Pensions at a Glance 2015
OECD and G20 indicators

Chapter 4

Sensitivity of replacement rates to the model parameters

This chapter examines how changes made to each economic parameter affect the theoretical replacement rate estimations. The analysis also compares the new baseline economic assumptions to those used in previous editions of the publication before finally contrasting these new results with country-specific assumptions based on the level of economic development.

4.1. Introduction

The underlying economic assumptions behind any pension model are critical for calculating future replacement rates. Full descriptions of the economic parameters used in this publication are provided in Chapter 5. Beyond demographics, they mostly pertain to discount rates, rates of return on pension assets, price inflation and real-wage and real-GDP growth.

This chapter is organised as follows. After a run-down of key findings, it examines the impact of the change in economic parameters between *Pensions at a Glance 2013* and this current edition in Section 4.2. Sections 4.3 to 4.6 then analyse the impact of changing each of the parameters in turn, i.e. inflation, real wage and real GDP growth, the rate of return and the discount rate. Section 4.7 focuses on life expectancy and presents two alternative estimates of mortality rates, while finally Section 4.8 provides projections based on country specific economic parameters in contrast to the OECD wide parameters used with the *OECD Pensions at a Glance* series.

There are obvious limitations in analysing the impact of each parameter taken separately. For example, long-term trends in wage growth and in financial rates of return are often interrelated in practice. If higher real wages result from better economic prospects over time, the marginal productivity of capital and therefore equilibrium rates of return are likely to be higher also. Also, economic developments that diminish risk-free interest rates over the long term are also likely to drive down financial returns. These analyses should therefore be viewed as measuring the impact of relative changes between variables.

Key findings

- The new economic assumptions used in the 2015 edition of *Pensions at a Glance* have a small average impact. Replacement rates increase by 1.5 percentage points for the full-career average-wage worker on average across the OECD countries. Sixteen countries show an increase, nine countries a decline and the remaining nine have unchanged replacement rates. The change ranges from a decline of 3.4 percentage points in Chile to a rise of 8 percentage points in Belgium.
- The replacement rates in defined-contribution schemes are generally more sensitive to the change in the values of the economic parameters in comparison to either defined-benefit or flat-rate schemes.
- Changing the rate of return has the greatest impact on the replacement rate, with an increase slightly over 7 percentage points on average for the nine countries affected. The largest variations are found in Israel, increasing by 15 percentage points, and in Chile and Denmark, both by 10 percentage points. These three countries have amongst the highest rates of contribution to defined contribution (DC) schemes, which also implies that the DC component represents a large proportion of the overall pension.
- As with rates of return changes in the discount rate only affects the replacement rate in the same nine countries, with an average impact of 3 percentage points across those countries for a change of 1 percentage point in the real discount rate. Israel has the highest sensitivity (6 percentage points) as the country has the largest defined-contribution scheme; in contrast, the sensitivity is less than 1 percentage point in Norway, where the defined contribution component is a small part of the total pension (the DC contribution rate is only 2% against 17.5% in Israel).

- The majority of countries are affected by changes in the real-wage growth assumption. Exceptions include countries that index all their parameter values (including flat-rate benefits) to real wage growth, as then everything increases in proportion resulting in a constant replacement rate. Variations in real-wage growth assumptions affect the replacement rate in five OECD countries beyond their direct impact, through their impact on real GDP growth in the OECD pension model.
- Lowering the annual rate of real-wage growth from 1.25% in the baseline to 0.5% increases replacement rates by 4 percentage points on average across the OECD, whilst increasing wage growth to 2% lowers the average by 3 percentage points. The largest variation is found in Israel and Australia as increases/decreases in wage growth affect the denominator (wages) more than asset accumulation (numerator), but in Australia the losses are mostly covered by the first-tier component (Age Pension). For those countries without defined-contribution schemes Turkey has the largest variation, of around 9 percentage points, in part due to a high replacement rate in the baseline to start with.
- Changes in price inflation trends only affect three countries and the impact on the replacement rates is minimal.
- Moving from the baseline common assumptions across countries to country-specific assumptions based on the level of economic development (measured by GDP per capita in PPP terms) brings limited differences in replacement rates. The majority of countries would have replacement rates within 2 percentage points of the baseline value, with only seven countries having greater changes in absolute terms.

4.2. Impact of parameter changes since *Pensions at a Glance 2013*

All results in previous editions of *Pensions at a Glance* were based on a consistent set of economic parameters across the series. However, major economic developments affecting all OECD countries over the last decade have called for a revision of the value of some key parameters. Long-term trends suggest lower future rates of real-wage growth, price inflation and financial return (Table 4.1). Moreover, the previous *Pensions at a Glance* editions were assuming that annuity providers were paying annuities from accumulated assets based on an actuarial formula that assumed away any fee and any reward from taking mortality risks in particular. In contrast, there is evidence that annuity amounts fall short of the actuarial no-fee computation (see e.g. Brown et al., 1999 and St. John, 2004 which suggest a wedge of 10 to 30%). The 2015 *Pensions at a Glance* assumption includes a conversion factor of 85% between annuities that are effectively paid and those that would result from a no-fee calculation.

Table 4.1. **Economic parameters used in *Pensions at a Glance* (PAG) 2013 and 2015**

	PAG 2013 (%)	PAG 2015 (%)
Price inflation	2.50	2.00
Real wage growth	2.00	1.25
Real discount rate	2.00	2.00
Real rate of return	3.50	3.00
Annuity conversion factor	100.00	85.00

Note: For *Pensions at a Glance* 2015, GDP growth is 0.75% in Italy and Poland and 1.55% in Turkey.
Source: OECD (2013), *Pensions at a Glance 2013: OECD and G20 Indicators*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/pension_glance-2013-en*; Chapter 5 of this publication.

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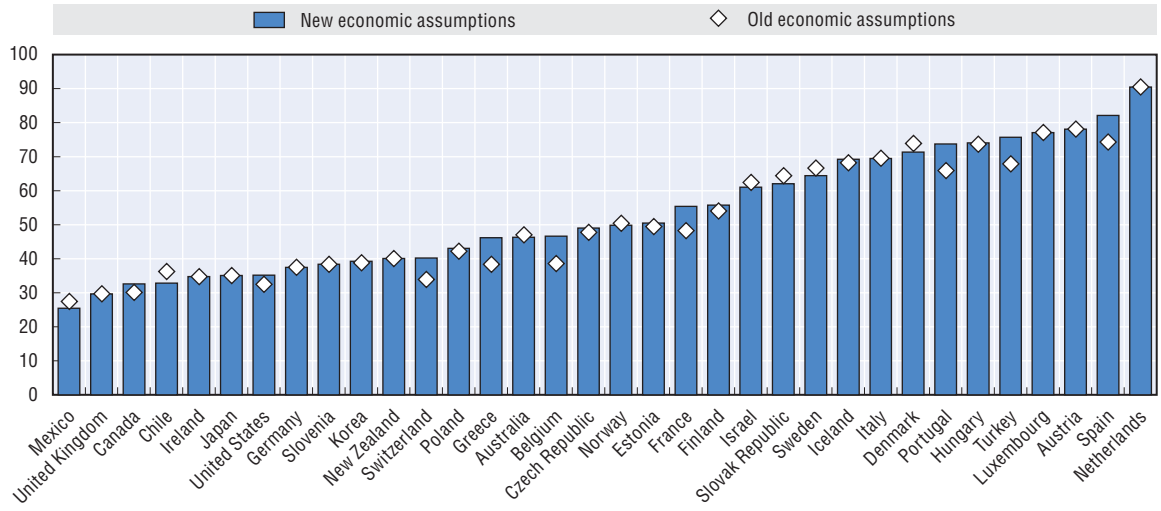
The full results for future gross replacement rates across various earnings levels under the new economic assumptions are shown in Chapter 6, Table 6.1, later in this publication. Figure 4.1 compares those baseline projections with those estimated based on the 2013 *Pensions at a Glance* economic assumptions summarised in Table 4.1.

Figure 4.1. **Future gross replacement results for male average earners under the new and old economic assumptions**

Percentage of earnings



Source: Author calculations using OECD pension model.

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From Figure 4.1 it is clear that although a few countries have seen a decrease in projected replacement rates following the economic parameter changes more have actually had an increase. How much of this can be attributed directly to the change in each specific economic parameter will now be covered in the following sections.

4.3. How changes in inflation affect replacement rate results

The analysis begins by varying the price inflation parameter whilst keeping all the other parameters constant. Only three OECD countries, Hungary, Spain and the United States, show any variation in their future replacement rates when either increasing or decreasing annual price inflation by 1 percentage point.* In these three countries, the variation is due to the same factor: previous earnings immediately prior to retirement used to compute the reference wage are held constant in nominal terms whatever the inflation rate. In the United States previous earnings are revalued up to the year in which the recipient reaches age 60 in line with growth in economy-wide average earnings. There is no adjustment of earnings for the two subsequent years until the benefit amount is calculated (at age 62). Similarly in Spain, the valorisation of previous earnings ceases two years prior to retirement age. The effect in both cases is to lower the replacement rate by 2-3 percentage points with each additional 1 percentage point increase in price inflation. This amounts to a fall in pension entitlements of 6% in the United States and only 2% in Spain as the replacement rate is more than double in the latter. In Hungary the non-valorisation of earnings only affects the final year and so the decline in replacement rate is only around 1 percentage point when moving from price inflation of 1% to 2%.

4.4. How changes in real wage affect replacement rate results

Higher wage growth assumptions increase the future pension amount. However, they generally lower the replacement rates as pension entitlements do not rise faster than wages (which is the

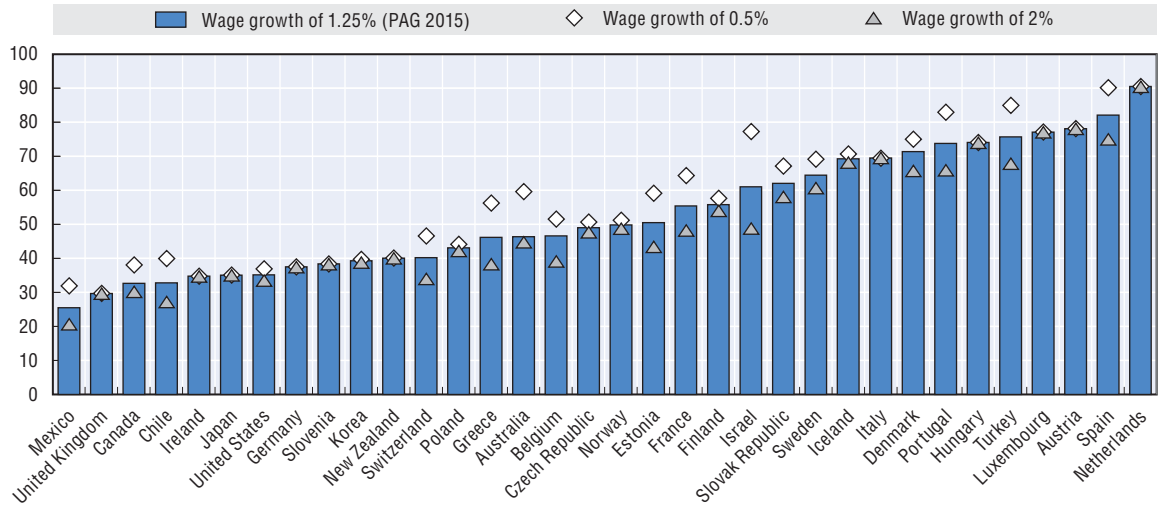
* Earnings immediately prior to retirement are also price indexed for one year in Austria. However, the pension calculation uses the best 40 years valorised with earnings, and under the assumption of a constant earnings profile the price indexation for the final year has no effect on the calculation.

denominator of the replacement rate) in both defined-benefit and defined-contribution schemes. For example, in countries such as Austria, Hungary and the Netherlands, the modelled mandatory pension is an earnings-related defined-benefit scheme. In all three countries, pension benefits are calculated based on an exogenous annual accrual rate, *x*, where the benefit amounts to *N.x.w* where *N* is the number of contributed years and *w* the reference wage. The replacement rate is therefore simply given by *N.x*, which does not depend on the evolution of past wages.

In Ireland, New Zealand and the United Kingdom there is a basic flat rate benefit based on either residence or contribution history, but in all cases the benefit is increased by the growth of earnings, thereby not affecting the future replacement rate. In fact, in the United Kingdom, there is a triple lock increase to pensions (the maximum of price inflation, nominal wage growth and 2.5%) which amounts to wage growth according to the long-term assumptions in the OECD pension model, implying an unchanged replacement rate provided that nominal wage growth is assumed to exceed 2.5% per year on average. In total ten OECD countries are unaffected by variations in annual real wage growth between 0.5% and 2% (Austria, Germany, Hungary, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Slovenia and the United Kingdom) (Figure 4.2).

Figure 4.2. **Gross replacement rate for average earners with different wage growth**

Percentage of earnings



Source: OECD pension models.

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Of those countries affected by variations in real-wage growth trends holding the other parameters constant, there is considerable variation in the impact due to the systems design. In Australia, Israel, Mexico and Chile, as shown in Figure 4.2, where the impact is largest, the main pension component is defined contribution. With an assumed constant rate of return in these schemes, a higher wage growth affects more the denominator of the replacement rates (wages) than the numerator (accumulated assets), and the replacement rates decrease as a result. Conversely, replacement rates increase when wage growth is lower. Mandatory defined contribution schemes also exist in Denmark, Estonia, Norway, the Slovak Republic and Sweden. Although they represent a smaller component of the overall pension system they contribute to the variation in these countries.

Additionally the value of any pension component that is indexed to prices will vary in relative terms depending on real-wage growth rates. For example, the basic pensions in Canada and Iceland are both indexed to prices, which means that the value of the benefit relative to wages is declining when real wages grow faster, thus clearly affecting the replacement rate for future retirees. Finally, a

number of countries, among them Belgium and France, uprate previous earnings according to prices and so, as with the basic pensions above, all else being equal the replacement rate is negatively affected by higher real-wage growth.

In four countries, Denmark, Italy, Poland and Turkey, pension benefits depend on real-GDP growth. By definition, real GDP is equal to labour productivity times labour input. Hence, the OECD pension model assumes that real-GDP growth is equal to real-wage growth plus the change in the working-age population. This means that for a common wage growth rate across countries, differences in GDP growth rate across countries are driven by demographics. In both Italy and Poland, as in many other countries, the projected size of the population aged 20-64 is set to decline over the next 50 years. This results in the assumed level of annual GDP growth in both countries being set at 0.5 percentage points below annual wage growth. Conversely, the working-age population is projected to increase in both Denmark and Turkey, and their respective GDP growth rate are 0.2 and 0.3 percentage points per year above the wage growth rate.

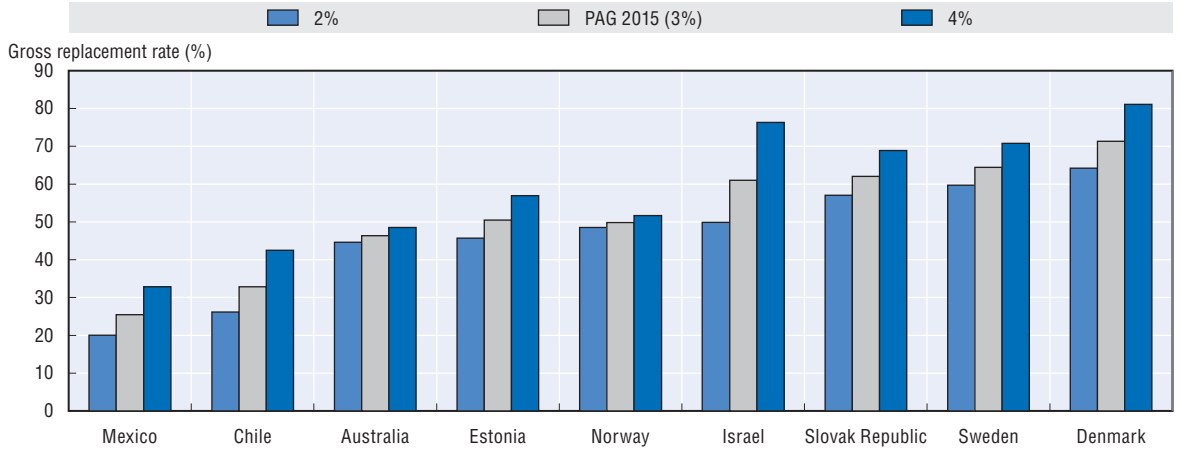
This real-GDP growth effect, which is taken into account in Figure 4.2, has an impact on replacement rates in three of these four countries. The exception is Italy, where the relevant factor is the difference between wage growth and GDP, which only depends on demographics and is equal to 0.5 percentage points across all the scenarios based on the same mortality tables. In Denmark, the basic and targeted components are indexed to real GDP growth minus 0.3%. This limits the impact of changing wage-growth assumptions, which directly affects the denominator of the replacement rate. Yet, overall, the replacement rate increases in Denmark by around 7 percentage points across the earnings levels when the annual wage-growth rate falls from 1.25% to 0.5% and falls by 6 percentage points when the wage-growth rate increases from the baseline to 2. In Turkey, the earnings-related component is indexed to 30% of the GDP change, and the replacement rate increases by 9 percentage points and decreases by 8 percentage points as the wage growth rate rises and falls by 0.75 percentage points, respectively. Finally, in Poland the sub-account system is indexed to GDP, but as it is a small component of the overall pension system the replacement rate only changes by 1 percentage point either way under the same scenarios as above.

4.5. How changes in the rate of return affect future replacement rates

The rate of return, or more accurately the difference between the rate of return and the rate of wage growth, is the most important indicator for replacement rates in defined-contribution schemes. With at least 45 years of contributions assumed in many countries for full-career workers, the level of the capital accumulated over this period varies considerably with even small changes to the rate of return. The default value for *Pensions at a Glance 2015* is 3% per year on average in real terms and the variant cases shown in Figure 4.3 are 2% and 4%.

Only nine OECD countries have mandatory defined-contribution schemes, and are therefore affected by changes in the rate of return assumption. There are a number of countries with sizeable voluntary defined-contribution components, as shown in Chapter 6 (see Figure 6.3), but only mandatory schemes are examined herein. Of these nine countries the contribution rates to the defined-contribution scheme range from a low of 2% in Norway to a high of 15% in Israel (Chapter 5, Table 5.6), which is a prime driver of the magnitude of the sensitivity of replacement rates to rate-of-return assumptions (Figure 4.3). In Israel, for example, the gross replacement rate is 11 percentage points lower with the 2% rate of return, and 15 percentage points higher with a 4% rate of return, in comparison with the default 3% level. By contrast the replacement rate for Norway is only 1.3 percentage points lower with the 2% rate of return and 1.9 percentage points higher at the 4% rate.

Figure 4.3. **Gross replacement rate for average earners with differing rates of return**



Source: OECD pension models.

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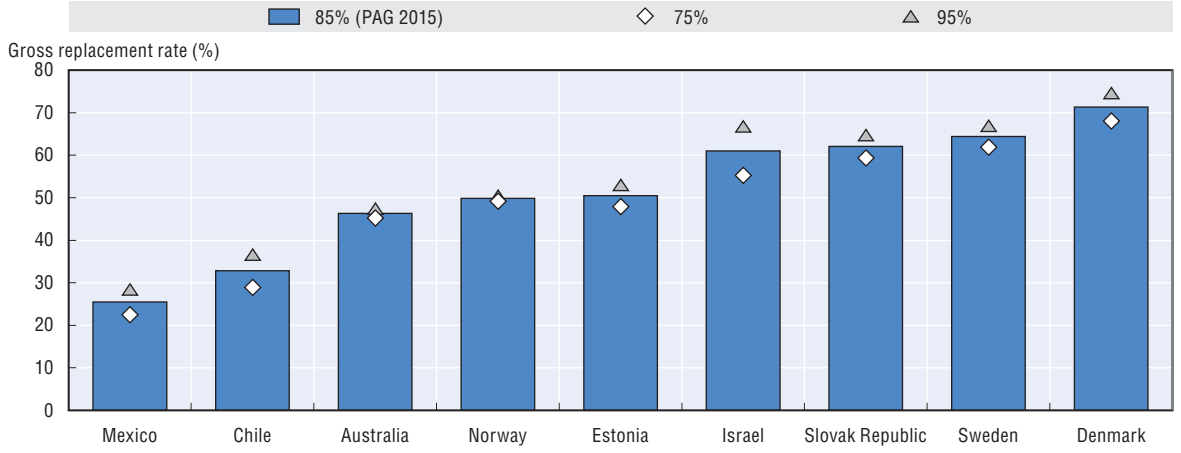
Figure 4.4. **Gross replacement rate for average earners with 3% rate of return and variable conversion factor**



Source: OECD pension models.

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As the defined contribution scheme is not the only component of the overall pension in many countries, the system design is also important. In Australia, for example, the defined-contribution superannuation guarantee is offset by the means-tested Age Pension. Therefore, when the level of return either increases or decreases the capital value of the Superannuation before annuitisation varies accordingly. When the resulting annual payment falls the loss is partially recovered from the Age Pension and vice versa when the annual annuity increases. Therefore, despite having a high contribution rate of 9.5%, increasing to 12% by 2025, there is little variation in the replacement rate in Australia with varying rates of return, in comparison to Israel, because of the Age Pension.

Another important factor is the conversion factor applied to defined-contribution assets used to compute annuities, which by default is 85%. This factor has been implemented to account for fees and charges and to reward risk-taking especially linked to mortality uncertainties at the time of annuitisation; the research on this topic suggests that this factor could be as low as 70% (St. John, 2004) or as high as 90% (Brown et al., 1999). For comparison purposes the conversion factor has been increased and decreased by 10 percentage points from its baseline level of 85%.

The sensitivity of the replacement rate to the conversion factor is shown in Figure 4.4. Overall, the impact is not large. For example, in both Australia and Norway, there is very little variation depending on the conversion factor; however, there are two different factors at play. Firstly, in Norway, the contribution level is low at 2% and the defined-contribution component is a small proportion of the overall pension. Secondly, in Australia, for the same reason as mentioned above, the offsetting of the defined-contribution superannuation guarantee with the Age Pension partially reduces the impact of any reduction in the conversion factor. As with the previous findings in Figure 4.3, the biggest absolute change is found in Israel at +/- 6 percentage points, but the largest percentage changes are found in Chile and Mexico, both at +/- 12%.

4.6. How changes in the discount rate affect replacement rates

The discount rate has no impact on the value of pensions in defined-benefit schemes. In contrast, varying the discount rate directly affects annuities for a given level of accumulated assets in defined-contribution schemes. With a lower discount rate, future flows have a higher net present value all other things equal. Hence, a given level of accumulated assets will be able to finance a lower pension benefit, and the replacement rate will be lower. It is the opposite when discount rates increase.

Figure 4.5 compares the value of the future pension replacement rates when the real discount rate is assumed to equal 1%, 2% (the baseline assumption in *Pensions at a Glance 2015*) and 3%. The nine OECD countries affected by this change are those that have a mandatory defined-contribution (DC) scheme. The impact of the change depends on the absolute size of the DC scheme, measured for example by the mandatory contribution rates, the relative importance of the DC scheme in the pension system taken into account in the computation of replacement rates, and on other parameters such as the retirement age. The largest absolute change is found in Israel at +/- 6 percentage points for a 1 percentage point difference in the discount rate. However, when the baseline replacement-rate level is taken into account, both Chile and Mexico record the largest (relative) change, at around +/- 11%, which is larger than Israel at +/- 9% and Australia at +/- 8%. Smaller variations are found in Denmark, Estonia, Norway, the Slovak Republic and Sweden as the defined contribution component accounts for a smaller proportion of the overall pension system.

Figure 4.5. **Gross replacement rate, for average earners, by discount rate**

Percentage of earnings

Source: OECD pension models.

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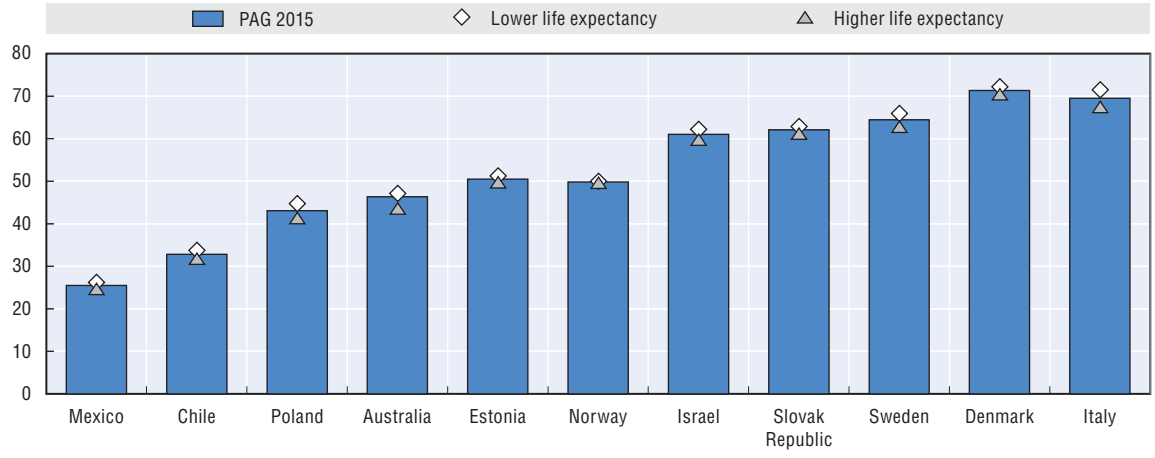
4.7. Impact of mortality rates

The final component directly affecting replacement rates in defined-contribution schemes is the mortality rates used to calculate the annuity factor, which links annuities to accumulated assets. However, varying mortality rates also affects the pension wealth – the total value of the lifetime flow of retirement incomes – within defined-benefit schemes, as although the replacement rate is unaffected, the duration of future payment will change. For this analysis, the available mortality data has been both reduced and increased by 10% to provide a clear assessment of the full impact. This has the effect of increasing and decreasing the life expectancy at age 65 by around one year on average across countries.

On top of the nine countries discussed in Sections 4.5 and 4.6, replacement rates are also affected in Italy and Poland, which have a notional account but no DC scheme. In addition, Norway and Sweden have both, which increases the sensitivity to mortality rates beyond that recorded in the defined-contribution scheme. Increasing life expectancy lowers the replacement rate, as the period of payment is longer. The overall impact is virtually identical across countries, which is unsurprising as the change in mortality levels is the same. However, the countries with NDC schemes show more sensitivity as the level of contribution is considerably higher (Figure 4.6). For example in Italy 33% of earnings is paid towards the NDC scheme.

Figure 4.6. **Gross replacement rate, for average earners, by mortality level**

Percentage of earnings



Source: OECD pension models.

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4.8. Country-specific economic assumptions

All of the above analysis has taken a common set of economic assumptions for all OECD countries. This section concentrates on country specific assumptions where every country is estimated to have different levels of price inflation, real-wage growth, and real interest rates depending on the level of economic development measured by the GDP per capita level. Country-specific values are based on estimations presented in Box 4.1 with the full country-specific results presented in Table 4.2. Estimations confirm that a higher level of economic development measured by GDP per capita is associated with higher inflation, higher real-wage growth and higher real interest rates, with some non-linearity identified for the first two variables.

Box 4.1. **Calculation of country-specific economic parameters**

For every key parameter, several models were estimated, and the one with the lowest root mean square error (RMSE) was selected.

Inflation rate regressions: The dependent variable is the inflation rate over the period 2000-13. Annual inflation rates were capped at 20% to limit the influence of outliers. Despite this, Turkey turned out to be a clear outlier overall and was excluded from the regressions. The first regression includes a constant term and the difference (in logs) between the volume of GDP per capita in PPP in 1995 and its average across countries in 1995. Over this period, less developed countries recorded higher inflation rates on average. As the negative relation with GDP per capita may hold for less developed countries but not for the most developed, non-linearity was introduced in the second regression, by including the previous difference only for countries having had a below average level of GDP per capita in 1995. In the third regression, the constant term from the second regression was restricted to match the *Pensions at a Glance* assumption of 2%. In the fourth regression, the regressor was the same as for the second regression but the threshold was allowed to vary instead of being set at the GDP-per capita average, and the value of that thereshold which led to the lowest RMSE was chosen. In the fifth regression, only a constant term was included, and in the last model the previous constant term was set to match the *Pensions at a Glance* assumption of 2%. The first and fifth regressions were estimated by Ordinary Least Squares (OLS) while the second, third and fourth ones were estimated by Non-linear Least Squares (NLS).

The best model fit, in terms of lowest RMSE (= 1.00), was achieved by the second model whose parameter estimates (with robust standard errors in brackets) are shown below. An above-average increase of 10% in real GDP-per capita (up to a threshold equal to the average) is associated with a medium-term decrease of 0.23 percentage points in the inflation rate.

$$\text{Inflation rate} = 2.187 - 2.285 * \min\{(\text{Log GDP pc} - \text{Log Average GDP pc}), 0\}$$

$$[0.213]\ [0.501]$$

Real-wage growth regressions: The dependent variable is the real wage growth rate over the period 1989-2013. Estonia turned out to be a clear outlier and was excluded from the regressions. Again the same models were used with the *Pensions at a Glance* assumption of 1.25%. The best model fit, in terms of lowest RMSE (= 0.73), was achieved by the second and fourth models. The second approach was chosen and the parameter estimates (with robust standard errors in brackets) are shown below. An above-average increase of 10% in real GDP per capita (up to a threshold level equal to the average) is associated with a medium-term decrease of 0.19 percentage points in the real wage growth rate.

$$\text{Wage growth rate} = 0.762 - 1.860 * \min\{(\text{Log GDP pc} - \text{Log Average GDP pc}), 0\}$$

$$[0.152]\ [0.413]$$

Real GDP growth: Country-specific values for the real-GDP growth rate are obtained from the rate of real-wage growth and demographics, as explained in Section 4.4.

Real discount rate regressions: The dependent variable is the annual ten-year real government yield over the period 2000-13. Annual real interest rates are capped at 10%. The same models were estimates as above using the *Pensions at a Glance* assumption of 2%. The lowest RMSE (= 0.84) is achieved by the first model. This highlights the negative relationship with economic development but rejects the assumption that a better fit could be obtained by non linearities. Estimated parameters (with robust standard errors in brackets) are shown below. An above-average increase of 10% in real GDP per capita is associated with a medium-term decrease of 0.10 percentage points in the real interest rate:

$$\text{Real interest rate} = 2.195 - 0.989 * (\text{Log GDP pc} - \text{Log Average GDP pc})$$

$$[0.123]\ [0.481]$$

The forecasted values were calculated for each country by using the corresponding parameter estimates and GDP per capita data in 2014. All forecasted country values (Table 4.2) have been rescaled so that the overall OECD average matches the *Pensions at a Glance 2015* assumptions.

Real rate of return: There is no comprehensive and available historical data on rates of return on financial assets across countries. Country-specific rates of return were assumed to exceed real discount rate by 1 percentage in all countries.

Table 4.2. **Country-specific economic parameters**

	Price inflation	Real earnings growth	Discount rate	Rate of return
Australia	1.62	0.94	1.78	2.78
Austria	1.62	0.94	1.79	2.79
Belgium	1.62	0.94	1.85	2.85
Canada	1.62	0.94	1.82	2.82
Chile	2.90	1.98	2.49	3.49
Czech Republic	2.24	1.44	2.21	3.21
Denmark	1.62	0.94	1.81	2.81
Estonia	2.48	1.64	2.31	3.31
Finland	1.62	0.94	1.92	2.92
France	1.68	0.99	1.97	2.97
Germany	1.62	0.94	1.82	2.82
Greece	2.54	1.69	2.34	3.34
Hungary	2.66	1.79	2.39	3.39
Iceland	1.62	0.94	1.81	2.81
Ireland	1.62	0.94	1.72	2.72
Israel	1.98	1.24	2.10	3.10
Italy	1.86	1.14	2.05	3.05
Japan	1.76	1.06	2.00	3.00
Korea	1.91	1.18	2.07	3.07
Luxembourg	1.62	0.94	1.08	2.08
Mexico	3.50	2.47	2.75	3.75
Netherlands	1.62	0.94	1.76	2.76
New Zealand	1.72	1.02	1.98	2.98
Norway	1.62	0.94	1.41	2.41
Poland	2.67	1.80	2.40	3.40
Portugal	2.35	1.54	2.26	3.26
Slovak Republic	2.43	1.60	2.29	3.29
Slovenia	2.23	1.43	2.20	3.20
Spain	1.95	1.21	2.08	3.08
Sweden	1.62	0.94	1.79	2.79
Switzerland	1.62	0.94	1.55	2.55
Turkey	3.23	2.26	2.64	3.64
United Kingdom	1.62	0.94	1.93	2.93
United States	1.62	0.94	1.61	2.61
Average	**2.00**	**1.25**	**2.00**	**3.00**
Minimum	1.62	0.94	1.08	2.08
Maximum	3.50	2.47	2.75	3.75

Source: OECD calculations.

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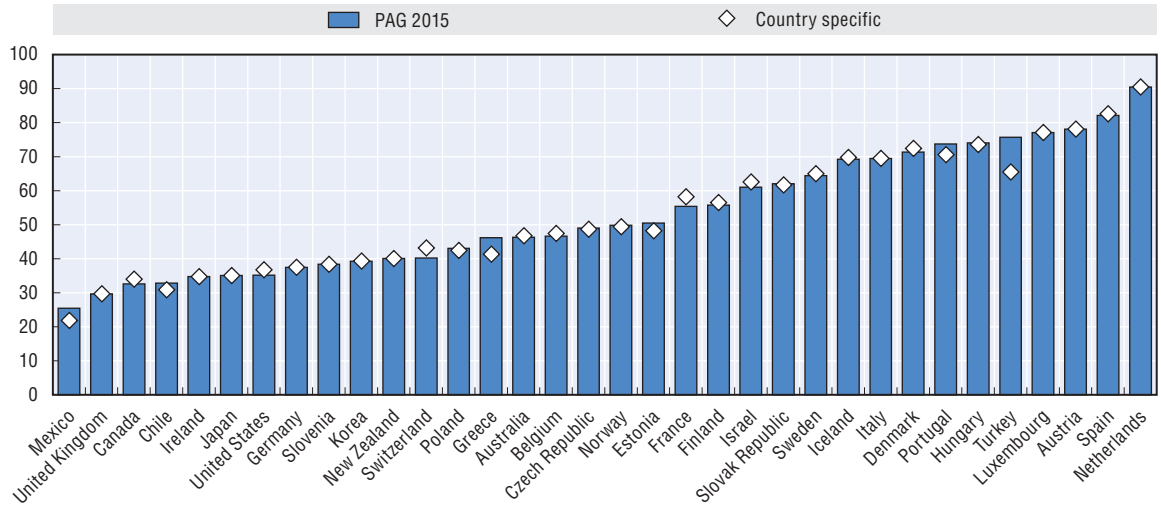
The results for the gross replacement rate are shown in Figure 4.7 in comparison with the *Pensions at a Glance 2015* baseline.

Overall, there is very little change in the replacement rates based on *Pensions at a Glance 2015* and the country-specific assumptions shown in Table 4.2. The different assumptions have no impact on replacement rate in some countries. For example, the pensions in Ireland, New Zealand and the United Kingdom are effectively flat-rate and so the changes in the economic parameters do not alter the replacement rates as the benefits are uprated in line with wage increase. This means that the expected benefits effectively remain constant relative to past wages. The results for Austria, Germany, Japan, Luxembourg, the Netherlands and Slovenia are also constant under both scenarios, as in these countries all the applicable components of the pension system are indexed to wages.

Figure 4.7. **Future gross replacement results for male average earners under *Pensions at a Glance 2015* and country-specific assumptions**

Percentage of earnings



Source: Author calculations using OECD pension model.

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The biggest increase obtained by moving to country-specific assumption are in France and Switzerland at around 3 percentage points. This change comes mostly from the lower assumptions for real-wage growth (and the sensitivity to this parameter as discussed in Section 4.4). At the other end of the scale the largest fall in replacement rates are found in Turkey (10 percentage points), Greece (5 percentage points) and Mexico (4 precentage points). In Turkey and Greece this is caused by the considerably higher level of wage growth, at 2.26% and 1.69%, respectively, rather than the common 1.25% in the baseline. In Mexico the difference between the rate of return and wage growth is only 1.28% as opposed to 1.75% under *Pensions at a Glance 2015*, so the value of the capital upon retirement is much lower relative to earnings.

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