Study on replacement rates and other issues related to pension systems

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BETTER POLICIES FOR BETTER LIVES

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STUDY ON REPLACEMENT RATES AND OTHER ISSUES RELATED TO PENSION SYSTEMS

1. Introduction

The Chilean Presidential Advisory Committee on the Pension System requested the OECD to conduct a short study on replacement rates and other issues related to pension systems. The objectives of this study are to assess the comparability across countries of replacement rates published by the OECD, describe gender gaps in OECD pension systems and analyse the issue of informality.

This document follows the terms of reference agreed between the OECD and the Presidential Advisory Committee on the Pension System. All tables are provided in a separate statistical annex.

2. Analysis of the comparability across countries of replacement rates published in the OECD publication "Pensions at a Glance 2013"

The 2013 edition of *Pensions at a Glance* (PAG 2013) contains a comprehensive selection of pension policy indicators, covering: the design of pension systems; future pension entitlements for men and women at different earnings levels; finances of retirement-income systems as a whole; the demographic and economic context in which retirement-income systems operate; private pensions and public-pension reserve funds. This section mainly draws on information taken from PAG 2013.

2.1. Description of the main characteristics of the pension systems of the OECD countries

Table 1 describes the structure of pension systems in OECD countries. In this table, the mandatory component of the pension system has been decomposed into public redistributive schemes, mandatory defined benefit (DB) schemes (whether public or private) and mandatory defined contribution (DC) schemes (whether public or private).

Programmes aimed to prevent poverty in old-age (redistributive schemes) are provided by the public sector and are of three main types:

- Resource-tested or targeted plans pay a higher benefit to poorer pensioners and reduced benefits to better-off retirees. In these plans, the value of benefits depends either on income from other sources or on both income and assets. All countries have general social safety-nets of this type, but in some cases they only cover a few older people who had many career interruptions. Rather than mark every country in Table 1, only 12 countries are considered with targeted schemes. Full-career workers with low earnings (30% of the average) would be entitled to targeted benefits in these countries.

- Basic schemes pay either flat rate benefits (the same amount to every retiree) or their value depends only on years of work, not on past earnings. Additional retirement income does not change the entitlement. Some 13 OECD countries have a basic pension scheme or other provisions with a similar effect.

- Minimum pensions, which share many features with targeted plans, are found in 18 OECD countries. The value of entitlements takes account only of pension income: unlike targeted schemes, it is not affected by income from savings, etc. Minimum credits in earnings-related schemes, such as those in Belgium and the United Kingdom, have a similar effect: benefits for workers with very low earnings are calculated as if the worker had earned at a higher level.

Only Ireland and New Zealand of the OECD countries do not have mandatory, contributory pension provision. In the other 32 countries, there are four kinds of scheme:

- Mandatory DB plans are provided by the public sector in 18 OECD counties. Private (occupational) 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 and on individual earnings.

- There are points schemes in four OECD countries: French occupational plans (operated by the public sector) and the Estonian, German and Slovak public schemes. Workers earn pension points based on their earnings each year. At retirement, the sum of pension points is multiplied by a pension-point value to convert them into a regular pension payment.

- Mandatory DC plans are compulsory in 10 OECD countries. In these schemes, contributions flow into an individual account. The accumulation of contributions and investment returns is usually converted into a pension-income stream at retirement. In Denmark and Sweden, there are quasi-mandatory occupational DC schemes in addition to compulsory plans.

- There are notional-accounts schemes in four OECD countries (Italy, Norway, Poland and Sweden). These record contributions in an individual account and apply a rate of return to the balances. 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 stream of pension payments using a formula based on life expectancy. Since this is designed to mimic DC schemes, they are often called notional defined contribution plans (NDC).

Voluntary funded pension plans, whether occupational or personal, exist in every country. Table 1 only identifies those countries where voluntary funded pension plans cover at least 40% of the working-age population. Only nine OECD countries fulfil that criterion.

All countries finance at least partially their mandatory pension system using tax revenues. New Zealand is the only country financing its mandatory pension system solely through the tax system. Most of the other countries have a pay-as-you-go (PAYG) component, except Australia, Chile, Iceland, Mexico and the Netherlands, where mandatory pensions are financed through funded pension plans. Canada, Denmark, Israel, Norway, Sweden and Switzerland have a mixed mandatory pension system, partially PAYG and partially funded.

The average public pension contribution rate in the 25 OECD countries that levy separate pension contributions is 19.2%, of which 8.0% from employees and 11.2% from employers.[1] Contributions to mandatory private pension schemes vary from 2.5% in Sweden to 15% in Israel.[2] In general, both the employer and the employee contribute to the mandatory pension system. The only exception is Australia (only the employer contributes to the private DC system).

In most countries, the current legal retirement age for men is 65 or over. This is not yet the case in the Czech Republic, Estonia, France, Hungary, Korea, the Slovak Republic and Turkey. However, all these countries plan to reach that level in the future. Legal retirement ages are currently lower for women than for men in Austria, Chile, the Czech Republic, Estonia, Israel, Italy, Poland, the Slovak Republic,

1. In Chile, an individual needs to contribute 18.84% of covered wages to be insured. Of those 18.84%, 10% go to the DC system.

2. In Estonia and the Slovak Republic, the 4% employer contribution to the mandatory private pension system is taken from the public pension contribution rate.

Switzerland, Turkey and the United Kingdom. Over the long-term, only Israel and Switzerland are still planning to have legal retirement ages below 65 for women.

All countries have an element of poverty alleviation through either minimum pensions, universal payments or social assistance schemes. Also consumption smoothing is applicable to all countries except for Ireland and New Zealand as they are the only countries without a mandatory scheme related to earnings. Those with a minimum pension have been marked as redistributive in Table 1.

2.2. Description of the requirements to access to non-contributory pensions in countries where such schemes exist

Table 2 describes the characteristics of non-contributory pension schemes in OEDCD countries where such schemes exist. It includes solely residence-based pensions, while resource-tested safety-net benefits are not included.

The number of years of residence required to be entitled to a non-contributory pension varies from zero (Ireland, Korea, Norway and Portugal) to 40 years (Denmark and Iceland). The age requirement is usually the same as the current legal retirement age, except in Estonia (age 63 for women), Korea (65) and Portugal (66).

Universal pensions can only be found in Denmark and New Zealand. The value of benefits in targeted pensions depends on income from other sources in most countries. Only in Australia both income and assets are used to determine the level of the targeted pension.

The fiscal cost of non-contributory pensions varies from 0.3% of GDP in Korea to 6.7% of GDP in Portugal. Yearly benefits vary from USD 1,066 per year in Korea to USD 28,924 in Norway.

2.3. Detailed description of the methodology used for the calculation of replacement rates in the OECD Pensions at a Glance series

Table 3 provides the value of key variables used for the calculation of theoretical replacement rates in PAG 2013:

- The number of years associated with a full career (by gender);
- Mortality tables used;
- Income taxes and social security contributions paid by pensioners (in USD and as a % of income);
- The average income of the average earner for the calculation of the replacement rate. The same average income is used for men and women. The average income is provided in national currency and in USD in Table 3.
- The average pension level for the calculation of the replacement rate is not provided. The OECD only publishes replacement rates.

The pension entitlements calculated in *Pensions at a Glance* are computed with rules currently legislated in OECD countries. Changes in rules that have already been legislated, but are being phased-in gradually, are assumed to be fully in place from the start. For PAG 2013, reforms legislated since 2012 were included where sufficient information was available.

The values of all pension-system parameters reflect the situation in the year 2012. The calculations show the pension entitlements of a worker who enters the system today and retires after a full career. The main results are shown for a single person.

Career length

A full career is defined as entering the labour market at age 20 and working until the standard pension-eligibility age, which, of course, varies between countries. The implication is that the length of career varies with the statutory retirement age: 40 years for retirement at 60, 45 with retirement age at 65, 47 with retirement at 67, etc. Age 20 is approximately the average age of labour-market entry in OECD countries, although obviously some countries lie above and below this average. People often spend periods out of paid work in unemployment, full-time education, caring for children, disabled or elderly relatives, etc. However, most OECD countries have mechanisms in place to protect the pension entitlements for such periods. Rules for periods of unemployment and caring for children are often very complex. The OECD pension models include these rules.

Coverage

The pension models used in *Pensions at a Glance* 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 (self-employed) 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" and are particularly significant in Denmark, the Netherlands and Sweden.

An increasing number of OECD countries have broad coverage of voluntary, occupational pensions which play an important role in providing retirement incomes. For these countries, a second set of replacement rates is calculated with entitlements from these voluntary pension plans in *Pensions at a Glance*. Table 3 does not report this set of contribution rates.

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.

Economic variables[3]

The comparisons are based on a single set of economic assumptions for all the OECD countries. In practice, the level of pensions will be affected by economic growth, real earnings growth and 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.

3 . Some of the assumptions described here will be changed in the 2015 edition of *Pensions at a Glance*. Price inflation, 2% per year (2.5% in PAG 2013); real earnings growth, 1.25% (2% in PAG 2013); and real rate of return after administrative charges, 3% (3.5% in PAG 2013). In addition, the calculations in PAG 2015 will assume that benefits from defined contribution plans are paid in the form of a price-indexed life annuity at 85% of the actuarially fair price (100% of the actuarially fair price in PAG 2013).

Price inflation is assumed to be 2.5% per year. In practice, this assumption has little effect on the results because of indexation.

Real earnings growth of 2% per year (given the assumption for price inflation, this implies nominal wage growth of 4.55%). 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 worker earnings in every year of the working life. In addition, public redistributive pensions (i.e. targeted benefits, basic pensions and minimum pensions) are assumed to be wage-indexed.[4]

The real rate of return after administrative charges on funded, defined contribution pensions is assumed to be 3.5% per year.

The discount rate (for actuarial calculations) is assumed to be 2% per year. The discount rate is set at the same rate as real earnings growth, which is a common finding of growth models and other dynamic economic models.

The baseline modelling uses country-specific projections of mortality rate from the United Nations population database for the year 2060.

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. This is calculated from the mortality projections. 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 which changes. 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, used to calculate pension entitlements, are available in the on-line "Country profiles" from the OECD website: www.oecd.org/pensions/pensionsataglance.htm. The modelling assumes that tax systems and social-security contributions remain unchanged in the future. This 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 2012 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 in *Pensions at a Glance*.

Net and gross replacement rates

The last columns of Table 3 provide the net and gross theoretical replacement rates for the average earner by gender, as published in PAG 2013. Numbers only include the mandatory component of the pension system.

4 . This assumption may change in the 2015 edition of *Pensions at a Glance*, from wage-indexation to current legislation (which means price-indexation for some countries, including Chile).

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. Often, the replacement rate is expressed as the ratio of the pension to final earnings (just before retirement). In *Pensions at a Glance*, however, pension benefits are shown as a share of individual lifetime average earnings (revalued in line with economy-wide earnings growth). Under the baseline assumptions, workers earn the same percentage of average worker earnings throughout their career. In this case, lifetime average revalued earnings and individual final earnings are identical. If people move up the earnings distribution as they get older, then their earnings just before retirement will be higher than they were on average over their lifetime and replacement rates calculated on individual final earnings would be lower.

The gross replacement rate shows the level of pensions in retirement relative to earnings when working. For workers with average earnings, the gross replacement rate averages 54% in the 34 OECD countries. But there is significant cross-country variation. At the bottom of the range, Mexico and the United Kingdom offer future replacement rates of less than a third to men starting work today. The Netherlands at the top of the range, offer replacement rates of more than 90%. Other countries with high projected replacement rates are Denmark at 79% and Austria at 77%.

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. For average earners, the net replacement rate across the OECD averages 66%, which is 11 percentage points higher than the gross replacement rate. This reflects the higher taxes and contributions that people paid on their earnings when working than they paid on their pensions in retirement. Net replacement rates again vary across a large range, from under a third in Mexico to over 100% in the Netherlands.

2.4. Additional theoretical replacement rates for different contribution densities and income levels

Net and gross theoretical replacement rates for male and female average earners are provided for different entry ages in Tables 4 and 5 respectively. These different entry ages represent different contribution densities. An entry age of 20 is considered as leading to the maximum career length and therefore represents 100% of the full career. The model assumes that workers do not earn any pension entitlement until reaching the entry age. An entry age of 25 therefore assumes that workers have five years of contributions missing in their career. On average across the OECD countries, the resulting career length represents 89.1% of the full career (the contribution density resulting from an entry age of 25 is not the same for all countries as the length of the full career varies according to the official age of retirement in each country). An entry age of 30 results in a career corresponding to 78.1% of the full career on average, an entry age of 35 results in a career corresponding to 67.5% of the full career on average, an entry age of 40 results in a career corresponding to 56.7% of the full career on average, an entry age of 45 results in a career corresponding to 45.9% of the full career on average, an entry age of 50 results in a career corresponding to 35.1% of the full career on average, an entry age of 55 results in a career corresponding to 24.3% of the full career on average, and an entry age of 60 results in a career corresponding 13.5% of the full career on average.

When the entry age considered implies a career shorter than the minimum career length required to be entitled to a pension in a given country, no replacement rate is provided for that entry age.

Replacement rates decline with delayed entry age and smaller contribution densities. For male workers at average earnings, the average gross replacement rate for OECD countries for entry age 20 is 54.2%, compared to 50.2% for labour-market entry at 25, 46.1% at entry age 30, 41.7% at entry age 35,

37.3% at entry age 40, 33.5% at entry age 45, 29.9 at entry age 50, 26.8% at entry age 55 and 23.7% at entry age 60.

In Canada, Ireland, New Zealand, Portugal, Spain and the United States, replacement rates are the same for several entry ages. This is because Ireland and New Zealand have flat-rate pension systems. In the other countries, the maximum replacement rate is reached after 35 to 40 years; therefore, contributing more years does not change the pension benefit level except if these years are among the highest earnings.

For entry ages of 20, 25 and 30, net and gross replacement rates are presented for male workers with a range of different earnings levels: between one-fourth and one time the average worker earnings. This range permits an analysis of future retirement benefits across the earnings distribution. The results of these simulations are provided in Table 6 (entry age 20), Table 7 (entry age 25) and Table 8 (entry age 30).[5]

Most OECD countries protect low-income workers from old-age poverty by providing higher replacement rates for them than for average earners. For example, workers with full career (entry age 20) earning only half the average receive replacement rates averaging around 70%, compared with 54% for average earners. However, replacement rates in five countries are the same at average and half-average pay: Austria, Germany, Hungary, Italy and Spain. At the top of the range, there are two countries that provide low earners with pensions equal to or higher than their earnings when working: Denmark (replacement rate of 121%) and Israel (104%). Workers with full career earning only one-fourth the average receive a replacement rate at or above their earnings when working in 23 out of 34 OECD countries.

For low earners, the effect of taxes and contributions on net replacement rates is more muted than for workers higher up the earnings scale. This is because low-income workers typically pay less 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 additional concessions granted to pensions or pensioners under the personal income tax. For example, assuming an entry age of 25 years old, the net replacement is 10.0 percentage points higher on average than the gross replacement rate for workers earning only one-fourth the average. The difference is 10.7 percentage points for workers earning only half the average, 11.4 percentage points for workers earning three-fourth the average and 11.3 percentage points for workers earning the average.

2.5. Critical assessment of the limitations and advantages of comparing replacement rates published in Pensions at a Glance

Pensions at a Glance presents a direct comparison of pension promises across OECD countries. It provides a framework to assess the future impact of today's pension policies, including their economic and social objectives. The approach adopted is to make theoretical projections of pension benefits for workers at different levels of earnings. This approach has many advantages:

- It takes account of the detailed rules of pension systems but summarises them in measures that are easy to compare across countries.

- It is forward looking, assessing the future implications of today's pension policies. It does not confuse the situation of current retirees and those approaching retirement with the long-run stance of the pension system.

5. Replacement rates for different earnings levels are not available for short careers resulting from an entry age beyond age 30.

- It is “decomposable”. Its primary aim is to assess the parameters and rules of the pension system, keeping the economic and demographic assumptions in a steady state throughout the modelling period. The effects of countries’ demographic profile, macroeconomic aggregates, earnings distribution, etc. can be isolated both from one another and from pension policy choices.

Furthermore, this approach, which has been applied to all 34 OECD member countries, is:

- comprehensive and adaptable, since it covers all mandatory sources of retirement income for private-sector workers, including minimum pensions, basic and means-tested schemes, and earnings-related programmes; it also covers voluntary defined contribution pension schemes when these cover a significant share of the population;

- broad, covering the full earnings range from low- to high-income workers;

- flexible to assumptions, such as economic variables (inflation, interest rates, real earnings growth) or parameters (*e.g.*, what would happen if a country switched from wage to price indexation of pensions, or changed the accrual rate, etc.); and

- inclusive, since it also allows for the large effects of the personal income tax and social security contributions on living standards in work and in retirement: all indicators are presented gross and net of taxes and contributions.

However, like in any model, assumptions have to be made and these bring some limitations when comparing across countries. In particular, assumptions related to career length, coverage, targeted pensions, full application of long-term rules, sensitivity to the shape of the individual career earnings path and economic parameters may require caveats when comparing replacement rates across countries.

A full career is defined as entering the labour market at age 20 and working until the standard pension-eligibility age. However, the standard pension-eligibility age varies between countries. The implication is that the length of career varies with the statutory retirement age: 40 years for retirement at 60, 45 with retirement age at 65, 47 with retirement at 67, etc. Everything else being equal, countries with higher statutory retirement ages will therefore have higher calculated replacement rates, especially in defined contribution systems.

The results are shown for a single person only. This is because the rules governing benefits for married couples are complex in many countries, and because the results depend on assumptions over both partners’ career histories. Part of the relevance of the calculated replacement rates therefore depends on the family structure and on labour market participation of women in each country.

Some OECD countries have entirely separate schemes for civil servants and other public-sector workers. Some countries also have special programmes for agricultural workers and the self-employed. These are not included in the replacement rate calculations of *Pensions at a Glance*. The comparisons currently look only at the main national scheme for private-sector employees. Depending on the importance of the public-sector and of self-employment, the calculated replacement rates may therefore apply to a varying portion of the population in each country.

Targeted benefits are modelled in *Pensions at a Glance* but assets are not taken into account when calculating the entitlements. Targeted benefits can be means-tested, where both assets and income are taken into account, purely income-tested or withdrawn only against pension income. However, where means-tests take account of assets, the income test is taken as binding in the calculations. Replacement rates may therefore be overestimated for people who are income-poor but asset-rich.

In addition, public redistributive pensions (i.e. targeted benefits, basic pensions and minimum pensions) are assumed to be wage-indexed. However, some countries actually implement price-indexation. Replacement rates may therefore be overestimated in countries where current legislation applies less than wage-indexation. This assumption may be relaxed in the 2015 edition of *Pensions at a Glance* to reflect the actual legislation in each country.

The calculations assume that all entitled pensioners take up targeted benefits. However, people might not claim a benefit to which they are entitled for a number of reasons, including lack of information knowledge about the entitlement, social stigmas, and inertia that is often related to complex administrative routines. When a large proportion of the population is entitled to resource-tested pensions, a low take-up rate would mean that calculated replacement rates would be overestimated for a lot of people. This is unlikely to apply to basic or earnings-related public pensions which may be administered with more automatized routines.

The modelling is based on the long-term pension rules as if they were already in place. For example, if the contribution rate to a defined contribution scheme is legislated to increase from 5% to 10% over the next 20 years, the calculations assume a contribution rate of 10% from today, which would clearly overestimate the replacement rates. The opposite would apply for those countries that are reducing the accrual rate over time where the replacement rate would be underestimated.

The calculations assume that individual earnings grow in line with the economy-wide average. When this is not the case, a different shape of the individual career earnings path will have a consequence on pension entitlements from defined contribution pension plans and some defined benefit schemes. In defined contribution pension plans, contributions are usually a fixed percentage of earnings. The amount of assets accumulated may therefore differ at retirement depending on whether larger gains in real earnings occur at the beginning or at the end of the career. The great majority of OECD countries use lifetime average earnings to calculate pension benefits from defined benefit schemes. This, coupled with a policy of earnings valorisation of earlier years' pay, means that pension entitlements are insensitive to the shape of the individual career earnings path. An individual with a steeper age-earnings profile will receive the same benefit relative to lifetime average revalued earnings. In some countries, however, pension benefits are calculated based on a limited number of best or final years' pay. In the French public scheme, benefits are currently based on the best 20 years' earnings, which will gradually move to 25 years. Similarly, Norwegian pensions are based on the best 20 years' points. In Spain, the earnings measure is the final 15 years. The shape of the individual career earnings path has thus an impact on pension entitlements in these countries.

The pension systems are in general designed within a specific economic context, and estimating replacement rates based on common OECD-wide assumptions has some limitations. The projection of long-term theoretical replacement rates in *Pensions at a Glance* is based on a common set of parameter values across all OECD countries, determined using historical data. They refer to inflation rates, discount rates, wage growth rates and rates of return on financial assets. Assuming identical values has the advantage of avoiding the complex process of determining country-specific situations. It facilitates the comparison of what pension systems deliver across countries independent of differences in how economies are performing. However, it ignores country specificities that may influence the design of pension systems. In particular, initially less developed OECD countries have experienced higher real-wage growth and higher real-interest rates than the ones currently assumed in the calculations. As the economic development level is not taken into account in setting the values of key parameters, pension entitlements may be underestimated in these countries. In addition, using historical data to set parameter values may be a poor guide in the context of macroeconomic and demographic changes taking place since the last decade.

2.6. Critical assessment for Chile of the limitations and advantages of comparing its replacement rates with each country for which Pensions at a Glance reports a replacement rate

Pensions at a Glance calculates for all OECD countries theoretical replacement rates for an individual entering the labour market today at age 20 and working for a full career in the private sector at the average wage until the official age of retirement (which varies between countries). The rules of the pension system that applies to that individual are the rules in the current legislation for all mandatory pension schemes. One could argue that the replacement rates in *Pensions at a Glance* are a sort of maximum replacement rate an individual can achieve in each country given current rules because of the full career assumption. Within that framework, the replacement rates calculated for Chile are fully comparable with the ones calculated for the other countries.

The assumption used for the real rate of return after administrative charges on funded, defined contribution pensions of 3.5% per year does not reflect the current experience of the Chilean pension system. According to the Chilean Superintendence of Pensions, the system has delivered so far an average real rate of return of 9% and, in 2012, the average fee charged by pension funds was 1.42% of the salary. Obviously, higher returns assumptions for Chile would lead to higher replacement rates and would move Chile up in the country ranking. However, the question remains of whether such high real net rates of return will remain in the future. As Chile continues to develop and catches-up with other OECD countries, rates of return are expected to converge to levels similar to those observed in these other countries. Therefore, assuming a 3.5% real net return for the next 40 to 45 years may not be overly pessimistic. Ideally, one would need to assume a gradual decline of returns over time for Chile to get closer to the best estimate.

The full-career assumption may not fit well in the case of Chile. The calculations assume full contribution density, from age 20 to the official age of retirement (respectively 65 for men and 60 for women in the case of Chile). The reason for modelling only full careers is that periods out of the labour market are covered in many countries pension systems, with credits for periods in higher education, military service, unemployment, child rearing, etc. Simply assuming that people who are not in work are not covered by the pension system during career gaps would produce inaccurate figures for pension entitlements in many countries. In the case of Chile, such a programme exists for women: for each live birth, the state deposits a subsidy in the woman's individual account. The subsidy is equivalent to 18 months' contributions based on the minimum wage. However, contribution densities in Chile are nowadays just around 50%, meaning that people only contribute about half of their full career to the pension system, due to shifts between the formal and the informal sector, as well as shifts from paid jobs to self-employment (contributions to the pension system are voluntary for the self-employed).[6] Replacement rates in *Pensions at a Glance* therefore overestimate the likely replacement rates that most people in Chile will enjoy at retirement. These replacement rates should only be considered as a maximum entitlement that individuals with a full career may reach.

Finally, take-up rates for targeted benefits are well below 100% in Chile today. In Chile, people are entitled to the solidarity pillar if they have accumulated insufficient assets in their mandatory defined contribution plan to give them a retirement income above a certain income threshold. However, actual data by the Chilean Superintendence of Pensions show a take-up rate of 43% since the new solidarity pillar was introduced in 2008. People may not claim their solidarity benefits because of a lack of knowledge, although the Chilean authorities argue that the population has been widely informed when the new solidarity pillar was introduced. The amount of personal and family information that needs to be disclosed may also restrain some people from claiming their benefits. In the long-term, more and more eligible

6. Since 2012, self-employed people automatically contribute to the DC system, with the option to opt-out. Contributions should become mandatory for the self-employed as of 2015.

individuals are expected to claim such benefits as they get familiar with the new system. The assumption of full take-up rate will therefore likely be less of an issue for Chile as time goes by.

2.7. Comparative analysis of the replacement rates calculated in Pensions at a Glance with the ones calculated for the additional profiles

The net and gross theoretical replacement rates provided for different entry ages and earnings levels (Tables 4 to 8) are fully comparable across all OECD countries in the framework defined in *Pensions at a Glance*. The same limitations apply as the ones identified above.

PAG 2013 only looks at cases where individuals enter the labour market at age 20. The additional profiles relax this assumption and provide theoretical replacement rates for entry ages in the full range between age 20 and age 60.

In PAG 2013, pension entitlements are presented for workers (entry age 20) with a range of different earnings levels: between 0.5 times and twice the average worker earnings. The additional profiles focus on a lower earnings range: between one-fourth and one time the average worker. They are provided for different entry ages (20, 25 and 30) for male workers.

3. Establish and describe the gender gaps that exist in the pension systems of the OECD countries

3.1. Description of the level and type of employability of men and women in OECD countries

Table 9 provides information on the level and type of employment of women and men in OECD countries. Starting with labour force information data for the year 2013 (population of working-age, economically active population, employment rate, unemployment rate, inactivity rate), the table shows that on average in OECD countries, the employment rate of women (60.3%) is lower than the one of men (72.2%) by about 12 percentage points. Women employment rates are below 50% in Greece, Italy, Mexico, and Turkey. At the other extreme, they are above 70% in Denmark, Iceland, Norway, Sweden and Switzerland. On average in the OECD, unemployment rates have a similar level for both men and women, at around 9%.

Regarding rates of informality, please refer to Section 4 for a full discussion on concepts, definitions and measurements.

The employment distribution by gender and occupation in 2013, according to the International Standard Classification of Occupations (ISCO-08), shows that women tend to be more often than men in service and sales workers occupations than men and less often in managerial positions.

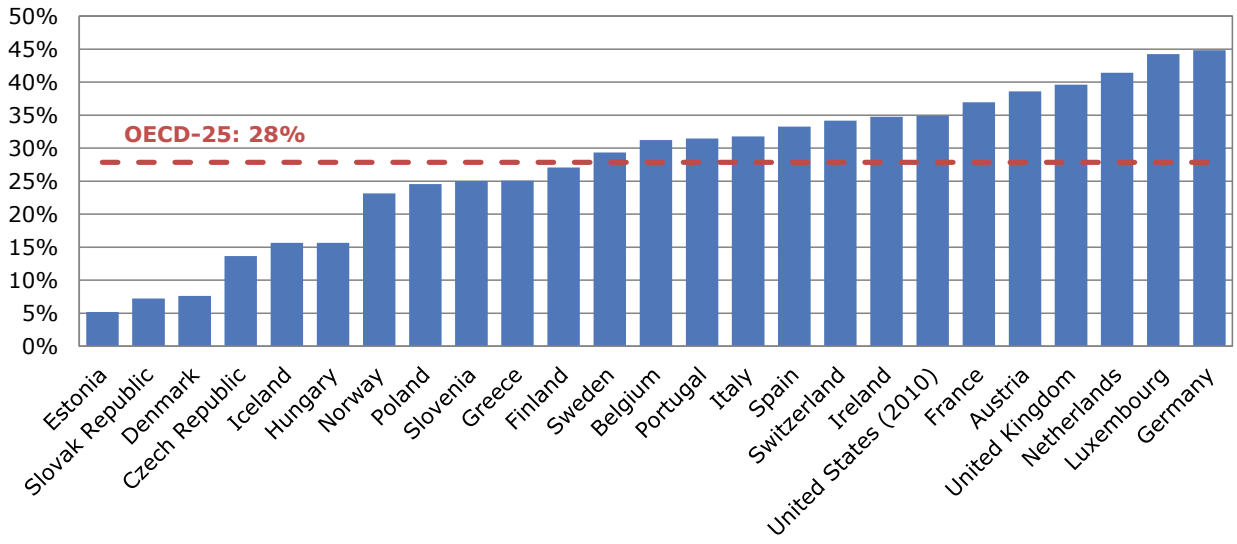
In terms of economic activities (according to the International Standard Industrial Classification, ISIC-Rev.4), women are more represented than men in education and human health and social work activities. Women are less represented than men in manufacturing and construction.

Table 10 provides mean years of schooling as calculated by the UNESCO Institute for Statistics. Mean years of schooling is defined as the average number of years of education completed by a country's adult population (25 years and older), excluding years spent repeating grades. On average in the OECD countries with available information (the data may not refer to the same year of measurement), women have completed 11.2 years of education and men have completed 11.6 years of education. Countries when men and/or women have spent less than 10 years in education on average include Chile (both men and women), Greece (women), Italy (women), Mexico (both men and women), Portugal (both men and women), Spain (both men and women) and Turkey (both men and women).

The gender wage gap is provided for full-time employees in Table 11. The gender wage gap is defined as the difference between male and female median wages divided by the male median wages. Between 2000 and 2013, on average in the OECD countries, the gap has declined from women earning 18.2% less than men in 2000 to women earning 15.5% less than men in 2013. The largest gender wage gaps are observed in 2010 (latest year in which the data are available for almost all countries) in Estonia, Israel, Japan, Korea, the Netherlands and Turkey (above 20%). Gender wage gaps were below 10% in 2010 in Belgium, Hungary, Luxembourg, New Zealand, Norway, Poland and Spain.

Finally, Figure 1 presents the average pension gap in 2011. The gender pension gap is defined as the difference between male and female average gross (public and private) pension payments divided by male ones. On average for the 25 OECD countries with available data, the total pension income of women is 28% lower than the total pension income of men. The pension gap is larger than 40% in the Netherlands, Luxembourg and Germany. It is below 10% in Estonia, the Slovak Republic and Denmark.

Figure 1. Average pension gap on total pension income, 2011



Source: d'Addio, A.C. (2015), Explaining the gender pension gap in OECD countries; OECD gender data portal.

3.2. Description of the type of participation in the pension system of men and women in OECD countries

Table 12 provides various elements describing the participation of the population to the pension system. The percentage of over 65s receiving non-contributory safety-nets (targeted pensions) is first presented. The importance of targeted pensions varies enormously across countries. Nearly 80% of Australians receive at least some payment from the resource-tested scheme and nearly 90% in Denmark. At the other end of the spectrum, 2% of fewer of pensioners receive targeted benefits in Germany, Japan, Luxembourg and Sweden. The breakdown by gender is not available. The coverage of contributory pensions among people older than 65 is not available either.

Private pension income may be paid to pensioners as a lump sum, an annuity, programmed withdrawals or combinations thereof. In 2013, all of the payments made by private pension plans to pensioners were in the form of a pension stream (annuity of programmed withdrawal) in Finland and Norway. At the opposite, pension plans only paid lump sums in 2013 in Slovenia.

While Table 1 provides current legal retirement ages, Table 12 provides long-term legal retirement ages. This includes changes that have been legislated but are not yet in effect. Virtually all OECD countries already have a normal pension age of at least 65 or plan to reach that level in the future. In two of these, normal pension age for women will be lower, at 64 in both Israel and Switzerland. Seventeen countries will have normal pension ages for men and women above age 65. Only Iceland and Norway are currently at 67, but Australia, Denmark, Germany, and the United States plan to reach that level in the future, with the United Kingdom going further to 68.

Finally, data on contribution density are only available for current pensioners and for European countries (source EU Ageing Report 2012). The contribution density is measured as the number of years that new pensioners in 2010 have contributed during their career. Numbers cover both men and women. On average for the 16 OECD countries with available information, new pensioners in 2010 have contributed 36.6 years to the pension system. Numbers vary from 29.3 years in Greece to 48 years in the Netherlands.

3.3. Definition and detailed description of the main strategies implemented in the OECD countries to compensate for gender gaps in the labour market related to pregnancy, children and/or elderly care

Compensation strategies during maternity and paternity leaves

Parental leave systems are diverse and individual systems do not always fit neatly into classifications suitable for international comparison. That said, four broad or general types of parental leave are generally identifiable:

- Maternity leave (or pregnancy leave): employment-protected leave of absence for employed women at around the time of childbirth, or adoption in some countries. The ILO convention on maternity leave stipulates the period of leave to be at least 14 weeks. In most countries, beneficiaries may combine pre- with post-birth leave; in some countries a short period of pre-birth leave is compulsory as is a 6 to 10 week leave period following birth. Almost all OECD countries have public income support payments that are tied to taking maternity leave. In some countries (for example, Australia, Germany, Iceland, New Zealand, Norway and Sweden), there is no separate regulation for maternity leave with stipulations instead integrated into the parental leave scheme.

- Paternity leave: employment-protected leave of absence for employed fathers at the time of childbirth. Paternity leave is not stipulated by international convention. In general, periods of paternity leave are much shorter than for maternity leave. Because of the short period of absence, workers on paternity leave often continue to receive full wage payments. In some countries, father specific leave entitlement is part of the parental leave scheme, rather than established as a separate right.

- Parental leave: employment-protected leave of absence for employed parents, which is often supplementary to specific maternity and paternity leave periods, and frequently, but not in all countries, follows the period of maternity leave. Entitlement to the parental leave period is often individual (i.e. each parent has their own entitlement) while entitlement to public income support is often family-based, so that in general only one parent claims such income support at any one time (except for a short period after childbirth). In some countries parental leave is generally a sharable family entitlement but with certain periods reserved for use by the mother or father, while in others (such as Austria and Germany) ‘bonus’ paid weeks are offered if both parents use a certain portion of the family entitlement. Assuming that the family wishes to maximize the total

length of leave on offer, this implies that a certain number of weeks are effectively 'reserved' for fathers.

- Home care leave (or childcare or child raising leave): employment-protected leaves of absence that sometimes follow parental leave and that typically allow at least one parent to remain at home to provide care until the child is two or three years of age. Home care leaves are less common than the other three types of leave and are offered only in a minority of OECD countries. They are also often unpaid, and where a benefit is available the home care leave tends to be paid only at a low flat-rate.

Table 13 shows the duration of paid maternity leave, paid parental and home care leave available to mothers, and paid father-specific leave. In all cases, entitlements reflect only those weeks of leave for which at least some payment is available. Because payment rates vary across countries and types of leave, entitlements are presented in both 'duration in weeks form' and in 'full-rate equivalent' (FRE) form, that is, as the length of the paid leave in weeks if it were paid at 100% of previous earnings. The calculation of the full-rate equivalent (FRE) can be summarized by: FRE = Duration of leave in weeks × payment (as per cent of average earnings) received by the claimant over the course of the leave

On average across OECD countries, mothers are entitled to 17 weeks of paid maternity leave around childbirth. Almost all OECD countries offer paid maternity leaves that last at least three months – which is not surprising given that both the ILO convention on maternity leave and the current EU directive on maternity leave stipulate that mothers should have access to at least 14 weeks of maternity leave – with the United States the only country to offer no statutory entitlement to paid leave on a national basis. In some countries entitlements to paid maternity leave extend to over six months. In the United Kingdom, for example, mothers can take up to nine months paid maternity leave.

Maternity leaves are generally well paid. On average across OECD countries, maternity benefits replace approximately 78% of average gross earnings, with twelve countries offering a mother on average earnings full compensation across the leave. Payment rates are lowest in Ireland and the United Kingdom, where around only one-third of gross average earnings are replaced by maternity benefit. As a result, despite lengthy paid leave entitlements, full-rate equivalent paid maternity leave in these countries lasts only nine and twelve weeks respectively.

Paid leaves specific to or reserved for fathers tend to be far shorter than maternity leaves. On average, OECD countries offer nine weeks of paid father-specific leave. Nine OECD countries provide no paid father-specific leave at all, and ten offer two weeks or less. However, at the other end of the scale, nine countries reserve three months or more of paid leave for fathers, with the father-specific entitlements in the two East Asian OECD countries – Japan and Korea – lasting as long as twelve months.

Father-specific leaves are often well paid when short, although payment rates tend to fall once entitlements last longer than one month or so. Of those countries that offer at least one month, the highest payment rates are in Finland – where 71% of average gross earnings are replaced by payments across the nine-week leave – and in Norway, where a father on average wages receives up to 91% of previous gross earnings over the 14-weeks of parental leave reserved for fathers. Although only 58% of average earnings are covered by the parental leave benefit in Japan, these payments stretch across all of 52 weeks of the father's individual entitlement. This produces a 'full-rate equivalent' father-specific leave equal to 30.4 weeks, which is by far the most generous paid father-specific entitlement in the OECD.

Compensation strategies for people caring for children

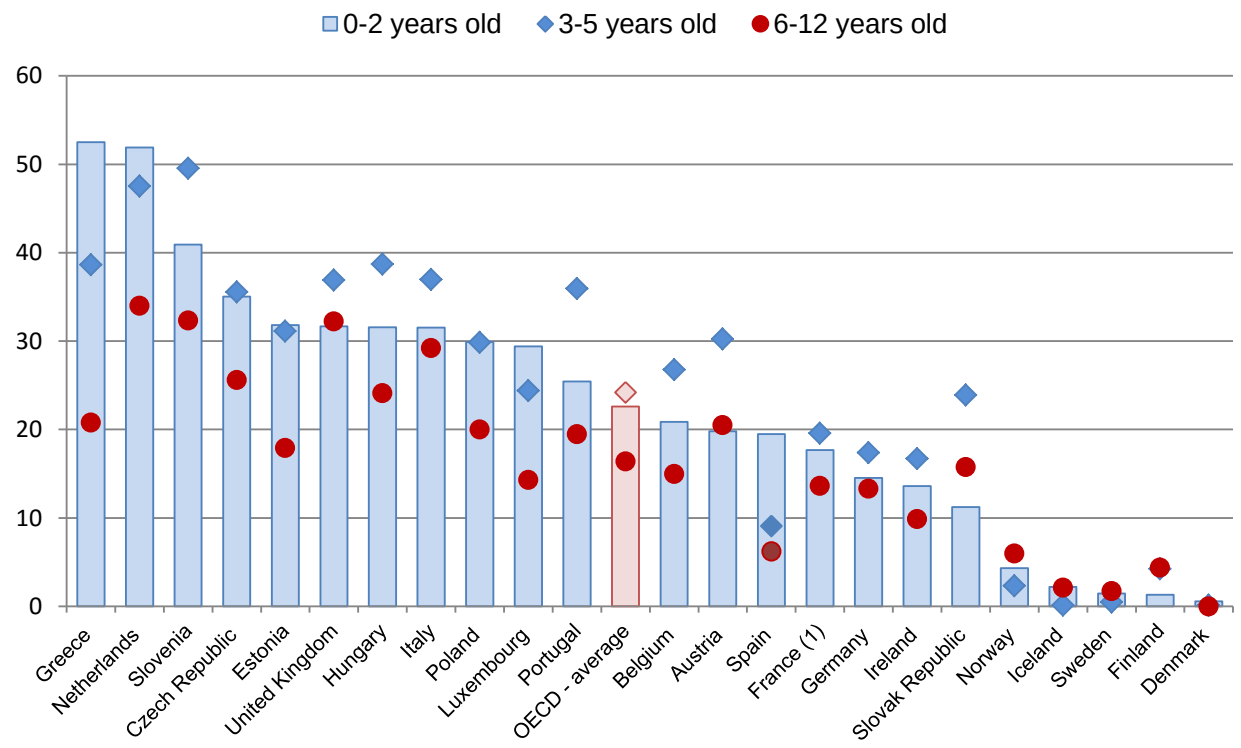
The availability and generosity of paid parental and home care leave varies considerably across countries (Table 13). The OECD average entitlement stands at just less than 37 weeks, with most countries offering somewhere between 20 and 52 weeks. However, ten OECD countries offer no entitlement to paid parental or home care leave, while at the other extreme four OECD countries provide a statutory entitlement to over two-and-a-half years of paid parental and home care leave.

Parental leave payment rates tend to be far lower than those for maternity leave. On average across the OECD, parental leave benefits replace just under half of average gross earnings, and in only one OECD country (Chile) is parental leave fully paid for a worker on average earnings. The lowest payment rates tend to be found in countries with the longest entitlements. In the Slovak Republic, for example, payments across the 130-week paid parental and extended leave entitlement replace only 23% of average earnings, while in Finland the payment rate falls to 20.1%. In large part this is because a substantial portion of the lengthy paid entitlements available in these countries take the form of extended home-care type leaves. The broad objective of these leaves is a little different to general paid parental leave – rather than providing parents with short-term compensation for any earnings forgone by suspending employment, these extended benefits look to offer medium-term financial support to parents who wish to remain at home to care for young children. As a result, these prolonged leaves tend to be paid at a lower flat-rate and often replace only a small proportion of previous earnings.

Figures 2 to 4 present data on informal childcare arrangements. Informal care is generally defined as care arranged by the child's parent either in the child's home or elsewhere, provided by relatives, friends, neighbours, babysitters or nannies and it is generally unregulated. This indicator presents data from surveys with different definitions and groupings of childcare providers. For example, some surveys classify as informal care all informal childcare providers (relatives and non-relatives) who do not receive payment for this activity (EU-SILC). Other surveys define informal care as non-regulated care provided by grandparents, other relatives and non-relatives but do not distinguish between paid and unpaid care (Australia, Korea and the United States). Data for European countries includes unpaid care provided by grandparents, other relatives, friends or neighbours. Data for Korea concern the same type of providers as EU-SILC, but it includes paid and unpaid care. Data presented for Australia and the United States include childcare provided by a grandparent regardless of payment.

The proportion of children using informal care varies widely across OECD countries. More than half of Dutch and Greek toddlers (under 3 years old) are cared for by an unpaid childminder, while less than 10% of Nordic parents use some form of informal care in a typical week, which reflects the comprehensiveness of the formal day-care system in these countries. Figure 2 shows that not only young children are cared for by unpaid childminders (grandparents, relatives, friends or neighbours) but also children in the older age groups.

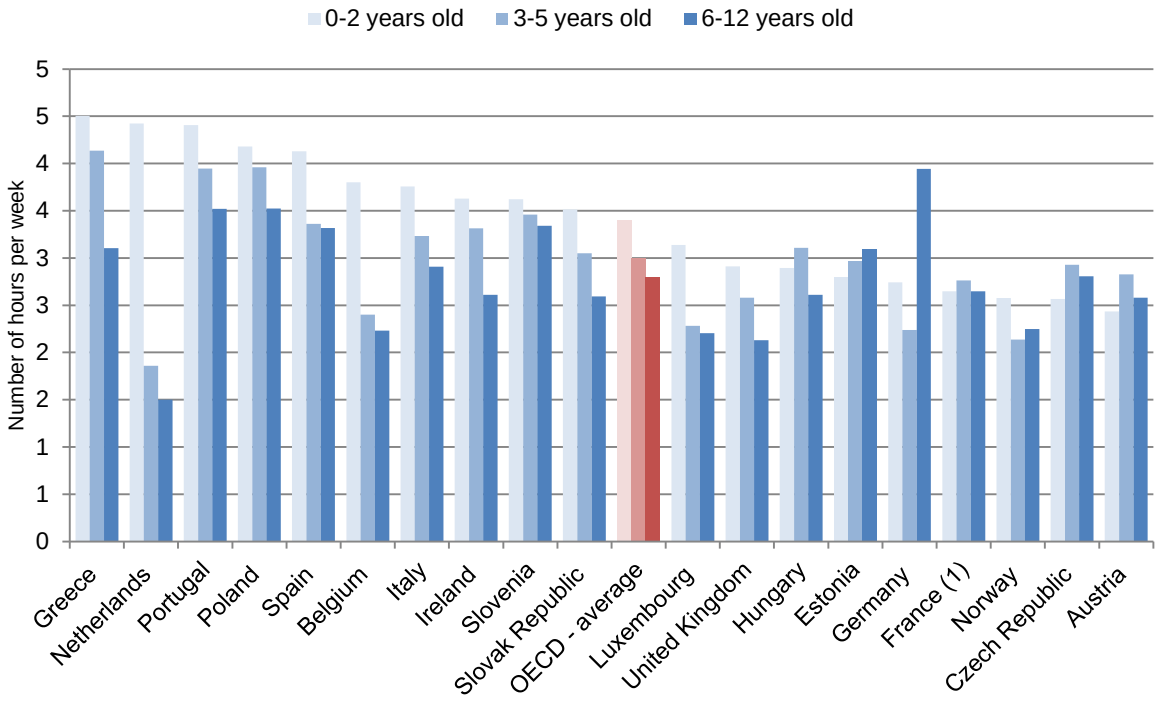
Figure 2. Use of informal childcare arrangements during a typical week by children's age, 2011



Source: OECD Family database, Indicator PF3.3: Informal childcare arrangements; www.oecd.org/social/family/database.

Figure 3 shows that, in general, parents use informal childcare only for a few hours during a typical week. Children in this chart spent around 3 hours per week being cared for by informal childcare providers. In most countries, youngest children spent slightly more time in informal care than school-aged children. This is particularly so in the Netherlands where the difference between the youngest and the eldest is of around 3 hours (4.4 hours and 1.5 hours, respectively). In Germany, on the contrary, school-aged children spent more time in informal care than the youngest kids.

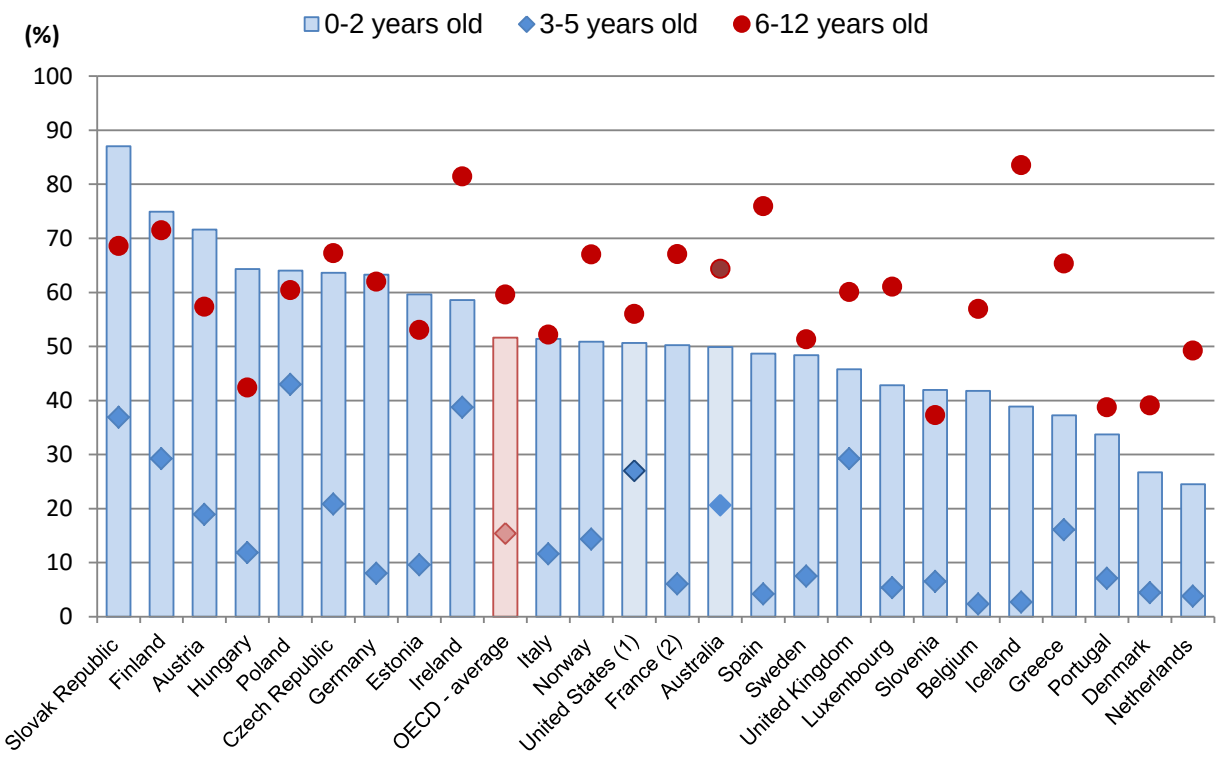
Figure 3. Average number of hours during a typical week, children aged 0 to 12, 2011



Source: OECD Family database, Indicator PF3.3: Informal childcare arrangements; www.oecd.org/social/family/database.

Figure 4 shows the proportion of children not using childcare arrangements (neither formal nor informal) during a typical week. The proportions are highest for very young children and older children going to primary school. For the youngest, full-time parental care is the most likely solution, while children in their last pre-school years (when in many countries, but not the Netherlands, parents frequently increase working hours as children grow up) are most likely to be minded by informal carers for a short period around kindergarten hours on a regular basis. When children enter primary school, the intensity with which childcare arrangements are used tails off.

Figure 4. Children with no usual childcare arrangements by children's age, 2011



Source: OECD Family database, Indicator PF3.3: Informal childcare arrangements; www.oecd.org/social/family/database.

Figures 5 to 7 present data on childcare support. Parents pay childcare fees to childcare institutions (e.g. day-care centres, family day care) for the services they provide to them and their children. The data presented here concerns the amount payable for a two-year old and a three-year old, for one month of full-time care not accounting for periods where childcare may not be available or required (e.g. vacation). Where fee information is provided per hour of care, full-time care is assumed to cover 40 hours per week. 'Fees' are gross amounts charged to parents, regardless of the subsidy that providers may receive from public authorities or private donations. Gross fee payments also do not reflect the amount of childcare-related cash benefits, tax advantages or refunds/rebates that may be available to parents. Where prices depend on income of family characteristics, the maximum applicable fee is shown. Unless fees are rule-based or uniform across institutions, averages or "typical" fees are shown.

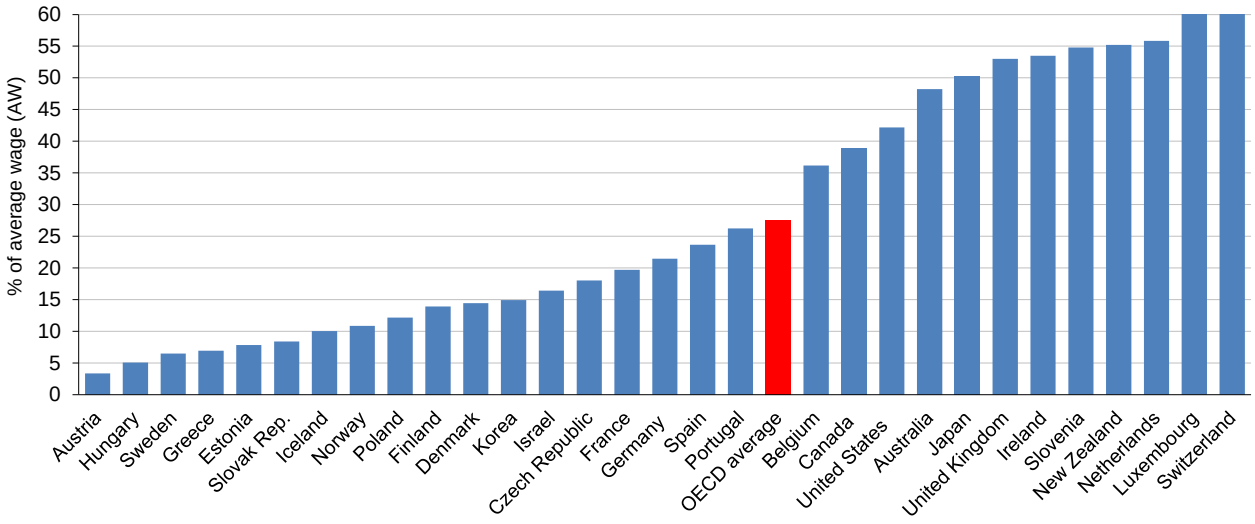
Net childcare costs as defined here include fees minus cash benefits, rebates and tax concessions, and other relevant benefits. Subtracting the latter from the gross fee charged by the childcare provider gives the net cost to parents, i.e. the "out-of-pocket" expenses resulting from the use of a formal childcare facility. Calculations of net childcare cost relate to full-time care *for two children aged 2 and 3* in a typical childcare facility. The results presented below do account for tax reductions, childcare benefits and "other benefits", which are not primarily childcare-related (e.g. family or housing benefits) but nonetheless, influence household income position. Childcare costs may vary with family situation and earnings level. Information is presented for two different household situations:

- A married couple where both spouses work full-time, one earning average wage (100% of AW) and the other one earning below-average wages (50% of AW).

- A full-time employed sole parent with below-average earnings (50% of AW).

The choice of childcare arrangements (parental, formal and/or informal care) is influenced by a large number of factors, with affordability often being among the most relevant. Figure 5 shows that across OECD countries, the average "typical" childcare fee paid for a two-year old in full-time care is just over 27% of average earnings with wide variation across countries. This amount ranges from around 5% of average wage or less in Hungary and Sweden to above 50% in Japan, Ireland, Luxembourg, the Netherlands, New Zealand, Slovenia, Switzerland and the United Kingdom. The data here represent the "typical" fees charged by accredited childcare centres in the country, and ignore variation in childcare fees by type of care, region/municipality.

Figure 5. Childcare fees per two-year old attending accredited early-years care and education services, 2012



Source: OECD Family database, Indicator PF3.4: Childcare support; www.oecd.org/social/family/database.

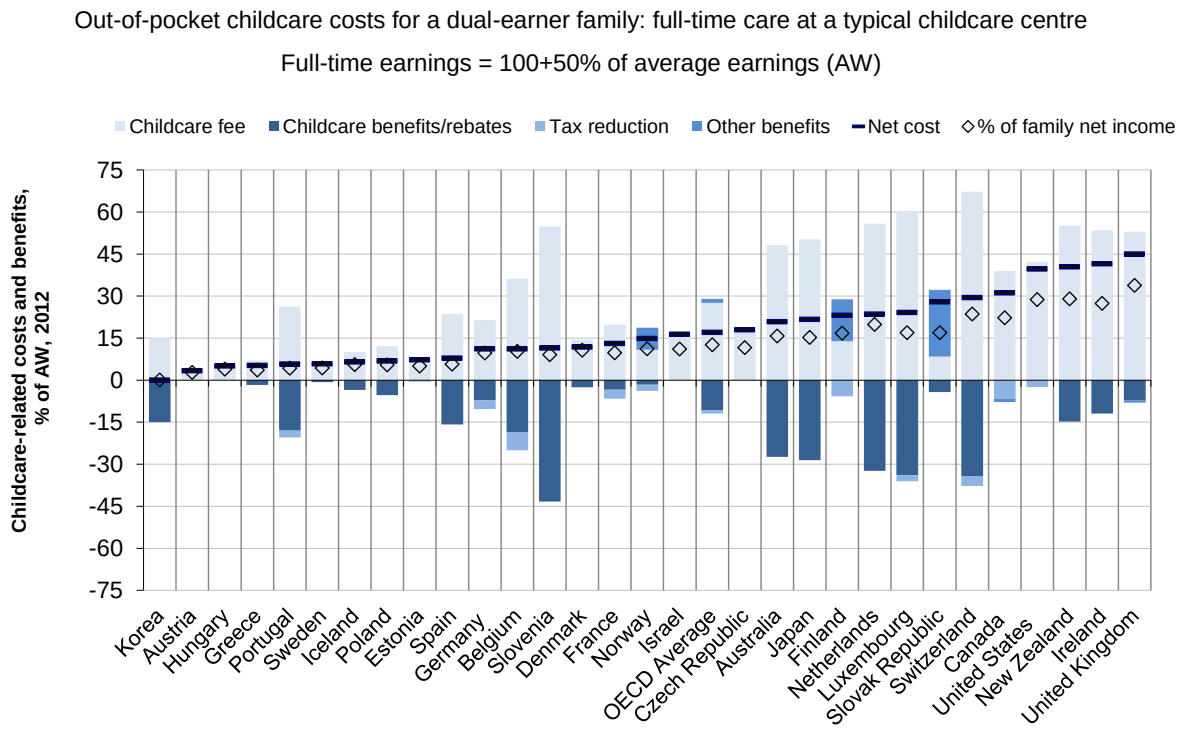
In many countries childcare fees are often reduced for low-income families; are sometimes lower for sole parents; can differ by the number of children in care; and, often decrease with a child's age. The objective of these measures is to address equity concerns (ensuring accessibility of childcare for families with limited means) or to reduce the cost of children to larger families.

Country comparisons of gross childcare fees alone are, however, not very informative as net childcare costs can be substantially lower. As mentioned above, childcare fees are often reduced for families in particular circumstances and these reductions can be both substantial and widespread. In addition, countries provide a range of cash benefits, rebates and tax reductions aimed at helping parents reduce the net cost of purchased childcare. Nevertheless, even after accounting for government support, in many countries overall costs remain substantial.

For dual-earner couples with gross earnings at 150% of the average wage, the average out-of-pocket expenses for two children in full-time care are around 17% of average earnings (Figure 6) with wide variation across countries. Net childcare costs are low in countries where gross fees are relatively low and in Korea and Portugal, where there is considerable (income-tested) childcare benefit support. In these countries, net childcare costs for families with two children are around or below 5% of average wage. By contrast, centre-based formal care is most expensive for working couples in most Anglophone countries (except Australia) with net costs above 30% of average wage. In Ireland and the United Kingdom net

childcare costs for a working couple with 150% of average earnings are highest at more than 40% of average wage.

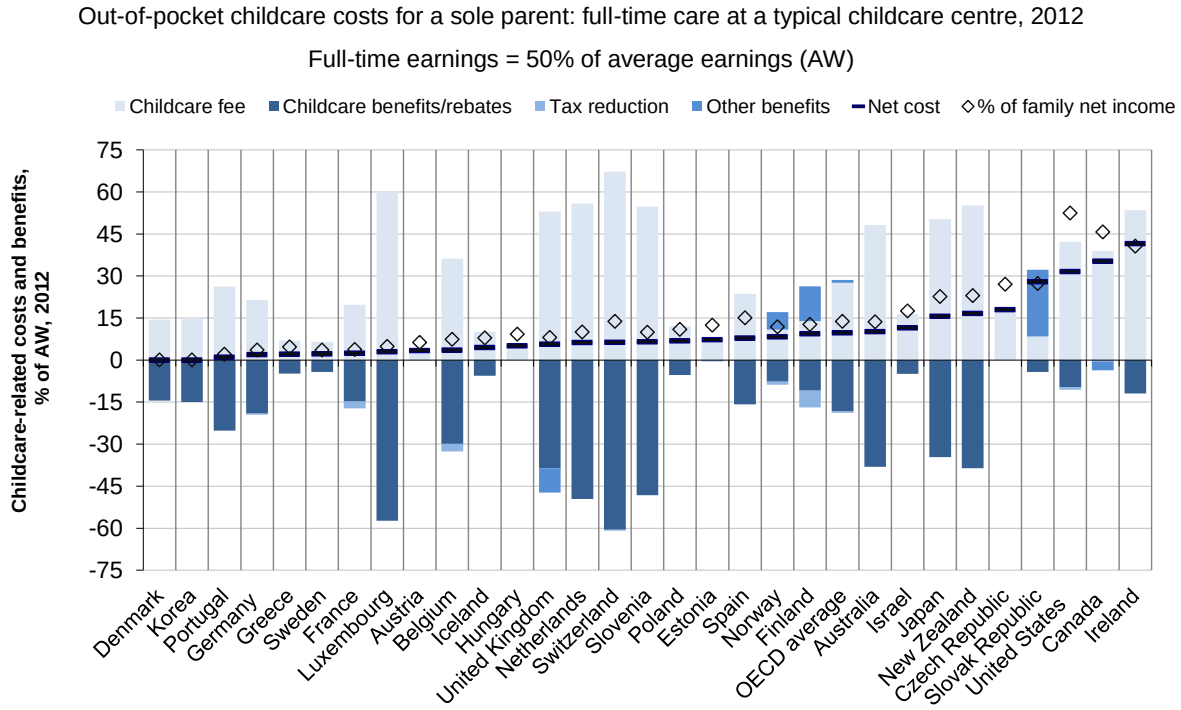
Figure 6. Net childcare costs for a dual-earner family with full-time earnings of 150% of the average wage, 2012



Source: OECD Family database, Indicator PF3.4: Childcare support; www.oecd.org/social/family/database.

Unless they can rely on informal care arrangements, sole parents need to have access to formal childcare to be able to participate in the labour market. For sole parents with earnings at 50% of average wages net childcare costs are almost half that faced by dual-earner families, that is 10% of average wages (Figure 7). Compared to dual-earner families, net childcare costs are significantly lower in Luxembourg, New Zealand, Switzerland and the United Kingdom (more than 20 percentage points less), mostly achieved through targeted childcare benefits and rebates. In Canada, Ireland and the United States the out-of-pocket childcare costs are high, at over 30% of average wage, where such targeted benefits are lacking or relatively low.

Figure 7. Net childcare costs for a sole-parent family with full-time earnings of 50% of the average wage, 2012



Source: OECD Family database, Indicator PF3.4: Childcare support; www.oecd.org/social/family/database.

Finally, Table 14 provides the typology of childcare and early education services in OECD countries. Childcare and early-education services for children not yet of schooling age can be categorized in three broad groups.

- Centre-based day-care: encompasses all childcare that is provided outside the home in licensed centres. The services provided can be full or part time and are most commonly referred to as nurseries, day care centres, crèches, playschools and parent-run groups. In general, these services are provided to children not yet 4 years of age and provide care to children before commencing pre-school. The type of childcare provision is mixed, depending upon the country. In many European countries provision is mainly public topped up by parental fees which are off-set by tax credits, child allowances and so on (please refer to indicator on cost of childcare). The ministry responsible for formal childcare and early education services for very young children (around age 2) is often the Ministry of Education, as for example, in Australia, Mexico, the Netherlands, New Zealand, Portugal, and Sweden), or the Ministry of Social Affairs, as, for example, in Denmark, Finland, France, and Japan. Private provision of early childcare is prominent in some countries e.g. Australia, Canada, Ireland, New Zealand, the Netherlands, Switzerland, the UK, and the United States. Within the category of centre-based services a small proportion is group family childcare, mini-crèches and parental run childcare centres (see country notes for details). These have been developed by groups of parents (sometimes with informal beginnings) but have moved onto acquire accreditation and subsidies from the state.

- Family day care (FDC) is traditionally provided in a home setting. This can be at the child-minder's home, or at the child's own home where a qualified or registered child minder looks after the child. The maximum number of very young children who can be cared for in this way is usually 3 or 4. This type of care is most common for children prior to pre-school i.e. those aged

up to 3, and is sought either because the availability of places in crèche/nurseries is too limited or parents prefer a homely environment (particularly for very young children).

- Pre-school early education programmes: this category includes centre-based (or often school-based) programmes designed to meet the needs of children preparing to enter primary (compulsory) education. In most countries, these programmes include at least a 50% educational content and are supervised by qualified staff. In some countries, these programmes are run on a full-time basis and offer out-of-school hours provision on the same premises. Some countries however have traditionally provided kindergarten programmes as part-time and are now looking to reform these programmes (see below for country notes). Others have effectively extended the primary school programmes by bringing in one or two years pre-school into primary schools, for example the "Prep" year in Queensland, Australia, „infant classes" in Ireland, group 1 (the first year in the former "kleuterschool") in the Netherlands, the "Educacióon infantil" in Spain, and "Reception classes" in the UK.

Table 14 presents these three categories and also illustrates whether they are publicly or privately provided. The year of reference is between 2000 and 2005. However, in 2010, the information in this table was verified and updated by national authorities.

Compensation strategies for people caring for older adults

According to OECD (2011), there is a lack of comprehensive or comparable international evidence on carers. The definition and measurement of unpaid care presents significant challenges, especially when attempting to make international comparisons. Many carers do not see themselves as such and, even if questioned, would not declare that they were carers. Society's attitudes towards family responsibilities and the availability of services to support both carers and people with health limitations vary widely across countries, influencing the pattern and declaration of informal caring. Studies use different definitions of carers which differ depending on the caring activities included and who is the care recipient, leading to the inclusion or exclusion of so-called instrumental activities of daily living, and the inclusion or exclusion of young care recipients and people with ill health.

To assess the characteristics of carers and the impact of informal caring, different national and cross-country surveys are used in OECD (2011). No threshold is used in the general definition of carers and all individuals with caring responsibilities of at least one hour per week are included. All definitions focus on personal care inside or outside the household but there are differences in the scope of the definition. In particular, the question in Australia specifies the type of activities included in care and that they are performed towards someone who has a long-term health condition, who is elderly or who has a disability. In contrast, the definition in the United Kingdom is broader and includes looking after or providing special help to someone who is sick, disabled or elderly. The results might be sensitive to variable definitions and measurement error.

The descriptive analysis on the characteristics of carers is limited to the sample of individuals aged 50 years and above. The choice is partly driven by data limitations and partly by the fact that this group is more likely to be involved in caring responsibilities and more at risk of labour market exit. Data from Australia and the United Kingdom reveal that 75% to 80% of carers are aged 45 and above. Older workers aged between 50 to 64 years are also more prone to early retirement, particularly in the case of family responsibilities.

Across the OECD, more than one in ten adults (family and friends) is involved in informal, typically unpaid, caregiving, defined as providing help with personal care or basic activities of daily living (ADL) to people with functional limitations. There are significant variations in the percentage of the population

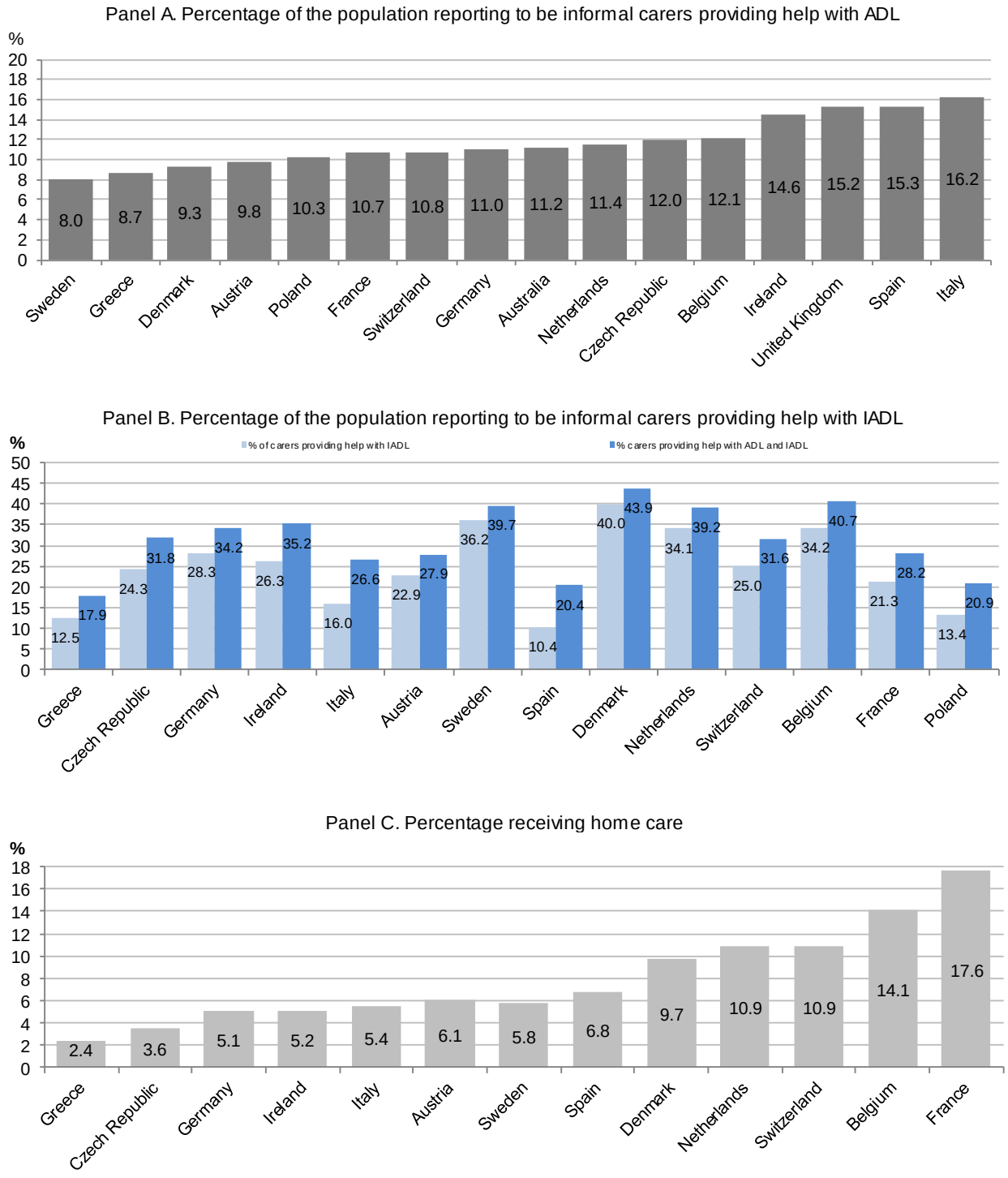
involved in this type of caregiving across OECD countries. As can be seen in Panel A of Figure 8, the percentage of the population reporting to be informal carers across OECD countries for which data are available ranges from 8% to just over 16%. There is no clear geographic distribution in the rate of caregiving: certain southern European countries have among the highest percentages (Italy, Spain) but Greece ranks among the lowest rates together with Denmark and Sweden. Some of the country differences are due to slightly different definitions and interpretations of caring for dependents across countries as mentioned above.

A larger number of carers provide help with instrumental activities of daily living (IADL, that is help with shopping or paperwork for instance), even in countries with comprehensive public long-term care coverage. When informal caring is defined with such a broader focus, close to one in three adults aged over 50 provide unpaid care (Figure 8, Panel B). Except in southern European countries, a greater proportion of adults provide help with IADL compared to help with ADL. Northern European countries, despite having a comprehensive public coverage for formal care, have the highest share of individuals providing help with IADL.

Carers are more likely to be female but more males become carers at older ages (Figure 9). Across the 16 OECD countries reviewed, close to two-thirds of informal carers aged over 50 years are women. Caregiving tends to decrease at older ages with a smaller percentage of carers being present at age 75 and above, probably being related to health limitations. At the same time, the gender distribution of carers changes with age. Relatively more males are carers among the 75-years-old and above: in two-thirds of the countries a similar or higher percentage of male carers than female carers is observed.

The OECD does not have information on compensation strategies related to elderly care in the labour market.

Figure 8. Caregiving varies by country and type of help provided



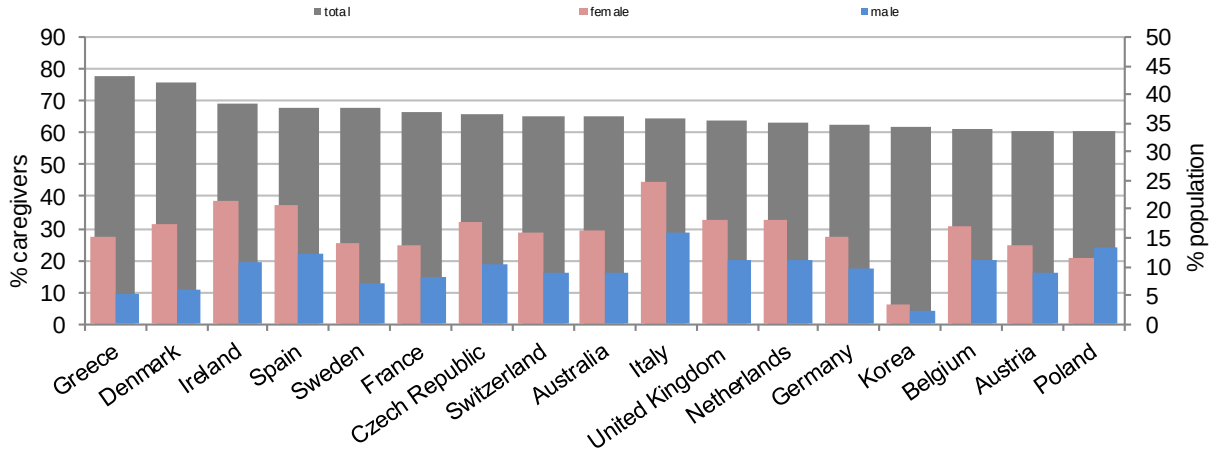
Source: OECD (2011).

Figure 9. Informal carers are predominantly women

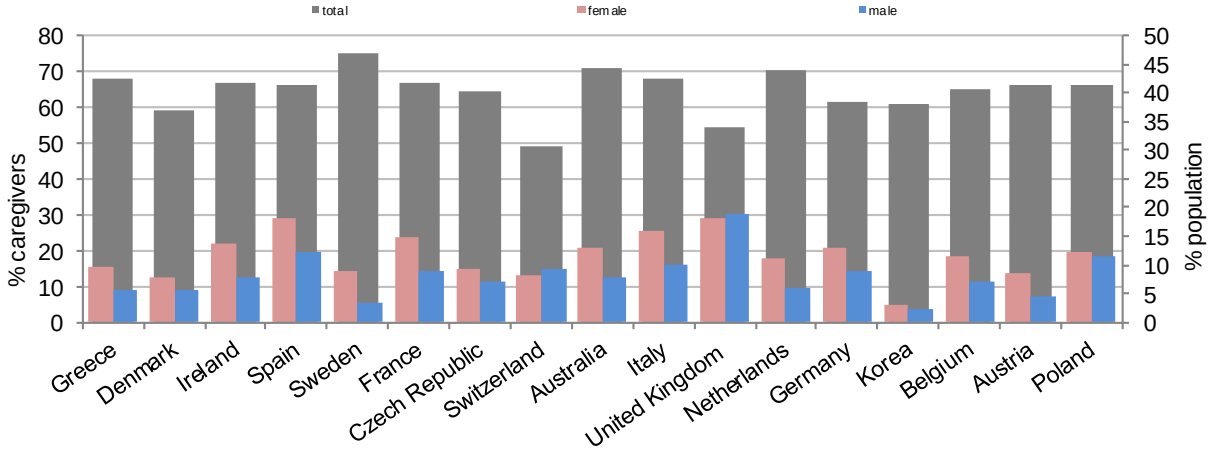
Percentage of informal carers who are female by age group (left axis)

Percentage of the population reporting to be carers by gender and age group (right axis)

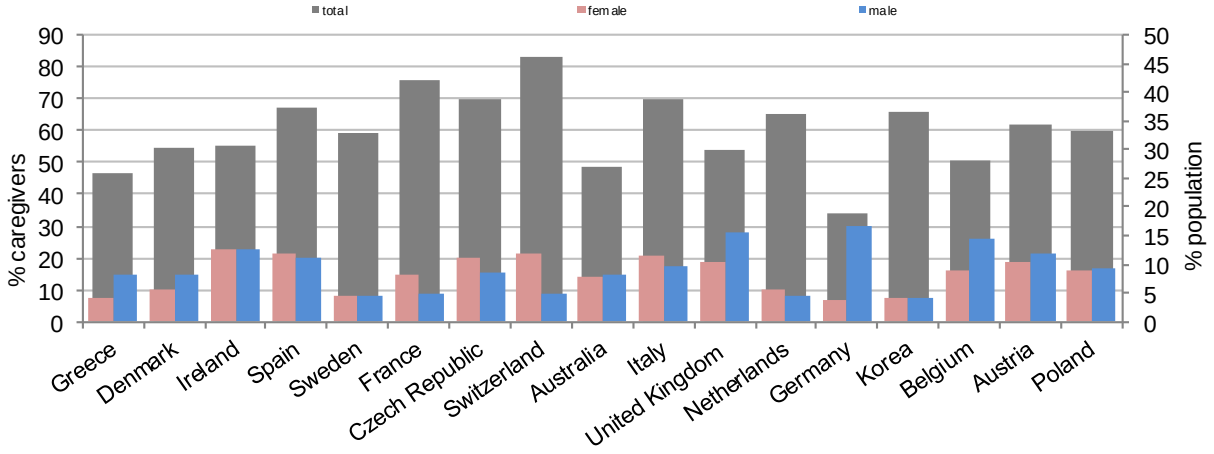
Persons aged 50-64



Persons aged 65-74



Persons aged 75+



Source: OECD (2011).

3.4. Description of the main strategies implemented in the OECD countries to compensate for gender gaps in the pension system

Many OECD countries grant pension credits to women who interrupt their careers to raise children. These schemes vary in terms of beneficiaries of credits, length of credited periods, funding sources and policy objectives. Table 15 describes the rules for childcare credit mechanisms in OECD pension systems in 2012.

In countries where such credits do not exist, compensation for caring periods is often provided through other redistribution mechanisms such as basic universal pensions granted independently of contributions, means-tested benefits, or, as in the United States, through a benefit formula which automatically excludes a number of years on low or without earnings. For these countries, career breaks, including for childcare, are therefore often offset, especially for low earners.

3.5. Strategies to compensate for gender gaps in the labour market and in the pension system that Chile could implement

Gender gaps in the labour market and in the pension system can be mostly closed by improving gender equality on education, employment and entrepreneurship. In 2013, the OECD Council adopted recommendations on gender equality in education, employment and entrepreneurship. The Council recommends that through a whole-of-government approach and through means such as appropriate legislation, policies, monitoring and public awareness campaigns, OECD countries:

- adopt practices that promote gender equality in education by:
  - ensuring that boys and girls have equal access to good-quality education, equal rights and opportunities to successfully complete schooling and in making educational choices;
  - reviewing and where necessary adapting school and early childhood education curricula, teaching and school practices to eliminate gender discrimination and stereotyping;
  - making the study of science, technology, engineering, mathematics (STEM) financial and entrepreneurship issues, as well as education, arts and the humanities, equally inclusive and attractive for both boys and girls; promoting the development of stronger reading habits among boys and girls;
  - campaigning and raising awareness among young men and women, parents, teachers and employers about gender-stereotypical attitudes towards academic performances and the likely consequences of overall educational choices for employment and entrepreneurship opportunities, career progression and earnings;
  - encouraging more women who have completed STEM studies to pursue professional careers in these areas, for example by means of career counselling, adult education, internships, apprenticeships and targeted financial support;
- promote family-friendly policies and working conditions which enable fathers and mothers to balance their working hours and their family responsibilities and facilitate women to participate more in private and public sector employment by:
  - designing tax-benefit systems so that both parents have broadly similar financial incentives to work;

- securing availability of and access to affordable good-quality early childhood education and care as well as affordable long-term care for other dependants, including for example disabled children or elderly relatives;

- providing employment-protected paid maternity and paternity leave to working mothers and fathers;

- encouraging working fathers to take available care leave, for example by reserving part of the parental leave entitlement for the exclusive and non-transferable use by fathers;

- providing incentives to fathers to use flexible work entitlements, promoting a more temporary use of part-time work among men and women, providing incentives for women to participate more hours in the labour force, and raising awareness of gender stereotypes to encourage a more equal sharing of paid and unpaid work (household responsibilities) between men and women;

- ensuring that all parents can participate in the labour market regardless of their partnership status, providing ample employment supports to sole parents;

- ensuring that policies that address the problem of unemployment do not discriminate either directly or indirectly against women;

- improving employment conditions and access to social support for informal workers, especially those in the most vulnerable categories such as home-based and domestic workers;

- increase the representation of women in decision-making positions by:

  - encouraging measures such as voluntary targets, disclosure requirements and private initiatives that enhance gender diversity on boards and in senior management of listed companies; complementing such efforts with other measures to support effective board participation by women and expand the pool of qualified candidates; continuing to monitor and analyse the costs and benefits of different approaches – including voluntary targets, disclosure requirements or boardroom quotas – to promote gender diversity in leadership positions in private companies;

  - introducing mechanisms to improve the gender balance in leadership positions in the public sector, such as disclosure requirements, target setting or quotas for women in senior management positions; strengthening the flexibility, transparency and fairness of public sector employment systems and policies; and monitoring progress of female representation in the public sector;

  - encouraging greater participation and representation of women at all levels of politics, including in government, parliament, local authorities, and the judiciary system;

- eliminate the discriminatory gender wage gap by: strengthening the legal framework and its enforcement for combating all forms of discrimination in pay, recruitment, training and promotion; promoting pay transparency; ensuring that the principle of equal pay for equal work or for work of equal value is respected in collective bargaining and/or labour law and practice; tackling stereotypes, segregation and indirect discrimination in the labour market, notably against part-time workers; promoting the reconciliation of work and family life;

- promote all appropriate measures to end sexual harassment in the workplace, including awareness and prevention campaigns and actions by employers and unions;

- reduce the gender gap in entrepreneurship activity by:

  – designing appropriate responses to gaps and market failures, including: policies to reduce barriers to women entrepreneurship, administrative burdens on firms and excessive regulatory restrictions; policies to support firm growth, internationalisation and innovation; support for the development and implementation of awareness campaigns, training programmes, mentoring, coaching, and support networks, including professional advice on legal and fiscal matters;

  – ensuring equal access to finance for female and male entrepreneurs through actions that influence both the supply of and demand for finance by: easing access to finance for viable businesses owned by men and women; taking steps to improve the knowledge and attitudes of financial institutions; increasing awareness of finance sources and tools among women entrepreneurs; and, encouraging more women to join business angel networks or venture capital firms.

- pay attention to the special needs of women from disadvantaged minority groups and migrant women in relation to the aims set out above;

- reduce the gender gap in financial literacy by developing and implementing initiatives and programmes aimed at addressing women's financial literacy needs, and in particular at fostering their awareness, confidence, competencies and skills when dealing with financial issues;

- mainstream the gender equality perspective in the design, development and evaluation of relevant policies and budgets, for example by conducting systematic gender-impact assessments and generating appropriate data and evidence to build a benchmark for future assessments as well as a compilation of best practices for governments and government agencies;

- strengthen accountability mechanisms for gender equality and mainstreaming initiatives across and within government bodies.

4. Concepts, definitions, measurement methodology and indicators of informality

4.1. Concepts and definitions of informality

An internationally agreed framework delimits informal employment based on job and production unit characteristics. Employees are in informal jobs if the employment relationship is not subject to labour law, taxation, social protection or entitlement to certain benefits. Self-employed workers are in informal jobs if the production units they work in are in the informal sector, or if they are in households producing for their own final consumption. The first international definition of informality for statistical purposes was agreed at the XV International Conference of Labour Statisticians in 1993. This looked at the characteristics of productive units (enterprises) and in particular their legal status (household enterprises or unincorporated enterprises belonging to households). The definition included (i) informal own-account enterprises that occasionally employ family workers or employees and (ii) enterprises of informal employers which are small in size and/or unregistered themselves and/or do not register their workers. Typically, agricultural household production units are excluded for practical reasons.

Alternatively, formal employment could be defined as that which is subject to written contract or a document that certifies social protection entitlement (OECD, 2010 uses this definition). This follows the ILO (2003), which defined the informal economy not by the characteristics of productive units but rather by employment relations. They included all remunerative work that is not recognised, regulated or protected by the existing legal or regulatory framework, and non-remunerative work undertaken in an income-producing enterprise. The unit of observation is jobs. The definition therefore comprised: (i) informal employment in informal enterprises, defined as above, including employers, employees, own account operators and unpaid family workers in informal enterprises, and also (ii) informal employment outside informal enterprises including domestic workers, casual or day labourers, temporary or part-time workers, industrial outworkers (including home workers) and unregistered or undeclared workers. This option facilitates comparability since this regulation is common to most countries. However, this way to identify formal workers is not without limitations, given the availability of verbal labour contracts. Besides, the use of written contracts does not allow identifying informal production units.

A third option is to count workers covered by contributory social protection schemes as formal. This approach takes advantage of data availability from household and labour force surveys. This is the "legalistic" definition of formality in the terminology of Perry et al. (2007).[7] However, it might be less comparable between countries and suffers from potential indeterminacies as a result of unbundling of social benefits. Cover against health problems, occupational hazards, old age, maternity or unemployment may be provided separately, and coverage for different workers may differ across these dimensions, making them formal in one but informal in others. This is particularly true of pension coverage. Besides, in some countries affiliation is not mandatory for the self-employed.

4.2. Rates of informality for selected countries

Existing OECD work on the informal economy mostly focuses on a limited set of countries. For instance, OECD (2008) focused on informal employment in seven lower-income OECD countries (the Czech Republic, Hungary, Korea, Mexico, Poland, the Slovak Republic and Turkey). It examined several different types of informal employment – ranging from employees who are not registered for social security contributions to those who declare only part of their income for tax purposes (Table 16). According to this study, informal employment is most widespread in Mexico and Turkey where 40-60% of the workforce is either employed without social security coverage or runs its own business. It also discusses the effects of various drivers of informality, such as household characteristics and policies (notably taxation and labour regulations), on the development of the informal economy.

Jütting and de Laiglesia (2009) examine patterns of informal employment in developing and transition countries. The levels of informal employment vary widely across countries, reaching the highest shares in sub-Saharan Africa, where close to 80% of all employed people work informally, followed by Southeast Asia and Latin America (Table 17). Most informal workers in the developing world are self-employed and either work independently or own and manage very small enterprises.

4.3. Detailed description of the methodology used for the calculation of rates of informality

In OECD (2008), informal employment is defined as employment engaged in the production of legal goods and services where one or more of the legal requirements usually associated with employment (such as registration for social security, paying taxes or complying with labour regulations) are not complied with. Transforming this "ideal" definition into comparable cross-country statistics on informal employment

7. Informal employment can be measured according to productive characteristics, whereby a worker is deemed informal if they are (i) unskilled self-employed, (ii) salaried in a small private firm or (iii) a zero-income worker. This is the "productive" definition.

is complicated by difficulties in measuring various aspects of informality. In practice, the definitions used in empirical work depend both on data availability and the focus of the research.

Table 16 provides estimates of informal employment and undeclared work in seven OECD countries. Jobs without social security coverage or written employment contracts are used as a proxy for informality among employees, as is common in the literature. Non-farm own-account workers (i.e. self-employed without employees) are not necessarily informal, but previous research has shown that these workers typically have higher rates of tax and social security evasion than employees. In addition, some own-account workers could be considered false self-employed, in that they work every day for the same employer but are either forced or choose to be self-employed in order to bypass labour law or tax and social security obligations. Unpaid family workers are included because they provide a significant source of labour for informal family businesses and derive utility from informal family businesses in much the same way as own-account workers. Multiple job holders, like own-account workers, are not necessarily informal, but have greater opportunities for failing to declare income or register for social security than workers with only one job. Under-declaration of income for tax or social security purposes is also considered in its own right, although the estimates presented probably represent a lower bound on the extent of undeclared income, due to the sensitivities of questions about tax evasion.

While the range of informality examined is broad, it cannot be all-encompassing due to the difficulties in measuring a phenomenon which is, by definition, illegal in some senses. Nevertheless, the estimates help in understanding the relative importance of various types of informality and the characteristics of informal workers. There may, of course, be substantial overlap between alternative definitions of informal employment. For example, employees who are not registered for social security are also likely to fail to declare all or part of their income to the tax authorities. Where possible, estimates exclude the farm sector, which is typically declining in importance over time and makes up only a small proportion of total employment in four of the countries examined (the exceptions being Poland, Mexico and Turkey).

Table 17 shows the share of informal employment in total non-agricultural employment for developing and transition countries in the following regions: North Africa, Sub-Saharan Africa, Latin America, South and Southeast Asia, West Asia and Transition countries. For this table, data on informal employment have been estimated with various methods and definitions according to the periods of time (see Jütting and de Laiglesia, 2009 for more details).

Informal employment being defined as the non-coverage by social protection, it is measured by the response to the question on coverage in labour force surveys. However, it is only recently that labour force surveys have included this type of question. Previously labour statisticians assumed that registered employment was equivalent to protected employment and the use of the "residual method" which consists of subtracting registered formal employment from total employment for the various industries was systematically implemented.

During the 1970s and the 1980s, and until recently for some countries, data on informal employment were obtained in this way. With progress and improvements in definitions and data collection, direct data have been obtained from labour force surveys, which have more often included appropriate questions for capturing informal employment, especially questions on social protection coverage.

Recently, the adoption of guidelines for the definition and measurement of informal employment by the 17th International Conference of Labour Statisticians in 2003 has facilitated the compilation of harmonised data through labour force surveys and the response to the question of the benefit of social protection. In the most recent period, labour force surveys have come to include the criteria for defining informal employment (most Latin American countries, Thailand, Algeria), and some of them have

simultaneously included the criteria for defining the informal sector (Algeria, Russian Federation), which allows a more detailed knowledge of the composition of informal employment.

Before the approach to "informal sector" measurement was recommended through mixed household/establishment surveys (in the early 1990s) and through labour force surveys (in the early 2000s), the "residual method" was systematically implemented, subtracting formal registered employment from total non-agricultural employment: Algeria (1977, 1985), Tunisia (1975, 1980), Egypt (1976, 1986), Morocco (1982), Mali (1976), Niger (1977), Mauritania (1980, 1988), Senegal (1980), Burkina Faso (1985), Guinea (1984), Kenya (1990) and Iran (1986, 2004). Generally, the first estimate available in a country is the "residual" one, allowing policy makers and statisticians to become aware of the size of the segment of the labour force and to convince them of the necessity to implement a survey of the phenomenon.

In a second period, the first mixed household/establishment surveys become available: Mali (1989), Mexico (1989), Niger (1994), Kenya (1999), India (1999-2000), Morocco (1999-2000); in other countries, improvements of establishment surveys and micro-enterprise surveys are preferred, leading to improved residual estimates: Tunisia (1997, 2002).

5. Strategies to incorporate the set of independent or informal workers in the contributory pension systems of the OECD countries

As shown in Table 18, in Australia, Chile, Denmark, Mexico and Switzerland, self-employed workers can contribute voluntarily to the pension system but are not covered by any mandatory pension scheme. In all the other OECD countries, self-employed workers have mandatory social protection coverage. In most countries, they are covered by the same pension scheme as employees (e.g. Canada, Hungary and Korea). In other countries, self-employed workers contribute to separate special pension schemes (e.g. Austria, Belgium and France). Some countries provide preferential tax treatment for social contributions to the self-employed to extend social protection coverage. This is illustrated for selected countries in Table 19.

When self-employed workers are covered by the pension system (either through their own scheme or through the same scheme as for employees), increasing contribution densities comes down to increasing formal work. OECD (2008) assesses policies that affect the incentives for firms to employ workers informally and for workers to fail to declare income to tax and social security authorities. It examines informal employment in detail for seven lower- and middle-income OECD countries where it poses particular challenges – the Czech Republic, Hungary, Korea, Mexico, Poland, the Slovak Republic and Turkey. The main findings are the following.

- Combating informal employment requires a comprehensive approach to reduce the costs and increase the benefits to businesses and workers of operating formally and ensure that regulations are adequately enforced.

- A high wage floor in Hungary and Turkey and high non-wage labour costs in all countries except Korea create incentives for informal employment or under-declaration of earnings among employees. Reducing labour costs, particularly for low-wage workers, could encourage greater formalisation:

  – In Hungary and Turkey, high labour costs result from the combination of binding minimum wages in the formal sector and high labour taxes, partly driven by generous pension systems. In Hungary, while a small minority of minimum-wage earners probably under-report their income, further minimum-wage hikes designed, in part, to reduce tax evasion may reduce employment prospects for genuine low-productivity workers.

  - In all countries except Korea (and Mexico for large businesses), labour taxes are relatively high compared with taxes on capital, providing few incentives for full declaration of wage earnings. Given the limited room for manoeuvre in fiscal policy in these countries, granting labour tax relief would probably involve increasing other taxes. Property taxes could be a good candidate, as they are amongst the least distortive taxes.

- Granting preferential tax treatment to the self-employed, notably through taxes on turnover instead of net income, tends to encourage false self-employment and under-declaration. It is easier for the self-employed to evade taxes than for wage earners and it can be difficult for tax authorities to detect their true income accurately. Simplified taxes for small businesses may, however, be appropriate in countries, such as Mexico and Turkey, where many self-employed are not equipped to establish proper book-keeping procedures. However, simplified tax regimes should be designed so as to provide incentives to declare employees' wages.

- Complex tax systems increase compliance costs for taxpayers and encourage under-declaration. This is the case in Hungary, Poland, Mexico and Turkey, where a number of tax exemptions and credits remain in place in the personal and/or corporate income tax systems. While the Slovak Republic and Korea have relatively simple tax systems, handling the complex social contribution collection system – involving different funds, income bases/ceilings and payment periods – is costly for firms. Proposed reforms to contribution collection in Korea should go some way to alleviating this problem.

- Relaxing restrictions on the use of temporary or fixed-term contracts and reducing firing costs for young or inexperienced workers would improve incentives for firms to hire formal workers. Informal employment is used by firms to increase internal flexibility for firms in Mexico (and probably Turkey), where regulations limit the use of temporary and fixed-term contracts. Introducing probationary periods for new workers on permanent contracts in Mexico and Korea and reducing requirements to make redundancy payments to workers with short tenure in the Czech Republic, the Slovak Republic and Mexico could reduce informality, especially among young workers. Existing retirement allowance schemes in Korea, Mexico and Turkey can also lead to early or forced retirement among older workers, who then often have little choice but to work informally.

- Workers' perceptions of the value of the benefits they are likely to receive from social protection schemes may be a factor encouraging formal work or the full declaration of earnings if workers have some say in whether or not they are employed formally:

  - The design of the pension system can affect incentives for informality. Some have argued that the closer the link between contributions and benefits, the less workers will perceive pension contributions as a tax, and thus the lower the negative effect of contributions on formal sector participation. However, cross-country data show no systematic relationship between the degree of redistribution and pension coverage. Very strongly redistributive systems, such as in the Czech Republic, may nevertheless favour under-declaration of earnings. Other characteristics of the pension system may also play a role. For example, systems with little link between contribution records and benefits, such as in Turkey, favour early retirement of workers and continued activity in the informal sector. Minimum contribution periods in countries where workers often move in and out of formal employment, such as for the minimum guaranteed pension in Mexico, also create disincentives to work in the formal sector.

  - Easing somewhat access conditions for unemployment benefits, increasing the link between benefits and contributions (while being careful to preserve work incentives) and/or reducing contribution rates could improve incentives for formalisation. In six of the countries studied, unemployment insurance schemes have strict access conditions, low benefit levels and very limited links to contributions, especially in Poland, the Slovak Republic and Turkey.

- Improving trust in government and the quality of public services can play an important role in reducing informality by increasing the perceived benefit to taxpayers of paying taxes. All seven countries examined perform below the OECD average on indicators of government effectiveness and corruption control, although progress has been made in recent years.

- Combined with improving incentives for formalisation, effective enforcement of labour, tax and social security regulations is essential to combat informal employment. Existing enforcement resources can be used more efficiently in all seven countries by implementing or increasing the use of risk-assessment processes to target inspections and increasing coordination and information-sharing between enforcement agencies. In many cases, detecting informal employment is not currently the primary focus of tax or labour inspectorate activities. Combating informality also requires broadening the focus of enforcement bodies from revenue maximisation (for tax authorities) and occupational health and safety (for labour inspectorates) to include formalisation by targeting new groups, such as small firms or the service sector, where informal employment is prevalent, providing advice and technical assistance to small firms and improving income detection for small firms and the self-employed.

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