economic differences in life expectancy evolve.

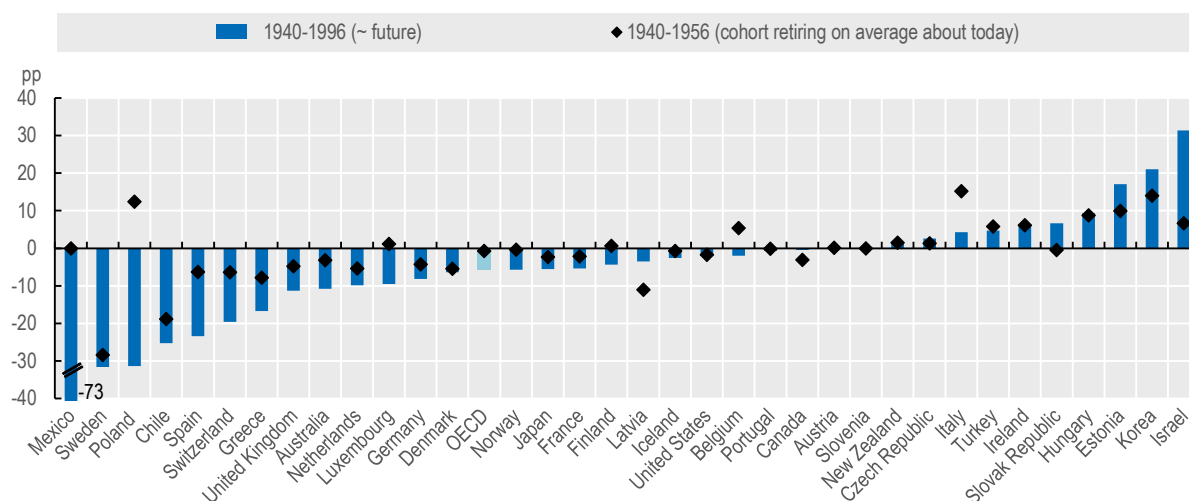
If gains in life expectancy are not evenly distributed and favour higher-income groups, further exacerbating inequality in life expectancy, a higher retirement age would raise equity concerns. There is conflicting evidence about trends in life-expectancy inequality. In some countries, however, such as Denmark and the United States, it has risen. In any case, whether one focuses on the static or the dynamic side, first-best health policies should tackle inequality in life expectancy.

Changes in pension replacement rates

Pension reforms over the past decades have led to about a small one percentage-point decline for the OECD on average in pension replacement rates between individuals born in 1940 and those retiring about today (1956 birth cohort), but to significant changes in a few countries (OECD, 2019^[7]). According to current legislation, larger changes will affect those born in 1996 - which enter the labour market about today. Replacement rates will be lower for full-career workers born in 1996 relative to those born in 1940 in about 60% of OECD countries, but higher in about 30%; they will be stable in the remaining 10%. The OECD average is expected to fall by 5.8 percentage points (i.e. by slightly more than 10%) for the cohort born in 1996 compared to the cohort born in 1940 (Figure 1.17).

Figure 1.17. **Replacement rates will fall in the majority of countries**

Change in theoretical gross replacement rate 1940-1956 and 1940-1996



Note: Lithuania is not shown as data for the 1940 cohort are missing, and is not included in the OECD average.

Source: OECD (2019^[7]).

StatLink <https://doi.org/10.1787/888934040794>

There are large drops in replacement rates of more than 30 percentage points in countries that started from a relatively high levels for the 1940 cohort, such as Mexico, Poland and Sweden. While the old DB scheme in Mexico pays high pensions, ensuring almost a full replacement of past earnings for those born before 1977 with a full career, the current DC scheme would yield low replacement rates given low contribution rates.

The introduction of NDC schemes in Sweden and Poland has substantially lowered replacement rates for cohorts of retirees affected by the reform while it has had a much smaller impact in Norway (6 p.p.). In Latvia, the impact of the new NDC pensions was large

as well, but the 1940 cohort was already affected. As NDC schemes are by design supposed to ensure actuarial fairness, the fall in replacement rates mostly reflects the extent of the financial unsustainability of the pre-reform systems. In Italy, the other OECD country having introduced an NDC pension system, a fall in the replacement rate at the normal retirement age is only avoided by the sharp increase in the retirement age due to the link to life expectancy.

On top of the countries listed above, the baseline replacement rate will fall by more than 15 p.p. in Chile, Greece, Spain and Switzerland. Chile replaced its complex public DB scheme by a privately managed fully funded DC scheme based on low contribution rates while issuing recognition bonds to account for accrued entitlements in the DB scheme. Greece lowered the accrual rates in the DB system and changed the indexation of basic pensions from wage growth to price inflation. In 2013, Spain introduced a sustainability factor that would automatically reduce pensions with increasing longevity.²⁵ In Switzerland, basic pension components and pensionable earnings thresholds are indexed to the average of wage growth and price inflation, thereby falling relative to wages over time. Moreover, in occupational pensions increasing longevity combined with the low interest rate environment led to a reduction in the legal minimum rates of return, which are now binding.

Replacement rates have increased by more than 15 percentage points for countries with a relatively low replacement rates for the 1940 cohort. In particular, Estonia, Israel and Korea have expanded their pension system. Israel and Estonia introduced mandatory funded DC schemes in the 2000s while Korea introduced a mandatory public DB scheme in 1988.

Absolute changes in replacement rates between the 1940 and 1996 cohorts are lower than 5 p.p. in 13 OECD countries. This is because pension reforms have been more limited in these countries or, like in the Czech Republic, Finland, France, Latvia, Portugal or the United States, because the increase in retirement ages have at least partly offset the impact of reforms affecting generations born after 1940. Actually, in Denmark, Italy and Turkey the comparatively small changes in the replacement rate go along with large increases in the normal retirement age, implying that younger generations can expect similar benefit levels as older generations in percent of last wages, only if they work longer and retire at a much later age.

Notes

1. When computing the old-age to working-age ratio based on normal retirement ages according to legislated rules instead of age 65, the projected increase is reduced (<https://voxeu.org/article/effect-population-ageing-pensions>).
2. At-risk-of-poverty-or-social-exclusion reflects persons who are either *at risk of poverty, severely materially deprived or living in a household with a very low work intensity* ([https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_\(AROE\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROE))).
3. In some countries such as Australia this partly reflect the fact that many pensioners have taken their accumulated pensions as lump sums, which are not counted as current income, rather than annuitising them to provide income streams. In addition there are considerable differences between countries in terms of wealth (housing or otherwise) held by older people, this is not reflected in income poverty.
4. Currently the only restriction in place is career length or the statutory retirement age. The impact of this new reform has not been incorporated in the OECD indicators, since the reform passed the final vote in the Senate after the cut-off date for the publication. Based on this reform, the normal retirement age will increase from 57 (52) to 65 (62) for men (women).

5. It will also be possible to stop the pension payments and start them later again. While the pension payments are stopped they will grow in an actuarially neutral way.
6. Current legislation's stated goal is to keep the time spent in retirement constant at 14.5 years on average according to life expectancy at 60. Every 5 years the retirement age for 15 years in the future is determined and voted on by the Danish Parliament. If the Danish Parliament votes to uphold the law and current estimates of future average life expectancy hold, the statutory pension age will eventually be increased to 74 years.
7. Some countries have lower eligibility depending on the numbers of children, for women in particular. In the Slovak Republic, for example, women can retire half a year earlier each child they have up to three.
8. Denmark restricted early-retirement rules in voluntary schemes by raising the minimum retirement age from 60 to 62; participants can delay claiming benefits up to 20 years (previously 15 years) after the statutory normal retirement age.
9. This does not influence the normal retirement age in 2018 shown in Figure 1.10.
10. The AFP remains available flexibly between the ages of 62 and 70 with the AFP lifelong supplement actuarially adjusted depending on the age of retirement and the possibility to combine with labour income (just like the private sector).
11. In Ireland and the United Kingdom the basic pension benefits are linked to the contribution period, but the minimum years for a full basic pension are still reached with a 5 year break.
12. In the case of opting out if the funds are withdrawn, assets will be subject to income tax.
13. Employees pay 3% and the state adds 1.5% since 2019. The auto-enrolment procedure is repeated every 3 years. But employees have the right to opt out or temporarily suspend contributions.
14. First, the restriction rule for unlisted securities was removed and replaced by an investment ceiling for illiquid assets set at 40% of the fund's assets. The definition of illiquid investments is broader than that of unlisted securities and is also including real estate. Second, the minimum portfolio allocation to interest-bearing securities with low credit and liquidity risk was reduced from 30% to 20%. Third, the requirement that 10% of the fund assets had to be managed by external managers was removed. And finally, a new target was introduced that the fund's assets must be managed in an exemplary manner through responsible investments and responsible ownership. Special emphasis should be placed on how a sustainable development can be promoted without compromising with the overall objective of the investment activities.
15. Pension funds' uprating of pension benefits is directly linked to funding ratios, which in turn are directly influenced by returns.
16. France will do so also if the proposed reform is adopted.
17. Italy takes into account projected aggregate spending on survivor pensions when calculating the annuity, thus lowering pensions payments compared to countries taking into account only life expectancy at retirement.
18. In 2019, nominal wage growth was 0.6%. Absent of any sustainability factor pensions would therefore have grown by 0.6%. But the number of contributors increased by 0.1%, and the life-expectancy index was minus 0.3% (remaining fixed for the foreseeable future), thus the sustainability factor was minus 0.2% (=0.1%-0.3%). In addition, the unrealised benefit reduction (minus 0.3%) was carried over from the previous year. Therefore, taking wage growth, the sustainability factor and the carry over mechanism into account, pension benefit increased by 0.1% (=0.6%-0.2%-0.3%).
19. It measures the number of pensioners expressed in "equivalent pensions", meaning total pension expenditure divided by the pension someone receives with 45 pension points. Similarly the number of contributors is expressed in terms of "equivalent contributions": total contributions divided by contributions of someone who would earn exactly one pension point.
20. Rentenversicherungsbericht 2018: https://www.bmas.de/SharedDocs/Downloads/DE/Thema-Rente/rentenversicherungsbericht-2018.pdf?__blob=publicationFile&v=4
21. Wage-growth uprating is adjusted by the shortfall of the balance ratio. For instance if the balance ratio is 97% and nominal wage growth is 3.275%, uprating is $97\% \times 103.275\% - 100\% = 0.17675\%$ instead of 3.275% without the impact of the balance ratio.
22. Provided that indexation and uprating does not lead to a fall in the funding ratio below 110%.
23. In Portugal indexation depends on real-GDP growth. If economic growth is below 2% pensions in payment are only indexed to prices. However, if it exceeds 2% certain levels of pensions in payment are indexed to prices plus a share of real-GDP growth.

24. In the Netherlands plans for a law to adjust the link are close to being presented to parliament.
25. This is based on current legislation, which currently says that the sustainability is suspended only until 2023.

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ANNEX 1.A

*Pension reforms decided between September 2017 and
September 2019*

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
Australia		July 2019. Superannuation funds have to cancel supplemental life and disability insurance coverage for accounts with 16 consecutive months of inactivity unless participants actively choose to maintain the coverage.		From July 2018, members with total superannuation balances below AUD 500,000 are allowed to carry forward unused concessional (before-tax) contribution-limit amounts for up to 5 years. From July 2019, members can access the unused contribution.	From July 2019, fairer and more equitable means test rules for lifetime income stream products will take effect. The rules support the development of new retirement income products that may help people manage the risk of outliving their savings in retirement. From July 2019, the Work Bonus income test concession (the amount excluded from the pension income test) for pensioners who reached the normal retirement age (except Parenting Payment Single) was increased from AUD 250 to AUD 300 a fortnight and extended to include earnings from self-employment. The maximum accrual limit also increased from AUD 6,500 to AUD 7,800.	July 2019. The law caps the total annual administrative fees superannuation funds can charge accounts with balances below AUD 6,000 at 3% of the year-end balance. (Previously, there was no fee cap.) The law also prohibits superannuation funds from charging exit fees when accounts with any balance amount are transferred to other providers.	From July 2019, the Pension Loans Scheme (a voluntary, reverse mortgage type loan providing a fortnightly income stream) was expanded to all Australians who reached the normal retirement age with securable real estate/assets owned in Australia. The maximum fortnightly payment (pension plus loan) also increased from 100% to 150% of the fortnightly maximum rate of pension. July 2019. Superannuation funds have to transfer accounts with balances below AUD 6,000 to the Australian Taxation Office (ATO) after 16 consecutive months of inactivity. Within 28 days of receiving an inactive account, ATO will combine it with an active account belonging to the same participant if such an account exists and the combined balance would be at least AUD 6,000. If the account cannot be combined, ATO will continue to hold it until it can be combined or issue a lump-sum payment to the participant if he or she is aged 65 or older or the account balance is less than AUD 200.
Austria					In July 2019 it was decided that a new means-tested top up will be introduced in 2020. Single Insured with at least 30 years of contribution will receive at least EUR 1.080. Single Insured with at least 40 years of contribution will receive at least EUR 1.315. Couples were at least one		

Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
				partner has a contribution history of 40 years or more will receive EUR 1.782. The new regulation requires a permanent residency in Austria. All pensions are subject to tax.		
Belgium	From March 2019 onwards, a new voluntary second pillar pension plan is in place for employees who do not have access to an occupational pension provided by the employer. Contributions to this Free Supplementary Pension for Employees (Vrij Aanvullend Pensioen voor Werknemers) receive a 30% tax credit. In addition a new private pension for the self-employed was introduced in 2018 (Pensioenovereenkomst voor Zelfstandigen). Contributions to this scheme also receive a tax credit of 30%.	For individuals retiring from January 2019 onwards, the rule that limits the maximum number of years that generate pension rights is abolished. While previously no accrual occurred after 45 years of first pillar pension build-up, an individual can now continue to build-up pension rights when he or she decides to keep on working after 45 career years. From December 2018 onwards the rules governing the inclusion of years of study in first pillar pension rights for employees and self-employed workers are harmonized. The rules applying to civil servants are still partly different but will also be harmonized gradually. The rules governing the calculation of pension rights that are built up by individuals during an unemployment period that exceeds one year have changed. Before 2017 these pension rights were based on the earned wage before unemployment; from 2017 onwards these pension rights will be based on a lower minimum wage. The new rules apply to individuals retiring from 2019 onwards.				
Canada				March 2019. The Government of Canada proposed to enhance the Guaranteed Income Supplement (GIS)		

Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
				earnings exemption by increasing the exemption from CAD 3,500 to CAD 5,000, extending it to self-employment income, and providing a partial exemption on the next CAD 10,000 of self-employment earnings. This would apply starting in July 2020.		
Chile	In February 2019 new legislation was introduced for self-employment. The law makes contributions to the social security system compulsory for the self-employed, gradually increasing from 10% in 2018 to 17% in 2028. To smooth the impact on the net income of self-employed workers, the law introduces the following options: Default-option: individuals contribute to the whole social security system (insurances, health and pensions). Contribution for insurances and health will have a constant rate, while the contribution rate for pensions increases with the total contribution rate. Alternative option: individuals contribute with a lower contribution base for health and pensions, which increases gradually in a horizon of 9 years from 5% of taxable income to 100% of taxable income in 2027.					
Czech Republic		June 2017 the government will use an indexation formula based either on the increase in consumer prices for households of pensioners or the increase in consumer prices of all households – whichever is higher (come				

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
			into effect from 2018). August 2018 the pension indexation changes the universal basic amount (flat rate) part of pensions from 9% to 10% of the national average wage and also there is a special extra bonus CZK 1000 (approximately EUR 38) for all people above 85 years in the indexation (come into effect from 2019).				
Denmark	December 2017. From January 2018, in voluntary old-age savings accounts, participants can claim their pension 3 years before the statutory normal retirement age at the earliest (previously 5 years before), and can delay claiming benefits up to 20 years after the statutory normal retirement age (previously 15 years). Participants opting for programmed payments, can receive the payments up to 30 years after their statutory normal retirement age (up from 25 years).	May 2018. From July 2018, to qualify for a full state pension, individuals born since July 1, 1958, must reside in Denmark for at least 90% of the years from age 15 to the statutory normal retirement age. (Previously, 40 years of residency was required).	May 2018. From July 2018, individuals who delay claiming the state pension have two new payment options of how the deferral supplement is paid; a 10-year annuity or a 10-year annuity plus a lump sum, while a lifetime annuity was the only payment option before. July 2019: A lump sum of DKK 30,000 is granted for working 1.560 hours within 12 months after reaching age of retirement (public pension)	December 2017. From January 2018, in voluntary old-age savings accounts, the annual contribution limit of participants with more than 5 years until the statutory normal retirement age is DKK 5,100 and DKK 46,000 for those who have 5 or fewer years. Previously, the limit was DKK 29,600 regardless of the participant's age.	December 2017. From January 2018, income received from voluntary old-age savings accounts will no longer affect the participants' entitlement to public benefits. March 2019: From January 2019 the amount of income the participant can earn before it will influence negatively on the pension is increased from DKK 60,000 to DKK 100,000. Furthermore the amount of income a participant's partner can earn without it influencing negatively on the participants pension is increased as well as the ratio with which a participant's partner's income influences on the pension is reduced.		
Estonia	2018. From 2027 the pensionable age will be linked with life expectancy. The flexible retirement concept will allow people to retire flexibly before the legal pensionable age as they can receive pensions even while they keep on working. In order to increase one's pension it is now possible to stop the pension payments and start them later again.	2018. People born between 1970 and 1982 will be able to join voluntary schemes from 1 January 2020 to 30 November 2020. Voluntary contributions will be made by new entrants from 1 January 2021.	2018. From 2021 the earnings related pension formula will have a new component. From 2021 onwards, the fourth part of the pension formula, which is called the compound part, will be introduced. The compound part is a combination of the second part and the third part (length of service and insurance components).			2018. From September 2019 II pillar pension fund's management fee maximum limit decreases from 2% to 1.2%. Pension funds can also take optional performance fee.	2018. From May 2019 default voluntary pension schemes for those who don't choose it by themselves are three pension funds with lowest fees and invest at least 75% to equities. Pension fund's equity limits will increase from 75% to 100%.

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
	While the pension payments are stopped they will grow actuarially neutrally. It is also possible to take out only half of pension which makes later pension payments higher. In 2021 the concept of flexible pension will come into force.						
Finland					January 2018. National pensions' indexation was frozen. The guarantee pension was raised by EUR15.01 per month. January 2019. National pensions' index freeze continues, but guarantee pensions raised by EUR 9.25 per month. June 2019.		January 2019. Disability pensioners' earning limit was raised by about EUR 50 for those who receive only minimum pension or whose earnings before the pension have been very low. From now on, the pension payment continues normally if earnings do not exceed the amount of guarantee pension.
France			May 2019. Social partners agreed to the rules to adjust the indexation of the value and cost of points until 2033. The point cost will be indexed to wage growth. From 2020 to 2023, the point value will be indexed to price inflation. From 2023, the point value will be indexed to annual wage growth minus a sustainability factor (1.16%). In practice, this means that the indexation will be slightly discretionary between price inflation (unless inflation is larger than wage growth) and price inflation plus 0.2 percentage points, without being negative. With the merger of the occupational AGIRC and ARRCO schemes as of 1 January 2019 (decided in 2015), for pensions claimed thereafter, there is one single account for calculating pension points. With the merger, all ARRCO points	The implementation of the merger between AGIRC and ARRCO is as follows: One set of rates and two salary bands used to calculate contributions under the merged program. The merged program includes a new general equilibrium contribution that replaces several special contributions under the ARRCO and AGIRC programs.	From 1 April 2018 to 1 January 2020, the old-age safety net (ASPA) is increasing by about 12.5%.	January 2018. Increase of one tax applying to retirement pensions (CSG). The CSG rate increased from 6.6% to 8.3% while the rate applied to wages increase from 7.5% to 9.2%. January 2019. Introduction of a threshold to limit the measure to retirees earning pensions above EUR 2000. The threshold level of EUR 2000 implies that about 30% of retirees are exempt from the increase.	May 2019. Reform of the occupational and voluntary pension plans (PACTE law). The reform replaced four types of defined contribution (DC) plans with three new ones known collectively as Retirement Savings Plans (produits d'épargne retraite, or PER).

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
			have become AGIRC-ARRCO points with no change in value (1 ARRCO point equals 1 AGIRC-ARRCO point); AGIRC points have been converted to AGIRC-ARRCO points by applying a conversion factor (1 AGIRC point equals 0.347791548 AGIRC-ARRCO points).				
Germany		2017. From January 2018, employers can offer opt-out and DC plans that lack a guaranteed minimum retirement benefit if employees agree as part of the collective bargaining process. December 2018. From July 2019, reduced social insurance contributions (see Column "Contributions") acquire full pension entitlements while they acquired only partial pension entitlements before.	2017. The pension point value and other parameters used in the calculation of pensions, which are currently still lower in Eastern than in Western Germany, are going to converge fully by 2025. December 2018. In 2019-2025, the pension point value has to be increased if the target replacement rate for old-age pensions would otherwise fall below 48% of the average wage, while this value was set at 46% until 2020 and 43% in 2020-2030.	December 2018. In 2019-2025, the overall contribution rate of employers and employees cannot rise above 20% of covered earnings, backed up by the general budget of the federal government, or fall below 18.6 %. From July 2019, employees with monthly earnings from EUR 450 to EUR 1,300 will pay reduced social insurance contributions, while it was from EUR 450 to EUR 850 before.			December 2018. From January 2019, 0.5 additional pension points are retroactively allotted to women with children born before 1992. December 2018. From January 2019, the period in which pension supplements because of reduced earning capacity can be received is extended to the age of 65 years and 8 months. Thereafter it will be raised in line with the standard retirement age (gradual rise to 67 years in 2031).
Greece							
Hungary				The contribution rate paid by employers to Pension Insurance Fund reduced from 15.75 % to: - 15.50% in January 2018; - 13.69% in January 2019; - 12.29% in July 2019.	From 2018 the means-tested benefit rises with the general pension adjustment ratio. Before this date, the amount of this benefit was based on the minimum old-age pension.		
Iceland				July 2018. The contribution rate paid by private-sector employers under mandatory occupational pension program rose from 8% of an employee's gross earnings to 11.5 %.	January 2018. Introduction of "half-and-half" pension that allows individual to receive 50% of the full old-age pension without an income test if he or she opts to receive 50 % of occupational pension. Normally, old-age pension is reduced if a beneficiary's annual income exceeds certain limits.		
Ireland							

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
Israel							
Italy	January 2019. Conditions for early retirement were expanded to allow more individuals to retire early. Until 2026, for early pensions only, the link between career length eligibility conditions (M: 42y and 10m - F: 41y and 10 m) and life expectancy has been suspended. From 2019 to 2021, an individual can retire if the sum of his or her age and years of contributions is at least 100. The earliest case is at age 62 with 38 years of contributions. Employed women who have reached age 58 can retire 12 months after accumulating at least 35 years of contributions. Under this "women's option" pension is fully calculated according to the NDC rules which translates into an actuarial adjustment of the benefits. From 2019 to 2026, individuals who contributed for at least 12 months before reaching age 19 and have at least 41 years of contributions can retire. Until 2026, the links between retirement age and career-length eligibility conditions with life-expectancy have been suspended only for workers in arduous occupations.		June 2019. The indexation rule for pensions in payment has changed. Indexation is now 100% of changes in the "cost-of-life" index for pensions up to three times the minimum pension; 97% of changes in the "cost-of-life" index for pensions up to four times the minimum pension; 77% of changes in the "cost-of-life" index for pensions up to five times the minimum pension; 52% of changes in the "cost-of-life" index for pensions up to six times the minimum pension; 47% of changes in the "cost-of-life" index for pensions up to eight times the minimum pension; 45% of changes in the "cost-of-life" index for pensions up to nine times the minimum pension; 40% of changes in the "cost-of-life" index for pensions higher than nine times the minimum pension.		In 2019, the government increased the level of means-tested safety-net benefits for older people through introducing the so-called citizen's pension on top of the existing safety-net benefits for older people (the so-called assegno sociale)		From 2021 the calculation mechanism of life-expectancy growth used in pension calculations has been slightly modified, introducing an upper threshold of 3 months of maximum growth.
Japan		May 2019. From April 2020, limit qualified dependent spouses of employees who participate in the Employee's Pension Insurance (Category III insured persons) to those who reside in Japan.				March 2018. From April 2020, set a ceiling on pension income deduction for high income pensioners (pension income is more than JPY 10 million). Reduce income deduction for high-income pensioners (income other	

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
						than pension exceeds JPY 10 million).	
Korea							
Latvia			From October 2018, a higher percentage of the real increase in the social insurance contribution wage sum is applied to old-age pensions with long insurance period. Namely, 60% - if the insurance period is between 30 and 39, as well as to those pensions awarded for work in hazardous and hard-working conditions or particularly hazardous and hard-working conditions, and 70% - if the insurance period is 40 years and more. From 1 October 2019, to the old age pensions with the insurance period 45 years or more will be applied 80% (instead of 70%) of the real increase in the social insurance contribution wage sum. As of 1 July 2018, the supplement to a pension for each insurance year until the year 1995 (before NDC) has been determined in the amount of EUR 1.50 (instead of EUR 1 earlier) per insurance year, if the old age or disability pension has been granted before 31 December 1996. From 1 October 2019, the granted supplement to the old age and disability pension shall be indexed to the actual consumer price index and 50% of the real increase in the social insurance contribution wage sum. From the year 2019, survivor benefits were introduced, the surviving spouse can receive a benefit in the amount of 50% of the				

Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
		deceased persons' pension, including a supplement to the pension for 12 months.				
Lithuania	June 2018. The voluntary funded pension scheme introduced in 2004 is transformed into an auto-enrolment scheme for employees younger than 40 years. Employees have the right to opt out or temporarily suspend contributions. The auto-enrolment procedure is repeated every 3 year. Total contributions are: 1.5% state and 3% employee.		June 2018, the employer's social security contribution rate is reduced from 31% of monthly payroll to 1.5%, and the employee contribution rate will rise from 9% of monthly earnings to 19.5%. Contributions are paid on earnings up to a new annual covered earnings ceiling set at 120 times the average monthly wage of the previous year for 2019, 84 times for 2020, and 60 times for 2021 and onwards.			
Luxembourg	January 2019. Voluntary supplementary pension schemes that were previously only available to certain wage earners have been extended to self-employed workers. The fiscal and social frameworks have been amended in a way to ensure an equal treatment between both wage earners and self-employed workers.					
Mexico				January 2019. Mexico established a universal pension programme (Programa Pensión para el Bienestar de las Personas Adultas Mayores) for ages 68+ (65+ for indigenous population). This replaces the targeted old-age social assistance programme for ages 65+ who were not receiving a contributory pension above MXN\$1,092 (Programa de Pensión para Adultos Mayores, PPAM). Those aged 65-67 who were receiving the PPAM will		Since November 2018, the General Provisions on Financial Topics established that pension funds may consider ESG factors in their risk management's policy and investments' strategies.

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
					automatically receive the new universal pension. The objective is to reach out 8.5 million people in 2019 Vs. 5.5 million in 2018 with PPAM by expanding coverage (by eliminating the minimum pension income's test) and substantially increasing the level of benefits (almost 120%) above the PPAM.		
Netherlands	June 2019. The eligibility age for the state pension (AOW) will rise more slowly to reach 67 in 2024 (instead of 2021).	May 2019. From 1 January 2021 employers must offer adequate (comparable to regular employees) pension for payroll-employees.					January 2019. Pension providers will be allowed to automatically transfer the total contributions of those who have accrued rights to an annual pension of at least EUR 2 but less than EUR 474.11 to another pension provider after employment termination. In addition, they will be able to cancel the pension rights of participants with rights of less than EUR 2.
New Zealand		From January 2019, the 'five years after age 50' residence requirement for the basic pension can be met through residence in any one or more of New Zealand, the Cook Islands, Niue or Tokelau. (Previously, only residence in New Zealand could be used toward this residence requirement. The 'ten years after age 20' residence requirement must still be met using residence in New Zealand.) From July 2019, people aged over 65 may now join KiwiSaver.		From April 2019, people may choose a contribution rate of 6% or 10% (adding to the existing options of 3%, 4% and 8%) for the KiwiSaver program.			
Norway		November 2017. A voluntary tax-favoured individual pension savings program replaced a similar program introduced in 2008. Under the new program, participants	Jan 2019. A new rule to Contractual Early Retirement Schemes (AFP) for public-sector employees born from 1963. The AFP in the public sector, which had been an				

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
		can contribute up to NOK 40,000 per year (previously NOK 15,000) and receive an income tax deduction (worth up to NOK 9,200 in 2018). In addition, investment returns are exempt from capital gains taxes and withdrawals from the account are taxed as ordinary income.	early-retirement scheme for those aged between 62 and 66, was changed into a lifelong supplement to the old age pension, in line with the private sector. However, the AFP remains available flexibly between the ages of 62 and 70 with an actuarial adjustment of the lifelong supplement and can be combined with labour income (just like the private sector). In addition the public-sector scheme will follow the actuarial rules for benefit determination similar to one for the private-sector workers and thus, the benefits will be based on the life-time earnings rather than last-year earnings.				
Poland		January 2019. Introduction of a new defined contribution occupational pension plans called Employee Capital Plans. Employers will be required to offer a plan to their employees. The new law will affect companies gradually: from July 2019 those with more than 250 employees, from January 2020 those with 50-249 employees, from July 2020 for those with 20-49 employees, from January 2021 those with 1-19 employees and public finance sector. The self-employed will not be covered. The minimum contributions for employees is 2% and 1.5% for employers. Additional premium of PLN 240 will be paid yearly after fulfilling certain conditions. The plans will be mandatory for employers while the employees will be auto-enrolled. The new law		January 2018. Introduction of e-contributions. One transfer to ZUS - the contributions to three or four different bills have disappeared.	March 2019. Increasing the minimum pension to PLN 1,100 and ensuring a minimum benefit increase of PLN 70. March 2019. Mothers of 4 or more children are entitled to minimum pension without satisfying any additional conditions. May 2019. One-off benefit for all pensioners in 2019 at the level of PLN 1,100.		

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
		aims to cover around 11.5 million workers.					
Portugal	October 2017. Early retirement from age 60 with full benefits to individuals who had at least 48 years of contributions or at least 46 years of contributions if they began covered employment at age 14 or younger. October 2018. Early retirement from age 60 with full benefits is extended to individuals who began covered employment at age 16 or younger and have at least 46 years of contributions. Previously, penalty-free early retirement was available only to individuals who had at least 48 years of contributions or at least 46 years of contributions if they began covered employment at age 14 or younger. December 2018. Early retirement from the age of 63 without the application of the sustainability factor is possible for individuals who had 40 years of contributions at age 60. From October 2019 this is extended to people aged 60.				December 2018. From January 2019, an extraordinary supplement (amount in cash, granted monthly) is assigned to the beneficiaries from minimum pensions. The supplement's calculation is carried out according to the extraordinary updates carried out between 2017 and 2018. The following individuals may receive this extraordinary complement: Invalidity, old age and dependency pensioners of the social security scheme and of the convergent social protection scheme, who benefit from minimum pensions from January 2019; beneficiaries of minimum invalidity or old-age pensions assigned between January 2017 and December 2018.		
Slovak Republic	March 2019. The Act on the maximum retirement age at 64 years was passed by the Slovak parliament on 28 March 2019, this law entered into force on 1 July 2019. Women with children can retire without penalty 6 months earlier per child (with a maximum reduction of 18 months). From 2020 onwards, the retirement age will be increased on a discretionary basis by the				April 2019 the old-age safety net level (Assistance in Material Need) increased by 5% (except of Housing Allowance). In addition, the regular indexation of the safety net was established. This will be increased in line with coefficient used for indexation of the subsistence level (lower of two indices: growth wage and CPI for low-income households) since January.		

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
Slovenia	Ministry of Labour, Social Affairs and Family. The retirement age is capped at 64 after which there will be no further increases.				October 2017, an amendment to the Pension and Disability Insurance Act introduced a new instrument of a guaranteed amount of the lowest old-age or disability pension in the amount of EUR 500 (EUR 530,57 in 2019), i.e. if the old-age or disability pension for legally prescribed full pensionable service as per current regulations fails to reach the relevant amount.		
Spain			2018. The Revalorisation Pensions Index (IRP) used to index pensions in payments was suspended. Instead, pensions were increased in line with the CPI at 1.6% in both 2018 and 2019. The sustainability factor which was supposed to start being applied in January 2019 to adjust initial pensions to life expectancy was suspended until 2023. A Commission will be created to propose alternative measures. August 2018. The replacement rate for the survivor pension is increased from 52 to 56% of the regulatory base for beneficiaries aged 65 or older. This was followed by another 4 % increase to 60 % in January 2019. Both increases are only applicable to beneficiaries without other incomes.			February 2018. Maximum management and deposit fees that financial companies can charge for plan administration are lowered and earlier withdrawals from most plans are allowed.	
Sweden	June 2019. The upper age limit in the Employment Protection Act (LAS) has been				October 2019. The guarantee pension is increase by SEK 200 a month. The housing	In 2018 and 2019 the tax on pension income was lowered.	September 2018. The Swedish Pensions Agency tightened the regulations for

	Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
	extended from 67 years to 68 as of January 2020, and it will increase to 69 by January 2023.				cost level was increased in the housing supplement from first SEK 5000 to SEK 5600 in 2018 and then to SEK 7000 a month in 2019. All income is equalised when calculating the housing supplement. A free income area is created for work income equal to SEK 24 000 a year when receiving the housing supplement. All changes will apply from December 2019.		PPM funds. The new regulation requires, among others, at least SEK 500 million of funds outside PPM and a minimum 3 years of relevant experience. The funds that do not meet the new requirement were to be removed from PPM platform in 2019. As a result, in January 2019, 553 funds remained available while 269 deregistered. January 2019. Investment rules for the four main pension buffer funds changed. 1) The investment ceiling for illiquid investments was increased from 5% to 40% of portfolio assets. In addition, buffer funds will not be required to sell illiquid investments to maintain the ceiling. 2) The minimum portfolio allocation to interest-bearing securities was reduced from 30% to 20%. 3) The requirement to designate a specific portion of fund assets to be managed by external managers was eliminated. 4) A requirement that buffer funds manage assets in a “sustainable” manner by assessing how well their portfolios would fare under a range of adverse climate-change scenarios was introduced.
Switzerland				AVS contributions on gross earnings will increased by 0.3 points by 2020. In addition, government subsidies to the financing of AVS pensions will be increased from 19.55% to 20.2% of total revenues.			October 2017. Introduction of new provisions regulating “1e” pensions for employees with annual salaries above CHF 126,900 (4.5x the maximum annual social security pension). The provisions require companies that sponsor 1e plans to offer a greater selection of

Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
						investments while limiting the investment risk for plan participants. The revised plan design eliminates mandatory interest guarantees, thus reducing overall pension liabilities for plan sponsors.
Turkey		May 2018. TRL 1000 before the two religious holidays, and a total of TRL 2000 per year holiday bonuses began to be given to pensioners.	January 2018. New Generation Incentive: between 2018-2020, tax and premium support is provided for private sector employers who provide additional employment according to the average number of insured persons in the previous year. The benefit period is limited to a maximum of 12 months for each insured person; for women, young people aged 18-25 and people with disabilities, the period of support is 18 months. March 2018. "1 from me, 1 from you": Premium, tax and wage support was provided for small enterprises in the manufacturing sector, if they provide additional employment. In 2017, the employers of 1-3 workers in the manufacturing sector, among them young people (18-25 years). The costs of the additional recruited youth are provided by the state for 1 month and by the employer for 1 month. May 2018. Young entrepreneur incentive: In the event that young people between the ages of 18 and 29 work for the first time as self-employed persons, the state provided their premiums throughout the year. January 2019. Minimum wage support: In 2019, an incentive of TRL 150	April 2017. The requirement to take the income test was abandoned and access to health benefits was provided for 2019: TRL 76.75 (single contribution ratio: 3% of the minimum wage=2558.40*0.03=TRL 76.75). February 2019. After the decisions made in January 2019, the pensions which were below TRL 1000 were paid as TRL 1000.		January 2018. Implementation of new rules that cap the portion of a pension company's portfolio an asset management company can oversee at 40%. (Previously, a single asset management company could oversee a pension company's entire portfolio.) Under these rules, a pension company must reassess the apportionment of its portfolio in the first two months of each year based on the portfolio's net value at the end of the preceding year. August 2018. Crediting conditions (crediting for foreign insurance periods) for the citizens working abroad has changed. The contribution rates used in crediting calculations was raised from 32% to 45%. The credited days used to fall under the employee status, after the amendment it will be regarded as self-employed.

Retirement age	Coverage	Pension benefits	Contributions	Minimum and basic pensions, income and means testing	Taxes and fees	Other
			per insured was provided for establishments employing 500 or less insured employees, and TRL 101 per insured for establishments of employing 500 or more insured employees.			
United Kingdom					Feb 2018/April 2018. DC pension schemes will be required to publish charges and transaction costs for each fund used by members, along with an illustration of how those costs compound over time, the strategy of their default fund/s, and the scheme's assessment of value for money. Also required to tell members annually where info can be found.	Sept 2018/Oct 2019. DC + DB schemes to have a policies on: how they take account of ESG considerations including climate change; stewardship of pension scheme investments; how (if at all) they take account of members' views. In addition DC schemes to publish these and other policies and to report annually on how they have implemented them. 23 Oct 2018 were laid to amend the Pensions Act 2004 requiring trustees to have an effective system of governance that is proportionate to the complexity and risk profile of their scheme. As part of looking at their system of governance, schemes are required to carry out and document an own risk assessment.
United States						

Chapter 2

Non-standard forms of work and pensions

This chapter looks into pension arrangements for non-standard workers across OECD countries. Non-standard workers are defined as workers not covered by full-time open-ended contracts, i.e. part-time, temporary or self-employed workers, in particular those undertaking new forms of work. The analysis starts with describing the relevant characteristics of non-standard workers, then it depicts related pension issues and details the specific pension rules applying to them. These lead to discussing policy options on how to make pension systems more inclusive given transforming labour markets. The chapter fits into a broader OECD work stream focused on the Future of Work and the Future of Social Protection.

Introduction

Non-standard work is an umbrella term referring to a wide range of jobs. Non-standard workers can be independent contractors who work alone, self-employed workers potentially employing other people, dependent employees working part-time, workers on temporary contracts, casual workers, platform workers and other workers who are not in “standard” employment, i.e. working full-time and on open-ended contracts for a single employer (OECD, 2019^[1]). Depending on the type of non-standard work, working conditions, job security and social protection rules vary considerably, highlighting that non-standard workers are far from being a homogenous group.

Many types of non-standard work raise concerns in terms of social protection in general and pension protection in particular (Chapter 7 in OECD (2019^[1])). In several OECD countries, all or some types of self-employed workers are exempt from enrolling in earnings-related pensions that are mandatory for dependent employees, increasing the risk of low old-age income. In addition, part-time and temporary workers do not have access to the same pension protection as standard workers in some countries.

While the debate on pensions for non-standard workers is not new, the topic is of growing importance. Globalisation, automation and demographic changes transform labour markets at a rapid pace, potentially leading to an expansion of non-standard work. There is a high degree of uncertainty around how labour markets will look in the future, but one possible outcome is that there will be a rising number of non-standard workers. Countries must prepare for this possibility because labour markets can change quickly while policy responses, especially in the area of pensions, are often difficult processes and it can take a long time until their effects become apparent.

The emergence of “new” forms of work raises concerns on how workers engaged in such activities are covered for future pensions. “New” forms of work refer to platform work, very short-term contracts, so-called zero-hour contracts, i.e. contracts with no guaranteed working hours and, more generally, further types of own-account work. Many workers on such contracts have a high degree of flexibility in organising their work, but a low degree of job security and low earnings. Furthermore, governments struggle to organise pension protection for new forms of work; indeed, under such contracts, it is sometimes difficult to define to what extent workers are self-employed or dependent while some related work might remain informal. While new forms of work currently account for a small share of total employment only, they have the potential of becoming a large group of workers in the future.

All types of non-standard work combined, non-standard employment accounts for more than one-third of employment in OECD countries (Section 1). Many workers remain in non-standard employment for a long time. Non-standard workers often earn less than standard workers, face higher unemployment risks and have interrupted pension contribution histories. Moreover, they are less comprehensively covered by pension systems. All these factors add up, possibly leading to low pensions for a large group of older people.

This chapter takes stock of different approaches to organising pensions for non-standard workers in OECD countries. Section 2 sets the scene by summarising labour market trends in non-standard employment, showing that it is not an isolated phenomenon. Section 3 discusses why non-standard work raises pension issues, highlighting that different types of non-standard work pose different challenges. Section 4 describes pension rules for non-standard workers, distinguishing rules for the self-employed, part-time workers and temporary workers. Section 5 examines how pensions for non-standard workers could be improved. Section 6 concludes.

Trends and characteristics of non-standard work

Non-standard work accounts for a considerable share of employment

While full-time dependent employment based on an open-ended contract - referred to as standard work - is the most widespread form of work, non-standard work is relatively frequent and far from being an isolated phenomenon. In OECD countries, about 15% of workers were self-employed in 2017, and 13% and 15% of dependent employees were, respectively, on temporary contracts or worked part-time, i.e. less than 30 hours a week, with half of them working less than 20 hours a week. Some workers combine different dimensions of non-standard work, e.g. working part-time and on temporary contracts. Altogether, non-standard work accounts for more than one-third of total employment in OECD countries.

Part-time work

In many OECD countries, part-time work has been on the rise over the years. In about two-thirds of OECD countries, its share among all dependent employment is higher today than 20 years ago (OECD, 2019^[1]). In addition, short part-time work (i.e. working 20 hours or less per week) had also increased from 6% of dependent employment in 1985 to 9% in 2005 for the 13 countries for which data are available and has remained broadly stable since then. These long-term increases were driven by several factors, including more women entering employment on a part-time basis, changing life-style choices and possibly changing labour demand.

While two out of three part-time workers in OECD countries worked part-time by choice in 2017, one in three would have preferred to work longer hours, implying that they were underemployed (OECD, 2019^[1]). The scope of underemployment varied a lot across countries, from less than 2% of dependent employment in the Czech Republic, Estonia, Japan, Hungary and Turkey to above 10% in Australia, Italy and Spain. Compared to 2006, underemployment increased in two-thirds of OECD countries, from 4.3% to 5.4% of dependent employment on average across countries. While the rise of underemployment was particularly marked in countries that were hard hit by the economic crisis, it cannot be entirely ascribed to temporary fluctuations and high cyclical unemployment, but was also driven by structural changes.

Temporary work

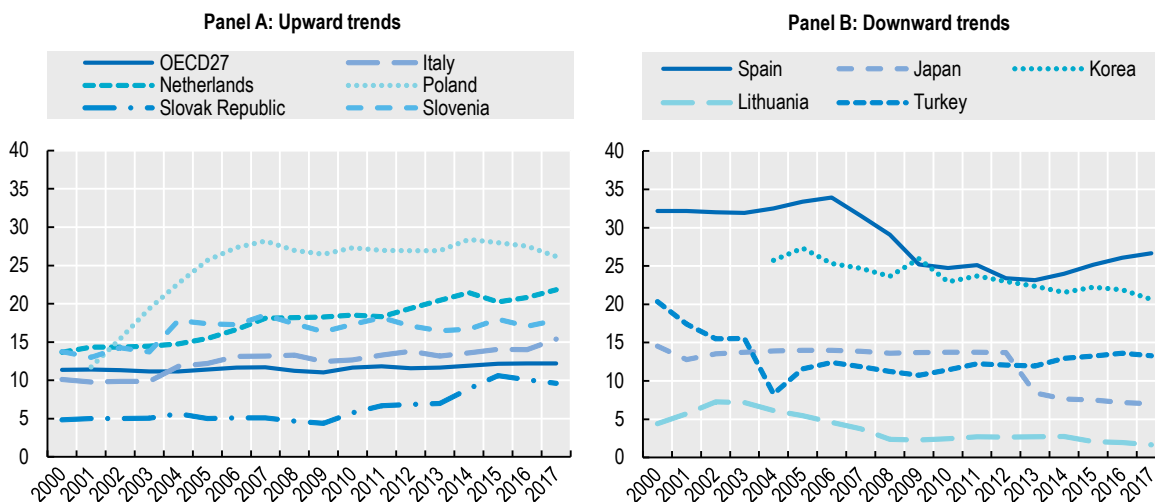
Temporary employment has followed a long-term upward trend. Among the 14 OECD countries for which data are available, it increased from about 10% of dependent employment in the mid-1980s to 13% in 2000 and 14% in 2017. An average increase of 1 percentage point between 2000 and 2017, from 11% to 12%, is also found for a broader group of 27 OECD countries. This long-term trend was caused by both gradual developments and rapid changes.

Temporary employment in Poland boomed during the country's strong economic expansion between 2001 and 2007, increasing from 12% of total employment to 28%, and stabilised at this very high level afterwards (Figure 2.1, Panel A). Other countries reported sustained, albeit less pronounced increases, e.g. Italy, Luxembourg, the Slovak Republic and Slovenia. By contrast, following two decades of record-high levels of temporary employment, the share of temporary contracts in Spain fell from 34% to 26% between 2006 and 2009 (Panel B). Similar declines took place in Turkey and in Japan. In Lithuania, after peaking at 7% in 2002, the share of temporary workers in employment shrank to 2% in 2008 and has remained roughly stable afterwards.

The upward trend of temporary work coincides with decreasing job tenure. When adjusted for changes in the age structure of the workforce, average job tenure decreased by 5%, or almost five months, in OECD countries between 2006 and 2017, especially affecting workers with low education (OECD, 2019^[1]). Yet, the United States is a notable exception as it has experienced an increase in average job tenure over the last two decades, mainly due to a decline in very short employment spells (Pries and Rogerson, 2019^[2]). However, job tenure and the use of temporary contracts have evolved in the same direction over the last decade in Australia, Canada, Estonia, Greece and Lithuania (OECD, 2019^[1]).

Figure 2.1. **Trends in temporary employment differ across countries**

Temporary employment as a share in total employment in selected OECD countries, 2000-17, % of dependent employment



Note: Countries selected based on the outstanding dynamics.

Source: OECD Labour Force Statistics.

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Self-employment

The share of self-employment among total employment declined from 17% to 15% between 2000 and 2017 in OECD countries on average. This drop is not a new phenomenon, but rather the most recent episode of a continuing long-term trend. Several dynamics contributed to this trend. The agricultural sector, for instance, has experienced a significant concentration over the last decades and many formerly independent farmers switched jobs, becoming employees, often in other sectors. By contrast, in the media sector, digitalisation has affected traditional providers by facilitating remote cooperation and has led to a large number of more flexible but less protective freelance contracts.

Decreases in the share of self-employment were particularly strong in countries that were economically catching up, such as Hungary, Korea, Poland, Portugal and Turkey. However, the picture is not uniform and the share of self-employment in total employment increased in some OECD countries, including the Czech Republic, Estonia, the Slovak Republic and the Netherlands. In some cases, clearly identifiable factors explain the increasing trend at least partially, e.g. lower taxes and social-security contributions in the Netherlands (Milanez and Bratta, 2019^[3]) and in Italy (Box 2.1 further below).

Non-standard work is undergoing transformation

Non-standard work is undergoing substantive transformation. In recent years, the decline of some types of self-employment including in agriculture has been partly offset by the emergence and expansion of new forms of non-standard work, in particular jobs relying on new technologies, such as platform-based taxi-like drivers. While today this type of work accounts for only 0.5-3% of total employment in developed countries, it is of considerable importance for young people who rely on new forms of work more frequently than older generations and some of whom seem to set a higher value on work autonomy (OECD, 2019^[1]).

New work arrangements make the boundary between dependent work and self-employment even less clear-cut than it used to be. For example, some self-employed workers are very similar to dependent employees in the sense that they only have one single client, lack financial independence and have limited control over their working conditions, including their work schedule. On average in the OECD, 16% of own-account workers have one predominant client, with the rate ranging from 6% in Denmark to 29% in the Slovak Republic (OECD, 2019^[1]). While having only one client does not necessarily mean that a person is wrongfully classified as self-employed there is the risk that false self-employment is common among such workers. Pension contributions, and more generally social security contributions that are substantially lower for independent workers than for dependent employees might indeed encourage social dumping, with some employers trying to lower their labour costs by outsourcing work instead of hiring dependent workers (Milanez and Bratta, 2019^[3]).

New technologies can help formalise home-based activities that were not classified as formal employment in the past, such as work tasks or gigs performed over internet. Internet platforms have the potential – albeit only marginally exploited for now – of improving the formalisation of independent contractors' work, e.g. by documenting their working hours and actual income, thereby providing a reliable basis for pension contributions. However, the distinction from non-commercial home production can be particularly challenging, for example because some platforms remunerate workers using platform-specific points, gifts or crypto-currencies (Mineva and Stefanov, 2018^[4]).

Within dependent employment, too, new forms of work have emerged and expanded over the last two decades (OECD, 2019^[1]). As is the case with self-employment, more risks are transferred from employers to employees or other parties in these new employment arrangements. In the case of temporary work agencies, an agency hires workers and assigns them to a user firm. Thus, contrary to most platform work, an employment contract exists, but the employer role is divided between an agency and an actual principal. On-call and zero-hour contracts do not guarantee working hours, implying that a worker's monthly income is unpredictable. Such contracts exist in some OECD countries, including Australia, Ireland, the Netherlands, New Zealand and the United Kingdom.

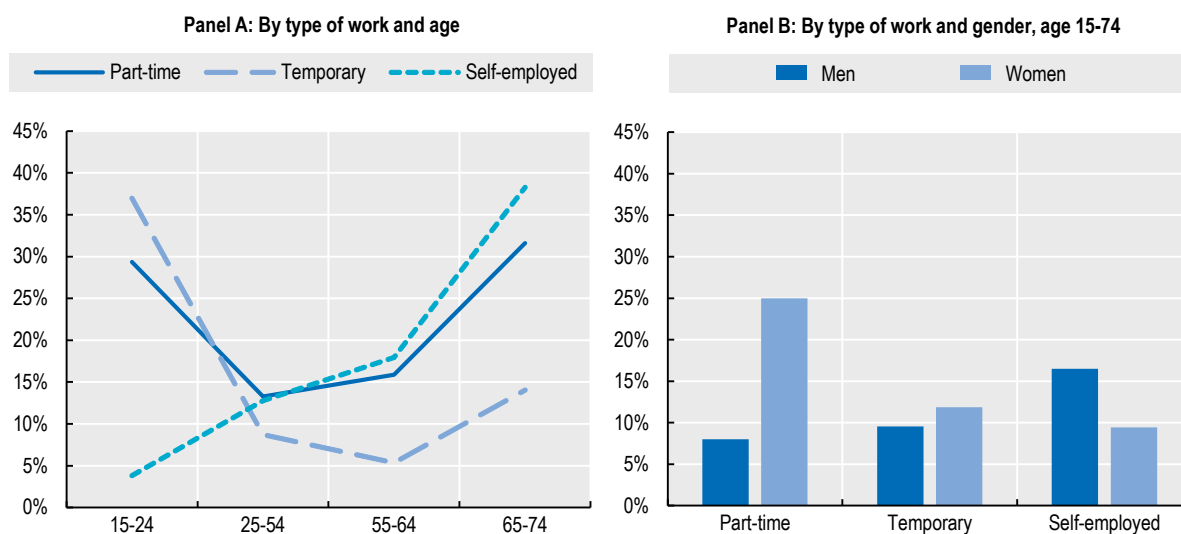
Non-standard work is frequent among workers over 65 and women

Non-standard work is common among older workers. While overall employment rates decrease at older ages, the share of non-standard work is particularly high among workers over 65: only about 15% of workers between 65 and 74 are in standard employment, against more than 60% at ages 55-64 and 25-54 (Figure 2.2, Panel A).

One-third of workers aged 65-74 are employees working part-time, compared to 16% among 55-64 year-olds and 13% among 25-54 year-olds. Part-time work enables older workers to gradually withdraw from the labour market, especially when reduced earnings are offset by full or partial pension benefits (OECD, 2017^[5]). Still, combining work and pensions is uncommon across OECD countries: more than 5% of people aged 60-69 combine work and pensions in Denmark, Estonia, Israel, Sweden, Switzerland and the United States only (OECD, 2019^[6]). In contrast to part-time work, temporary employment is not particularly common among older workers, with only 5% of 55-64 year-old and 14% of 65-74 year-old workers working as employees on temporary contracts, against 9% among 25-54 year-olds and 37% among 15-24 year-olds.

Figure 2.2. **Self-employment and part-time employment are more common among older workers**

% of employment, average across 26 OECD countries, 2018



Note: For temporary and part-time employment data are shown for the 65+ instead of the 65-74 age-group due to data availability. Definitions of part-time work differ slightly between OECD and Eurostat. Source: Eurostat.

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Self-employment, too, is frequent among older workers. Many self-employed only become independent workers at later stages of their career, which is one factor explaining why the self-employed tend to leave the labour market later than other types of workers. The share of self-employed workers in total employment is 38% among the 65-74 year-olds, compared to 18% among 55-64 year-olds and 13% among 25-54 year-olds (Figure 2.2, Panel A). A further reason why the self-employed work longer is that they are less directly affected by legal and institutional obstacles to longer working lives, such as mandatory retirement ages and workplace pressure to retire at a specific age, which is common for example in Korea (OECD, 2018^[7]). Seven in ten self-employed workers in the United States

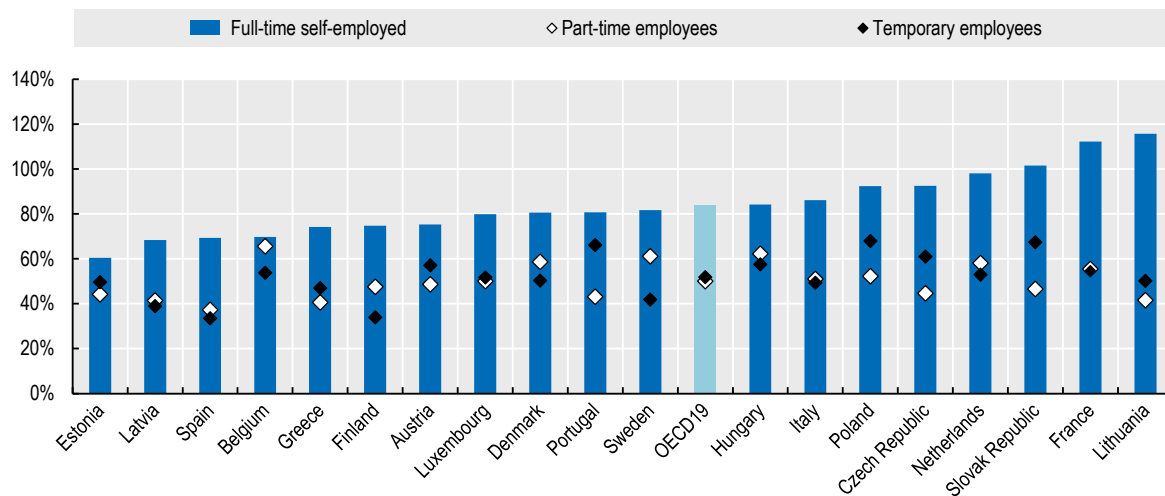
expect to retire after age 65 or not at all and six in ten plan to work in retirement (Transamerica, 2019^[8]). Self-employment enables a smooth transition from work to retirement because it allows workers to reduce working hours at their own discretion.

Non-standard work is also common among women, in particular part-time work. One reason is that part-time work enables to reconcile care and work responsibilities and care tasks are still today mostly carried out by women (OECD, 2017^[9]). Part-time work is three times more frequent among working women than among working men, and one in four working women works part-time in the OECD (Figure 2.2, Panel B). Part-time work may compromise career prospects, however, and be an obstacle to the economic independence of women within families (OECD, 2019^[10]). By contrast, self-employment is more frequent among men.

Non-standard work generates low earnings and is often persistent

Non-standard workers have, on average, lower earnings than full-time employees on permanent contracts. Across the 19 OECD countries for which data are available, part-time and temporary workers earn around 50% less per year than full-time workers, with the difference being much wider in some countries such as Latvia and Spain (Figure 2.3). The difference is due to a lower hourly pay, a lower number of hours worked (e.g. part-time workers) and employment breaks (e.g. temporary workers). When controlling for employee's and employer's characteristics, OECD (2015^[11]) finds an hourly wage penalty of 12% for temporary workers.

Figure 2.3. Non-standard workers earn substantially less than standard workers
Annual median gross labour income of non-standard workers relative to standard workers, 20-60 year-olds, 2016



Note: Full-time self-employed and part-time workers are only included in the calculation if they have been in the same employment status for at least 12 months. They are compared to dependent employees working full-time over the past 12 months. Median income of temporary workers is compared to the income of the permanent workers. Income refers to yearly total cash income. Only observations with positive income are included.

Source: EU-SILC, 2017.

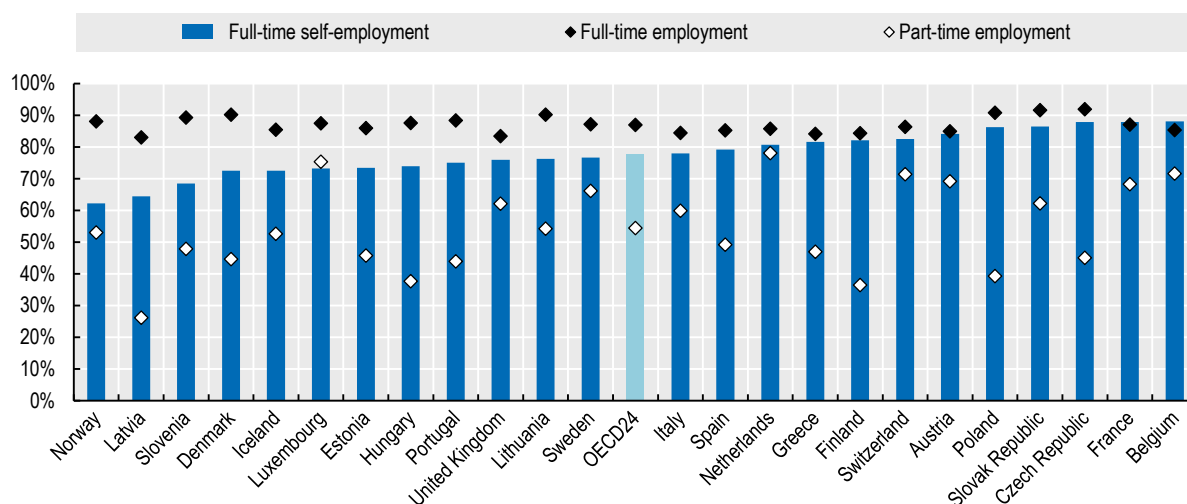
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Median full-time self-employed workers earn 16% less than full-time employees on average across OECD countries, but there is substantial variation across countries.¹ In Estonia, Latvia and Spain median full-time self-employed workers earn less than 70% of a

median full-time dependent worker's wage while in France, Lithuania and the Slovak Republic, they earn more than 100% of it.

In many cases, non-standard employment is not a short episode interrupting a worker's career in standard employment. On average across the OECD, 87% of standard employees remain (or are again) standard employees within a two-year timeframe, while 78% of full-time self-employed workers and 54% of part-time workers keep their employment status (Figure 2.4).² OECD (2015^[11]) points out that even when controlling for other characteristics, the transition rates from temporary to permanent work often remain below 50% over three years. In many countries, temporary work improves chances to find a permanent position while this is less often the case for self-employment and part-time work.³

Figure 2.4. Non-standard work can be a long employment spell
Probability of remaining in a given working category over 2 years, 22-55 year-olds



Note: Based on the variable PL031: Self-defined current economic status.
Source: Longitudinal EU-SILC 2017.

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Combining independent with dependent employment is common

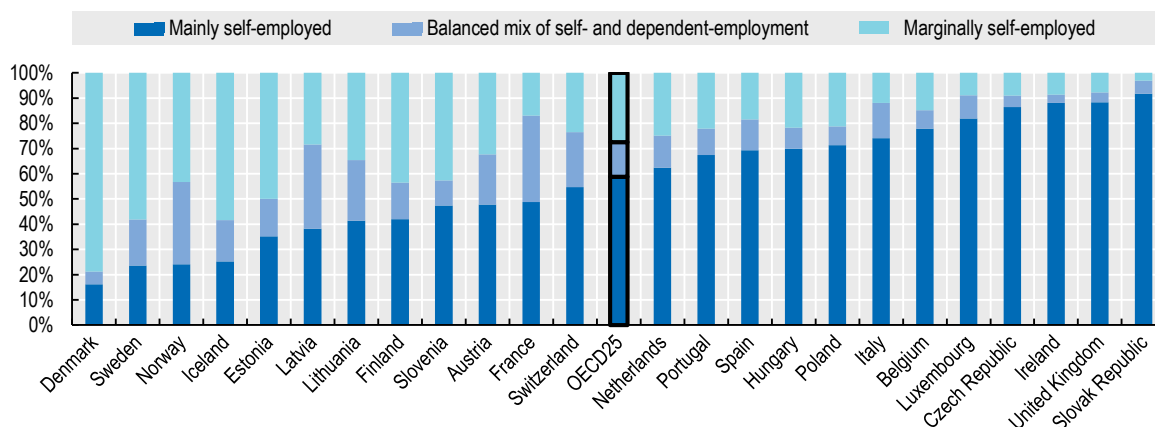
Self-employment is not the only source of earnings for many self-employed workers. Self-employment represents more than two-thirds of earnings for 59% of people with any income from self-employment in a given year on average across countries (Figure 2.5).⁴ For 14% of them, income from dependent and independent work are similarly important and for 27% self-employment is rather a supplementary activity, providing less than one-third of their total earnings.⁵

Why does non-standard work raise pension issues?

Current pension outcomes for non-standard workers can be enhanced in many countries. Improving pension rules for these workers is challenging, however. Compared to full-time employees on open-ended contracts, non-standard workers have a number of characteristics that make their pension treatment complex. The self-employed, in particular, are the group that raises the most serious issues in terms of pension coverage

Figure 2.5. **Combining self- and dependent employment is common in many countries**

As % of workers receiving yearly income from self-employment, 2015



Note: Data based on the yearly income from self-employment (PY050) and dependent employment (PY010). Mainly self-employed category stands for the self-employed workers who receive at least 2/3 of their total yearly income from self-employment and less than 1/3 from dependent employment. Balanced mix of self-and-dependent employment means that at least 1/3 of total labour income is coming from either source; marginally self-employed means that the income from self-employment was lower than a third of total labour income.

Source: EU-SILC, 2016.

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because, in contrast to other types of work, they do not have a formalised employment relationship (employment contract) that can be used as a verified basis for pension contributions. The emergence and expansion of new forms of work has amplified the pension issues related to non-standard work, especially among low-income earners. As most pension systems were built on the premise of stable, linear careers, the development of new forms of work raises concerns about old-age income prospects of future generations of retirees.

Temporary and part-time contracts raise challenges for pension adequacy

Temporary contracts often provide employment protection less comprehensively than open-ended contracts and temporary workers less often reach job tenure needed to benefit from the full protection. It is generally relatively easy and cheap for employers to end a fixed-term contract upon its term - i.e. not to renew it - while they have to comply with notice periods and make severance payments when they lay off workers on permanent contracts. In many countries, people out of employment continue to acquire pension rights as long as they receive unemployment benefits. While this instrument cushions the effect of job losses on pensions, it is only partially effective for temporary workers. Due to frequent job changes and job losses, temporary workers tend to have comparatively short employment tenure, often resulting in shorter unemployment benefit durations or restricted access to unemployment benefits.

More directly, short employment spells bear the risk that workers do not fulfil the minimum number of working days required to credit work periods (often a month or a quarter) towards entitlements to contribution-based pension benefits. In addition, some types of temporary contracts in several countries do not generate pension entitlements.⁶ In particular, agency work, casual work, seasonal work and traineeships are excluded from pension coverage in some countries despite being covered by employment contracts.

Frequent job changes within temporary employment also result in lower occupational pension coverage. Pension vesting periods can have negative effects on the pension rights of temporary workers because of their short tenure. Due to a lack of portability, work spells at different companies do not always add up, and frequent job changes lead to lower pension entitlements. In addition, entitlements can be paid out as a lump sum upon contract termination (Chapter 3), defeating the purpose of offering protection in old age.

Part-time work, too, poses pension challenges. In some cases, part-time work leads to full crediting of contribution periods. In others, periods of part-time work are not taken into account for calculating pension entitlements, and, in particular in some countries, validating a specific period requires working a minimum number of hours or earning a minimum level of income. Such exclusions increase the risk that workers fail to meet the eligibility conditions both for first-tier contributory and earnings-related pensions, or that they only meet them if retiring at older ages.

Both temporary and part-time work are often associated with low income, e.g. due to more time out of employment or fewer hours worked. Low income during the working life spills over to low old-age income. Moreover, weak workplace attachment due to temporary contracts and part-time work reduces the opportunities to acquire job-specific skills and limits access to job-level training. As a result, low earnings are associated with more patchy careers and shorter total contribution periods, which additionally lowers retirement income for low-earners (Valdés-Prieto and Leyton, 2019^[12]). Hence, contribution-length requirements of 10 or more years to access earnings-related pensions can substantially reduce pensions of non-standard workers with low earnings.

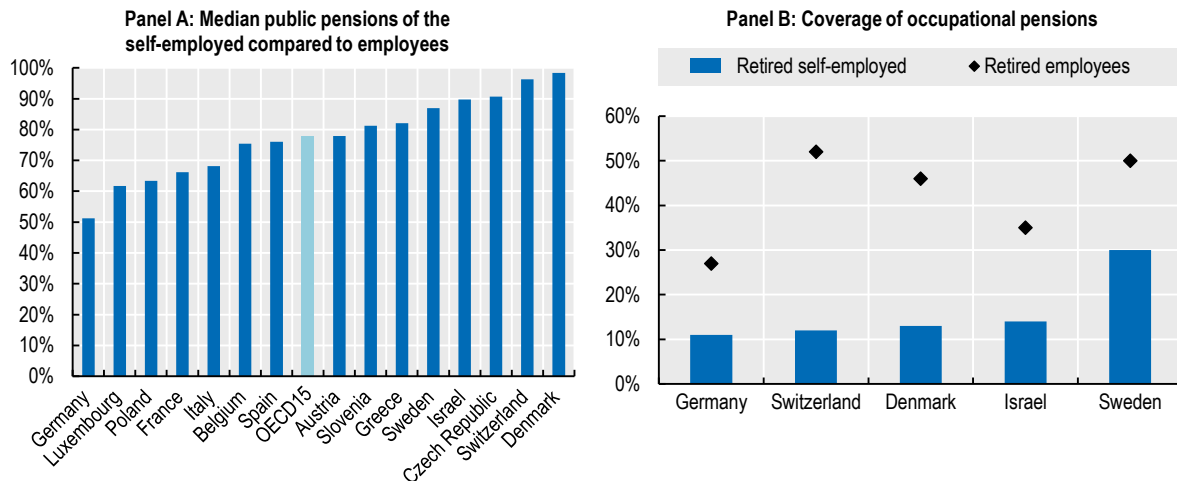
The self-employed have lower pensions than employees

Former self-employed tend to have lower public pensions than former employees.⁷ On average across 15 OECD countries, the retired self-employed receive, at the median, 22% lower public pensions than retired employees (Figure 2.6, Panel A). The gap is much smaller, typically below 10%, in countries with substantial basic pensions, such as the Czech Republic, Denmark, Israel and Switzerland. By contrast, retirees who were self-employed in France, Germany, Italy, Luxembourg and Poland have median pensions that are more than 30% lower than among former employees.

The lower public pensions of the self-employed are not offset by more private occupational pensions. The former self-employed receive occupational pension from either dedicated schemes or from entitlements earned as dependent workers. In all five countries with private occupational pension coverage of at least 10% of pensioners in the SHARE survey, namely Denmark, Germany, Israel, Sweden and Switzerland, coverage rates among retirees are much larger among former employees than among former self-employed (Figure 2.6, Panel B). Occupational private pension coverage among former self-employed workers is highest in Sweden, at 28%.⁸ The low coverage of self-employed workers widens the income gap between the self-employed and employees upon retirement.

Partly as a result of lower public pensions and lower coverage by occupational schemes, the former self-employed tend to have lower old-age income than former employees in many countries. The median retired self-employed has a disposable income that is, on average in the 14 OECD countries for which data are available, 16% lower than that of retired employees (Pettinicchi and Börsch-Supan, 2019^[13]).⁹ It is more than 20% lower in Finland, France, Poland and Spain.

Figure 2.6. **Retired self-employed individuals receive lower public pensions and are less often covered by private occupational pensions**



Note: Population 50+, 2017 or 2015. Coverage of occupational pension not shown if lower than 10% among retired employees.

Source: OECD computations based on data of Pettinicchi and Börsch-Supan (2019^[13]), originally computed with the SHARE survey data.

StatLink <https://doi.org/10.1787/888934040908>

In the majority of countries, the income gap between the self-employed and employees is wider among retirees than among older workers (older than 50 years). On average across countries, it equals 6% among workers (at the median) against 16% among retirees as discussed above, a gap of 10 percentage points. In Italy and Spain, the gap is more than 30 percentage-point larger among current retirees than among current workers.¹⁰ This seems paradoxical given that redistributive mechanisms in pension systems aim to reduce inequalities in old age. Among possible explanations is the fact that the self-employed contribute less to pensions (see further on in this section).

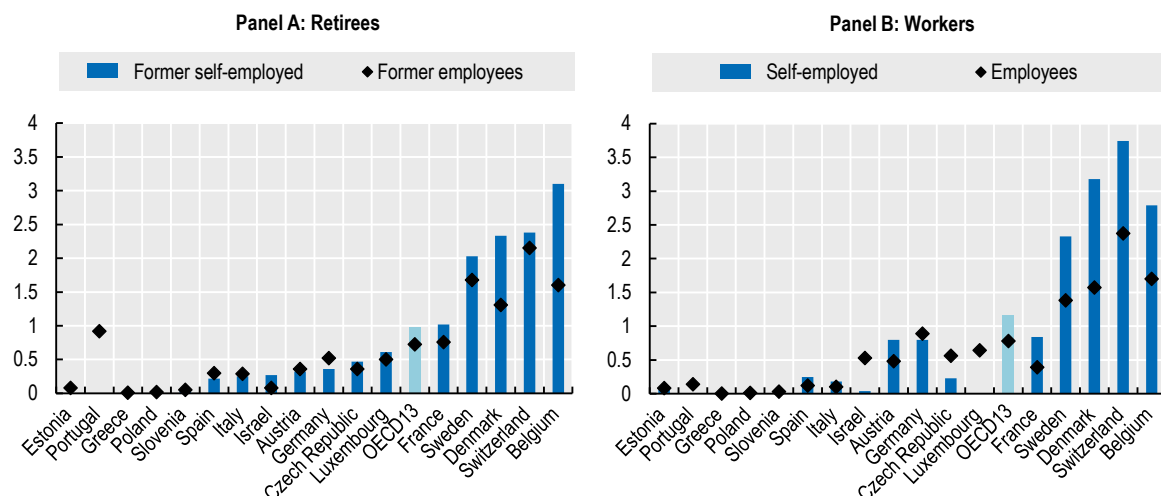
Wealth does not outweigh lower pensions for most of the self-employed

One common argument for a lower level of needed protection from mandatory pensions for the self-employed is that they have more private saving, e.g. liquid savings or capital invested in their business. However, while the situation can vary greatly among the self-employed, the median assets of the self-employed are only slightly higher than the median assets of employees. This pertains even to retired former self-employed who have typically already liquidated the capital they had invested in their businesses.

Compared to the median (in terms of assets) employee, the median self-employed has a higher net liquid assets¹¹ to annual income ratio, both when working (1.2 against 0.8) and after retirement (1.0 against 0.7), on average in the OECD (Figure 2.7). These numbers mean that the liquid assets of a median retired self-employed equal 12 months of retirement income, compared to 9 months for employees. Retired self-employed have relatively more assets than retired employees in 10 of the 17 covered countries, but their additional assets correspond to more than 12 months of income only in Belgium and Denmark; hence, the impact on the capacity to finance consumption over the whole retirement period is not substantial in most countries (Panel A). Moreover, while active, the self-employed have higher assets-to-income ratios than employees in all countries shown in Panel B except the Czech Republic, Germany and Israel, whereas differences are smaller among retirees.

Figure 2.7. The self-employed have slightly more assets than employees when they retire

Median liquid assets-to-income ratio, annual income, workers 50+, 2017 or 2015

Source: OECD computations using data of Pettinicchi and Börsch-Supan (2019^[13]), statistics computed with the SHARE survey data.StatLink <https://doi.org/10.1787/888934040927>

Evidence from the United States suggests that among business owners, including sole proprietors, voluntary pension savings and house ownership are complement rather than substitute: business owners are more likely to participate in voluntary pension plans if they own a house (Lichtenstein, 2010^[14]). As a result, retired self-employed workers with low pensions are also less likely to dispose of assets in the form of housing, making them a financially vulnerable group. Many former self-employed workers do not dispose of a sufficient level of assets to offset low pension entitlements and to justify exempting them from enrolling in pension schemes.¹² Furthermore, in the Netherlands, more frequent home ownership among the self-employed than employees cushions only partially the impact of lower pensions on consumptions.¹³

The self-employed contribute less to old-age pensions than employees

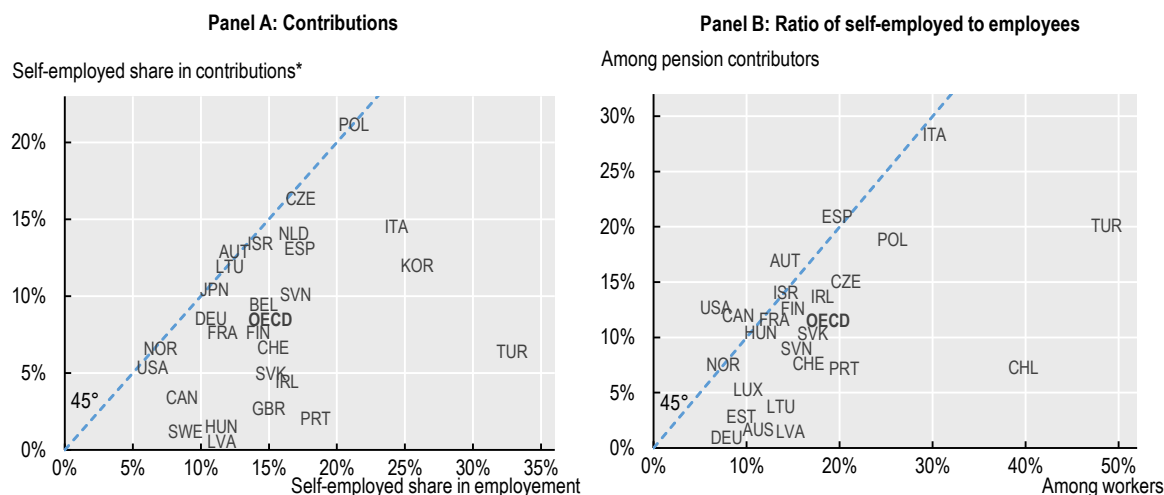
In many countries, the self-employed are less comprehensively covered by mandatory pensions than dependent employees. A range of indicators suggests that the self-employed pay lower pension contributions than employees with similar earnings. In many countries, the share of social-security contributions paid by self-employed workers in total contributions is much lower than the share of self-employment in total employment (Figure 2.8, Panel A) - including informal self-employed workers and employees - which cannot be explained by differences in contributions to unemployment insurance. The stark differences suggest that there is a substantial public pension coverage gap between the self-employed and employees.

The share of contributions paid by the self-employed is less than half the share of self-employment in total employment in Canada, Hungary, Ireland, Korea, Latvia, Portugal, the Slovak Republic, Sweden, Switzerland, Turkey and the United Kingdom. In Italy, Korea and Turkey, where the self-employed account for about one-quarter of total employment or more, coverage gaps are likely to affect a particularly large number of people, leading to lower pensions for many in the future. In countries with contribution-based basic pensions, such as Ireland and the United Kingdom, there is no close link between the

amount of contributions and entitlements and the impact on future pensions is likely to be smaller.

Figure 2.8. The self-employed contribute little to social security systems

Share of social-security contributions paid by the self-employed* vs share of self-employment in total employment** in 2015, and ratio of self-employed to employees in administrative vs survey data** in 2017



Note: Country-specific information is available in the statlink below. (*) Share of contributions paid by self-employed includes also the contributions paid by non-working individuals in some countries, as only this aggregate is available. (**) The numbers of the self-employed and employees are based on the (LFS) survey data which means that they account for informal work as opposed to the administrative data for these categories.

Source: Information provided by countries, OECD Tax Revenue and OECD Labour Force Statistics.

StatLink  <https://doi.org/10.1787/888934040946>

A low number of contributors towards pensions is a second measure hinting to contribution gaps among the self-employed. This measure has the advantage of covering pensions only (rather than social security), but is available for a limited number of countries. The ratio of the self-employed to employees is typically considerably lower among contributors than among all workers; the difference is particularly large in Chile, Latvia, Portugal and Turkey (Panel B). In these countries, the low number of self-employed workers contributing to the pension scheme is likely to be the main reason for contribution gaps, i.e. a lot of self-employed workers do not contribute to earnings-related pensions at all. Conversely, the number of contributors does not show substantial gaps in Canada, Ireland and Hungary, suggesting that contribution gaps are primarily driven by lower contributions per contributor.

Further evidence from OECD countries suggests that the self-employed pay comparatively low levels of pension contributions. In Poland, the Slovak Republic, Slovenia, and Spain, 70% or more of the self-employed pay only compulsory minimum pension contributions (Spasova et al., 2017_[15]). In the United Kingdom, 27% of full-time self-employed men had active pension accounts in 2012-13, compared to 51% of full-time male dependent employees (D'Arcy, 2015_[16]).

A high degree of discretion in setting the contribution base, no requirement to participate in earnings-related pension schemes, reduced incentives to participate in voluntary schemes and potentially lower contribution rates are the most important factors explaining why many self-employed workers pay lower pension contributions than dependent workers. In some cases, lower contributions for the self-employed are the result of policies aimed at increasing total employment, promoting entrepreneurship, raising labour income of some occupational groups such as farmers or increasing incentives to work as a self-employed by raising take-home pay.

Lower pension contributions for the self-employed are sometimes justified as a way to reflect the specific preferences of the self-employed to manage their own finances (including old-age savings) and/or remain outside of standard pension schemes (Karpowicz, 2019^[17]). The self-employed also tend to have a lower degree of risk aversion (Ekelund et al., 2005^[18]; Colombier et al., 2008^[19]). These preferences might be related to limited confidence in public pensions (ISSA, 2012^[20]). In some countries, such as Germany and the Netherlands, the self-employed have opposed against being integrated into employee pension schemes (Kautonen et al., 2010^[21]).

However, the consequences of low contributions might be severe, both today and in the future. Lower contributions first deteriorate the finances of PAYGO schemes in many OECD countries. In the future, low contributions typically translate into low old-age income and to greater reliance on non-contributory benefits, which in turn adds to the fiscal pressure stemming from population ageing. Furthermore, lower pension contribution rates for at least some types of the self-employed might create financial incentives for companies to hire independent workers instead of hiring standard workers, raising concerns regarding false self-employment and social dumping (Box 2.1).

Minimum pensions and contributory basic pensions play a key role in preventing and alleviating old-age poverty. In most cases, the amount of contributions to these schemes does not increase entitlements. In such a situation, the incentives to reduce contributions through underreporting of income are strong: it is easier for some categories of workers to do so, in particular self-employed workers.¹⁴

Integrating the self-employed into employees' schemes is challenging

Integrating the self-employed into employees' pension schemes is challenging in practice. Pension contributions for employees are often based on their gross wage, which does not correspond to any category of a self-employed worker's earnings (Figure 2.10). Gross wages are the sum of employee contributions, related personal income taxes and net wages after tax. They are lower than total labour costs from the employer perspective, as labour costs include employer contributions. By contrast, the total revenue of the self-employed includes gross labour and capital income (before contributions and taxes) as well as work-related expenses and material costs.

For the self-employed, labour and capital income are usually indistinguishable. Some countries artificially separate labour and capital income based on "theoretical wages" (e.g. Finland), but calculation rules for the latter are highly discretionary. Norway and Switzerland allow deducting interests on capital outlays to determine the relevant income for pension contributions. Many countries allow the self-employed either to decide themselves the part of their income that corresponds to labour income or to set contribution bases freely within some limits. Apart from pensions, separating wages from

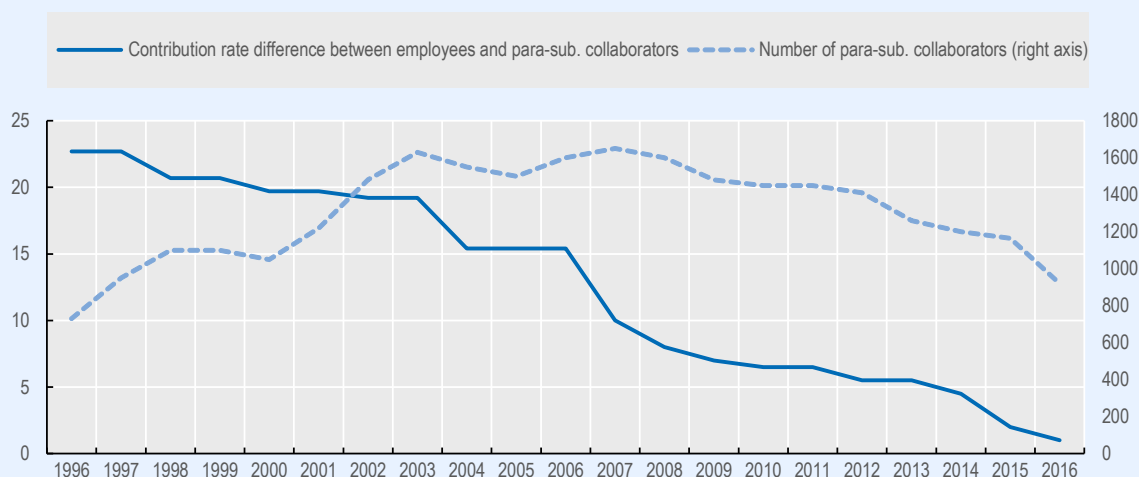
Box 2.1. Do lower pension contributions for the self-employed erode standard employment?

When pension contributions, and social security contributions more generally, are lower for the self-employed than for workers in standard employment, companies may face financial incentives to outsource tasks to independent contractors rather than hiring dependent employees and paying employer contributions. Similarly, workers might opt for higher net wage at the cost of lower protection. This problem has lately become an important topic in the public policy debate and there is controversy around the social protection of workers in such activities, e.g. food delivery drivers.

This phenomenon is not new, however. In Italy, so-called para-subordinate collaborators used to pay substantially lower pension contributions than standard employees for many years, including in cases where they depended significantly or even exclusively on one single contractor. Lower pension contribution rates may have contributed to a quickly growing number of para-subordinate collaborators in Italy in the late 1990s and early 2000s. In order to remove incentives to make excessive use of para-subordinate employment and in an attempt to combat false self-employment, the Italian government gradually increased contribution rates for para-subordinate collaborators over time, along with other policy measures, such as stricter controls to detect false self-employment and more limitations to the use of para-subordinate collaborators. The measures seem to have been effective. After peaking around 2007, the number of para-subordinate collaborators has fallen sharply, by about 40% between 2007 and 2016.

Figure 2.9. **Para-subordinate collaborators in Italy**

Pension contribution-rate difference between employees and para-subordinate collaborators, and number of para-subordinate collaborators (in 1000s)



Source: OECD (2018)_[22]

StatLink  <https://doi.org/10.1787/888934040965>

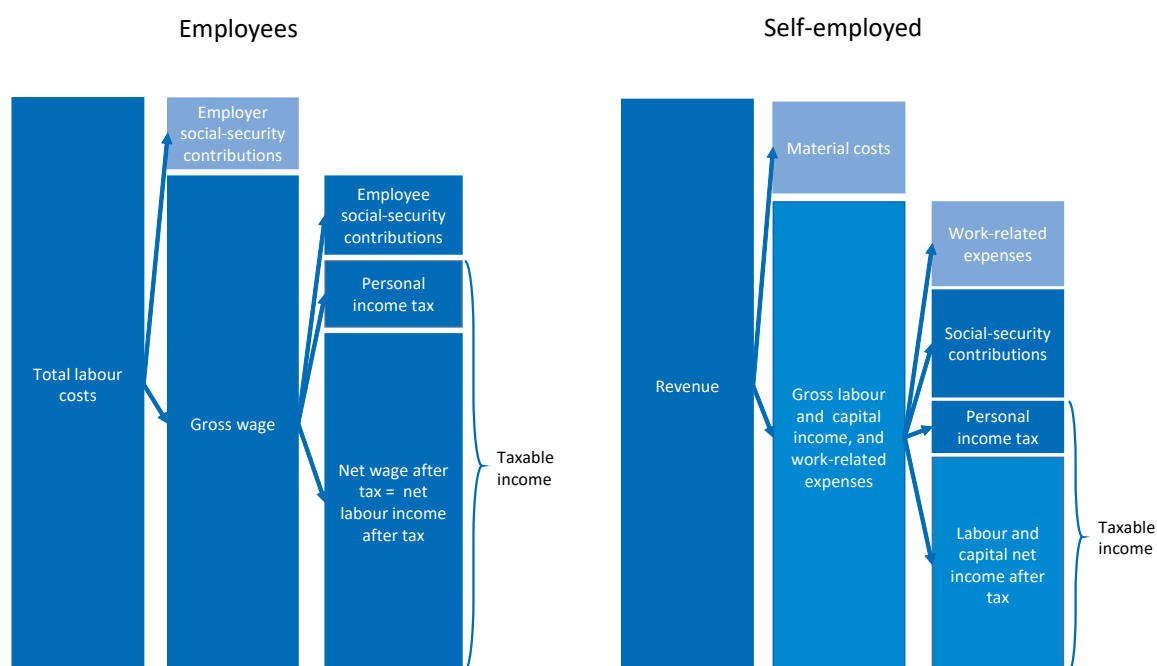
profits poses challenges for tax policies as both are often taxed differently with capital income being often taxed less than labour income (OECD, 2009_[23]; OECD, 2015_[24]).¹⁵

Fully harmonising the pension contribution base between dependent and self-employed workers would thus require either paying contributions on total personal income or precisely separating labour from capital income of the self-employed. The first case implies that contributions would also be paid on returns from savings, including savings from labour income. This would require a profound transformation of employee pensions. In the second case, separating the sources of income without any discretion seems infeasible at least for some groups of self-employed workers. Hence, in general,

harmonisation requires leaving the self-employed with some degree of flexibility in determining labour and capital shares.

A separate issue relates to contributions. Applying the full contribution rate for standard employment (i.e. the sum of employers' and employees' contributions) to self-employed workers' total revenue or their gross income would result in higher total contributions than for employees with the same taxable income. Conversely, applying it only to income net of contributions (before tax) would lead to lower contributions paid by the self-employed.

Figure 2.10. **Earnings of employees and the self-employed are not easily comparable**



Source: OECD

Income validation, bargaining power and income variability

The self-employed do not have a (distinct) employer, which results in additional complications in designing pensions. First, paying both employee and employer contributions to mandatory pensions may lead to the perception that contributions are a bigger financial burden for the self-employed than for employees, as employer contributions for the latter are less directly visible.

Second, there is thus no employer to validate the income of the self-employed, making it harder to prevent income underreporting (i.e. at least partial informality) and low contributions. Evidence from Spain, for instance, suggests that income underreporting is much more common among the self-employed than among employees (Martinez-Lopez, 2012^[25]). Findings from other countries confirm that the self-employed often underreport their earnings (Hurst, Li and Pugsley, 2010^[26]; Bucci, 2019^[27]). In the United States, a 2018 survey found that 32% of self-employed admittedly underreport their income for tax purposes (Bruckner and Hungerford, 2019^[28]). Moreover, the inclination towards informality might be magnified when working with or through the internet platforms, especially if the platforms are based abroad and do not report any transaction data to

domestic authorities. In some cases, however, the self-employed might be tempted to choose higher contribution base. For example, in the defined benefit schemes that relate the benefit amount to earnings from the last years before retirement - as opposed to career-long earnings - the self-employed might choose high contribution bases in the last years of their careers to inflate their pensions. For this reason, Spain limits the ceiling to freely-declared contribution base for people at age 47 or older who chose a lower contribution base previously. Furthermore, it is usually not possible to objectively measure a self-employed worker's working time, implying that hourly wages cannot be calculated in any reliable way. When entitlements to minimum pensions and access to mandatory earnings-related schemes depend on working time, the rules in place for dependent employees cannot be extended to the self-employed without modifications.

Third, stable earnings are one component of an employee's employment contract because employers carry most of the risks, such as the risk of fluctuating demand. As they bear all the risks, the income of self-employed workers is often subject to substantial variation. As a result, they reach floors and ceilings of pensionable earnings more erratically. Depending on pension rules, income below the floor results in either not paying any contributions and not gaining any entitlement or in paying the minimum contribution; the latter leads to a high effective contribution rate and potentially to liquidity problems. Conversely, exceeding the contribution ceiling results in a lower effective contribution rate.¹⁶

Pension rules for non-standard forms of work

Pension rules often provide less comprehensive coverage for non-standard than for standard workers. This section gives an overview of how pension systems integrate non-standard workers, highlighting that there are major differences across countries. It discusses the rules for the self-employed, part-time workers and temporary workers and summarises recent policy changes.

Self-employment

Coverage and scope

The pension coverage of the self-employed varies considerably across OECD countries. While most countries require the self-employed to participate in earnings-related pension schemes, the self-employed contribute in a similar way as employees in only ten countries (Table 2.1, first column). Even in these countries, insufficient compliance with pension rules may undermine pension coverage. In Korea, for example, the majority of the self-employed is not covered by public pensions despite their legal obligation to join the public pension scheme (Kim and Lee, 2012^[29]).

In eighteen countries (second to fourth column), self-employed workers are mandatorily covered by earnings-related schemes, but pension coverage is somehow limited because they are allowed to contribute less than employees through reduced contribution rates (second column), a high degree of discretion in setting their income base, which often results in only minimum contributions being paid (third column), or minimum income thresholds below which they are exempt from contribution obligations (fourth column). In Australia, Denmark, Germany, Japan, Mexico and the Netherlands, the self-employed are, in contrast to employees, not required to join earnings-related schemes - the same used to be the case in Chile and Israel, too, but earnings-related schemes have recently become mandatory for self-employed workers.¹⁷ Finally, in Ireland and the United Kingdom, the self-employed

participate in contributory-based basic schemes on similar terms as employees while the earnings-related schemes are voluntary for all types of workers.

As for voluntary pensions, most countries grant the self-employed access to voluntary private pensions with tax advantages, in line with the situation of employees. In order to compensate for lower coverage in mandatory schemes, the cap for tax-exempt contributions to voluntary schemes is higher for the self-employed than for employees in Belgium, France, Japan and Switzerland. In addition, Belgium, France, Germany, Luxembourg and Japan set up specific voluntary pension programmes for at least some groups the self-employed, which benefit from tax-deductions and subsidies. In New Zealand, Poland, Turkey and the United Kingdom, employees are automatically enrolled in workplace pensions, from which they can opt out, while the self-employed are not (Chapter 3).¹⁸

Table 2.1. Self-employed workers do not fully contribute to (quasi) mandatory pensions
Contributions requirements to mandatory and quasi-mandatory pensions for the self-employed, OECD countries

Mandatory or quasi-mandatory contributions to earnings-related schemes				Mandatory contributions to basic pensions only	No mandatory pension contributions
Employee-like	Reduced contribution rate	Only flat-rate contributions mandatory	Regular contributions mandatory only above income threshold		
Canada	Austria	Poland	Austria	Ireland*	Australia
Czech Republic	Belgium	Spain	Chile	Japan	Denmark
Estonia	France	Turkey	Finland	Netherlands	Germany
Greece	Chile		Latvia	United Kingdom*	Mexico
Hungary**	Iceland		Slovak Republic		
Korea	Israel		Turkey		
Lithuania**	Italy				
Luxembourg	Latvia				
Slovenia**	Norway				
United States	Portugal				
	Sweden				
	Switzerland				

Note: Employee-like means that self-employed are covered by the same or equivalent schemes as employees, have the same contribution rates and thresholds, and that their contributions are income based. (*) In Ireland, and the United Kingdom neither self-employed nor dependent workers are covered by mandatory or quasi-mandatory earnings-related schemes but basic pensions are financed with contributions. (**) In Hungary, Lithuania and Slovenia, some self-employed workers operating under specific legal forms pay only flat-rate contributions. Additional country-specific information is available in the statlink to Figure 2.11.

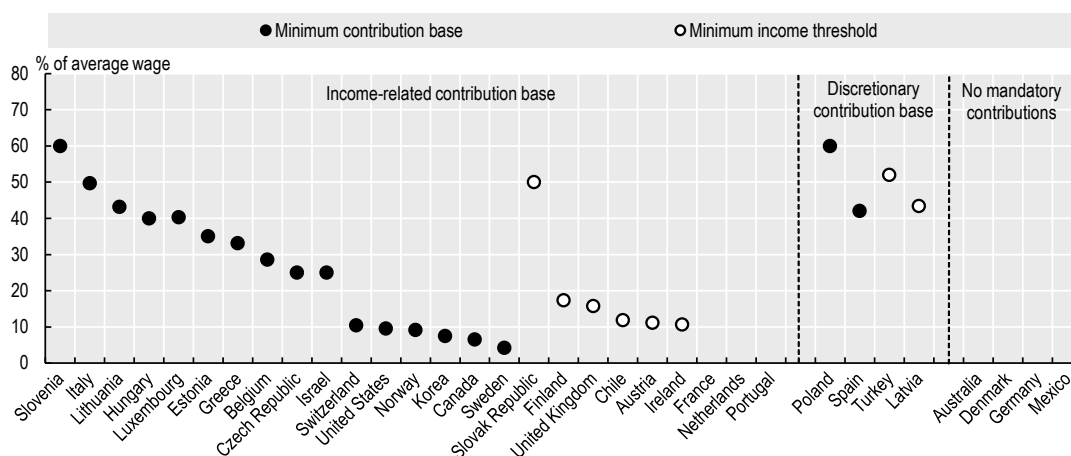
Source: Information provided by countries, MISSOC (2018_[30]), Spasova et al. (2017_[15]) and SSA (2018_[31]).

Pension and social security contribution base

Even when pension rules, for a given contribution base, are similar for dependent employees and self-employed workers, pension contributions can differ substantially. The contribution base, i.e. the earnings taken into account to calculate contributions, is not identical for both types of workers. For dependent employees, pension contributions are usually paid on gross wages, which are equal to total labour costs minus the employer part of social security contributions. For the self-employed, there is no genuine equivalent of gross wages (Section 3).

Most countries use some income-related measure as the contribution base for the self-employed (Figure 2.11). Depending on countries, this measure is income either before or after deducting social security contributions. A number of countries apply the contribution rate to a fraction of income only, e.g. 50% in the Czech Republic, 67% in the Slovak Republic, 75% in Slovenia and 90% in Lithuania.

Figure 2.11. **Contribution base for mandatory pensions for the self-employed in OECD countries**
2019 or latest available



Note: Iceland, Japan and New Zealand are not shown in the figure. Iceland fixes contribution bases depending on occupation, making contributions only loosely dependent of actual income. Exemptions from paying contributions on these pre-set bases require approval by the Directorate on Internal Revenue (OECD, 2018^[7]). In Japan, contributions are flat-rate payments, i.e. setting an income base is not necessary. In New Zealand, no mandatory pension contributions exist, neither for employees nor for the self-employed. Additional country-specific information is available in the statlink below.

Source: Information provided by countries, MISSOC (2018^[30]), Spasova et al. (2017^[15]) and SSA (2018^[31]).

StatLink <https://doi.org/10.1787/888934040984>

Most self-employed workers in Latvia, Poland, Spain and Turkey as well as some self-employed workers operating under specific legal forms in Hungary, Lithuania and Slovenia are subject to mandatory pensions but have a high degree of discretion in choosing their income base within given brackets. Finland also provides a high degree of discretion in setting contribution bases but with an additional, hard-to-verify restriction: the contribution base should correspond to a wage that would be paid if the work of the self-employed was carried out by another, equally competent person in place of the self-employed. A high degree of flexibility bears the risk of low contributions regardless of true earnings, e.g. due to financial short-sightedness.¹⁹ In a third group of countries, as shown in Table 1.1, pension contributions for the self-employed are not mandatory (Figure 2.11).

Most countries set minimum contribution bases or minimum income thresholds (Figure 2.11).²⁰ Minimum contribution bases are minimum amounts to which pension or social security contributions for the self-employed apply, even if true income is lower. Minimum contribution bases prevent the self-employed from contributing very low amounts, but they also imply that the effective contribution rate is high for earners below the threshold. To mitigate this drawback, Poland allows the self-employed to lower their contributions for a limited period if their revenue is low. Minimum bases are high in some countries, even at or exceeding 50% of the average wage in Italy, Poland and Slovenia.

Minimum thresholds are minimum levels of income below which the self-employed are exempt from mandatory pension or social security contributions;²¹ in that case, they do not accrue pension entitlements either. These thresholds exist in eight OECD countries, ranging from 11% of the average wage in Ireland to around 50% in the Slovak Republic and Turkey. In Latvia, incomes below the threshold actually result in a considerably lower contribution rate.²²

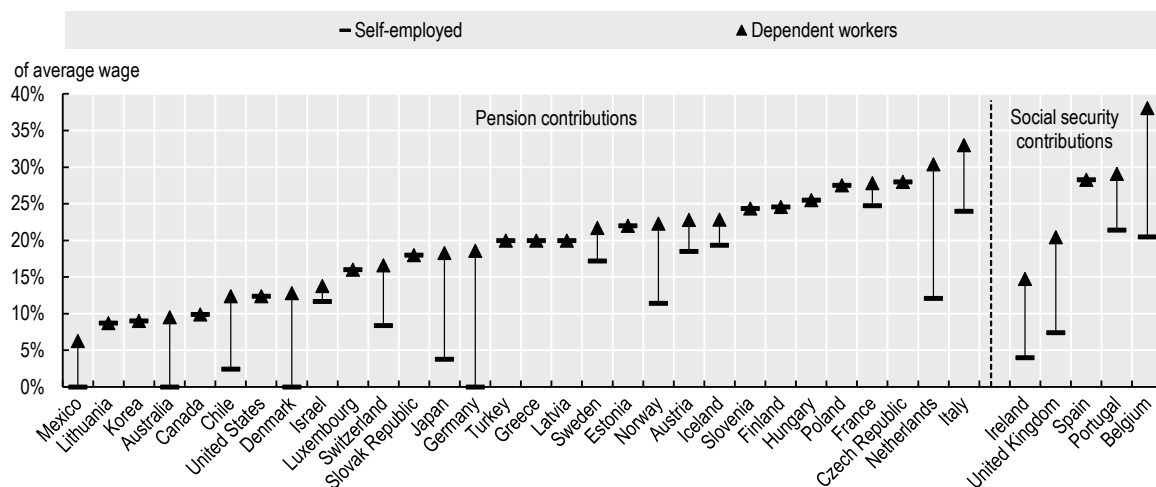
Contribution rates

In most countries, contributions are earmarked to pensions while in five countries social contributions cover social insurance as a whole for the self-employed, i.e. including disability insurance, sometimes unemployment insurance and further types of social insurance. In these latter cases, it is usually not possible to disentangle pension contributions from other types of social contributions.

In half of the countries with earmarked pension contributions, contribution rates are aligned between dependent workers and the self-employed (Figure 2.12): the self-employed pay a contribution rate that corresponds to the total contribution rate of employees, i.e. the sum of employee and employer contributions. This is the case in Canada, the Czech Republic, Estonia, Finland, Greece, Hungary, Korea, Latvia, Lithuania, Luxembourg, Poland, the Slovak Republic, Slovenia, Turkey and the United States. In the other countries with earmarked pension contributions, contributions rates are lower for the self-employed. In Australia, Denmark, Germany, Japan, Mexico, the Netherlands, Sweden and Switzerland, this happens because it is not compulsory for the self-employed to contribute at all or only partly to earnings-related schemes. By contrast, in Austria, Chile, France, Iceland, Israel and Italy the self-employed are mandatorily covered by all earnings-related schemes, but contribution rates are lower. In Austria, however, the reduced contribution rate for the self-employed does not lead to lower pension entitlements because contributions are topped up with taxes. In Norway, the self-employed pay lower public pension contributions and, additionally, they are not covered by the private scheme that is mandatory for employees.

Figure 2.12. The self-employed often pay lower contribution rates for pensions or social security

Contribution rates (mandatory / quasi-mandatory pension or social security), self-employed vs dependent workers, 2018 or latest



Note: For dependent workers, contribution rates refer to the effective rates for average-wage earners i.e. total contributions paid divided by average earnings. For the self-employed, contribution rates refer to the rates paid on the mandatory contribution base by self-employed workers with taxable income equal to average net wage before taxes, i.e. to mandatory contributions paid divided by mandatory contribution base. Hence, reduced mandatory contribution base does not automatically lower contribution rates. Rates refer to the rates paid by the self-employed themselves and paid by dependent workers and their employers. Additional country-specific information is available in the statlink below.

Source: Information provided by countries, MISSOC (2018_[30]), Spasova et al. (2017_[15]) and SSA (2018_[31]).

StatLink  <https://doi.org/10.1787/888934041003>

Among the countries that do not single out pension contributions from other social-security contributions, contribution rates paid by the self-employed are identical to the total contribution rate of dependent employees - i.e. to the sum of employee contributions and employer contributions – in Spain only (Figure 2.12). In Belgium, Ireland, Portugal and the United Kingdom, the self-employed pay lower social-security contribution rates than employees, and these differences are large. Except in Portugal, one reason why contributions rates are lower for the self-employed is because they are not insured against unemployment (OECD, 2018^[7]).²³

While pension contribution rates shown in the above chart refer to the generic rule in place for the self-employed, they may vary considerably across categories of self-employment; in particular they might be very different for specific occupations, low-income self-employed and economically dependent self-employed. In Germany, the self-employed are, in general, not mandatorily covered by pensions as shown in Figure 2.11. However, some self-employed (e.g. independent childbirth assistants) are mandatorily insured in the general retirement scheme, typically paying flat-rate contributions, while other types of self-employed workers (e.g. doctors) are mandatorily enrolled in one of 89 different pension schemes that are organised by professional associations. Furthermore, specific rules apply to self-employed artists and publicists. They pay only the employee part of contributions, i.e. half of total contributions, while the remainder is financed through a specific contribution paid by their clients and a government subsidy. Similarly, in the Netherlands, painters are required to join the occupational pension scheme, which is not the case for most of other self-employed workers.

In Italy, rates differ across different types of self-employment. The contribution rate for self-employed workers is around 24% for farmers, artisans, sole-traders, contract workers and the so-called “new” self-employed, i.e. workers in non-regulated professions; for liberal professions a number of categories with different contribution rates exist, ranging between 10% and 33% of professional income. France has a number of occupational categories with different contribution rates. In general, the pension contribution rate for independent workers is 24.75%, but different rates – and in some cases lump sums – apply to liberal professions. In addition, self-employed workers with limited revenue who make use of simplified administrative rules to set up their business, so called micro-entrepreneurs, are subject to lower specific contribution rates. The current proposals related to the implementation of a universal pension scheme in France (Chapter 1) include the unification of the schemes covering liberal professions and independent workers even though some specificities might apply to various professions, including artists, journalists and seafarers. Moreover, Austria, Finland, France, Germany, Greece, Poland and Spain set up special schemes for farmers (Choi, 2009^[32]). In Poland, farmers pay very low social-security contributions that are based on their agricultural area rather than income. The scheme for farmers is considerably subsidised from general taxation as in 2018 contributions financed only 15% of expenditures despite the comparatively low pension benefit level of farmers. Box 2.2 discusses more examples of pension arrangements for selected occupations: taxi-like platform drivers and journalists.

In countries with widespread occupational pensions, such as Denmark, Ireland, the United Kingdom and the United States, employees’ contributions to the schemes are usually complemented by employers’ contributions. Such contribution matching by employers is not possible for the self-employed, who have to cover the total contribution

rate themselves in order to have the same level of coverage from occupational schemes as dependent employees.

In most countries, workers who combine self-employment with dependent employment pay contributions based on either combined income from both types of work or on income from each type of work separately. However, a few countries apply specific rules in that case. In Belgium, the minimum contribution level is substantially lower for those whose self-employed activity is an ‘additional profession’ (about 35% of the self-employed) i.e. those who combine self-employment with at least half-time work as an employee. Such workers do not build up any public pension rights through self-employment. In Korea, only earnings from dependent work are subject to pension contributions and increase pension entitlements when dependent work and self-employment are combined.

Box 2.2. Pension rules for taxi-like platform workers and journalists

(1) Taxi-like platform workers

Online labour platforms have remarkably expanded in recent years. Taxi-like platforms are one example of quickly evolving platforms, even though their use is illegal in a couple of countries, including Japan, Norway and Turkey. Standard taxi drivers are classified as self-employed workers, but in some countries, some of them are considered dependent employees. Pension rules applying to traditional taxi drivers and to drivers in taxi-like platforms are usually identical, i.e. there is no specific regulation for such drivers.

In Finland, restrictions regarding taxi services were loosened in July 2018, and both traditional taxi-drivers and taxi-like platform drivers are now treated identically with regard to pension insurance: they are covered by the standard pension insurance for the self-employed – the so-called YEL insurance – if they exceed the minimum income threshold. Earned income, which is used as the basis for social contributions, is also calculated identically. The emergence of so-called umbrella companies has made the pension treatment of platform workers more complex in Finland. Umbrella companies invoice platforms on behalf of the self-employed and freelance professionals for the services they provided and manage some administrative tasks for the self-employed. For instance, umbrella companies transfer contributions from self-employed taxi-like platform drivers to insurance institutions. The intermediary service provided by umbrella companies has raised questions regarding the extent to which such companies can be seen as employers.

In France, taxi-like platform workers, just like standard taxi drivers, are independent workers and can choose between being insured as traditional independent workers (“travailleurs indépendants”) and operating as so-called micro-entrepreneurs if they meet eligibility criteria. In the latter case, drivers pay a monthly or quarterly contribution rate (22% in 2019) directly on their revenue rather than their income – i.e. no costs can be deducted – and all social risks, including old-age insurance, are covered.

The categorisation of taxi-like platforms workers as self-employed or dependent workers is still an ongoing and controversial discussion in many countries. In Austria, the taxi-like platform Uber is in a constant legal dispute over the services the company is allowed to provide. Recently, the country’s Supreme Court ruled that Uber is not allowed to act as an online facilitator for car rentals; this ruling implies that many platform drivers who were not required to pay pension contributions because they were classified as independent contractors, now pay mandatory pension contributions as they are considered as contractual partners of Uber. In Belgium, the situation of platform workers is very diverse and no definitive conclusion regarding their social rights has been reached. In 2016, new legislation was put in place to regulate platform work. According to this legislation platform workers earning up to EUR 6000 per year do not pay contributions and therefore do not build up social rights, including pensions.

In general, the key issue raised by platform workers is the difficulty to determine whether the platform should be treated as the employer or whether platform workers should be considered as self-employed. Depending on how this issue is solved, pension rules follow accordingly.

Box 2.2. Pension rules for taxi-like platform workers and journalists (cont.)

(2) Journalists

Journalists have been strongly affected by technological change and the move from printed to digital content. As a result, business models have evolved and the contractual situation of the profession moved from predominantly dependent to mostly independent employment. In some OECD countries, all journalists are self-employed while in others they can be either self-employed or dependent workers. In most countries, standard pension rules for employees or self-employed workers apply accordingly.

However, some countries provide special pension schemes for journalists. In Belgium, a supplementary pension for workers recognised as ‘professional journalists’ (beroepsjournalisten) has been in place since 1971 on top of their general public pension. This scheme is mandatory, financed through an additional 2% contribution by the employer and an additional 1% contribution by the journalist. For journalists with a full career, this supplementary pension leads to an additional pension of up to 33% of their public pensions, depending on how long they contributed to the scheme.

In Austria, journalists are commonly classified as dependent employees or as freelance journalists, which in the latter case means that they are considered “new” self-employed workers. The “new” self-employed are covered by the same mandatory public scheme as common self-employed workers.

In Germany self-employed artists and members of the publishing professions are compulsorily insured in the Artists’ Social Insurance (Künstlersozialversicherung). Workers in this scheme pay only half of the contributions while the remaining half is paid by clients (30%) and a tax-financed state-subsidy (20%). The scheme entitles to old-age pensions, disability pensions and survivor pensions.

In France, professional journalists are insured in the mandatory schemes for employees. Stringers (“pigistes”) – who are paid for each publication rather than working time – benefit from a 20% reduction on capped social security contributions (both salary and employer’s share) and non-capped contributions (employer’s share only) to the general scheme. This reduced rate does not lower benefits and is financed through redistribution within the scheme. In addition, journalists can deduct 30% of their professional expenses (limited to 7,600 euros per calendar year) from the social security contribution they have to pay.

In Latvia, revenue from royalties, which is the main source of income for many journalists, is subject to a reduced pension contribution rate and reduced entitlements, at 5% compared to 20% for employees. Contributions on royalties are directly paid by clients.

In Italy, pensions for free-lance and employed journalists are provided by the Institute of Pensions for Journalists (INPGI). The fund has remained defined benefit while most other workers are covered by notional defined contribution schemes. In 2017, expenditures exceeded revenues by 42%, highlighting the large imbalances between total contributions and benefits (Itinerari Previdenziali, 2019^[33]).

Pension entitlements

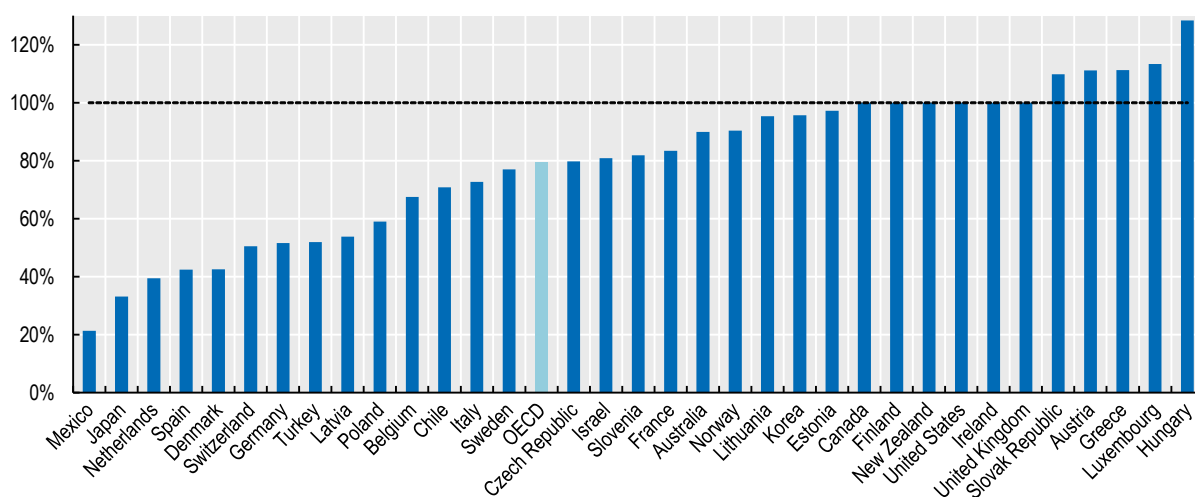
Self-employed workers with a taxable income (i.e. net of social security contributions) equal to the net average wage before tax (gross wage net of employee’s contributions) can expect to receive in the future - after contributing what is mandatory during a full career – an old-age pension equal to 79% of the theoretical gross pension of the average-wage worker in the OECD on average (Figure 2.13).^{24 25}

In countries where the self-employed are not required to contribute to earning-related pension schemes while employees are, the relative theoretical pension is among the lowest. In these countries, the old-age pension of the self-employed from mandatory schemes is limited to the old-age safety net including the basic pension. In the full-career case, the theoretical pension of the self-employed is about half the pension of employees or even much lower in Mexico (21%), Japan (33%) and also Denmark, Germany and the Netherlands. Among these countries, Australia stands out as the means-tested basic pension (Age Pension) gives the self-employed 90% of what average-wage employees get from mandatory earnings-related schemes (Superannuation).

Low theoretical relative pensions for the self-employed - between 40% and 60% of employees' pensions - are also found in Poland, Spain and Turkey where only flat-rate contributions to earnings-related schemes are mandatory for the self-employed, and in Latvia, where mandatory contributions above the minimum wage are reduced substantially.

Figure 2.13. Theoretical pensions of the self-employed are lower than those of employees

Theoretical pensions of a self-employed worker relative to an employee having both a taxable income (net income or net wage before taxes) equal to the average net wage before taxes, for individuals with a full career from age 22 in 2018 and contributing only the amount that is (quasi) mandatory to pensions.



Note: For Iceland, details of pension calculation for the self-employed are not available. For Portugal, the contribution base is linked to revenues as opposed to income and the calculation is not possible. Additional country-specific information is available in the statlink below.

Source: Information provided by countries and OECD pension model.

StatLink  <https://doi.org/10.1787/888934041022>

Lower contribution rates and a reduced contribution base result in lower pensions from mandatory earnings-related schemes for the self-employed relative to employees with the same taxable earnings in many countries. For example, in Belgium, France (points-scheme component) and Italy, reduced contribution rates directly affect entitlements within the public system while in Norway, Sweden and Switzerland pensions are lower because the self-employed pay none or reduced contributions to mandatory funded schemes. As a result, theoretical pensions of the self-employed relative to employees reach 50% in Switzerland; around 70% in Belgium, Chile²⁶ and Italy; around 80% in the Czech Republic, France, Israel and Sweden; around 90% in Lithuania, Norway and Slovenia and 97% in Estonia. However, there can be some offsetting factors. For example in the Czech Republic, progressive replacement rates result in the relative theoretical pensions of the self-employed reaching 80% even though the contribution base is set at 50% of taxable income only. In Norway, the reduced contribution rate to the public scheme does not reduce the benefits implicitly while in Austria the reduced contributions of the self-employed are explicitly topped up with taxes.

Some countries calculate pensions of the self-employed based on gross income, i.e. income before deducting contributions. This leads to higher pensionable earnings “all else

equal” in the case studied here (taxable income of the self-employed equal to the net wage before tax) as the contribution rate paid by the self-employed is higher than the employee part for dependent workers. Hence, the theoretical pension of the self-employed is slightly higher than that of employees in Austria, Greece, Hungary, Luxembourg and the Slovak Republic. In the Slovak Republic, this more than compensates the lower contribution base for the self-employed, which is set at 67% of gross earnings, leading to the contribution base being higher for the self-employed than for employees with the same taxable earnings by 10%. The United States allow the self-employed to deduct half of social security contributions before calculating the contribution base. Given that employees and employers pay equal shares of contributions, this deduction equalises theoretical pensions between the self-employed and employees.

Ireland, New Zealand and the United Kingdom which pay only flat benefits in mandatory pension schemes for employees provide the self-employed and employees with the same benefits.

Part-time work

Reduced working hours lower total earnings and ultimately pensions from earnings-related schemes. In some countries the effect of part-time work during at least part of the career on pensions might be limited depending on earnings levels, through the effects of non-contributory benefits, contribution-based basic pensions, minimum pensions and reference-wage rules for earnings-related schemes. However, the effect on pensions can be over-proportional in other countries, i.e. pensions can decrease more strongly than earnings. Such a situation can arise when minimum earnings requirements or minimum working time requirements for pensions are in place. For example, while minimum earnings requirements formally apply to all dependent workers in some countries, requirements at levels below the monthly minimum wage of full-time workers are binding only for part-timers or some temporary workers.

Minimum earnings or minimum working time requirements exist in less than half of OECD countries (Table 2.2). Germany, Japan and Korea are examples of countries with a minimum number of working hours needed to be eligible for mandatory pensions. Fourteen countries set a minimum earnings level – on a weekly, monthly, quarterly or yearly basis – to acquire entitlements to mandatory pensions (Figure 2.14), ranging from less than 5% of average earnings in Ireland and Finland to over 50% in Turkey. In Germany, while there is no minimum earnings requirement, workers with a monthly income of 450 EUR or less (so-called “minijobbers”) have the possibility to opt out of the statutory pension insurance.²⁷ Nineteen countries require neither a minimum level of earnings nor a minimum number of hours, i.e. all part-time workers are covered by pension schemes.

While minimum earnings requirements and minimum working time requirements penalise part-time workers who do not fulfil them, other part-time workers may benefit from them. This can be the case when part-time workers meet the minimum requirements by a small margin and accrue (almost) the same pension rights as full-time workers. In particular, if the requirements are set at low levels and the link between contributions and pension rights is weak, as is the case for example with minimum pension schemes based simply on validating contribution periods, many part-time workers may benefit. In such a situation, pension rules imply redistribution from full-time workers to part-time workers.

In Estonia, Hungary, Lithuania and Spain, rules exist to determine pension entitlements or eligibility to benefits for part-time workers in some particular ways. In Lithuania, every insured person must pay pension contributions on at least the monthly

Table 2.2. **Minimum earnings and working-time requirements for pension entitlement**

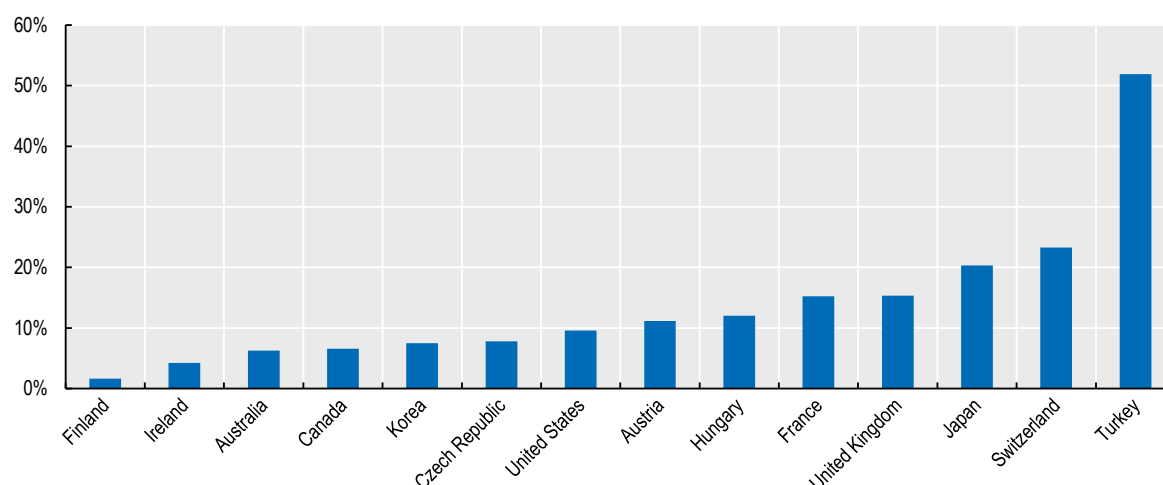
Minimum level of earnings	Minimum number of hours worked	No requirement
Australia, Austria, Canada, Czech Republic, France, Finland*, Hungary, Ireland, Japan, Korea, Switzerland, Turkey, United Kingdom, United States	Denmark (9 hours/week), Germany (up to 3 months or 70 days/year), Japan (20 hours/week), Korea (15 hours/week), Norway (funded scheme; 20% of full time)	Belgium*, Chile, Estonia, Greece, Iceland, Israel, Italy, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Poland, Portugal, Slovak Republic*, Slovenia, Spain, Sweden

Note: (*) In Belgium, working less than one-thirds and two-thirds of the full-time annual equivalent results in this year not being accounted for eligibility to early retirement and minimum pension, respectively. In the Slovak Republic the minimum level of earnings applies only to validate eligibility to minimum pensions but not to old-age pensions. (**) In Finland, there is a very low minimum threshold of earnings to be covered by pensions at 1.6% of average wage that is set for practical reasons, i.e. not to place large administrative burden on tiny tasks such as walking the neighbour's dog.

Source: Information provided by countries, MISSOC (2018^[30]), Spasova et al. (2017^[15]) and SSA (2018^[31]).

Figure 2.14. **Most countries provide no or low minimum earnings requirements to accrue entitlements**

Minimum earnings to accrue pension rights for dependent employees, % of average wage



Note: Only countries in which minimum earnings requirements exist are included in the figure.

Source: Information provided by countries, MISSOC (2018^[30]), Spasova et al. (2017^[15]) and SSA (2018^[31]).

StatLink  <https://doi.org/10.1787/888934041041>

minimum wage to validate a month for pension calculation purposes. When pension contributions are paid based on an amount below the monthly minimum wage, insurance time records are proportionally lower. Similar mechanisms exist in Estonia and Hungary for earnings below the minimum wage. In Spain, part-timers can receive higher benefits than full-time workers with the same total earnings.

Pension entitlements from part-time work can differ even though the same number of hours are worked at the same hourly wage. For example, working 3 out of 5 days per week leads to a shorter validated contribution period than working 60% of normal hours 5 days a week in some countries including Greece and Turkey that validate contribution periods on a daily basis. Other countries use longer periods: weeks (e.g. Ireland, the United Kingdom), months (e.g. Poland) or quarters (e.g. France).

In all OECD countries, workers with more than one part-time job have to pay mandatory pension contributions based on either total income from all jobs or separate income from each workplace, and receive benefits accordingly. In 2015, Belgium introduced “flexi jobs” which are available to workers and pensioners working at least 80% of full-time

hours and gaining additional income in a specific list of sectors, such as restauration. These jobs are exempt from income tax and both employee and employer pension contributions are reduced. In the Czech Republic, the income stemming from a special work contract, that permits to perform an additional job for up to 20 hours a week or up to 300 hours a year, is excluded from pension contributions and entitlements.

Temporary work

In most countries, pension insurance rules for temporary workers are aligned to the rules for standard workers. However, some countries set reduced or no pension contribution rates for temporary agency workers, young workers, seasonal workers, apprentices and/or trainees, resulting in lower entitlements. Trainees are not covered by pensions in Hungary, while temporary agency workers and contractors are excluded from pensions in Korea. In Lithuania, casual and seasonal workers on voucher-based contracts are exempt from enrolling in mandatory pensions. In Poland, temporary work regulated by civil law rather than the labour code – so-called ‘civil law contracts for a specified work’ – is not subject to mandatory pension contributions.

Even when temporary workers have the same pension rules as standard employees, they tend to have less pension coverage due to shorter employment spells. For example, occupational pension plans in the Netherlands cover workers only after six months of employment in the same company, which effectively reduces coverage of temporary workers and workers employed by temporary agencies. Additionally, vesting periods of employer contributions, i.e. the time it takes for employees to become owners of the contributions made on their behalf in occupational pensions are often over one year. In some countries, vesting periods for employer contributions in occupational pensions can even exceed three years, as in New Zealand, Turkey and the United States. Long vesting periods are a problem for temporary workers because they tend to change employers frequently. Most countries, but not all, provide options to transfer occupational schemes to other employer schemes or not to close them (without making additional contributions). Allowing to transfer entitlements from voluntary occupational to personal pension schemes is less common, but it is allowed e.g. in Canada, Denmark, Spain and the United States. Withdrawing entitlements upon contract termination is possible in a few countries (Chapter 3), losing the link with retirement purposes.

Pension credits are often granted as long as unemployed people receive unemployment benefits. Patchy employment histories can prevent temporary workers from receiving unemployment benefits, thereby magnifying the impact of career breaks on pensions. Indeed, OECD (2019^[1]) shows that non-standard workers are less often covered by unemployment benefits than standard workers. However, the picture is not uniform and OECD countries vary a lot in terms of unemployment benefit rules. The minimum contribution period required to be entitled to unemployment benefits ranges from less than six months in Canada and Iceland to more than two years in Mexico (OECD, 2018^[7]). In many cases, the eligibility conditions allow for some flexibility and, for example, Sweden requires working and contributing only in six out of the last twelve months before applying for benefits while the Slovak Republic requires working in at least 24 out of the last 48 months.

Policy changes

More than half of OECD countries have reformed pension rules for non-standard workers over the last two decades. In many cases, the reforms aimed at expanding the

coverage of the self-employed and part-timers. Earnings-related schemes have recently become mandatory for self-employed workers in Israel. Since 2012, Chile tried to include the self-employed through auto-enrolment into the funded pension scheme that is mandatory for employees, but the majority of them (80% in 2017) opted out; since 2019, pension contributions have been compulsory for the self-employed who issue invoices, except for older workers and low-income earners. In 2013, the pension coverage for some non-standard workers, such as working students, individuals on special civil-law contracts and workers performing the so-called complementary tasks (e.g. cleaning or babysitting), was expanded in both Slovenia and the Slovak Republic, and, in Slovenia only, for the self-employed with low earnings. In Germany, the current coalition agreement plans to establish mandatory pension insurance for all self-employed workers.

A few countries introduced specific regulation to limit pension coverage gaps for self-employed workers with only few major clients. While in Germany, self-employed persons who work predominantly for one client²⁸ and do not have employees have been mandatorily insured in the pension system since 1999, in Italy and Portugal the contributions of independent contractors relying on single contracts are now topped up by their clients. In addition, in Portugal if a self-employed worker depends significantly on one single client – the so-called ordering customer – the latter has to pay social security contributions for the self-employed. The contribution rate varies depending on the degree to which the worker relies on the client.²⁹

In 2019, Poland introduced specific exemptions to reduce the financial burden of minimum contribution amounts for self-employed workers with low earnings. They can set the contribution base between 30% of the minimum wage, which is five times lower than previously, and 60% of the average wage for three years within a five-year period. Pension entitlements are adjusted accordingly.

Some countries modified pension rules to increase pension coverage among part-time workers. France, Germany, Japan, Korea and Switzerland expanded the coverage of part-time workers by lowering minimum-hours and/or earnings requirements. In 2014, France lowered the earnings threshold, from the equivalent of 200 to 150 hours of work at the minimum wage per quarter. Germany expanded the pension coverage for part-timers with low earnings through auto-enrolment since 2013 (while granting them an opt-out possibility). In Japan, since 2016 employers with more than 500 employees are required to provide coverage to part-time workers working at least 20 hours a week (previously it was 30 hours) and earning more than JPY 88000 per month (20% of the average earnings). Since 2017, part-time workers in smaller firms who satisfy the conditions above have also been entitled to join earnings-related pensions if management and employees agree. Similarly, in Korea, when the National Pension was introduced in 1988, it covered only employees in workplaces with at least 10 workers who had worked for more than three months. Compulsory coverage was gradually extended to include many non-standard workers.³⁰ Switzerland also lowered the entry threshold of the occupational pensions to include more low-income workers, particularly part-time workers.³¹ In 2018, Latvia extended the mandatory pension coverage to self-employed workers with income below the minimum wage, who had been covered only voluntarily before, through mandating them to pay reduced pension contributions at 5% compared with the regular rate of 20%.

Improving pension provision for non-standard workers

Pension systems that mitigate disparities between standard and non-standard workers in terms of coverage, contributions and entitlements tend to ensure fairer

protection, reduce inequalities, pool risks as broadly as possible and facilitate labour mobility across job types. The increasing flexibility of employment arrangements and, in particular, the development of new forms of work highlight that the boundary between dependant employment and self-employment is not always clear-cut. This may challenge policymakers, where the prevalence of workers along this boundary is increasing, to adapt social protection in general, and old-age pensions in particular, to this new environment (OECD, 2018^[22]).

Non-standard work is often encouraged, for example financially, to promote entrepreneurship, to reduce informality or to offer greater flexibility for firms and even some workers. In a number of cases, non-standard work is associated with income vulnerabilities during the working age, which have repercussions on old-age income prospects. Fighting precarious forms of employment is a crucial objective, but it goes beyond the scope of pension policies analysed in this chapter. One of its extreme forms, informal employment, can be most efficiently addressed through a multi-pronged approach, aiming to increase the benefits and reduce the costs of formalisation and to strengthen enforcement mechanisms (OECD, 2015^[34]). Policies aiming at reducing if not eliminating preferential tax treatment for the self-employed while at the same time addressing tax avoidance are important to strengthen the financing of social benefit schemes and enhance their retirement income prospects. As for precarious employment, work arrangements such as successive fixed-term contracts and false self-employment might be in part the result of lower social contributions for the self-employed, raising concerns regarding social dumping (OECD, 2019^[1]; Spasova et al., 2017^[15]). These arrangements should be addressed by tackling their root causes, including the regulatory and policy settings in the labour market that de facto contribute to its segmentation and result in lower social contributions and benefits.

This section provides policy options to improve pension provisions for non-standard workers. Some problems faced by these workers, such as the impact of low lifetime earnings and of career breaks on retirement income, also affect standard workers.

Better coordinating contributory and non-contributory schemes

Well-tailored coordination of contributory and non-contributory schemes is important for pensions in general, and in particular for non-standard workers who are often not mandatorily insured. The objective of a good coordination is to ensure a good level of old-age income protection for non-standard workers as well as to provide them with incentives to contribute to pensions and build up pension entitlements.

Non-contributory first-tier pensions – i.e. residence-based basic pensions and old-age social assistance benefits – set a lower bound to old-age income, irrespective of retirees' work histories. In many countries, the level of the old-age safety net is not high enough to ensure that recipients do not fall below the poverty line, e.g. defined as 50% of median household disposable income (Chapter 6). The level of non-contributory first-tier pensions depends in theory on redistributive preferences in each country; it is the result of trading off income adequacy for the most vulnerable groups against containing financial costs and maintaining incentives to contribute to earnings-related pensions.

There are three main ways of achieving sound coordination of contributory and non-contributory schemes. First, first-tier pensions can be universal flat-rate benefits – which might depend on household composition – on top of which contributory entitlements build up. This is the case in the Netherlands and New Zealand for example. Second, the safety-

net benefit could be withdrawn progressively against the earnings-related component, as in Chile, Norway or Sweden for instance. The choice of the withdrawal rate is in itself the result of a trade-off. A low rate implies a more universal coverage, limits stigma associated with benefiting from the safety net and lowers disincentives to contribute to pensions. However, it implies also that the safety net is not tightly targeted, therefore generating higher costs for public finances. The third case is the combination of the two others: one part is universal and the other is withdrawn against the earnings-related component, as for example in Canada, Denmark and Iceland.

Well-coordinated schemes based on either one of the three settings above ensure in a transparent way that every entitlement provides some additional protection beyond the old-age safety net, which is available to people who never contributed to earnings-related pensions. While every old-age individual, including people with career histories in non-standard employment, receives some minimum benefits, additional amounts are paid in relation with contribution histories.

Simple entitlement rules in contributory pensions greatly facilitate a good coordination of contributory and non-contributory schemes. Emphasising the importance of a good coordination for non-standard workers thus strengthens the case against complex rules. Ensuring that all labour income at least up to a high enough threshold and all periods of non-standard work generates pension entitlements is an important step towards pension adequacy for non-standard workers.

Improving access to pensions for vulnerable non-standard workers

Appropriate compliance measures are essential to improve access to pensions for non-standard workers. Non-standard work in general, and platform work in particular, is indeed more subject to informality than standard employment. Large fines for non-compliance cannot offset the weak enforcement of mandatory contributions (Kanbur and Ronconi, 2018^[35]), which seems to be an issue in Chile for example (Valdés-Prieto and Leyton, 2019^[12]). From a technical perspective, more and more data to improve compliance are becoming available from both public (tax and social security registers) and private (e.g. banking, platform work) sources, and more efficient algorithms (e.g. artificial intelligence) have the potential of targeting labour and tax inspections more efficiently. However, the use of such data raises privacy concerns and would in addition require increasing public administration capabilities and an improved coordination of labour, social security and tax administration (OECD, 2008^[36]).³²

New forms of work often fall into the shadow area between dependent and independent employment. In several countries such as Austria and the United Kingdom there is a major legal dispute around the question whether platform workers are employees or self-employed. When they are classified as employees, platforms may be required to pay the employer part of pension contributions. In addition, in the area of occupational pensions, platforms might also be required to offer occupational pension plans and pay matched employers contributions, as with workers in standard employment.

For the false self-employed, who are hired as self-employed but de facto perform dependent work, properly classifying them as dependent employees would improve pension protection. It often requires only enforcing the existing labour code. Spasova et al. (2017^[15]) suggest to increase fines and impose retroactive payments of contributions for employers who make use of false self-employment. Some countries implement alternative

but complex solutions for some self-employed, e.g. free-lancers, who heavily depend on single clients by making the clients pay the employer part of the contributions or by levying contributions on selected products e.g. publications.³³ For voluntary pension schemes – in particular those with auto-enrolment – contributions paid by clients can substantially increase coverage, similar to what is the case for matching contributions paid by the employers. However, such solutions complicate the pension system.

Moreover, policy that seeks equal treatment of all labour income implies that temporary work contracts should not be excluded from mandatory pension protection, irrespective of their duration, and that no minimum tenure for acquiring pension entitlements should exist. Currently, agency work, zero-hour contracts and seasonal work are not covered in some countries and minimum tenure requirements are not uncommon.

Contributory first-tier pensions (contribution-based basic and minimum pensions), which exist in about half of OECD countries, increase old-age benefits based on the length of the contribution history. This redistributive instrument potentially benefits part-time workers substantially depending on the rules to validate contribution periods.

For standard workers, the effect of career breaks on pensions depends on how tightly entitlements are linked to earnings and on the instruments at hand to cushion employment shocks, such as pension credits during unemployment. On average across countries, slightly more than one-third of employment shocks are transmitted to pension income: pensions for standard workers decrease by about 1.3% for each year out of employment on average across OECD countries (Figure 5.12 in Chapter 5) while they would decrease by about 2.7% with a one-to-one link between earnings and pensions.

For non-standard workers, the impact on earnings-related pensions is larger, i.e. pension entitlements in the case of job losses are lower, because they tend to receive lower unemployment benefits, which results in lower pension entitlements. First, non-standard workers might lack direct access to unemployment protection (e.g. many types of self-employed workers and some groups of temporary workers are not covered by unemployment insurance). Second, they often have shorter work spells, which results in a lower maximum length of unemployment benefits and/or lower benefits. Pension policies cannot insure against all shocks that occur in the labour market, and the source of this transmission may be addressed more directly through unemployment policies for non-standard workers.

Mandating pensions for the self-employed?

Earnings-related schemes for standard workers are typically mandatory for two main reasons, which equally apply to the self-employed. First, due to short-sighted behaviour people left to themselves often under-save for retirement, for example because they underestimate their long-term needs. This feature motivates the paternalistic approach according to which contributions should be mandatory. The self-employed are similarly prone to myopic behaviour as dependent employees. Second, providing effective protection against old-age income risks relies on having access to a broad pool of contributors. This is important for the pension provider's capacity to insure for example longevity risks, i.e. the risks that some people live longer than what their individual contributions can finance. Besides, fully including all non-standard workers in mandatory pensions in the same way as standard workers limits the financial incentives employers and workers might have to misuse non-standard employment to lower labour costs.

It is sometimes argued that the self-employed have more financial assets, potentially related to their business activity, or even more housing assets, which would give them good reasons not to contribute to pensions. Such arguments should be rejected.

As discussed in earlier sections of this chapter, the self-employed are a very diverse group, and these considerations regarding exemptions from mandatory pensions would apply only to the wealthiest among them. Policies grounded in such arguments would require complex asset tests – potentially based on future assets; in addition, it could raise the question why wealthy standard workers should not be excluded from mandatory pensions as well. Excluding some groups of workers based on high incomes or high (future) assets is difficult to justify. An equal treatment in terms of pension insurance also requires that any redistributive feature benefitting non-standard workers is broadly shared, i.e. not financed by contributions from standard workers only.

To achieve pension adequacy for more workers, voluntary occupational schemes could be available for all contract types through default plans in countries where they are available for dependent workers. Equal treatment could also apply to auto-enrolment schemes. Opt-out rates might be higher for non-standard workers, and contributions of self-employed workers cannot be matched by employers, contrary to what is the case for dependent employees. Nevertheless, non-standard workers are probably as malleable as standard workers to nudging. In particular, contributions could be automatically deducted when taxes are collected.

Moving towards harmonisation

As discussed before, there are good arguments in favour of harmonising pension rules broadly between dependent and independent workers. Aligning pension rules across work types implies that total contribution rates are equalised for all workers, with the self-employed paying the sum of employee and employer contributions. One serious obstacle towards a full harmonisation relates to the assessment of the contribution base for the self-employed (see next sub-section).

Lower contribution rates for the self-employed are used explicitly or implicitly in some countries to make self-employment economically attractive and to reduce incentives for informality. If the lower contributions are not offset by public subsidies, such policies might bear social costs, however, to the extent that they imply lower future benefits. In that case, achieving their objective of promoting self-employment is facilitated by the underestimation by the self-employed of their needs in old age; i.e. by short-sighted behaviours.

Lower pension contributions generating lower pension entitlements should not be used as an instrument to promote self-employment. Rules defining pensionable earnings should be harmonised as much as possible between dependent and independent workers, and pensionable earnings should generate the same entitlements based on the same total contribution rate. The main question then is who pays the missing contributions.

Social policies can be designed to account for the fact that some vulnerable self-employed cannot afford full pension contributions. In this case, the possibility to contribute at a lower rate should be part of an explicit redistributive policy. The lower rate should be compensated by a subsidised contribution component, financed by taxes or the pool of pension contributions, at least for low earners. In other words, allowing the self-employed to pay a lower total contribution rate should take into account the financial cost of this

policy. If not offset by public subsidies, this cost will be revealed as a social cost in the long term, penalising retirees who were encouraged to become self-employed workers.

Likewise, when special pension and tax regimes exist for self-employed workers with limited income (e.g. microenterprises in France and Latvia, or flat-rate contribution regimes in Hungary, Lithuania and Slovenia) or for economically dependent self-employed workers (e.g. in Germany, Italy, Spain or Portugal) it is particularly important to ensure that these regimes do not involve lower pension contributions unless they are topped up. That is, simplified pension or tax regimes should not lead to lower pensions.

Better harmonisation of pension rules between standard and non-standard workers facilitates the portability of pensions across jobs and companies. The importance of pension portability is highlighted by more frequent job switches among non-standard workers and the large number of non-standard workers who combine several jobs of various types. Personal individual accounts can be helpful to ensure full portability of private pension entitlements of non-standard workers (Hu and Stewart, 2009^[37]).

... while recognising that fully harmonising the contribution base is difficult

Fully aligning the contribution base of the self-employed to that of employees is not possible. For employees, contribution rates – both the employee and employer parts – apply to the gross wage, which does not have an equivalent for the self-employed. For the latter, the contribution base is either determined by (a part of) revenue or income, i.e. after deduction of costs, or not strictly linked to income categories. The choice of the contribution base directly influences how pension entitlements are built.

Beyond the possibility that may exist to under-report revenue, the self-employed often enjoy additional flexibility. They may have wide options to deduct work-related expenses, divide income into labour and capital shares and in some cases freely choose contribution bases. For self-employed workers with limited material costs and capital requirements such as some free-lancers and platform workers, total revenue, or a fraction of it, would be the most reliable contribution base. Revenue as contribution base has also the advantage of limiting the administrative burden related to the often complex cost deductions in tax accounting. In particular, low earners are disadvantaged by the fixed costs of proper cost documentation (OECD, 2008^[36]). However, using revenue as the contribution base for all self-employed workers would be inappropriate, especially in cases when material and capital costs are high, and would result in an unequal treatment of different types of self-employment. Hence, for self-employed workers with substantial material costs, such as sole traders, income is a more appropriate contribution base.

In general, using income as the contribution base largely ensures equal treatment among different types of self-employed. Income net of social security contributions (taxable income) is, as a concept, closer to net wages before tax and thus allows for closer harmonisation of pension rules. However, applying the harmonised contribution rates to taxable income leads to lower contributions because taxable income is net of *all* contributions whereas the gross wage is only net of *employer's* contributions. For example, if the total contribution rate for employees is 20%, equally split between the employee and employer, then a gross wage of 100 corresponds to a net wage before tax of 90, with total contributions of 20. If the self-employed with the same taxable income of 90 effectively pay a 20% contribution rate on taxable income, then total contributions equal $20\% \times 90 = 18$, lower than total contributions paid for employees. A higher degree of harmonisation might be reached by setting a higher nominal contribution rate for the self-employed to account for the difference between gross and net wages before tax (22.2% on taxable income in the

above example to reach contributions of 20, as $20/90 = 22.2\%$). For the same reason, applying the harmonised contribution rates to gross income (before deducting any contributions) leads to higher contributions because gross income – as opposed to gross wage – includes total contributions.

Harmonisation can thus be improved by applying a *higher nominal* contribution rate to the taxable income of the self-employed, but this is likely to be politically difficult to implement. Alternatively, the total contribution rate can be applied to rescaled taxable income or part of gross income.³⁴ Yet, another option is to use the *taxable income* as the contribution base for both employees and the self-employed, which is the case in Sweden for public pensions.

Limiting the large degree of flexibility in defining the contribution base also helps aligning pension rules for self-employed and dependent workers. However, limiting flexibility in setting the contribution base might not be sufficient to prevent low levels of contributions in practice and appropriate compliance measures might be needed, e.g. in the form of rigorous labour inspections. In Italy, an innovative approach to controlling income was implemented: the reported income of the self-employed was compared to their estimated profits and actual living standards, thereby permitting to identify cases of tax underreporting more easily (Bucci, 2019_[27]).

Conclusion

Non-standard work refers to a very diverse group of workers, with the most common forms of non-standard work being self-employment, part-time work and temporary employment. Non-standard employment accounts for more than one-third of employment in the OECD. Part-time work is three-times more frequent among women than among men and self-employment is particularly frequent among older workers.

Globalisation, automation and demographic changes transform labour markets at a rapid pace. There has been an expansion of new forms of non-standard work, in particular jobs relying on new technologies such as platform-based taxi driving. In many cases, non-standard work is associated with lower income and tends to be persistent, which typically affects workers' financial long-term prospects.

While the debate on pensions for non-standard workers is not new, the way non-standard workers are covered by pension systems might become a topic of growing importance. As most pension systems were built on the premise of stable, linear careers, the development of new forms of work raises concerns about the old-age income of future generations of retirees. Yet, the recent evolution of labour markets calls for more inclusive and harmonised pensions for all rather than for a radical shift in designing and financing pensions.

Pension rules for non-standard workers vary substantially across countries, are often particularly complex and differ from the rules for standard workers in many countries. The self-employed, in particular, are the group that raises the most challenging issues in terms of pension coverage because they do not have employment contracts that can be used as the basis for pension contributions. Some new forms of work raise similar challenges while being in addition more prone to informality. Yet, pension systems should be designed to mitigate disparities between standard and non-standard workers in terms of coverage, contributions and entitlements so as to protect against old-age poverty, smooth the living standards upon retirement, ensure fair treatment, pool risks as broadly as possible and facilitate labour mobility across job types.

The **main findings** of this Chapter are the following.

Self-employment

- The self-employed contribute less to old-age pensions than employees and receive lower pension benefits when they retire. On average across 15 OECD countries, the retired self-employed receive, at the median, 22% lower public pensions than retired employees.
- Even though the self-employed possess somewhat higher assets than employees, their additional assets are generally insufficient to make up for the lower level of pension benefits.
- The self-employed are required to contribute to mandatory earnings-related pensions in a similar way as employees in only 10 OECD countries.
- Even when pension rules are similar for dependent employees and self-employed workers, pension contributions can differ substantially because the contribution base, i.e. the earnings taken into account to calculate contributions, is not identical for both types of workers.
- In 18 countries, self-employed workers are mandatorily covered by earnings-related schemes, but they are allowed to contribute less than employees through reduced contribution rates, discretion in setting their income base or minimum income thresholds. Latvia, Poland, Spain and Turkey, for example, have discretion in choosing their income base within given brackets.
- In 6 countries - Australia, Denmark, Germany, Japan, Mexico and the Netherlands - the self-employed are not required to join earnings-related schemes, contrary to employees.
- Most countries use some income-related measure as the contribution base for the self-employed. A number of countries apply the contribution rate to a fraction of income only, e.g. 50% in the Czech Republic, 67% in the Slovak Republic or 75% in Slovenia.
- Most countries set minimum contribution bases or minimum income thresholds. Minimum contribution bases ensure that the self-employed contribute at least some minimum amounts, but they imply that the effective contribution rate is high for low earners. They range from 10% of the average wage or less in Canada, Korea, Norway, Sweden, Switzerland and the United States to 60% in Poland and Slovenia. Minimum income thresholds, which reduce pension coverage of the self-employed with low earnings, exist in eight OECD countries, from 11% of the average wage in Ireland to around 50% in the Slovak Republic and Turkey.
- In half of countries with earmarked pension contributions, the self-employed pay a contribution rate that is equal to the sum of employee and employer contribution rates for employees in mandatory schemes. In the other countries, including France, Italy and Switzerland, contributions rates are lower for the self-employed.
- Self-employed workers with income net of social security contributions equal to the net average wage will receive, after paying during a full career only the contributions that are mandatory, an old-age pension equal to 79% of the theoretical pension of the average-wage private-sector employee on average in the OECD. This relative pension ranges from less than 50% in Denmark, Japan, Mexico, the Netherlands and Spain to more than 90% in more than one-third of countries: Austria, Canada, Finland, Greece, Hungary, Ireland, Korea, Lithuania, Luxembourg, New Zealand, the Slovak Republic, Slovenia, the United Kingdom and the United States.
- In New Zealand, Poland, Turkey and the United Kingdom, employees are automatically enrolled in workplace pensions, while the self-employed are not.

- Contribution rates may vary considerably within countries across categories of self-employment, as in France, Germany, Italy and the Netherlands. Austria, Finland, France, Germany, Greece, Poland and Spain have special schemes for farmers for example.
- A number of countries, including Germany, Italy and Portugal, introduced specific regulation to limit pension coverage gaps for self-employed workers with only few major clients.

Part-time work

- One in three part-time workers in OECD countries would have preferred to work longer hours, while about two out of three work part-time by choice. Among workers aged 65-74, about one-third work part-time.
- Part-time workers can benefit from redistributive mechanisms within pension systems through non-contributory benefits, minimum pensions, contributory-based basic pensions and reference-wage rules for defined benefit schemes. While pension rules for part-time workers tend to be in line with those for standard workers, minimum earnings and minimum working time requirements for pension right accruals prevent part-time workers who fail to meet them from building up pension entitlements.
- Minimum earnings and minimum working time requirements exist in about half of OECD countries. Denmark, Germany, Japan, Korea and Norway require minimum working hours to be eligible for mandatory pensions, while 14 countries set a minimum earnings level to acquire entitlements to mandatory pensions, from less than 5% of average earnings in Finland and Ireland to over 50% in Turkey.

Temporary work

- In most countries, pension insurance rules for temporary workers are aligned to the rules for standard workers. However, some countries, including Hungary, Korea, Lithuania and Poland set reduced or no pension contribution rates for temporary agency workers, young workers, seasonal workers, apprentices and/or trainees, resulting in lower entitlements.
- Even when pension rules for temporary workers and standard workers are fully harmonised, temporary workers face lower pensions because they are out of employment more often and generally build up less pension entitlements while unemployed.
- Long vesting periods are a problem for temporary workers due to short job tenure. Vesting periods for employer contributions in occupational pensions can exceed three years in several countries, including New Zealand, Turkey and the United States.

In analysing the challenges raised by pensions for non-standard workers, the following **policy implications** emerge.

- A well-coordinated system of contributory and non-contributory pension schemes, particularly important for the self-employed and individuals undertaking new forms of work, can be achieved to ensure a high level of old-age safety net while providing clear incentives to contribute to earnings-related pensions.
- Simple entitlement rules in contributory pensions greatly facilitate the coordination of contributory and non-contributory schemes.
- To remove barriers and exclusions that temporary and part-time workers face in meeting pension eligibility conditions, minimum earnings and minimum working time requirements for pensions should be set at sufficiently low levels. Policy that seeks equal treatment of all labour income implies that temporary work contracts should not be

excluded from mandatory pension protection, irrespective of their duration, and that no minimum tenure for acquiring pension entitlements should exist.

- The reasons supporting mandatory pensions for dependent employees apply to the self-employed similarly. Moreover, fully including all non-standard workers in mandatory pensions in the same way as standard workers limits the financial incentives employers and workers might have to misuse non-standard employment to lower labour costs.
- Aligning pension rules across work types means that total contribution rates are equalised for all workers. In particular, the guiding principle should be that the self-employed pay the sum of employee and employer contributions. Voluntary occupational schemes should be available for all contract types through default plans in countries where they are available for dependent workers. Equal treatment could also apply to auto-enrolment schemes.
- If lower mandatory pension contributions for the self-employed are used as an instrument to promote self-employment or to achieve some social policy objectives, resulting lower pension entitlements should be avoided by topping up the lower implied contributions through subsidies, at least for low earners.
- The contribution base for the self-employed that might realistically ensure the highest degree of harmonisation with employees and across the large variety of self-employed is taxable income. Full harmonisation based on taxable income would imply a higher total nominal contribution rate for the self-employment or the same contribution rate on taxable income rescaled to better correspond to the gross wage. An alternative would be to apply the same contribution rate to a share of gross income. Serious limitations of contribution bases based on income come from the absence of simple solutions to separate labour and capital income for the self-employed as well as the large differences in deductible costs between the self-employed and employees.
- Limiting the large degree of flexibility in defining the contribution base is one step towards aligning pension rules for self-employed and dependent workers. However, formally limiting flexibility in setting the contribution base might not be sufficient to prevent low levels of contributions and appropriate compliance measures might be needed.
- Pension policies cannot insure against all shocks that occur in the labour market. When the source of the transmission from non-standard work to low pension entitlements is low unemployment insurance, this may be more directly addressed by changing unemployment policies.

Notes

1. The survey data on income of the self-employed are prone to underestimation. For example, Di Marco (2006_[43]) argues their income was underestimated by 12% in the early waves of EU-SILC.
2. OECD/EU (2017_[41]) shows lower durability of self-employed businesses compared to the self-employment status as the self-employed might switch between business while remaining self-employed.
3. In addition, temporary employment can have a long-term impact on earnings, as e.g. in Spain where temporary employment spells lowered earnings even 27 years later (García-Pérez, Marinescu and Vall Castello, 2018_[49]).
4. The income from self-employment is classified as the main source of income if it amounts to at least two-thirds of a self-employed worker's yearly earnings.

5. Combining different forms of employment is even more common among workers in new forms of work. In the United Kingdom, 58% of gig-economy workers are permanent employees engaging in gig economy to top up their income (CIPD, 2017^[46]).
6. Source: Information provided by countries and Spasova et al. (2017^[15]).
7. This is based on the data from Pettinicchi and Börsch-Supan (2019^[13]). The authors do not account for differences in characteristics between employees and the self-employed. The retired (or former) self-employed and retired (or former) employees refer to retired persons who spent more than half of their working life as self-employed or employees, respectively. This classification is based on the retrospective questions about past employment spells longer than 6 months using Sharelife or wave 7 of Share.
8. The self-employed often do not have access to occupational pensions, and when they do, access conditions are less favourable. For example, dedicated pension plans for some groups of the self-employed rarely supply financial-education tools for managing savings comparable to those provided by employers (Transamerica, 2019^[8]). In addition, automatic enrolment in workplace pensions is less common for the self-employed, e.g. in New Zealand, Poland and the United Kingdom. Even when automatic enrolment is in place, the lack of employer (matching) contributions removes an important incentive to participate.
9. Source: OECD computations based on data by Pettinicchi and Börsch-Supan (2019^[13]), originally computed with the SHARE survey data.
10. This might be due to less old-age social protection for the self-employed, but this could also result from cohort effects, i.e. the fact that the earnings gaps of the current self-employed might be lower than in the past.
11. Net liquid assets do not include important elements of total wealth such as real estate, mortgages or the value of own businesses, but include financial assets such as stocks or bonds and the money earned when selling out a business.
12. In the United States, 40% of the self-employed expect to receive 401k or 403k pensions vs 67% of employees (Transamerica, 2019^[8]).
13. Further evidence from the Netherlands suggests that, upon retirement, the self-employed experience a larger drop in income – net of housing costs – than employees, amounting to 24% against 17% at median. This 7 percentage-point difference is driven by lower occupational pensions, which by themselves would yield a difference of 22 percentage points. Yet, many self-employed workers pay off their mortgages before retiring, thereby lowering the difference by 5 percentage points. Higher private savings of the self-employed reduce the difference by a further 8 percentage points. The remaining 2 percentage points are due to basic pensions (Zwinkels et al., 2017^[47]). Mastrogiacomo and Alessie (2015^[38]) also showed that the self-employed in the Netherlands have limited voluntary retirement savings.
14. Also other redistributive features of pensions incentivise exploiting the flexibility in setting the contribution base to lower the contributions. This might occur in numerous earnings-related schemes where contributions paid increase more strongly with income than pension entitlements, as in the Czech Republic or Norway for example. By contrast, in schemes with a very limited degree of redistribution, such as basic pensions financed by flat-rate contributions in Japan, this problem does not arise.
15. The inseparability of labour and capital income has given rise to inconsistencies. For example, income from self-employment is often treated as labour income for social security contributions while it is treated as capital income in national accounts (Gollin, 2002^[40]).
16. In addition, self-employed workers with low incomes often have lower bargaining power than low-income employees. First, a minimum wage for the self-employed does not exist. Second, competition laws typically prevent the self-employed from organising bargaining activities collectively whereas employees can enrol in trade unions. Workers in false or non-voluntary self-employment might not have any obvious alternative to accepting unfavourable contracts (OECD, 2019^[1]). The poor income situation of many self-employed workers is not a new phenomenon, however. The topic was already of major political concern in the 1990s (Freedman and Chamberlain, 1997^[39]) and it was even discussed as early as in the 1940s (Wynn and Paz-Fuchs, 2019^[45]). By contrast, workers with high earning potential can earn more when independent as they are not subject to wage policies, which sometimes compress wages. Indeed, almost half of the self-employed in the United States point to higher earnings as a reason for working independently (Transamerica, 2019^[8]).

17. In Ireland, Japan, the Netherlands and the United Kingdom the self-employed mandatorily contribute only towards basic pensions.
18. In Poland, the employees are auto-enrolled to the Employees Capital Plans, which is a long-term savings scheme from which assets can be withdrawn after reaching the age of 60 as opposed to Employee Pension Programs which are voluntary.
19. In order to circumvent this problem, Finland imposes a constraint which is, however, difficult to verify: the contribution base “must correspond to a wage that would be paid if the work of the self-employed was carried out by another, equally competent person in place of the self-employed” (<https://www.etk.fi/en/the-pension-system/pension-security/pension-coverage-and-insurance/self-employed/>).
20. Most countries also set a ceiling to contribution bases, in line with what is the case for dependent employees.
21. Although they can join voluntarily in some countries as in Chile for example.
22. Lithuania does not provide a strict minimum threshold but, if contributions are below the minimum wage, reduced periods are credited.
23. In Portugal, social security contributions amount to 21.4% of average reference income for most types of self-employed workers, but the contribution rate is higher for specific types of self-employed and can reach 25.1%. In Austria, farmers pay a rate of 17%, while other self-employed workers pay 18.5%; both benefit from a so-called partner-contribution from the federal budget amounting to 5.8% and 4.3%, respectively.
24. First-tier benefits are taken into account in these projections, but neither the voluntary schemes nor those that are mandatory for only some specific groups of the self-employed, e.g. liberal professions or farmers, are.
25. This is despite the fact that a taxable income, which is net of all contributions and of many work-related expenses that a self-employed can deduct, that corresponds to the average gross wage tends to imply that this self-employed individual earns more than the average-wage worker “all else equal” (Figure 2.10).
26. In Chile, the contribution rates of the self-employed will increase from 2.7% in 2018 to reach 10% in 2028, i.e. the level of employees.
27. If they make use of this option, only the employer pays contributions to the statutory pension scheme and pensions will be proportionally lower.
28. Which is considered to be the case if at least 83.3% of their work income stems from one client.
29. In Portugal, when self-employed workers receive between 50% and 79% of their income from one single ordering customer, a social security contribution rate of 7% applies since 2019. The rate increases to 10% when they receive 80% of their income or more from one ordering customer. Below 50%, customers do not pay contributions. Before 2019, ordering customers paid a contribution rate of 5% in case self-employed workers received at least 80% of their income from them and nothing if it was less. By contrast, Spain introduced in 2007 a special category of dependent self-employed (*trabajador autónomo económicamente dependiente*, TRADE) for those receiving at least 75% of revenue from a single client, without introducing any special pension rules for them.
30. Employees working at least 80 hours per month were included in 2003, at least 60 hours in 2010, and non-standard workers working at least 8 days per month in 2018.
31. Furthermore, the government started to earmark 12% of the financial aids paid to artists to their pension scheme.
32. The analysis of policies targeted at improving compliance with contribution obligations (OECD, 2019^[44]; Mineva and Stefanov, 2018^[41]) as well as with verifying revenues and costs of the self-employed goes beyond the scope of this chapter (see (OECD, 2018^[42]; Bigio and Zilberman, 2011^[50]) for more detail).
33. Such solutions may reduce the net income of self-employed less than when they pay contributions fully by themselves, as there is some evidence that employer-borne payroll taxes are not fully passed through to net wages (Saez, Schoefer and Seim, 2019^[48]).
34. Given contribution rates of employees (c_e) and employers (c_r), the total contributions paid for an employee are $W_g(c_r + c_e)$, W_g denoting the gross wage. When expressed in terms of the net wage before tax (W_n), these equal $(c_r + c_e)W_n/(1 - c_e)$. If the contribution rate of a self-employed worker (c_{se}) is applied to taxable income (I_n) then contributions equal $c_{se}I_n$. When the taxable

income of a self-employed worker is equal to net wage before taxes of a dependent employee, both pay the same contributions if $c_{se} = \frac{(c_r + c_e)}{(1 - c_e)}$. This implies that the contribution rate of the self-employed applied to taxable income should be larger than the total contribution rate that applies to employees' gross wages ($c_{se} > c_r + c_e$). Alternatively for equal contribution rates between the self-employed and employees ($c_{se} = c_r + c_e$) with the same taxable income, equalising total contributions requires adjusting contribution bases: $I_b = \frac{I_n}{1 - c_e} = \frac{I_g - I_b(c_r + c_e)}{1 - c_e} = \frac{I_g}{1 + c_r}$. Hence, fully harmonising contributions between the self-employed and employees requires to rescale the taxable income by $\frac{1}{1 - c_e}$ or include only a share of gross income: $\frac{1}{1 + c_r}$.

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Chapter 3

Are funded pensions well designed to adapt to non-standard forms of work?

This chapter looks at the design features of funded pension arrangements to see how they may affect participation, contributions and pension outcomes of different categories of workers. The purpose is to determine whether their design is well adapted to the situation of workers in non-standard forms of work to help them save for retirement.

Introduction

This chapter considers the situation of workers in non-standard forms of work with respect to funded pension systems, continuing with the topic addressed in Chapter 2. Given that workers not in a full-time permanent employment relationship sometimes have more limited access to pay-as-you-go (PAYG) pensions and build up lower entitlements, supplementary funded pension arrangements could be one solution to improve their retirement prospects. This would require, however, that the design of funded pension arrangements suits the specific needs and circumstances of these workers to help them complement their retirement income.

This chapter analyses whether the design of funded pension arrangements is well adapted to the situation of workers in non-standard forms of work to help them save for retirement. It looks at the design features of funded pension arrangements to see how they may affect participation, contributions and pension outcomes of different categories of workers.¹ This analysis is part of the OECD study on “The role of funded pensions in providing retirement income to people in non-standard forms of work”, which aims at shedding light on the current access to funded pensions of different categories of workers in non-standard forms of work, and assessing different approaches to increasing coverage and contribution levels.²

Workers in non-standard forms of work have more limited access to, and lower pension income prospects from, funded pension arrangements than full-time permanent employees. Self-employed workers participate less in funded pensions than employees do when funded pension systems are organised mostly through occupational plans, to which the self-employed usually lack access. Some countries require lower contribution levels from the self-employed or do not allow them to save as much as employees in funded pensions, thereby reducing their future potential retirement income. Part-time and temporary employees also participate less in funded pensions than full-time permanent employees do. They indeed have worse access to occupational pension plans when a minimum income, a minimum number of working hours or a minimum length of employment is required to be able to join a plan. In addition, vesting periods and the limited portability of occupational pension rights and assets affect the pension income outcomes of workers switching jobs frequently, in particular temporary employees. Finally, the possibility of accessing funds before the age of retirement may remove a barrier for participating for workers with unstable and fluctuating earnings, but raises issues of retirement income adequacy.

As a response to the growing workforce in non-standard forms of work, some countries should improve the design of funded pension arrangements and align it further with the *OECD Core Principles of Private Pension Regulation* in order to offer these workers the possibility of saving in complementary pension plans. Policy makers should aim to prevent exclusion from plan participation for workers in non-standard forms of work, limiting the use, or eliminating, eligibility criteria based on salary, working hours, length of employment and type of contract. Access to personal pension plans should not

discriminate between different types of workers. In addition, vesting periods should be minimised to allow workers to accrue entitlements as early as possible. Countries should also facilitate the portability of pension rights and assets upon changing jobs.

This chapter is structured as follows. Section 2 analyses the formal and effective access to funded pensions of different categories of workers. Section 3 looks at differences across workers with respect to contribution rates, contribution caps, and the possibility to suspend the payment of contributions. Section 4 analyses design features of funded pensions that may influence pension income outcomes differently across various categories of workers. Finally, Section 5 concludes.

Formal and effective access to funded pensions

The combination of different formal access and eligibility criteria results in different effective access to funded pensions for various categories of workers. The extent to which different categories of workers can access to funded pension arrangements may affect their capacity to accumulate enough resources to finance their retirement and thereby to avoid a large fall in their standard of living when retiring. This section therefore first describes the current formal access of different categories of workers to funded pensions. It then provides details on the different eligibility criteria that workers need to fulfil in order to effectively join funded pensions. It ends with statistics on effective participation rates by types of workers for countries with available data.

Formal access

Formal access of different categories of workers to funded pensions depends first on the structure of the funded pension system. Formal access indeed varies whether the funded pension system is occupational or personal. An individual can join an occupational pension plan only if there is an employment or professional relationship between that individual and the entity that establishes the plan (the plan sponsor). Employers or groups thereof, as well as labour or professional associations (e.g. self-employed professionals) may establish occupational plans, jointly or separately. By contrast, access to personal pension plans does not have to be linked to an employment relationship. A pension fund or a financial institution acting as pension provider directly establishes and administers the plans. In addition, within occupational and personal systems, participation of employers and/or employees may be mandatory or voluntary. This affects the actual participation level, or effective access, to funded pensions of different types of workers, which will be analysed later.

Access to funded pension plans for different types of workers varies across countries. Table 3.1 presents a summary of the extent to which different types of workers have access to occupational and personal pension plans in OECD and selected non-OECD G20 countries. The access of a category of workers to a particular type of plan is qualified as “Full” in Table 3.1 when all workers of that category can or have to join the plan. The access is qualified as “Partial” when there are eligibility criteria limiting the possibility of certain workers in the respective category to join the plan, such as thresholds on earnings or number of working hours. For example, in the second row (quasi-mandatory occupational pension systems) and third column (temporary employees), the cell indicates “Full” for Denmark and Sweden as all employees are covered by collective agreements, including those with temporary contracts. By contrast, for the Netherlands, the cell indicates “Partial” because some types of seasonal employees (such as agricultural) are exempt from

Table 3.1. **Summary table: Access to funded pension plans for different categories of workers, by type of plan**

		Full-time permanent employee	Non-standard worker				
			Part-time permanent employee	Temporary employee	Temporary agency worker	Contractor	Other self-employed worker
Mandatory occupational (MO)		Full: AUS, FIN, ISL, NOR, CHE	Full: FIN, ISL Partial: AUS, NOR, CHE	Full: AUS, FIN, ISL Partial: NOR, CHE	Full: AUS, FIN, ISL Partial: CHE NA: NOR	Full: AUS, FIN, ISL NA: NOR, CHE	Full: ISL NA: AUS, FIN, NOR, CHE
Quasi-mandatory occupational (QMO)		Full: DNK, KOR, NLD, SWE	Full: DNK, NLD, SWE Partial: KOR	Full: DNK, SWE Partial: KOR, NLD	Partial: NLD NA: DNK, KOR, SWE	Full: DNK, NLD NA: KOR, SWE	Full: DNK, NLD NA: KOR, SWE
Voluntary occupational (VO)		Full: AUT, BEL, DEU, GRC, IRL, ITA, JPN, LUX, NOR, PRT, SVN, ESP, SWE, USA, BRA, CHN, IDN, ZAF Partial: CAN, FIN, FRA	Full: BEL, DEU, GRC, ITA, NOR, SVN, ESP, SWE, CHN, IDN, ZAF Partial: AUT, CAN, FIN, FRA, IRL, JPN, LUX, PRT, USA, BRA	Full: AUT, BEL, GRC, ITA, SVN, SWE, CHN, ZAF Partial: CAN, FIN, FRA, DEU, IRL, JPN, LUX, PRT, ESP, USA, BRA, IDN NA: NOR	Full: GRC, SVN, SWE, ZAF Partial: PRT, USA NA: AUT, BEL, CAN, FIN, FRA, DEU, IRL, ITA, JPN, LUX, NOR, ESP, BRA, CHN, IDN	Full: GRC, ITA, NOR, BRA Partial: PRT, SWE NA: AUT, BEL, CAN, FIN, FRA, DEU, IRL, JPN, LUX, SVN, ESP, USA, CHN, IDN, ZAF	Full: GRC, ITA, NOR, PRT, SVN, BRA Partial: SWE NA: AUT, BEL, CAN, FIN, FRA, DEU, IRL, JPN, LUX, ESP, USA, CHN, IDN, ZAF
Automatic enrolment (AE)		Full: CAN, ITA, LTU, NZL, POL, TUR, GBR, USA	Full: ITA, LTU, NZL, POL, TUR Partial: CAN, GBR, USA	Full: LTU, POL, TUR, GBR Partial: CAN, ITA, NZL, USA	Full: LTU, NZL, POL, TUR, GBR Partial: CAN, ITA, USA	Full: CAN, LTU, NZL, GBR NA: ITA, POL, TUR, USA	Full: CAN, LTU, NZL, GBR NA: ITA, POL, TUR, USA
Mandatory personal (MP)		Full: CHL, DNK, EST, ISR, LVA, MEX, SWE, CHN, IDN	Full: CHL, EST, ISR, LVA, MEX, SWE, CHN, IDN Partial: DNK	Full: CHL, DNK, EST, ISR, LVA, MEX, SWE, CHN, IDN	Full: CHL, DNK, EST, ISR, LVA, MEX, SWE, CHN, IDN	Full: EST, ISR, LVA, SWE, CHN Partial: CHL NA: DNK, MEX, IDN	Full: EST, ISR, LVA, SWE, CHN NA: CHL, DNK, MEX, IDN
Voluntary personal (VP)		Full: All countries	Full: All countries	Full: All countries	Full: All countries	Full: All countries	Full: All countries

Notes: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). “Full” means that the worker has full access to the plan, “Partial” means that the worker has limited access to the plan due to eligibility criteria, and “NA” means that the worker does not have access to the plan. In the case of Chile, among contractors, only self-employed workers issuing invoices for their services are mandatorily covered by the personal account system. In Korea, the retirement benefit system is mandatory and can take two forms: a severance payment system and an occupational pension plan. The obligation of the employer is to provide a severance payment system, but, by labour agreement, the company can set up an occupational pension plan instead.

accumulating occupational pension entitlements. Finally, certain types of plans are not available (“NA”) to certain categories of workers.

While employees always have access (fully or partially) to mandatory or quasi-mandatory occupational pension plans, access by the self-employed varies across countries. In mandatory occupational pension systems, the law mandates employers to set up and participate in a plan, and all eligible employees have to join that plan. The mandate to join an occupational pension plan is extended to the self-employed in Iceland, but not in Australia, Norway and Switzerland.³ However, in Australia, contractors paid fully or principally for their labour are considered as employees for pension purposes and entitled to mandatory superannuation contributions by the employer. In Switzerland, the self-employed can usually join profession-wide arrangements, the pension institution established for their employees, or the Substitute Occupational Benefit Institution on a voluntary basis. In addition, in some countries, the mandate on employers to establish pension plans for their employees comes from industry-wide or nation-wide collective bargaining agreements. As such agreements may not cover all sectors, these systems are classified as quasi-mandatory. Participation is mandatory for all employees to whom the collective agreement creating the plan applies. Occupational pension plans under profession-wide agreements for the self-employed can be set up in Denmark and the Netherlands; they are rare in Sweden.

Access to voluntary occupational pension plans is usually restricted to employees as it commonly depends on whether employers establish such plans for their employees. In voluntary occupational pension systems, employers can freely decide whether to establish a pension plan for all or part of their employees. In most cases, participation is also voluntary for eligible employees. There are exceptions in Belgium, France, Japan (employee's pension funds), Luxembourg and South Africa, where employees fitting the eligibility criteria must join the plan set up by their employer. In Canada, Germany and Ireland, the mandatory or voluntary nature of employees' participation depends on plan rules.⁴

Self-employed workers are usually not covered by voluntary occupational pension plans, as they do not have an employer setting one up for them. In some countries, however, profession-wide associations of self-employed workers may establish, on a voluntary basis, an occupational pension plan for their members. This is the case in Greece, Italy, Norway, Portugal, and Brazil.⁵

Alternative options are available in the workplace to employees not covered by a voluntary occupational pension plan in Germany and Ireland. In Germany, employees who are compulsorily covered by the social security pension scheme can require their employer to deduct part of their salary and contribute it to an occupational pension plan (co-called "salary conversion"). In Ireland, all employers are required to enter into a contract with a Personal Retirement Savings Accounts (PRSA) provider to allow all employees not covered by an occupational pension plan access to at least one standard PRSA.

While the automatic enrolment of individuals into a pension plan usually targets employees, the plan itself may be accessible to the self-employed as well. In most automatic enrolment systems, employers enrol their employees automatically into a pension plan. Participation from employees is still voluntary as they can opt out of the plan. In New Zealand (KiwiSaver), Poland (Employee Capital Plans, PPK), Turkey and the United Kingdom, employers are required to offer access to a pension plan (either occupational or personal) and to enrol their employees automatically into that plan. In Canada (Pooled Registered Pension Plans) and the United States, employers can voluntarily offer a pension plan with an automatic enrolment feature. In addition, in Canada, New Zealand and the United Kingdom, the self-employed can voluntarily join the system by contracting directly with a plan provider.⁶ In Lithuania, all workers younger than 40, irrespective of their employment status, are automatically enrolled into a pension fund by a public entity, with the possibility to opt out.

Mandatory personal pension plans cover both employees and self-employed workers (fully or partially) in most countries. In mandatory personal pension systems, the law mandates individuals to join a plan. This obligation covers all workers in Estonia, Israel, Latvia, Sweden and China. In Chile, among self-employed workers, only those issuing invoices have the obligation to contribute to a pension plan. The self-employed are exempt from mandatory contributions to personal pension plans in Denmark (ATP), Mexico and Indonesia. In Denmark, however, self-employed workers who have been in the ATP scheme as employees for at least three years can remain members and contribute voluntarily into the scheme. In the same way, in Mexico, self-employed workers who have been in the formal system can continue making voluntary contributions to the mandatory scheme of the Social Security Institute.

In all countries, all workers have access to, and can open, a voluntary personal pension plan by contracting directly with a pension provider. Participation is voluntary for

individuals. Access to these plans is usually granted to labour income earners only, but in some countries, individuals without earnings (e.g. Chile, Germany) and even children (e.g. Chile, the Czech Republic, New Zealand) can access them. Individuals can usually choose the level and regularity of contributions. By contrast, in Japan (national pension funds), Portugal (public funded scheme), the Slovak Republic (second pillar pension funds) and India (APY and PM-SYM schemes), plan rules define the level and regularity of contributions into voluntary personal plans.

Some countries provide different types of voluntary personal pension plans to different types of workers. For example, in Belgium, France and Japan, self-employed workers have access to specific plans that employees usually cannot join.^{7 8} This may be to compensate for the existence of pension plans that only employees can join, in particular occupational ones. In India, the PM-SYM scheme is dedicated to informal workers (so-called unorganised workers).

Eligibility criteria

Some plans establish eligibility criteria to limit the population effectively allowed to join. These criteria include minimum income thresholds, minimum number of working hours and minimum length of employment. Legislation may provide minimum standards for eligibility, meaning that, once the thresholds are met, workers can have access to the plans. Employers and providers may still, however, offer pension plans to workers who have not met the thresholds (e.g. Canada, the United States).

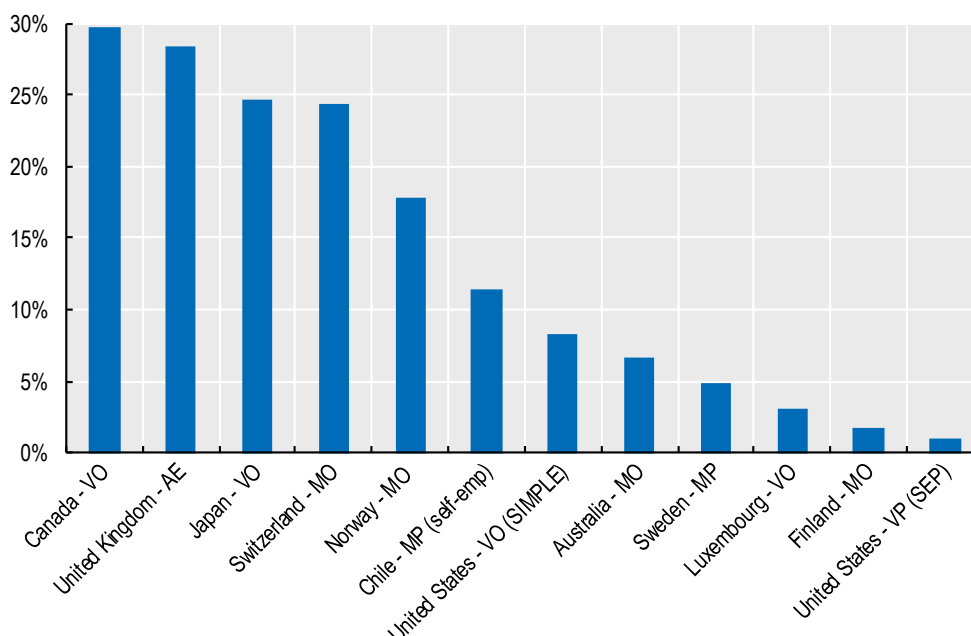
Minimum income thresholds restrict access to funded pension plans by low-income earners. This may have a larger effect on part-time employees, as they may find it harder to reach the threshold given their lower number of hours worked with a given employer. Figure 3.1 shows that the thresholds that workers' income should exceed in order to be eligible to join a pension plan represent 25% to 30% of the average wage in the economy in Switzerland, Japan, the United Kingdom and Canada. They represent less than 5% of the average wage in Sweden, Luxembourg and Finland.⁹ In the United States, employers offering a retirement plan (e.g. SIMPLE or SEP) must cover employees receiving compensations above certain thresholds, although they are free to offer the plans to employees who do not meet those earnings thresholds. By contrast, India has a maximum income threshold for the PM-SYM scheme, in which only unorganised workers with a monthly income up to INR 15 000 are eligible to participate. Other countries do not apply income thresholds.

Minimum income thresholds can be designed in such a way that part-time employees are not at a disadvantage. In the Netherlands for example, the number of working hours does not penalise part-time employees when there is an income threshold established to join an occupational pension plan. This is because the salary of a part-time employee is converted into the salary that would be earned at the full-time rate of employment before the application of the threshold.

Establishing a minimum number of working hours to be able to join a plan excludes some part-time employees from the eligible population of funded pension plans. This is more common in occupational pension systems, as shown in Figure 3.2. In Australia, in addition to the monthly non-uprated earnings threshold that applies to all workers, those younger than 18 or working as a private or domestic worker (such as a nanny or housekeeper) need to work at least 30 hours per week to be entitled to mandatory employer contributions into the superannuation system. In Japan, voluntary occupational pension plans require 75% of full-time working hours, although for large firms (with 501 and more

Figure 3.1. **Minimum income required to join a funded pension plan**

As a % of average annual wages



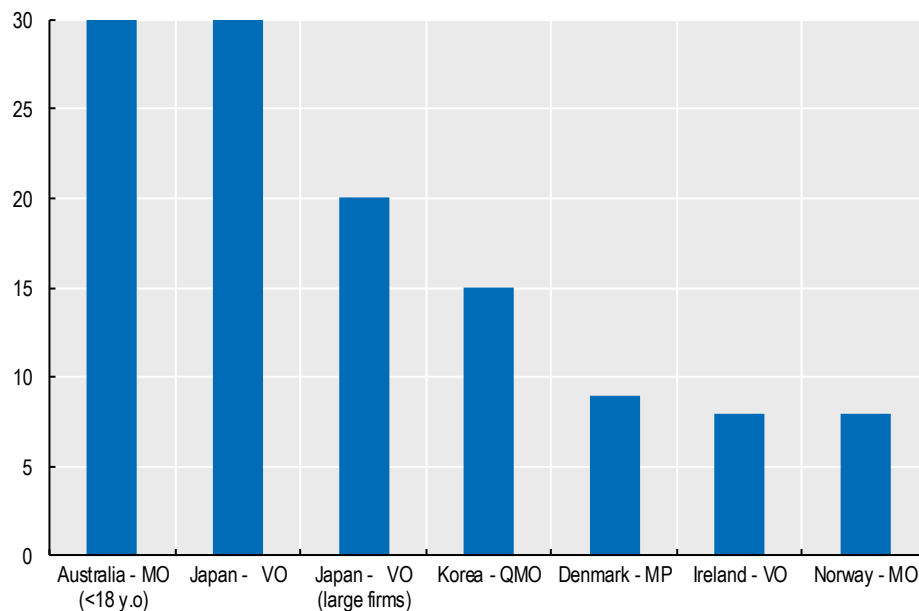
Notes: Average annual wages per full-time and full-year equivalent employee. Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). For the United States, “SEP” means Simplified Employee Pension and “SIMPLE” means Savings Incentive Match Plans for Employees. The limits represent the maximum income that employers can require before joining a funded pension plan.

Source: Calculations based on the OECD Average annual wages database.

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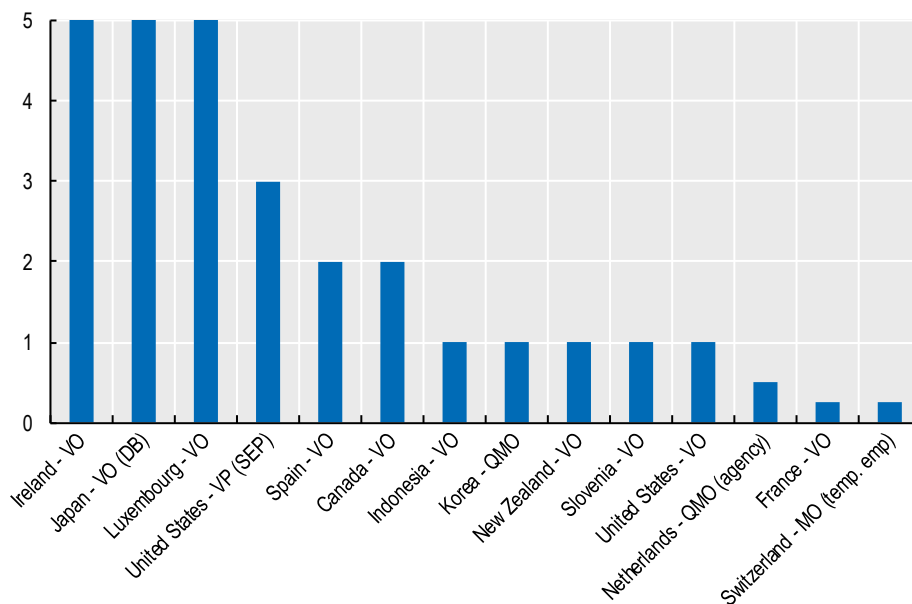
employees) the requirement is reduced to 20 hours a week if the employee (excluding students) receives a monthly pay of at least JPY 88 000 and can expect to work continuously for at least one year. In Denmark, Ireland and Norway, between 8 and 9 working hours per week are necessary to be eligible to join a pension plan.¹⁰ Other countries do not apply thresholds on the number of working hours.

Finally, minimum length of employment or contract duration requirements may also restrict access to occupational pension plans by temporary employees. Employees may not be allowed to join an occupational pension plan from the first day of employment. This may penalise temporary employees the most as their contract duration may be shorter than the qualifying period. Figure 3.3 shows that the minimum length of employment required before joining an occupational pension plan varies from 13 weeks in Switzerland (for temporary employees) to 5 years in Ireland, Japan (DB) and Luxembourg. These are maximum limits. In Japan for example, normal practice is three years and some companies allow new employees to join the plan immediately. Five countries use a minimum length of employment of one year. In the United States, one year of employment would normally be required in an occupational plan. However, a traditional 401(k) plan may require two years of employment for eligibility to receive an employer contribution if the plan provides for immediate vesting. In addition, in Norway, seasonal workers must be covered by a mandatory occupational pension plan only if they work at least 20% of full-year employment. Other countries do not require minimum length of employment or contract duration, or do not have legal rules.

Figure 3.2. **Minimum number of working hours per week required to join a funded pension plan**

Notes: When the requirement is expressed as a percentage of full-time working hours (Ireland, Japan and Norway), the calculations assume that a full-time job requires 40 hours of work per week to get a number of hours. Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”).

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Figure 3.3. **Minimum number of years of employment required to join a funded pension plan**

Notes: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). For the United States, “SEP” means Simplified Employee Pension. Employees must be included in the SEP plan if they have worked for the employer in at least 3 of the last 5 years. For the Netherlands, the information refers to temporary agency workers. For Switzerland, the information refers to temporary employees.

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Effective access

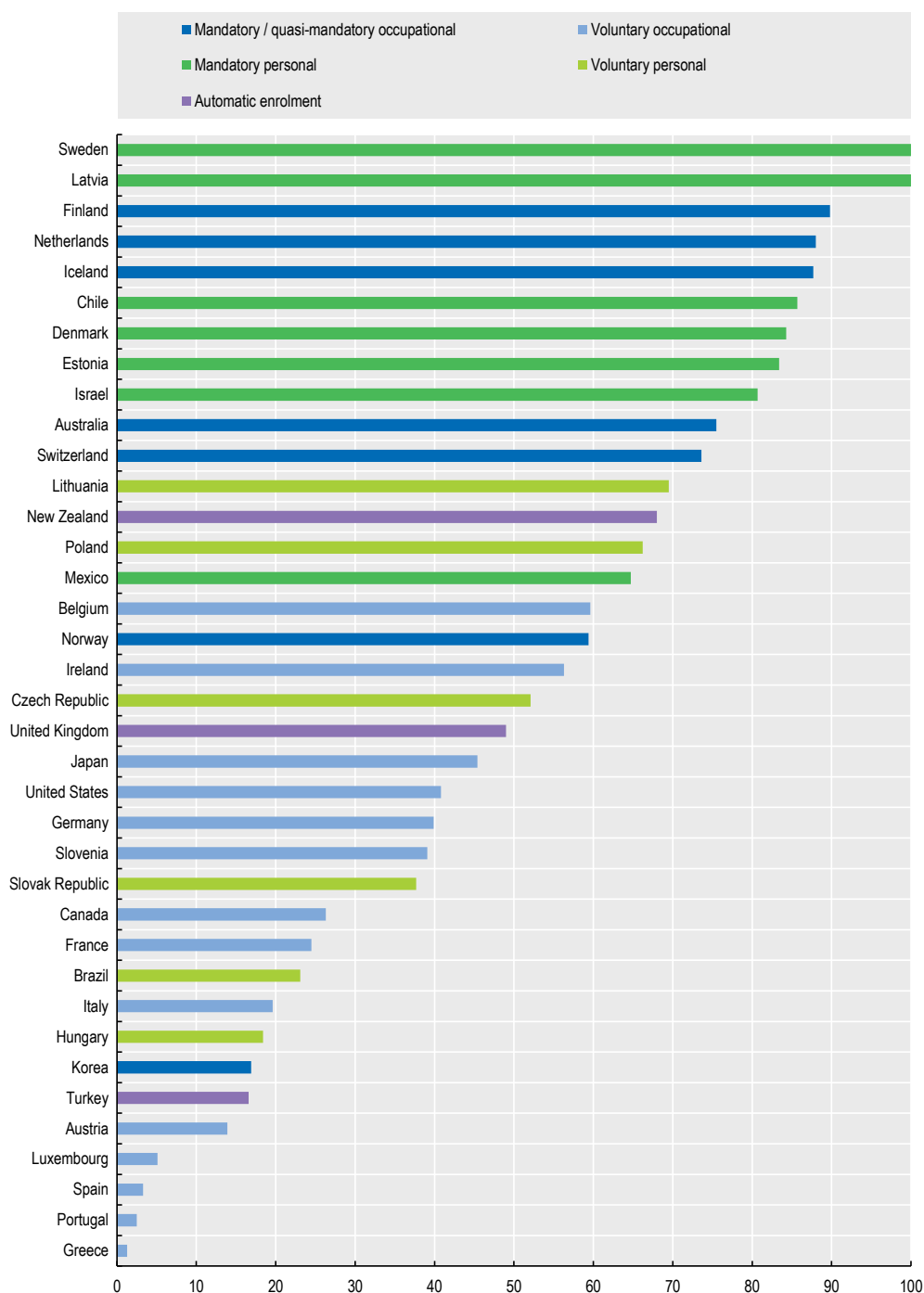
Mandatory and quasi-mandatory pension systems usually achieve higher overall participation rates than voluntary systems. Figure 3.4 shows that, in most countries with mandatory systems, more than 70% of the working-age population participates in a funded pension plan. However, countries with high levels of informality (e.g. Mexico) do not reach this threshold.¹¹ By contrast, no single country with a voluntary system achieves participation rates above 70%. Voluntary personal plans linked to the public pension system (e.g. the second pillar in Lithuania, Poland and the Slovak Republic) achieve relatively high participation rates of between 40% and 70%. Finally, participation rates in voluntary occupational plans can be quite low (e.g. below 15% in Austria, Luxembourg, Spain, Portugal and Greece). Indeed, participation in voluntary occupational plans requires a combination of three elements: i) that the employer offers a plan, ii) that the employee is eligible to join that plan and iii) that the eligible employee chooses to join that plan.

In pension systems organised mostly through occupational plans, self-employed workers tend to participate less than employees do. Data on participation rates in funded pensions by employment status are scarce. The left panel of Figure 3.5 shows participation rates in voluntary pension plans (both occupational and personal) for seven countries, while the right panel shows the proportion of workers aged 50 and older having occupational pension rights or assets for six countries. In Denmark, Ireland, Italy, Japan, Sweden, Switzerland, the United Kingdom and the United States, employees are more likely to participate in a funded pension arrangement than self-employed workers. These countries are mostly organised through occupational pension systems (either voluntary or mandatory), which usually do not cover the self-employed. In addition, in the Netherlands, only about 20% of self-employed workers declared in a survey that their current or last job before retirement entitles them to a retirement pension, compared with 84% for the total surveyed employed population (Karpowicz, 2019^[1]). In Australia, while contributing to superannuation funds is nearly universal among employees, only 27% of the self-employed made contributions in 2016-17.¹² In Chile, in 2017, 86% of employees contributed regularly to the pension system, as opposed to only 6% of the self-employed.¹³ In Denmark, 81% of employees paid into an occupational or personal pension plan in 2017, as opposed to 53% of the self-employed. In addition, 66% of the self-employed saved less than 5% of gross income that year, while only 16% of the employees saved that little.¹⁴ Finally, it is noteworthy that still large proportions of the self-employed expect to receive pension benefits from mandatory or quasi-mandatory occupational pension plans in Denmark (51%), Sweden (74%) and Switzerland (55%), as they accumulated pension rights or assets from past jobs as employees.

Dedicated pension arrangements for the self-employed may help in bridging the gap of pension participation between employees and the self-employed. In Belgium, France and Japan, the self-employed have access to dedicated voluntary personal pension plans that employees cannot join. In addition, in Germany, basic pensions (“Rürup”) are designed to target the self-employed, although any other taxpayer can join these plans as well. Figure 3.5 shows that, in Belgium, participation in voluntary plans is the same for employees (via occupational plans) and the self-employed (via dedicated personal plans). In France, 35% of self-employed workers contribute to dedicated personal plans (called Madelin contracts), while only 15% of employees contribute to an occupational pension plan (6% to a PERCO and 9% to other occupational plans). In Germany, 11.5% of self-employed workers aged 40 to 59 have a basic pension contract, as opposed to only 1.8% for

Figure 3.4. Overall participation in funded pensions by type of plan, 2017 or latest available year

As a percentage of the working-age population



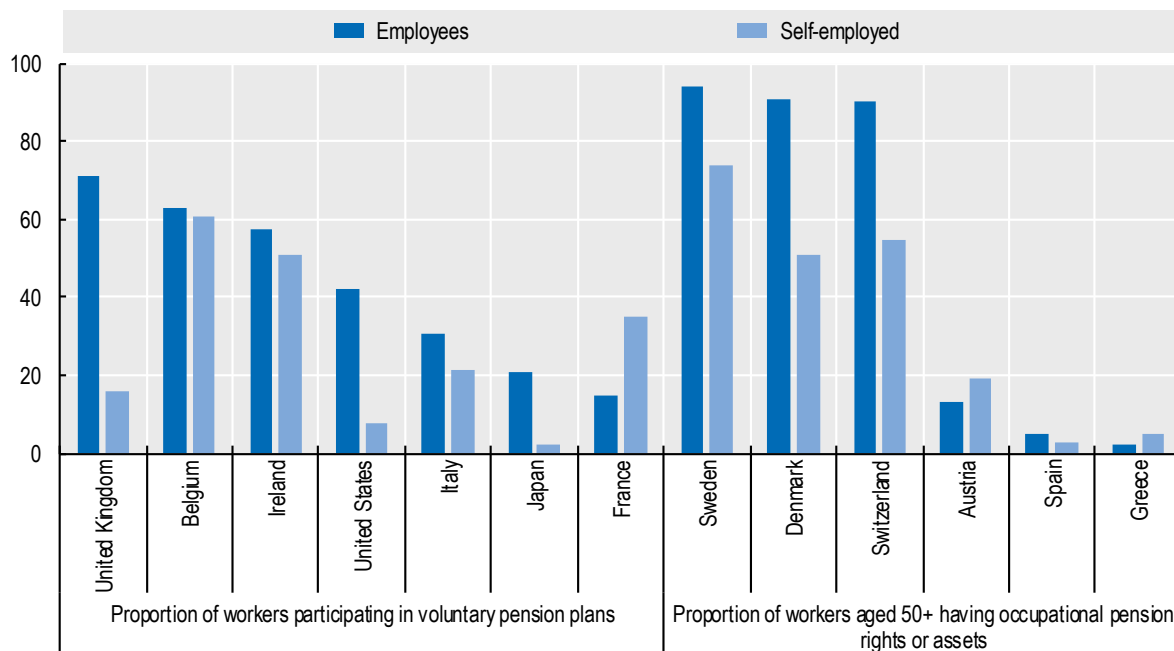
Source: OECD Global Pension Statistics.

StatLink  <https://doi.org/10.1787/888934041117>

employees.¹⁵ In Japan, however, very few self-employed workers participate in national pension funds, the dedicated voluntary personal plans. The fact that participation in these plans becomes mandatory after joining may restrain take up.

Figure 3.5. **Participation in funded pensions by employment status**

As a percentage of the relevant population

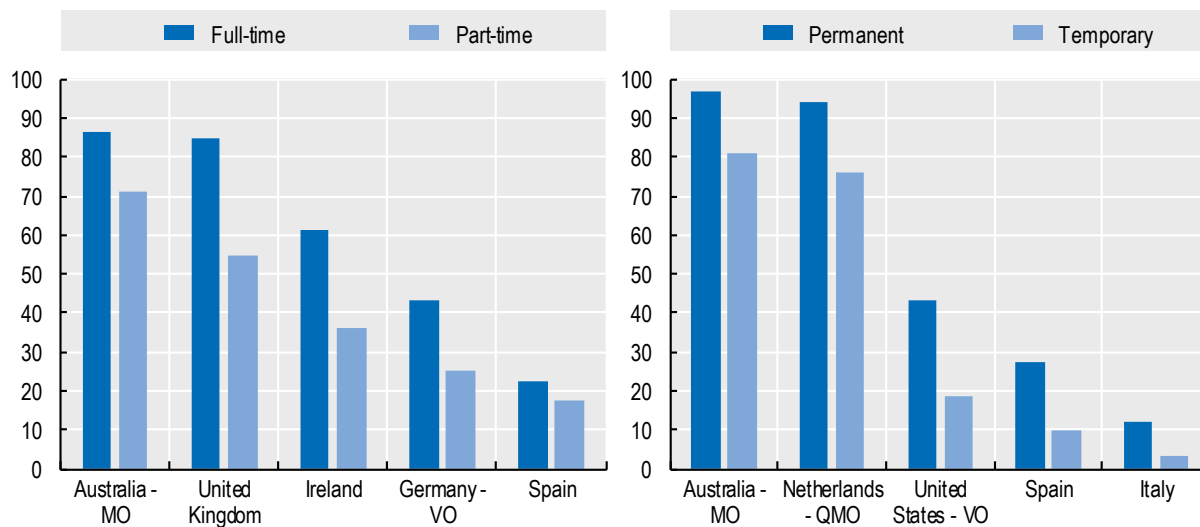


Source: National sources for participation in voluntary pension plans and SHARE wave 7 for workers aged 50 and older having occupational pension entitlements (Technical Report: Using SHARE data to measure pension adequacy in Europe)

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Figure 3.6. **Participation in funded pensions by type of contract**

As a percentage of the relevant population



Notes: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). For the United Kingdom, participation refers to workplace pensions, which include voluntary occupational plans and group personal plans.

Source: Chapter 4 of the OECD Pensions Outlook 2012 and national sources.

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Part-time and temporary employees participate less in funded pensions than full-time and permanent employees do. Participation rates by type of contract are only available for a few countries. As shown in the left panel of Figure 3.6, in the five countries with available data, part-time employees participate less in funded pensions than full-time employees do. Minimum thresholds on earnings and working hours tend to exclude part-time workers from the population eligible to join occupational pension plans. Minimum requirements on length of employment and contract duration may also partially explain why temporary workers participate less in occupational pension plans than permanent employees do, as illustrated in the right panel of Figure 3.6.

Contribution levels

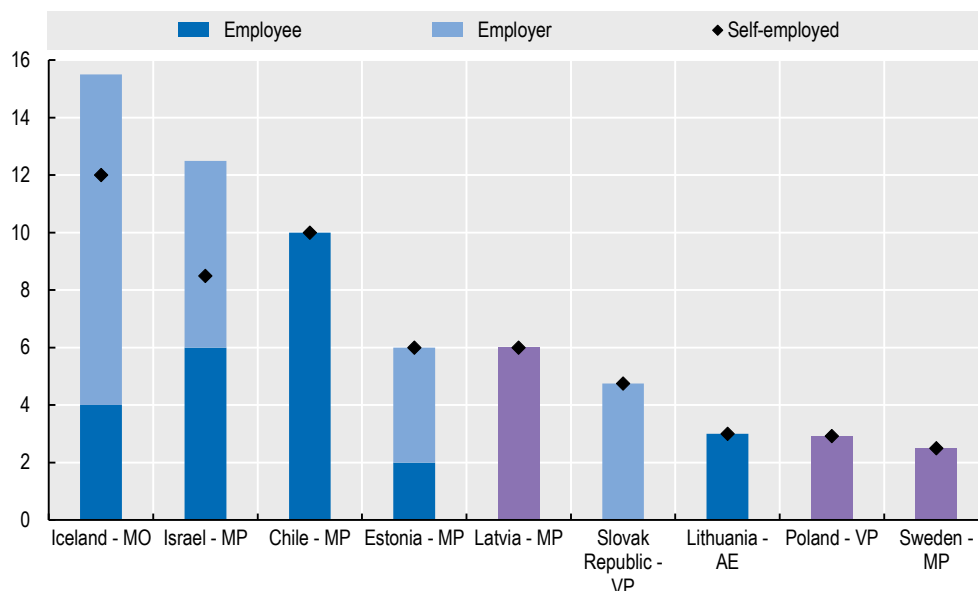
Different categories of workers may face dissimilar rules concerning contributions on top of different access rules, potentially inducing some workers to save less for their retirement than others. This may happen because employees and self-employed workers are members of different types of plans to which different contribution rules apply, or because contribution rules vary according to the type of worker within a plan. There are differences across workers with respect to contribution rates, contribution caps, and the possibility to suspend the payment of contributions.

Contribution rates

Minimum or mandatory contribution rates required from self-employed workers are either equal to or lower than those required from employees, who may share the burden with their employer. Figure 3.7 shows the minimum or mandatory contribution rates that apply to pension plans covering all types of workers. For employees, the contribution rate is split between the individual part and the employer part. In Iceland and Israel, mandatory contributions to funded pensions are lower for the self-employed than for employees. The difference is 4 percentage points (pp) in Israel and 3.5 pp in Iceland. In China, employees pay 8% of wages to the basic urban worker pension scheme, while the self-employed can choose to pay between RMB 100 and RMB 2 000 per year in the equivalent basic national resident pension scheme (pillar 1b). In the other countries, overall contribution rates are the same for all types of workers. While self-employed workers have to pay the full amount by themselves, employees share the contribution burden with employers in all countries in Figure 3.7, except Chile and Lithuania.

Different requirements in terms of contributions to mandatory funded pension plans for different types of workers may result in differences in take-home pay. It may also give an incentive to provide services through self-employed arrangements (e.g. contractors) rather than through an employment relationship with employees. When the overall contribution rate of employees, which includes the employee and the employer contribution, is higher than that of the self-employed, the self-employed will have a higher take-home income *ceteris paribus*. Providing services through self-employed arrangements may look more attractive as it could lead to a higher take-home income or lower employment cost to invest more or reduce prices potentially gaining market share. Unfortunately, this could also lead to a higher risk of a larger fall in their standard of living upon retirement if they fail to save more by themselves into a voluntary pension plan. Having the same overall contribution rate across employees and the self-employed in mandatory pension systems ensures that all workers will achieve the same replacement rate at retirement. Some categories of self-employed workers may find it hard, however, to

Figure 3.7. **Minimum or mandatory contribution rates applying to pension plans covering employees and self-employed workers**



Notes: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). Purple colour represents cases where the contribution rate cannot be split precisely between the employee and the employer parts.

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pay the equivalent of both employer and employee pension contributions, in particular when they have low and fluctuating earnings.

In voluntary pension systems, the prospect of getting employer contributions creates an incentive for employees to contribute themselves to funded pensions. This type of incentive is not available to the self-employed, who may therefore contribute less in voluntary systems. Employees may indeed benefit from employer contributions in occupational or even sometimes personal pension plans (e.g. employers can contribute to their employees’ voluntary personal pension plan in the Czech Republic, Estonia, Finland and Iceland). In voluntary systems where employees can decide whether or not to participate in a pension plan offered at their workplace, an employer contribution may provide an incentive to participate in that plan, as only employees who decide to participate get the employer contribution. The literature shows that employer matching contributions in occupational pension plans in the United States increase participation levels (Choi, 2015^[2]; Madrian, 2013^[3]). This sort of incentive is not available to the self-employed. If self-employed workers contribute to voluntary pension plans, but do not cover the employer part of the contributions additionally, they will have lower assets accumulated at retirement and smaller pension benefits.

Contribution caps

Contribution caps can also influence contribution levels, although most countries do not differentiate them by type of worker. Table 3.2 lists the countries according to whether the contribution cap is the same or differs across employees and self-employed workers. Contributions to funded pension arrangements are usually capped, especially when these contributions can be deducted from an individual’s taxable income. Although individuals

Table 3.2. **Difference in overall contribution caps between employees and the self-employed**

Same cap for employees and the self-employed	Higher cap for employees	Higher cap for the self-employed
Australia, Austria, Belgium, Canada, Chile, Denmark, Estonia, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Mexico, Netherlands, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States India, Indonesia, South Africa	Czech Republic* Finland* (voluntary plans) Ireland* Israel Korea* Luxembourg* Norway* Poland* Brazil* China	Belgium (free supplementary plans) France Japan Switzerland (personal plans)

Notes: New Zealand and Turkey do not have contribution caps. Countries marked with * have a separate cap or no cap for employer contributions. In Portugal, there is no distinction a priori between employees and self-employed workers, but contribution caps depend on the rules of the pension plans and can differ across workers.

and employers may not contribute up to the maximum amount, the cap determines the maximum contribution level and can eventually influence future retirement income. Most countries apply the same contribution cap to all types of workers. This means that the overall cap for employee and employer contributions is the same as the cap for contributions done by self-employed workers alone.

In some countries, the cap for contributions made by or on behalf of employees is higher than the one for the self-employed. In the case of the Czech Republic, Finland, Ireland, Korea, Luxembourg, Norway, Poland and Brazil, two different caps apply to employee/individual contributions and employer contributions. While the same cap may apply to individual contributions irrespective of the type of worker, the fact that employees may also receive an employer contribution increases their overall cap as compared to self-employed workers. For example, in Luxembourg, any worker may contribute up to EUR 3 200 in voluntary personal plans. However, employees may also receive an employer contribution in an occupational plan, capped at 20% of the employee's ordinary earnings. In the case of China, employees and the self-employed have access to different plans, to which different contribution caps apply.

Finally, in Belgium, France, Japan and Switzerland, the self-employed can contribute more in selected funded pension plans than employees. In Belgium, employees not covered by an occupational pension plan and self-employed workers can access pension plans called "free supplementary pensions". The cap for employees is the highest of EUR 1 600 or 3% of gross salary received two years before. By contrast, the self-employed may contribute up to the highest of 8.17% of professional income or EUR 3 187.04. In France, the overall contribution limit for employees in occupational plans is 8% of 8 times the annual social security ceiling. Self-employed workers with high taxable profit may contribute up to 10% of 8 times the annual social security ceiling plus 15% of 7 times the annual social security ceiling in so-called Madelin contracts. In Japan, the self-employed benefit from a higher overall cap (JPY 816 000) than employees offered an occupational plan by their employer (JPY 660 000 combining any occupational and personal plan). The relatively higher cap for the self-employed may be to compensate for the fact that they are excluded from the earnings-related public pension scheme. Finally, in Switzerland, the self-employed can contribute 20% of taxable income up to CHF 34 128 in personal plans, as opposed to only CHF 6 826 for employees, in order to account for the fact that the self-employed do not have compulsory contributions paid into occupational plans.¹⁶

Suspension of contributions

The possibility of suspending the payment of contributions tends to be more readily available to the self-employed than to employees. This suspension also influences the total amount of contributions paid over a lifetime. In general, contributions to occupational pension plans cannot be paused during employment, whereas workers can usually decide freely to increase, decrease or stop contributing at any time in personal pension plans. While flexibility in the payment schedule of contributions may be welcomed for certain categories of workers, in particular those with volatile earnings, it also raises adequacy concerns if people do not increase their contributions afterwards to fill the gap.

Pension income outcomes

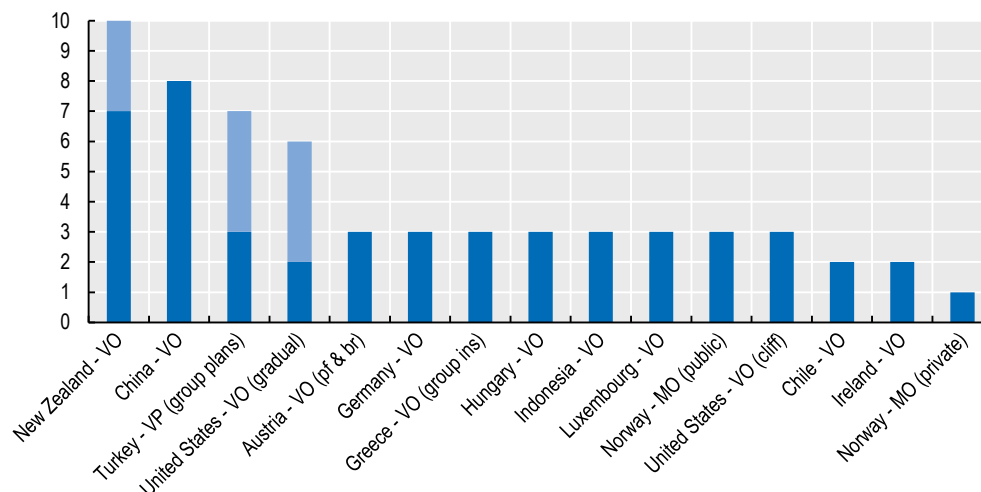
There are certain design features of funded pension arrangements that may influence pension income outcomes differently across various categories of workers. When vesting periods apply, in particular in occupational plans, workers participating in and contributing to funded pensions may lose some of their pension rights (in DB plans) or the part of the assets (in DC plans) linked to the employer contributions when changing jobs. In addition, there may be leakages from the funded pension system when individuals change jobs (lack of portability) or when they have the possibility of accessing their funds before retirement age (early access), ultimately affecting future retirement income.

Vesting period

Being a member of an occupational pension plan does not necessarily mean that employees start accruing pension rights or accumulating assets from the first day of membership. Some pension plans apply a vesting period, which is the length of time an individual must be a member of the plan (i.e. contributing to the plan or having contributions being made on his/her behalf) before he or she becomes fully the owner of the rights accruing, or assets accumulating, within the plan. This vesting period comes on top of any number of years of employment that the worker had to fulfil before becoming a member of the plan (Figure 3.3). While employee contributions vest immediately in all countries and for all types of plans, it is not always the case for employer contributions. This may penalise temporary workers and workers switching jobs frequently, including between the formal and informal sectors, as they may not work long enough with the employer to vest the contributions, which would then be lost.

In a majority of countries, employer contributions to occupational pension plans vest immediately to the employee. With the exception of Norway, immediate vesting is the rule for mandatory and quasi-mandatory occupational pension plans.¹⁷ Immediate vesting of employer contributions also applies to voluntary plans in Austria (direct insurance and occupational group insurance), Belgium, Canada (federal jurisdiction), Greece (occupational insurance funds), Italy, Japan (corporate DC plans), Latvia, New Zealand (KiwiSaver), Poland, Slovenia, Spain, the United Kingdom, India (national pension system) and South Africa.

The maximum length of the vesting period for employer contributions within each occupational plan varies widely across countries. As shown in Figure 3.8, it is only one year in Norway for private sector employees and two years in Chile and Ireland. A maximum vesting period of three years applies in Austria (pension funds and book reserves), Germany, Greece (group pension insurance), Hungary, Luxembourg, Norway (for public sector employees) and Indonesia. In the United States, occupational pension plans may apply “cliff” vesting or “graduated” vesting.¹⁸ For example, for 401(k) plans, cliff vesting

Figure 3.8. **Maximum length of the vesting period for employer contributions in occupational pension plans**

Notes: The figure represents the maximum allowed and employers can choose to set a shorter vesting period. Lighter blue colour represents graduated vesting. The numbers for the United States represent the case of traditional 401(k) plans. Other rules apply to DB plans and safe harbour plans. Pension systems are classified between occupational (mandatory "MO", quasi-mandatory "QMO" and voluntary "VO"), personal (mandatory "MP" and voluntary "VP") and automatic enrolment (in personal or occupational plans, "AE").

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implies a 100% vesting after no more than three years of membership. With graduated vesting, 20% of employer contributions vest after 2 years, 40% after 3 years, 60% after 4 years, 80% after 5 years, and 100% after 6 years.¹⁹ Finally, in Austria (support funds), France (article 39 plans) and Norway (AFP plans), employees only fully acquire the accrued benefits in their occupational DB plan when they leave the employer for retirement. This means that all the rights are lost if the employee changes employer or leave the labour force before the retirement age specified in the plan rules. This affects negatively labour mobility.

Within the European Union, the vesting period cannot be longer than three years for workers moving to a different member state. The EU Portability Directive (or "Directive on minimum requirements for enhancing worker mobility by improving the acquisition and preservation of supplementary pension rights") places a limit of three years on the combined length of any minimum waiting period and vesting period applied in occupational pension plans. The Directive only refers, however, to "outgoing" workers, i.e. plan members moving between member states. There is no EU rule governing the maximum vesting period for members staying in a given member state. However, the expectation is that countries do not differentiate between mobile and non-mobile workers when applying the Directive, so that all workers covered by an occupational pension plan would have to work for a maximum of three years with the employer before acquiring rights.

Portability of pension rights and assets

Issues related to the portability of pension rights and assets arise essentially with occupational pension plans and can have a negative impact on workers switching jobs frequently, including employees on temporary contracts. When changing employers,

members of an occupational pension plan with their former employer usually cannot continue contributing into the same plan. In addition, the new employer may not offer an occupational plan, leading to the risk that workers may stop saving for retirement. When the new employer offers a plan, the consolidation of past and current occupational plans is not always possible, in particular with DB plans, potentially leaving employees with multiple inactive pension accounts from past employment. By contrast, pension systems operating mainly through personal pension plans are, by definition, fully portable. Personal pension plans can follow members throughout their career and accept contributions, irrespective of the employer and the type of work.

Workers in most countries have the option of keeping their accrued rights and assets in the occupational plan of their former employer or transfer them into their new employer's occupational plan upon changing jobs. Table 3.3 lists the options available to workers with their occupational pension rights and assets when leaving their employer. In a majority of countries, the options of keeping deferred rights and assets in the plan or transferring them to a new occupational plan are available. Only in Korea and Turkey neither of these two options are available, an employee who terminates employment before reaching retirement age can receive a payment for the years of service rendered. In Turkey, they can also transfer the assets to a personal plan. In Canada and Japan, workers can start getting a pension income from their occupational plan when leaving an employer, even when this occurs before the age of retirement.

Transfers of occupational pension entitlements into personal pension plans are more rarely available. Upon leaving an employer, accrued occupational pension rights and assets can be transferred into a personal pension plan in Canada, Chile, Denmark, France, Ireland, Italy, Japan, Poland, Portugal, Spain, Turkey, the United Kingdom, the United States, Indonesia and South Africa. In Canada, such transfers are only possible to locked-in personal plans, from which the funds cannot normally be used for any purpose other than to provide the individual with a retirement pension. In Denmark, only the self-employed can transfer their pension entitlements from a previous job as an employee into a personal plan. In Japan, entitlements in DB and DC plans can be transferred to the personal DC plan of the National Pension Fund Association.

Former employees can cash in their small accrued benefits in some countries. In Australia, Austria, Germany, Luxembourg, the Netherlands and Switzerland, small entitlements are directly paid to the individual rather than kept as deferred rights or transferred to another plan (Table 3.3). This may avoid that administration fees eat up all the assets if they were to remain in the plan. In the United Kingdom, employees leaving their employer after less than two years of work may be able to get a refund on their contributions. This more likely concerns temporary workers. In the United States, employers can force leaving employees to take account balances of up to USD 1 000 out of the plan. In Brazil and Indonesia, employees can receive a refund of their own contributions plus interest. In Switzerland, individuals can receive their vested benefit as a lump sum if they establish an independent business and are no longer covered by the mandatory occupational pension system.

Upon changing jobs, workers can keep contributing to the same occupational plan in selected countries. In occupational pension systems structured in part through collective agreements (industry-wide or sector-wide pension plans), if an employee moves to an employer covered by the same agreement, the employee will stay in the same pension fund and portability is automatic. This applies in Australia, Belgium, Denmark, Finland, Iceland, the Netherlands, Sweden, the United States and South Africa. In the absence of collective

Table 3.3. Options available with occupational pension entitlements when leaving an employer

Country	Type of plan	Defer rights	Transfer to new employer's occupational plan	Transfer to personal plan	Get an annuity / retirement income	Cash in	Continue contributing into the same plan
Australia	MO	X	X			If balance < AUD 200	X
Austria	VO	X	X			If vested benefit < EUR 12 600	X
Belgium	VO	X	X				X
Canada	VO	X	X	To locked-in plans	X		
	AE	X	X	To locked-in plans	X		X
Chile	VO		X	X		X	
Denmark	QMO	X	X	For self-employed			X
Finland	MO	X					X
France	VO	X	X	X			X
Germany	VO	X	X			If cash value of accrued pension benefit < EUR 31.15/month	
Greece	VO	X	X			X	X
Iceland	MO	X					X
Ireland	VO	X	X	X			
Italy	VO	X	X	X		X	X
Japan	VO – EPF		X				
	VO - DB plans		X	To the NPFA	If membership = 20 years	If membership = 3 years	
	VO - DC plans		X	To the NPFA			
Korea	QMO					X	
Luxembourg	VO	X	X			If no longer affiliated to social security; small deferred rights	
Netherlands	QMO	X	X			If small entitlement	X (up to 10 years for self-employed)
New Zealand	AE		X				X
	VO	X	X			X	
Norway	MO	X	X				
Poland	VO	X	X	X			
Portugal	VO	X	X	X			
Slovenia	VO	X	X				
Spain	VO	X	X	X			
Sweden	QMO	X					X
Switzerland	MO	X	X			If establishes independent business; leave the country; vested amount < annual contribution	
Turkey	VO			X		X	
United Kingdom	AE	X	X	X		If worked < 2 years	X
United States	VO	X	X	X		X	
Brazil	VO	X	X			X	X
Indonesia	VO	X	X	X		If membership < 3 years	
South Africa	VO	X	X	X			

Note: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”).

agreements, it is still possible to continue contributing into the same plan in Australia, Austria (except book reserves and support funds), Canada (PRPP), France, Greece, the United Kingdom and Brazil. In particular, in the United Kingdom, workers becoming self-

employed can use the National Employment Saving Trust (NEST). In the Netherlands, self-employed workers may be allowed to continue contributing voluntarily to the plan they have been a member of as an employee for up to ten years following the termination of employment.

Early access to funds

Flexibility in accessing funds accumulated in funded pensions before the age of retirement should be restricted to exceptional circumstances as it reduces future retirement income. Workers with unstable and fluctuating earnings, however, may value this option and may be more willing to participate in funded pensions when they are given the possibility of withdrawing money in order to cope with unplanned contingencies. Unfortunately, this raises issues of retirement income adequacy, as the funds accessed early may not be compensated for afterwards.

Table 3.4. **Countries allowing early access to funds by type of condition**

Conditions	Countries allowing early access to funds
Purchase/repair home	Australia (VP), Belgium, Canada (VP, loan), France, Germany (VP), Iceland, Italy, Korea, Mexico (MP, loan), New Zealand (AE), Poland (AE, loan), Portugal (VP-PPR schemes), Switzerland, United States, South Africa (loan)
Reaching a certain age/membership duration	Austria (PV), Canada, Czech Republic, Estonia (VP), Germany (VP), Hungary (VP), Ireland (VP), Italy, Japan (VP), Lithuania (pillar 2), Luxembourg (VP), Mexico (VP), Portugal (VP-PPR schemes), Slovak Republic (pillar 3), Slovenia, Spain, Turkey, United States, India, Indonesia (MP)
Disability	Australia, Estonia (VP), Finland (VP), France, Italy, Latvia (VP), Lithuania (VP), Luxembourg (VP), Mexico (VP), New Zealand (AE), Portugal (employee contributions), Switzerland, Turkey, United States, China (VO), India (VP), Indonesia (MP)
Serious illness	Australia, Canada, Denmark, Iceland (VP), Ireland, Italy, Luxembourg (VP), New Zealand (AE), Poland (AE), Portugal (employee contributions), Spain, Sweden (VP), United Kingdom
Financial hardship	Australia, Canada, France, Korea, New Zealand (AE), Sweden (VP), Turkey, United States
Unemployment	Finland (VP), France, Israel (self-employed), Italy, Mexico (MP), New Zealand (VO), Portugal (employee contributions), Spain
Small balance	Australia, Canada, Greece, Israel, Luxembourg (VO), Sweden (VP), Switzerland (MO), United States (VO)
Medical expenses	Australia, Italy, Korea, United States
Training/education expenses	Canada (VP, loan), Korea, United States
Leaving the country	Australia (temporary residents only), Canada, Luxembourg (VO), New Zealand (AE), Switzerland, China (VO)
Death of partner/heirs	Australia, Finland (VP), France, Korea, Latvia (VP)
Wedding expenses	Korea, Mexico (MP)
Establish an independent business	Switzerland
Without any motive	Chile (voluntary savings), Denmark (QMO, loan), Hungary (VP), Israel (loan), Mexico (VP), Portugal (VO, loan), United States (loan)

Note: Pension systems are classified between occupational (mandatory “MO”, quasi-mandatory “QMO” and voluntary “VO”), personal (mandatory “MP” and voluntary “VP”) and automatic enrolment (in personal or occupational plans, “AE”). When individuals need to reimburse the money withdrawn from the pension plan within a certain timeframe, this is notified by the term “loan”.

The most common conditions required to be able to access funds early are for the purchase of a home or its repair, upon reaching a certain age or membership duration, and in case of disability. Homeownership is considered in many countries as a mean to achieve financial security in retirement, and is therefore considered as an asset for retirement.²⁰ As shown in Table 3.4, 15 of the countries analysed allow individuals to either withdraw or borrow money from selected pension plans to buy a home or make reparations. Twenty countries constrain withdrawals to individuals reaching a certain age or after a certain membership period, recognising the long-term saving nature of pension plans. These requirements more often relate to personal pension plans than to occupational plans. In some cases, withdrawals are possible at any time, but the minimum age or membership

period define when these withdrawals become tax free. The age requirement varies from 40 in Austria to 62 in Germany (for Riester and basic pension schemes), and the membership period requirement from 5 years in Mexico to 10 years in Austria, Hungary, the Slovak Republic, Spain, India (depending on entry age and sector) and Indonesia. The two requirements are combined in Estonia, Japan, Luxembourg and Turkey. Finally, members becoming disabled, either temporarily or permanently, may withdraw their funds early in 17 countries.²¹ This possibility is more frequent for voluntary personal pension plans.

Periods of vulnerability may also trigger the possibility of accessing funds early. Individuals suffering from terminal medical conditions, having shorter life expectancies due to physical or mental disability, or having reduced work capacity due to an accident or illness may withdraw their assets early in 13 countries, mostly from voluntary systems. Suffering financial hardship, unemployment (usually long-term) or facing exceptional expenses for medical reasons or to cover the funerals of relatives are other conditions that individuals may use to access their funds in some countries. Other qualifying motives, such as wedding expenses, training or education expenses, or leaving the country are less common. Switzerland is the only country allowing members to take all of their vested rights in their mandatory occupational pension scheme as a lump sum when establishing an independent business.

Another way of accessing funds before the age of retirement is through loans. Pension funds are allowed to lend money to plan members in 13 countries. It may be for the purchase of a property (e.g. Canada, Iceland, Mexico, Poland and South Africa) or for any other motive.²² In Switzerland, members of occupational plans may pledge their right to future benefits not yet accrued or a sum up to the amount of their vested rights in order to finance the purchase of a principal residence for their use, or to amortise a mortgage on such a residence. Pension assets may also be used as a collateral in the United Kingdom.

Conclusion

This chapter has shown that workers in non-standard forms of work, i.e. workers in non-standard forms of employment (part-time and/or temporary salaried employees) and self-employed workers, participate less in funded pensions than full-time permanent employees do. This relates to four main factors:

- **Self-employed workers lack mandatory coverage in selected funded pension systems.** The mandatory or voluntary nature of enrolment strongly influences participation rates. Mandatory and quasi-mandatory pension systems achieve higher overall participation rates than voluntary systems. However, the obligation to join the funded pension system is not always extended to self-employed workers. For example, the self-employed are not mandatorily covered by funded schemes in Australia, Denmark, Mexico, the Netherlands, Norway and Switzerland.
- **In pension systems organised mostly through occupational plans, self-employed workers tend to participate less than employees do** because access to such plans requires an employment or professional relationship between workers and the entity that establishes the plan. Dedicated pension arrangements for the self-employed, such as those in Belgium and France, may, however, help to bridge the gap of pension participation between employees and the self-employed.
- **In most countries with automatic enrolment schemes, the self-employed are not automatically enrolled into a pension plan**, except in Lithuania. In Canada, New

Zealand and the United Kingdom, the self-employed can voluntarily join the system by contracting directly with a plan provider.

- **Some plans establish eligibility criteria to limit the population effectively allowed to join, affecting in particular part-time and temporary employees.** These criteria include minimum income thresholds (e.g. Canada, Japan, Switzerland and the United Kingdom), minimum number of working hours (e.g. Australian, Japan and Korea) and minimum length of employment (e.g. Ireland, Japan and Luxembourg). They restrict access by part-time and temporary employees to occupational pension plans.

In most countries, mandatory contribution rates in compulsory funded systems, as well as minimum contribution rates and overall contribution caps in voluntary systems, are identical across all categories of workers. In some countries, however, **the self-employed are required to contribute less than employees or are not allowed to save overall as much as employees** (who may also receive employer contributions). For example, in Iceland and Israel, the self-employed have a lower mandatory contribution rate than employees. In other countries, the self-employed actually enjoy higher contribution caps in selected pension arrangements, probably to reflect the fact they cannot participate in occupational plans, do not benefit from employer contributions, and sometimes contribute less to public pension schemes.

Several design features affect negatively the pension income outcomes of workers in non-standard forms of work:

- **Vesting periods penalise workers switching jobs frequently.** While contributions done by the workers themselves vest immediately in all types of funded pension arrangements, employees may not start getting ownership of their employer's contributions as of the first day of membership in a plan. Temporary employees may lose the benefit of employer contributions if their employment contract is shorter than the vesting period. A maximum vesting period of three years can be found in selected schemes in Austria, Germany, Greece, Hungary and Norway.
- **Lack of portability of occupational pension rights and assets affects workers switching jobs frequently.** In most countries, workers have the option of keeping their accrued rights and assets in the occupational plan of their former employer or transfer them to their new employer's occupational plan upon changing jobs. In occupational pension systems structured through collective agreements (industry-wide or sector-wide pension plans), if an employee moves to an employer covered by the same agreement, the employee will stay in the same pension fund and portability is automatic, as in Australia, Belgium, Denmark, Finland, Iceland, the Netherlands, Sweden and the United States. The option of cashing in pension entitlements when leaving an occupational pension plan before retirement creates leakages from the system but is usually restricted to small amounts, as in Australia, Austria, Germany, Luxembourg, the Netherlands, Switzerland and the United States.
- **Flexibility in accessing funds accumulated in funded pensions before the age of retirement may remove a barrier to the participation of workers with unstable and fluctuating earnings, but raises issues of retirement income adequacy.** The most common conditions required to be able to access funds early are for the purchase of a home or its repair, upon reaching a certain age or membership duration, and in case of disability. This may be too lenient and put individuals at risk of suffering a fall in their standard of living upon retirement.

Countries willing to enhance or develop the role of the funded pension system for non-standard workers and offer them complementary pension plans to save for retirement, need to adjust the design of these plans. A better alignment with the *OECD Core Principles of Private Pension Regulation*, in particular Core Principles 8 and 10, could help some countries to have a more inclusive funded pension system, which does not penalise a growing proportion of the workforce (OECD, 2016^[4]).

Policy makers should aim to prevent exclusion from plan participation for workers in non-standard forms of work. Regulation should ensure non-discriminatory access to occupational pension plans. This implies limiting the use of, or even eliminating, eligibility criteria based on salary, working hours, length of employment and type of contract (Core Principle 8). The equivalent principle applies to personal plans, which should be accessible to any individual (Core Principle 10).

Vesting periods should be minimised to allow workers to accrue entitlements as early as possible. While entitlements derived from member contributions should be vested immediately, vesting periods for employer contributions could be eliminated or kept short. Practices that substantially undermine benefit accrual and vesting rights should also be prohibited (Core Principle 8). This particularly concerns pension plans that only pay pension benefits to members who work with the same employer that promotes the plan until the age of retirement.

Finally, countries should limit leakages from the funded pension system originating from job changes and early withdrawal possibilities. Policy makers should facilitate the portability of pension rights and assets, allowing individuals who are changing jobs to keep saving in the same arrangement, or to transfer their vested rights to the plan of their current employer or to a similar alternative arrangement (Core Principle 8). Flexibility in accessing funds accumulated in funded pensions before the age of retirement should be restricted to exceptional circumstances as it reduces future retirement income.

Future work will assess different approaches to encouraging non-standard workers to save for retirement, taking into account the role already played by the PAYG system. Given the heterogeneity of this population, different solutions may be required. In addition, care should be given to performance and costs, so that workers in general are not discouraged from saving into funded pension arrangements.

Notes

1. The analysis covers all OECD countries, as well as selected non-OECD G20 countries.
2. The project benefits from the collaboration with the European Commission's DG Employment, Social Affairs and Inclusion and with Principal International Group.
3. In Finland, the statutory earnings-related pension scheme for the self-employed (YEL) is financed on a PAYG basis and therefore not considered in this analysis.
4. In the case of Canada, the analysis focuses on federally regulated registered pension plans (RPPs) and federal legislation for pooled registered pension plans (PRPPs). Each province has pension standards legislation with respect to provincially regulated RPPs. The province of Quebec has a version of PRPPs called Voluntary Retirement Savings Plans (VRSPs).
5. In the United States, the Department of Labor has issued a final regulation that would expand access to multiple employer retirement plans for small employers and self-employed workers.
6. In the United Kingdom, employees earning less than GBP 10 000 a year are not enrolled automatically in the plan by their employer but they can opt into the plan voluntarily.
7. In Germany, basic pensions are designed to target the self-employed, but any other taxpayers can join such plans.

8. In France, according to the PACTE Law, the plans dedicated to the self-employed (Madelin contracts) will be closed from 1 October 2020. New individual retirement savings plan available to any individual as of 1 October 2019 share most of the features of the Madelin contract for those joining the plan as self-employed workers.
9. In the case of Chile, the threshold represents the income under which self-employed workers issuing invoices are no longer mandated to contribute (but they can still contribute voluntarily).
10. In the United States, employers are permitted to exclude part-time workers. There is also a limit in the number of working hours, but over a full year. In general, an employee must be allowed to participate in a qualified retirement plan if he or she has reached age 21 and has at least one year of employment. One year of employment is considered 1 000 hours of work performed during the year, or approximately 19 hours per week.
11. Korea is also far below the threshold, as the obligation for employers to provide a retirement benefit scheme to their employees can be fulfilled by just offering a severance payment plan.
12. This may be partly explained by the fact that there is a AUD 500 000 lifetime capital gains tax exemption when an individual rolls over the sale proceeds from a sole proprietorship or stake in a general partnership business into a recognised retail or self-managed superannuation fund.
13. This number refers to self-employed workers contributing regularly to the pension system and does not include the self-employed contributing via the tax process. With the new law introduced in 2019, which makes contributing to the social security system compulsory for self-employed workers that invoice for their services, this participation rate will increase.
14. Source: ATP. A recent analysis shows that the proportion of self-employed workers paying into a pension fell between 1999 and 2017, due to the termination of the SP scheme and changes to tax rules (ATP, 2019^[5]).
15. By contrast, 31.4% of employees have a Riester pension contract, as opposed to 20.3% for the self-employed (Source: LeA study).
16. Employees who are not member of a pension fund can also contribute 20% of their taxable income.
17. In Norway, for private sector workers, the parliament approved the abolishment of the one-year vesting period, but the rule has not yet entered into force. The vesting period in the public sector will fall to one year as of 1 January 2020.
18. According to the Bureau of Labor Statistics, 34% of workers participating in savings and thrift plans in 2017 enjoyed full immediate vesting, 34% were under graduated vesting and 24% under cliff vesting.
19. The gradual vesting in the case of New Zealand does not refer to KiwiSaver plans, but to occupational pension plans with low coverage rates, especially among new employees.
20. However, there may be a lack of financial instruments to make housing wealth partly liquid at retirement.
21. These individuals would most likely also receive disability benefits from the government.
22. In the case of Mexico, this is only possible with the housing sub-account.

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Chapter 4

Design of Pension Systems

The five indicators in this section look in detail at the design of retirement income systems in OECD countries and other major economies. The first indicator sets out the taxonomy of the different kinds of retirement-income programmes found around the world. It uses this framework to describe the architecture of 44 countries' pension systems.

The next four indicators set out the parameters and rules of the pension systems. The description begins with the second indicator covering first-tier schemes, showing the values and coverage of basic, targeted and minimum pensions. The third indicator looks at the mandatory earnings-related pensions systems. It shows how benefits are determined in these schemes and the range of earnings that are covered. The fourth and fifth indicators present, respectively, the current and the future retirement ages by pension scheme for an individual entering the labour market at age 22 and working a full, uninterrupted career.

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

Key results

Retirement-income regimes are diverse and often involve a number of different programmes. The taxonomy of pensions used here consists of two mandatory “tiers”; the first generates retirement income independent of past earnings level with the second covering earnings-related components. Voluntary provision, be it personal or employer-provided, makes up a third tier.

Figure 4.1 is based on the role of each part of the system. The first tier comprises programmes offering the first layer of social protection in old age, and for which past earnings are irrelevant in the calculation of retirement income. Such schemes often target some absolute, minimum standard of living in retirement. Mandatory earnings-related components (second-tier) contribute to smoothing consumption, and therefore standards of living, between working life and retirement. *Pensions at a Glance* focuses mainly on these mandatory components, although information is also provided on some widespread voluntary, private schemes (third tier).

Table 4.1 shows the architecture of pension systems in OECD countries based on the rules that determine eligibility and benefit level while categorising mandatory earnings-related pensions as public or private in accordance with national accounts. Panel A describes the latest legislation applying to future retirees while Panel B shows where those rules have changed compared to current retirees.

Basic pensions can take two different forms: a residence-based benefit or a benefit that is only available to those who contributed during their career. The level of the benefit may vary with the number of residence or contribution years but is independent of the earnings level during the career. Seven OECD countries have a residence-based basic pension for future retirees while Norway and Sweden are replacing theirs with targeted schemes that involve a means test. Nine OECD countries feature a contribution-based basic pension.

Eligibility for **targeted** plans requires meeting some residence criteria. In these plans, the value of the benefit depends on income from other sources and possibly also assets. Hence, poorer pensioners receive higher benefits than better-off retirees. All countries have general safety nets of this type but only those countries are marked in which full-career workers with very low earnings (30% of average) would be entitled. This holds for nine OECD countries, both currently and in the future.

Minimum pensions can refer to either the minimum of a specific contributory scheme, or to all schemes combined and are currently found in 17 OECD countries, with Chile and Italy phasing this scheme out. In most countries, the value of entitlements only takes account of pensions rather than testing for other income. Minimum pensions either define a minimum for total lifetime entitlements, which may increase in level once the length of the contribution period exceeds certain thresholds, or they are based on minimum

pension credits that calculate year-by-year entitlements of low earners based on a higher earnings level.

Only Ireland and New Zealand in the OECD do not have second-tier pensions, with the United Kingdom also phasing it out. In the other countries, there are four kinds of scheme.

Public pay-as-you-go schemes will follow **defined benefit** (DB) rules for future retirees in 17 OECD countries. In another 10 countries, they apply to current retirees but have been replaced due to financial sustainability issues. Private occupational DB schemes are mandatory or quasi-mandatory in three OECD countries (Iceland, the Netherlands and Switzerland). Retirement income depends on the number of years of contributions, accrual rates and individual pensionable earnings.

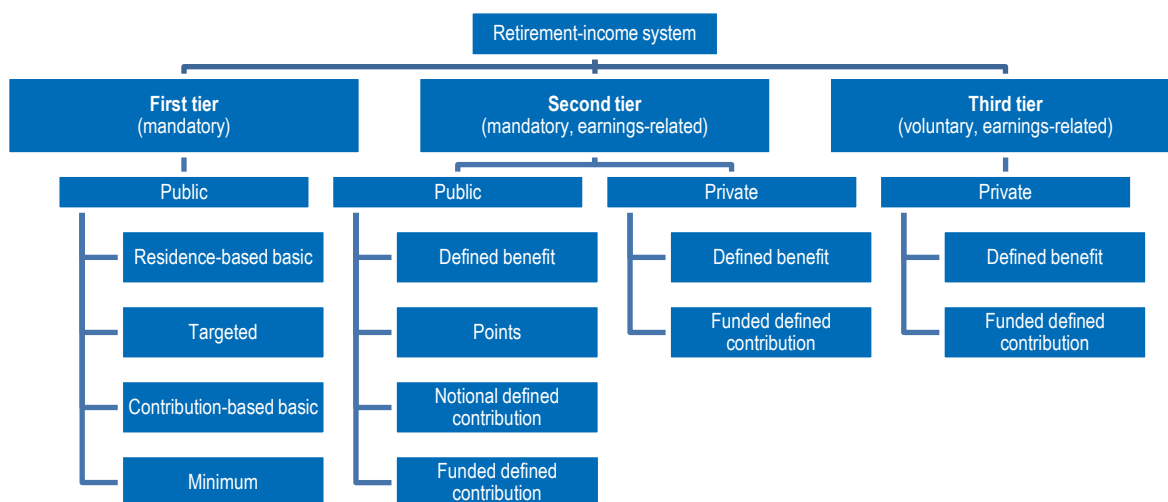
There are **points** schemes in five OECD countries: French occupational plans managed by social partners under public supervision and the Estonian, German, Lithuanian and Slovak public schemes. Workers earn pension points based on their earnings. At retirement, the sum of pension points is multiplied by a pension-point value to convert them into a regular pension payment.

Funded defined contribution (FDC) plans are compulsory for future retirees in nine OECD countries. In these schemes, contributions flow into an individual account. The accumulation of contributions and investment returns is usually converted into a monthly pension at retirement. In Denmark and Sweden, there are quasi-mandatory, occupational FDC schemes in addition to smaller compulsory public plans.

There are **notional defined contribution** (NDC) schemes in five OECD countries (Italy, Latvia, Norway, Poland and Sweden). These are pay-as-you-go public schemes with individual accounts that apply a notional rate of return to contributions made, mimicking FDC plans. The accounts are “notional” in that the balances exist only on the books of the managing institution. At retirement, the accumulated notional capital is converted into a monthly pension using a formula based on life expectancy. NDC schemes are a comparatively new development (OECD, 2019).

Further Reading

OECD (2019), Will Future Pensioners Work for Longer and Retire on Less? Policy Brief on Pensions, July 2017, OECD Publishing, Paris, <https://www.oecd.org/pensions/public-pensions/OECD-Policy-Brief-Future-Pensioners-2019.pdf>.

Figure 4.1. **Taxonomy: Different types of retirement-income provision**Table 4.1. **Structure of retirement-income provision through mandatory schemes**

First tier						Second tier					
Residence-based		Contribution-based				Residence-based		Contribution-based			
Basic	Targeted	Basic	Minimum	Public	Private	Basic	Targeted	Basic	Minimum	Public	Private
Panel A. Latest legislation (applying to future retirees entering the labour market in 2018 at age 22)											
Australia	✓				FDC	Netherlands	✓				DB [q]
Austria			✓	DB		New Zealand	✓				
Belgium			✓	DB		Norway		✓		NDC	FDC
Canada	✓			DB		Poland			✓	NDC	
Chile	✓				FDC	Portugal			✓	DB	
Czech Republic		✓	✓	DB		Slovak Republic			✓	Points	
Denmark	✓	✓		FDC	FDC [q]	Slovenia			✓	DB	
Estonia		✓		Points	FDC	Spain			✓	DB	
Finland	✓			DB		Sweden		✓		NDC + FDC	FDC [q]
France			✓	DB + Points		Switzerland			✓	DB	DB
Germany		✓		Points		Turkey			✓	DB	
Greece	✓			DB		United Kingdom		✓			
Hungary			✓	DB		United States				DB	
Iceland	✓	✓			DB [q]						
Ireland			✓			Remaining G20 countries					
Israel	✓		✓		FDC	Argentina		✓	✓	DB	
Italy				NDC		Brazil			✓	DB	
Japan			✓	DB		China			✓	NDC + FDC	
Korea			✓	DB		India			✓	DB + FDC	
Latvia			✓	NDC + FDC		Indonesia			✓	DB + FDC	
Lithuania			✓	Points		Russian Federation		✓		Points	FDC
Luxembourg			✓	DB		Saudi Arabia			✓	DB	
Mexico			✓		FDC	South Africa		✓			
Panel B. Current legislation where different from Panel A (applying to new retirees in 2018) *											
Chile	✓		✓	DB	FDC	Mexico			✓	DB	
Estonia		✓		DB/Points	FDC	Norway	✓	✓		DB	FDC
Italy			✓	DB + NDC		Poland			✓	DB/NDC	
Latvia			✓	DB/NDC + FDC		Sweden	✓	✓		DB/NDC + FDC	FDC [q]
Lithuania		✓		DB/Points		United Kingdom			✓	DB	

Note: *Information for non-OECD countries unavailable. A tick for the column "Targeted" is only shown if a full-career worker at 30% of the average wage is eligible. [q] = Quasi-mandatory scheme based on collective agreements with a very high coverage rate, see Chapter 9. DB = Defined benefit, FDC = Funded defined contribution, NDC = Notional defined contribution. The contribution-based basic pension in Israel is a 2% top-up (total maximum 50%) on the residence-based basic pension for each contribution year beyond 10 years. In Iceland and Switzerland, the government sets contribution rates, minimum rates of return and the annuity rate at which the accumulation is converted into a pension for mandatory occupational plans. These schemes are therefore implicitly defined benefit. In Mexico, the government pays a transfer to the individual private FDC account of a contributing employee every month. In Canada, the basic pension (OAS) is income-tested but only through the tax system ("claw back").

Source: See "Country Profiles" available at <http://oe.cd/pap>.

Key results

Residence-based basic pensions exist in nine OECD countries and are, on average, worth 17% of the gross average wage. Almost all OECD countries provide targeted benefits like guarantee pensions and social assistance for their residents. On average in the OECD, people without a contributory record could receive 16% of average earnings from targeted schemes, subject to a means test, and 20% when including residence-based basic pensions. Nine OECD countries provide contribution-based basic pensions, with the full benefit being equal to 14% of the gross average wage on average across these countries. Almost half of OECD countries provide a minimum pension benefit within their contributory scheme, most often above the basic or social assistance level and, on average, at 25% of average earnings for the full benefit.

There are four main ways in which OECD countries might provide retirement incomes to meet a minimum standard of living in old age (Table 4.2). The left-hand part of the table shows the value of benefits provided under these different types of schemes. Values are presented in *relative* terms – as a percentage of countries' gross average wages – to facilitate comparisons between countries (See the "Average wage" indicator in Chapter 7). The right-hand part of the table shows the number of total recipients as a share of the population aged 65 and over.

Benefit level

Benefit values are shown for a single person. In some cases – in particular for minimum pensions – each partner in a couple can receive an individual entitlement. In other cases – especially for targeted schemes – the couple is treated as the unit of assessment and generally receives less than twice the entitlement of a single person.

Only four OECD countries have neither a basic nor a minimum pension: Australia, Finland, Germany and the United States. Moreover, almost all OECD countries provide targeted benefits that are subject to further means tests. The existence of multiple programmes in many countries complicates the analysis of effective benefit levels. In some cases, benefits under these schemes are additive. In others, there is a degree of substitution between them.

Figure 4.2 therefore summarises the level of non-contributory, residence-based benefits. Residence-based basic pensions are present in nine cases with an average benefit of 17% of the gross average wage and a maximum of 40% in New Zealand. Norway and Sweden are phasing them out. All OECD countries provide targeted benefits to their residents, but people in Greece, the Netherlands and New Zealand cannot receive such a benefit on top of a full residence-based basic pension. In Canada, Denmark and Iceland, residence-based basic pensions do not reduce the targeted benefit. On average in the OECD, 16% of gross average earnings can be received from targeted schemes subject to further means tests, and a total of 20% when including residence-based basic pensions.

As for the contributory components of first-tier pensions, one-third of OECD countries has neither contribution-based basic nor minimum pensions (Figure 4.3). One-quarter of the OECD countries provides contribution-based basic pensions, which lie on average at 14% of average earnings for the full benefit. They range from 6% of average earnings in Israel, where they are paid as a bonus to the residence-based basic pension, to 27% in Ireland. In almost half of OECD countries, low contributory pensions are topped up to a higher minimum pension level, up to 25% of average earnings on average. These minimum pensions vary between a low of about 10% of the average wage in the Czech Republic, Hungary and Latvia to a high of about 40% in Turkey.

Coverage

The importance of first-tier benefits varies enormously across OECD countries. The percentage of over-65s receiving such benefits is shown in the final four columns of Table 4.2. Different approaches of reporting the number of recipients, for example in case of benefits paid to couples or even households, may blur the data comparability across countries to some extent.

Naturally, residence-based basic pensions have on average the highest coverage. However, contribution-based basic pensions also have very high recipient numbers in most countries that have such a scheme. Sometimes recipient numbers exceed 100% of the population aged 65 and older hinting to recipients younger than 65 or living abroad.

The incidence of receiving a minimum pension is very diverse across countries and positively related to the level of the benefit. Minimum pensions are received by almost 40% of the over-65s in France and Portugal. In Belgium, Italy, Luxembourg and Spain around 30% of the over-65s receive a minimum pension while it is less than 10% in the Slovak Republic and at 2% or under in Hungary and Slovenia.

The range in targeted schemes is similarly big, with in particular Chile, Korea and Mexico showing high recipient numbers of more than every second person aged 65 or older.

Table 4.2. Current level and recipients of first-tier benefits

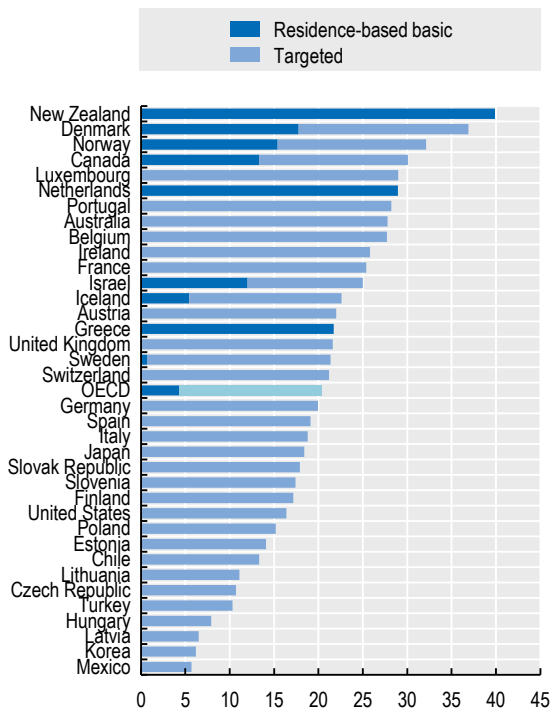
Benefit value in 2018 (% of AW earnings)				Recipients in 2016 (% of population aged 65 and over)				Benefit value in 2018 (% of AW earnings)				Recipients in 2016 (% of population aged 65 and over)			
Residence-based basic	Targeted	Contribution-based basic	Minimum	Residence-based basic	Targeted	Contribution-based basic	Minimum	Residence-based basic	Targeted	Contribution-based basic	Minimum	Residence-based basic	Targeted	Contribution-based basic	Minimum
Australia	27.8			69				Netherlands	29.0			108	1		
Austria	22.0		30.0	10		..		New Zealand	39.9			104	2		
Belgium	27.7		30.8	5		31		Norway	15.4	32.1		103			
Canada	13.3	16.8		97	31			Poland		15.2	22.8		5		..
Chile	13.3		16.7	60		..		Portugal		28.2	29.7		6		38
Czech Republic	10.7	8.5	10.9	..	118	..		Slovak Republic		17.9	35.1		1		7
Denmark	17.8	19.2		101				Slovenia		17.4	31.0		17		2
Estonia	14.1	13.1		3	122			Spain		19.1	34.2		3		25
Finland	17.2			41				Sweden	0.7	21.4		..	35		
France	25.4		22.3	4		39		Switzerland		21.2	15.5		0		..
Germany	20.0			1				Turkey		10.3	40.4			22	
Greece	21.7			..	..			United Kingdom		21.6	16.7		19	107	
Hungary	7.9		8.3	0		1		United States		16.4			2		
Iceland	5.4	17.2		71	..			Other G20 countries							
Ireland	25.8	27.0		15	59			Argentina		15.7	4.7	17.1	..	..	..
Israel	12.0	25.0	6.0	89	..	..		Brazil			46.1				..
Italy	18.8		21.1	7		32		China			..				..
Japan	18.4	15.0		3	91			India			14.5				..
Korea	6.2	11.3		73	32			Indonesia			12.5				..
Latvia	6.5		11.0	..	..			Russian Federation		13.2	12.7		..	..	
Lithuania	11.1	12.8		2	108			Saudi Arabia			23.9				..
Luxembourg	29.0	9.9	36.8	1	112	29		South Africa		17.0			..		
Mexico	5.7		30.0	64	..										

Note: .. = Data are not available. The benefit level shown is for new pensioners in 2018. People in Greece, the Netherlands and New Zealand cannot receive a targeted benefit on top of a full residence-based basic pension. Recipients' data is 2012 for Italy (minimum), Luxembourg, Slovenia and Turkey, and 2014 for Switzerland and the Netherlands.

Source: Information provided by countries and OECD's Social Recipients database.

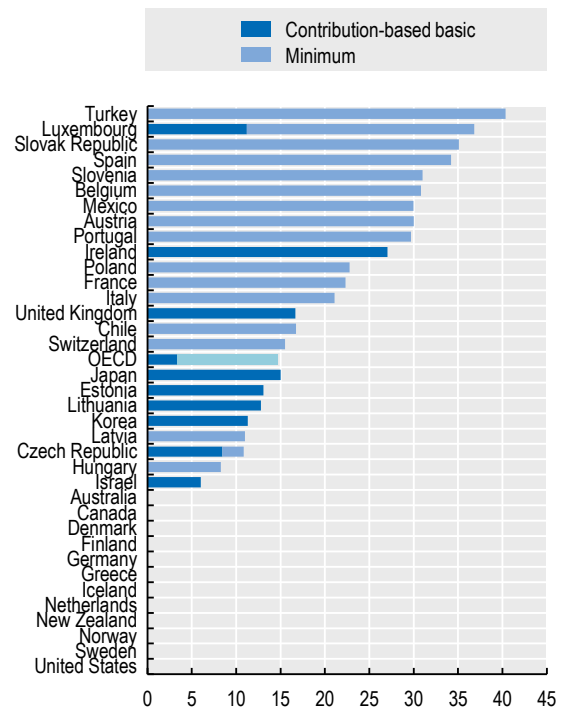
StatLink  <https://doi.org/10.1787/888934041231>

Figure 4.2. Non-contributory first-tier benefits
Percentage of gross average earnings, 2018



StatLink  <https://doi.org/10.1787/888934041250>

Figure 4.3. Contributory first-tier benefits
Percentage of gross average earnings, 2018



StatLink  <https://doi.org/10.1787/888934041269>

Key results

The second tier of the OECD's taxonomy of retirement-income provision comprises mandatory earnings-related pensions. Key parameters and rules of these schemes determine the value of entitlements, including the long-term effect of pension reforms that have already been legislated.

Generic earnings-related schemes are of four different types governed by different rules of benefit calculation. DB schemes specify a nominal accrual rate, expressed as a percentage of individual pensionable earnings, at which benefit entitlements build up for each year of coverage. The higher the contribution rate the higher the accrual rate that can be sustained by contributions. In points schemes, the pension benefit is equal to the number of points accumulated during the career multiplied by the point value. FDC (NDC) schemes apply an annuity divisor to turn (notional) accumulated capital in the individual account at retirement age into a monthly pension benefit. Table 4.3 presents future parameters and rules for benefit calculation that will apply to people who enter the labour market in 2018, according to the latest legislation.

Nominal accrual rates of at least 2% apply in Portugal, Spain and Turkey. Japan and Korea credit the lowest rates of about 0.5%. In half of DB schemes the accrual rate is constant. In the Czech Republic, Portugal, the public scheme in Switzerland and the United States, entitlements vary with the earnings level, granting higher accrual rates to lower earners. Accrual rates increase with a longer contribution history in Greece and Luxembourg while in Hungary, Slovenia and Spain accruals are higher for the first years of coverage. Moreover, in Slovenia, women receive a higher rate than men and in the Swiss occupational plan accrual rates increase with age as contribution rates do. In some countries, total accrual rates are limited by a ceiling or by a maximum number of years that generate accruals.

Earnings measures used to calculate benefits differ by country. The vast majority of OECD countries uses entire career earnings, with Portugal and the United States coming close by using the best 40 and 35 years, respectively. Only the main scheme in France and public pensions in Slovenia and Spain will be based on a comparatively small fraction of career earnings; the best 25, best 24 and final 25 years of earnings, respectively.

All schemes apply a **valorisation rate** to past earnings to take account of changes in “living standards” between the time pension rights accrued and the time they are claimed. The most commonly used rate is the growth of average earnings. Belgium, the main scheme in France, occupational DB schemes in the Netherlands and the system in Spain only revalue earnings with price inflation, thereby leading to a negative impact of real-wage growth on replacement rates and making the finances of the system (more) sensitive to real-wage growth (OECD, 2019^[2]). Also Finland, Portugal and the United States revalue earlier years' earnings with a mix

of price and wage inflation, and in Estonia and Turkey it is a mix of prices and, respectively, wage bill and GDP growth.

The interest rate applied to paid contributions in DC plans is the counterpart to valorisation rates in DB and points schemes. It is based on financial market returns in FDC schemes and on notional interest rates in NDC schemes. The latter are equal to the rate of GDP growth in Italy, wage bill growth in Latvia and a mix of the two in Poland. Norway and Sweden apply earnings growth. On top, Sweden redistributes accrued entitlements of deceased contributors to all other contributors in the system. One key parameter for DC plans is the **contribution rate** paid into individual accounts).

Most countries set a limit on the earnings used to calculate pension benefits. Pension schemes in nine countries do not have a ceiling. The highest ceilings apply in the occupational scheme in France and the Slovak Republic, at about 800% and 700% of average earnings, respectively. The lowest ceilings at 70-80% of average earnings are in Israel and Switzerland.

Indexation refers to the growth of pensions in payment. Price indexation is most common. However, eight countries uprate benefits with a mix of price inflation and wage growth, and four countries combine inflation and GDP or wage bill growth. Norway and Sweden index pensions based on wage growth minus fixed rates of 0.75% and 1.6%, respectively.

The **effective accrual rate** measures the rate at which benefit entitlements are effectively built for each year of coverage. It is thus closely connected to the replacement rates shown in Chapter 5. For DB schemes, it equals the nominal accrual rate corrected for the effects applying to pensionable earnings (thresholds, valorisation of past earnings, sustainability factors). In FDC and NDC schemes the effective accrual rate depends on contribution rates, rates of returns and annuity factors.

Based on current legislation, the highest future effective annual accrual rates are in Austria (1.78%) and Italy, Luxembourg, Portugal, Spain and Turkey (also larger than 1.6%). The lowest rates, below 0.2%, are in the FDC schemes of Norway and Sweden, reflecting low contribution rates. The effective accrual rate from mandatory schemes will equal 1% on average among OECD countries.

Further Reading

OECD (2019), *OECD Reviews of Pension Systems: Portugal*, OECD Reviews of Pension Systems, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264313736-en>.

Table 4.3. **Future parameters and rules of mandatory earnings-related pensions, latest legislation**

At the normal retirement age of a full-career worker who entered the labour market at age 22 in 2018

Country	Type of scheme	DB schemes		DB, points or NDC schemes			FDC or NDC schemes		Ceiling for pensionable earnings (% of average earnings)	Effective accrual rate of a male full-career average earner (% of earnings)
		Nominal accrual rate (% of individual pensionable earnings)		Earnings measure	Valorisation rate	Indexation rate	Total contribution rate (%)			
Australia	FDC						10.2		252	0.69
Austria	DB	1.78		L	w	d			152	1.78
Belgium	DB	1.33		L	p	p			103	1.04
Canada	DB	0.83		L	w	p [c]			104	0.73
Chile	FDC						10		268	0.73
Czech Republic	DB	0.85 [w]		L	w	50%w + 50%p			375	0.85
Denmark	FDC (occ.)						12		None	0.97
Estonia	Points/FDC			L	w	80%wb + 20%p	6		None	0.21/0.56
Finland	DB	1.50		L	80%w + 20%p	20%w + 80%p			None	1.23
France	DB/points	1.16		B25/L	p/w	p/p			101/796	1.01/0.35
Germany	Points			L	w	w - x			154	0.86
Greece	DB	0.92 [y]		L	w	50%w + 50%g			342	0.92
Hungary	DB	1.30 [y]		L	w	p			None	1.30
Iceland	DB	1.40		L	w	p			None	1.40
Ireland	None									
Israel	FDC						12.5		78	0.71
Italy	NDC			L	g	p	33		324	1.61
Japan	DB	0.55		L	w	p or w [a]			230	0.50
Korea	DB	0.50		L	w	p			117	0.50
Latvia	NDC/FDC			L	wb	p + 75%wb	14/6		463/none	0.54/0.49
Lithuania	Points			L	w	wb			458	0.24
Luxembourg	DB	1.65 [y]		L	w	p, w [c]			202	1.65
Mexico	FDC						6.5		362	0.52
Netherlands	DB (occ.)	1.15		L	p [c]	p [c]			None	0.85
New Zealand	None									
Norway	NDC/FDC			L	w	w - 0.75%	18.1/2		114/193	0.88/0.13
Poland	NDC			L	wb, g	p, w [c]	19.5		264	0.68
Portugal	DB	2.22 [w]		B40	Min(25%w+75%p, p+0.5%)	p, g			None	1.62
Slovak Republic	Points			L	w	50%w + 50%p			656	1.18
Slovenia	DB	0.97 [f/m, y]		B24	w, d	w			203	0.97
Spain	DB	2.70 [y]		F25	p	0.25%, p + 0.5%			170	1.68
Sweden	NDC/FDC/FDC (occ.)			L	w	w - 1.6% [c]	14.9/2.3/4.5 [w]		111/111/none	0.8/0.17/0.31
Switzerland	DB/DB (occ.)	0.64 [w]/0.68 [a]		L/L	f/r	50%w+50%p/0%			70/70	0.5/0.53
Turkey	DB	2.00		L	p + 30%g	p			389	1.69
United Kingdom	None									
United States	DB	1.24 [w]		B35	w, p	p			234	0.85

Note: Empty cells indicate that the parameter is not relevant. [a] = varies with age, [c] = valorisation/indexation conditional on financial sustainability, [f/m] = varies by gender, [w] = varies with earnings, [y] = varies with years of service, B = number of best years, F = number of final years, L = lifetime average, d = discretionary valorisation/indexation, f = fixed-rate, g = growth of gross domestic product; p = price inflation, w = growth of average earnings, wb = wage bill growth. Denmark: typical contribution rate for quasi-mandatory occupational plans. ATP pension only enters the last column. Germany: x depends on changes in both sustainability and contribution factors. Italy: indexation is to price inflation for low pensions and 75% of price inflation for high pensions. Japan: indexation is to earnings growth until age 67 and to price inflation after age 68. Luxembourg: indexation is to price inflation plus a share of real earnings growth, depending on the financial situation of the pension scheme. Poland: indexation is to price inflation + at least 20% of real average-earnings growth in the previous year. Portugal: indexation is higher relative to prices for low pensions and vice versa. Indexation rises with higher GDP growth. Switzerland: in the public scheme, ceiling applies to average earnings measure at retirement rather than annual earnings in the contribution years. United States: valorisation with earnings growth to age 60, no adjustment from 60 to 62, valorisation with price inflation from 62 to 67. Accrual rates applied to average earnings measure at retirement rather than annual earnings in the years of contribution. In some countries accrual stops after a certain number of contribution years or when a certain total accrual rate is reached. This is the case in Belgium (45 years), Canada (40 years), Portugal (40 years), Spain (100%), Turkey (90%) and the United States (35 years). In other countries a maximum pension or a late retirement age may stop accrual too.

Source: See "Country Profiles" available at <http://oe.cd/pag>.

StatLink  <https://doi.org/10.1787/888934041288>

Key results

The rules for eligibility to retire and withdraw a pension benefit are complex and often reflect conflicting objectives. This is all mirrored in the different criteria for pension benefit withdrawal in different schemes. The 2018 average normal retirement age across OECD countries for an individual with a full career and who entered the labour market at age 22 was equal to 63.5 years for women and 64.2 years for men. The lowest normal retirement age applied in Turkey, equalling 48 and 51 for women and men, respectively. Iceland, Norway and, for men only, Israel and Italy had the highest normal age of 67. The largest gender difference was 5 years in Austria and Israel, and 4.2 years in Poland.

Table 4.4 shows the rules for both normal and early retirement for mandatory pension schemes. “Normal” retirement is defined as receiving a full pension without penalties. In some schemes, a pension can be claimed earlier, from the “early” retirement age onwards, implying benefit penalties that adjust for the longer retirement spell. The indicated ages are theoretical, applying to a person entering the labour force at age 22 and working without interruption. Chapter 6 looks at effective ages of labour market exit and employment rates at older ages.

Early age

A very early pension withdrawal is often only possible in occupational pension plans, like in Australia, France and Sweden at age 55. The non-occupational public schemes in both Korea and Lithuania allow receiving benefits before age 60. In the FDC schemes of Chile and Mexico and the DB scheme in the Slovak Republic, early retirement requires that the pension entitlements exceed a floor that is a proxy for the subsistence level. In the Slovak Republic, this is only possible within two years to the normal retirement age while no age condition apply in Chile and Mexico.

In general, most DB and points schemes specify an early retirement age next to the normal retirement age. Public DB or points schemes typically allow withdrawing a pension between 2 and 5 years earlier than the normal retirement age. In Greece and Luxembourg the early and normal retirement ages coincide for the case of an uninterrupted career from age 22.

Only in Austria (for women), Hungary, Turkey and the United Kingdom DB schemes currently do not include an early-retirement option. Basic pensions and targeted schemes often exclude such a possibility as well. Exceptions are found where the public pension consists of both a basic and a DB component, like in the Czech Republic and Japan.

In DC systems the benefit level automatically actuarially adjusts, through the annuity divisor, to the

remaining life years at the age of first benefit claim. Therefore, only an early age is indicated in Table 4.4 for such schemes. However, the NDC schemes in Italy, Latvia and Poland still specify a standard retirement age indicated as normal retirement age in the table.

Normal retirement age

In many OECD countries, different normal retirement ages apply to different components of the overall retirement-income package. In particular, in those countries where targeted schemes have a higher eligibility age than the earnings-related scheme, the age of pension benefit withdrawal may in practice differ across earnings levels, : individuals with high earnings-related pensions might afford to retire before having access to first-tier components. Pension schemes in 14 countries still specify normal retirement ages by gender setting a lower age for women than for men.

The OECD defines the normal retirement age in a given country as the age of eligibility of all schemes combined, based on a full career after labour market entry at age 22. Women in Chile, for example, are eligible for the defined contribution component at age 60 but they are not eligible to the targeted pension before age 65. The latter is therefore recorded as their normal retirement age in 2018 (Figure 4.4).

In 2018, the OECD average normal retirement age was equal to 64.2 years for men and 63.5 years for women. It ranges from 48 for women and 51 for men in Turkey to 67 in Iceland, Norway and, for men only, Israel and Italy. The largest gender difference of 5 years are in Austria and Israel. In non-OECD G20 countries normal retirement ages tend to be lower, except for men in Argentina at 65. Gender differences exist in half of those countries but not in India, Indonesia, Saudi Arabia and South Africa.

Table 4.4. **Current early and normal retirement ages by type of pension scheme**

For an individual retiring in 2018 after an uninterrupted career from age 22

		Scheme	Early	Normal			Scheme	Early	Normal
Australia		T	n.a.	65	Japan	men	Basic, DB	60	65
		FDC	55	..		women	Basic, DB	60	64
Austria	men	DB, Min	62	65	Korea		Basic, DB	57	61
	women	DB, Min	n.a.	60	Latvia		NDC, Min, FDC	60.8	62.8
Belgium		DB	63	65	Lithuania	men	Points	58.6	63.6
		Min	n.a.	65		women	Points	56.9	61.9
Canada		Basic, T	n.a.	65	Luxembourg		Basic, DB, Min	62	62
		DB	60	65	Mexico		T, Min	n.a.	65
Chile		Min, T	n.a.	65			FDC	60 or SL	..
	men	FDC	any age & SL	65	Netherlands		Basic	n.a.	65.8
	women	FDC	any age & SL	60			DB (Occ)	sector-specific	..
Czech Republic	men	Basic, DB, Min	60	63.2	New Zealand		Basic	n.a.	65
	women	Basic, DB, Min	60	62.7	Norway		Basic, T	n.a.	67
Denmark		Basic, T	n.a.	65			DB	62	67
		FDC (ATP)	65	..	Poland	men	NDC, Min	n.a.	65
		FDC (Occ)	60	..		women	NDC, Min	n.a.	60.8
Estonia		Basic, points	60.3	63.3	Portugal		DB	62	65.2
		FDC	62	..			Min	n.a.	65.2
Finland		DB	63	65	Slovak Republic	men	DB, Min	60.2 & SL	62.2
		T	63.3	65		women	DB, Min	60.2 & SL	62.2
France		DB, Min	62	63.3	Slovenia	men	DB, Min	60	62
		Points	55	63.3		women	DB, Min	60	61.7
Germany		Points	63	65.5	Spain		DB, Min	63	65
		T	n.a.	65.5	Sweden		Basic, T	n.a.	65
Greece		Basic, DB	62	62			NDC, FDC	61	..
Hungary	men	DB, Min	n.a.	63.5			FDC (Occ)	55	65
	women	DB, Min	n.a.	62	Switzerland	men	DB, Min	63	65
Iceland		Basic, T	n.a.	67		women	DB, Min	62	64
		DB (Occ)	65	67		men	DB (Occ)	58	65
Ireland		Basic, T	n.a.	66		women	DB (Occ)	58	64
Israel	men	Basic, T	n.a.	67	Turkey	men	DB, Min	n.a.	51
	women	Basic, T	n.a.	62		women	DB, Min	n.a.	48
	men	FDC	67	..	United Kingdom	men	Basic, DB	n.a.	65
	women	FDC	62	..		women	Basic, DB	n.a.	62.7
Italy	men	NDC + DB	63.6	67			T	n.a.	62.7
	women	NDC + DB	63.6	66.6	United States		DB	62	66

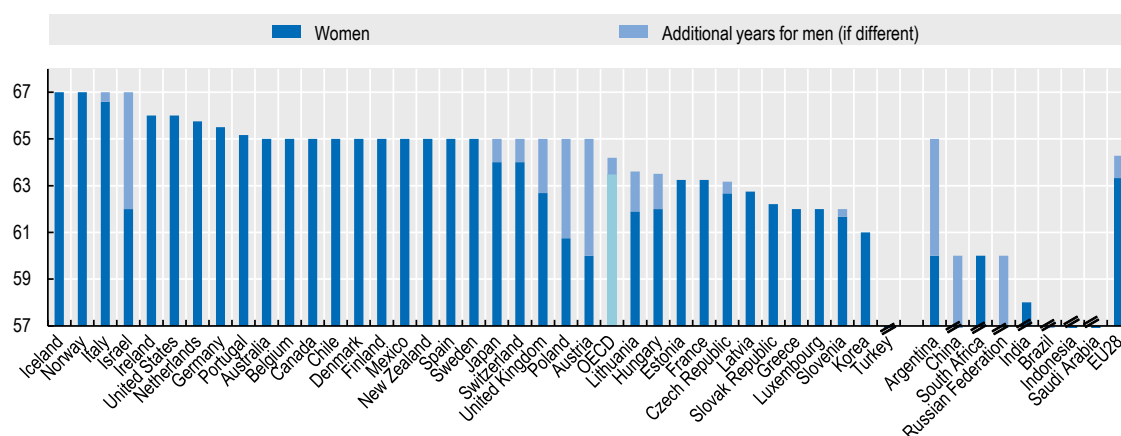
Note: n.a. = early retirement or deferral of pension is not available; Occ = occupational, Min = minimum pension, SL = subsistence level reached, T = targeted, .. = no normal retirement age indicated as benefits automatically adjusted to the age of retirement in an actuarially neutral way. Normal and early retirement ages for a scheme describe the ages at which the receipt of a pension, respectively, with and without penalties is first possible, assuming labour market entry at age 22 and an uninterrupted career. Slovak Republic: For women with children the normal retirement age is reduced dependent on the number of children, with a minimum of 59.75. Finland: Early partial retirement on 25% or 50% of accrued pension rights is possible from age 61.

Source: OECD based on information provided by countries; see "Country Profiles" available at <http://oe.cd/pag>.

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Figure 4.4. **Current normal retirement age by gender**

For an individual retiring in 2018 after an uninterrupted career from age 22



Note: For better visibility, the scale of this chart excludes the lowest observed values, which equal 47 for both men and women in Saudi Arabia, 48 and 51 for women and men respectively in Turkey, 52 for women in Brazil, 55 for women in the Russian Federation, 56 for both men and women in Indonesia and 57 for men in Brazil. The retirement age for women in China depends on the type of work and lies between 50 and 60.

Source: OECD based on information provided by countries; see "Country Profiles" available at <http://oe.cd/pag>.

StatLink  <https://doi.org/10.1787/888934041326>

Key results

Future normal and early retirement ages will continue to rise. Assuming labour market entry at age 22 in 2018 the normal retirement age will increase to 66.1 for men and 65.7 for women on average across all OECD countries against 64.2 and 63.5 years, respectively, for retirement in 2018.

Normal retirement age

Across countries, the average normal retirement age for a man with a full career from age 22 equalled 64.2 years in 2018 (Figure 4.6). For the generation entering the labour market in 2018, this age will increase to 66.1 years (hence around 2062). Meanwhile, the remaining life expectancy of men at age 65 is projected to increase on average from 18.1 to 22.5 years (see Chapter 6), so by more than twice as much as the normal retirement age.

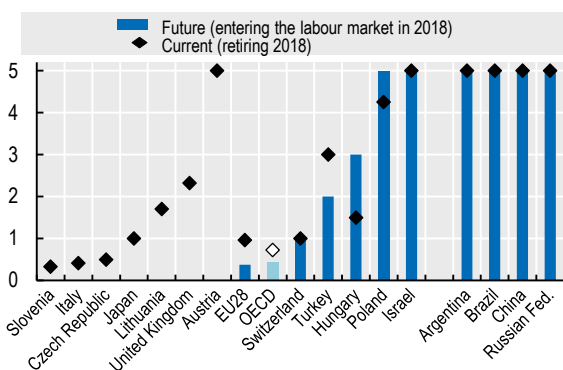
The normal retirement age of men will increase in 20 out of 36 OECD countries by an average of 3.5 years based on current legislation. The highest increase is projected for Turkey, from 51 currently to 62 years. Assuming that legislated life expectancy links are applied, also Denmark, from 65 to 74 years, and Estonia, from 63.3 to 71 years, will rapidly raise the retirement age.

The lowest future retirement age for men equals 62 in Greece, Luxembourg, Slovenia and Turkey. Normal retirement ages in G20 countries outside the OECD tend to be lower, both today and in the future; in Saudi Arabia even below 50.

In 2018, gender differences in the normal retirement age existed in one-third of OECD countries Figure 4.5. However, for the generation entering the labour market in 2018, gender gaps will have been phased out everywhere in the OECD except in Hungary, Israel, Poland, Switzerland and Turkey. In Turkey, it will be phased out for those entering in 2028. Marked gender gaps also exist in several non-OECD G20 countries.

Figure 4.5. **Gender gap in current and future normal retirement ages**

Based on a full career from labour market entry at age 22



Note: See the StatLink. Source: OECD based on information provided by countries.

StatLink <https://doi.org/10.1787/888934041345>

In many OECD countries, different rules apply to different components of the overall retirement-income package. Where normal retirement ages differ across pension schemes the maximum across schemes defines the normal retirement age of the country.

Table 4.5 shows the rules for early, normal and late retirement by pension scheme for a person entering the labour force at age 22 in 2018. The lowest normal age will apply in the FDC scheme of Chile for women, equalling 60 years. However, as women in Chile are not eligible to the targeted pension before 65 the latter is recorded as their normal retirement age.

Early retirement

In FDC schemes benefits are automatically actuarially adjusted to the age at retirement and, therefore, only an early retirement age is specified, like in Norway and Sweden for NDC. The NDC schemes in Italy, Latvia and Poland still specify a standard retirement age indicated as normal age in the table.

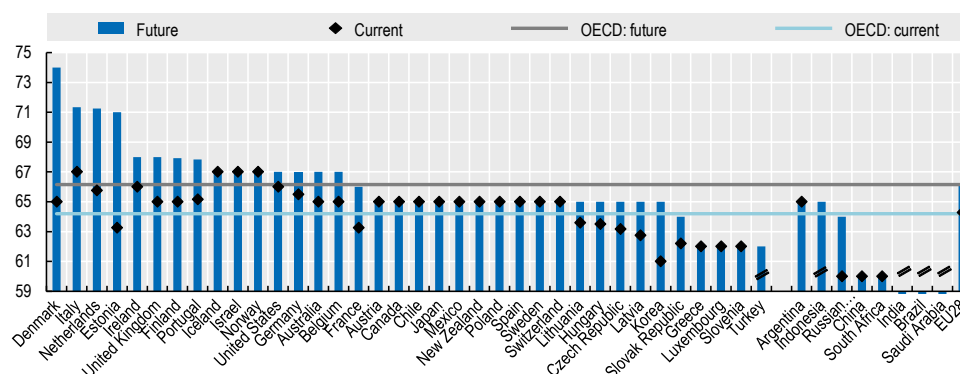
All DB and points schemes, except in Hungary and Turkey, will allow to claim a pension early. In Greece and Luxembourg early and normal retirement ages coincide for a full-career worker entering the labour market at age 22. Pension benefits for early retirees are usually reduced to reflect the longer durations in retirement. Only Belgium and Luxembourg do not impose such a penalty.

Residency-based basic and targeted schemes exclude the option for early pension receipt. The contribution-based schemes in the Czech Republic, Estonia, Greece, Japan, Korea and Luxembourg that pay both basic and earning-related components allow early retirement. Countries that combine basic or targeted schemes with occupational pensions typically set a comparatively low retirement age in the occupational scheme while the basic or targeted scheme assures a certain minimum retirement income only above 65.

Late retirement

Options for retirement deferral often mirror those for early pensions. DB, DC and points schemes usually compensate the shorter expected retirement spell by bonuses which tend to be higher than the penalties for early retirement, with a maximum-rate of about 12% per year in case of a 10-year deferral in the basic/targeted scheme of Denmark and in some exceptional cases for a one-year deferral in the Portuguese DB scheme. France in the mandatory occupational scheme, Greece and, again, Belgium and Luxembourg, deviate by not paying a deferral bonus in DB or points schemes. Many basic, minimum and targeted schemes do not pay a bonus either. Late retirement ages, maximum accrual rates and maximum pensions stop accrual of pension rights in some countries (see note of Table 4.3).

Figure 4.6. **Current and future normal retirement ages for a man with a full career from age 22**
Current and future refer to retiring 2018 and entering the labour market in 2018, respectively



Note: For better visibility, the scale of this chart excludes the lowest observed values of 47 for both current and future in Saudi Arabia, 51 for current in Turkey, 56 for current in Indonesia, 57 for both current and future in Brazil and 58 for both current and future in India. More notes in the StatLink.
Source: OECD based on information provided by countries; see “Country Profiles” available at <http://oe.cd/pag>.

StatLink <https://doi.org/10.1787/888934041364>

Table 4.5. **Future ages, penalties and bonuses for early, normal and late retirement by type of pension scheme**
For an individual with an uninterrupted career after entering the labour market at age 22 in 2018

	Scheme	Early age	Penalty (p.a.)	Normal age	Bonus (p.a.)		Scheme	Early age	Penalty (p.a.)	Normal age	Bonus (p.a.)	
Australia	T	n.a.		67	0%	Italy	NDC	68.3	..	71.3	..	
	FDC	60	..		..	Japan	Basic, DB	60	6%	65	8.4%	
Austria	DB, Min	62	5.1%	65	4.2%	Korea	Basic, DB	60	6%	65	7.2%	
Belgium	DB	63	0%	67	0%	Latvia	NDC, Min, FDC	63	..	65	..	
	Min	n.a.		67	0%	Lithuania	Points	60	4.8%	65	8%	
Canada	Basic	n.a.		65	7.2%	Luxembourg	Basic, DB, Min	62	0%	62	0%*	
	T	n.a.		65	0%	Mexico	T, Min	n.a.		65	0%	
	DB	60	7.2%	65	8.4%		FDC	60 or SL	..		..	
Chile	Min, T	n.a.		65	0%	Netherlands	Basic	n.a.		71.3	0%	
	(M)	FDC	any age & SL	65	..		DB (Occ)	sector-specific	..		..	
	(W)	FDC	any age & SL	60	..	New Zealand	Basic	n.a.		65	0%	
Czech Republic	DB	60	3.6-6% [I]	65	6%	Norway	T	n.a.		67	0%	
	Basic, Min	60	0%	65	0%		NDC	62	..		..	
Denmark	Basic, T	n.a.		74	6.9-11.9% [I]		FDC (Occ)	62	..		..	
	FDC (ATP)	74	..		..	Poland	(M)	NDC, Min	n.a.	65		
	FDC (Occ)	69	..		..		(W)	NDC, Min	n.a.	60	..	
Estonia	Basic, points	68	4.8%	71	10.8%	Portugal	DB	62	6%	67.8	0-12% [I, w, y]	
	FDC	68	..		..		Min	n.a.		67.8	0%	
Finland	DB	65	4.8%	67.9	4.8%	Slovak Republic	DB, Min	62 & SL	6.5%	64	6%	
	T	n.a.		67.9	4.8%	Slovenia	DB, Min	60	3.6%	62	4%	
France	DB, Min	62	5%	65	5%	Spain	DB, Min	63	6% [y]	65	4% [y]	
	Points	57	4-5.7% [I, y]	66	0%	Sweden	T	n.a.		65	0%	
Germany	Points	63	3.6%	67	6%		NDC, FDC	61	..		..	
	T	n.a.		67	0%		FDC (Occ)	55	..	65	..	
Greece	Basic, DB	62	6%	62	0%	Switzerland	(M)	DB, Min	63	6.8%	65	5.2-6.3% [I]
Hungary	(M)	DB, Min	n.a.	65	6%		(W)	DB, Min	62	6.8%	64	5.2-6.3% [I]
	(W)	DB, Min	n.a.	62	6%		(M)	DB (Occ)	58	3-4% [I]	65	4-4.4% [I]
Iceland	Basic, T	n.a.		67	6%		(W)	DB (Occ)	58	3-4% [I]	64	4-4.4% [I]
	DB (Occ)	65	7%	67	8%	Turkey	(M)	DB, Min	n.a.	62		
Ireland	Basic, T	n.a.		68	0%		(W)	DB, Min	n.a.	60		
Israel	(M)	Basic, T	n.a.	67	5%	United Kingdom	Basic	n.a.		68	5.8%	
	(W)	Basic, T	n.a.	62	5%	United States	DB	62	6.7-5% [I]	67	8%	
	(M)	FDC	..		..							
	(W)	FDC	62	..	..							

Note: (M) = men, (W) = women, [a] = depending on age, [I] = depending on length of anticipation or deferral, [y] = depending on number of contribution years, n.a. = early retirement is not available, Min = minimum pension, Occ = occupational, SL = subsistence level reached, T = targeted, .. = no data indicated as benefits in DC schemes automatically adjusted to the age of retirement in an actuarially neutral way. Normal and early retirement ages for a scheme describe the ages at which the receipt of a pension, respectively, with and without penalties is first possible, assuming labour market entry at age 22 and an uninterrupted career. Where retirement ages for men and women differ they are shown separately. The reference retirement age used in the modelling has been bolded. Denmark: The bonus rate in the basic/targeted scheme is based on life expectancy at the age of first pension receipt and therefore depends on the length of deferral. Slovak Republic: For women with children the pension age is reduced dependent on the number of children. Finland: Early partial retirement on 25% or 50% of accrued pension rights is possible from age 61. In Greece and Latvia, there are temporary penalties of early retirement until the normal retirement age of 10% and 50% of the pension respectively. *There is no bonus for postponing retirement in Luxembourg but the accrual rate is higher for each year that the sum of the individual's age and number of contribution years will exceed 100.

Source: OECD based on information provided by countries; see “Country Profiles” available at <http://oe.cd/pag>.

StatLink <https://doi.org/10.1787/888934041383>

Chapter 5

Pension Entitlements

Pension entitlements are calculated using the OECD pension models. The theoretical calculations are based on national parameters and rules that apply in 2018. They relate to workers entering the labour market in 2018 at the age of 22 and include the full impact of pension reforms that have been legislated and are being phased in. A note on the methodology used and assumptions made precedes the pension indicators.

The indicators begin with the gross pension replacement rate in mandatory pension schemes: the ratio of pensions to individual earnings. Thereafter follows an analysis of the impact of changing the entry age from 20 to 22. The second shows the replacement rates for mandatory and voluntary pension schemes where these schemes have broad coverage. Thereafter follows an analysis of the tax treatment of pensions and pensioners. The fourth and fifth indicators show the net replacement rates, taking account of taxes and contributions. After this follows two indicators of pension wealth: the lifetime discounted value of the flow of retirement benefits. This indicator also takes into account the retirement age, indexation of benefits, and life expectancy. The pension wealth indicator is presented in gross and net terms. There then follows an indicator showing pension entitlements for couples compared to a single worker. Finally there are two indicators showing the impact of career breaks for childcare and unemployment on total pension entitlements.

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.

Introduction

The indicators of pension entitlements that follow here in Chapter 5 use the OECD cohort-based pension models. The methodology and assumptions are common to the analysis of all countries, allowing the design of pension systems to be compared directly. This enables the comparison of future entitlements under today's parameters and rules.

The pension entitlements that are presented are those that are currently legislated in OECD countries. Reforms that have been legislated before publication are included where sufficient information is available. Changes that have already been legislated and are being phased in gradually are modelled from the year that they are implemented and onwards.

The values of all pension system parameters reflect the situation in 2018 and onwards. The calculations show the pension benefits of a worker who enters the system that year at age 22 – that worker is thus born in 1996 – and retires after a full career. The baseline results are shown for single individuals. All indexation and valorisation rules follow what is legislated in the baseline scenario.

Career length

A full career is defined here as entering the labour market at age of 22 and working until the normal pension age (see indicator on “Future retirement ages”). The implication is that the length of the career varies with the normal retirement age: 40 years for retirement at 62, 45 for retirement at 67, etc.

People often spend periods out of paid work in unemployment, full-time education, caring for children, disabled or elderly relatives, etc. Most OECD countries have mechanisms in place to protect the pension entitlements for such periods. Rules for periods of unemployment and caring for children, which are often very complex, are set out in the online “Country Profiles” available at <http://oe.cd/pag>. The OECD pension models include these rules.

Coverage

The pension models presented here include all mandatory pension schemes for private-sector workers, regardless of whether they are public (i.e. they involve payments from government or from social security institutions, as defined in the System of National Accounts) or private. For each country, the main national scheme for private-sector employees is modelled. Schemes for civil servants, public-sector workers and special professional groups are excluded.

Schemes with near-universal coverage are also included, provided that they cover at least 85% of employees. Such plans are called “quasi-mandatory” in this report. They are particularly significant in Denmark, the Netherlands and Sweden.

An increasing number of OECD countries have broad coverage of voluntary, occupational pensions and these play

an important role in providing retirement incomes. For these countries, a second set of results for replacement rates is shown with entitlements from these voluntary pension plans.

Resource-tested benefits for which retired people may be eligible are also modelled. These can be means-tested, where both assets and income are taken into account, purely income-tested or withdrawn only against pension income. The calculations assume that all entitled pensioners take up these benefits. Where there are broader means tests, taking account also of assets, the income test is taken as binding. It is assumed that the whole of income during retirement comes from the mandatory pension scheme (or from the mandatory plus voluntary pension schemes in those countries where the latter are modelled).

Pension entitlements are compared for workers with a range of different earnings levels from 0.5 times the average worker earnings (AW). This range permits an analysis of future retirement benefits of both the poorest and richer workers.

Economic variables

The comparisons are based on a single set of economic assumptions for all the OECD countries and other major economies analysed. In practice, the level of pensions will be affected by economic growth, rate of return on financial assets, real-wage growth, discount rates and price inflation, and these will vary across countries. A single set of assumptions, however, ensures that the outcomes of the different pension regimes are not affected by different economic conditions. In this way, differences across countries in pension levels reflect differences in pension systems and policies alone. The baseline assumptions are set out below.

Price inflation is assumed to be 2% per year. **Real earnings** are assumed to grow by 1.25% per year on average (given the assumption for price inflation, this implies nominal wage growth of 3.275%). **Individual earnings** are assumed to grow in line with the economy-wide average. This means that the individual is assumed to remain at the same point in the earnings distribution, earning the same percentage of average earnings in every year of the working life. The **real rate of return** on funded, defined contribution pensions is assumed to be 3% per year. Administrative charges, fee structures and the cost of buying an annuity are assumed to result in a **defined contribution conversion factor** of 90% applied to the accumulated defined contribution wealth when calculating the annuity. The **real discount rate** (for actuarial calculations) is assumed to be 2% per year.

Chapter 4 in the 2015 edition of *Pensions at a Glance* includes a sensitivity analysis to the various parameters used here.

The baseline modelling uses country-specific projections of **mortality rates** from the United Nations population database for every year from 2018 to 2100.

The calculations assume that benefits from defined contribution plans are paid in the form of a price-indexed life annuity at an actuarially fair price assuming perfect foresight. This is calculated from the mortality projections once the conversion factor is taken into account. If people withdraw the money in alternative ways, the capital sum at the time of retirement is the same: it is only the way the benefits are spread that is changed. Similarly, the notional annuity rate in notional accounts schemes is (in most cases) calculated from mortality data using the indexation rules and discounting assumptions employed by the respective country.

Taxes and social security contributions

Information on personal income tax and social security contributions paid by pensioners, which were used to calculate pension entitlements, are in the “Country Profiles” available at <http://oe.cd/pag>.

The modelling assumes that tax systems and social-security contributions remain unchanged in the future. This constant policy assumption implicitly means that “value” parameters, such as tax allowances or contribution ceilings, are adjusted annually in line with average worker earnings, while “rate” parameters, such as the personal income tax schedule and social security contribution rates, remain unchanged.

General provisions and the tax treatment of workers for 2018 can be found in the OECD’s *Taxing Wages* report. The conventions used in that report, such as which payments are considered taxes, are followed here.

Key results

The future gross replacement rate represents the level of pension benefits in retirement from mandatory public and private pension schemes relative to earnings when working. For workers with average earnings and a full career from age 22, the future gross replacement rate at the normal retirement age averages 49.0% for men and 48.2% for women in the 36 OECD countries, with substantial cross-country variation. At the bottom of the range, five countries offer future gross replacement rates from mandatory schemes below 30% at the average wage: Ireland, Lithuania, Mexico, Poland and the United Kingdom. Austria, Italy and Luxembourg, at the top of the range, offers replacement rates higher than 75%.

Most OECD countries aim to protect low-income workers (here defined as workers earning half of average worker earnings) from old-age poverty, which results in higher replacement rates for them than for average earners. Low-income workers would receive gross replacement rates averaging 60%, compared with 49% for average-wage workers. Some countries, such as Australia, Ireland and Korea, pay relatively small benefits to average earners, but are closer to or even above average for low-income workers. However, projected replacement rates in nine countries are the same for a full career at average and half-average pay: Austria, Finland, Germany, Hungary, Italy, Latvia, Spain, Sweden and Turkey.

At the top of the range, based on current legislation, low earners in Denmark will receive a future gross replacement rate of 114% after a full career; retirement benefits are thus higher than their earnings when working. At the other end of the scale, Germany, Lithuania and Mexico offer gross replacement rates below 40% to low-income earners, thus implying a gross retirement income lower than 20% of average earnings after a full career. On average in the 36 OECD countries, the gross replacement rate at 1.5 times average earnings (here called “high earnings”) is 45%, somewhat below the 49% figure for average earners. Replacement rates for these high earners equal 80% in Italy, while at the other end of the spectrum, the United Kingdom offers a replacement rate of around 15%.

For the non-OECD countries, the projected replacement rates for average earners range from 17% in South Africa to 83% in India.

All of the replacement rates are calculated for full-career workers from the age of 22, which means that career lengths differ between countries. Denmark has an estimated long-term retirement age of 74 years for those starting in 2018, whilst in Turkey it will be 60 for women and 62 for men, and in both Luxembourg and Slovenia retirement will still be possible with a full pension at age 62 for both men and women (Table 5.1).

Gross pension replacement rates differ for women in nine countries, due to a lower pension eligibility age than for men (Hungary, Israel, Poland, Switzerland and Turkey), gender specific accrual rates (Slovenia) or the use of sex specific mortality rates to compute annuities (Australia,

Chile and Mexico). The replacement rates are expressed as percentage of earnings which are not gender specific. Differences between the sexes are substantial in Australia, Chile, Hungary, and especially Israel and Poland, with replacement rates (i.e. monthly benefits) for women being between 7% and 27% lower than for men. In Slovenia, however, the replacement rates for women are 5% greater due to a higher accrual rate. This difference will be phased out for those entering the labour market from 2023.

Gross pension replacement rates fall with age from 49% on average at the time of retirement to 43% at age of 80, a fall of 12% relative to wages. This difference is due to the indexation of pension benefits in payment, which do not follow wages in many countries. With price indexation from a normal retirement age of 65, the fall is equal to 17% based on the OECD model assumptions. The earlier the normal retirement age the larger the fall with price indexation. The largest fall of about 20% are found in Greece and Turkey as the normal retirement age is 62, and in Sweden because the indexation of the NDC schemes is wages minus 1.6%, which is less than price indexation in the OECD model. Countries where the indexation of pension benefits follows wages – Ireland, Luxembourg, the Netherlands, New Zealand, Slovenia and the United Kingdom – have the same replacement rate at age 80 than at the normal retirement age.

Definition and measurement

The old-age pension replacement rate measures how effectively a pension system provides a retirement income to replace earnings, the main source of income before retirement. The gross replacement rate is defined as gross pension entitlement divided by gross pre-retirement earnings.

Often, the replacement rate is expressed as the ratio of the pension to final earnings (just before retirement). Under the baseline assumptions, workers earn the same percentage of average worker earnings throughout their career. Therefore, final earnings are equal to lifetime average earnings revalued in line with economy-wide earnings growth. Replacement rates expressed as a percentage of final earnings are thus identical to those expressed as a percentage of lifetime earnings.

Table 5.1. **Gross pension replacement rates by earnings, mandatory schemes**

Individual earnings, multiple of mean for men (women where different)															
Pension age		0.5		1		1.5		Pension age		0.5		1.0		1.5	
Australia	67	64.9	(62.1)	30.9	(28.1)	30.9	(28.1)	New Zealand	65		79.3		39.7		26.4
Austria	65	76.5		76.5		76.5		Norway	67		50.4		45.4		36.3
Belgium	67	57.3		46.8		33.7		Poland	65	(60)	29.4	(29.8)	29.4	(22.5)	29.4 (22.5)
Canada	65	50.9		39.0		29.8		Portugal	68		75.8		74.4		73.1
Chile	65	36.2	(34.6)	31.2	(28.8)	31.2	(28.8)	Slovak Republic	64		59.5		49.6		47.0
Czech Republic	65	75.0		45.9		36.2		Slovenia	62		47.8	(50.0)	38.8	(40.7)	36.0 (37.9)
Denmark	74	113.8		74.4		64.0		Spain	65		72.3		72.3		72.3
Estonia	71	61.4		47.1		42.3		Sweden	65		54.1		54.1		65.3
Finland	68	56.5		56.5		56.5		Switzerland	65	(64)	53.0	(51.8)	42.4	(41.3)	29.2 (28.5)
France	66	60.2		60.1		54.0		Turkey	62	(60)	67.4	(64.3)	67.4	(64.3)	67.4 (64.3)
Germany	67	38.7		38.7		38.7		United Kingdom	68		43.5		21.7		14.5
Greece	62	63.1		49.9		45.5		United States	67		50.1		39.4		33.1
Hungary	65	(62)	56.1	(52.2)	56.1	(52.2)	56.1 (52.2)	OECD	66.1	(65.7)	60.0	(59.4)	49.0	(48.2)	44.7 (44.0)
Iceland	67		75.3		66.1		65.1								
Ireland	68		54.1		27.0		18.0								
Israel	67	(62)	77.4	(66.7)	50.1	(41.8)	33.4 (27.9)	Argentina	65	(60)	83.7	(76.9)	71.2	(64.4)	67.1 (60.3)
Italy	71		79.5		79.5		79.5	Brazil	57	(52)	92.1	(92.1)	58.9	(46.1)	58.9 (46.0)
Japan	65		42.5		32.0		28.5	China	60	(55)	90.6	(77.3)	71.6	(60.8)	65.2 (55.3)
Korea	65		55.6		37.3		27.0	India	58		83.4	(80.4)	83.4	(80.4)	83.4 (80.4)
Latvia	65		44.6		44.6		44.6	Indonesia	65		55.3	(53.0)	55.3	(53.0)	55.3 (53.0)
Lithuania	65		36.8		23.6		19.2	Russian Federation	64	(59)	62.3	(57.9)	49.6	(45.2)	44.9 (40.5)
Luxembourg	62		91.5		78.8		74.5	Saudi Arabia	47		59.6		59.6		59.6
Mexico	65		35.1		25.7	(24.0)	24.6 (23.0)	South Africa	60		34.5		17.2		11.5
Netherlands	71		73.5		70.9		70.1	EU28	66.3	(65.9)	60.3	(60.2)	52.0	(51.7)	48.8 (48.5)

Key Results

The future gross replacement rate shown in Table 5.1 for the average-wage worker assumes that this worker earns the average wage all along her or his career from age 22 in 2018 (baseline case). The indicator here compares those results with an average earner that entered the labour market in 2018 at age 20, the default scenario used in previous editions of the publication. Such a variation in entry age has a small impact on replacement rates, with the average gross replacement rate decreasing from 50.4% to 49.0% when moving the entry age from 20 to 22 years due to the impact of lower entitlements in many countries.

All the analysis in previous editions of this publication have covered those entering the labour market at age 20 and then working a full career until the country-specific retirement age. For this and subsequent editions the new base case is defined with a career entry age of 22. To show the impact of this deferral of labour market entry by 2 years the gross replacement rates for average earners have also been calculated with entry at age 20 and are presented in Table 5.2. As both cases assume labour market entry in 2018, they refer to two different birth cohorts: 1998 (entry at age 20) and 1996 (at age 22).

The expansion of higher education justifies this shift in the baseline scenario. Between 2000 and 2015, the OECD-wide average share of women aged 25 to 64 with high education (levels 5-8 of the 2011 International Standard Classification for Education, ISCED) rose from 21% to 38%. Among men, the increase was from 22% to 32% (OECD, 2017). The average entry age into the labour market has increased over time and is currently above 20 in most if not all OECD countries: data from the latest EU Pension Adequacy Report (European Commission, 2018) show that entry age in the EU is on average 22.8 years and is above 20 in all EU countries (except Denmark where it equals 19.7 years). *Education at a Glance* publishes an indicator of “Expected years in education and at work between ages 15 and 29” in the module “Transition from school to work”. On average across OECD countries, people completed their education at age 22.1 in 2016, which is very close to the average of the 22 EU countries that are OECD Members (22.3).

Changing the entry age for this edition leads to a decrease in the gross replacement rate for average earners of 1.4 percentage points from 50.4% to 49.0%. However the impact varies by country because of the specific design of pension systems. Intuitively one would assume that starting the career two years later would just mean that there are two fewer years of contributions, as is the case for the 30 OECD countries that have the same retirement age for entry at age 20 and entry at age 22 for men (29 countries for women). Yet the impact of two missing years of contributions is not mechanical depending on the exact links between contributions and benefits from all

components. Among these 30 countries, the scale of the fall varies from a high of 4.6 percentage points in Turkey and 3.6 percentage points in Austria to actually increasing by 0.1 percentage point in Canada. In Canada, the full earnings-related pension is achieved after 40 years of contributions so there is no impact of the change; the basic pension is indexed to prices and as the 1996 birth cohort will retire in 2061, i.e. two years earlier than the 1998 cohort, its level relative to wages will be higher as real wages are assumed to grow by 1.25% per year.

Replacement rates in Ireland, New Zealand, Portugal, Spain and the United Kingdom are identical. The maximum replacement rate is obtained in Portugal and Spain after only 40 and 38.5 years, respectively. In Ireland, New Zealand and the United Kingdom there are only basic pensions as the mandatory component and both are indexed to earnings growth, thereby maintaining their value relative to earnings irrespective of the entry age for those with full careers.

In Belgium, France, Germany, Luxembourg and Slovenia the replacement rates are also identical for entry at age 22 and at age 20 as the retirement age for all these four countries also increases by two years given the rules to get a full pension. In both Denmark and Hungary the retirement age changes though only for women in Hungary. In Denmark the age increases by one year for the 1998 cohort (which enters at age 20) because of links to life expectancy, whilst in Hungary the retirement age decreases by two years as women can retire with a full pension after 40 years of contribution.

Further Reading

European Commission (2018), “Pension Adequacy Report 2018; Current and future income adequacy in old age in the EU”, Vol. Publications Office of the European Union, Luxembourg, <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8084&furtherPubs=yes>.

OECD (2017), *Education at a Glance 2017: OECD Indicators*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/eag-2017-en>.

Table 5.2. Difference in gross pension replacement rates for average earners by entry age

Average earnings for men (women where different)						Difference in pension age	Difference in replacement rates				
Entry at age 22 (base case)				Entry at age 20 (old base case)							
Pension age		Replacement rate		Pension age				Replacement rate			
Australia	67	30.9	(28.1)	67	32.8	(29.8)		-1.9	(-1.7)		
Austria	65	76.5		65	80.1			-3.6			
Belgium	67	46.8		65	46.8		2.0	0.0			
Canada	65	39.0		65	38.9			0.1			
Chile	65	31.2	(28.8)	65	33.3	(30.7)		-2.1	(-1.9)		
Czech Republic	65	45.9		65	47.6			-1.7			
Denmark	74	74.4		75	77.7		-1.0	-3.3			
Estonia	71	47.1		71	49.4			-2.4			
Finland	68	56.5		68	58.8			-2.3			
France	66	60.1		64	60.1		2.0	0.0			
Germany	67	38.7		65	38.7		2.0	0.0			
Greece	62	49.9		62	53.0			-3.1			
Hungary	65	(62)	56.1	(52.2)	65	(60)	58.7	(54.8)	(2.0)	-2.6	(-2.6)
Iceland	67	66.1		67	68.8			-2.7			
Ireland	68	27.0		68	27.0			0.0			
Israel	67	(62)	50.1	(41.8)	67	(62)	52.2	(43.7)		-2.1	(-1.9)
Italy	71	79.5		71	82.7			-3.2			
Japan	65	32.0		65	33.4			-1.4			
Korea	65	37.3		65	39.3			-2.0			
Latvia	65	44.6		65	47.4			-2.8			
Lithuania	65	23.6		65	24.5			-0.9			
Luxembourg	62	78.8		60	78.8		2.0	0.0			
Mexico	65	25.7	(24.0)	65	28.2	(26.4)		-2.6	(-2.4)		
Netherlands	71	70.9		71	72.2			-1.2			
New Zealand	65	39.7		65	39.7			0.0			
Norway	67	45.4		67	47.6			-2.1			
Poland	65	(60)	29.4	(22.5)	65	(60)	30.7	(23.4)		-1.3	(-0.9)
Portugal	68	74.4		68	74.4			0.1			
Slovak Republic	64	49.6		64	52.0			-2.4			
Slovenia	62	38.8	(40.7)	60	38.8	(40.7)	2.0	0.0			
Spain	65	72.3		65	72.3			0.0			
Sweden	65	54.1		65	56.2			-2.1			
Switzerland	65	(64)	42.4	(41.3)	65	(64)	42.9	(41.8)		-0.5	(-0.5)
Turkey	62	(60)	67.4	(64.3)	62	(60)	72.0	(68.9)		-4.6	(-4.6)
United Kingdom	68	21.7		68	21.7			0.0			
United States	67	39.4		67	39.4			0.0			
OECD	66.1	(65.7)	49.0	(48.2)	65.9	(65.4)	50.4	(49.6)		-1.5	(-1.4)
Argentina	65	(60)	71.2	(64.4)	65	(60)	74.0	(67.1)		-2.7	(-2.7)
Brazil	57	(52)	58.9	(46.1)	57	(52)	62.5	(48.8)		-3.6	(-2.7)
China	60	(55)	71.6	(60.8)	60	(55)	76.0	(65.1)		-4.4	(-4.3)
India	58		83.4	(80.4)	58		86.3	(83.0)		-2.9	(-2.6)
Indonesia	65		55.3	(53.0)	65		57.9	(55.5)		-2.6	(-2.5)
Russian Federation	64	(59)	49.6	(45.2)	63	(58)	50.5	(46.1)		-0.9	(-0.9)
Saudi Arabia	47		59.6		45		59.6			0.0	
South Africa	60		17.2		60		17.2			0.0	
EU28	66.3	(65.9)	52.0	(51.7)	66.0	(65.5)	53.4	(53.0)		-1.3	(-1.3)

Source: OECD pension models.

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Key results

Private pensions play a large role in about half of OECD countries. For mandatory schemes, the OECD average for gross replacement rates of an average earner from public schemes alone is 40%, compared with 49% with private pensions included. For the eight OECD countries where voluntary private pensions are widespread, plus Israel and Mexico, the average replacement rate is 58% for an average earner choosing to contribute for the whole career compared with 36% when only mandatory schemes are considered. If the full-career average-wage earner only starts contributing in a voluntary scheme from age 45, the replacement rate is 45% against 59% when contributing for the whole career on average among the eight countries.

Table 5.3 shows the interplay between mandatory public, mandatory private and voluntary pension schemes. As shown in the previous indicator, the average replacement rate from mandatory schemes for a full-career average earner is equal to 49%: for the 17 OECD countries where the calculations of entitlements only cover mandatory public pensions, the average replacement rate for an average worker earner is 55%; for the 9 OECD countries with both public and mandatory private provision but no voluntary, the average replacement rate is 51%; and for the last 10 countries with significant voluntary pensions, the replacement rate from the mandatory component alone is 36%.

Mandatory private pensions

Mandatory private pensions exist in 11 countries including Denmark, the Netherlands and Sweden where private pensions have near-universal coverage, and are described as “quasi-mandatory”.

In Iceland, the Netherlands and Switzerland, private pensions are mainly defined benefit, whilst in the other countries they are defined contribution. Replacement rates from mandatory private schemes range from 6% in Norway to over 50% in Denmark and Iceland. All of the other countries are between 19% and 32% at the average wage, with the exception of the Netherlands at 42%. In Sweden the contribution rate for the private pension increases from 4.5% below to 30% above the ceiling for the public scheme, hence the total replacement rate is higher for high earners than average earners.

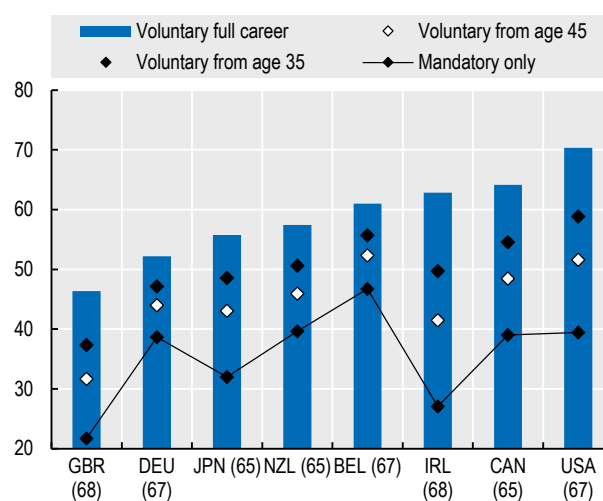
Voluntary private pensions

Voluntary private pensions are shown for eight countries where voluntary private pensions cover more than 40% of the population aged 15 to 64 (see the indicator of “Coverage of private pension plans” in Chapter 9). In addition, the housing account in Mexico and the severance account in Israel have been added as if they are not utilised during the working career, they are then transferred to the pension accounts at retirement. Voluntary private pensions include both voluntary occupational and voluntary personal plans. In Japan, a defined benefit plan is modelled, with the others having defined contribution schemes. In Israel the voluntary scheme modelled is the severance pay scheme, which is used as a pension if not utilised during the career. In Mexico the housing account is modelled, which is also used as a pension at the point of retirement if funds still remain.

When voluntary private pensions are taken into account for the whole career in Belgium, Canada, Germany, Ireland, Israel, Japan, Mexico, New Zealand, the United Kingdom and the United States the average replacement, for these ten countries, is 58% for an average earner compared with 36% when only mandatory schemes are considered. The voluntary component has the largest impact on the replacement rate (more than 29 percentage points) in Ireland, the United Kingdom and the United States.

The length of the contribution period clearly has an impact on the total replacement rate. The chart below compares the full-career full-contribution case with the full-career case but with contributions in the voluntary scheme from age 35 and 45 only, perhaps a more appropriate scenario. The schemes in Israel and Mexico are not considered as contributions are mandatory at all ages to severance and housing accounts respectively.

Gross replacement rate including voluntary contributions from different ages



StatLink <https://doi.org/10.1787/888934041478>

Among these eight countries, only contributing from age 35 (45) reduces the gross replacement rate by 10 (16) percentage points on average compared with the full-contribution case. In Belgium, Canada and the United States making contributions to the voluntary scheme from age 35 would result in a gross replacement rate above 55%.

Table 5.3. **Gross pension replacement rates from mandatory public, mandatory private and voluntary private pension schemes**

Percentage of individual earnings

	Mandatory Public			Mandatory private (DB & DC)			Total mandatory			Voluntary (DB & DC)			Total with voluntary		
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Australia	34.0	0.0	0.0	30.9	30.9	30.9	64.9	30.9	30.9						
Austria	76.5	76.5	76.5				76.5	76.5	76.5						
Belgium	57.3	46.8	33.7				57.3	46.8	33.7	14.2	14.2	10.4	71.6	61.0	44.1
Canada	50.9	39.0	29.8				50.9	39.0	29.8	25.1	25.1	25.1	71.9	64.1	54.9
Chile	5.1	0.0	0.0	31.1	31.2	31.2	36.2	31.2	31.2						
Czech Republic	75.0	45.9	36.2				75.0	45.9	36.2						
Denmark	63.1	23.7	13.3	50.7	50.7	50.7	113.8	74.4	64.0						
Estonia	33.8	19.4	14.6	27.6	27.6	27.6	61.4	47.1	42.3						
Finland	56.5	56.5	56.5				56.5	56.5	56.5						
France	60.2	60.1	54.0				60.2	60.1	54.0						
Germany	38.7	38.7	38.7				38.7	38.7	38.7	13.5	13.5	13.5	52.2	52.2	52.2
Greece	63.1	49.9	45.5				63.1	49.9	45.5						
Hungary	56.1	56.1	56.1				56.1	56.1	56.1						
Iceland	12.3	3.1	2.1	63.0	63.0	63.0	75.3	66.1	65.1						
Ireland	54.1	27.0	18.0				54.1	27.0	18.0	35.8	35.8	35.8	89.9	62.9	53.8
Israel	36.1	18.0	12.0	41.3	32.1	21.4	77.4	50.1	33.4	19.8	15.4	10.3	97.2	65.5	43.7
Italy	79.5	79.5	79.5				79.5	79.5	79.5						
Japan	42.5	32.0	28.5				42.5	32.0	28.5	23.8	23.8	23.8	66.2	55.8	52.3
Korea	55.6	37.3	27.0				55.6	37.3	27.0						
Latvia	44.6	44.6	44.6				44.6	44.6	44.6						
Lithuania	36.8	23.6	19.2				36.8	23.6	19.2						
Luxembourg	91.5	78.8	74.5				91.5	78.8	74.5						
Mexico	12.6	3.2	2.0	22.5	22.5	22.5	35.1	25.7	24.6	17.3	17.3	17.3	48.2	43.0	41.9
Netherlands	57.9	29.0	19.3	15.6	42.0	50.8	73.5	70.9	70.1						
New Zealand	79.3	39.7	26.4				79.3	39.7	26.4	17.8	17.8	17.8	97.1	57.4	44.2
Norway	45.7	39.6	30.1	4.7	5.9	6.2	50.4	45.4	36.3						
Poland	29.4	29.4	29.4				29.4	29.4	29.4						
Portugal	75.8	74.4	73.1				75.8	74.4	73.1						
Slovak Republic	59.5	49.6	47.0				59.5	49.6	47.0						
Slovenia	47.8	38.8	36.0				47.8	38.8	36.0						
Spain	72.3	72.3	72.3				72.3	72.3	72.3						
Sweden	41.6	41.6	30.8	12.5	12.5	34.4	54.1	54.1	65.3						
Switzerland	32.4	21.4	15.2	20.6	21.0	14.0	53.0	42.4	29.2						
Turkey	67.4	67.4	67.4				67.4	67.4	67.4						
United Kingdom	43.5	21.7	14.5				43.5	21.7	14.5	29.1	29.1	22.9	72.6	50.9	37.4
United States	50.1	39.4	33.1				50.1	39.4	33.1	30.9	30.9	30.9	81.0	70.3	64.0
OECD	51.1	39.6	34.9				60.0	49.0	44.7				66.1	55.2	50.5
Argentina	83.7	71.2	67.1				83.7	71.2	67.1						
Brazil	92.1	58.9	58.9				92.1	58.9	58.9						
China	90.6	71.6	65.2				90.6	71.6	65.2						
India	83.4	83.4	83.4				83.4	83.4	83.4						
Indonesia	33.1	33.1	33.1	22.2	22.2	22.2	55.3	55.3	55.3						
Russian Federation	62.3	49.6	44.9	20.4	20.4	20.4	82.7	70.0	65.2						
Saudi Arabia	59.6	59.6	59.6				59.6	59.6	59.6						
South Africa	34.5	17.2	11.5				34.5	17.2	11.5	49.1	49.1	49.1	49.1	49.1	49.1
EU28	54.7	45.5	41.2				60.3	52.0	48.8				63.6	55.4	51.8

Note: DB=defined benefit; DC = defined contribution.

Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041497>

Key results

The personal tax system plays an important role in old-age support. Pensioners often do not pay social security contributions. Personal income taxes are progressive and pension entitlements are usually lower than earnings before retirement, so the average tax rate on pension income is typically less than the tax rate on labour income. In addition, most income tax systems give preferential treatment either to pension incomes or to pensioners, through additional allowances or credits to older people.

More than half (20 out of 35) OECD countries provide older people with additional basic relief under the personal income tax. Generally, this takes the form of an extra tax allowance or tax credit. In many cases – Canada and the United Kingdom, for example – this additional relief is phased out for older people with higher incomes.

A significant number of countries offer tax relief for particular sources of retirement income. Relief from income tax for public pensions, either full or partial, is available in 14 OECD countries. For example, between 15% and 50% of income from public pensions in the United States (social security) is not taxed, depending on the total income of the pensioner. In Australia, for example, benefits derived from pension contributions, and investment returns, which have both been taxed, are not taxable in payment for over 60s. This applies to the mandatory defined contribution scheme and voluntary contributions to such plans.

By contrast some countries such as Denmark, Iceland, the Netherlands and Sweden tax earned income from work less than pensions.

Overall, 28 OECD countries have some concession for older people or pension income under their personal income taxes. In only eight countries is the tax treatment of pensions and pensioners at least the same as it is for people of working age.

Virtually all OECD countries levy employee social security contributions on workers: Australia and New Zealand are the only exceptions. In addition to these two countries, a further 19 do not levy social security contributions on pensioners. The rate of contributions in the 15 countries that do levy social security contributions on retirees is always lower than the rate charged on workers. Typically, old-age retirement income is not subject to contributions for pensions or unemployment (for obvious reasons). However, pensioners can be subject to levies to pay for health or long-term care and, in some cases, are liable for “solidarity” contributions to finance a broad range of benefits.

Empirical results

The chart shows the percentage of income paid in taxes and contribution by workers and pensioners.

Starting with workers, countries have been ranked by the proportion of income paid in total taxes (including social contributions) at an average earner level. This is then compared to the total tax rate paid by a pensioner after a full-career at the average wage, hence receiving the gross replacement rate in the base case (Table 5.1, as set out in the indicator “Gross pension replacement rates” above).

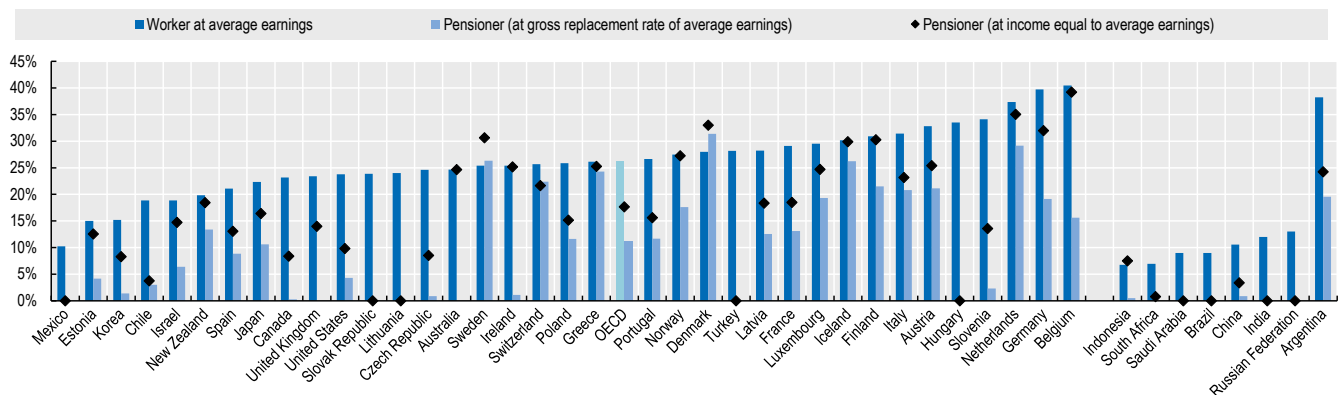
In eight OECD countries and six other major economies, such a pensioner would not pay any tax in retirement. In some cases, such as the Slovak Republic and Turkey, this is because pensions are not taxable. In the United Kingdom it is because the pension income would be less than the income-tax personal allowance offered to older people. Pensioners with the gross replacement rate of a full-career average earner would pay 11% of their income in taxes and contributions on average across the OECD. By comparison, taxes and contributions paid by an average earner – so not including any contributions from the employer – average 26% of the gross wage in OECD countries and 13% in other major economies.

The last series in the chart comparison show how much a pensioner would pay if his income before tax is equal to the gross average wage. The total tax rate is 18% on average in OECD countries, some eight percentage points lower than what workers’ pay (including contributions) with the same level of earnings.

The difference between this 18% rate for pensioners with an income equal to average earnings and the 11% paid in taxes and contributions paid on the income which is equal to the gross replacement rate for an average earner illustrates the impact of progressivity in income-tax systems for pensioners.

Table 5.4. **Treatment of pensions and pensioners under personal income tax and mandatory public and private contributions**

	Extra tax	Full or partial relief for pension income		Mandatory contributions on pension income		Extra tax	Full or partial relief for pension income		Mandatory contributions on pension income
	Allowance/credit	Public scheme	Private scheme			Allowance/credit	Public scheme	Private scheme	
Australia	✓	✓	✓	None	Netherlands	✓			Low
Austria				Low	New Zealand				None
Belgium		✓		Low	Norway	✓	✓		Low
Canada	✓	✓	✓	None	Poland				Low
Chile	✓			None	Portugal	✓			None
Czech Republic	✓	✓		None	Slovak Republic		✓		None
Denmark				None	Slovenia	✓			Low
Estonia	✓			None	Spain		✓		None
Finland		✓		Low	Sweden	✓			None
France				Low	Switzerland				Low
Germany		✓	✓	Low	Turkey		✓		None
Greece				Low	United Kingdom	✓			None
Hungary		✓	✓	None	United States	✓	✓		None
Iceland				None					
Ireland	✓			Low					
Israel	✓			Low	Argentina		✓		Low
Italy	✓		✓	None	Brazil		✓		None
Japan	✓	✓	✓	Low	China				None
Korea	✓	✓		None	India	✓			None
Latvia	✓			None	Indonesia				None
Lithuania	✓	✓	✓	None	Russian Federation				Low
Luxembourg	✓			Low	Saudi Arabia				Low
Mexico			✓	None	South Africa	✓			None

Source: See online "Country Profiles available at <http://oe.cd/pag>.StatLink  <https://doi.org/10.1787/888934041516>Figure 5.3. **Personal income taxes and social security contributions paid by pensioners and workers**

Source: OECD pension models; OECD tax and benefit models.

StatLink  <https://doi.org/10.1787/888934041535>

Key results

Whilst the gross replacement rate gives a clear indication of the design of the pension system, the net replacement matters more to individuals, as it reflects their disposable income in retirement in comparison to when working. For average earners with a full career, the net replacement rate from mandatory pension schemes at the normal retirement age averages 59% across the OECD, which is ten percentage points higher than the average gross replacement rate. This reflects the higher effective tax and social contribution rates that people pay on their earnings than on their pensions in retirement, mostly due to the progressivity of tax systems, some tax advantages to pensions and lower social contributions on pension benefits. Net replacement rates vary across a large range, from around 30% in Lithuania, Mexico and the United Kingdom to 90% or more in Austria, Luxembourg, Portugal and Turkey for average-wage workers. For low earners (with half of average worker earnings), the average net replacement rate across OECD countries is 68% while it is 55% for high earners (150% of average worker earnings).

The previous indicator of the “Tax treatment of pensions and pensioners” showed the important role that the personal tax and social security contribution systems play in old-age income support. Pensioners often only pay health contributions and receive preferential treatment under the income tax. Tax expenditures and the progressivity of income taxes coupled with gross replacement rates of less than 100% also mean that pensioners have a lower income tax rate than workers. As a result, net replacement rates are generally higher than gross replacement rates.

For average earners, the net replacement rate across the OECD averages 59% for mandatory schemes, from a low of 28% in the United Kingdom to a high of 94% in Turkey and 90% in Austria, Luxembourg and Portugal. Moreover, the pattern of replacement rates across countries is different on a net rather than a gross basis.

On average, for average earners, the net replacement rate is ten percentage points higher than the gross replacement rate. The difference is over 30 percentage points in Hungary and Turkey and around 15-20 percentage points in Belgium, France, Portugal, the Slovak Republic and Slovenia. In Hungary, the Slovak Republic and Turkey, pension income is neither liable for taxes or social security contributions, whilst in Belgium and Portugal they are much lower because of either higher tax allowances or much lower contribution levels.

For low earners, the effect of taxes and contributions on net replacement rates is slightly more muted than for workers higher up the earnings scale. This is because low-income workers typically pay less in taxes and contributions relative to average earners. In many cases, their retirement incomes are below the level of the standard reliefs in the personal income tax (allowances, credits, etc.). Thus, they

are often unable to benefit fully from any additional concessions granted to pensions or pensioners under their personal income tax.

The difference between gross and net replacement rates for low earners is eight percentage points on average. The Czech Republic, Germany, Hungary, Slovenia and Turkey have much higher replacement rates for low earners on a net basis than in gross terms. The net replacement rate for workers earning 150% of the average is highest in Turkey. The lowest replacement rates for high earners are found in Ireland, Mexico, New Zealand, Switzerland and the United Kingdom where workers earning 150% of the average will receive pensions that amount to less than one-third of their net earnings when working. In addition to the higher contribution levels in the occupational system for higher earners in Sweden, the net replacement rates are furthermore affected by the fact that pension income and work income are taxed differently and at different rates.

For non-OECD countries, there is very little variation in net replacement rates within countries across the earnings range. However, there is considerable difference between countries, ranging from 19% for average earners in South Africa to 95% in India.

Definition and measurement

The net replacement rate is defined as the individual net pension entitlement divided by net pre-retirement earnings, taking account of personal income taxes and social security contributions paid by workers and pensioners. Otherwise, the definition and measurement of the net replacement rates are the same as for the gross replacement rate. Details of the rules that national tax systems apply to pensioners can be found in the online Country Profiles available at <http://oe.cd/pag>.

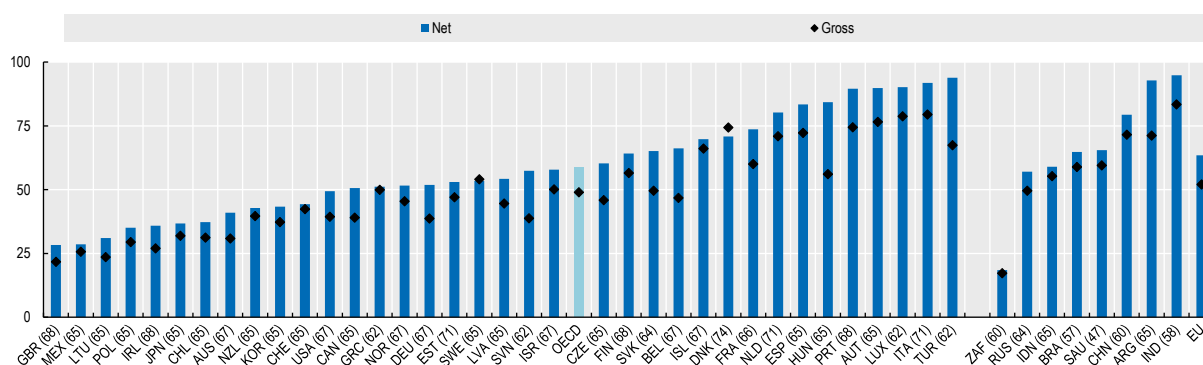
Table 5.5. Net pension replacement rates by earnings

Individual earnings, multiple of mean for men (women where different)																
Pension age		0.5		1		1.5		Pension age		0.5		1.0		1.5		
Australia	67	75.5	(72.2)	41.0	(37.3)	43.8	(39.8)	New Zealand	65	79.8		42.8		30.3		
Austria	65	89.7		89.9		89.6		Norway	67	57.0		51.6		43.0		
Belgium	67	70.7		66.2		48.3		Poland	65	(60) 35.9	(36.3)	35.1	(27.3)	34.7	(26.8)	
Canada	65	58.3		50.7		39.7		Portugal	68	88.0		89.6		89.0		
Chile	65	44.6	(42.6)	37.3	(34.4)	37.9	(34.9)	Slovak Republic	64	71.7		65.1		63.3		
Czech Republic	65	91.6		60.3		47.9		Slovenia	62	62.8	(65.8)	57.5	(60.0)	53.7	(53.5)	
Denmark	74	104.5		70.9		63.3		Spain	65	78.6		83.4		82.8		
Estonia	71	65.6		53.1		49.0		Sweden	65	60.7		53.4		68.9		
Finland	68	65.1		64.2		64.9		Switzerland	65	(64) 54.3	(52.8)	44.3	(43.0)	31.7	(30.8)	
France	66	71.4		73.6		69.0		Turkey	62	(60) 86.2	(82.3)	93.8	(89.6)	98.7	(94.2)	
Germany	67	56.1		51.9		51.4		United Kingdom	68	51.0		28.4		20.2		
Greece	62	57.6		51.1		50.3		United States	67	61.2		49.4		42.7		
Hungary	65	(62) 84.3	(78.4)	84.3	(78.4)	84.3	(78.4)	OECD	66.1	(65.7)	68.3	(67.6)	58.6	(57.6)	54.7	(53.7)
Iceland	67	80.5		69.8		69.8										
Ireland	68	60.5		35.9		26.7										
Israel	67	(62) 81.1	(69.2)	57.8	(49.0)	42.4	(35.9)	Argentina	65	(60) 102.8	(95.5)	92.8	(85.2)	88.8	(81.4)	
Italy	71	92.0		91.8		94.4		Brazil	57	(52) 100.1		64.8	(50.6)	64.8	(50.5)	
Japan	65	45.9		36.8		33.3		China	60	(55) 98.5	(84.0)	79.4	(67.7)	73.6	(63.2)	
Korea	65	60.8		43.4		32.6		India	58	94.8	(91.3)	94.8	(91.3)	94.8	(91.3)	
Latvia	65	55.2		54.3		52.2		Indonesia	65	58.2	(55.8)	59.0	(56.7)	58.6	(56.3)	
Lithuania	65	48.4		31.0		25.3		Russian Federation	64	(59) 71.7	(66.6)	57.0	(52.0)	51.6	(46.6)	
Luxembourg	62	99.0		90.1		85.9		Saudi Arabia	47	65.4		65.4		65.4		
Mexico	65	35.6		28.6	(26.7)	28.6	(26.7)	South Africa	60	34.5		18.5		12.9		
Netherlands	71	78.0		80.2		78.5		EU28	66.3	(65.9)	69.8	(69.7)	63.5	(63.0)	60.4	(59.9)

Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041554>

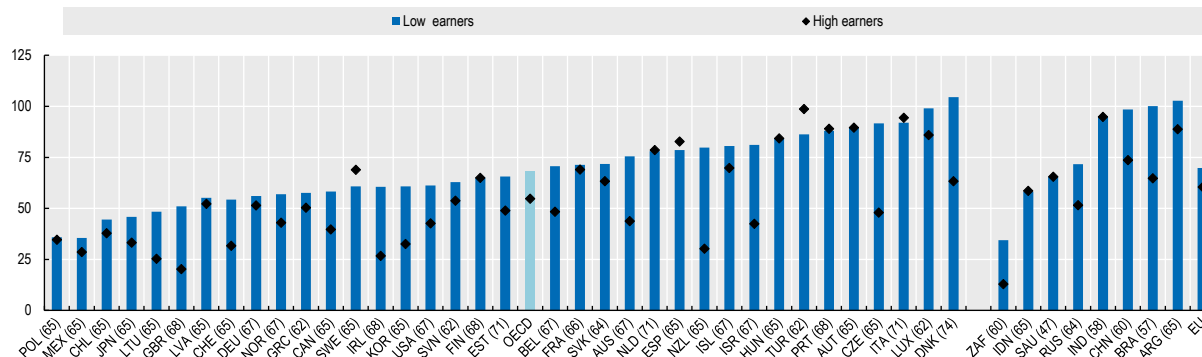
Figure 5.4. Net pension replacement rates: Average earners



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041573>

Figure 5.5. Net pension replacement rates: Low and high earners



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041592>

Key results

The OECD average for net replacement rates of an average earner from mandatory (public and private) schemes is 59%. When voluntary private pensions are taken into account for a full career of contributions, among the eight OECD countries where voluntary private pensions are widespread, and Israel and Mexico, the average net replacement rate for these ten countries is 70% compared with 36% in gross terms when only mandatory schemes are taken into account.

The personal tax system plays an important role in old-age support. Pensioners often do not pay mandatory contributions and, as personal income taxes are progressive and pension entitlements are usually lower than earnings before retirement, the average tax rate on pension income is typically less than the tax rate on earned income. In addition, most income tax systems give preferential treatment either to pension incomes or to pensioners, by giving additional allowances or credits to older people. Therefore, net replacement rates are usually higher than gross replacement rates.

For the 17 OECD countries where the calculations cover only public pensions, the net replacement rate for a full-career average earner is 68% on average. For the nine OECD countries with public and mandatory private provision, but no voluntary schemes the average net replacement rate is 56%. In the ten countries where voluntary pensions are modelled the average net replacement rate reaches 70% for a worker choosing to contribute for the whole career.

For the other major economies, although there is a wide variation between country and across earnings level, there is a smaller difference between gross and net replacement rates as pensions are not normally liable for any taxation.

Mandatory private pensions

Twelve countries have mandatory private pensions, including a subset of three countries – Denmark, the Netherlands and Sweden – having private pensions that ensure near-universal coverage and so are described as “quasi-mandatory”.

In Iceland, the Netherlands and Switzerland, private pensions are defined benefit while in the other countries they are defined contribution.

Voluntary private pensions

Replacement rates are shown for ten countries where voluntary private pensions are widespread (see the

indicator of “Coverage of private pensions” in Chapter 9). For the other economies South Africa also has a significant voluntary scheme. It is assumed that workers with voluntary private pensions spend a full career in the scheme.

The rules that have been modelled are in the “Country Profiles” available at <http://oe.cd/pag>. In nine of the ten countries, a defined contribution plan is modelled, with a defined benefit schemes applying in Japan.

In general, both the defined contribution and defined benefit schemes pay a constant gross replacement rate with earnings. (Data on actual contribution rates by earnings are not available for most countries, and so an average or typical rate is assumed across the earnings range). However, progressive tax rules mean that the net replacement rate differs across the earnings range. Whilst the increase in gross replacement rate is generally constant across earnings the net replacement rate tends to increase more with earnings as the previous work earnings are taxed at much higher rates as individuals move up the earnings distribution.

Definition and measurement

The net replacement rate is defined as the individual net pension entitlement divided by net pre-retirement earnings, taking account of personal income taxes and social security contributions paid by workers and pensioners. Otherwise, the definition and measurement of the net replacement rates are the same as for the gross replacement rate. Details of the rules that national tax systems apply to pensioners can be found in the online Country Profiles available at <http://oe.cd/pag>.

Table 5.6. **Gross and net pension replacement rates from mandatory (public and private) and voluntary pension schemes**
Percentage of individual earnings

	Gross mandatory public and private			Net mandatory public and private			Total gross with voluntary			Total net with voluntary		
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Australia	64.9	30.9	30.9	75.5	41.0	43.8						
Austria	76.5	76.5	76.5	89.7	89.9	89.6						
Belgium	57.3	46.8	33.7	70.7	66.2	48.3	78.1	61.0	44.1	87.9	72.4	57.8
Canada	50.9	39.0	29.8	58.3	50.7	39.7	71.9	64.1	54.9	82.4	83.3	73.4
Chile	36.2	31.2	31.2	44.6	37.3	37.9						
Czech Republic	75.0	45.9	36.2	91.6	60.3	47.9						
Denmark	113.8	74.4	64.0	104.5	70.9	63.3						
Estonia	61.4	47.1	42.3	65.6	53.1	49.0						
Finland	56.5	56.5	56.5	65.1	64.2	64.9						
France	60.2	60.1	54.0	71.4	73.6	69.0						
Germany	38.7	38.7	38.7	56.1	51.9	51.4	52.2	52.2	52.2	68.6	68.0	67.5
Greece	63.1	49.9	45.5	57.6	51.1	50.3						
Hungary	56.1	56.1	56.1	84.3	84.3	84.3						
Iceland	75.3	66.1	65.1	80.5	69.8	69.8						
Ireland	54.1	27.0	18.0	60.5	35.9	26.7	89.9	62.9	53.8	105.6	81.1	75.5
Israel	77.4	50.1	33.4	81.1	57.8	42.4	97.2	65.5	43.7	98.9	73.2	53.7
Italy	79.5	79.5	79.5	92.0	91.8	94.4						
Japan	42.5	32.0	28.5	45.9	36.8	33.3	66.2	55.8	52.3	74.0	61.5	59.5
Korea	55.6	37.3	27.0	60.8	43.4	32.6						
Latvia	44.6	44.6	44.6	55.2	54.3	52.2						
Lithuania	36.8	23.6	19.2	48.4	31.0	25.3						
Luxembourg	91.5	78.8	74.5	99.0	90.1	85.9						
Mexico	35.1	25.7	24.6	35.6	28.6	28.6	48.2	43.9	42.5	48.8	48.9	49.4
Netherlands	73.5	70.9	70.1	78.0	80.2	78.5						
New Zealand	79.3	39.7	26.4	79.8	42.8	30.3	97.1	57.4	44.2	98.8	62.2	50.4
Norway	50.4	45.4	36.3	57.0	51.6	43.0						
Poland	29.4	29.4	29.4	35.9	35.1	34.7						
Portugal	75.8	74.4	73.1	88.0	89.6	89.0						
Slovak Republic	59.5	49.6	47.0	71.7	65.1	63.3						
Slovenia	47.8	38.8	36.0	62.8	57.5	53.7						
Spain	72.3	72.3	72.3	78.6	83.4	82.8						
Sweden	54.1	54.1	65.3	60.7	53.4	68.9						
Switzerland	53.0	42.4	29.2	54.3	44.3	31.7						
Turkey	67.4	67.4	67.4	86.2	93.8	98.7						
United Kingdom	43.5	21.7	14.5	51.0	28.4	20.2	72.6	50.9	37.4	82.3	61.0	47.4
United States	50.1	39.4	33.1	61.2	49.4	42.7	79.1	69.1	62.6	94.1	83.7	79.0
OECD	60.0	49.0	44.7	68.3	58.6	54.7	66.1	55.2	50.5	75.0	65.4	61.6
Argentina	83.7	71.2	67.1	102.8	92.8	88.8						
Brazil	92.1	58.9	58.9	100.1	64.8	64.8						
China	90.6	71.6	65.2	98.5	79.4	73.6						
India	83.4	83.4	83.4	94.8	94.8	94.8						
Indonesia	55.3	55.3	55.3	58.2	59.0	58.6						
Russian Federation	62.3	49.6	44.9	71.7	57.0	51.6						
Saudi Arabia	59.6	59.6	59.6	65.4	65.4	65.4						
South Africa	34.5	17.2	11.5	34.5	18.5	12.9	49.1	49.1	49.1	54.6	59.2	61.9
EU28	60.3	52.0	48.8	69.8	63.5	60.4	63.6	55.4	51.8	73.6	67.0	64.0

Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041611>

Key Results

Pension wealth relative to individual earnings before retirement measures the total discounted value of the lifetime flow of all retirement incomes in mandatory pension schemes at retirement age. For average earners, pension wealth for men is 8.9 times and for women 9.8 times annual individual earnings on average in OECD countries. Gross pension wealth relative to annual individual earnings is higher for women because of their longer life expectancy. The main determinants of differences across countries are differences in the gross replacement rate, in the length of the retirement period measured by remaining life expectancy at the normal retirement age, and in indexation rules.

Replacement rates give an indication of the pension promise relative to individual earnings, but they are not comprehensive measures of cumulated pension payments; they look only at the benefit level relative to individual earnings at the point of retirement, or more generally at a given, later age. For a full picture, life expectancy, normal retirement age and indexation of pension benefits must also be taken into account. Together, these determine for how long the pension benefit is paid, and how its value evolves over time. Pension wealth – a measure of the stock of future discounted flows of pension benefits – takes account of these factors. It can be thought of as the lump-sum needed at the retirement age to buy an annuity giving the same flow of pension payments as that promised by mandatory retirement-income schemes.

In defined benefit systems there is often no or a weak link between the replacement rate and the expected duration of benefit withdrawal. However, in the long run, ensuring financial sustainability imposes a trade-off between the replacement rate and the duration of retirement. When retirement ages and pension benefits are held constant, pension wealth increases with longevity gains. In defined contribution systems there is a more direct link between the size of the benefit and the expected duration of benefit withdrawals. In these systems the pension wealth measure is equal to the accumulated assets and therefore independent of longevity increases as these automatically reduce the benefits.

Gross pension wealth at individual earnings equal to the average wage is highest in Luxembourg at 18.7 times annual individual earnings for men and 20.6 times for women. The lowest pension wealth for men is found in the United Kingdom and for women in Mexico at 4.1 and 4.3, respectively, due to low replacement rates.

This indicator is built based on the average (gender specific) mortality rates within countries. It thus assumes away differences in life expectancy across income levels. Hence, higher individual replacement rates for low earners than for average earners mean that the computed pension wealth relative to individual earnings is also higher for low earners. For men with individual earnings equal to half average-earnings, pension wealth is 10.9 times their annual earnings on average, compared with 8.9 times for average-wage workers, and 12.1 and 9.8 times, respectively, for women. In the countries where pension wealth for low

earners is highest (Luxembourg and New Zealand), its value is between 17 and 22 times individual earnings for men and slightly above at 19 to 24 times individual earnings for women.

Impact of life expectancy

In countries where the duration in retirement is shorter, such as Estonia and Hungary, the individual pension wealth is smaller. The effect is the opposite in Switzerland and some of the Nordic countries, where life expectancy is high. Similarly, since women's life expectancy is longer than men's, pension wealth for women is higher in all countries that use unisex mortality tables to compute annuities or that have defined benefit systems. In addition, some countries still have lower retirement ages for women; this extends the payment period even further.

Impact of indexation

Pension wealth is affected by indexation rules at a given initial replacement rate level. Although most OECD countries now index pensions in payment to prices, there are exceptions: Germany, Ireland, Luxembourg and the United Kingdom, for example, link their, basic, defined benefit or point systems to average earnings. Since earnings tend to grow faster than prices pension wealth is higher with wage than price indexation, for a given level of replacement rate. If Luxembourg, for example, indexed to prices rather than wages, the pension wealth for an average male earner would decrease from 18.7 to 15.7 with unchanged initial benefit based on the OECD pension model.

For the non-OECD countries there is great variation with South Africa at only 4.7 and 5.7 times individual earnings for average earners for men and women compared with China at 15.2 and 15.8 times individual earnings for men and women respectively.

Definition and measurement

The calculation of pension wealth uses a uniform real discount rate of 2%. Since the comparisons refer to prospective pension entitlements, the calculations use country-specific mortality rates by age and sex at the year of retirement. Pension wealth is expressed as a multiple of gross annual individual earnings.

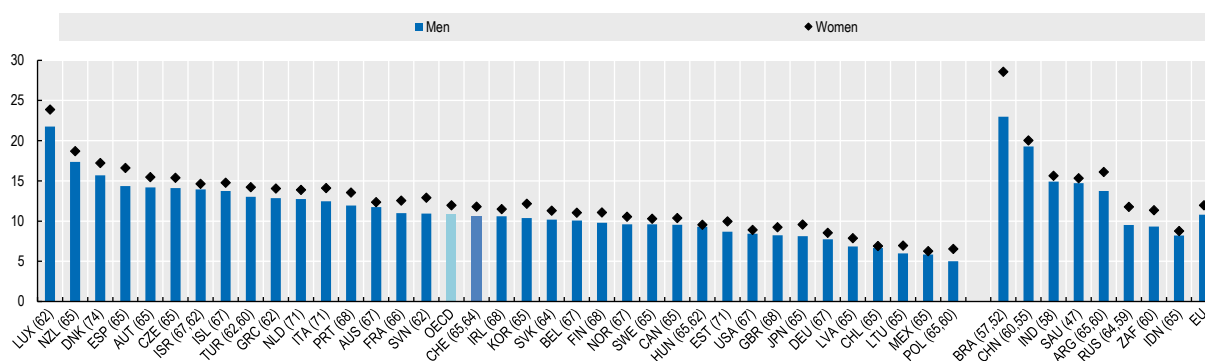
Table 5.7. Gross pension wealth by earnings, multiple of annual earnings

	Individual earnings, multiple of mean							Individual earnings, multiple of mean					
	0.5	1.0	1.5	0.5	1.0	1.5		0.5	1.0	1.5	0.5	1.0	1.5
	Men			Women				Men			Women		
Australia	11.7	5.6	5.6	12.4	5.6	5.6	New Zealand	17.4	8.7	5.8	18.7	9.4	6.2
Austria	14.2	14.2	14.2	15.5	15.5	15.5	Norway	9.6	8.6	6.9	10.5	9.5	7.5
Belgium	10.1	8.2	5.9	11.0	9.0	6.5	Poland	5.0	5.0	5.0	6.5	4.9	4.9
Canada	9.6	7.3	5.6	10.4	8.0	6.1	Portugal	11.9	11.7	11.5	13.6	13.3	13.1
Chile	6.7	5.7	5.8	6.9	5.7	5.8	Slovak Republic	10.2	8.5	8.0	11.3	9.4	8.9
Czech Republic	14.1	8.6	6.8	15.4	9.4	7.4	Slovenia	10.9	8.9	8.2	12.9	10.5	9.8
Denmark	15.7	10.1	8.6	17.2	11.1	9.4	Spain	14.4	14.4	14.4	15.6	15.6	15.6
Estonia	8.7	6.7	6.0	10.0	7.6	6.9	Sweden	9.6	9.6	11.7	10.3	10.3	12.6
Finland	9.8	9.8	9.8	11.1	11.1	11.1	Switzerland	10.7	8.5	5.9	11.8	9.3	6.4
France	11.0	11.0	9.9	12.5	12.5	11.3	Turkey	13.0	13.0	13.0	14.2	14.2	14.2
Germany	7.7	7.7	7.7	8.5	8.5	8.5	United Kingdom	8.2	4.1	2.7	9.2	4.6	3.1
Greece	12.8	10.2	9.3	14.0	11.1	10.1	United States	8.4	6.7	5.5	8.9	7.1	5.8
Hungary	9.3	9.3	9.3	9.5	9.5	9.5	OECD	10.9	8.9	8.1	12.1	9.8	8.9
Iceland	13.7	11.9	11.6	14.8	12.7	12.5							
Ireland	10.6	5.3	3.5	11.5	5.7	3.8							
Israel	13.9	9.0	6.0	14.6	9.2	6.1	Argentina	13.8	11.7	11.0	16.1	13.5	12.6
Italy	12.5	12.5	12.5	14.1	14.1	14.1	Brazil	23.0	14.7	14.7	28.6	14.3	14.3
Japan	8.1	6.1	5.4	9.6	7.2	6.4	China	19.3	15.2	13.9	20.0	15.8	14.3
Korea	10.4	7.0	5.0	12.1	8.1	5.9	India	14.9	14.9	14.9	15.6	15.6	15.6
Latvia	6.8	6.8	6.8	7.9	7.9	7.9	Indonesia	8.2	8.2	8.2	8.8	8.8	8.8
Lithuania	6.0	3.8	3.1	7.0	4.5	3.6	Russian Federation	9.5	7.6	6.8	11.8	9.2	8.2
Luxembourg	21.7	18.7	17.7	23.9	20.6	19.4	Saudi Arabia	14.7	14.7	14.7	15.3	15.3	15.3
Mexico	5.8	4.3	4.1	6.3	4.3	4.1	South Africa	9.3	4.7	3.1	11.4	5.7	3.8
Netherlands	12.7	12.3	12.2	13.9	13.4	13.2	EU28	10.8	9.2	8.6	12.0	10.2	9.5

Source: OECD pension models.

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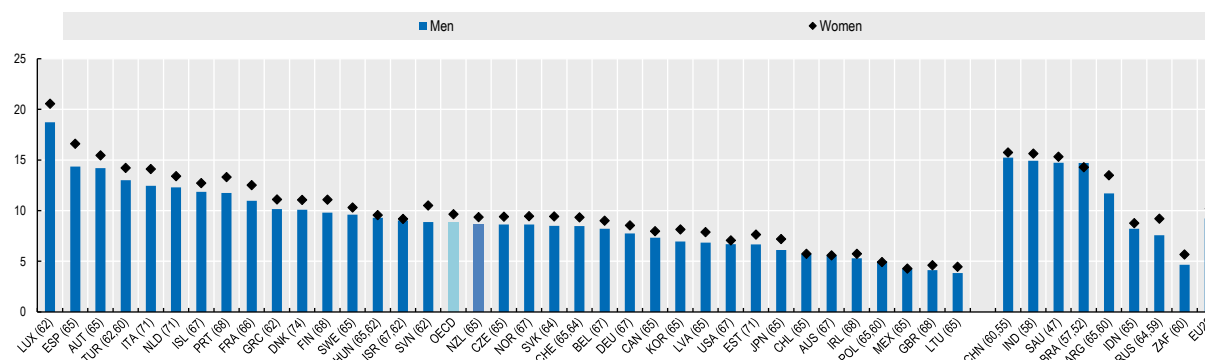
Figure 5.6. Gross pension wealth for lower earners by gender, multiple of annual earnings



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041649>

Figure 5.7. Gross pension wealth for average earners by gender, multiple of annual earnings



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041668>

Key Results

As with gross pension wealth, net pension wealth relative to individual net earnings measures the total discounted value of the lifetime flow of all retirement incomes in mandatory pension schemes at retirement age. For average earners, net pension wealth for men is 10.6 times and for women 11.7 times annual individual net earnings on average in OECD countries. Net pension wealth relative to annual individual earnings is higher for women because of their longer life expectancy. The main determinants of differences across countries are differences in the net replacement rate, in the length of the retirement period measured by remaining life expectancy at the normal retirement age, and in indexation rules.

Replacement rates give an indication of the pension promise relative to individual earnings, but they are not comprehensive measures of cumulated pension payments; they look only at the benefit level relative to individual earnings at the point of retirement, or more generally at a given, later age. For a full picture, life expectancy, normal retirement age and indexation of pension benefits must also be taken into account. Together, these determine for how long the pension benefit is paid, and how its value evolves over time. Net pension wealth – a measure of the stock of future discounted flows of pension benefits after taxes and social contributions – takes account of these factors. It can be thought of as the total net benefits that will be received on average from the mandatory retirement-income schemes.

In defined benefit systems there is often no or a weak link between the replacement rate and the expected duration of benefit withdrawal. Of course, in the long run, ensuring financial sustainability imposes a trade-off between the replacement rate and the duration of retirement. When retirement ages and pension benefits are held constant, pension wealth increases with longevity gains. In defined contribution systems there is a more direct link between the size of the benefit and the expected duration of benefit withdrawals. In these systems the pension wealth measure is equal to the accumulated assets and therefore independent of longevity increases as these automatically reduce the benefits.

Net pension wealth at individual earnings equal to average worker earnings is highest in Luxembourg at 21.4 times annual individual net earnings for men and 23.5 times for women. The lowest pension wealth is found in Mexico at 4.8 times for both men and women, due to low replacement rates.

Higher individual replacement rates and the increased tax allowance for many pensioners mean that net pension wealth relative to individual net earnings tends to be higher for low earners than for average earners as well, at least as the estimations here abstract from differences in life expectancy across income levels. For men with individual earnings equal to half-average earnings, net pension wealth is 12.4 times their net earnings on average, compared with 10.6 times for average wage workers. Similarly, for women with low earnings, net pension wealth of 13.8 compares with 11.7 times individual earnings for average earners.

For higher earners net pension wealth is on average 9.9 for men and 10.9 for women, only slightly lower than that for average earners, with Luxembourg again highest and the United Kingdom lowest.

Impact of life expectancy

In countries where the duration in retirement is shorter and where pension benefits are defined benefit, such as Estonia and Hungary, the individual pension wealth is smaller. The effect is the opposite in Switzerland and some of the Nordic countries (in DB systems), where life expectancies are high. Similarly, since women's life expectancy is longer than men's, pension wealth for women is higher in all countries that use unisex mortality tables or that have defined benefit systems. This is simply because in that case the same level of pension benefits can be expected to be paid over a longer retirement period. In addition, some countries still have lower retirement ages for women; this extends the payment period even further. Pension wealth is also affected by pension ages. A low retirement age in a defined benefit system such as in Luxembourg increases the pension wealth at a given level of benefit.

For the non-OECD countries there is great variation with South Africa at only 5.0 times individual earnings for average earners for men and 6.1 for women compared to 17.0 and 17.8 times individual earnings for men and women in India.

Definition and measurement

Net pension wealth is the present value of the flow of pension benefits, taking account of the taxes and social security contributions that retirees have to pay on their pensions. It is measured and expressed as a multiple of net annual individual earnings in the respective country.

Taxes and contributions paid by pensioners are calculated conditional on the mandatory pension benefit to which individuals are entitled to at different levels of earnings. The calculations take account of all standard tax allowances and tax reliefs as well as concessions granted either to pension income or to people of pension age.

Details of the rules that national tax systems apply to pensioners can be found in the online "Country Profiles" available at <http://oe.cd/pag>.

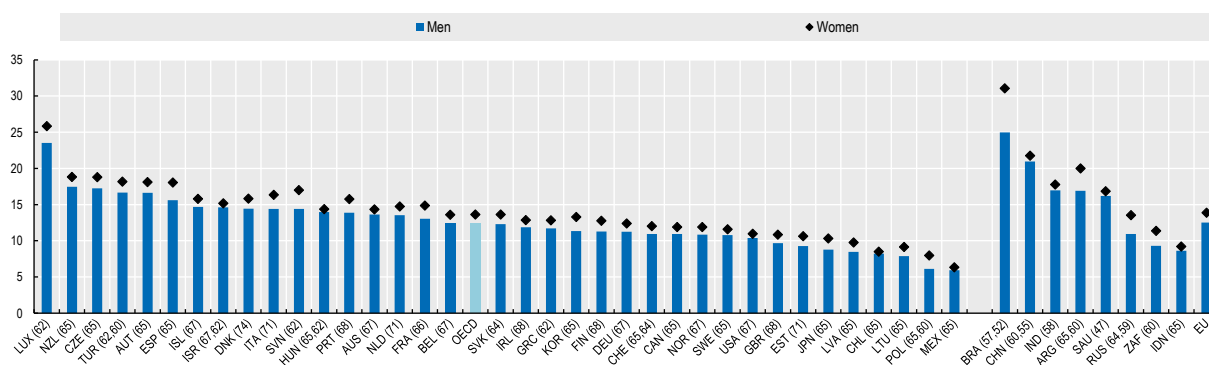
Table 5.8. Net pension wealth by earnings

	Individual earnings, multiple of mean							Individual earnings, multiple of mean					
	0.5	1.0	1.5	0.5	1.0	1.5		0.5	1.0	1.5	0.5	1.0	1.5
	Men			Women				Men			Women		
Australia	13.6	7.4	7.9	14.4	7.4	7.9	New Zealand	17.5	9.4	6.6	18.8	10.1	7.1
Austria	16.6	16.7	16.6	18.1	18.2	18.1	Norway	10.9	9.8	8.1	11.9	10.7	8.9
Belgium	12.4	11.6	8.5	13.6	12.8	9.3	Poland	6.1	6.0	5.9	8.0	6.0	5.9
Canada	10.9	9.5	7.4	11.9	10.3	8.1	Portugal	13.9	14.1	14.0	15.7	16.0	15.9
Chile	8.2	6.9	7.0	8.5	6.9	7.0	Slovak Republic	12.3	11.2	10.8	13.6	12.4	12.0
Czech Republic	17.2	11.4	9.0	18.8	12.4	9.8	Slovenia	14.4	13.2	12.3	17.0	15.5	13.8
Denmark	14.4	9.6	8.5	15.8	10.5	9.3	Spain	15.6	16.6	16.5	18.1	19.2	19.1
Estonia	9.3	7.5	6.9	10.6	8.6	7.9	Sweden	10.8	9.5	12.4	11.6	10.2	13.3
Finland	11.3	11.1	11.3	12.8	12.6	12.7	Switzerland	11.0	8.9	6.3	12.0	9.7	7.0
France	13.0	13.5	12.6	14.9	15.3	14.4	Turkey	16.6	18.1	19.0	18.2	19.8	20.8
Germany	11.2	10.4	10.3	12.4	11.5	11.4	United Kingdom	9.7	5.4	3.8	10.8	6.0	4.3
Greece	11.7	10.4	10.2	12.8	11.4	11.2	United States	10.4	8.4	7.2	11.0	8.9	7.6
Hungary	14.0	14.0	14.0	14.4	14.4	14.4	OECD	12.4	10.6	9.9	13.8	11.7	10.9
Iceland	14.7	12.5	12.5	15.8	13.4	13.4							
Ireland	11.9	7.0	5.2	12.9	7.6	5.7							
Israel	14.6	10.4	7.6	15.2	10.8	7.9	Argentina	16.9	15.2	14.6	20.0	17.9	17.1
Italy	14.4	14.4	14.8	16.3	16.3	16.8	Brazil	25.0	16.2	16.2	31.0	15.7	15.7
Japan	8.8	7.0	6.4	10.3	8.3	7.5	China	21.0	16.9	15.7	21.8	17.5	16.4
Korea	11.3	8.1	6.1	13.3	9.5	7.1	India	17.0	17.0	17.0	17.8	17.8	17.8
Latvia	8.5	8.3	8.0	9.8	9.6	9.2	Indonesia	8.6	8.8	8.7	9.2	9.4	9.3
Lithuania	7.9	5.1	4.1	9.2	5.9	4.8	Russian Federation	10.9	8.7	7.9	13.5	10.6	9.5
Luxembourg	23.5	21.4	20.4	25.8	23.5	22.4	Saudi Arabia	16.2	16.2	16.2	16.8	16.8	16.8
Mexico	5.9	4.8	4.8	6.3	4.8	4.8	South Africa	9.3	5.0	3.5	11.4	6.1	4.2
Netherlands	13.5	13.9	13.6	14.7	15.2	14.8	EU28	12.5	11.3	10.7	13.9	12.5	11.8

Source: OECD pension models.

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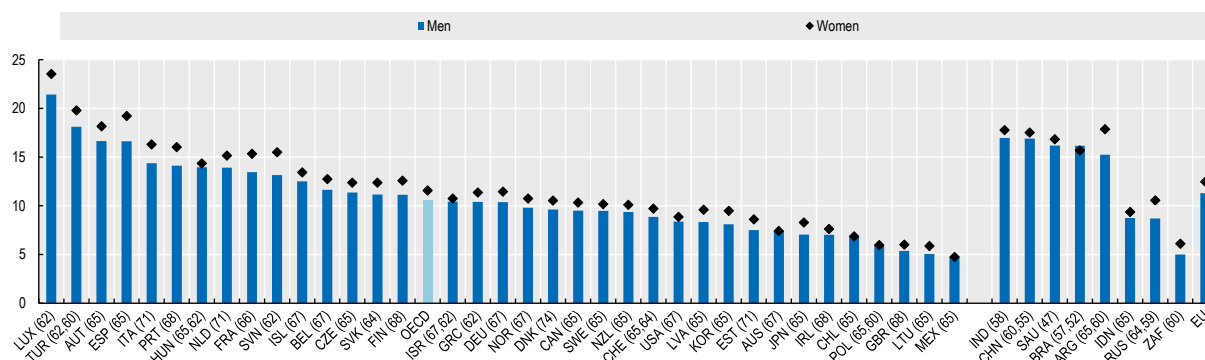
Figure 5.8. Net pension wealth for lower earners by gender, multiple of annual earnings



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041706>

Figure 5.9. Net pension wealth for average earners by gender, multiple of annual earnings



Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041725>

Key results

Most of the indicators of pension entitlements in this report are based on analysis of a single person. In many countries, pension systems are effectively “individualised”: the position of a couple is the same as that of two single people with the same level of total earnings. In others, however, being in a couple has an effect on pension entitlements.

There are two ways in which partnership status affects pension entitlements. First, some systems offer “derived” rights: these are benefits for the couple that derive from the working experience and contributions of one spouse. Secondly, some first-tier benefits are calculated based on family status, assessed using the couple as a “pension unit” rather than treating each individual separately. For this analysis the word “couple” refers to the benefit unit that is recognised in each country, be that through marriage, civil partnership or cohabitation, etc.

The table shows calculations of pension entitlements for three different family types. In the first two, total gross earnings are held constant at 100% of the economy-wide individual average. A single man with these earnings is compared with a single-earner couple (male earner). The final case shows a couple consisting of two earners, each with 100% of average earnings, compared with two singles, each with average earnings.

On average single male workers at average earnings will have after a full career a gross pension entitlement of 49.0% of previous earnings compared to 55.8% for a couple in which this worker had a non-working partner. Given an equivalence scale of square root of 2 for a couple (Chapter 7), this 55.8% of average earnings for a couple provides an equivalent of 39.5% for a single person, so one-fifth lower than 49.0%. Overall just under half of OECD countries provide a higher gross entitlement for one-earner couples at the average wage compared to a single earner. Those that do not are Austria, Chile, Estonia, France, Germany, Greece, Hungary, Italy, Korea, Latvia, Lithuania, Luxembourg, Mexico, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Switzerland and Turkey.

The largest difference is found in Australia where single-earner couples at average earnings have a pension entitlement that is 31.8 percentage-points higher than for a single earner as both individuals have entitlement to the first-tier pension (Age Pension). Likewise, there is some entitlement to the targeted pension for the partner irrespective of the earnings-related pension of the worker in Denmark, whilst in New Zealand the pension is entirely tax-financed with a lower rate for each member of the couple than singles.

There is significant variation between countries in terms of the policy adopted for non-workers within a couple.

In some countries, benefits are higher for couples than for single people because of basic schemes that pay a higher rate to a couple than to a single person (although less than the entitlement of two single people) as in the Netherlands, for example. In Ireland and the United Kingdom, there are spousal benefits in the basic pension for partners in a couple who do not earn a full basic pension entitlement in their own right.

In Japan and the United States, there are spousal benefits in the public, earnings-related schemes. Again, these higher benefits are paid to couples where one partner has not earned a large entitlement in his or her own right. Resource-tested schemes explain why Denmark has higher benefits for one-earner couples than for single people with average earnings. Even at average earnings, both would be eligible for resource-tested benefits. Similarly, in Belgium, Finland and Sweden, a single person on average earnings would not be entitled to a minimum pension. However, a couple with one partner earning the economy-wide average would receive a top-up.

For the couple with both earning the average wage, results are only shown for those cases that would give a different pension entitlement to two single individuals. The only countries with couple specific rules are Denmark and New Zealand. In New Zealand the residence-based component is paid at a lower level for each individual in a couple than if they were single. In Denmark the rate of withdrawal of the means-tested component is higher for couples than for single individuals.

Definition and measurement

The old-age pension entitlement measures how effectively a pension system provides a retirement income to replace earnings, the main source of income before retirement. The gross entitlement is defined as gross pension divided by gross pre-retirement earnings.

For the couple analysis, both partners are assumed to be of the same age to ensure eligibility to all benefit entitlements and to enable easier comparison with the single-earner scenario. For the two-earner couple, both are assumed to retire at the earliest age at which no penalty will apply to their benefits, with the female pensioner then having their benefits indexed until reaching the male retirement age for those countries with lower female retirement age.

Table 5.9. **Gross pension entitlements by earnings: singles versus couples, % of average earnings**

	Single, average earner – male (female where different)	Single earner couple - male at average earnings	Couple, each with average earnings
Australia	30.9 (28.1)	62.7	
Austria	76.5		
Belgium	46.8	58.2	
Canada	39.0	46.8	
Chile	31.2 (28.8)		
Czech Republic	45.9	55.9	
Denmark	74.4	97.1	141.3
Estonia	47.1		
Finland	56.5	68.7	
France	60.1		
Germany	38.7		
Greece	49.9		
Hungary	56.1 (52.2)		
Iceland	66.1	79.0	
Ireland	27.0	45.1	
Israel	50.1 (41.8)	59.2	
Italy	79.5		
Japan	32.0	42.5	
Korea	37.3		
Latvia	44.6		
Lithuania	23.6		
Luxembourg	78.8		
Mexico	25.7 (24)		
Netherlands	70.9	91.5	
New Zealand	39.7	60.1	60.1
Norway	45.4	64.1	
Poland	29.4 (22.5)		
Portugal	74.4		
Slovak Republic	49.6		
Slovenia	38.8 (40.7)		
Spain	72.3		
Sweden	54.1	61.4	
Switzerland	42.4 (41.3)		
Turkey	67.4 (64.3)		
United Kingdom	21.7	32.9	
United States	39.4	59.2	
OECD	49.0 (48.2)	55.8	96.3

Note: Values are only shown for single-earner couples where the pension received differs from that of a single male earner. Values are only shown for couples with average earnings when they differ from the rates that would apply to a single man and single woman combined.

Source: OECD pension models.

StatLink  <https://doi.org/10.1787/888934041744>

Key results

The analysis above has concentrated on showing full-career replacement rates where there has been no period of absence from the labour market. This future gross replacement rate shows the level of pension benefits in retirement from mandatory pension schemes relative to earnings when working. However, many individuals will have an interrupted career because of having children and this indicator shows how this will affect future pension entitlements. Women with average earnings and taking five years out of the labour market to care for children will have a pension equal to 96% of that for a full-career female worker on average across the 36 OECD countries with substantial cross-country variation. At the top of the range, Greece offers benefits 5% higher than for the full-career worker, but getting a full pension requires retiring five years later, whilst at the bottom of the range Mexico has a future benefit at 86% of the full-career worker.

All OECD countries, with the exception of the United States offers credit for periods of maternity, but the analysis presented here covers the period beyond maternity leave, looking specifically at childcare periods. Most OECD countries aim to protect periods of absence from the labour market to care for children. Whilst fathers are becoming increasingly able to access periods of credit the mother is still the primary recipient in many countries and so this analysis has been computed for females only.

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.

The gross pension entitlements of mothers who take time out of employment is illustrated in Figures 5.10 and 5.11 at different earnings levels for breaks from work of five and ten years, respectively. In Greece the benefits are higher with a five-year career break for childcare though these individuals will retire five years later to get a full pension; they only have higher benefits because those in payment for the full-career worker are indexed to prices. In the Czech Republic, 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. Those breaks are therefore excluded from the averaging periods used to compute pension entitlements. In Spain, too, the five years that mothers may spend looking after their children count as insured periods. 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 Germany having a child gives one parent a credit of one pension point for three years, thereby making it equivalent for pension purposes to earning the average wage throughout the credit period resulting in a much higher benefit entitlement for low earners. Similarly in Estonia credits are given based on the nationwide average income again resulting in higher benefits for low earners.

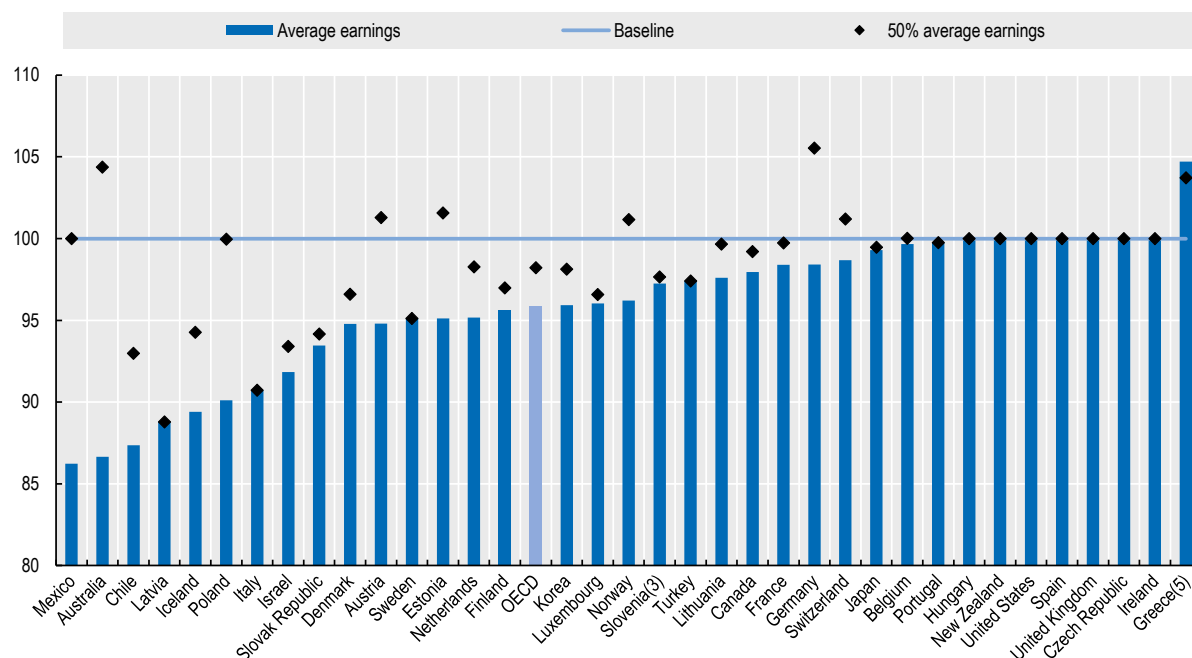
In Austria, Chile, Iceland, Israel, Italy, Latvia, Lithuania and Mexico, contribution gaps can make a substantial dent in retirement income, especially if the childcare period lengthens. In some of these countries crediting mechanisms for childcare do not exist (such as in Iceland, Israel and Mexico). In the other countries where they do exist they better cover short interruptions and/or low-earners.

In six countries, Greece and Slovenia for both 5- and 10-year breaks and France, Hungary, Luxembourg and Portugal for the 10-year break, 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 22 but takes ten years out of work will have contributed for less than 40 years at age 62, and will therefore have to work until 65 to be able to retire without penalty.

Definition and measurement

The OECD baseline full-career simulation model assumes labour market entry at the age of 22. For the childcare career case, women are assumed to embark on their careers as full-time employees at 22, and to stop working during a break of up to ten years from age 30 to care for their two children born when the mother was aged 30 and 32; they are then assumed to resume full-time work until normal retirement age, which may increase because of the career break. Any increase in retirement age is shown in brackets after the country name on the charts, with the corresponding benefits for the full career worker indexed until this age. The simulations are based on parameters and rules set out in the online "Country Profiles" available at <http://oe.cd/pag>.

Figure 5.10. **Gross pension entitlements of low and average earners with a 5-year childcare break versus worker with an uninterrupted career**

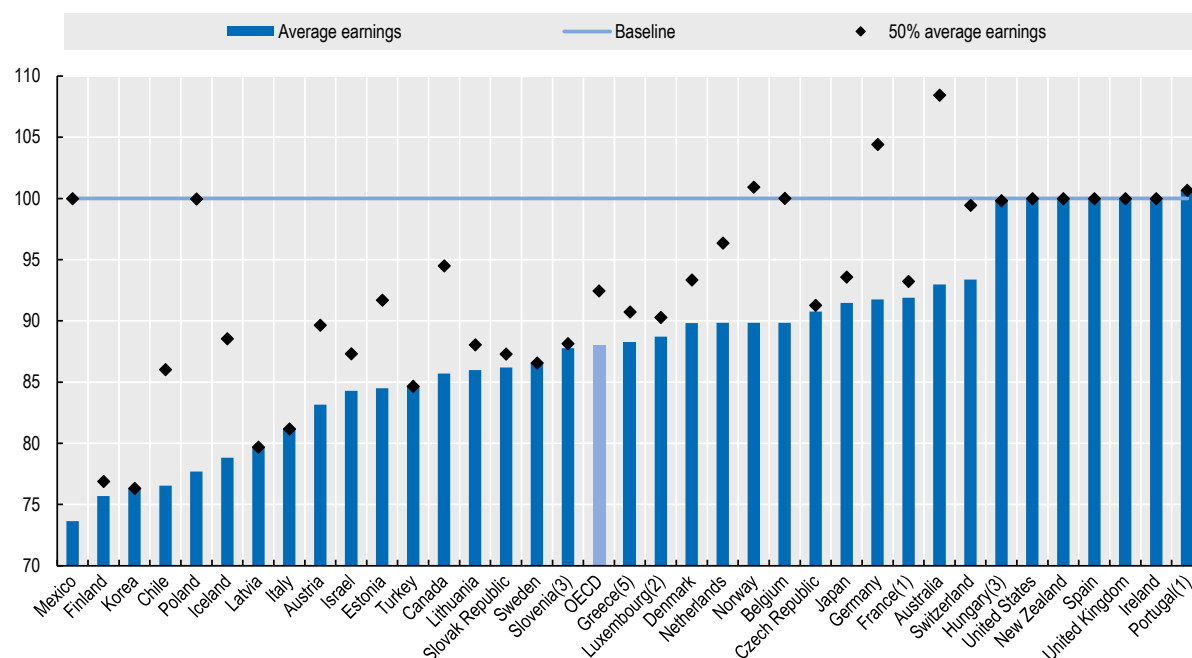


Note: Figure in brackets refers to increase in retirement age. Individuals enter the labour market at age 22 in 2018. Two children are born in 2026 and 2028 with the career break starting in 2026.

Source: OECD pension models.

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Figure 5.11. **Gross pension entitlements of low and average earners with a 10-year childcare break versus worker with an uninterrupted career**



Note: Figure in brackets refers to increase in retirement age. Individuals enter the labour market at age 22 in 2018. Two children are born in 2026 and 2028 with the career break starting in 2026.

Source: OECD pension models.

StatLink <https://doi.org/10.1787/888934041782>

Key results

The base case at the beginning of this chapter concentrates on showing full-career replacement rates where there has been no period of absence from the labour market. This future gross replacement rate shows the level of pension benefits in retirement from mandatory pension schemes relative to earnings when working. However, many individuals will have an interrupted career because of unemployment and delaying entry into the labour market. This indicator shows how this affects future pension entitlements. Workers with average earnings and taking five years out of the labour market due to unemployment will have a pension equal to 94% of that of a full-career worker on average across the 36 OECD countries with substantial cross-country variation. At the top of the range, Greece, Luxembourg and Portugal offer higher benefits due to higher retirement ages, whilst at the bottom of the range Australia, Chile, Estonia, Korea, Mexico, the Slovak Republic and Turkey have a future benefit at 87%-88% of the full-career worker.

Most OECD countries aim to protect at least the initial periods of absence from the labour market due to unemployment. On average five years of unemployment will result in a pension of 94% of that of a full-career worker for the average-wage case. With 10 years of unemployment after a five year delay to beginning the career this falls to 76%, with both scenarios leading to a higher retirement age in a few countries. For low earners, the impact of these two career breaks on their pension benefits is lower, with a relative pension of 96% and 82%, respectively, compared with the full-career case.

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 of career absence and for high-earners. In Chile, Korea, Latvia and Mexico, the pension loss after a five-year unemployment break is around 13% as there is no instrument to cushion the impact of the employment shock on pension. On the other hand, in some countries, pension rules can offset the fallout from spells of unemployment. This applies for example in Ireland, Spain, the United Kingdom and the United States. In Spain and the United States, this is because total accrual rates and the reference wage used to compute benefits are not affected – for example, pension entitlements stop accruing in Spain and the United States after 38.5 and 35 years, respectively. In Ireland and the United Kingdom, this is because such a break does not affect the basic pension level. In New Zealand as well periods of unemployment do not affect the basic pension as it is entirely residence based. The Netherlands' residence-based basic pension affords some protection against unemployment, while the occupational pension is sharply reduced by unemployment breaks.

In Greece, Luxembourg and Portugal the benefit upon retirement will be higher but the individual needs to work five, three or one year longer, respectively, to get a full pension (i.e. without penalty). For both Greece and Portugal this is also because the indexation of benefits in payment to the full-career worker is below wage growth. In Luxembourg contributions at later ages result in a slightly higher accrual

with a long career. Average-wage workers have to retire later to benefit from a full pension after experiencing the five-year unemployment break in France and Slovenia as well due the required contribution rules.

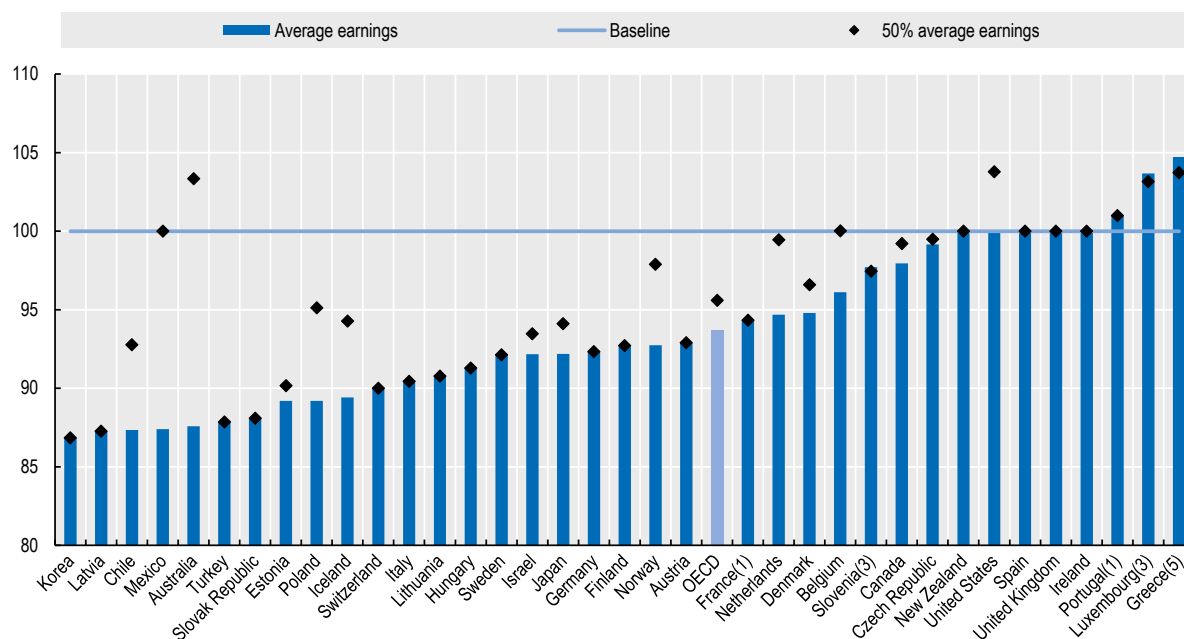
There are countries which afford the low-paid better protection against long-term unemployment than average earners, because minimum pensions and resource-tested schemes play a crucial role in some of them – Australia, Belgium, Canada, Chile, Iceland, Mexico, Norway and Poland. Where there is no pension 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. The longer period of unemployment under study here also implies retiring later in Spain. In Korea long absences have a more marked impact as contributions are not possible from age 60, giving a 23-year career in comparison to a 38-year career for the base case.

In Mexico and Poland low earners even with long-career breaks meet the criteria to receive the minimum pension, as is the case for full-career low earners, and thus their pension entitlement is not affected by the career break.

Definition and measurement

For the unemployment career case, men are assumed to embark on their careers as full-time employees at 22 or 27 for the late entry case, and to stop working during a break of up to ten years from age 35 due to unemployment; they are then assumed to resume full-time work until normal retirement age, which may increase because of the career break. Any increase in retirement age is shown in brackets after the country name on the charts, with the corresponding benefits for the full career worker indexed until this age. The simulations are based on parameters and rules set out in the online “Country Profiles” available at <http://oe.cd/pag>.

Figure 5.12. **Gross pension entitlements of low and average earners with a 5-year unemployment break versus worker with a full career**

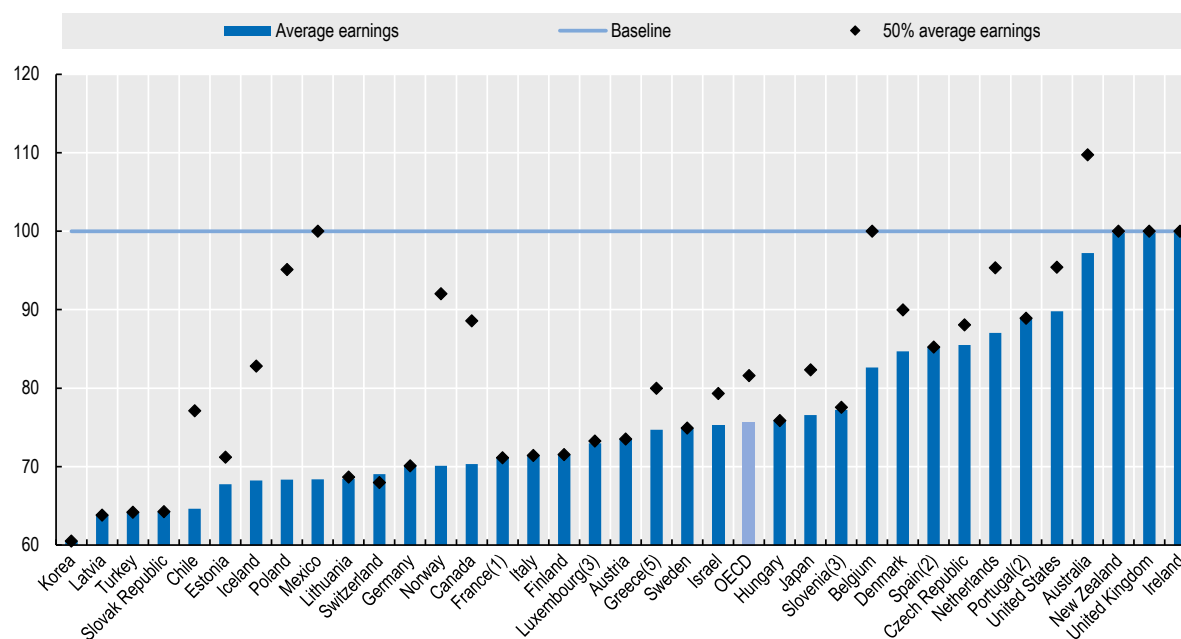


Note: Figure in brackets refers to increase in retirement age due to the career break. Individuals enter the labour market at age 22 in 2018. The unemployment break starts in 2031.

Source: OECD pension models.

StatLink <https://doi.org/10.1787/888934041801>

Figure 5.13. **Gross pension entitlements of low and average earners with a 10-year unemployment break after entering the labour market 5 years later**



Note: Figure in brackets refers to increase in retirement age due to the career break. Individuals enter the labour market at age 27 in 2023. The unemployment break starts in 2031.

Source: OECD pension models.

StatLink <https://doi.org/10.1787/888934041820>

Chapter 6

Demographic and Economic Context

Population ageing has been one of the main driving forces behind changes in pension policies and reforms. Ageing is the result of two demographic trends. The first indicator looks into the number of births and the development over the last 50 years. The second driver of population ageing is increasing life expectancy. Changes in life expectancy – at birth and at age 65 – are shown as the second indicator. The third indicator looks into the degree of ageing measured as the level of and change in the number of people aged 65 and above relative to the number of people of working age (20-64). The fourth indicator takes a look at the employment rates of older workers. The fifth indicator presents calculations for the age at which people leave the labour market - the “Effective age of labour market exit”. The last indicator measures the expected life years at the labour-market exit age by combining life expectancy with the previous indicator.

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

Key Results

The total fertility rate is below the estimated replacement level – the number of children needed to keep the total population constant – of about 2.1 in developed countries in 34 out of 36 OECD countries. The exceptions to this are Israel with a total fertility rate of 3.04 and Mexico at 2.14. Fertility rates fell sharply in the second half of the 20th century, and have stabilised in the OECD on average since 2000. However, in more than half of OECD countries, fertility rates have slightly increased since the early 2000s. Fertility rates have a profound implication for pension systems because they, along with life expectancy, are the drivers of substantial shifts in demographic structures. Since 1960, there has been a steady convergence of fertility rates across countries, which is expected to be prolonged in the next decades.

Fertility rates currently average 1.66 across OECD countries, well below the level that ensures population replacement. The trend to fewer children has been going on since the late 1950s, but stopped around the turn of century on average. The fall in fertility rates reflected changes in individuals' lifestyle preferences, in family formation, and in the constraints of everyday living, such as those driven by labour-market insecurity, difficulties in finding suitable housing and unaffordable childcare.

Another effect might come from changes in women's aspiration regarding partnership and childbearing norms, especially in countries such as Japan and Korea where there is a strong link between marriage and maternity. However, the childbearing patterns of unmarried men and women have also changed. For example, half or more of births now occur outside of marriage in France, Iceland, Norway and Sweden. The average proportion of births outside marriage in OECD countries is now one-third of the total.

Over the last 50 years, there has been a steady convergence in fertility rates across OECD countries. In 1960, Korea, Mexico and Turkey had rates around twice the OECD average, with Hungary and Latvia not much over half, and an overall standard deviation of 1.2. This latter figure has decreased considerably over time, falling to 0.3 by 2020 and forecast to be only 0.1 by 2060.

Since 2000, the fertility rates in 21 out of 36 countries have slightly increased while the average has remained stable. The increases from a very low level have been stronger in a few countries, including the Czech Republic (+0.47), Latvia (+0.54) and Slovenia (+0.35). The strongest declines have been observed in Chile (-0.55), Mexico (-0.71) and Turkey (-0.57).

This recent increase in fertility rates is forecasted to continue in more than two-thirds of OECD countries, albeit very slowly, and the average rate will be 1.71 across OECD countries by 2050 according to the median forecast of the United Nations Population Prospects. However, forecast uncertainty is considerable, with the 20th percentile of

probabilistic projections for the OECD average at only 1.41 and the 80th percentile close to reproduction at 1.96 (Figure 6.1).

Low fertility rates have wider social and economic consequences. The old-age to working-age ratio will increase sharply placing additional burdens on the working-age population to finance pay-as-you-go pensions and health care for older people. Moreover, the workforce will also age over time and so might be less adaptable to technological change.

Among the other major economies, Argentina, India, Indonesia, Saudi Arabia and South Africa all currently have fertility rates well above the replacement level of 2.1. However, the downward trend is expected to continue in these countries as well as in Brazil, with fertility rates going below the natural replacement rate by 2030. By contrast, the trough was reached at low levels in China and the Russian Federation about 20 years ago.

Definition and measurement

The total fertility rate is the number of children that would be born to each woman if she were to live to the end of her child-bearing years and if the likelihood of her giving birth to children at each age was the currently prevailing age-specific fertility rate. It is generally computed by summing up the age-specific fertility rates defined over a five-year interval. A total fertility rate of 2.1 children per women – the replacement level – broadly ensures a stable population size, on the assumptions of no migration flows and unchanged mortality rates.

Further Reading

D'Addio, A. and M. d'Ercole (2005), "Trends and Determinants of Fertility Rates: The Role of Policies", *OECD Social, Employment and Migration Working Papers*, No. 27, OECD Publishing, Paris, <https://dx.doi.org/10.1787/880242325663>.

Table 6.1. Total fertility rates, 1960-2060

	1960	1980	2000	2020	2040	2060		1960	1980	2000	2020	2040	2060
Australia	3.41	1.99	1.79	1.83	1.73	1.72	New Zealand	4.07	2.18	1.95	1.90	1.77	1.73
Austria	2.57	1.65	1.39	1.53	1.65	1.71	Norway	2.84	1.81	1.86	1.68	1.73	1.75
Belgium	2.50	1.70	1.60	1.71	1.75	1.77	Poland	3.47	2.23	1.51	1.42	1.57	1.66
Canada	3.88	1.73	1.56	1.53	1.52	1.61	Portugal	3.12	2.55	1.46	1.29	1.49	1.61
Chile	4.75	2.94	2.20	1.65	1.57	1.61	Slovak Republic	3.24	2.46	1.40	1.50	1.65	1.71
Czech Republic	2.38	2.36	1.17	1.64	1.75	1.78	Slovenia	2.38	2.16	1.25	1.60	1.71	1.75
Denmark	2.55	1.68	1.76	1.76	1.79	1.80	Spain	2.70	2.55	1.19	1.33	1.51	1.61
Estonia	1.99	2.06	1.33	1.59	1.71	1.75	Sweden	2.25	1.66	1.56	1.85	1.84	1.83
Finland	2.77	1.66	1.74	1.53	1.53	1.63	Switzerland	2.39	1.54	1.48	1.54	1.61	1.65
France	2.70	1.86	1.76	1.85	1.84	1.83	Turkey	6.50	4.69	2.65	2.08	1.82	1.73
Germany	2.27	1.51	1.35	1.59	1.67	1.71	United Kingdom	2.49	1.73	1.74	1.75	1.77	1.77
Greece	2.42	2.42	1.31	1.30	1.37	1.54	United States	3.58	1.77	2.00	1.78	1.80	1.81
Hungary	2.32	2.25	1.38	1.49	1.63	1.70	OECD	3.19	2.26	1.67	1.66	1.68	1.71
Iceland	4.17	2.45	2.06	1.77	1.67	1.68							
Ireland	3.58	3.25	1.90	1.84	1.70	1.69	Argentina	3.13	3.40	2.63	2.27	2.02	1.87
Israel	3.89	3.47	2.93	3.04	2.63	2.32	Brazil	6.06	4.24	2.47	1.74	1.56	1.59
Italy	2.29	1.89	1.22	1.33	1.42	1.53	China	5.48	3.01	1.62	1.69	1.73	1.76
Japan	2.17	1.83	1.37	1.37	1.49	1.59	India	5.90	4.97	3.48	2.24	1.92	1.76
Korea	6.33	2.92	1.50	1.11	1.25	1.48	Indonesia	5.67	4.73	2.55	2.32	2.00	1.85
Latvia	1.95	1.89	1.17	1.72	1.78	1.80	Russian Federation	2.82	1.94	1.25	1.82	1.83	1.83
Lithuania	2.66	2.10	1.47	1.67	1.75	1.78	Saudi Arabia	7.18	7.28	4.40	2.34	1.83	1.65
Luxembourg	2.23	1.49	1.72	1.45	1.52	1.61	South Africa	6.05	5.05	2.88	2.41	2.07	1.88
Mexico	6.78	5.33	2.85	2.14	1.80	1.71	EU28	2.67	2.06	1.49	1.56	1.64	1.70
Netherlands	3.10	1.60	1.60	1.66	1.72	1.74							

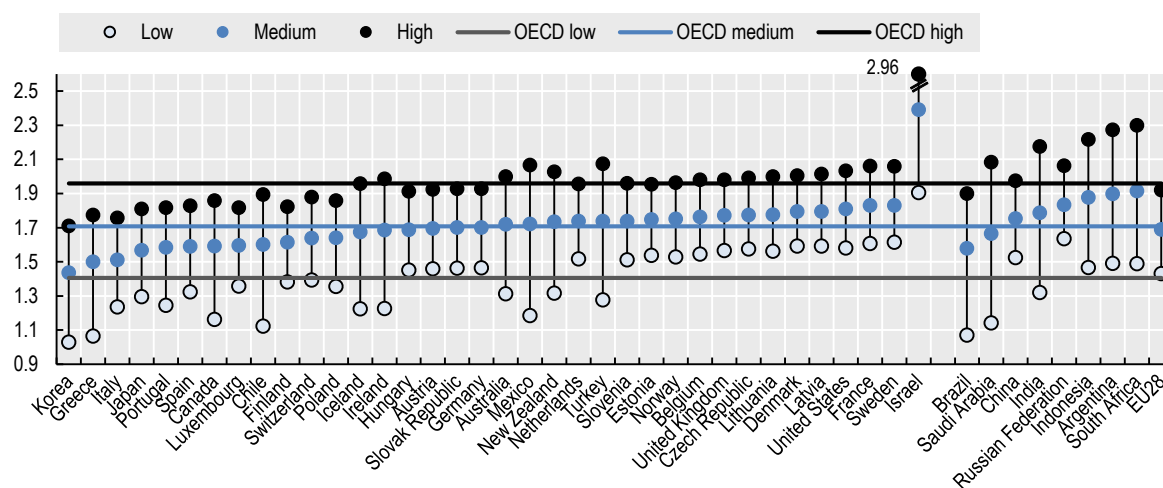
Note: The data refers to 5-year periods whose end-point is indicated in the first row of the table.

Source: United Nations, Department of Economic and Social Affairs, (2019). World Population Prospects 2019, Online Edition (for future periods: medium-variant forecast).

StatLink  <https://doi.org/10.1787/888934041839>

Figure 6.1. Uncertainty about total fertility-rate projections

Low, medium and high variant projections for 2050-2055



Note: For better visibility, the scale of this chart excludes the highest observed values, which is 2.96 in Israel for the high-variant projection. Low, medium and high variant projections correspond to the 20%, 50% and 80% percentiles of probabilistic projections, respectively.

Source: United Nations, Department of Economic and Social Affairs (2019). Probabilistic Population Projections based on the World Population Prospects 2019: <http://population.un.org/wpp/>.

StatLink  <https://doi.org/10.1787/888934041858>

Key Results

The remarkable increase in life expectancy is one of the greatest achievements of the last century. Lives continue to get longer, and this trend is predicted to continue although the pace of improvement in old age has slowed slightly. In 2015-20, life expectancy at birth averaged 78.1 years for men and 83.4 years for women. Among women, the figure was highest in Japan (87.5 years) and lowest in Mexico (77.8 years). For men, life expectancy at birth was highest in Switzerland (81.6 years) and lowest in Latvia and Lithuania (69.9 and 70.0 years, respectively). On average across OECD countries, remaining life expectancy at age 65 is projected to increase by 3.9 years among women and 4.5 years among men by 2065.

Remaining life expectancy at 65 significantly contributes to wellbeing at older ages. It also influences the finances of retirement-income systems. In 2015-20, on average in OECD countries, women aged 65 could expect to live an additional 21.3 years, which is forecast to increase to 25.2 years by 2060-65. Men of the same age could expect to live 18.1 more years in 2015-20, with a projected increase of 4.5 years by 2060-65 to reach about 22.5 years. Gender gaps are therefore expected to decrease slightly over the next 45 years (from 3.3 to 2.7 years on average in OECD countries). The improvement in remaining life expectancy at age 65 will slow a little. It increased from 13.7 years in 1955-1960 to 15.9 years in 1985-1990 before accelerating to 19.8 years in 2015-2020 in the OECD on average. It is expected to rise further to 22.6 years in 2045-2050 (Figure 1.4, Panel A in Chapter 1).

There is considerable variation between OECD countries in life expectancy at older ages. Women in Japan are predicted to live another 28.8 years on reaching age 65 in 2060-65, followed by Korea (27.4 years). In contrast, women in Mexico are expected to live an extra 22.1 years.

For men there is less variation between countries than there is for women. Switzerland will have the longest life expectancy at age 65 in 2060-65 (23.9 years), followed by Australia, Israel and Japan (23.8 years). By contrast, Latvia (19.2), Lithuania and Hungary (both 19.9) are ranked at the bottom.

The gender gap in life expectancy at age 65 is predicted to be between almost two and four years in favour of women in nearly all OECD countries in 2060-65. Larger gender gaps of 4.5 to 5 years are observed in both Japan and Korea. The smallest gender gap are forecasted for the United States and the United Kingdom at 1.5 and 1.7 years respectively.

Given this trend, many OECD countries have increased or legislated to increase their pension benefit eligibility ages: see Chapter 1 on "Recent Pension Reforms". Others have introduced elements into their retirement-income provision that will automatically adjust the level of pensions as people live longer. Overall longevity gains are due to rising living standards, but also greater access to quality health services.

Turning to the non-OECD major economies, life expectancy is generally lower than the OECD average. Life expectancy at birth is by far the lowest in South Africa at 60.2 years for men and 67.1 years for women. The highest life expectancy at birth is found in Argentina for women at 79.8 years and in China at 74.5 years for men. Life expectancy at 65 is the lowest for South African women (14.7 years) and men (11.5 years). By 2060-65 those aged 65 will live longest in Brazil at 23.7 years for women and 21.1 years for men.

The above numbers refer to period life expectancy, which measures life expectancy (current or projected) based on mortality rates for people of different ages at a given time (2015-20 or 2060-65 here) that hence belong to different birth cohorts. By contrast, cohort life expectancy is based on the projected mortality rates that would apply to the same birth cohort at different ages. It thus takes account of continuing improvements (after 2015-20 or 2060-65) that would benefit a given birth cohort. On average, these cohort estimates add 1.5 years for women aged 65 in 2060-65 and 1.0 years for men.

Definition and measurement

Life expectancy is defined as the average number of years that people of a particular age could expect to live if they experienced the age- and sex-specific mortality rates prevalent in a given country in a particular year: in this case, 2015-20 and 2060-65. Since the determinants of longevity change slowly, life expectancy is best analysed over a long time horizon. Cohort life expectancy takes account of the projected changes in mortality estimates for a given cohort.

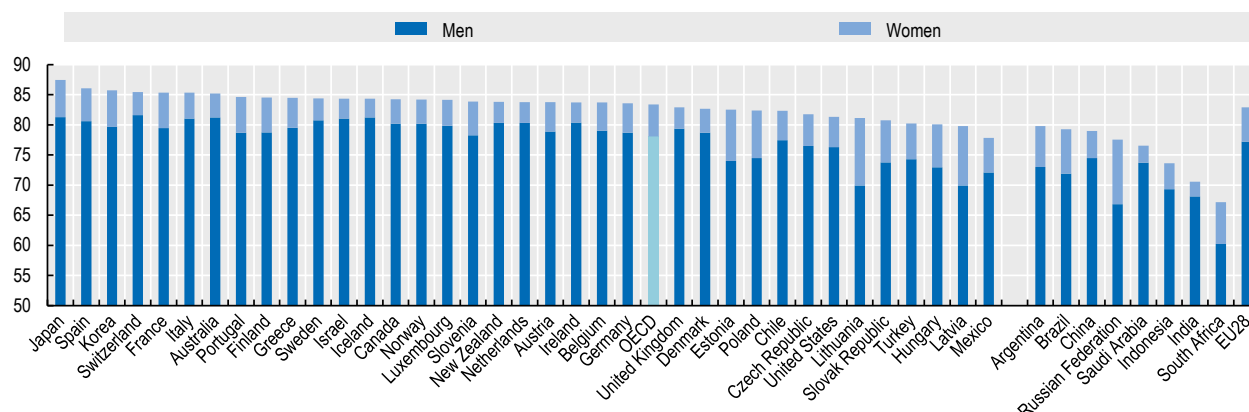
Further Reading

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Whitehouse, E.R. (2007), "Life-expectancy Risk and Pensions: Who Bears the Burden?", OECD Social, Employment and Migration Working Paper No. 60, OECD Publishing, Paris, <http://dx.doi.org/10.1787/060025254440>.

Figure 6.2. **Current life expectancy at birth for men and women, in years**

Based on mortality rates of the period 2015-20



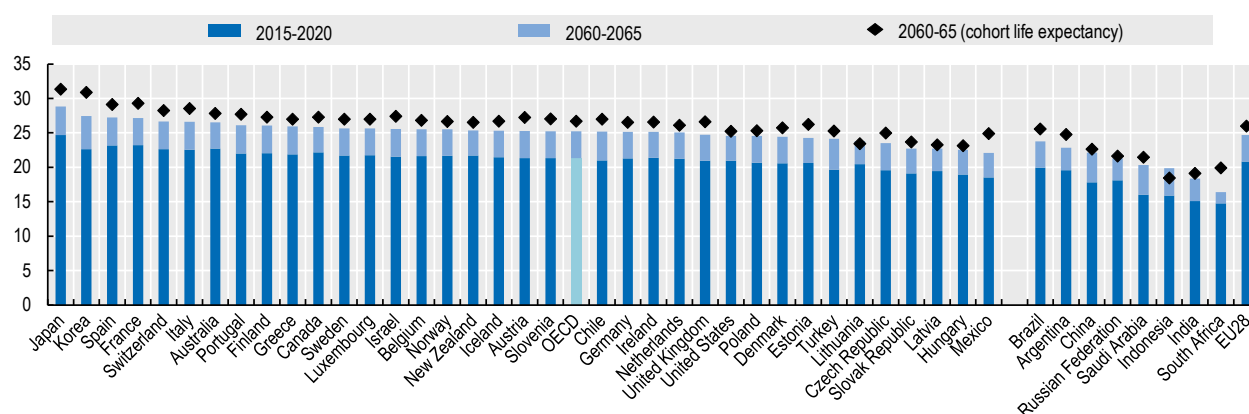
Note: Shown is period life expectancy that is based on mortality rates in a specific period, here 2015-2020, rather than to a specific birth cohort.

Source: United Nations, Department of Economic and Social Affairs, (2019). World Population Prospects 2019, Online Edition.

StatLink <https://doi.org/10.1787/888934041877>

Figure 6.3. **Remaining life expectancy at age 65 for women, current and projections, in years**

Based on mortality rates of the indicated period or cohort

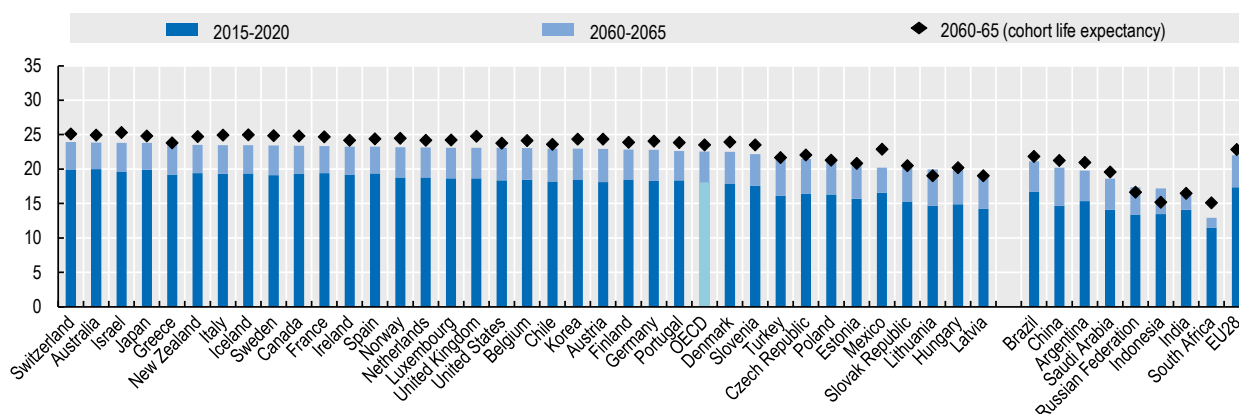


Source: United Nations, Department of Economic and Social Affairs, (2019). World Population Prospects 2019, Online Edition.

StatLink <https://doi.org/10.1787/888934041896>

Figure 6.4. **Remaining life expectancy at age 65 for men, current and projections, in years**

Based on mortality rates of the indicated period or cohort



Source: United Nations, Department of Economic and Social Affairs, (2019). World Population Prospects 2019, Online Edition.

StatLink <https://doi.org/10.1787/888934041915>

Key Results

There are 31 individuals aged 65 and over for every 100 persons of working age (ages 20 to 64) on average across all OECD countries while they were only about 21 thirty years ago. Population ageing has been accelerating as this average old-age to working-age demographic ratio – computed by keeping age thresholds constant – is projected to reach 53 over the next thirty years.

Currently, the demographically oldest OECD country is Japan, with an old-age to working-age ratio equal to 52.0 (meaning 52 individuals aged 65 and over for 100 persons of working age defined as 20 to 64). Finland and Italy also have high old-age ratios, of about 40. By 2050, the old-age to working-age ratio is expected to reach more than 70 in Greece (75.0), Italy (74.4), Japan (80.7), Korea (78.8), Portugal (71.4) and Spain (78.4).

By contrast, Mexico and Turkey are the youngest countries based on this indicator, with old-age to working-age ratios of 13.2 and 15.2 respectively, followed by Chile, at 19.7. In the second half of this century, however, these countries are expected to age considerably. By 2080, the old-age ratio would rise above the OECD average in Chile (67.5 compared to 60.8) and closer to the average in Mexico and Turkey (50.9 and 58.2, respectively).

Four Anglo-Saxon OECD countries – Australia, Canada, Ireland and the United States – have relatively low old-age ratios, between 25 and 30. This is partly due to inward migration of workers and – except for Canada – to comparatively high fertility rates just below replacement level in recent decades.

The evolution of old-age to working-age ratios depends on mortality rates, fertility rates and migration. OECD countries have seen prolonged increases in life expectancy that most analysts project to continue, implying an increasing number of older people and most likely of pensioners too.

There have also been substantial declines in fertility, which, of course, will eventually diminish the number of workers entering the labour market. For example, fertility rates fell below the replacement level on average in OECD countries around the mid-1980s, implying shrinking

populations in the long term. In the future, however, there is a great deal of uncertainty over how fertility rates will evolve (Figure 6.1).

For the OECD as a whole, the increase in the old-age to working-age ratio is projected to continue according to the medium forecast of United Nations Populations Prospects, from 31.2 in 2020 to 53.4 in 2050 and 60.8 in 2080. By far, Korea is facing the most rapid population ageing among OECD countries. The old-age ratio would increase from 6.3 in 1950 to 94.6 in 2080 and Korea would move from being the fifth youngest country in the OECD in 2020 to the oldest in 2080.

European countries are already slightly older than OECD countries and the forecast pattern for the EU28 broadly follows the OECD average. All of the non-OECD major economies have old-age to working-age ratios below the OECD average. However, many will face rapid population ageing in the coming decades. In Brazil and China, for example, the old-age ratio will increase from below 20 currently to above 60 in 2080. By the end of the projection horizon, South Africa is forecasted to be the youngest country, even below the OECD average today, with an old-age ratio of 26.8.

Projections of the old-age to working-age ratio underlie marked uncertainty on developments in fertility, mortality and migration. Therefore, the OECD average of the old-age to working-age ratio in 2050 lies within the range 50.8-56.0 in only 60% of simulated forecasts by the UN (Figure 6.5).

Definition and measurement

The old-age to working-age demographic ratio is defined as the number of individuals aged 65 and over per 100 people of working age defined as those at ages 20 to 64.

Table 6.2. Demographic old-age to working-age ratio: Historical and projected values, 1950-2080

	1950	1960	1990	2020	2050	2080		1950	1960	1990	2020	2050	2080
Australia	14.0	16.0	18.8	27.7	41.6	49.4	New Zealand	16.3	17.0	19.5	28.3	43.8	57.5
Austria	17.3	21.0	24.3	31.3	56.0	60.2	Norway	16.0	19.8	28.5	29.6	43.4	53.4
Belgium	18.1	20.3	24.8	33.1	51.3	56.8	Poland	9.4	10.5	17.3	30.5	60.3	68.6
Canada	14.0	15.1	18.4	29.8	44.9	54.0	Portugal	13.0	14.8	23.9	38.6	71.4	72.3
Chile	7.2	7.9	10.9	19.7	44.6	67.5	Slovak Republic	11.9	12.6	18.2	26.5	54.6	58.1
Czech Republic	13.9	16.3	22.0	33.8	55.9	52.8	Slovenia	12.5	13.7	17.3	34.7	65.0	60.7
Denmark	15.6	19.0	25.9	34.9	44.6	52.4	Spain	12.8	14.6	23.1	32.8	78.4	74.4
Estonia	19.3	17.7	19.7	34.9	54.9	63.2	Sweden	16.8	20.2	30.9	35.9	45.5	53.4
Finland	11.9	13.5	22.0	40.1	51.4	65.0	Switzerland	15.8	17.6	23.6	31.3	54.4	56.7
France	19.5	20.8	24.0	37.3	54.5	62.2	Turkey	6.5	7.0	9.4	15.2	37.0	58.2
Germany	16.2	19.1	23.5	36.5	58.1	59.5	United Kingdom	17.9	20.2	26.9	32.0	47.1	55.1
Greece	12.4	12.2	22.9	37.8	75.0	79.7	United States	14.2	17.3	21.6	28.4	40.4	51.1
Hungary	13.2	15.5	22.9	33.4	52.6	55.4	OECD	13.9	15.5	20.6	31.2	53.4	60.8
Iceland	14.1	16.4	19.0	26.6	46.2	64.5							
Ireland	20.9	22.8	21.6	25.0	50.6	60.0							
Israel	7.1	9.1	17.8	23.9	31.3	39.9	Argentina	7.5	10.1	17.3	20.2	30.3	45.5
Italy	14.3	16.4	24.3	39.5	74.4	79.6	Brazil	6.5	7.1	8.4	15.5	39.5	63.7
Japan	9.9	10.4	19.3	52.0	80.7	82.9	China	8.5	7.6	10.2	18.5	47.5	60.6
Korea	6.3	7.6	8.9	23.6	78.8	94.6	India	6.4	6.4	7.9	11.3	22.5	40.8
Latvia	18.1	17.7	19.9	35.5	53.0	49.9	Indonesia	8.6	7.6	7.7	10.6	27.3	41.0
Lithuania	17.5	14.0	18.4	34.7	55.7	55.7	Russian Federation	8.7	10.5	17.2	25.3	41.7	41.9
Luxembourg	15.8	17.6	21.1	22.3	43.8	50.1	Saudi Arabia	7.5	8.4	6.1	5.3	28.2	44.8
Mexico	8.0	8.3	9.6	13.2	28.9	50.9	South Africa	8.5	8.4	8.7	9.6	17.4	26.8
Netherlands	13.9	16.8	20.6	34.3	53.3	62.2	EU28	14.7	16.2	21.8	33.5	56.3	61.7

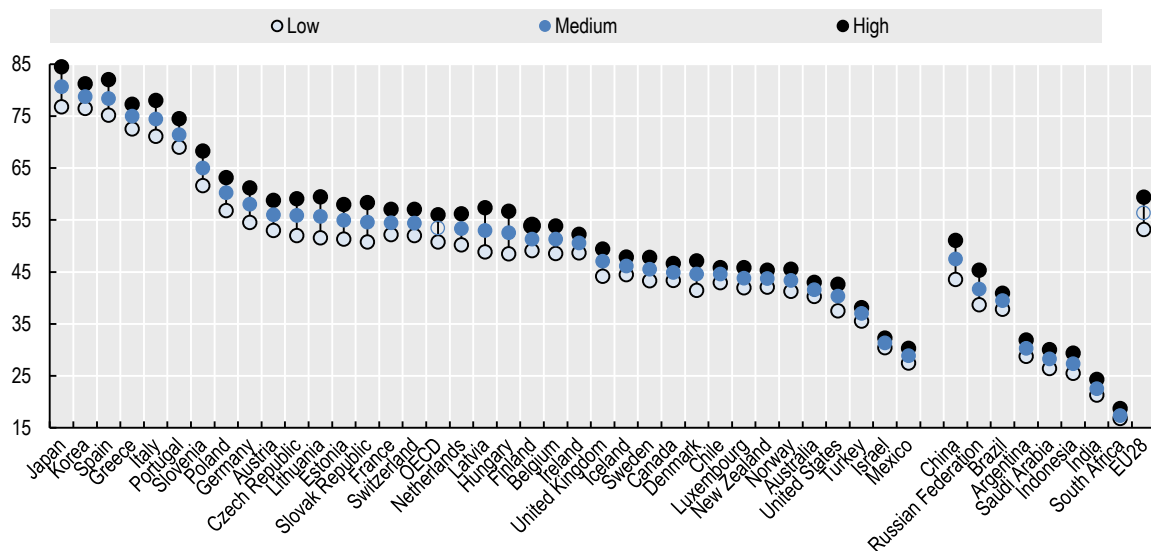
Note: The demographic old-age to working-age ratio is defined as the number of individuals aged 65 and over per 100 people aged between 20 and 64.

Source: United Nations, Department of Economic and Social Affairs (2019), World Population Prospects 2019, Online Edition (for future periods: medium-variant forecast).

StatLink  <https://doi.org/10.1787/888934041934>

Figure 6.5. Uncertainty about demographic old age to working age ratio projections

Low, medium and high variant projections for 2050-2055



Note: Low, medium and high variant projections correspond to the 20%, 50% and 80% percentiles of probabilistic projections respectively.

Source: United Nations, Department of Economic and Social Affairs (2019). Probabilistic Population Projections based on the World Population Prospects 2019: <http://population.un.org/wpp/>.

StatLink  <https://doi.org/10.1787/888934041934>

Key Results

The employment rate falls with age in all OECD countries. For individuals aged between 55 and 59 years, the average employment rate across all OECD countries was 72.5% in 2018, 49.6% for the 60-64 age group and 22.3% for those aged 65-69. In ten OECD countries the employment rates were above the OECD average for all age groups aged 55 and over; by contrast it was below average for all age groups in nine OECD countries. Employment rates of people aged 55-64 have improved since the start of the century in most OECD countries, from 43.9% in 2000 to 61.5% in 2018 on average.

There are large cross-country variations in the employment rates of people aged 55 to 69 in the OECD. In 2018, Iceland displayed the highest rates among all age groups, at 82.9% for those aged 55 to 59, 78.0% for individuals aged between 60 and 64 and 52.6% for those aged 65 to 69. By contrast, the lowest employment rates were found in Greece and Turkey where employment rates for people aged 55 to 59 were 52.3% and 39.6%, respectively. At ages 60-64 and 65-69 Luxembourg recorded the lowest employment rates in 2018, with 19.0% and 3.3% respectively. In addition, among the 60-64 age group, the employment rate is at 30% or lower in Belgium, Greece, Slovenia and Turkey.

In the Czech Republic, Denmark, Finland and Germany the employment rates are well above the OECD average of 72.5% for individuals aged 55 to 59. However, they fall quickly with age and are below the OECD average for individuals aged between 65 and 69. In contrast, the employment rates in Mexico are below the OECD average for the 55 to 59 year-olds but above average in the age groups 60 to 64 and 65 to 69. In a large number of European OECD countries the employment rates are below the OECD average for all age groups considered: Belgium, Greece, Italy, Luxembourg, Poland, Portugal, Slovenia, Spain and Turkey.

Employment rates of people aged between 55 and 64 have improved in almost all OECD countries since the year 2000. On average, they have increased by 17.6 percentage points passing from 43.9% in 2000 to 61.5% in 2018. By comparison, the employment rate in the 25 to 54 age group increased, on average, from 76.8% in 2000 to 81.2% in 2018. The greatest increase for the 55-to-64 age group occurred in Germany from a relatively low level of 37.6% in 2000 to 71.4% in 2018. It is also larger than 30 percentage points in Hungary and the Slovak Republic. In Iceland and

Turkey, the employment rates of the 55-64 declined slightly between 2000 and 2018.

Except for Korea where the pension system has not yet matured, countries with low normal retirement ages tend to have low employment rates among people aged between 60 and 64 years. This is the case in particular in Austria, Greece, Luxembourg, the Slovak Republic and Slovenia where the current normal retirement age (averaged across genders) is at 62.5 years or lower. Among countries with a high retirement age, the employment rate among older workers is low in Italy.

Definition and measurement

Employment rates are calculated as the ratio of the employed to the total population in the respective age group. Employed people are those (aged 15 or over) who report that they have worked in gainful employment for at least one hour in the previous week or who had a job but were absent from work during the reference week.

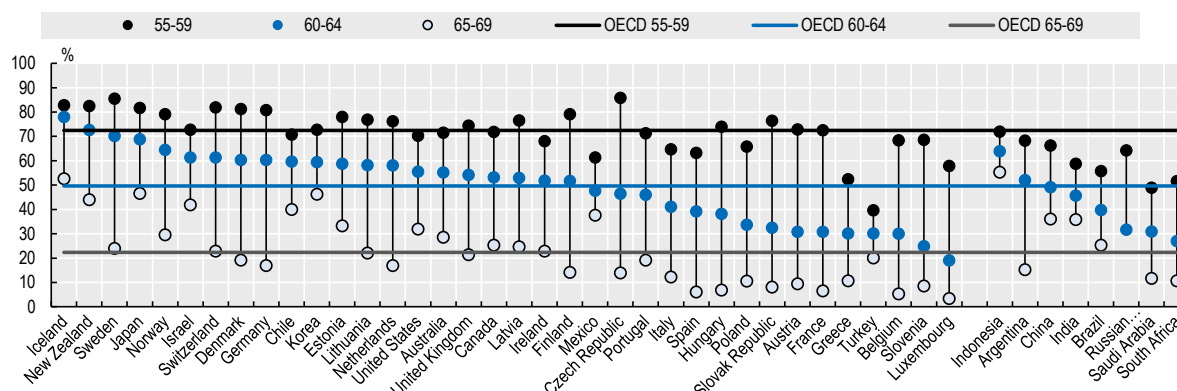
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OECD reviews on ageing and employment policies: *Working Better with Age* reports on Denmark, France, Netherlands, Norway, Poland and Switzerland (see <http://www.oecd.org/els/employment/olderworkers>).

Sonnet A., H. Olsen and T. Manfredi (2014), "Towards More Inclusive Ageing and Employment Policies: The Lessons from France, the Netherlands, Norway and Switzerland", *De Economist*, Vol. 162, December.

Figure 6.6. Employment rates of workers aged 55-59, 60-64 and 65-69 in 2018

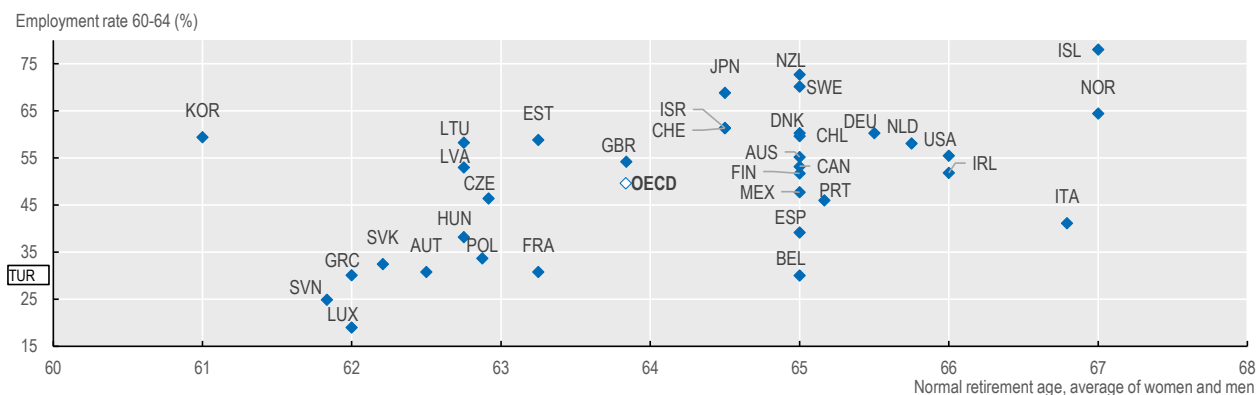


Note: Data for China, India and Indonesia refer to year 2010, 2012 and 2017 respectively. Age group 65-69 data for Russian Fed. are unavailable.

Source: OECD database Labour Market Statistics by sex and age: employment-population ratio. Argentina and Saudi Arabia: International Labour Organization, ILOSTAT, <https://ilostat.ilo.org>.

StatLink <https://doi.org/10.1787/888934041972>

Figure 6.7. Employment rate at ages 60-64 vs. normal retirement age in 2018

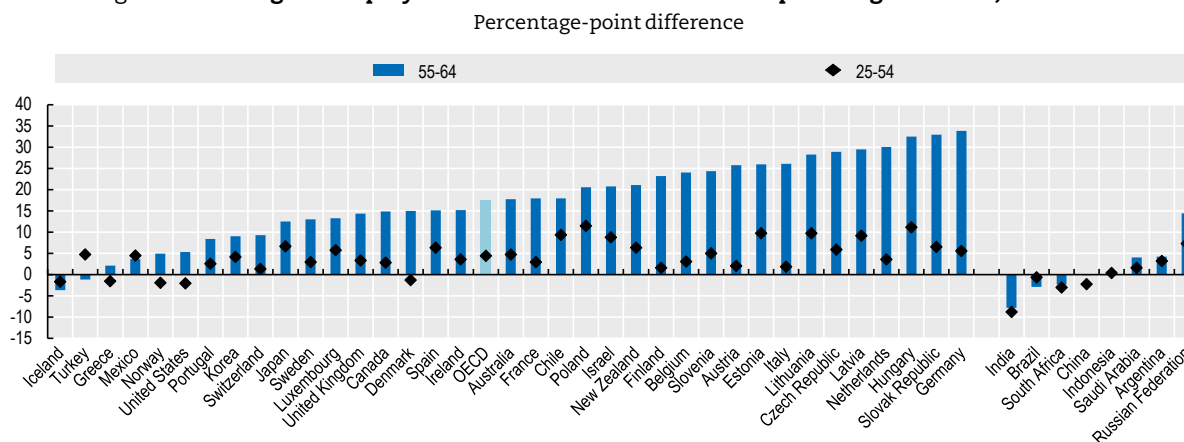


Note: For better visibility, the scale of this chart excludes the lowest observed value for the normal retirement age in Turkey, which is 49.5 (average of 48 and 51 for women and men respectively), with the employment rate equalling 30.1%.

Source: OECD database Labour Market Statistics by sex and age: employment-population ratio. Normal retirement age data: See Chapter 4.

StatLink <https://doi.org/10.1787/888934041991>

Figure 6.8. Change in employment rates of older workers and prime-age workers, 2000-2018



Note: Data for Argentina, Brazil, China, Indonesia, Saudi Arabia and South Africa refer to period 2004-2018, 2001-2018, 2000-2010, 2000-2017, 2009-2018 and 2001-2018 respectively.

Source: OECD database Labour Market Statistics by sex and age: employment-population ratio. Argentina and Saudi Arabia: International Labour Organization, ILOSTAT, <https://ilostat.ilo.org>.

StatLink <https://doi.org/10.1787/888934042010>

Key Results

The average effective age of labour market exit was 65.4 for men and 63.7 for women across OECD countries in 2018. It is fourteen months higher than the average normal retirement age for men and two months higher for women. The lowest effective exit age is found in Luxembourg for men and in the Slovak Republic for women at 60.5 and 59.9 years, respectively. At the other end of the range, Korea displayed the highest figures, at 72.3 years for both women and men.

The average effective age of labour market exit remained below 65 in 2018 in slightly less than half of OECD countries for men and in two-thirds of them for women. Average exit ages are at or below 60 for women only in Greece, Hungary and the Slovak Republic. They are below 62 for both men and women in Belgium, France, Greece, Luxembourg and the Slovak Republic. By contrast, both women and men in Korea and men in Chile, Japan, Korea and Mexico withdrew from the labour market on average after age 70. In nearly all OECD countries, men exit the labour market after women, with the largest difference observed in Mexico (4.8 years). Only in Estonia, France and Luxembourg is the effective age of labour market exit higher for women than for men, though only slightly.

On average across the OECD, the normal retirement age of men was 1.2 years lower than the effective age of labour market exit in 2018; for women it was 0.2 years lower. However, there is considerable variation between countries. The effective age of labour market exit is lower than the normal retirement age in 19 countries for women, and 16 for men and is lower for both men and women in 14 out of the 36 OECD countries. In Italy the effective age of exit is 3.7 and 5.1 years lower than the normal retirement age for men and women, respectively. By contrast, in Korea and Turkey, the effective labour market exit age is considerably higher than the normal retirement age for both men and women.

After several decades of a sharp downward trend, the average effective exit age reached its lowest level in the late 1990s for women and the early 2000s for men on average

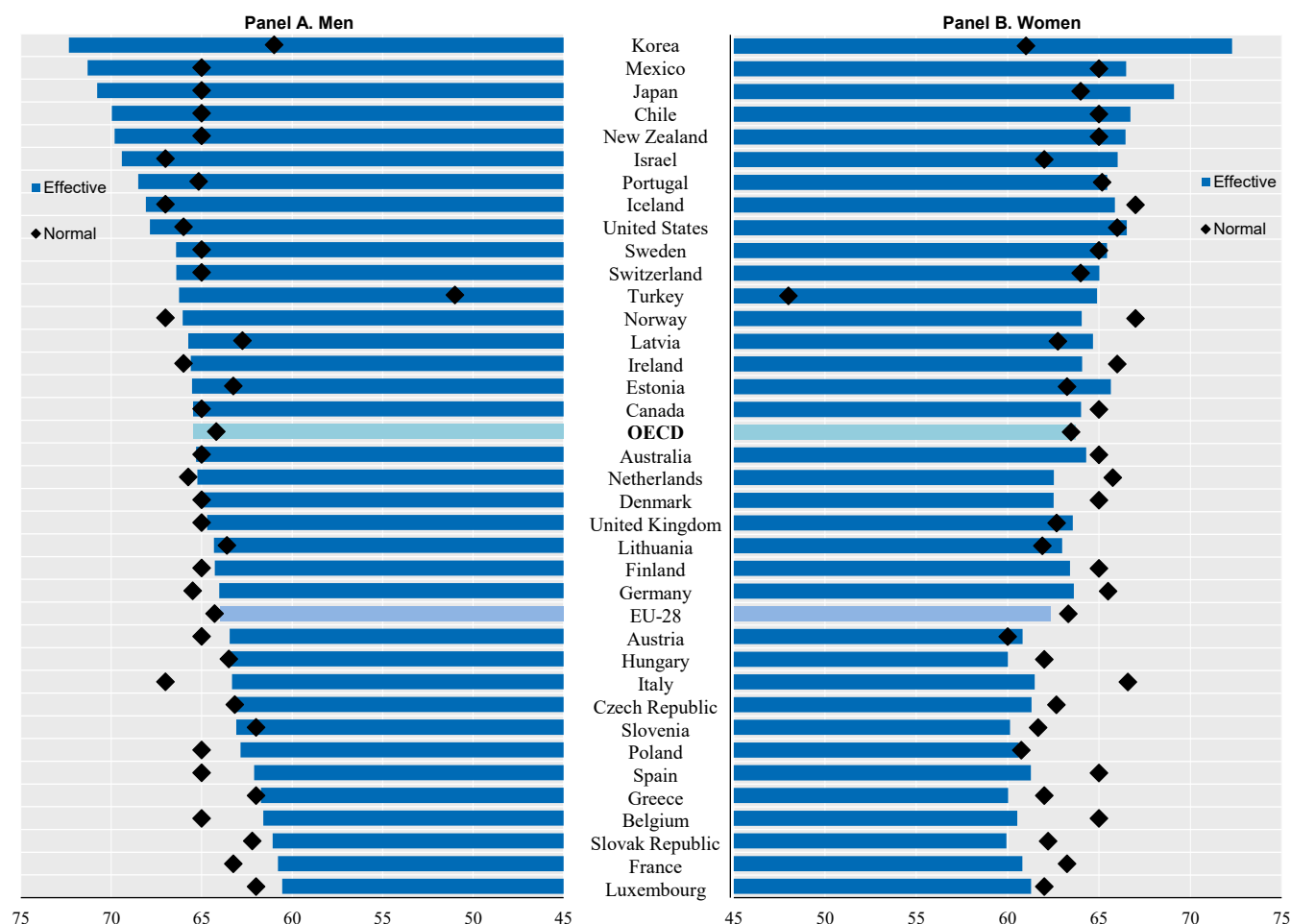
across countries. In 1970, the average effective exit age was 68.8 years for men and 66.5 years for women, against 63.1 and 61.0 years, respectively, in 2000. Since the year 2000, the effective age increased by over five years for men in Estonia, Hungary, Korea, New Zealand and Portugal and by just over 6.5 years for women in Estonia, Korea and New Zealand, with Turkey even increasing by almost eight years. The evolution of the average normal retirement age in the OECD shows a similar pattern as for the exit age, for both women and men, although the decline in the normal retirement age from the 1970s until the turn of the centuries was less pronounced and the upturn started earlier - at the beginning rather than the end of the 1990s.

Definition and measurement

The average effective age of labour market exit is defined as the average age of exit from the labour force for workers aged 40 and over. In order to abstract from compositional effects in the age structure of the population, labour force withdrawals are estimated using changes in labour force participation rates rather than labour force levels. These changes are calculated for each (synthetic) cohort divided into five-year age groups.

The normal retirement age is defined as the age of eligibility to all mandatory components of the pension system in 2018, assuming labour market entry at age 22 and an uninterrupted career. This age corresponds to Figure 4.4 in Chapter 4.

Figure 6.9. Average effective age of labour market exit and normal retirement age in 2018

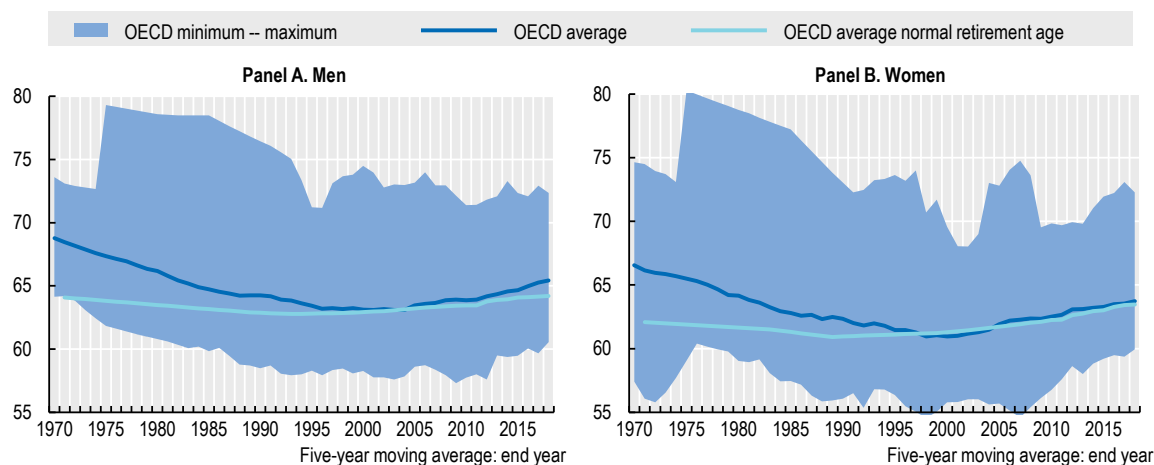


Note: Effective retirement age is shown for the five-year period 2013-18. Normal retirement age is shown for individuals retiring in 2018 after a full career from labour market entry at age 22.

Source: OECD estimates based on the results of national labour force surveys and the European Union Labour Force Survey, <https://www.oecd.org/els/emp/average-effective-age-of-retirement.htm>. Normal retirement age: See Chapter 4.

StatLink <https://doi.org/10.1787/888934042029>

Figure 6.10. Average effective age of labour market exit in OECD countries, 1970-2018



Source: OECD estimates based on the results of national labour force surveys, the European Union Labour Force Survey and, for earlier years in some countries, national censuses, <https://www.oecd.org/els/emp/average-effective-age-of-retirement.htm>. Normal retirement age: Estimate based on data provided by countries.

StatLink <https://doi.org/10.1787/888934042048>

Key Results

The expected life years after labour market exit indicator measures the remaining life expectancy at the age of average labour market exit by gender. In 2018, the OECD average was 22.5 years for women and 17.8 years for men. France had the highest expected duration, equal to 26.9 years for women and 22.7 years for men. The lowest remaining life expectancy equalled 12.9 years for men in Mexico and 16.3 years for women in Korea. The average number of expected life years after labour market exit across OECD countries has increased over time. In 1970, women and men in the OECD countries spent on average 14.5 and 10.5 years of their life after labour market exit, respectively. By 2018, this had increased to 22.5 years for women and 17.8 years for men.

This indicator measures the remaining life expectancy at the average age of labour market exit. Women can expect to live 25 years or more after exiting the labour market in Austria, Belgium, France, Greece, Italy, Luxembourg and Spain (Figure 6.11, Panel B). Similarly, men can expect to survive more than 20 years after labour market exit in Belgium, France, Greece, Italy, Luxembourg and Spain (Figure 6.11, Panel A). Women's remaining life expectancy at the average age of labour market exit was below 20 years in Chile, Korea, Latvia, Mexico, Turkey and the United States, and men's was below 15 years in Chile, Korea, Latvia and Mexico.

Men typically can expect to live 4.7 years less than women after labour market exit on average in the OECD (Figure 6.11). In Hungary, Lithuania, Poland and Slovenia the gender gap was six years or more. Longer periods after labour market exit expose women to old-age income poverty (cf. Chapter 7), as in some countries price indexation magnifies the impact of gender pay gaps, observed in all OECD countries, on pension benefits and of longer life expectancies.

The average length of life after labour market exit has increased over time. In 1970 men in the OECD countries spent on average 10.5 years after their exit from the labour market while by 2018 they could expect a duration of 17.8 years (Figure 6.12, Panel B). Women's life expectancy at

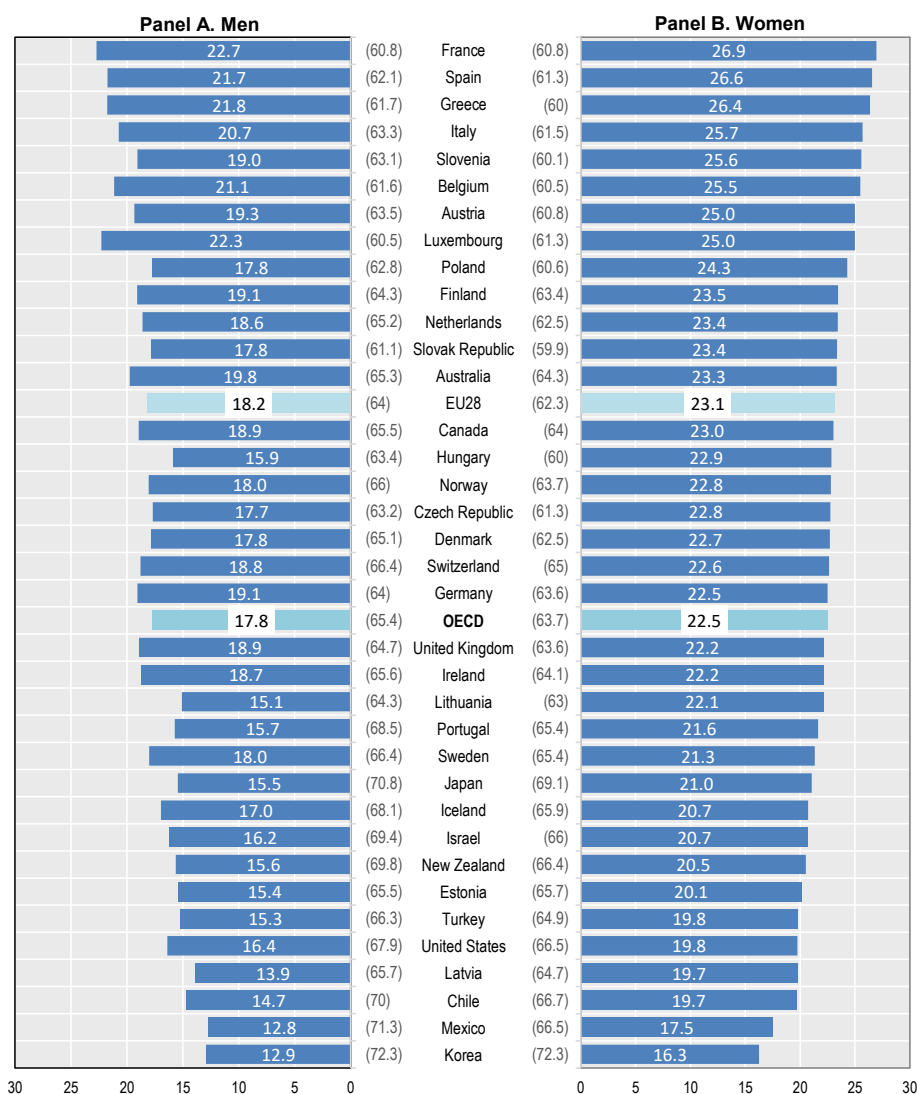
labour market exit equalled 14.5 years on average in the OECD in 1970, which increased to 22.5 years in 2018 (Figure 6.12, Panel A). The increase in the expected lifetime after labour market exit from 1970 to around 2000 is due to both a drop in the effective exit age from the labour force and increased longevity. Since then, expected life years after exit from the labour market have rather stabilised as continuing life expectancy gains in old age have been offset by increases in labour market exit ages.

Definition and measurement

Expected life years after labour market exit for women and men is measured as the respective remaining life expectancy at the average age of effective labour market exit. Estimates of remaining life expectancy are calculated based on the UN World Population Prospects - The 2019 Revision dataset.

The average effective age of labour market exit is defined as the average age of exit from the labour force for workers aged 40 and over. In order to abstract from compositional effects in the age structure of the population, labour force withdrawals are estimated using changes in labour force participation rates rather than labour force levels. These changes are calculated for each (synthetic) cohort divided into five-year age groups.

Figure 6.11. Remaining life expectancy at labour market exit, by gender in 2018

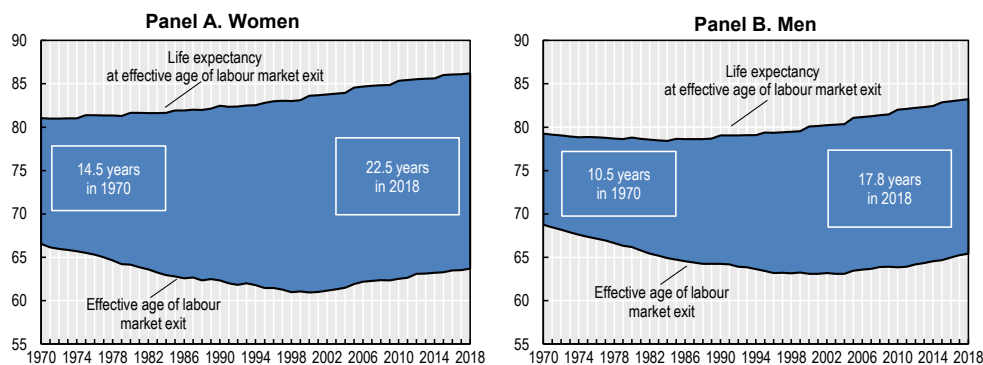


Note: Numbers in parenthesis indicate the average effective age of labour market exit in 2018 by gender. Life expectancy at labour market exit is based on period-specific mortality rates.

Source: OECD calculations based on United Nations Population Prospects: 2019 Revision, exit ages: see previous section.

StatLink <https://doi.org/10.1787/888934042067>

Figure 6.12. Expected life years after labour market exit, OECD average 1970-2018



Note: Life expectancy at labour market exit is based on period-specific mortality rates.

Source: OECD calculations based on United Nations Population Prospects: 2019 Revision, exit ages: see previous section.

StatLink <https://doi.org/10.1787/888934042086>

Chapter 7

Incomes and poverty of older people

These four sets of indicators look at the economic situation of older people in recent years. The first indicator examines the income of older people, comparing them with the population as a whole. It also shows the income sources of older people, whether the income comes from publicly provided benefits, private occupational transfers, work, or private personal pensions and other savings.

The second indicator looks at relative income poverty of older people. It shows the proportion of older people living on incomes of less than half the national median income and their average income gap to the poverty line. It also compares the poverty rates of older people with poverty rates of the population as a whole and reports on changes over time.

The third indicator looks at income inequality among older people. It shows Gini and percentile ratios for people aged over 65 and also compares them to the total population and across time.

The final indicator presents the “Average worker earnings” that underpin all pension modelling. These data are used widely in the report and many values for parameters and all modelling results for pension entitlements are reported as percentages of national average worker earnings.

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

Key Results

Incomes of older people are on average lower than those of the total population. The over-65s had incomes of 87% of the total population's in 2016 on average, broken down into 93% for the 66-75 and 80% for the over-75s. In 22 out of 36 OECD countries, public transfers provide more than half of gross income after age 65.

People over 65 had incomes amounting at 87% of population incomes, on average, in 2016 or latest (Table 7.1). Older people fared best in France, Israel and Luxembourg in relative terms where incomes for the over-65s were equal or slightly higher than for the total population. Older people also had high relative incomes in Greece, Italy, Portugal and Spain in international comparison. In Estonia and Korea, by contrast, the income of older people was about one-third lower.

Average incomes tend to fall with age after retirement. Lower incomes for older retirees are partly explained by cohort effects such as the past growth of real earnings. Over time this translates to higher earnings for each successive cohort and therefore higher pensions in retirement if pensions of past cohorts are not indexed to wage growth. Indeed, indexation principles of pension benefits in payment also play a large role: price indexation protects purchasing power, but tends to lower relative income over time. This particularly affects older women who live longer, which adds to their lower own entitlements due to lower past employment and wages compared to men. Moreover, older people live alone more often, which lowers their equivalised disposable income given household economies of scale.

The income of people aged over 65 has increased relative to the total population's in more than two-thirds of OECD countries over the past decades. Driven by a maturing pension system, the over-65s in Israel have seen the strongest rise in their relative income of about 20 percentage points, from 81% in 1995 to 101% in 2017. Greece and Norway record a similar strong increase as well as Portugal since 2005. The sharpest decline (-8 p.p.) is reported for the over-65s in Chile since 2006, but from a high level.

Looking at other G20 countries, incomes of people aged over 65 substantially exceeded those of the total population in Brazil and India in 2013 and 2011, respectively. In China, the Russian Federation and South Africa relative income of the 66+ lies above 80%.

Sources of income

Of the four main sources of income on which older people draw, public transfers (earnings-related pensions, resource-tested benefits, etc.) and private occupational transfers (pensions, severance payments, death grants, etc.) account for two-thirds of the total income (Figure 7.1). Public transfers account for 55% and private occupational transfers represent 10% of older people's incomes on average. The

countries where over-65s are most reliant on public transfers are Austria, Belgium, Finland and Luxembourg: more than 80% of their incomes come from that source. Public transfers represent only 6%, 15% and 18% of all income in Mexico, Turkey and Chile, respectively. Private occupational transfers are of particular importance in 12 OECD countries, with the Netherlands being highest at 39%.

Work accounts for 25% and capital for about 10% of older people's incomes on average. Work is especially important in Korea and Mexico, where it accounts for more than half of old-age income; it also represents a large share of income in Chile, Estonia, Israel, Japan, Korea, Latvia, Lithuania, New Zealand, Poland, the Slovak Republic, Turkey and the United States. Also, as incomes are measured at the household level, work is likely to be a more important income source for older people where many of them live in multi-generational households.

Capital, mostly private pensions, represents 40% of all income sources of older people in Canada. In Denmark and New Zealand, capital represents over 20% of all income.

Definition and measurement

Incomes of older people groups all incomes from employment, self-employment, capital and public transfers. The data shown are for disposable incomes (i.e., net of personal income tax and social security contributions). Incomes are measured on a household basis and equivalised with the square-root equivalence scale to adjust for differences in household size. See OECD Income Distribution Database for more details on definitions and data sources. The special chapter on "Incomes and poverty of older people" in OECD (2013) provides a more detailed analysis.

Further Reading

OECD (2019), , *Income DIstribution Database*, <http://www.oecd.org/social/income-distribution-database.htm> (accessed on 15 September 2019).

OECD (2019), , *Will Future Pensioners Work for Longer and Retire on Less? Policy Brief on Pensions*, <https://www.oecd.org/pensions/public-pensions/OECD-Policy-Brief-Future-Pensioners-2019.pdf>.

OECD (2013), *Pensions at a Glance 2013: OECD and G20 Indicators*, OECD Publishing, Paris, https://dx.doi.org/10.1787/pension_glance-2013-en.

Table 7.1. **Incomes of older people, 2016 or latest available year**
Average income by age group in % of average income of total population

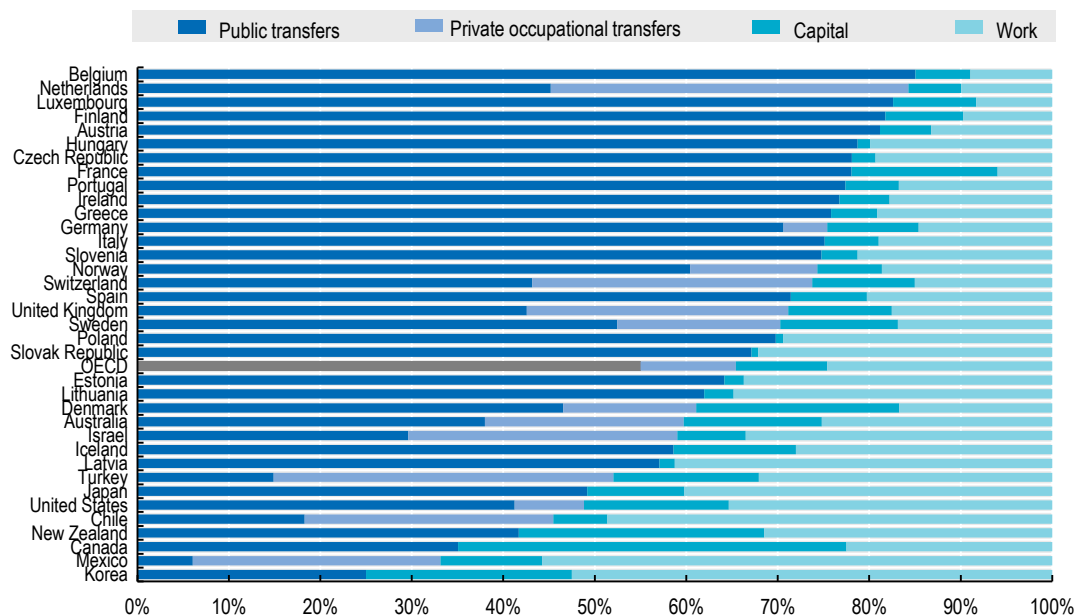
	All aged over 65	Age 66-75	Aged over 75	All aged over 65: mid-1990s (mid-2000s*)		All aged over 65	Age 66-75	Aged over 75	All aged over 65: mid-1990s (mid-2000s*)
Australia	72.3	77.9	63.9	66.4	Mexico	92.5	97.6	84.4	86.0
Austria	93.8	97.1	89.8	87.0*	Netherlands	85.6	91.2	76.9	84.1
Belgium	79.7	84.1	74.9	73.7*	New Zealand	86.2	95.4	71.1	79.0
Canada	90.5	94.1	84.9	94.3	Norway	91.6	101.1	77.0	72.4
Chile	93.5	95.8	90.0	101.5*	Poland	88.7	89.3	87.8	96.0*
Czech Republic	75.6	78.9	69.6	78.5*	Portugal	99.0	109.7	86.9	80.5*
Denmark	80.9	86.2	72.7	70.7	Slovak Republic	87.2	90.6	81.0	80.6*
Estonia	66.7	72.2	60.5	..	Slovenia	89.6	93.2	84.0	84.6*
Finland	83.2	90.5	73.1	81.6	Spain	95.3	102.9	86.9	84.8*
France	103.2	107.6	97.7	100.1	Sweden	85.5	97.0	68.1	85.8
Germany	88.6	92.5	85.1	85.8	Switzerland	80.0	84.5	73.8	81.7*
Greece	96.8	103.4	89.4	77.9	Turkey	86.0	89.1	81.1	90.0
Hungary	94.5	95.7	92.5	89.2	United Kingdom	83.6	90.6	73.9	76.1
Iceland	94.3	100.5	84.7	80.6*	United States	93.8	102.1	80.9	90.0
Ireland	84.1	89.8	75.6	70.0*	OECD	87.4	93.0	79.7	..
Israel	101.2	109.7	88.9	80.7	Other G20 countries				
Italy	99.6	107.8	91.4	87.9	Brazil	117.7	117.5	118.1	122.5*
Japan	87.8	89.7	85.5	88.7	China	83.9	85.0	81.9	..
Korea	65.1	72.2	54.6	..	India	108.5	106.8	112.2	116.9*
Latvia	71.3	78.3	63.5	72.9*	Russian Federation	81.3	82.9	79.0	..
Lithuania	74.1	81.6	65.2	73.4*	South Africa	95.8	94.3	99.2	..
Luxembourg	105.3	107.0	102.4	..					

Notes: * = Data for mid-1990s unavailable, so data for mid-2000s shown: 2005 except for Austria and Spain (2007), Brazil, Chile and Switzerland (2006), India (2004). Most recent data are for 2016 except for the following countries: Canada, Chile, Finland, Israel, Korea, Norway, Sweden, the United Kingdom and the United States (2017), Iceland, Japan, Switzerland, South Africa and Turkey (2015), New Zealand (2014), Brazil (2013), China and India (2011). Mid-1990s data – where available – are for 1995 except for the following countries: France (1996), Greece, Mexico, Turkey and the United Kingdom (1994). Due to a break in series, 2006-data for Chile as well as mid-1990s data (except for Canada and Finland) are scaled with a factor measuring the age-specific effect of the series break on income levels using data from 2011 or closest available. .. = Historical data for Estonia, Korea and Luxembourg are not comparable due to breaks in series and those for China, the Russian Federation and South Africa are unavailable and are not shown here.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm>.

StatLink  <https://doi.org/10.1787/888934042105>

Figure 7.1. **Income sources of older people, 2016 or latest available year**
% of total equivalised gross household income and transfers



Note: Income from work includes both earnings (employment income) and income from self-employment. Private occupational transfers include pensions, severance payments, death grants and other. Capital income includes private personal pensions and income from the returns on non-pension savings. Data are for 2016 except for some countries; see note of Table 7.1.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink  <https://doi.org/10.1787/888934042124>

Key Results

On average in the OECD, 13.5% of individuals aged over 65 live in relative income poverty, defined as having an income below half the national median equivalised household disposable income. Their income gap to the relative poverty line is 23.5% on average. Poverty rates are higher for older people than for the population as a whole, which averages 11.8%. However, this result is driven by a handful of countries. In 20 out of 36 OECD countries, the old-age income poverty rate is lower than for the population as a whole. It tends to rise with age during retirement and is higher for women. In recent decades, poverty has tended to shift from people aged over 65 to people aged 18 to 25.

According to the latest available figures, relative poverty rates of people aged over 65 exceeded 40 percent in Korea, were above 30 percent in Estonia and Latvia, and more than 20 percent in Australia, Lithuania, Mexico and the United States. By contrast, the Czech Republic, Denmark, France, Iceland, the Netherlands, Norway and the Slovak Republic have the lowest relative poverty rates, below 5%. The first-tier pension level is an important factor influencing old-age poverty rates (see the indicator on “Basic, targeted and minimum pensions” in Chapter 4). There are considerable country differences in wealth (housing or otherwise) held by older people, which is not reflected in income poverty rates.

In 15 OECD countries, older people are more likely to be income poor than the total population (Figure 7.2). In these countries, the average old-age poverty rate is equal to 22% compared to 14% in the total population. The largest difference between the two is found in Korea where older people have 26 percentage-point higher poverty rates than the total population, followed by Estonia, Latvia and Australia. Apart from Finland, where rates are identical, older people are less likely to be poor than the total population in the other 20 OECD countries. Most notably among these are Greece, the Netherlands and Spain, where the old-age poverty rate is about 6 percentage points lower.

G20 countries beyond the OECD paint a very diverse picture. Poverty rates among the over-65s are high in China (39%) and India (23%). Brazil records a lower rate of 8% for the over-65s, far below the rate of 20% in the total population.

Poverty among older age groups

Poverty among the “younger old” (aged 66-75) is less frequent than among the “older old” (aged 75 and over); the OECD average poverty rates are 11.6% and 16.2%, respectively. The difference between the two is particularly high in Korea (+20.4 percentage points), Latvia (+15.2), and Estonia (+13.7). There are many explanations for this pattern. In Korea, the pension system is still maturing guaranteeing a higher pension income to younger generations. Moreover, in all three countries, individual pensions are indexed to less than earnings growth (Table 4.3 in Chapter 4). This lowers the relative value of pensions compared to earnings when retirees grow older, as earnings tend to grow in real terms over time. Also, women

predominate among the older age group. Nevertheless, in five OECD countries – Austria, Chile, Hungary, Luxembourg and Poland – the over 75s fare slightly better than their younger counterparts do.

Poverty and gender

Older women are at greater risk of poverty than older men in all countries except Chile where risks are nearly equal. The average old-age poverty rates for women and men in the OECD equal 15.7% and 10.3%, respectively. Lower earnings-related pension income and longer life expectancy are among the main drivers of higher poverty incidence among women than among men.

The smallest gender differences in the poverty rate apart from Chile are observed in Brazil, Denmark, France, Hungary, Ireland and the Netherlands with less than 2 percentage points. The largest gender differences, more than 15 percentage points, are in Baltic countries, followed by Korea at about 12 percentage points. There are also significant differences of more than 5 percentage points in Austria, Canada, the Czech Republic, Israel, Japan, New Zealand, Poland, Slovenia, Sweden, the United Kingdom and the United States.

Definition and measurement

For international comparisons, the OECD treats poverty as a “relative” concept. The yardstick for poverty depends on the median household income in the total population in a particular country at a particular point in time. Here, the poverty threshold is set at 50% of median, equivalised household disposable income. Poverty depth measures how much the average income of the poor is below the relative poverty threshold, in percent of this threshold. See OECD Income Distribution Database for more details on definitions and data sources.

Further Reading

OECD (2019), *Income Distribution Database*, <http://www.oecd.org/social/income-distribution-database.htm> (accessed on 15 September 2019).

OECD (2017), *Preventing Ageing Unequally*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264279087-en>.

Table 7.2. Income poverty rates by age and gender, 2016 or latest available year
Percentage with income lower than 50% of median equivalised household disposable income

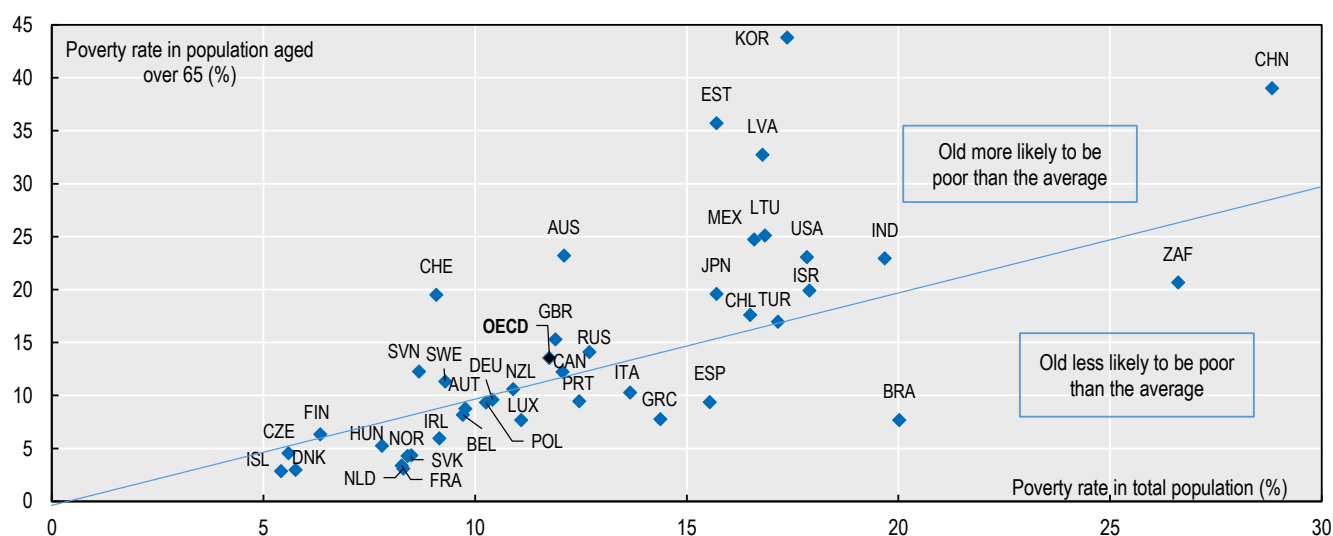
Older people (aged over 65)						Total population	Older people (aged over 65)						Total population
All	By age		By gender		All		All	By age		By gender		All	
	Age 66-75	Aged over 75	Men	Women				Age 66-75	Aged over 75	Men	Women		
Australia	23.2	19.5	28.7	21.2	24.8	12.1	Mexico	24.7	22.5	28.2	23.3	25.9	16.6
Austria	8.7	9.0	8.5	5.9	11.0	9.8	Netherlands	3.1	2.0	4.9	2.8	3.5	8.3
Belgium	8.2	8.0	8.4	7.0	9.1	9.7	New Zealand	10.6	7.7	15.2	6.6	14.0	10.9
Canada	12.2	10.9	14.3	9.3	14.7	12.1	Norway	4.3	2.4	7.3	2.1	6.2	8.4
Chile	17.6	17.7	17.4	17.6	17.5	16.5	Poland	9.3	10.1	8.2	5.5	11.8	10.3
Czech Republic	4.5	4.1	5.4	1.4	6.9	5.6	Portugal	9.5	7.8	11.3	7.2	11.1	12.5
Denmark	3.0	2.0	4.5	2.1	3.7	5.8	Slovak Republic	4.3	3.6	5.7	2.6	5.5	8.5
Estonia	35.7	29.3	43.0	21.4	42.8	15.7	Slovenia	12.3	10.5	15.0	6.8	16.3	8.7
Finland	6.3	3.7	10.0	4.6	7.6	6.3	Spain	9.4	8.7	10.1	7.8	10.6	15.5
France	3.4	2.8	4.1	2.6	3.9	8.3	Sweden	11.3	7.9	16.5	7.3	14.8	9.3
Germany	9.6	8.9	9.4	7.4	10.6	10.4	Switzerland	19.5	15.5	25.0	17.0	21.6	9.1
Greece	7.8	7.6	7.9	6.4	8.8	14.4	Turkey	17.0	14.3	21.0	14.9	18.5	17.2
Hungary	5.2	5.9	4.3	4.8	5.5	7.8	United Kingdom	15.3	12.1	19.7	12.5	17.7	11.9
Iceland	2.8	2.4	3.5	1.7	3.9	5.4	United States	23.1	19.7	28.3	19.6	25.9	17.8
Ireland	6.0	4.9	7.6	5.8	6.1	9.2	OECD	13.5	11.6	16.2	10.3	15.7	11.8
Israel	19.9	17.3	23.8	16.2	23.0	17.9							
Italy	10.3	10.0	10.6	7.9	12.1	13.7	Other G20 countries						
Japan	19.6	16.7	22.9	16.2	22.3	15.7	Brazil	7.7	7.9	7.3	7.5	7.8	20.0
Korea	43.8	35.5	55.9	37.1	49.0	17.4	China	39.0	37.7	41.5	37.9	40.1	28.8
Latvia	32.7	25.6	40.8	20.0	38.8	16.8	India	22.9	23.3	22.2	21.9	24.0	19.7
Lithuania	25.1	21.7	29.2	13.4	31.0	16.9	Russian Federation	14.1	15.0	12.7	8.4	17.0	12.7
Luxembourg	7.7	8.9	5.4	6.3	8.9	11.1	South Africa	20.7	20.5	21.1	13.3	24.7	26.6

Notes: Data are for 2016 except for some countries; see note of Table 7.1 for details.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink  <https://doi.org/10.1787/888934042143>

Figure 7.2. Income poverty rates by age: older vs. total population, 2016 or latest available year



Notes: Data are for 2016 except for some countries; see note of Table 7.1 for details.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink  <https://doi.org/10.1787/888934042162>

Poverty depth

Substantial country differences exist in the so-called poverty depth measured by the gap between the average income of the poor and the relative poverty line, here defined as 50% of median income (Figure 7.3). Among the elderly, the largest poverty depth – more than 40% of the income at the poverty threshold – is in Hungary, Korea and Mexico. In Japan, the Netherlands, Spain, Turkey and the United States, the poverty depth of the 66+ exceeds 30%. The lowest average gaps of less than 15% are reported in Canada, the Czech Republic, Denmark, Estonia, Finland, Iceland, New Zealand and Sweden.

Poverty depth is smaller for the elderly (23.5%) than for all poor (30.6%). This is the opposite in only Hungary, Ireland, Korea, Mexico and Turkey as well as China and India among non-OECD G20 countries.

A higher poverty incidence tends to coincide with larger poverty depth in OECD countries. This effect is even stronger for the total population (coefficient of correlation of 0.40) than for the over-65s (0.32).

Change in poverty in recent decades

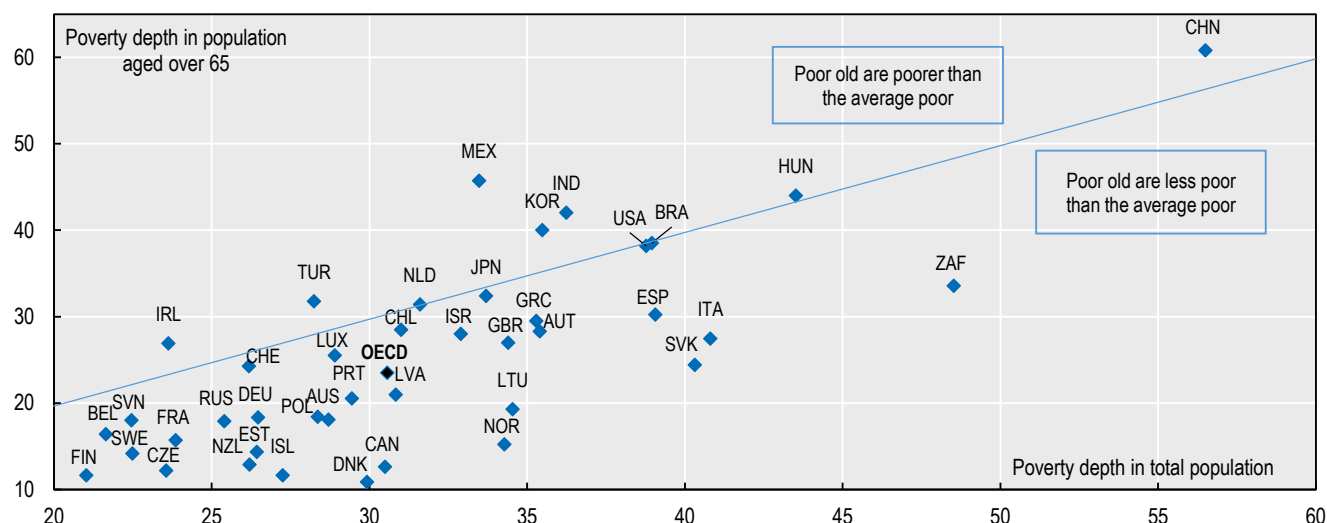
The incidence of poverty has substantially changed over time, at least in some countries (Table 7.3). Among the elderly, relative poverty rates fell between the mid-1990s and 2016 (or latest available year) in 12 out of 19 OECD countries for which data are available and on average by 2.1 percentage points. The largest declines were observed in Greece (-17.5 percentage points), Israel (-9.7) and Norway (-11.8) while poverty rates in Canada (+9.1) and New Zealand (+9.3) increased substantially.

Data are available from the mid-2000s in all OECD countries except Estonia, Korea and Luxembourg. On average, the old-age poverty rate has declined by 1.4 percentage points by 2016.

By contrast, poverty rates increased over recent decades for most parts of the population – and in particular for young adults. Difficult labour market conditions since the great recession contribute to this development. The poverty rate of the 18 to 25 year-olds increased in 16 out of 19 countries between the mid-1990s and 2016 and by 3.6 percentage points (p.p.) on average. They declined only slightly in Australia, Hungary and Mexico, and increased strongly in Denmark (+8.2), Greece (+10.1), Israel (+9.0) and Norway (+7.4). Between the mid-2000s and 2016, the OECD-33 average increased by 1.4 percentage points, with the maximum increase of 9.5 percentage points in Lithuania.

As a result, poverty shifted from the old, who used to have the highest poverty incidence, to young adults. The poverty shift, measured by the difference in poverty-rate changes for the over-65s and the 18-25s, averaged -5.7 p.p. for the OECD-19 between the mid-90s and the latest available data and at -2.8 p.p. for the OECD-33 since the mid-2000s. The most extreme shift in poverty from the old to the young happened in Denmark (-15.2), Greece (-27.6), Israel (-18.7) and Norway (-19.2) since the mid-1990s and, among additional countries for which data are available since the mid-2000s, in Ireland (-15.8), Portugal (-14.9) and Spain (-15.4). The strongest poverty shifts in the opposite direction, hence from young to old, were in Canada (+8.4) since the mid-1990s and in Latvia (+12.6) since the mid-2000s.

Figure 7.3. **Income poverty depth by age: older vs. total population, 2016 or latest available year**
Mean income gap of poor population relative to the poverty line (in % of the poverty-line income)



Note: Data are for 2016 except for some countries; see note of Table 7.1 for details. In Spain, for example, the average income of the poor aged over 65 is 30.2% below the income threshold that determines whether a person counts as poor, which equals 50% of the median income in the total population here. That is, their average income is equal to 34.9% of median income. The average income of all poor in Spain is 39.1% below that poverty line.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink <https://doi.org/10.1787/888934042181>

Table 7.3. **Change in relative income poverty rates between the mid-1990s and 2016 by age**
Percentage-point change in share with income lower than 50% of median equivalised household disposable income

Country (* change since mid-2000s instead of mid-1990s)	Aged over 65	Age 0-17	Age 18-25	Age 26-65	Total	Poverty shift: aged over 65 vs. 18-25	Country (* change since mid-2000s instead of mid-1990s)	Aged over 65	Age 0-17	Age 18-25	Age 26-65	Total	Poverty shift: aged over 65 vs. 18-25
Australia	0.8	-0.4	-0.2	0.1	0.5	0.9	Latvia*	9.6	-5.8	-3.0	-2.4	-0.8	12.6
Austria*	-4.6	1.8	2.9	0.3	0.1	-7.5	Lithuania*	9.7	-0.4	9.5	0.0	2.6	0.2
Belgium*	-7.4	2.9	2.6	1.5	0.5	-9.9	Luxembourg	..	..	..	..	..	..
Canada	9.1	-4.1	0.6	0.4	0.2	8.4	Mexico	-3.6	-3.0	-1.0	-2.0	-2.6	-2.6
Chile*	0.5	-4.7	0.3	-3.7	-3.6	0.2	Netherlands	-0.4	1.2	4.6	2.8	1.9	-5.0
Czech Republic*	2.2	-1.1	0.7	0.0	0.1	1.5	New Zealand	9.3	1.4	1.7	2.3	2.7	7.6
Denmark	-7.0	1.9	8.2	2.2	1.2	-15.2	Norway	-11.8	4.8	7.4	2.7	1.4	-19.2
Estonia	..	..	..	..	..	..	Poland*	5.0	-8.5	-2.7	-1.1	-2.1	7.7
Finland	1.0	1.6	5.2	2.0	2.1	-4.2	Portugal*	-8.5	1.0	6.4	1.3	-0.2	-14.9
France	-0.8	2.5	1.6	0.3	0.5	-2.3	Slovak Republic*	-2.2	4.4	1.3	1.5	1.2	-3.5
Germany	-0.3	4.3	5.4	3.8	3.3	-5.8	Slovenia*	-2.3	1.1	2.0	2.4	1.6	-4.3
Greece	-17.5	5.6	10.1	2.6	0.8	-27.6	Spain*	-10.2	1.6	5.2	4.1	1.4	-15.4
Hungary	2.8	0.0	-1.0	2.9	1.9	3.9	Sweden	7.1	6.8	2.6	5.5	5.7	4.5
Iceland*	-1.4	-1.9	-0.1	-0.2	-0.9	-1.3	Switzerland*	1.7	-1.5	-0.1	-1.5	-0.6	1.8
Ireland*	-12.5	-3.6	3.3	-0.6	-2.3	-15.8	Turkey	-6.1	6.4	3.6	-0.1	1.5	-9.7
Israel	-9.7	11.5	9.0	3.3	5.9	-18.7	United Kingdom	-2.9	-4.4	2.6	0.9	-0.5	-5.5
Italy	-6.6	-2.5	2.3	0.7	-1.1	-8.9	United States	0.6	-1.2	1.8	2.5	1.3	-1.2
Japan	-3.4	1.8	3.4	1.7	2.0	-6.9	OECD19	-2.1	1.8	3.6	1.8	1.5	-5.7
Korea	..	..	..	..	..	..	OECD33*	-1.4	0.0	1.4	0.7	0.3	-2.8

Notes: Except for some countries, most recent data are for 2016 while mid-1990s data are for 1995 and adjusted for a break in series. Where mid-1990s data are unavailable mid-2000s data are shown, which are for 2005 except for some countries. See note of Table 7.1 for details. Historical data for Estonia, Korea and Luxembourg are not comparable due to breaks in series and are not shown here.

Source: OECD calculations based on OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink <https://doi.org/10.1787/888934042200>

Key Results

On average in the OECD, the Gini of disposable income equals 0.302 among people aged over 65. The highest value is observed for Mexico (0.500) and the lowest in the Czech Republic (0.185). Two other measures of income inequality, the P90/P10 and the P50/P10 ratios, paint a similar picture across countries as the coefficient of linear correlation between the Gini and both percentile ratios are very high at 0.93 and 0.84, respectively. Income inequality tends to be lower among the elderly than in the total population. For the Gini this holds for more than two-thirds of OECD countries and by 0.015 points on average.

According to the latest available figures, the Gini of disposable income for people aged over 65 were very high in Mexico (0.500), Chile (0.441), Korea (0.419) and the United States (0.411). By contrast, the Czech Republic (0.185), the Slovak Republic (0.202), Belgium (0.222), Norway (0.225), Denmark and Finland (both 0.233) as well as the Netherlands (0.235) have the lowest Ginis. Such a range means that there are huge differences in the level of old-age income inequality across OECD countries.

In 25 OECD countries, income inequality for the total population (measured by the Gini index) is higher than among older people. The largest difference equalling 0.068 for the Ginis is found in the Czech Republic, followed by Greece, the Netherlands and Belgium. Important factors that explain a lower level of inequality in old-age are first-tier pension benefits, other redistributive features of earnings-related pension schemes and ceilings on pensionable earnings (Chapter 4). Yet, older people are more unequal than the total population in 11 countries, most notably Korea and Mexico.

Except for the Russian Federation, income Ginis for people over 65 in G20-countries lie far above the OECD average. The age pattern is similar to the OECD average except for China and India where Ginis for the over-65s markedly exceed those for the total population.

P90/P10 and P50/P10 ratios

The coefficient of correlation between the Gini and both the 90/10 and the 50/10 percentile ratios are very high (0.93 and 0.84, respectively), indicating a very similar country ranking of income inequality as for the Gini. Also the age pattern follows mostly the one observed for the Gini.

On average in the OECD, a person at the 90th percentile of the disposable income distribution among the over-65 year olds has an income equal to 3.8 times the one at the 10th percentile. At the 50th percentile, the income is 1.8 times the P10 level. Among OECD countries, highest P90/P10 ratios for older people are again in Mexico (9.5), Korea (7.0) and Chile (6.6). For the P50/P10 ratio, the United States replaces Chile among the three OECD countries with the highest inequality. Percentile ratios are extremely high in China where P90/10 and P50/P10 ratios are equal to 29.0 and 8.9, respectively.

The Czech Republic (2.2), Denmark (2.3), the Netherlands and the Slovak Republic are the only countries reporting a P90/P10 ratio below 2.5. Along with Australia,

those countries also report the lowest P50/P10 ratios of 1.3 or 1.4.

Change of inequality over time

Income inequality at ages over 65 has, on average, barely changed over recent decades. For the 19 countries with available data, the average Gini index has been stable between the mid-1990s and 2016 or the latest available data. This was also the case since the mid-2000s for the OECD-33. There was an increase of income inequality for the total population among OECD-19 countries since the mid-1990s, with an average Gini increase of 0.011.

While the average movements in inequality at older ages were moderate in the OECD, there are substantial country differences. Inequality among older people decreased markedly since the mid-1990s in Greece, Israel and Turkey (by more than 0.05). Such a large decline is also recorded in the Slovak Republic but over the shorter period since the mid-2000s. At the other end of the country range, New Zealand and Sweden report large increases in inequality since the mid-90s, as well as Australia, Denmark and the United States to a lesser extent and Lithuania over the shorter time span.

Definition and measurement

Gini and percentile ratios are core measures of inequality, here based on the distribution of equivalised household disposable income. The Gini index is defined between 0 (complete equality between all) and 1 (complete inequality, i.e., one person receives all income). Percentile ratios indicate the ratio of incomes of two persons who are at different positions in the disposable income distribution. The P90/P10 ratio compares the income at the 90th percentile to the one at the 10th percentile while the P50/P10 uses accordingly the 50th percentile in the numerator. See OECD Income Distribution Database for more details on definitions and data sources.

Further Reading

OECD (2019), *Income Distribution Database*, <http://www.oecd.org/social/income-distribution-database.htm> (accessed on 15 September 2019).

OECD (2017), *Preventing Ageing Unequally*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264279087-en>.

Table 7.4. Income inequality by age: older vs. total population, 2016 or latest available year
Gini coefficient, P90/P10 and P50/P10 ratios of the distribution of equivalised disposable household income

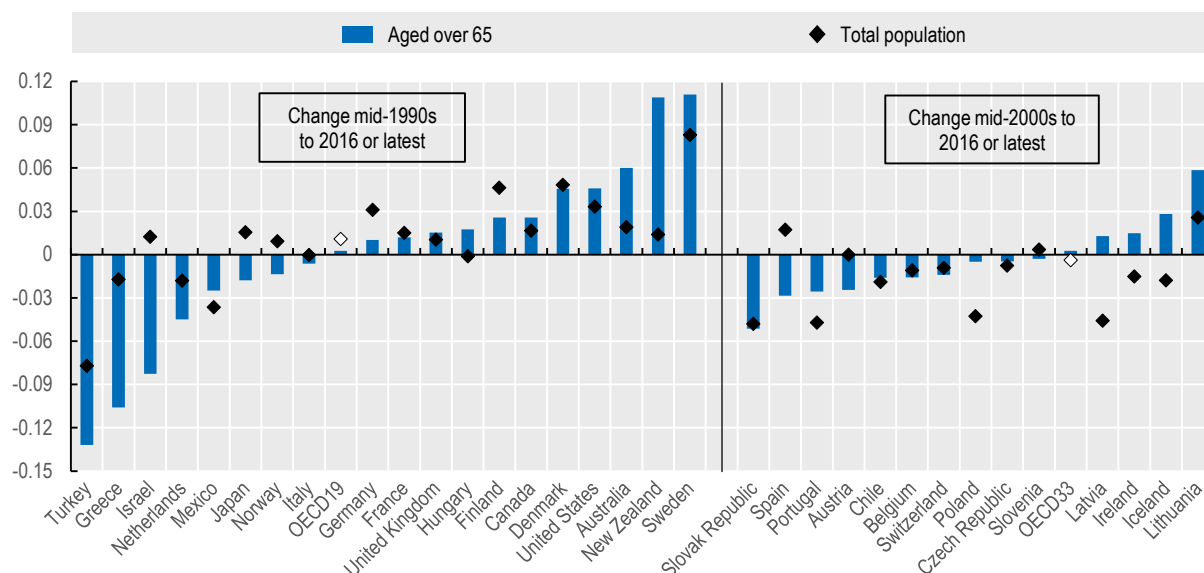
	Gini		P90/P10 ratio		P50/P10 ratio			Gini		P90/P10 ratio		P50/P10 ratio	
	Aged over 65	Total population	Aged over 65	Total population	Aged over 65	Total population		Aged over 65	Total population	Aged over 65	Total population	Aged over 65	Total population
Australia	0.325	0.330	3.1	4.3	1.4	2.1	Mexico	0.500	0.458	9.5	6.7	3.2	2.5
Austria	0.262	0.284	3.3	3.5	1.8	2.0	Netherlands	0.235	0.285	2.4	3.4	1.4	1.9
Belgium	0.222	0.266	2.6	3.3	1.5	2.0	New Zealand	0.354	0.349	3.8	4.3	1.6	2.1
Canada	0.291	0.310	3.5	4.1	1.8	2.1	Norway	0.225	0.262	2.6	3.1	1.6	1.9
Chile	0.441	0.460	6.6	7.2	2.5	2.5	Poland	0.250	0.284	3.1	3.7	1.8	2.0
Czech Republic	0.185	0.253	2.2	3.0	1.4	1.7	Portugal	0.346	0.331	4.3	4.5	1.8	2.2
Denmark	0.233	0.261	2.3	2.9	1.3	1.8	Slovak Republic	0.202	0.241	2.4	3.1	1.4	1.9
Estonia	0.283	0.314	3.2	4.7	1.5	2.3	Slovenia	0.252	0.244	3.2	3.1	1.8	1.9
Finland	0.233	0.266	2.7	3.1	1.6	1.8	Spain	0.300	0.341	3.7	5.3	1.9	2.6
France	0.273	0.291	3.0	3.4	1.7	1.9	Sweden	0.296	0.282	3.1	3.3	1.6	2.0
Germany	0.260	0.294	3.2	3.8	1.8	2.0	Switzerland	0.298	0.296	3.9	3.6	2.0	1.9
Greece	0.279	0.333	3.3	4.7	1.8	2.4	Turkey	0.376	0.404	5.0	5.7	2.1	2.3
Hungary	0.254	0.282	2.8	3.3	1.6	1.9	United Kingdom	0.336	0.357	3.9	4.3	1.9	2.1
Iceland	0.271	0.255	2.8	3.0	1.5	1.7	United States	0.411	0.390	6.9	6.2	2.7	2.7
Ireland	0.284	0.309	3.2	3.8	1.5	1.9	OECD	0.302	0.317	3.8	4.3	1.8	2.2
Israel	0.357	0.344	5.6	5.4	2.5	2.7							
Italy	0.307	0.328	3.8	4.5	1.9	2.3	Other G20 countries						
Japan	0.351	0.339	5.0	5.2	2.4	2.5	Brazil	0.440	0.470	5.5	8.7	1.9	3.0
Korea	0.419	0.355	7.0	5.8	2.7	2.8	China	0.545	0.514	29.0	23.0	8.9	7.8
Latvia	0.342	0.346	4.1	5.3	1.7	2.5	India	0.536	0.495	13.2	9.4	3.7	2.9
Lithuania	0.340	0.378	4.0	5.8	1.8	2.6	Russian Federation	0.292	0.331	3.6	4.6	1.8	2.2
Luxembourg	0.285	0.304	3.7	4.0	1.9	2.1	South Africa	0.600	0.620	12.5	25.6	2.4	4.8

Notes: Data are for 2016 except for some countries; see note of Table 7.1 for details.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink  <https://doi.org/10.1787/888934042219>

Figure 7.4. Change in income inequality over time: older vs. total population
Change in Gini of disposable income between mid-1990s or mid-2000s and 2016 or latest available year



Note: Disposable income here refers to equivalised disposable household income. Except for some countries, most recent data are for 2016 while mid-1990s data are for 1995 and adjusted for a break in series. Where mid-1990s data are unavailable mid-2000s data are shown, which are for 2005 except for some countries. See note of Table 7.1 for details. Historical data for Estonia, Korea and Luxembourg are not comparable due to breaks in series and are not shown here.

Source: OECD Income Distribution Database, <http://www.oecd.org/social/income-distribution-database.htm> (September 2019 version).

StatLink  <https://doi.org/10.1787/888934042238>

Key Results

“Average wage (AW)” is an important metric as all pension modelling results are presented as multiples of this measure. The average for all OECD countries was USD 41 479 in 2018.

Table 7.5 reports the OECD’s average wage (AW) levels for the year 2018. The wage earnings are defined as gross wages before deductions of any kind (including personal income taxes and social security contributions), but including overtime pay and other cash supplements paid to employees.

Average wages are displayed in national currencies and in US dollars (both at market exchange rates and at purchasing power parities, PPP). The PPP exchange rate adjusts for the fact that the purchasing power of a dollar varies between countries: it allows for differences in the price of a basket of goods and services between countries.

Wage earnings across the OECD countries averaged USD 41 479 in 2018 at market exchange rates. Switzerland and Iceland have the highest levels at USD 92 964 and USD 84 510, respectively. These are approximately 15 times the level recorded in Mexico, at USD 6 350, which is followed by the next lowest country, Turkey (USD 9 718).

At PPP wages averaged USD 45 6244. Switzerland is again highest amongst OECD countries, at USD 76 419, with Luxembourg, Germany and Iceland next at USD 68 240, USD 66 521 and USD 66 165 respectively. Mexico is again the lowest, at USD 13 027, but is now followed by Chile and Latvia at around USD 23 500. The higher figure for PPP wages suggests that many OECD countries’ exchange rates with the US dollar were lower than the rate that would equalise the cost of a standard basket of goods and services.

Average wages for the other major economies are not based on the average wage definition or another consistent

basis as such series are unfortunately not available. Data have been collected from national sources and thus vary between average individual income, average covered wage and average wage for a particular group of workers as available. The figures used range from a low of USD 1 522 in India to a high of USD 26 614 in Saudi Arabia, at market exchange rates.

Definition and measurement

The “average worker” earnings series (AW), defined as the average full-time adult gross wage earnings, was adopted from the second edition of *Pensions at a Glance* (OECD, 2007). This concept is broader than the previous benchmark of the “average manual production worker” (APW) because it covers more economic sectors and includes both manual and non-manual workers. The new AW measure was introduced in the OECD report *Taxing Wages* and also serves as benchmark for *Benefits and Wages*. The third edition of *Pensions at a Glance* (OECD, 2009) also included a comparison of replacement rates under the old and new measures of earnings for eight countries where the results were significantly different.

Further Reading

OECD (2019), *Taxing Wages 2019*, OECD Publishing, Paris, https://dx.doi.org/10.1787/tax_wages-2019-en.

OECD (2009), *Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries*, OECD Publishing, Paris, https://dx.doi.org/10.1787/pension_glance-2009-en.

Table 7.5. **Average wage (AW), 2018**

	OECD measures of average wages			Exchange rate, national currency per USD	
	National currency	USD, market exchange rate	USD, PPP	Market rate	PPP
Australia	85 778	64 089	59 872	1.34	1.43
Austria	47 120	55 619	59 934	0.85	0.79
Belgium	48 455	57 196	61 877	0.85	0.78
Canada	53 550	41 327	43 022	1.30	1.24
Chile	9 669 058	15 078	23 883	641.28	404.85
Czech Republic	383 304	17 639	30 377	21.73	12.62
Denmark	421 547	66 757	60 578	6.31	6.96
Estonia	16 103	19 008	29 390	0.85	0.55
Finland	43 984	51 918	50 122	0.85	0.88
France	39 436	46 549	50 904	0.85	0.77
Germany	50 546	59 664	66 521	0.85	0.76
Greece	21 214	25 040	36 459	0.85	0.58
Hungary	4 138 492	15 316	29 474	270.21	140.41
Iceland	9 152 462	84 510	66 165	108.30	138.33
Ireland	46 774	55 211	58 292	0.85	0.80
Israel	153 221	42 673	40 836	3.59	3.75
Italy	31 292	36 937	44 807	0.85	0.70
Japan	5 188 742	46 990	51 184	110.42	101.37
Korea	48 166 599	43 766	55 975	1100.56	860.51
Latvia	11 881	14 025	23 796	0.85	0.50
Lithuania	11 121	13 126	24 303	0.85	0.46
Luxembourg	59 497	70 229	68 240	0.85	0.87
Mexico	122 208	6 350	13 027	19.24	9.38
Netherlands	51 567	60 868	64 662	0.85	0.80
New Zealand	60 360	41 764	40 828	1.45	1.48
Norway	596 477	73 345	58 813	8.13	10.14
Poland	54 191	15 004	30 490	3.61	1.78
Portugal	18 343	21 652	30 908	0.85	0.59
Slovak Republic	12 131	14 319	24 846	0.85	0.49
Slovenia	19 671	23 220	33 819	0.85	0.58
Spain	26 923	31 779	41 557	0.85	0.65
Sweden	453 539	52 176	50 839	8.69	8.92
Switzerland	90 908	92 964	76 419	0.98	1.19
Turkey	46 921	9 718	29 110	4.83	1.61
United Kingdom	39 328	52 467	56 169	0.75	0.70
United States	54 951	54 951	54 951	1.00	1.00
OECD		41 479	45 624		
Other G20 countries					
Argentina	294 613	10 486	18 748	28.09	15.71
Brazil	26 929	7 370	13 275	3.65	2.03
China	72 067	10 893	20 217	6.62	3.56
India	105 963	1 549	5 845	68.39	18.13
Indonesia	31 800 000	2 234	7 490	14236.94	4245.61
Russian Federation	470 303	7 505	18 340	62.67	25.64
Saudi Arabia	99 802	26 614	63 275	3.75	1.58
South Africa	119 977	9 061	19 592	13.24	6.12

Note: USD = United States of America Dollar, PPP = purchasing power parity.

Source: OECD (2019), *Taxing Wages 2019*, OECD Publishing Paris and OECD's National Accounts database.

StatLink  <https://doi.org/10.1787/888934042257>

Chapter 8

Finances of retirement-income systems

The indicators in this chapter look at the finances of the retirement-income system. The first indicator presents an overview of the “Mandatory pension contributions” that workers have to pay towards their future pension entitlements.

The second indicator looks at the “Public expenditure on pensions”. It shows how much of gross domestic product is allocated towards national public pensions and the overall share of public pensions in the government budget. The third indicator focuses on private pension spending and looks at the total benefit spending on mandatory, quasi-mandatory and voluntary private schemes.

The final indicator presents long-term projections of pension spending and in particular the evolution of public expenditure on pensions in the period 2015-16 to 2050.

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

Key Results

Total mandatory effective pension contribution rates for an average earner averaged 18.4% in 2018 for the 33 OECD countries that have specific pension contributions. In Ireland, Spain and the United Kingdom, mandatory contributions are not earmarked for pensions and cover social insurance.

Most of the measures presented in *Pensions at a Glance* look at the benefits side of the pension system. The indicators here look at the contribution side, mapping out how much workers contributed towards their pension in 2018. Tax-financed pension benefits are not covered here.

Since different pension components in a country can be financed through different income sources mapping out the pension's contribution terrain is very important but it can also be difficult. This presentation aims to give a broad picture of the pension schemes modelled herein and where data are available.

Table 8.1 presents the 32 OECD countries where pension contributions are mandatory, either public or private, and New Zealand where there is no mandatory contributions. Countries that belong to this group have pension systems where the contribution rate paid is more directly linked to the pension system. However, there are still 12 countries within this group, Austria, the Czech Republic, Denmark, Finland, Germany, Iceland, Italy, Lithuania, Luxembourg, Poland, Slovenia and the United States, where contributions also finance disability or invalidity benefits. The average effective contribution rate in this group equalled 18.4% at the average wage in 2018. The highest total mandatory contribution rates are found in Italy at 33.0%. The Czech Republic, France and Poland also have high effective contribution rates, between 26% and 28%. By contrast the mandatory contribution in Mexico amounts to only 6.275%. In both Australia and Canada, tax-financed components play a large role and so contribution rates to contributory schemes are below 10%. The same is true for New Zealand, but as there is no mandatory earnings-related scheme the contribution level is zero.

The effective contribution rate to the public schemes is 18.1% compared to 9.1% for private schemes. Within the

public scheme employee contributions are around two-thirds of those of employers, representing effective contribution rates of 7.5% and 10.6%, respectively. In Slovenia, the split is almost reverse, as employees pay 15.5% compared to 8.85% for employers. In Australia, Estonia and Iceland, all mandatory contributions are paid by employers, while in Lithuania employees pay total contributions.

Table 8.2 looks at social insurance contribution rates that apply for a private-sector worker in Ireland, Spain and the United Kingdom. For these three countries it is difficult to separate the pension contributions from the other parts of social insurance such as survivor's benefits, disability benefits, unemployment, etc. In addition individuals cannot choose which systems to belong to and they therefore have to contribute fully to all parts.

The average contribution rate in this group is 21.2% for an average earner in 2018. The highest mandatory social insurance contributions are found in Spain at 28.3% and the lowest in Ireland at 14.75%.

Countries with higher pension contribution rates will often have above average pension benefits (as in the case of France, Iceland, Italy and the Netherlands). The choice of the contribution level should be the result of trading off lower net wages against higher future pensions. However, in addition higher mandatory contribution rates might hurt the competitiveness of the economy, and lower total employment while potentially increasing informality.

Further Reading

OECD (2019), *Taxing Wages 2019*, OECD Publishing, Paris, https://dx.doi.org/10.1787/tax_wages-2019-en.

Table 8.1. **Mandatory pension contribution rates for an average worker in 2018**

	Nominal rate					Ceiling (in % of gross average earnings), public / private	Effective rate on average earnings
	Employee, public	Employer, public	Employee, private	Employer, private	Total		
Australia			0.0	9.5	9.5	252	9.5
Austria*	10.3	12.6			22.8	152	22.8
Belgium	7.5	8.9			16.4	115	16.4
Canada	5.0	5.0			9.9	104	9.9
Chile			11.2	1.2	12.4	268	12.4
Czech Republic*	6.5	21.5			28.0	375	28.0
Denmark*			4.0	8.0	12.0	None	12.8
Estonia	0.0	16.0	2.0	4.0	22.0	None	22.0
Finland*	6.7 [a]	17.7			24.4 [a]	None	24.4 [a]
France	11.2 [w]	16.3 [w]			27.5 [w]	None (806)	27.5
Germany*	9.3	9.3			18.6	154	18.6
Greece	6.7	13.3			20.0	342	20.0
Hungary	10.0	15.5			25.5	None	25.5
Iceland*	0.0	7.4	4.0	11.5	22.9	None	22.9
Israel	3.9 [w]	2 [w]	6.0	6.5	18.4 [w]	340/78	13.8
Italy*	9.2	23.8			33.0	324	33.0
Japan	9.15	9.15			18.3	230	18.3
Korea	4.5	4.5			9.0	117	9.0
Latvia	10.0	10.0			20.0	463	20.0
Lithuania*	8.7	0.0			8.7	921	8.7
Luxembourg*	8.0	8.0			16.0	202	16.0
Mexico			1.1	5.2	6.3	601	6.3
Netherlands	18.0	0.0	7.7 [w]	14.8 [w]	x [w]	66/none	25.6
New Zealand					0.0		0.0
Norway	7.6	10.5	0.0	2.0	20.1	None/193	20.1
Poland*	11.3	16.3			27.5	264	27.5
Portugal	7.2	15.5			22.7	None	22.7
Slovak Republic	4.0	14.0			18.0	633	18.0
Slovenia*	15.5	8.9			24.4	None	24.4
Sweden	7.0	10.2	0.0	4.5 [w]	21.7 [w]	111/none	21.7
Switzerland	4.2	4.2	6.25 [a,w]	6.25 [a,w]	20.9 [a,w]	None/93	16.6 [a]
Turkey	9.0	11.0			20.0	389	20.0
United States*	6.2	6.2			12.4	234	12.4
OECD33							18.4

Note: *Contribution rate also finances disability or invalidity benefits. [a] and [w]: rate varies by age and earnings level respectively. In the private occupational schemes of the Netherlands and Switzerland contributions are only paid on the part of individual earnings exceeding 39% and 27% of average earnings respectively. Therefore, the total nominal contribution rate in the Netherlands equals 18% below 39% of average earnings, 40.5% between 39% and 66% of average earnings and 22.5% above. For occupational schemes in Denmark and the Netherlands, contribution rates are fund-specific, so typical rates are shown. In France, Latvia and Sweden, the indicated public contribution rates include contributions to mandatory occupational or personal pension schemes. Flat-rate contributions to the ATP scheme in Denmark are only included in the effective contribution rate. Public pensions in Finland are partly funded and privately managed while national accounts define them as public. For France, the total nominal rate drops from 27.5% to 24.8% at 101% of average earnings and - once the ceiling of the occupational scheme is reached (806% of average earnings for AGIRC in 2018 and AGIRC-ARRCO from 2019 while 302% in ARRCO in 2018) - it drops further to 2.3% without ceiling. For Israel, the public nominal rate for earnings below 47% of average earnings equals 1.52% compared to 5.9% above. For Sweden, the nominal rate in the private occupational scheme rises from 4.5% to 30% at 103% of average earnings. The indicated nominal rate in the private occupational scheme in Switzerland is an average of the age-specific rates (7% at ages 25-34, 10% at 35-44, 15% at 45-54 and 18% at 55-64). Likewise for employee contributions to the public scheme in Finland (7.85% between 53 and 62, otherwise 6.35%). For Latvia, contributions are assumed to be equally split between employee and employer as legislation does not make such a split explicit. For Chile, the indicated values include a 1.15%-rate for survivor pensions and a 1.23%-rate for administrative costs. In Hungary employer contributions are levied for pensions and health care together of which 79.5% go to the pension budget. For Mexico, contribution rates shown exclude contributions paid by the government to the private individual account in form of both a 0.225%-contribution and the social quota, which is an amount that varies with the wage level. Also contributions for public survivor and disability benefits of 0.625% (employee) + 1.75% (employer) + 0.125% (government) are not included. Also in Luxembourg (8%) and Israel (0.25%) the government pays contributions to mandatory pension schemes, which are excluded here. Data for Lithuania show the situation after the reform of social security contributions in June 2018.

Source: Country profiles and American Social Security Administration (various years), Social Security Programs Throughout the World.

StatLink  <https://doi.org/10.1787/888934042276>

Table 8.2. **Social insurance contribution rates for an average worker in 2016**

	Nominal rate					Ceiling (in % of gross average earnings), public / private	Effective rate on average earnings
	Employee, public	Employer, public	Employee, private	Employer, private	Total		
Ireland	4.0	10.8			14.8	None	14.8
Spain	4.7	23.6			28.3	170	28.3
United Kingdom	12 [w]	13.8 [w]			25.8 [w]	None	20.4

Note: The indicated rates cover different social security schemes across countries. Ireland: All schemes excluding for sickness and maternity benefits in kind. Spain: All schemes except for unemployment. United Kingdom: Old age, survivor, disability, sickness and maternity, work injury and unemployment. In the United Kingdom contributions are only paid on the part of individual earnings exceeding 21% of average earnings. Moreover, the employee contribution drops from 12% to 2% at 115% of average earnings.

Source: Country profiles and American Social Security Administration (various years), Social Security Programs Throughout the World.

StatLink  <https://doi.org/10.1787/888934042295>

Key Results

Public spending on cash old-age pensions and survivors' benefits in the OECD increased from an average of 6.6% of gross domestic product (GDP) to 8.0% between 2000 and 2015. Public pensions are often the largest single item of social expenditure, accounting for 18.4% of total government spending on average in 2015.

Greece spent the largest proportion of national income on public pensions among OECD countries in 2015: 16.9% of GDP. Other countries with high gross public pension spending are in continental Europe, with Italy at 16.2% and Austria, France and Portugal at between 13% and 14% of GDP. Public pensions generally account for between one-fourth and one-third of total public expenditure in these countries.

Iceland and Mexico spent 2.1% and 2.2% of GDP on public pensions, respectively. Korea is also a low spender at 2.9% of GDP. Mexico has a relative young population, which is also the case but to a lesser extent in Iceland, where much of retirement income is provided by compulsory occupational schemes (see the next indicator of "Pension-benefit expenditures: Public and private"), leaving a lesser role for public pensions; in addition the retirement age is high at age 67. Korea's pension system is not mature yet: the public, earnings-related scheme was only established in 1988 and the new targeted basic pension was introduced only in 2014. In Mexico, low spending also reflects relatively narrow coverage of pensions (only around 35% of employees).

Spending also tends to be low in countries with favourable demographics, such as Australia, Canada, Ireland and New Zealand. However, this is not always the case: Turkey spends 7.1% of GDP on public pensions despite being the second youngest OECD country in demographic terms. This is more than the Netherlands, Switzerland and the United Kingdom, despite the fact that these countries have a higher share of people aged over 65 as a share of the total population than in Turkey.

Trends

Public pension spending was fairly stable as a proportion of GDP over the period 1990-2015 in ten countries: Australia, Germany, Iceland, Israel, Lithuania, New Zealand, Poland, Slovenia, Sweden and Switzerland.

Public pension expenditure increased by more than 4 points of GDP between 2000 and 2015 in Finland, Greece, Portugal and Turkey, and between 2 and 3 percentage points in France, Italy, Japan and Spain.

Gross and net spending

The penultimate column of the table shows public spending in *net* terms: after taxes and contributions paid on benefits. Net spending is significantly below gross spending in Austria, Belgium, France, Italy, Poland, Switzerland and the Nordic countries, due to taxes on pension benefits. Gross and net spending are similar where pensions are not taxable such as in the Slovak Republic or where public benefits are generally below basic tax reliefs (Australia, the Czech Republic, Ireland and Slovenia).

Non-cash benefits

The final column of the table shows total gross public spending on older people, including non-cash benefits. In Denmark, Norway and Sweden, non-cash benefits exceed 2% of GDP. The most important are housing benefits. These are defined as "non-cash benefits" because they are contingent on particular expenditure by individuals. Australia, Finland, Japan and the Netherlands also record high figures for non-cash benefits.

Table 8.3. Public expenditure on old-age and survivors benefits

	Level (% of total government spending)		Level (% of GDP)					Change of level	Level in net terms (% of GDP)	Total including non-cash (% of GDP)
	2000	2015	1990	2000	2005	2010	2015	2000-2015	2015	2015
Australia	11.4	11.4	3.1	4.7	3.7	3.8	4.3	-0.4	4.3	5.3
Austria	23.3	26.1	11.3	11.9	11.9	13.0	13.3	1.4	10.9	13.9
Belgium	17.8	19.9	8.9	8.8	8.9	9.8	10.7	2.0	9.3	11.0
Canada	10.1	11.5	4.2	4.2	4.0	4.3	4.7	0.5	4.4	4.7
Chile			8.0	5.0	3.7	3.4	2.9	-2.1	2.9	2.9
Czech Republic	16.8	19.4	5.6	6.9	6.7	8.1	8.1	1.2	8.1	8.3
Denmark	12.0	14.8	6.1	6.3	6.5	7.2	8.1	1.8	5.9	10.2
Estonia	16.5	17.4		6.0	5.3	7.6	7.0	1.0	6.9	7.1
Finland	15.5	20.0	7.2	7.4	8.1	9.8	11.4	4.0	9.2	13.0
France	22.2	24.4	10.4	11.4	12.0	13.2	13.9	2.5	12.5	14.3
Germany	24.2	23.1	9.5	10.8	11.1	10.6	10.1	-0.7	9.7	10.1
Greece	21.9	31.3	9.5	10.2	11.4	14.2	16.9	6.7	15.7	16.9
Hungary	15.8	18.4		7.4	8.3	9.6	9.2	1.8	9.2	9.7
Iceland	5.1	4.9	2.2	2.1	1.9	1.6	2.1	0.0	1.8	2.5
Ireland	9.5	12.4	4.8	2.9	3.2	4.9	3.6	0.7	3.5	3.9
Israel	9.4	12.0		4.5	4.7	4.8	4.8	0.3	4.8	5.4
Italy	28.9	32.2	11.4	13.5	13.7	15.4	16.2	2.7	13.2	16.2
Japan		23.9	4.7	7.0	8.1	9.6	9.4	2.4	8.9	11.1
Korea	5.4	9.0	0.7	1.3	1.5	2.1	2.9	1.6	2.9	3.0
Latvia	23.2	18.4		8.7	5.5	9.3	7.0	-1.6	6.7	7.4
Lithuania	17.9	19.2		7.1	5.7	7.7	6.7	-0.4		6.9
Luxembourg	18.8	20.1	7.8	7.1	7.8	8.0	8.4	1.2	7.1	8.4
Mexico		7.9	0.4	0.8	1.0	1.6	2.2	1.5	2.2	2.2
Netherlands	11.2	12.0	6.3	4.7	4.7	5.0	5.4	0.7	4.9	6.2
New Zealand	13.0	12.7	7.2	4.8	4.2	4.6	4.9	0.1	4.2	4.9
Norway	11.2	13.5	5.5	4.7	4.8	5.2	6.6	1.9	5.3	8.8
Poland	24.9	26.4	5.0	10.5	11.3	11.1	11.1	0.7	9.6	11.2
Portugal	18.3	27.7	4.8	7.8	10.0	12.0	13.3	5.5	13.3	13.4
Slovak Republic	12.0	16.2		6.3	6.0	6.8	7.3	1.1	7.3	7.6
Slovenia	22.4	23.3		10.3	9.7	11.0	11.1	0.8	11.1	11.3
Spain	21.5	25.2	7.7	8.4	7.9	9.1	11.0	2.6	10.5	11.6
Sweden	12.9	14.4	7.3	6.9	7.2	7.3	7.2	0.3	5.5	9.4
Switzerland	17.8	19.1	5.1	6.0	6.2	6.1	6.5	0.5	5.1	6.8
Turkey		21.4	0.7	1.8	6.0	7.4	7.1	5.3	7.1	7.1
United Kingdom	13.4	14.8	4.5	4.8	5.0	6.3	6.2	1.4	5.9	6.6
United States	16.7	18.7	5.8	5.6	5.7	6.6	7.1	1.4	6.5	7.1
OECD	16.3	18.4	6.3	6.6	6.8	7.7	8.0	1.4	7.3	8.5

Note: See Adema, W. and M. Ladaique (2009), "How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)", *OECD Social, Employment and Migration Working Paper*, No. 92, OECD, Paris, <http://dx.doi.org/10.1787/220615515052> for more details on the data, sources and methodology.

Source: OECD Social Expenditures Database (SOCX); OECD Main Economic Indicators Database.

StatLink  <https://doi.org/10.1787/888934042314>

Key Results

Payments from private pension schemes were worth 1.5% of gross domestic product (GDP) on average in 2015, representing about one-fifth of total – public and private – spending, having increased from 0.7% of GDP in 1990 and 1.2% in 2005.

Private pensions are mandatory or achieve near-universal coverage through industrial relations agreements (“quasi-mandatory”) in less than half of the 36 OECD countries. In others, voluntary private pensions – either individual (“personal”) or employer-provided (“occupational”) – have broad coverage.

The biggest flow of private-pension payments is in the Netherlands: 5.8% of GDP in 2015. Added to public spending, total benefits are 11.2% of GDP. The United States is next at 5.2% followed by Switzerland at 5.1% of GDP. While Swiss occupational plans are compulsory, the data on private-pension payments include benefits from voluntary schemes above the statutory minimum level. Next is the United Kingdom at 5.0% when summing both the mandatory and voluntary components.

The next four countries – Australia, Canada, Iceland and Sweden – record private-pension payments of between 2.9% and 4.7% of GDP. Japan (where private pensions are voluntary) also has high levels of expenditure on private pensions, at 2.8% of GDP. Iceland has the highest share of private in total pension expenditure at 66%.

Many countries introduced compulsory private pensions in the 1990s: Australia, Estonia, Mexico, Poland, the Slovak Republic and Sweden. In some cases – particularly in Central and Eastern Europe – these new schemes were mainly taken up by younger workers. Many of them have yet to begin paying benefits and some have since reversed the decision with mandatory private schemes removed in Poland and becoming voluntary in the Slovak Republic. Much of the private benefit pay-outs recorded in Australia and Sweden relate to voluntary and quasi-mandatory (respectively) schemes that were already in place before private pensions were made compulsory. In all these cases, it will be some decades before all retirees have spent a full career in compulsory private pension plans.

Trends

The countries that have recorded an increase larger than 1 percentage point of GDP between 2000 and 2015 are Australia, Iceland, the Netherlands, Sweden, Switzerland and the United States. In some cases such as Iceland, Sweden and Switzerland, the starting point was below 0.5% of GDP. In the latter, occupational pensions became compulsory in 1985, which extended coverage significantly.

This is now being reflected in the rapid growth in private pension entitlements as each successive generation of retirees has spent longer on average covered by private pensions. Overall in the OECD, private pensions accounted for 13% of total pension expenditure in 1990, increasing to 20% by 2000 with that share being broadly stable since.

Tax breaks

Many OECD countries offer favourable tax treatment to retirement savings made through private pension plans. Often, individual contributions are fully or partially deductible from income and investment returns are fully or partially relieved from tax. Some countries offer tax relief on pension payments (see “Tax treatment of pensions and pensioners” in Chapter 5).

The cost of these fiscal incentives is measured in many OECD countries using the concept of “tax expenditures”, developed in the 1960s. This attempts to quantify the value of the preferential tax treatment relative to a benchmark tax treatment. The idea is that this is the amount of revenue forgone as a result of the tax incentives.

Data on tax expenditures for retirement savings are available for 23 OECD countries. Just under half of these figures are 0.2% of GDP or less. And in only seven countries – Australia, Canada, Germany, Ireland, Israel, Sweden and the United Kingdom – are reported tax expenditures worth 1% of GDP or more.

Tax expenditure figures come with important caveats: they are not comparable between countries because of differences in the benchmark tax system chosen. Despite their name, they are not equivalent to direct expenditures and so should not be added to numbers for public pension spending.

Further Reading

Adema, W. and M. Ladaïque (2009), “How Expensive is the Welfare State?: Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)”, *OECD Social, Employment and Migration Working Papers*, No. 92, OECD Publishing, Paris, <https://dx.doi.org/10.1787/220615515052>.

OECD (2010), *Tax Expenditures in OECD Countries*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264076907-en>.

Table 8.4. **Private pension-benefit expenditures**

Country	Scheme type	Level (% of GDP)					Change of level 2000-2015	Public and private benefit spending (% of GDP) 2015	Tax breaks (% of GDP) 2015
		1990	2000	2005	2010	2015			
Australia	m	0.0	2.9	1.9	3.4	4.7	1.8	9.0	1.7
Austria	v	0.4	0.6	0.5	0.6	0.7	0.1	14.0	0.0
Belgium	v	1.0	1.3	1.5	1.1	1.1	-0.2	11.8	0.2
Canada	v	2.5	3.9	4.2	3.4	3.1	-0.8	7.8	1.9
Chile	m	0.3	1.1	1.2	1.3	1.4	0.4	4.3	0.4
Czech Republic	v	0.0	0.2	0.2	0.4	0.3	0.1	8.4	
Denmark	q/m	0.0	0.0	0.0	2.0	2.6	2.6	11.5	
	v	1.6	2.4	2.5	1.2	0.8	-1.7		
Estonia								7.0	0.7
Finland	v	0.1	0.3	0.2	0.2	0.2	0.0	11.6	0.1
France	m	0.2	0.2	0.2	0.0	0.0	-0.1	14.1	0.1
	v	0.1	0.1	0.1	0.2	0.1	0.0		
Germany	v	0.7	0.7	0.7	0.8	0.8	0.1	10.9	1.0
Greece	v	0.3	0.0	0.1	0.1	0.1	0.0	16.9	
Hungary								9.2	0.0
Iceland	m	1.4	2.3	2.8	3.4	4.0	1.7	6.1	0.9
Ireland	v	0.9	1.0	1.5	1.8	1.1	0.1	4.7	1.0
Israel	v	0.0	0.7	1.5	1.3	1.3	0.5	6.1	1.2
Italy	v	1.1	1.1	1.1	1.3	1.2	0.1	17.4	0.0
Japan	m	0.2	0.4	0.4	0.6	0.5	0.0	12.1	
	v	0.0	2.8	2.1	2.6	2.3	-0.5		
Korea	v	0.2	0.6	0.4	0.4	0.8	0.2	3.7	
Latvia								7.0	0.1
Lithuania								6.7	
Luxembourg								8.4	
Mexico								2.2	0.2
Netherlands	q	3.6	4.6	4.9	5.5	5.8	1.2	11.2	
New Zealand								4.9	
Norway	v/m	0.6	0.6	0.6	0.6	1.0	0.4	7.6	0.2
Poland								11.1	
Portugal	v	0.3	0.2	0.3	0.2	0.7	0.5	14.0	0.0
Slovak Republic	v	0.0	0.2	0.4	0.3	0.4	0.2	7.7	
Slovenia								11.1	0.3
Spain	v	0.0	0.0	0.0	0.5	0.4	0.4	11.5	0.2
Sweden	q/m	1.2	1.7	1.9	2.3	2.9	1.3	10.1	
Switzerland	m	2.2	4.0	4.5	4.7	5.1	1.1	11.5	1.2
Turkey								7.1	
United Kingdom	m	0.1	0.4	0.5	0.6	0.7	0.4	11.2	1.2
United States	v	2.6	3.6	3.6	4.4	5.2	1.6	12.3	0.8
OECD		0.7	1.2	1.2	1.4	1.5	0.3	9.5	0.6

Note: m = mandatory private scheme, q = quasi mandatory; and v = voluntary. Blank cells indicate missing values.

Source: OECD Social Expenditures Database (SOCX); OECD Main Economic Indicators Database. See Adema and Ladaique (2009) for more details on the data, sources and methodology.

StatLink  <https://doi.org/10.1787/888934042333>

Key Results

Public spending on pensions has been on the rise in most OECD countries for the past decades, as shown in Table 8.3. Long-term projections show that pension spending is expected to go on growing in 21 OECD countries and fall in 15. On average public pension expenditure is projected to increase from 8.8% of gross domestic product (GDP) in 2015-16 to 9.4% of GDP in 2050.

The main driver of growing pension expenditures is demographic change. The projections shown in Table 8.5 are derived either from the European Commission's 2018 *Ageing Report* – which covers the EU28 members plus Norway – or from Standard & Poor's Global Ageing 2016 report. In the main table, data are presented forwards to 2060 for those countries where the figures are available. However, since the horizon is 2050 only for 11 OECD countries and all the other major economies this is the main comparison in the table.

Long-term projections are a crucial tool in planning pension policy: there is often a long time lag between when a pension reform occurs and when it begins to affect expenditure. There are some differences in the range of different programmes covered in the forecasts, reflecting the complexity and diversity of national retirement-income provision. For example, data for a number of countries do not include special schemes for public-sector workers while in others they are included. Similarly, projections can either include or exclude spending on resource-tested benefits for retirees. The coverage of the data also differs from the OECD *Social Expenditures Database* (SOCX), from which the data on past spending trends in the previous two indicators were drawn. The numbers for 2015-16 may differ between the SOCX database and the sources used here because of the different range of benefits covered and the definitions used.

Nevertheless, the figures do reveal broad trends. Pension spending is projected to grow from 8.8% of GDP to 9.4% of GDP by 2050 on average across all OECD countries. In the EU28 it is projected to increase from 10.0% of GDP in 2020 to 10.7% of GDP in 2045, after which it is effectively flat. This would be a significant achievement given the demographic change throughout the time period. The indicator of the “Demographic Old-Age to Working-Age Ratio” in Chapter 6 shows a 95% increase in the number of people above age 65 per 100 people aged between 20 and 64 from today until

2050. Cuts in benefits for future retirees at least relative to wages, through lowered indexation and valorisation of benefit formulae, together with increases in the age at which individuals can first claim pension benefits, will reduce growth in public pension expenditure.

Public pension expenditure is expected to increase in 21 OECD countries by 2050. In Korea, pension spending would more than double by 2050, though the increase is from a low base. This rapid increase reflects both the ageing process and the still maturing pension system. In Slovenia, public spending is projected to rise further: from above the OECD average at 10.9% of GDP in 2015-16, to 15.6% of GDP by 2050. According to these projections, six other countries would record an increase of more than 2% of GDP: Belgium, the Czech Republic, Germany, Ireland, Luxembourg and New Zealand. Conversely, Estonia, Sweden and Turkey would have a fall of about 1.5-2% of GDP and Greece almost 5%.

Long-term public pension spending is expected to increase in all major non-OECD economies but India, where it is constant at 1% of GDP, reflecting the low coverage levels. Most notable increases are in Brazil where pension expenditure would grow from 9% currently and reach 17% of GDP by 2050 and in Saudi Arabia from 2.7% in 2015 to 9.4% of GDP by 2050.

Further Reading

European Commission (2018), “2018 Ageing Report; Economic and budgetary projections for the 28 EU Member States (2016-2070),” Vol. Publications Office of the European Union, Luxembourg.

Standard & Poor's (2016), , *Global Aging 2016: 58 Shades of Gray*, McGraw Hill Financial, https://www.agefiactifs.com/sites/agefiactifs.com/files/fichiers/2016/05/global_aging_2016_-_58_shades_of_gray_28_apr_16.pdf.

Table 8.5. Projections of public expenditure on pensions, 2015-60, % of GDP

	2015-2016	2020	2025	2030	2035	2040	2045	2050	2055	2060
Australia	4.0							3.7		
Austria	13.8	13.9	14.0	14.4	15.0	14.9	14.6	14.6	14.7	14.7
Belgium	12.1	12.6	13.4	13.8	14.2	14.5	14.6	14.7	14.8	14.9
Canada	5.5							6.9		
Chile	5.1							4.2		
Czech Republic	8.2	8.1	8.1	8.2	8.5	9.2	10.1	10.8	11.5	11.6
Denmark	10.0	9.3	8.8	8.6	8.4	8.2	7.9	7.8	7.6	7.5
Estonia	8.1	7.8	7.3	7.2	7.1	7.1	7.1	7.1	7.1	6.9
Finland	13.4	13.8	14.5	14.8	14.5	13.9	13.4	13.2	13.2	13.5
France	15.0	15.0	15.3	15.4	15.3	15.1	14.4	13.8	13.1	12.5
Germany	10.1	10.3	10.8	11.5	11.9	12.0	12.1	12.2	12.4	12.5
Greece	17.3	13.4	12.2	12.0	12.3	12.9	12.6	12.5	11.9	11.5
Hungary	9.7	9.0	8.7	8.4	8.6	9.4	10.3	10.6	10.8	11.1
Iceland	3.3							3.5		
Ireland	5.0	5.1	5.5	5.8	6.3	6.7	7.1	7.4	7.5	7.2
Israel	5.3							6.2		
Italy	15.6	15.6	16.4	17.2	18.2	18.7	18.4	17.3	15.9	15.1
Japan	10.2							9.5		
Korea	2.6							6.3		
Latvia	7.4	6.8	6.2	6.2	6.3	6.3	6.1	6.1	6.1	5.6
Lithuania	6.9	7.0	6.9	7.1	7.2	7.0	6.8	6.5	6.3	6.0
Luxembourg	9.0	9.0	9.4	10.2	10.8	11.5	12.2	13.0	14.3	16.0
Mexico	1.8							3.0		
Netherlands	7.3	7.0	7.1	7.5	8.1	8.5	8.4	8.2	8.0	7.9
New Zealand	4.7							7.2		
Norway	10.7	11.0	11.5	11.7	11.9	11.9	11.9	12.0	12.2	12.5
Poland	11.2	11.1	11.2	11.0	10.8	10.8	11.0	11.2	11.3	11.1
Portugal	13.5	13.6	13.9	14.3	14.7	14.7	14.5	13.7	12.8	12.0
Slovak Republic	8.6	8.3	7.8	7.6	7.6	7.8	8.3	8.8	9.4	9.9
Slovenia	10.9	11.0	11.1	12.0	13.1	14.2	15.1	15.6	15.6	15.2
Spain	12.2	12.3	12.4	12.6	13.2	13.9	14.4	13.9	12.6	11.4
Sweden	8.2	7.6	7.4	7.2	7.0	6.8	6.6	6.6	6.8	7.0
Switzerland	9.8							10.7		
Turkey	7.2							5.6		
United Kingdom	7.7	7.7	8.0	8.0	8.4	8.6	8.3	8.3	8.6	8.9
United States	4.9							5.9		
OECD	8.8							9.4		
Argentina	7.8							10.4		
Brazil	9.1							16.8		
China	4.1							9.5		
India	1.0							1.0		
Indonesia	0.8							1.2		
Russian Federation	9.1							12.4		
Saudi Arabia	2.7							9.4		
South Africa	2.2							3.3		
EU28	10.3	10.0	10.0	10.2	10.4	10.6	10.7	10.7	10.8	10.7

Note: EU28 figure is a simple average of member states (not the weighted average published by the European Commission). Pension schemes for civil servants and other public-sector workers are generally included in the calculations for EU member states: see European Commission (2018), 2018 Ageing Report.

Source: European Commission (2018), 2018 Ageing Report; Standard & Poor's (2016), Global Aging 2016: 58 Shades of Gray: Argentina, Brazil, Canada, Chile, China, India, Indonesia, Israel, Japan, Korea, Mexico, New Zealand, Russian Federation, Saudi Arabia, South Africa, Switzerland, Turkey and the United States; Standard & Poor's (2013), Global Aging 2013: Rising to the Challenge: Iceland.

StatLink  <https://doi.org/10.1787/888934042352>

Chapter 9

Funded pensions and public pension reserve funds

This chapter provides eight indicators on funded and private pensions, and public pension reserves.

The first indicator looks at the proportion of the working-age population covered by funded and private pension plans. The second indicator shows the contribution rate in the law and the actual contributions paid by member (or by account) relative to average wages.

The third indicator reports assets in funded and private pension plans and public pension reserves. The fourth indicator focuses on the way these assets are invested. This indicator allows for a following analysis of the investment performance in 2018 and over a longer period.

The sixth indicator shows the different types of pension plans across countries. The seventh indicator looks at the fees charged to members in selected defined contribution plans. The final indicator focuses on defined benefit funding ratios, presented over the period 2008-2018.

Key results

A number of OECD countries achieved near-universal coverage of the working-age population through mandatory or quasi-mandatory plans in 2018. In ten OECD countries, voluntary private pensions (occupational and personal) covered more than 40% of the working-age population. Automatic-enrolment programmes are increasingly popular, with more countries having introduced them recently (e.g. Lithuania, Poland).

In 2018, 17 of the 36 OECD countries had some form of mandatory or quasi-mandatory funded and private pension system in place, ensuring a high coverage of the working-age population. In Finland and Switzerland, occupational pensions are mandatory and cover more than 70% of the working-age population: employers must operate a scheme and contribution rates are set by the government. Other occupational pension systems can be classified as quasi-mandatory: through industry-wide or nation-wide collective bargaining agreements, employers establish schemes that employees must join. As not all sectors may be covered by such agreements, these systems are not classified as mandatory (e.g. Denmark, the Netherlands, and Sweden). In these countries, the coverage is close to the one in countries with mandatory systems. By contrast, in Turkey, participation in a plan is mandatory only for certain employees (e.g. OYAK for military personnel in Turkey), accounting for the relatively low proportion of people in a mandatory plan.

Mandatory personal accounts systems are prevalent in Latin America where they have partly replaced social security benefits. Such plans can be found in Chile and Mexico for instance. Other OECD countries with such mandatory personal pensions include Denmark and Sweden (premium pension system). While coverage is nearly universal in Chile, Denmark, Estonia and Sweden, it is not the case in Mexico yet although the coverage rate has been increasing over the years as new workers joined personal pensions. A high incidence of informal employment may limit coverage levels.

Coverage of voluntary occupational pension plans varies across countries. These plans are voluntary because employers, in some countries jointly with employees, are free to set up an occupational plan. Personal pension plans are voluntary when individuals can freely decide whether to join them or not. The coverage of voluntary pension plans (occupational or personal) is above 40% in Belgium, the Czech Republic, Germany, Iceland, Ireland, Japan, Lithuania, Poland, Slovenia and the United States. By contrast, the coverage of voluntary pension plans is very low (below 5%) in countries such as Greece.

Four countries had introduced automatic-enrolment programmes in a funded pension plan, with an opt out option, at the national level by the end of 2018: Italy (2007), New Zealand (2007), Turkey (2017) and the United Kingdom (2012). New Zealand has achieved a coverage rate of 80% in the “KiwiSaver” scheme. In the United Kingdom that initiated its auto-enrolment programme more recently than New

Zealand, 46% of the working-age population was covered by an employer-sponsored plan in 2018. In Italy, since 2007 the severance pay provision (so-called *Trattamento di Fine Rapporto* – TFR) of private-sector employees is automatically paid into an occupational pension plan unless the employee makes an explicit choice to remain in the TFR regime. However, a vast majority of workers has chosen to do so, and only 10% of the working-age population is now covered by an occupational pension plan. Turkey is still in the early stages of automatic enrolment, probably accounting for the relatively low coverage in 2018. Automatic enrolment is also encouraged by regulation in Canada and the United States but at the firm level. Other countries have recently introduced automatic enrolment programmes such as Germany in 2018 (for occupational defined contribution pension plans for private-sector employees in the case of deferred compensation, if specified in collective agreements), Lithuania and Poland in 2019.

The proportion of individuals having a pension plan may be higher than the proportion of individuals actively saving for retirement and paying contributions to the plan. Individuals having a plan may simply hold rights in their former employers’ plan, or may have assets in their personal plans but may not contribute in a regular manner. The difference between individuals covered by a plan and individuals contributing to a plan can be large in some countries such as in Chile where only half of the members contributed the last month in 2018.

Definition and measurement

The term “funded and private pensions” actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

Several measures of coverage coexist as discussed in OECD (2012). To be a member of a pension plan from the perspective proposed here, an individual must have assets or have accrued rights in a plan.

Counting individuals more than once may arise when using administrative data as individuals can be members of both occupational and personal voluntary pension plans. Therefore, the overall coverage of voluntary pension plans cannot be obtained by summing the coverage rates of occupational and personal plans.

Further reading

OECD (2019), *Inclusiveness and Finance*.

OECD (2012), *OECD Pensions Outlook 2012*, OECD Publishing.

Table 9.1. **Coverage of funded and private pension plans in selected OECD and other jurisdictions, latest year available**
As a percentage of the working-age population (15-64 years)

	Mandatory / Quasi-mandatory	Auto-enrolment	Voluntary		
			Occupational	Personal	Total
Australia	75.2	x	x	..	..
Austria	x	x	14.4	22.2	..
Belgium	x	x	50.6	..	..
Canada	x	..	26.4	24.9	..
Chile	86.7	x	..	..	..
Czech Republic	x	x	x	64.1	64.1
Denmark	ATP: 85.2 / QMO: 63.4	x	..	18.0	18.0
Estonia	85.8	x	x	11.2	11.2
Finland	93.0	x	7.0	18.0	25.0
France	x	x	25.2	7.8	..
Germany	x	..	57.0	33.8	70.4
Greece	..	x	<5	..	..
Hungary	x	x	..	18.7	..
Iceland	87.7	x	x	45.2	45.2
Ireland	x	x	38.3	12.6	46.7
Israel	78.2	x	..	..	..
Italy	x	..	10.1	12.3	20.6
Japan	..	x	50.5	14.7	54.3
Korea	16.9	x	x	..	..
Latvia	~100	x	1.0	19.0	..
Lithuania	x	x	x	75.5	75.5
Luxembourg	x	x	4.9	..	..
Mexico	65.4	x	1.9	..	..
Netherlands	88.0	x	x	28.3	28.3
New Zealand	x	80.2	6.8	..	..
Norway	57.9	x	..	23.1	..
Poland	x	x	1.8	66.4	..
Portugal	x	x	3.8	<=17.2	17.2
Slovak Republic	x	x	x	39.7	39.7
Slovenia	x	x	..	..	40.1
Spain	x	x	..	..	26.1
Sweden	PPS: ~100 / QMO: ~90	x	x	24.2	24.2
Switzerland	73.6	x	x	..	..
Turkey	1.5	6.4	..	12.5	..
United Kingdom	x	46.0	..	5.0	..
United States	x	..	43.6	19.3	..
Argentina	..	..	..	..	..
Brazil	x	x	1.9	10.7	..
China	..	..	..	..	..
India	..	..	..	..	..
Indonesia	..	x	0.4	1.6	..
Russian Federation	78.7	x	..	..	4.7
Saudi Arabia	..	..	..	..	..
South Africa	..	..	..	..	..

Note: QMO = Quasi-mandatory occupational; PPS = Premium Pension System; ".." = Not available; "x" = Not applicable; "~" = Approximately. Coverage rates are provided with respect to the total working-age population (i.e. individuals aged 15 to 64 years old), unless specified otherwise in the detailed notes of this table. In Korea, the retirement benefit system is mandatory and can take two forms: a severance payment system and an occupational pension plan. The obligation of the employer is to provide a severance payment system, but, by labour agreement, the company can set up an occupational pension plan instead.

Source: OECD Global Pension Statistics; ABS Household Income and Wealth 2017-18 (Australia); FSMA Annual Report 2018 (Belgium); Statistics Canada; ATP Annual Report 2018 and Danish Insurance Association (Denmark); DREES "Les retraités et les retraites - Edition 2019" (France); Survey on Pension Provision 2015 of the Federal Ministry of Labour and Social Affairs (Germany); Quarterly National Household Survey, Module on Pensions Q4 2015 (Ireland); Ministry of Health, Labour and Welfare (Japan); OECD Pensions Outlook 2012 (Netherlands); Finance Norway; 2013 edition of the survey "Inquérito à Situação Financeira das Famílias (ISFF)" (Portugal); Spanish Survey of Household Finances (EFF) 2014 of the Bank of Spain; Statistics Sweden for voluntary personal plans; DWP's Family Resources Survey 2017/18 (United Kingdom); National Compensation Survey, Statistics of Income Tax Stats (United States).

StatLink  <https://doi.org/10.1787/888934042371>

Key results

Regulation usually defines a contribution rate for mandatory and auto-enrolment plans. Mandatory contribution rates for funded and private pension plans vary across countries. They are fixed at more than 10% of the salary in Denmark, Iceland and Israel. The contribution rate is lower in other countries like Australia (9.5% for employers only) or Chile (10% for employees only). Employees or employers may have made additional voluntary contributions in some mandatory pension systems.

Regulation usually defines a (minimum) contribution rate for mandatory and auto-enrolment plans. The responsibility to pay the contributions may fall on the employees (e.g. in Chile), on the employers (e.g. in Australia, Norway) or on both (e.g. in Estonia, Iceland, Switzerland). This obligation may only apply to certain employees or under certain conditions (e.g. mandatory employer contributions only for employees earning at least AUD 450 a month in Australia). Contributions may be topped by state matching contributions (e.g. New Zealand) or subsidies (e.g. social quota in Mexico).

Mandatory contribution rates are fixed at different levels across countries. Iceland sets the highest mandatory contribution rate at 15.5% of salary, split between employers (11.5%) and employees (4%). Mandatory contribution rates also represented over 10% of the salary in two other countries: Denmark (defined in collective agreements, ranging between 12% and 18%), and Israel. In Switzerland, the contribution credits to pay vary by age group, from 7% between 25 and 34 years old up to 18% beyond 55 years old. By contrast, Norway has the lowest mandatory rate among the reporting countries (2% paid by the employer). Employers and employees can however agree on whether employees have to contribute on top of employer contributions. These mandatory contribution rates sometimes vary by income (e.g. Denmark) or sector in which employees work (e.g. public or private in Mexico).

Individuals or their employers may have the possibility to contribute above the mandatory rate and make voluntary contributions. In New Zealand, the minimum contribution rate for KiwiSaver plans is 6% equally split between the employer and employee from 1 April 2013. Members can however select a higher personal contribution rate of 4%, 6% (from April 2019), 8% or 10% (from April 2019) of salary. In Poland where automatic enrolment in Employee Capital Plans (PPK) is implemented since 2019, the minimum contribution rate is 2% for employees and 1.5% for employers if employees do not opt out from PPK. Employers and employees have the possibility to make additional contributions of up to 2.5% (for employers) and 2% (for

employees). In Australia, employees have no obligation to contribute to a plan but can make voluntary contributions on top of their employer contributions.

In voluntary plans, there may be no required nor minimum amount of contributions expected at the national level. Personal plans may however include a ceiling to benefit from tax advantages. Occupational plans may define specific contribution rates for employees and employers in the plan rules. The contribution rates may vary according to the funding of the plan in case of defined benefit (DB) plans.

The highest average effective annual contributions per member (relative to average annual wages) can be found in mandatory systems with relatively high contribution rates (e.g. Australia, Iceland and Switzerland). Average contributions per member in Australia (14.8% of the average wages) are above the mandatory contribution rates of 9.5% of earnings, which could be the result of voluntary contributions of employees and additional contributions by employers on top of Australia's mandatory contribution rate of 9.5%. By contrast, average contributions per member in Chile (5.8% of average wages) were lower than the mandatory 10% of earnings, potentially reflecting irregular contributions from plan members to pension plans.

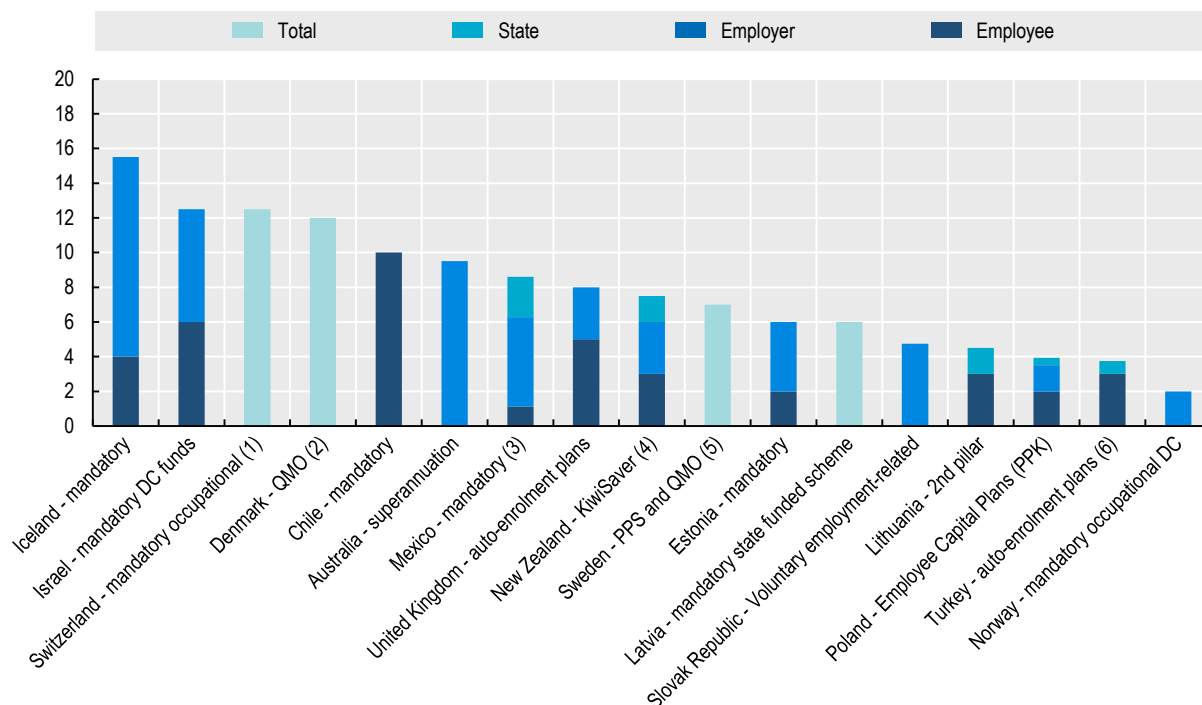
Among voluntary systems, average contributions per member (or plan) was below 10% of the average salary except in Canada and Luxembourg.

Definition and measurement

Average effective annual contributions may be expressed per account instead of member, as the exact number of members holding one (or several) pension plans is sometimes unknown. This is the case for instance in France where individuals can have an occupational (e.g. PERCO) and personal plans (e.g. PERP).

The population holding a pension plan may not be representative of the population on which the average annual wages were calculated and used for the assessment of the average effective annual contributions per member (or account).

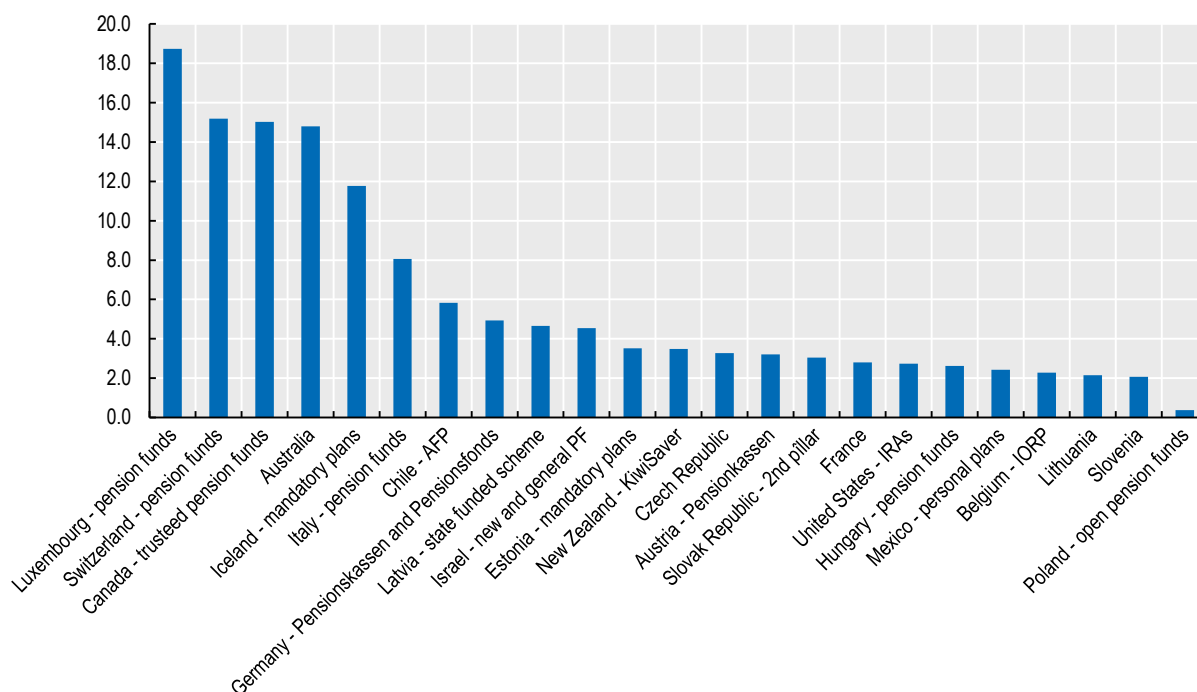
Figure 9.1. **Minimum or mandatory contribution rates (for an average earner)**
As a percentage of earnings



Source: ISSA Social Security Country Profiles.

StatLink <https://doi.org/10.1787/888934042390>

Figure 9.2. **Average annual contribution per active account or member in selected OECD countries, latest year available**
As a percentage of average annual wages



Source: OECD Global Pension Statistics.

StatLink <https://doi.org/10.1787/888934042409>

Key results

Substantial pension assets have been provisioned around the world. The weighted average of assets in funded and private pension plans in the OECD area was equal to 82.3% of gross domestic product (GDP) in 2018 (using GDP as weights). Seventeen OECD countries have also built up public pension reserves to help pay for state pensions. For these countries, assets in public pension reserve funds (PPRFs) represented 14% of GDP on average in 2018.

Assets in funded and private pension plans amounted to more than USD 42 trillion in 2018 in the OECD area. The United States had the largest pension market within the OECD member countries with assets worth USD 27.5 trillion, representing 64.8% of the OECD total. Other OECD countries with large pension systems include the United Kingdom with assets worth USD 2.8 trillion and a 6.6% share of OECD pension market in 2018; Canada, USD 2.5 trillion and 5.9%; Australia, USD 1.9 trillion and 4.5%; the Netherlands, USD 1.5 trillion, 3.6%; and Japan, USD 1.4 trillion and 3.3%.

The OECD average asset-to-GDP ratio, weighted according to the GDP of each country, was 82.3% in 2018. Eight OECD countries achieved asset-to-GDP ratios higher than 100% - Denmark (198.6%), the Netherlands (173.3%), Iceland (161.0%), Canada (155.2%), Switzerland (142.4%), Australia (140.7%), the United States (134.4%) and the United Kingdom (104.5%). These countries have private pensions from long ago, and with the exception of Canada, the United Kingdom and the United States, have mandatory or quasi-mandatory private pension systems.

Pension assets were of varying importance relative to GDP in the other countries. Eight OECD countries had asset-to-GDP ratios below 100% but above 20%. The ratios were below 20% in 20 OECD countries, including some with relatively recent mandatory funded and private pension plans such as Estonia. Greece recorded the lowest amount of assets relative to its GDP among OECD countries (below 1%).

Outside the OECD area, the size of pension assets also varied widely, from 95% in South Africa to 1% of GDP in India (for the National Pension System schemes and the contributory scheme Atal Pension Yojana).

Some prefunding also occurs in state pension systems, which are normally financed on a pay-as-you go basis. Public pension reserve funds (PPRFs) aim at playing a role in the future financing of some public pension systems, alleviating the impact of population ageing on the public purse. By the end of 2018, the total amount of assets in PPRFs were equivalent to USD 6.0 trillion for the 17 OECD countries for which data are available. The largest reserve was held by the US social security trust fund at USD 2.9 trillion, accounting for 48.7% of total OECD assets, although the assets consist of non-tradable debt instruments issued by the US Treasury to the social security trust. Japan's

Government Pension Investment Fund was second at USD 1.5 trillion – 24.5% of the OECD total. Of the remaining countries, Korea, Canada and Sweden had also accumulated large reserves, respectively accounting for 9.5%, 7.8% and 2.6% of the total.

In terms of total assets relative to the national economy, on average, PPRF assets accounted for 14.2% of GDP in the OECD area in 2018. The highest ratio was observed for the Korean National Pension Fund with 34.2% of GDP. Other countries where the ratio was of a significant size included Luxembourg with 30.8%, Sweden with 29.4% and Japan with 28.8%. PPRFs in Australia, Chile and Poland have been established relatively recently (between 2001 and 2006), probably explaining the low level of assets accumulated up to now. The expansion of this pool of assets may continue over the coming years, although some countries such as Spain have been withdrawing savings to cover social security deficits. Belgium closed its PPRF (Zilverfonds) in 2017. The Irish National Pension Reserve Fund, converted in 2014 into the Ireland Strategic Investment Fund, does not qualify anymore as a public pension reserve fund as its mandate now goes beyond financing pay-as-you-go pension plans.

Definition and measurement

The term "funded and private pensions" actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

Private pension plans are pension plans administered by an institution other than general government. They may be administered directly by a private-sector employer acting as the plan sponsor, a private pension fund or a private sector provider. In some countries, these may include plans for public-sector workers.

Funded public arrangements are pension plans which are managed by a public institution.

PPRFs are reserves established by governments or social security institutions to support public pension systems, which are otherwise financed on a pay-as-you-go basis. The assets in such reserve funds form part of the government sector, broadly defined.

Table 9.2. **Assets in funded and private pension plans and public pension reserve funds in OECD countries and other major economies, in 2018 or latest year available**

As a percentage of GDP and in USD million

	Funded and private pension plans		Public pension reserve funds	
	as a % of GDP	USD million	as a % of GDP	USD million
Australia	140.7	1 921 756	7.7	103 771
Austria	5.5	24 533	x	x
Belgium	10.9	56 038	x	x
Canada	155.2	2 524 309	28.4	472 278
Chile	70.2	193 110	5.1	14 138
Czech Republic	9.2	21 754	x	x
Denmark	198.6	677 088	x	x
Estonia	16.9	4 978	x	x
Finland	57.2	151 947	28.4	75 551
France	10.4	280 678	2.5	67 899
Germany	6.9	267 557	1.0	40 096
Greece	0.7	1 584	x	x
Hungary	5.3	7 968	x	x
Iceland	161.0	38 796	x	x
Ireland	33.9	125 746	x	x
Israel	57.4	203 224	x	x
Italy	9.8	197 817	x	x
Japan	28.3	1 400 143	28.8	1 478 578
Korea	28.5	455 985	34.2	573 155
Latvia	13.8	4 660	x	x
Lithuania	7.2	3 739	x	x
Luxembourg	2.7	1 853	30.8	20 762
Mexico	16.2	194 031	0.1	1 552
Netherlands	173.3	1 536 269	x	x
New Zealand	27.4	54 481	13.2	26 196
Norway	9.8	40 013	7.3	29 258
Poland	8.5	47 987	2.0	11 145
Portugal	19.3	44 543	8.1	18 911
Slovak Republic	11.7	12 038	x	x
Slovenia	6.8	3 595	x	x
Spain	12.5	173 285	0.4	5 725
Sweden	88.0	470 566	29.4	157 359
Switzerland	142.4	997 422	x	x
Turkey	2.5	17 541	x	x
United Kingdom	104.5	2 809 112	x	x
United States	134.4	27 549 363	14.3	2 939 300
OECD	Simple: 49.7 Weighted: 82.3	Total: 42 515 512	Simple: 14.2 Weighted: 14.3	Total: 6 035 674
Argentina	..	..	11.3	43 834
Brazil	25.5	449 315	x	x
China	1.7	215 526	3.3	437 900
India	1.0	23 472	..	..
Indonesia	1.8	18 029	..	..
Russian Federation	5.5	81 456	x	x
Saudi Arabia	..	..	..	..
South Africa	95.1	302 975	x	x

Note: “..” means not available; “x” means not applicable; “Simple” means simple average; “Weighted” means weighted average. The line “OECD” shows the total assets in millions of USD, the simple and weighted averages of assets as a percentage of GDP (using GDP expressed in USD to build weights).

Source: OECD Global Pension Statistics, Annual Survey of Public Pension Reserve Funds and other sources.

StatLink  <https://doi.org/10.1787/888934042428>

Key results

Assets in funded and private pension plans and in public pension reserve funds were invested mostly in traditional asset classes (primarily bonds and equities) for the latest year available. Proportions of equities and bonds varied considerably across countries but there is, generally, a greater preference for bonds.

In most countries, bonds and equities remained the two main asset classes in which pension assets were invested in 2018, accounting for more than half of investments in 32 out of 36 OECD countries, and in the five reporting non-OECD G20 jurisdictions. The combined proportion of bonds and equities was the highest (relatively to the size of the portfolio) in Chile (99.4%), Estonia (96.7%) and Mexico (96.3%). Pension assets may have been invested in these instruments either directly or indirectly through collective investment schemes. For some countries, the look-through of the investments of collective investment schemes was not available, such as for Sweden (in which 63.4% of assets were invested) and the United Kingdom (26.6% of investments). Only the direct investments in bonds and equities were known for these countries (e.g. 30% for Sweden, 39.2% for the United Kingdom). The overall exposure of pension assets to fixed income securities and equities was probably higher in these countries.

The proportion of equities and bonds varied considerably across countries in 2018. Although there was in general a greater preference for bonds, the reverse was true in some countries where equities outweighed bonds in six OECD countries (e.g. in Australia by 43.7% to 14.6%) and in South Africa (by 37.2% to 16.2%).

Public sector bonds, within bond investments as opposed to corporate bonds, represented a larger share of the combined direct bond holdings (i.e. excluding investment via collective investment schemes) in a number of countries in 2018. For example, public sector bonds comprised 96.9% of bond investments in Hungary and 87.6% in the Czech Republic, but only 24.8% in Norway and 10.5% in New Zealand.

Cash and deposits also accounted for a significant share of pension assets in some OECD countries and in Indonesia in 2018. For example, the proportion of cash and deposits was as high as 19.7% of pension assets for the Czech Republic, 27.5% in Indonesia and 34.5% for France (PERCO plans).

In most reporting countries, loans, real estate (land and buildings), unallocated insurance contracts and private investment funds (shown as “other” in the chart) only accounted for relatively small shares of the investments of pension assets in 2018 despite some exceptions. Real estate,

for example, was a significant component of pension providers’ portfolios (directly or indirectly through collective investment schemes) in Australia, Canada and Finland (between 10% and 15% of total assets).

Fixed income and equities were also the predominant asset classes within PPRF portfolios at the end of 2017. There was also a strong equity bias in some reserve funds, which reflects their long-term investment outlook and generally greater investment autonomy. For example, in 2017, Norway’s Government Pension Fund invested 60.9% of its assets in equities and 35.6% in fixed income, while the figures for Sweden AP funds were on average around 46% for equities and 33% for fixed income (AP1, AP2, AP3 and AP4 funds), and 47.2% and 20.3% for the Quebec Pension Plan. Japan’s GPIF has been recently investing more in equities than in fixed income, allocating 46.9% of assets in listed equities (compared to 46.6% in fixed income) at the end of 2016. On the other hand, reserve funds in Chile, Portugal and Poland for instance invested much more in bonds than equities in 2017.

The extreme case is the one of the US PPRF, which is by law fully invested in government bonds.

Some PPRFs also invested in real estate and non-traditional asset classes like private equity and hedge funds in 2017. For example, some of the funds with the highest allocation to private equity and hedge funds included those in Mexico (39.7% in total) and Australia (23.6%).

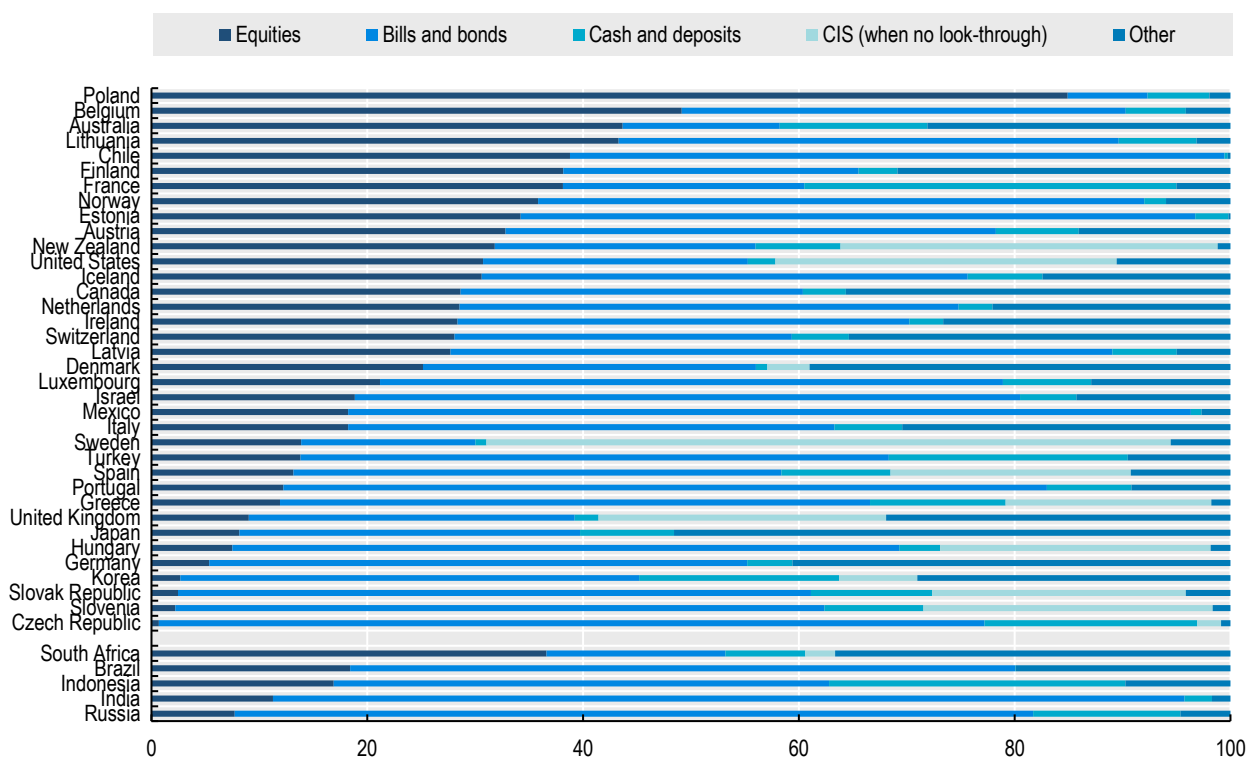
Definition and measurement

The term “funded and private pensions” actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

Asset allocation data include both direct investment in equities, bills and bonds and cash and deposits, and indirect investment through Collective Investment Schemes (CIS) when possible. The OECD Global Pension Statistics exercise collects data on investments in CIS, as well as the look-through of these investments in equities, bills and bonds, cash and deposits, and other. When the look-through was not provided by the countries, only the direct investments in equities, bills and bonds and cash and deposits are known and shown; investments in CIS are shown separately.

Figure 9.3. **Allocation of assets in funded and private pension plans in selected asset classes and investment vehicles, 2018 or latest year available**

As a percentage of total investment

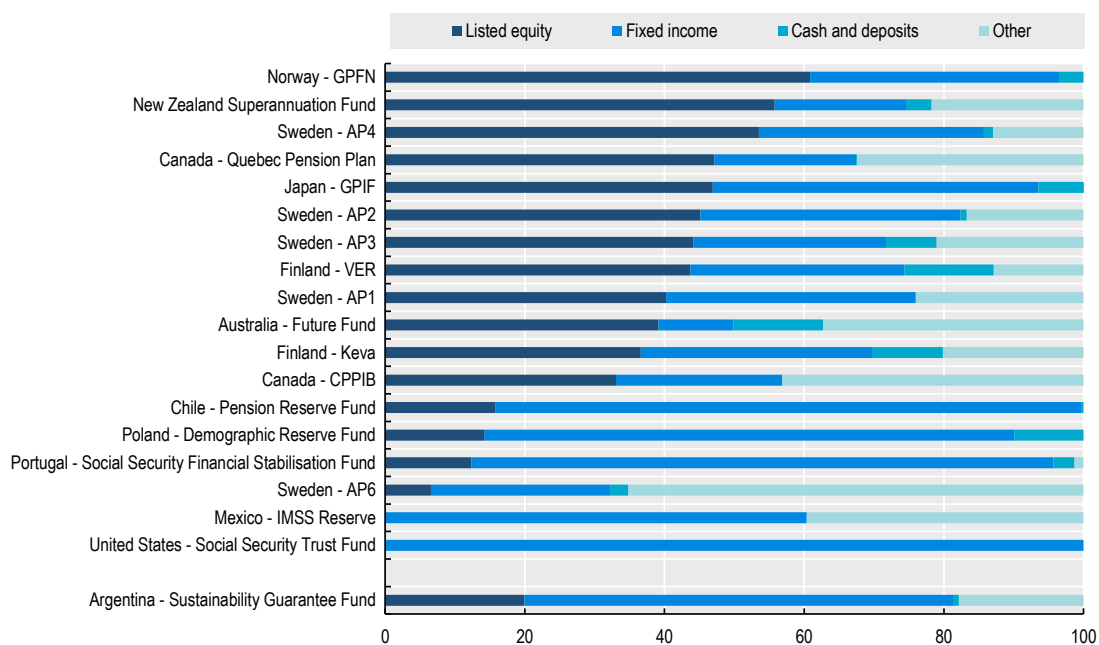


Source: OECD Global Pension Statistics.

StatLink <https://doi.org/10.1787/888934042447>

Figure 9.4. **Allocation of assets in public pension reserve funds in selected countries, 2017 or latest year available**

As a percentage of total investment



Source: OECD Annual Survey of Public Pension Reserve Funds.

StatLink <https://doi.org/10.1787/888934042466>

Key results

Real investment rates of return (net of investment expenses) of funded and private pension plans were negative on average in 2018 in the OECD (-3.2%). Pension plans suffered investment losses in 26 out of 31 reporting OECD countries, with the largest losses recorded in Poland (-11.1%) and Turkey (-9.4%). However, looking over the longer term, the investment performance of pension plans over the last 15 years was positive in real terms in 15 out of 18 reporting countries, with Canada achieving the strongest average annual return (4.8%), followed by Australia (4.7%). The real investment rates of return in 2018 was negative for 6 out of 14 public pension reserve funds (PPRFs). All reporting public pension reserve funds however achieved positive investment performance over the long-term.

The year 2018 was the worst on record (in terms of financial performance) for funded and private pension plans in a number of reporting countries since the 2008 financial crisis.

Real investment rates of return (net of investment expenses) of pension plans were negative on average in the OECD in 2018 (-3.2%). Pension plans suffered investment losses in 26 out of 31 reporting OECD countries, and in Russia among reporting non-OECD G20 jurisdictions. The largest losses in 2018 were recorded in Poland (-11.1%) and Turkey (-9.4%). However, some countries managed to observe positive real investment returns in 2018 such as Australia. Australian superannuation funds achieved a strong real investment rate of return (5.6%), calculated however over the financial year (June 2017-June 2018) instead of the calendar year.

As the real net investment return is the combination of the nominal performance of the plans and inflation, a low figure could be accounted for by either low gains or inflation. Among OECD countries, funded and private pension plans experienced positive returns in nominal terms in Chile (1.5%), the Czech Republic (0.4%), Israel (0.6%), Turkey (9.0%), but lower than inflation (2.6% in Chile, 2.0% in the Czech Republic, 0.8% in Israel and 20.3% in Turkey).

Poor financial results of pension plans in 2018 may be the result of the downturn on equity markets in the last quarter of 2018. Some of the major stock indices fell sharply in 2018 compared to 2017, suffering sometimes one of the worst declines since the 2008 financial crisis (e.g. S&P500).

The long-term nature of retirement savings means one needs to look at long-term returns. Average annual returns were all positive in nominal terms over the last 5, 10 and 15 years among reporting countries and remained positive in most of them after adjusting for inflation. Over the last 15 years, the annual average returns of pension plans were positive in 15 out of 18 reporting countries for which such calculation was possible. Canada recorded the strongest average annual return (4.8%) among OECD countries,

followed by Australia (4.7%). By contrast, the annual average return of funded and private pension plans was close to 0% in the Czech Republic and slightly negative in Estonia (-0.7%) and Latvia (-1.0%) in real terms.

PPRFs performed slightly better in 2018 than funded and private pension plans, with an average net investment rate of return of 1.9% in real terms (among the reporting PPRFs). The highest performer in 2018 was New Zealand Superannuation Fund with a real return at 10.8% (over the period June 2017-June 2018). By contrast, almost all AP funds in Sweden recorded a negative real investment rate of return in 2018, and so did Luxembourg's reserve fund and Finland's VER. However, over a longer time period (5, 10 or 15-year period), all reporting reserve funds achieved positive average annual investment returns (both in nominal and real terms).

Definition and measurement

The term "funded and private pensions" actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

Real (after inflation) returns are calculated in local currency before tax but after investment management expenses.

The average nominal net investment returns of funded and private pension plans are the results of a calculation using a common formula for all the countries except a few ones (e.g. Ireland, Israel) for which values have been provided by the jurisdictions using their own formula or are from national official publications. The common formula corresponds to the ratio between the net investment income at the end of the year and the average level of assets during the year.

For PPRFs, nominal returns come from annual reports or have been provided by the funds directly, using their own formula and methodology.

Table 9.3. Nominal and real geometric average annual investment rates of return of funded and private pension plans in 2018 and over the last 5, 10 and 15 years

In per cent

	Nominal				Real			
	2018	5-year annual average	10-year annual average	15-year annual average	2018	5-year annual average	10-year annual average	15-year annual average
Australia	7.8	8.7	6.6	7.3	5.6	6.7	4.4	4.7
Austria	-5.3	2.7	3.8	3.1	-7.1	1.2	1.9	1.2
Belgium	-3.2	4.3	6.0	5.3	-5.4	2.8	4.1	3.3
Canada	2.7	6.5	7.5	6.6	0.7	4.7	5.7	4.8
Chile	1.5	6.5	7.4	6.7	-1.0	3.1	4.7	3.3
Czech Republic	0.4	0.8	1.4	2.1	-1.6	-0.5	-0.1	0.0
Denmark	-0.5	4.9	5.9	5.8	-1.3	4.2	4.6	4.2
Estonia	-2.3	2.3	4.2	2.6	-5.5	0.7	2.2	-0.7
Finland	-1.5	4.5	..	..	-2.6	3.9	..	..
Germany	1.9	3.5	3.9	4.0	0.4	2.5	2.7	2.5
Greece	-0.8	3.8	..	..	-1.4	4.1	..	..
Hungary	-1.7	5.0	..	..	-4.3	3.6	..	..
Iceland	5.6	6.4	7.2	7.6	1.8	4.2	3.7	2.7
Ireland	-5.2	..	..	..	-5.9	..	..	..
Israel	0.6	4.1	7.1	..	-0.2	4.2	5.8	..
Italy	-1.7	2.2	3.2	3.2	-2.8	1.7	2.0	1.7
Korea	3.3	3.6	4.1	4.0	2.0	2.3	2.2	1.7
Latvia	-4.4	1.5	3.6	2.8	-6.7	0.0	2.2	-1.0
Lithuania	-4.3	3.1	..	..	-6.0	1.7	..	..
Luxembourg	-3.4	2.5	3.7	..	-5.2	1.5	2.0	..
Mexico	-0.3	4.2	6.4	..	-4.9	0.0	2.3	..
Netherlands	-1.2	6.1	7.7	6.1	-3.1	4.9	6.0	4.4
Norway	-0.1	4.9	6.2	5.9	-3.4	2.3	4.0	3.7
Poland	-10.0	..	..	..	-11.1	..	..	..
Portugal	-1.1	2.8	3.3	3.7	-1.8	2.2	2.2	2.2
Slovak Republic	0.0	1.8	1.7	..	-2.0	1.1	0.4	..
Slovenia	-0.5	5.0	5.1	..	-1.9	4.3	3.8	..
Spain	-3.1	2.2	3.4	..	-4.3	1.6	2.1	..
Switzerland	-3.0	3.1	4.2	3.3	-3.6	3.1	4.2	2.9
Turkey	9.0	9.1	9.1	..	-9.4	-2.1	-0.2	..
United States	-4.9	2.3	4.8	2.6	-6.7	0.8	3.0	0.5
Brazil	5.9	..	..	..	2.1	..	..	..
Indonesia	3.8	9.5	..	..	0.6	5.0	..	..
Russia	2.8	6.4	..	..	-1.4	-0.7	..	..
South Africa	4.9	8.1	9.2	9.5	0.5	2.6	3.6	4.0

Note: “..” means not available.

Source: OECD Global Pension Statistics.

StatLink  <https://doi.org/10.1787/888934042485>

Table 9.4. Nominal and real geometric average annual investment rates of return of Public Pension Reserve Funds in 2018 and over the last 5, 10 and 15 years

In per cent

Country	Public Pension Reserve Fund	Nominal				Real			
		2018	5-year annual average	10-year annual average	15-year annual average	2018	5-year annual average	10-year annual average	15-year annual average
Australia	Future Fund	5.8	8.6	9.4	..	3.9	6.7	7.1	..
Canada	CPPIB	8.9	11.2	10.1	8.2	7.2	9.4	8.3	6.4
Canada	PSP Investments	7.1	..	..	..	5.4	..	..	..
Canada	Quebec Pension Plan	4.2	9.1	..	..	2.2	7.3	..	..
Chile	Pension Reserve Fund	9.1	7.7	3.2	..	6.3	4.2	0.6	..
Finland	VER	-3.4	4.4	..	..	-4.5	3.8	..	..
Japan	GPIF	1.5	4.4	5.0	3.6	1.2	3.5	4.6	3.3
Luxembourg	FDC	-2.3	4.2	4.5	..	-4.1	3.2	2.8	..
New Zealand	New Zealand Superannuation Fund	12.4	13.1	14.4	11.0	10.8	11.9	12.7	8.8
Sweden	AP1	-0.7	7.2	8.6	..	-2.7	6.1	7.5	..
Sweden	AP2	-1.3	6.9	8.9	..	-3.3	5.8	7.7	..
Sweden	AP3	0.6	7.8	8.5	..	-1.4	6.7	7.4	..
Sweden	AP4	-0.2	8.2	9.9	..	-2.2	7.0	8.7	..
Sweden	AP6	9.6	9.4	7.8	..	7.4	8.3	6.7	..

Note: “..” means not available.

Source: OECD Annual Survey of Public Pension Reserve Funds; Annual reports.

StatLink  <https://doi.org/10.1787/888934042504>

Key results

The pension landscape includes various types of funded and private pension plans worldwide. Occupational and personal plans coexist in most OECD countries and in other jurisdictions. In 2018, the size of occupational plans in terms of assets varied greatly across countries. In most cases, pension funds would administer these plans although there are some notable exceptions (e.g. Denmark, France). Personal plans and occupational defined contribution plans are gaining importance at the expense of occupational defined benefit plans.

The pension landscape includes various types of funded and private pension plans worldwide. For example, pension plans may be accessed through employment or by individuals directly without any involvement of their employers. When plans are accessed through employment and were established by employers or social partners on behalf of their employees, these plans are considered as occupational. The OECD taxonomy classifies plans as personal when access to these plans does not have to be linked to an employment relationship and these plans are established directly by a pension fund or a financial institution acting as pension provider without any intervention of employers.

Occupational and personal plans coexist in most reporting countries: 32 out of the 36 OECD countries, as well as Brazil, India, Indonesia, Russia, and South Africa, have both occupational and personal plans. Individuals may be members of several occupational pension plans through different jobs during their career, and several personal pension plans that they have opened directly with a pension provider. The prominence of occupational plans in terms of assets varied greatly across countries in 2018. Assets in occupational plans represented 90% of all pension assets in Switzerland, but only 2% in Latvia where the funded system is mostly based on personal plans.

Depending on how pension benefits are calculated and who bears the risks, occupational pension plans can be either defined benefit (DB) or defined contribution (DC). In DC plans, participants bear the brunt of risk, while in traditional DB plans sponsoring employers assume all the risks. Employers in some countries have introduced hybrid and mixed DB plans, which come in different forms, but effectively involve some degree of risk sharing between employers and employees. For example, in the Netherlands, benefit levels may be conditional on the funding status of the pension fund. Cash balance plans (another type of hybrid DB plan) provide benefits based on a fixed contribution rate and a guaranteed rate of return (the guarantee is provided by the sponsoring employer, hence these plans are classified as DB). Such plans are part of the pension landscape in Belgium (where by law, employers must provide a minimum return guarantee), Japan and the United States. Mixed plans are those where the plan has two separate DB and DC components that are treated as part of the same plan. There are also DC plans such as those in Denmark that offer guaranteed benefits or returns. They are

classified as DC as there is no recourse to the sponsoring employer in case of underfunding.

The proportion of assets in DC plans and in personal plans is higher than in DB plans in most of the reporting countries. More than 50% of assets are held in DC plans or personal plans in 18 out of 21 reporting OECD economies, and in Brazil.

DC plans and personal plans have been gaining prominence at the expense of DB plans even in countries with a historically high proportion of assets in DB plans such as the United States. The fastest shift away from DB plans over the last decade happened in Israel (from 84% in 2008 to 56% of in 2018) where DB plans have been closed to new members since 1995. Some other countries also closed the access to certain DB plans to new members, such as Italy since 1993. New members had the possibility (in Italy) or the obligation (in Israel) to join DC plans instead. More recently, Iceland reformed a pension plan for state and municipal employees at the end of 2016, converting it from DB to DC.

Definition and measurement

The term "funded and private pensions" actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

The OECD has established a set of guidelines for classifying pension plans (OECD, 2005) on which this analysis is based.

In most OECD countries, pension funds are the main vehicle to fund occupational pensions, the main exception being countries such as Belgium, Denmark, France, Korea, Norway and Sweden where pension insurance contracts play a significant role, and Austria and Germany where book reserves – provisions on sponsoring employers' balance sheets – are one of the types of financing vehicle for occupational pension plans. Personal pension plans are often funded through pension insurance contracts or financial products provided by banks and asset managers (OECD, 2019).

Further reading

OECD (2019), Pension Markets in Focus, <https://www.oecd.org/daf/fin/private-pensions/pensionmarketsinfo.htm>

OECD (2005), Private Pensions: OECD Classification and Glossary, OECD, Paris. The OECD classification is available at www.oecd.org/finance/private-pensions/38356329.pdf.

Table 9.5. **Types of pension arrangements available in the OECD area according to the OECD taxonomy, 2018**

		Occupational Plans			
		DB Only	Both DB and DC	DC only	None
Personal Plans	Yes	Finland, Israel; Switzerland	Australia, Austria, Belgium, Canada, Denmark, France, Germany, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, United Kingdom, United States, Brazil, India, Indonesia, Russian Federation, South Africa	Chile, Greece, Hungary, Latvia, Poland, Slovenia	Czech Republic, Estonia, Lithuania, Slovak Republic
	No				

StatLink  <https://doi.org/10.1787/888934042523>Figure 9.5. **Split of pension assets by type of plan, 2018 or latest year available**

As a percentage of total assets



Source: OECD Global Pension Statistics.

StatLink  <https://doi.org/10.1787/888934042542>

Key results

Pension providers charge fees to members to cover their operating expenses for running pension plans. Most countries cap fees, generally fees on assets, which can be charged to members. Other initiatives to reduce the fees charged by the industry include auction mechanisms based on fees such as in Chile and in New Zealand (along with other criteria). Regardless of the fee structure, members paid the lowest amount of fees in 2018 in Australia, Chile and Israel (0.5% of assets).

Pension providers charge fees to their members to cover their operating expenses. Operating expenses include marketing the plan to potential participants, collecting contributions, sending contributions to investment fund managers, keeping records of accounts, sending reports to participants, investing the assets, converting account balances to annuities, and paying annuities.

Pension providers charge fees to members in different ways depending on the country. Fees can be charged on contributions or on salaries directly (e.g. Chile), on assets (e.g. Estonia, Spain), on performance, or a combination (e.g. the Czech Republic where pension funds can charge fees on assets and profits). On top of regular fees, members in some countries may be charged fees when they join, switch or leave a pension provider (e.g. the Czech Republic).

Most countries - 12 out of 20 reporting OECD countries - capped some of the fees that pension providers can charge to members. Most of these 12 countries capped fees on assets, which is one of the most widespread way for pension providers to charge members. Some have been lowering their cap on fees recently (e.g. Estonia, the Slovak Republic, Spain). In Estonia, the cap for management fees of mandatory pension funds became 1.2% for all pension funds from 2 September 2019 (while before, the cap was 1.2% for conservative funds only, 2% for the other funds). Spain recently reduced the cap on custody fees (from 0.25% to 0.2%) and the cap on management fees for fixed income funds (from 1.5% to 0.85%) and for equity funds (from 1.5% to 1.3%).

Other initiatives to reduce the fees charged by the industry include auction mechanisms based on fees such as in Chile and New Zealand (along with other criteria). Pension providers in Chile bid on fees charged to members. The winning pension provider receives all new eligible entrants.

In New Zealand, default providers are selected based on a range of selection criteria that include fees. These mechanisms intend to drive the fees down.

The amount of fees charged to members was heterogeneous across countries at the end of 2018. Regardless of the fee structure, the highest fees charged to members relatively to the amount of assets under management were recorded in Turkey (2.0% in 2017) and Spain (1.1%) among reporting OECD countries. By contrast, members paid the lowest amount of fees in Australia, Chile and Israel (0.5% of assets).

Definition and measurement

The term "funded and private pensions" actually refers to private pension arrangements (funded and book reserves) and funded public arrangements (e.g. ATP in Denmark).

Some fees may not be fully reported in all the cases. Data may underestimate the actual charges on the pension pot paid by members in some countries (e.g. through indirect costs reducing investment returns). For example, in Chile pension funds that invest in international mutual funds deduct management costs directly from the fund. These costs are reported separately by each pension fund administrator to the Superintendence of Pensions. However, they are not included in the fees charged to members.

Further reading

IOPS (2018), 2018 Update on IOPS work on fees and charges, IOPS Working Papers on Effective Pensions Supervision, No.32

OECD (2018), OECD Pensions Outlook 2018, OECD Publishing, Paris.

Table 9.6. Fee structure in selected OECD countries

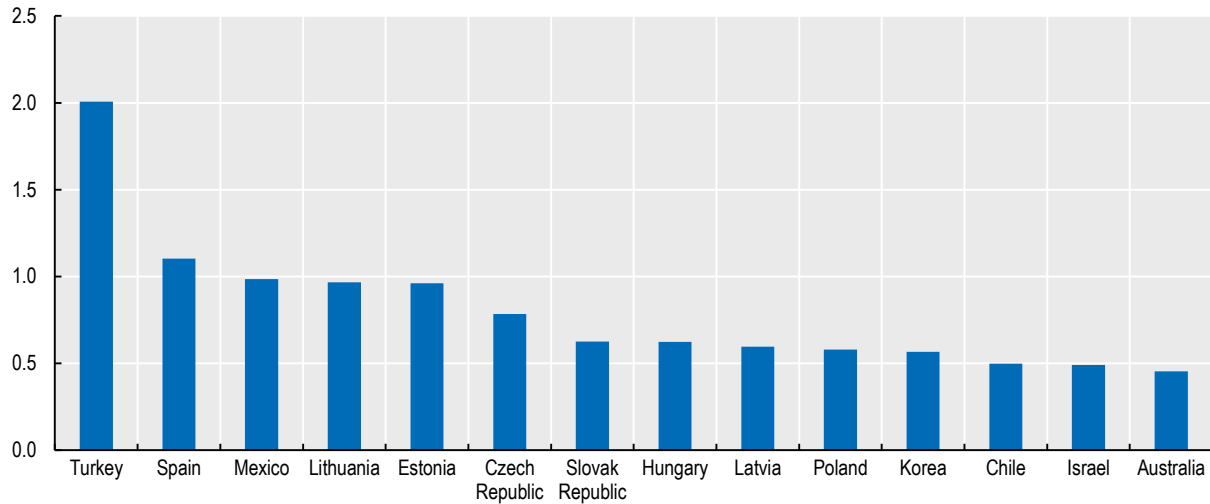
	Fees on salaries	Fees on contributions	Fees on assets	Fees on returns / performance	Other fees (e.g. exit fees, entry fees, switching fees)
Australia (except MySuper)	No cap	No cap	No cap	No cap	No cap
Chile	No cap	x	x	x	x
Czech Republic - transformed funds	x	x	Capped	Capped	Capped
Czech Republic - participation funds	x	x	Capped	Capped	Capped
Denmark	No cap	No cap	No cap	No cap	No cap
Estonia - mandatory schemes	x	x	Capped	x	Capped
Estonia - voluntary schemes	x	x	No cap	x	No cap
Ireland	No cap	No cap	No cap	No cap	No cap
Israel	x	Capped	Capped	x	x
Italy	x	No cap	No cap	Possible but rare	No cap
Korea - occupational DC	x	x	No cap	x	x
Latvia - state funded scheme	x	Capped	Capped	Capped	x
Latvia - private pension funds	x	No cap	No cap	No cap	x
Lithuania - 2nd pillar	x	x	Capped	x	Capped
Lithuania - 3rd pillar	x	No cap	No cap	x	Capped
Mexico	x	x	No cap	x	x
Poland - open pension funds	x	Capped	Capped	Capped	x
Poland - PPK	x	x	Capped	Capped	No cap
Portugal	No cap	No cap	No cap	No cap	Capped
Slovak Republic - 2nd pillar	x	Capped	Capped	Capped	x
Slovak Republic - 3rd pillar	x	x	Capped	Capped	Capped
Spain	x	x	Capped	x	x
Sweden - Premium pension	x	x	Capped	x	x
Turkey - auto-enrolment plans	x	x	Capped	Capped	x
United Kingdom - default funds	x	x	Capped	x	x
United States	No cap	No cap	No cap	No cap	No cap

Note: "x" means that the type of fee does not exist or is not allowed in the country.

Source: OECD Reviews of Pension Systems: Latvia; and OECD Global Pension Statistics.

StatLink  <https://doi.org/10.1787/888934042561>

Figure 9.6. Annual fees or commissions charged to members, 2018 or latest year available
As a percentage of total assets



Source: OECD Global Pension Statistics.

StatLink  <https://doi.org/10.1787/888934042580>

Key results

Funding ratios, which measure the amount of liabilities that available assets cover in defined benefit (DB) pension plans, evolved differently over the last decade across countries. The funding position of DB plans has improved in Finland, Germany and Switzerland, but deteriorated in Iceland, Mexico and the Netherlands among OECD countries and in Indonesia. Funding levels of DB plans were above 100% at the end of 2018 in all reporting countries but five: Iceland, Mexico, the United Kingdom and the United States among OECD countries, and Indonesia. Funding levels are calculated using national (regulatory) valuation methodologies of liabilities and hence cannot be compared across countries.

Providers of occupational defined benefit (DB) plans have faced challenges from low and falling interest rates over the last decade. A significant part of OECD pension assets is still in DB plans and other plans that offer return or benefit guarantees. Low and falling interest rates increase the values of liabilities of the providers of benefit promises, which depend on a discount rate generally based on long-term government bond yields, and lower the amount of assets accumulated as fixed income securities (including long-term government bonds) represent an important part of pension providers' portfolios.

Funding ratios, which measure the amount of liabilities that available assets cover, evolved differently over the last decade across countries. The funding position of DB plans has improved by 18 percentage points in Germany (from 105% in 2008 to 123% in 2018), 11 percentage points in Switzerland (from 95% in 2008 to 105% in 2018) and 6 percentage points in Finland (from 118% in 2011 to 125% in 2018). The opposite trend was observed in Iceland, Mexico and the Netherlands among OECD countries and Indonesia among other jurisdictions, where the funding ratio deteriorated between 6 percentage points (in Indonesia and the Netherlands) up to 17 in percentage points (in Mexico) over the last decade. The funding ratio remained more or less the same (within a -5/+5 percentage point range) in 2018 compared to the first year available since 2008 in Luxembourg, Norway, the United Kingdom and the United States.

Funding levels of DB plans were above 100% at the end of 2018 in all reporting countries but five: Iceland (32%), Mexico (67%), the United Kingdom (96%), the United States (58%) among OECD countries, and Indonesia (96%). Assets in DB plans in these five countries would not enable to cover the pension liabilities (the way they are calculated).

Funding levels are calculated using national (regulatory) valuation methodologies of liabilities and hence

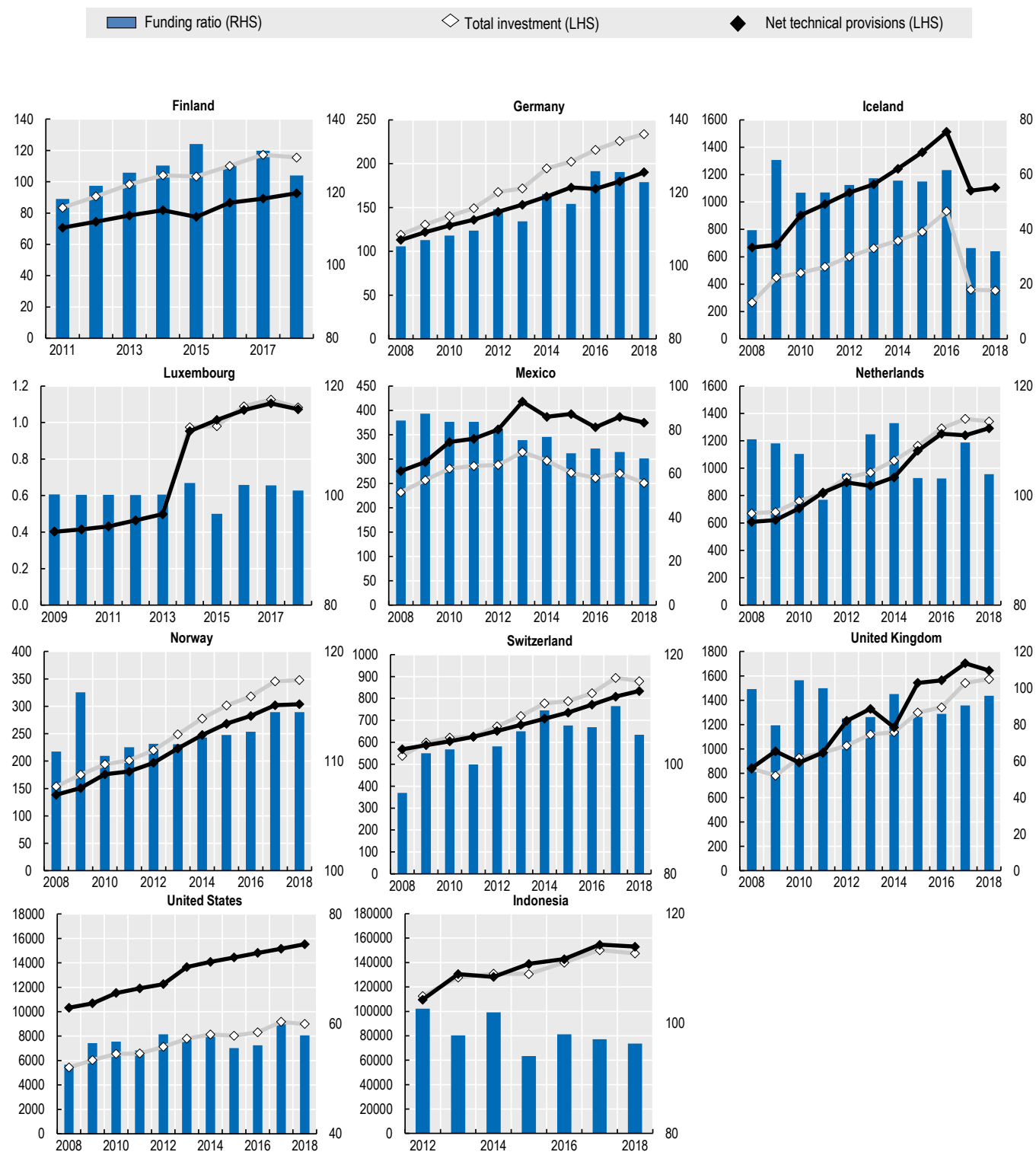
cannot be compared across countries. Some countries like Germany use fixed discount rates while others like the Netherlands use market rates as a discount rate. In Germany, the maximum discount rate for the calculation of technical reserves is set at 0.9% by regulation. The discount rate for Pensionskassen and Pensionsfonds offering insurance-like guarantees becomes fixed for the term of the contract. In the Netherlands, pension funds can use an Ultimate Forward Rate (UFR) for the valuation of liabilities. The UFR is an extrapolation of the observable term structure to take into account the very long duration of pension liabilities. The choice of the discount rate that is used to express in today's terms the stream of future benefit payments can have a major impact on funding levels.

Definition and measurement

The funding position of DB plans is assessed in this publication as the ratio between the investments and the technical provisions (net of reinsurance) of DB plans. Investments of DB plans may be a low estimate of assets of DB plans as they would not include receivables and claims against the plan sponsor to cover the funding shortfall. Technical provisions represent the amount that needs to be held to pay the actuarial valuation of benefits that members are entitled to. This is the minimum obligation (liability) for all DB pension plans.

Liabilities are estimated using country-specific methodologies. Methodologies differ across countries with respect to the formula used, the discount rate (e.g. a market discount rate, or a fixed discount rate), or with the way future salaries are accounted for (e.g. liabilities can be based on current salaries or on salaries projected to the future date that participants are expected to retire).

Figure 9.7. Assets and liabilities of DB plans (in billions of national currency) and their ratio (in per cent) in selected jurisdictions, 2008-2018



Note: LHS: left-hand side axis. RHS: right-hand side axis.
Source: OECD Global Pension Statistics.

StatLink <https://doi.org/10.1787/888934042599>

Pensions at a Glance 2019

OECD AND G20 INDICATORS

The 2019 edition of *Pensions at a Glance* highlights the pension reforms undertaken by OECD countries over the last two years. Moreover, two special chapters focus on non-standard work and pensions in OECD countries, take stock of different approaches to organising pensions for non-standard workers in the OECD, discuss why non-standard work raises pension issues and suggest how pension settings could be improved.

This edition also updates information on the key features of pension provision in OECD countries and provides projections of retirement income for today's workers. It offers indicators covering the design of pension systems, pension entitlements, the demographic and economic context in which pension systems operate, incomes and poverty of older people, the finances of retirement-income systems and private pensions.

Consult this publication on line at <https://doi.org/10.1787/b6d3dcfc-en>.

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