

## *Chapter 4*

# **GROWTH PROSPECTS AND FISCAL REQUIREMENTS OVER THE LONG TERM**

## Summary

- The composition of global output will continue to shift towards emerging economies as well as towards Asia; the combined GDP of China and India was 33% of that of the OECD in 2010 (on a PPP basis), but is expected to rise to 73% by 2060.
- Providing growth of the technology frontier continues at historical rates, average growth in OECD GDP per capita over the period to 2060 is projected to be similar to the 1½ per cent per annum experienced in the immediate pre-crisis period.
- With only a few major exceptions, the adverse effect of population ageing on labour utilisation in OECD countries will be largely offset by rising labour force participation. Up until 2030, this is achieved in most countries through already legislated increases in pensionable age, the positive effect of increased education and trend increases in female participation. Beyond 2030 it will require additional reforms to ensure that retirement ages are effectively indexed to life expectancy.
- The crisis is estimated to have reduced OECD-wide potential output per capita by about 3¼ per cent. For some European, mainly euro area, countries, the effect has been much larger, with the reduction in potential output in 2014 being more than 10% for the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland and Slovenia.
- For nearly all OECD countries, with the exception of Japan, the additional fiscal consolidation that would be required to reduce government debt to 60% of GDP by 2030 is less, and mostly much less, than that already expected to have been achieved between 2010 and 2015. Countries requiring average consolidation beyond 2015 of between 1 and 3 percentage points of GDP are Canada, France, Hungary, Iceland, Ireland, Italy, Poland and Portugal. Three countries – Spain, the United Kingdom and the United States – require between 3 and 5 percentage points of additional average fiscal consolidation beyond 2015.
- For Japan, even a massive fiscal consolidation of nearly 11 percentage points of GDP beyond 2015 would only stabilise the debt ratio by 2030, suggesting that a complementary and more ambitious package of structural and macroeconomic policies is needed.
- Reducing government debt to 60% of GDP would, for the 10 OECD countries for which government debt is currently highest, lower combined fiscal and net external debt risk premia by an average of 1½ percentage points, reduce government debt service by an average of 4 percentage points of GDP and boost medium-term growth by 0.2 percentage points per year (all by 2030, relative to a counter-factual in which current debt levels are maintained). Reducing government indebtedness would also promote resilience and help to contain any resurgence in global imbalances.
- Average real long-term interest rates are projected to rise by around 1½ percentage points over the next 4-5 years as output gaps close and policy rates normalise. Beyond this, supported by fiscal consolidation in OECD countries and a compositional shift in the share of world output towards high-saving non-OECD countries, no strong upward pressures on interest rates are expected until well after 2030.
- A faster pace of improvement in product market regulations could boost GDP substantially; for non-OECD countries by an average of 9% by 2030; and for the six OECD countries where regulation is currently most restraining, by an average of 6% by 2030.

- There would be substantial fiscal gains from reducing structural unemployment to 5% in many OECD countries; for Belgium, Poland, France, Greece and the Slovak Republic there would be an improvement in the primary balance of more than 2 percentage points of GDP and for Spain more than double that.
- In emerging market economies, there are major long-term gains to improving access to education, which could raise GDP for China, India, Indonesia and South Africa by 10% or more, although such gains would take time to materialise.

## Long-term global growth projections

*This chapter provides long-term projections for the global economy*

The global economy will undergo massive changes over coming decades, which will include: a compositional shift in global output towards non-OECD countries and Asia; a further reduction in inequality across countries, although large gaps between the living standards of the poorest and richest nations will remain; and demographic changes in the form of slowing population growth, ageing populations and a narrowing of the gender gap in labour force participation. This chapter attempts to quantify such trends through a consistent set of long-term projections that extend the short-term projections, presented in Chapters 1 to 3, out to 2060 using the model described in Johansson *et al.* (2013).<sup>1</sup> Bearing in mind the substantial caveats that inevitably apply to this form of exercise, these projections are then used as a back-drop for the analyses of fiscal imbalances and consolidation needs and the impact of structural reforms.

### *The modelling framework and statistical issues*

*A growth-accounting framework underlies the output projections*

The backbone of the underlying model is a consistent set of long-run projections for potential output (details in Box 4.1). By projecting each of the trend input components (employment, human capital, labour efficiency, and physical capital), potential output is projected out to 2060. The country coverage for the projections is all OECD countries as well as

#### Box 4.1. The growth accounting framework.

Potential output (Y) is based on a Cobb-Douglas production function with constant returns to scale featuring physical capital (K), human capital (H) and potential employment (N) as production factors plus labour-augmenting technological progress (E, hereafter referred to as “labour efficiency”) so that:

$$(1) \quad y = \alpha (n+e+h) + (1-\alpha) k,$$

where lower case letters denote logarithms and  $\alpha$  is the wage share.

By projecting the trend input components, potential output is projected out to 2060. A convenient expository decomposition (used in the tables discussed below) is to divide changes in GDP per capita, a crude metric for living standards, into productivity and labour utilisation components (where P is population):

$$(2) \quad \Delta(y-p) = \Delta(y-n) + \Delta(n-p)$$

1. The cut-off date for data used in the projections for this chapter is 15th April 2014. This means that there may be some minor differences with the short-term projections presented in Chapters 1 to 3. It also means that recent PPP updates for emerging economies are not incorporated in the projections, although their effect is discussed in the text.

#### Box 4.1. The growth accounting framework. (cont.)

Three distinct components of changes in trend productivity can be distinguished, from re-arranging (1):

$$(3) \quad (y-n) = \Delta e + \Delta h + \{(1-\alpha)/\alpha\} \Delta(k-y)$$

Each of these components are modelled and projected out to 2060 as follows (for further details see Johansson et al., 2013):

- The growth of *labour efficiency* is determined according to a conditional convergence framework,<sup>1</sup> so that the growth rate will converge towards the growth rate of the technology frontier, but the absolute level of labour efficiency may remain below the frontier even in the long-run because of particular country characteristics, including structural policy settings. In the current framework, product market regulations are an important determinant of the distance to the technology frontier. The degree of convergence depends on the starting point, with countries further away from the technology frontier converging faster. Convergence is also influenced by trade openness and by historical inertia. The growth of the technology frontier is assumed to be 1.3 per cent per annum, consistent with the historical growth rate over the decade preceding the crisis in the leading OECD countries, and this is the growth rate to which all countries will converge to in the very long run. In countries where regulations are currently more restrictive, product market and trade regulations are assumed to converge gradually towards the average regulatory stance observed across the OECD, while for other countries regulations remains unchanged.
- *Human capital* is measured as a function of average years of schooling per worker (with a decreasing rate of return). Convergence in human capital towards the frontier (represented by Korea) is assumed to continue at the same rate as observed globally over the period 1960-2005, with educational attainment in the current leader (Korea) continuing to rise gradually to 2060 (to 72% of persons aged 25-29 having obtained tertiary education from 63% in 2009).
- *Physical capital intensity* is assumed to stabilise gradually, by applying an autoregressive rule to the capital-output ratio ( $K/Y$ ). This rule allows a gradual stabilisation of the capital-output ratio in countries such as Canada, Australia and China where capital intensity has been rising historically. Over the projection period, capital intensity is further influenced by changes in interest rates.

Changes in labour utilisation, can be broken down into 3 components, where the labour force is denoted by LF and population of working age by PWA, with the latter taken to be the age group 15-74 given the long time horizon for the projections:

$$(4) \quad \Delta(n-p) = \Delta(n-lf) + \Delta(lf-pwa) + \Delta(pwa-p)$$

- The effect of changes in structural unemployment on labour utilisation are captured by the first term  $\Delta(n-lf)$ . In OECD countries the structural unemployment rate gradually returns to the lowest value estimated between 2007 and 2014. Unemployment in non-OECD countries in which the level is currently above the OECD average is assumed to converge gradually to the OECD average, while it remains unchanged in countries currently below the OECD average.
- For most countries changes in labour force participation, the second term ( $lf-pwa$ ) in (4), are projected using a cohort model, separately distinguishing cohorts by 5-year age groups and by sex. For remaining countries (including all non-OECD countries) a simplified approach is used to proxy the cohort model. The impact of policies differs between two stages of the projections. Recently-legislated pension reforms that involve an increase in the normal retirement age by 2030 are assumed to be implemented as planned, and the participation rates of older workers adjusted accordingly. In addition, retirement behaviour is assumed to reflect effects coming from a rising education level. Beyond 2030, a more stylised assumption is adopted whereby the share of active life in life expectancy is assumed to remain constant, hence the legal pensionable age is implicitly assumed to be indexed to longevity.
- A demographic effect on labour utilisation is captured by the third term in (4) as changes in the “active population rate” defined as the population of working age relative to the total population.

1. The growth rate of multi-factor productivity in this framework is equal to the growth rate of labour efficiency multiplied by the wage share.

non-OECD G20 countries (Argentina, Brazil, China, India, Indonesia, the Russian Federation, Saudi Arabia and South Africa), equivalent to just under 90% of world GDP in 2010 at market exchange rates.<sup>2</sup>

### **Imbalances in saving and investment affect interest rates and growth**

A second defining feature of the model is that it projects national saving and investment, with imbalances leading to changes in interest rates which in turn provide feedback on potential output growth by influencing the capital intensity of production (Box 4.2). At a global level, saving and investment are balanced through an equal adjustment in interest rates across all countries; so a tendency towards an *ex ante* “global savings glut” will put downward pressure on interest rates everywhere. For individual countries, excessive government debt or net external debt will push up national interest rates. A range of structural and macroeconomic factors drive national saving rates, but the most important are: demographic, as ageing populations save less; fiscal, as changes in public saving are only partially offset by lower private saving;

#### **Box 4.2. Projecting saving, investment and interest rates**

An important feature of the projection model is the determination of saving and investment and how imbalances are resolved or moderated through changes in interest rates, with consequences for growth.

Public saving for OECD countries is determined by fiscal closure rules acting on the underlying primary balance, which ensure that the government-debt-to-GDP ratio is stable either at recent levels or at a specified target. For those countries with initial gross general government debt in excess of 60% of GDP, fiscal policy is directed towards convergence on this debt level. Otherwise, for countries where debt is initially below the 60% threshold, fiscal policy is directed to stabilising the gross government debt ratio. To achieve these objectives, fiscal consolidation is assumed to take place through a gradual improvement in the underlying primary balance, with a maximum cap on consolidation in any single year of ½ percentage point of GDP. This assumption may contradict current government plans and is not necessarily consistent with national or supra-national fiscal objectives, targets or rules. No allowance is made for Keynesian effects of consolidation on demand. Effects on public budgets from population ageing and continued upward pressures on health spending are not explicitly included, or, put differently, they are implicitly assumed to be alleviated through reforms of relevant spending programmes or offset by other budgetary measures.

Private saving rates for OECD countries are determined according to OECD empirical work (Kerdrain *et al.*, 2010) which suggests that demographic effects, captured by old-age and youth dependency ratios, are major drivers of long-term trends in saving, but with additional effects from the fiscal balance, the terms of trade, productivity growth, net oil balances and the availability of credit. Total saving in OECD countries is determined as the sum of public and private saving, although there is a 40% offset of any improvement in public saving from reduced private saving due to partial Ricardian equivalence (in line with OECD estimates, for example Röhn, 2011).

For non-OECD countries, the total saving rate is determined according to an equation, which is close to being a total economy variant of the private saving equation for the OECD, with effects from the old-age and youth dependency ratios, the terms of trade, the availability of credit, the level of public health expenditure (as a proxy for public social protection) and productivity growth.

2. In the remainder of the chapter it should be borne in mind that statements relating to shares of global GDP or global country rankings relate to this incomplete country coverage.

**Box 4.2. Projecting saving, investment and interest rates (cont.)**

Non-housing investment is determined consistently with the capital stock and the share of housing investment in GDP is assumed to stabilise at long-run historical averages.

Current account balances are determined as the difference between projections of national investment and savings. An exception is a group of non-OECD oil exporting countries, defined to include Saudi Arabia, Russia as well as 27 smaller non-OECD countries. For these countries, no individual projections of current balances are made. Rather, the combined current account balance of all non-OECD oil exporting countries is calculated based on projections of their balance of trade in oil, assuming some continuation of the upward pressure on oil prices on which the short-term projections are based, mitigated over the medium-term by an assumed supply response.

Short-term interest rates are assumed to vary with the cycle, so that as output gaps close short-term interest rates return to neutral levels which are determined consistently with nominal potential growth. Long-term interest rates are determined as a convolution of short-term rates plus a term premium. Additional effects on interest rates (described in the bullets below) come from: a country-specific fiscal risk premium; a country-specific external debt premium; and a “world balancing premium”, which applies equally to all countries and ensures *ex post* global savings and investment remain in balance.

- Higher government debt levels are assumed to entail higher country-specific fiscal risk premia, consistent with the findings of Égert (2010) and Laubach (2009). For every percentage point that the debt ratio exceeds a threshold of 75% of GDP, the fiscal risk premium applied to long-term interest rates increases by 2 basis points, with an additional increase of 2 basis points for every percentage point that the debt ratio exceeds 125%. Japan is an exception to this rule, given the high proportion of government debt which is financed domestically, so that the fiscal risk premium is computed at one quarter the rate for other OECD countries.
- Current account imbalances are accumulated to provide a proxy for foreign asset positions – with higher levels of external indebtedness leading to higher country-specific risk premiums that are reflected in market interest rates, consistent with the findings of Lane and Milesi-Ferreti (2001), Rose (2010) and Turner and Spinelli (2013). This is implemented as an increase of 2 basis points in interest rates for every percentage point increase in the ratio of net external debt to GDP. For countries that are net creditors, there is no discount placed on their domestic interest rate, consistent with the findings of Turner and Spinelli (2013).
- Movements in global interest rates ensure that global saving and investment remain aligned. Hence if the *ex ante* sum of current account balances is more positive than previous periods, signifying an *ex ante* excess of global savings, then there will be downward pressure on all interest rates from a “global balancing premium” which stimulates investment and so brings global savings and investment back into balance.

and, for non-OECD countries, the level of social welfare provision, which reduces the need for precautionary saving. The capital intensity of production, and hence investment, responds to interest rates and so provides a partial equilibrating mechanism between saving and investment and helps to prevent the build-up of excessive national debt (and, equivalently, moderate sustained current account deficits).

**Output is assumed to return smoothly to potential over four to five years**

A further defining characteristic of the long-term growth projections is that they are anchored on the short-term projections for 2015, beyond which output gaps are assumed to close smoothly, typically over a period of four to five years, depending on their initial size. This implies above-trend growth for the first few years of the projections in countries with negative output gaps in 2015.<sup>3</sup> An alternative, whereby large negative output gaps are more persistent, raises the downside risk that hysteresis-type effects drag down the level of potential output further and on a more permanent basis (De Long and Summers, 2012). Once the output gap is closed, it is assumed that output grows in line with potential and that monetary policy ensures that inflation returns to a country or region-specific target.

**The crisis has reduced the level of potential output but not the growth rate**

Another optimistic assumption that underlies the projections is that the crisis has reduced only the level of potential output and has had no permanent adverse effect on its growth rate. Compared to a counter-factual based on pre-crisis trends, the level of aggregate OECD potential output has been reduced by about 3¼ per cent (Box 4.3), which corresponds to the (temporary) decline in OECD potential growth of about ½ percentage point per annum over the period 2008-13 (Table 4.1). There are, however, a number of smaller OECD countries, for which estimates suggest that losses exceed 10%. Some of this loss in potential output is assumed to be reversed over the medium term as hysteresis-induced increases in the structural rate of unemployment are reversed and the structural rate of unemployment gradually returns to pre-crisis levels.

**Policies play an important role in the baseline scenario**

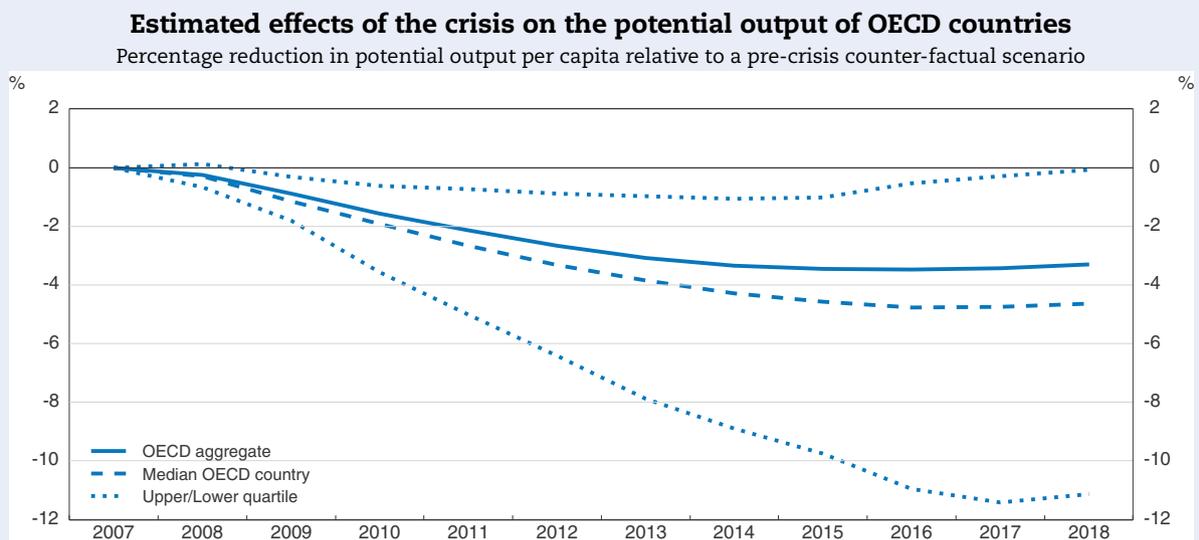
Structural and fiscal policies play an important role in the projections. The projection framework takes into account the impact of labour market and retirement policies on developments in unemployment and labour force participation, the impact of product market and trade regulations on innovation and technological diffusion,

#### Box 4.3. The effect of the crisis on potential output

For most OECD countries, the crisis has probably resulted in a permanent loss of potential output, so that even with a continuing recovery, GDP may not catch-up to its pre-crisis trajectory. The extent of these losses is uncertain, because of the inherent uncertainty surrounding estimates of potential output, the difficulty of knowing what the counter-factual would be and because of the difficulties of disentangling the effect of the crisis from other effects, including policy changes. Estimates of the impact of the crisis are derived from a comparison of the baseline potential output per capita to a counter-factual scenario in which: the trend participation and structural unemployment rates remain at their pre-crisis (2007) level; trend labour productivity is assumed to grow at the average rate observed in the pre-crisis period (2000-07); and demography remains the same as in the baseline. This method suggests a reduction in aggregate OECD-wide potential output of about 3¼ per cent in 2014 (see figure).

3. For the current projections, countries with large output gaps in 2015 – including the Czech Republic, Ireland, Italy, the Netherlands, Portugal and Spain – will experience average GDP growth about 1 percentage point per annum higher than potential growth to 2020, and for Greece the boost will be about double that.

## Box 4.3. The effect of the crisis on potential output (cont.)



Note: Estimated effects of the crisis are measured relative to a counter-factual scenario in which trend productivity continues at its pre-crisis (2000-07) trend growth rate; the structural unemployment and trend participation rates remain at their pre-crisis (2007) levels.

Source: OECD Economic Outlook 95 long-term database; and OECD calculations.

StatLink  <http://dx.doi.org/10.1787/888933050028>

There is, however, wide variation in the estimated effect of the crisis on individual countries. The estimated effect on the median OECD country is over 4% in 2014, reflecting that smaller countries have typically been hit harder than larger ones. Indeed, the worst affected countries (those in the lower quartile) will have lost about 11% of potential by 2016. Conversely, for the least affected countries (upper quartile), the effect of the crisis gradually dissipates.

The estimated impact of the crisis on individual OECD countries is heterogeneous and, especially for those most severely affected, is mostly explained by the loss of productivity growth (see second figure below). For the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland and Slovenia, the estimated negative impact of the crisis is above 10%, mostly reflecting lower trend productivity. The largest rise in the structural unemployment rate occurs in Spain, but the effect is partly counterbalanced by higher trend productivity, likely the consequence of a shift of production away from construction.

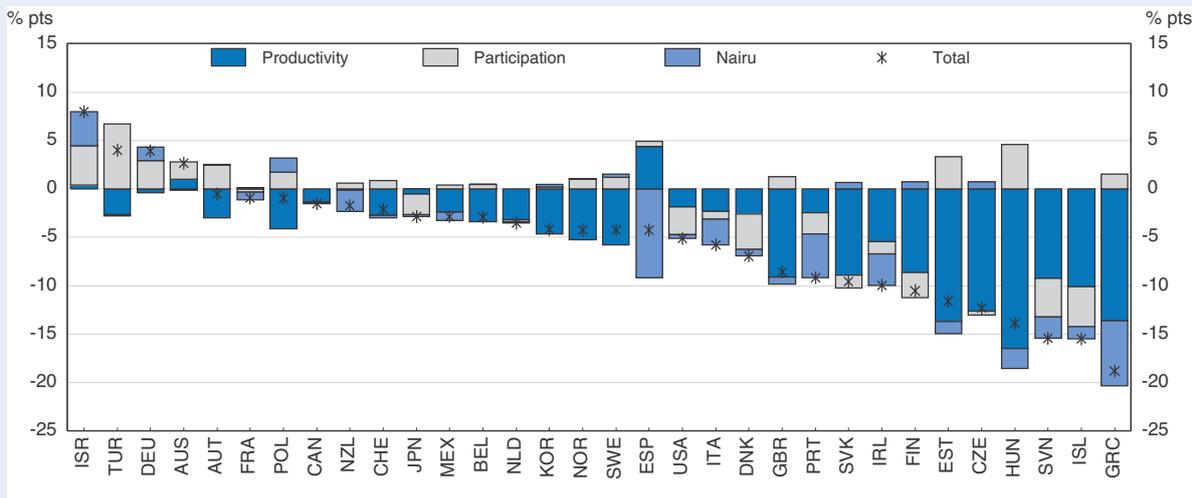
Conversely, for Israel, Turkey, Germany and Australia, the estimates of current potential output exceed the counter-factual mainly due to higher participation or lower structural unemployment than suggested by the immediate pre-crisis period. These latter results may be the consequence of previous labour market reforms (especially Germany) or the continuation of social trends in participation (especially rising female participation in Turkey and Israel) largely unaffected by the crisis, and illustrate the difficulties of constructing a reliable counter-factual.

The negative effect on participation is estimated to be greatest in Denmark, Iceland, Japan, Slovenia and the United States for which, judged relative to the immediate pre-crisis period, it could have subtracted between 3 to 4% from potential output. On the other hand, much of this fall may be explained by demographic trends; holding *age-specific* participation rates at their pre-crisis levels would explain most (for Denmark, Japan and the United States) or more than half (Iceland and Slovenia) of the *aggregate* fall in participation. If the adverse effect on labour force participation is ignored, then the estimate of the effect of the crisis on potential output in 2014 falls: from 5 to 2½ per cent for the United States; from 2¾ to ¾ per cent for Japan; and from 3¼ to 2¼ per cent for the aggregate OECD.

Box 4.3. The effect of the crisis on potential output (cont.)

### Estimated effects of the crisis on the potential output per capita of individual OECD countries

Difference in 2014



Source: OECD Economic Outlook 95 long-term database; and OECD calculations.

StatLink <http://dx.doi.org/10.1787/888933050047>

as well as the impact of fiscal consolidation in advanced economies and enhanced welfare policies in emerging economies on saving, global imbalances, indebtedness and capital accumulation via changes in the cost of capital. Over a time horizon covering several decades, these structural conditions and policies are likely to evolve, and so the baseline scenario incorporates a number of policy developments seen as probable in several areas (i.e. it is deliberately not a baseline assuming “unchanged policies”). While these policy changes are significant, there remains considerable scope for further structural reforms to improve trend growth, as explored in variant scenarios (see below).

**Beware, cross-country comparisons are distorted by statistical issues...**

**... due to changes to national accounts...**

In the following sections, GDP and GDP per capita are compared across countries. However, it is important to be aware that such comparisons are distorted by two statistical issues, namely the patchy switch to the new system of national accounts and recent updates to Purchasing Power Parities (PPPs).

- In those countries (Australia, Canada, Korea, Israel, Mexico and the United States) that have already switched to the new system of national accounts (SNA08),<sup>4</sup> the level of nominal GDP has been boosted by between 2½ and 8%. Moreover, as the switch has also raised historical real GDP growth, it affects projected future potential growth. This raises

4. Among other methodological changes, SNA08 involves a new treatment of expenditures on research and development, military equipment and financial intermediation services.

a problem that current and projected GDP of those countries that have already made the switch will be boosted relative to those that have not.<sup>5</sup>

**... as well as PPP revisions**

- Comparisons of GDP across countries are made using PPPs rather than market exchange rates. A major PPP revision for OECD countries (plus Russia) that updates the benchmark year from 2005 to 2011 was released earlier this year by the International Comparison Program (and is incorporated in the projections reported here), but the update for the rest of the world has only just been released (and so is not incorporated here). The latter update, incorporating methodological changes to the computations, results in a major upward revision in the relative size of emerging market economies. Notably, the PPP revision for China implies that GDP in 2011 was 18% larger than previously thought, which, scaling up GDP in following years commensurately, implies that China's GDP would surpass that of the United States this year rather than in the early 2020s as implied by the projections documented in this chapter. Similar revisions are expected for other BRIICS countries, implying a 23% increase in their combined GDP measured in PPPs in 2010.

**Changes in the composition of global GDP**

**Non-OECD growth is projected to exceed that of the OECD, but the difference diminishes**

Aggregate potential growth for the non-OECD is projected to continue to exceed that of the OECD, although the difference progressively narrows (Table 4.1, first four columns). Trend growth of the non-OECD since 2000 has averaged about 7% per annum, compared to 2% per annum for the OECD (but with a discernable dip since the crisis); in the projection, non-OECD growth slows to an average of under 5% per annum over the period 2014-30 and 3% per annum over 2031-60, whereas OECD growth averages just above and just under 2% per annum in the same periods. Only a small fraction of these changes can be attributed to changing population growth; non-OECD population growth slows from around 1% per annum recently to about zero over 2031-60, whereas OECD population growth slows from about  $\frac{3}{4}$  per cent per annum recently to  $\frac{1}{4}$  per cent per annum over 2031-60.

**Growth in China is set to slow and be surpassed by that in India and Indonesia**

While the slowdown in trend GDP growth is a feature of all non-OECD countries, it is most marked in the case of China; from averaging 9-10% per annum since 2000, the average growth rate is set to roughly halve over the period 2014-30 and halve again over 2031-60. India and Indonesia are projected to surpass China to become the two fastest growing countries by 2020, maintaining these positions until the end of the projection horizon in 2060.

**There will be a massive shift in global GDP towards non-OECD and Asia**

These growth patterns imply a massive shift in the composition of global output towards the non-OECD. Based on comparisons at current PPPs (see Box 4.4), the combined GDP of China and India was 33% of that of the OECD in 2010, but is expected to rise to 73% by 2060 (Figure 4.1).

5. Most European countries are expected to make the switch to SNA08 during the course of 2014, with non-OECD countries to follow.

Table 4.1. **Growth in total economy potential output and its components**

Average annual percentage change

	Potential GDP				Potential GDP per capita (1) = (2) + (3)				Trend productivity (2)				Potential employment ratio (3)			
	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060
Australia	3.2	3.1	3.2	2.4	1.8	1.5	2.0	1.6	1.1	1.2	2.0	1.5	0.7	0.3	0.0	0.1
Austria	2.1	1.7	1.9	1.6	1.7	1.4	1.6	1.6	1.2	0.7	1.7	1.6	0.5	0.7	-0.1	0.0
Belgium	1.8	1.2	2.0	2.0	1.4	0.4	1.4	1.6	0.9	0.4	1.6	1.6	0.5	0.0	-0.2	0.1
Canada	2.7	1.8	2.1	1.9	1.6	0.7	1.2	1.4	0.9	0.6	1.5	1.4	0.7	0.1	-0.3	0.0
Chile	3.8	4.5	4.4	2.2	2.7	3.5	3.7	2.1	1.6	2.0	3.0	1.9	1.1	1.5	0.7	0.2
Czech Republic	3.5	1.9	2.9	1.7	3.5	1.3	2.8	1.8	3.4	1.4	2.9	2.1	0.2	-0.1	-0.1	-0.2
Denmark	1.5	0.7	1.6	2.0	1.2	0.2	1.3	1.9	1.0	0.6	1.5	1.8	0.2	-0.4	-0.1	0.1
Estonia	5.1	2.0	2.8	1.8	5.4	2.0	3.1	2.1	4.4	2.1	3.1	2.2	1.0	0.0	0.0	-0.1
Finland	2.8	0.7	2.0	1.5	2.5	0.3	1.7	1.5	1.6	0.2	2.1	1.4	0.8	0.0	-0.4	0.1
France	1.8	1.2	2.2	1.5	1.1	0.7	1.8	1.4	0.9	0.9	1.9	1.3	0.2	-0.2	-0.1	0.1
Germany	1.3	1.2	1.1	1.1	1.2	1.4	1.3	1.6	0.9	0.8	1.6	1.6	0.3	0.6	-0.3	0.0
Greece	3.0	-0.9	2.2	1.3	2.6	-1.2	2.1	1.4	1.8	-0.4	2.0	1.6	0.8	-0.7	0.1	-0.2
Hungary	2.8	0.4	1.7	1.9	3.1	0.5	1.9	2.2	3.0	0.4	1.5	2.4	0.0	0.2	0.3	-0.3
Iceland	3.7	1.4	1.8	1.9	2.5	0.1	0.9	1.6	2.3	0.8	1.2	1.6	0.2	-0.7	-0.2	0.0
Ireland	5.4	1.7	2.3	1.4	3.5	0.8	1.4	0.7	2.3	1.6	1.1	0.6	1.2	-0.8	0.3	0.0
Israel	3.6	3.9	3.2	2.6	1.6	2.0	1.9	1.6	1.0	1.0	1.3	1.4	0.6	1.0	0.6	0.2
Italy	1.2	0.0	1.5	1.7	0.7	-0.6	1.2	1.7	0.2	-0.1	1.2	1.7	0.5	-0.5	0.0	0.0
Japan	0.7	0.5	1.1	1.2	0.5	0.5	1.4	1.8	0.9	0.8	1.5	1.9	-0.4	-0.2	-0.1	-0.1
Luxembourg	4.0	2.3	2.1	1.6	2.6	0.6	1.1	1.1	0.4	-0.7	0.8	1.2	2.2	1.3	0.3	-0.1
Mexico	2.5	2.4	2.9	3.2	1.2	1.2	2.0	2.9	0.6	0.2	0.9	2.4	0.6	1.0	1.0	0.5
Netherlands	2.0	1.1	2.1	1.8	1.5	0.6	1.8	1.9	0.9	0.4	1.9	1.8	0.6	0.2	-0.1	0.0
New Zealand	3.2	1.8	2.6	2.2	1.9	0.7	1.7	1.7	0.8	0.7	1.7	1.6	1.1	0.1	0.1	0.1
Norway	3.0	2.4	2.1	1.6	2.3	1.2	1.3	1.2	1.7	0.9	1.4	1.2	0.6	0.2	-0.1	0.0
Poland	4.1	3.4	2.2	0.9	4.2	3.3	2.3	1.3	3.6	3.0	2.8	1.7	0.6	0.3	-0.5	-0.4
Portugal	1.8	0.3	1.4	2.0	1.2	0.2	1.3	2.2	1.3	1.0	1.1	2.3	-0.1	-0.8	0.2	-0.1
Korea	4.6	3.7	2.9	1.6	4.1	3.1	2.6	1.8	3.2	2.5	2.4	1.9	0.8	0.5	0.2	-0.1
Slovak Republic	4.7	3.2	2.6	1.1	4.7	2.9	2.5	1.4	4.1	2.8	3.0	1.9	0.5	0.1	-0.5	-0.4
Slovenia <sup>1</sup>	3.3	0.9	1.8	1.8	3.1	0.3	1.6	1.9	2.6	1.1	2.0	2.1	0.5	-0.8	-0.4	-0.1
Spain	3.3	0.6	1.5	1.6	1.8	-0.2	1.1	1.4	0.5	1.2	0.6	1.6	1.3	-1.4	0.5	-0.2
Sweden	2.6	2.1	2.6	1.6	2.2	1.3	2.0	1.3	2.1	1.1	2.1	1.3	0.2	0.1	-0.1	0.0
Switzerland	1.8	1.9	2.1	1.7	1.2	0.7	1.5	1.5	0.9	0.4	1.7	1.6	0.3	0.3	-0.2	-0.1
Turkey	3.9	4.9	4.2	2.3	2.5	3.6	3.3	1.9	2.6	2.1	2.4	1.6	-0.1	1.4	0.8	0.3
United Kingdom	2.6	1.0	2.6	1.9	2.1	0.3	2.0	1.6	1.7	0.2	2.0	1.5	0.4	0.1	0.0	0.1
United States	2.6	2.0	2.4	1.7	1.7	1.1	1.6	1.2	1.8	1.5	1.9	1.1	-0.1	-0.4	-0.3	0.1
Euro area <sup>1</sup>	1.7	0.9	1.7	1.5	1.1	0.5	1.5	1.5	0.8	0.7	1.5	1.6	0.4	-0.2	-0.1	0.0
OECD <sup>1</sup>	2.2	1.7	2.2	1.8	1.5	1.0	1.7	1.6	1.3	1.0	1.7	1.5	0.2	0.0	0.0	0.1
Argentina	3.4	4.8	3.4	2.3	2.5	3.9	2.6	2.0	0.5	2.6	2.1	2.0	2.0	1.3	0.5	-0.1
Brazil	2.9	3.3	2.6	2.1	1.6	2.4	2.0	2.1	0.6	1.4	1.6	2.4	1.0	1.0	0.3	-0.4
China	10.2	9.2	5.0	2.4	9.5	8.5	4.7	2.8	8.9	8.6	5.1	3.2	0.5	-0.1	-0.4	-0.5
India	7.0	7.0	5.8	4.3	5.3	5.7	4.8	3.9	5.3	5.3	4.0	3.8	0.1	0.4	0.8	0.1
Indonesia	3.9	5.8	5.5	3.7	2.5	4.4	4.5	3.4	2.1	3.3	4.0	3.6	0.4	1.0	0.5	-0.2
Russia	5.3	3.4	2.7	1.4	5.6	3.5	3.1	1.9	4.5	3.8	3.7	2.1	1.1	-0.3	-0.6	-0.2
South Africa <sup>1</sup>	3.0	3.6	4.5	2.6	1.6	2.5	3.9	2.2	1.9	2.3	2.9	2.0	-0.3	0.1	1.0	0.2
Non-OECD <sup>1</sup>	7.1	7.0	4.8	2.9	6.0	6.0	4.1	2.9	5.7	5.9	4.1	3.1	0.3	0.1	0.1	-0.2

Note: Contributions to growth in trend productivity and the potential employment ratio are decomposed in Tables 4.2 and 4.3, respectively.

1. Starting year for potential output is 2001 for Slovenia, South Africa and non-OECD total; and 2002 for Estonia, the euro area and OECD total.

Source: OECD Economic Outlook 95 long-term database.

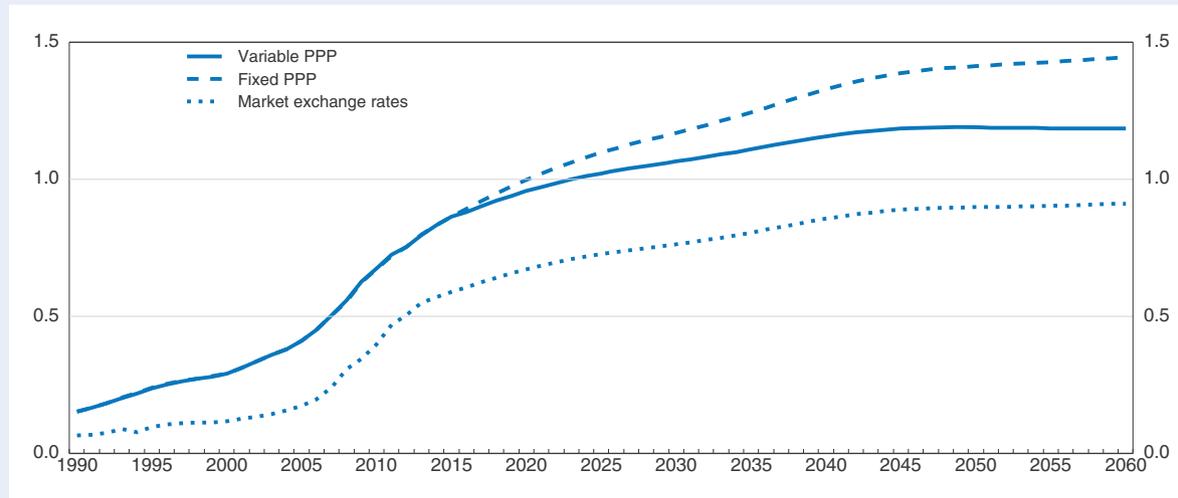
#### Box 4.4. Comparing GDP across countries using Purchasing Power Parities

Comparisons of income across countries that do not share the same currency are usually made using purchasing power parity (PPP) rather than market exchange rates. PPPs denote the exchange rates that give purchasing power equivalence; so that one dollar purchases the same quantity of goods and services in all countries. Notwithstanding the major impending PPP revision for non-OECD countries previously referred to (which stems from methodological computational changes), PPP exchange rates will typically evolve slowly over time, as the purchasing power of incomes across countries evolves, and are subject to less volatility than market exchange rates. Since the prices of locally produced goods and services which are not subject to competition from imports are generally lower in a country with lower income, a PPP-based measure of income will typically show incomes in less developed economies to be higher than with a market exchange rate-based measure.

The Balassa-Samuelson effect suggests that as incomes converge, PPPs will converge on market exchange rates so that the difference between using market exchange rates and current PPPs to compare OECD and non-OECD economies will diminish over time. The Balassa-Samuelson effect arises because the growth of productivity differs among sectors, while wages tend to be less differentiated. Typically, productivity growth is faster in the traded goods sector than in the non-traded goods sector. To the extent that the faster productivity growth in the traded goods sector pushes up wages in all sectors, the prices of non-traded goods relative to those of traded goods will rise, thus leading to a rise in the overall price index. The speed at which the PPP exchange rate changes in response to convergence in income per capita is given by the empirical results of Frankel (2006).

Since incomes per head are typically lower in non-OECD countries compared to OECD countries, and so the price of non-traded goods and services cheaper, the relative size of non-OECD economies vis-à-vis the OECD economies is typically greater when measured on a current PPP basis than at current market exchange rates. This effect was observed long-ago in international comparisons using the Penn World Tables and has become known as the Penn Effect. Its evolution over time is seen in Figure 4.1 where the global shares measured in current PPP get relatively closer to those measured with market exchange rates as income per capita converges. The figure below shows this for the evolution of China's GDP relative to that of the United States under different exchange rate measures.

**The ratio of China's GDP to that of the United States**

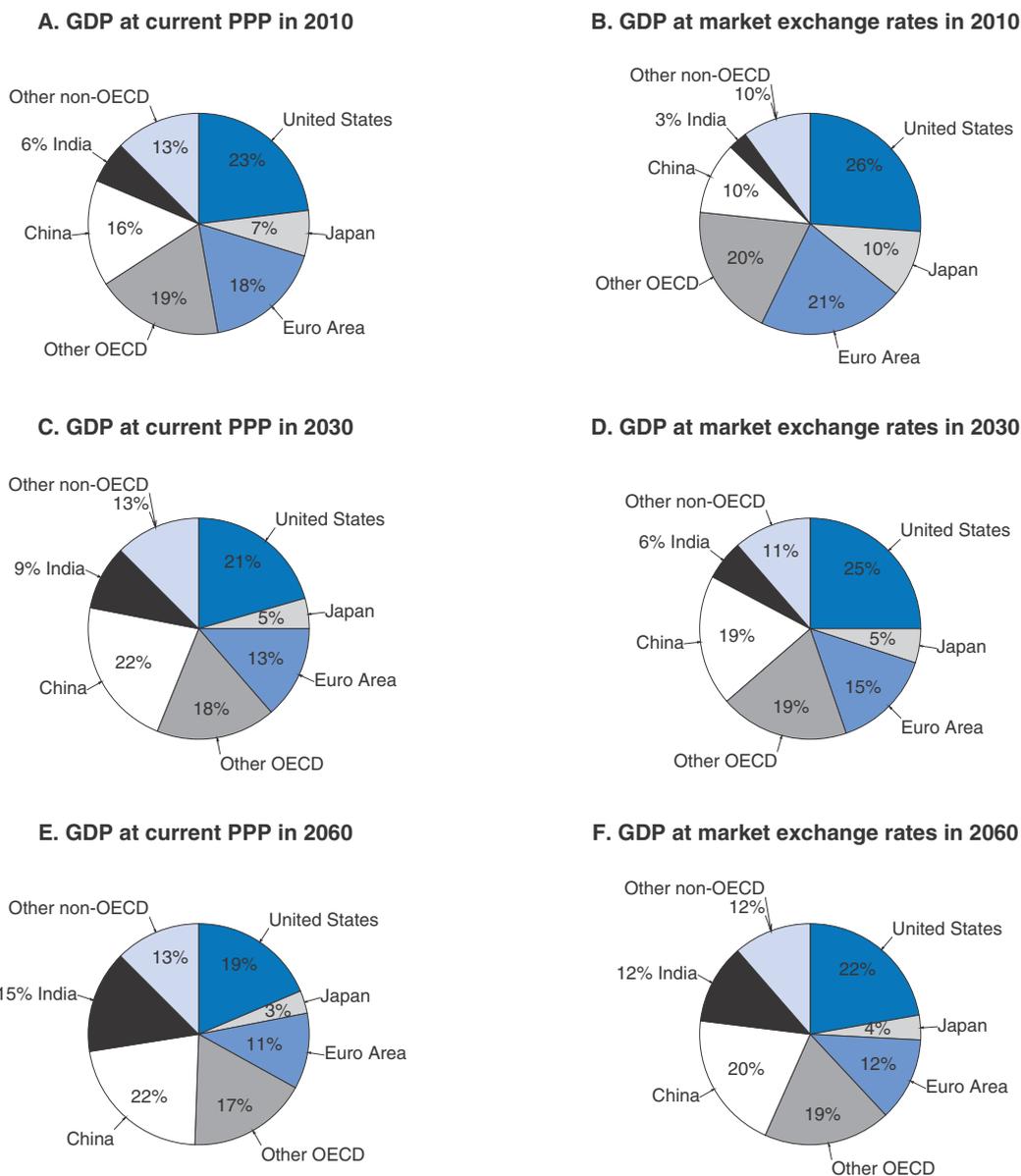


Source: OECD Economic Outlook 95 long-term database.

StatLink  <http://dx.doi.org/10.1787/888933050066>

Figure 4.1. **The changing composition of global GDP to 2060**

Percentage of world GDP



Note: World is here defined as the sum of OECD countries plus Argentina, Brazil, China, Indonesia, India, the Russian Federation, Saudi Arabia and South Africa.

Source: OECD Economic Outlook 95 long-term database.

StatLink  <http://dx.doi.org/10.1787/888933050085>

Moreover as previously emphasised, recent PPP revisions (not incorporated here) exacerbate the shift to the emerging economies. At the same time, there will be a shift in the share of world GDP accounted for by Asia, at the expense of both North America and Europe. Having accounted for about one-quarter of global GDP at the beginning of the century, Asia's share has already risen to over one-third and is expected to reach 40% by 2030 and stabilise at around 45% in the 2050s. This is reflected in the ranking of the top five countries by GDP at the end of the projection: China, United States, India, Japan and Indonesia.

### *Changes in GDP per capita living standards*

**OECD GDP per capita is projected to recover to pre-crisis growth rates**

A different perspective on the projections can be provided by examining growth in GDP per capita, a proxy for living standards and a benchmark for assessing the performance of an economy. Growth in aggregate OECD GDP per capita is projected to recover from the weakness experienced since the crisis, to be marginally higher over the period to 2060 than the 1½ per cent per annum experienced over 2000-07. Growth in non-OECD GDP per capita, which was seemingly little affected by the crisis, is much higher but projected to decline to 4% per annum to 2030 and 3% per annum over 2030-60.

**There will be a reduction in inequality across, but not necessarily within, countries**

Reflecting the conditional convergence properties of the modelling framework as well as some convergence in structural policy settings, there is a reduction in inequality across countries; for example, GDP per capita of the richest five countries does not quite double between now and 2060, whereas for the poorest five countries it increases by a factor of between 3½ and 7. However, the reduction in cross-country inequality could, in the absence of policy action, be mirrored by a sharp increase in within-country inequality driven by technological change which favours skilled earnings (OECD, 2014a).

**Countries with similar starting positions can experience different growth rates**

Despite the conditional convergence properties of the modelling framework, even countries starting from similar initial levels of GDP per capita are sometimes projected to experience different growth rates, implying changes in the ranking of countries over the projection (Box 4.5). Such changes can be best understood in terms of its decomposition into trend productivity and labour utilisation components, described in Box 4.1 and enumerated in Tables 4.1, 4.2 and 4.3.

**Growth in GDP per capita is mostly explained by trend productivity**

The main contribution to growth in GDP per capita for all countries comes from trend productivity growth (Table 4.2), which in turn is mainly explained by technical progress, measured in terms of “labour efficiency” in the modelling framework (see Box 4.1). For the aggregate OECD, labour efficiency is projected to grow at 1.4 and 1.3 % per annum over the periods to 2030 and 2030-60, respectively, which is slightly above and close to the assumed rate of growth of the technology frontier. However, most non-OECD countries and a number of OECD countries (Chile, the Czech Republic, Estonia, Korea, Poland and the Slovak Republic) have faster projected growth in trend labour efficiency, reflecting a combination of rapid historical growth and the still great distance to the frontier (all of these countries currently have GDP per capita below the OECD median). Conversely, a number of other OECD countries – including Ireland, Italy, Luxembourg, Mexico, Portugal and Spain – have much slower projected growth in trend labour efficiency, which reflects inertia from low historical growth that is mostly not just confined to the post-crisis period.

#### Box 4.5. Changes in the country rankings of GDP per capita

This box highlights those countries for which improvements in GDP per capita are most striking, either in absolute terms or in their relative position as regards country rankings. Cross-country comparisons of levels of GDP per capita are made in terms of current purchasing power parities (PPPs). Using current PPP rather than fixed PPP means that the GDP of low-income countries like India and China rises somewhat less over the projection, relative to high-income countries such as the United States. In interpreting the rankings the limited country coverage should be borne in mind, as well as statistical issues relating to recent revisions to PPPs and national accounts for some countries (as discussed earlier in the main text). In particular, in relation to the table in this box, the recent revisions to PPP's would raise historical GDP per capita in the BRIICs by an average of 5 percentage points relative to that of the United States.

Given the underlying framework of conditional convergence, absolute gains are larger for those countries which initially have the lowest GDP per capita. Thus, the average gain in GDP per capita to 2060, measured relative to the United States, is less than one percentage point for the countries currently ranked in the top ten, but averages 15 percentage points for the countries currently ranked in the bottom ten (see box table). However, the underlying conditional convergence assumption also suggests that changes in country rankings are likely to be understated; as illustrated by comparing changes in rankings over the historical period 1995-2012, which in absolute average terms are about 50% greater than over either of the projection periods 2012-30 or 2030-60. Or put another way, the model will not readily predict a repeat of historical episodes such as Japan's "lost decade", the effect of the financial crisis on Iceland or Ireland's "Celtic Tiger" transformation.

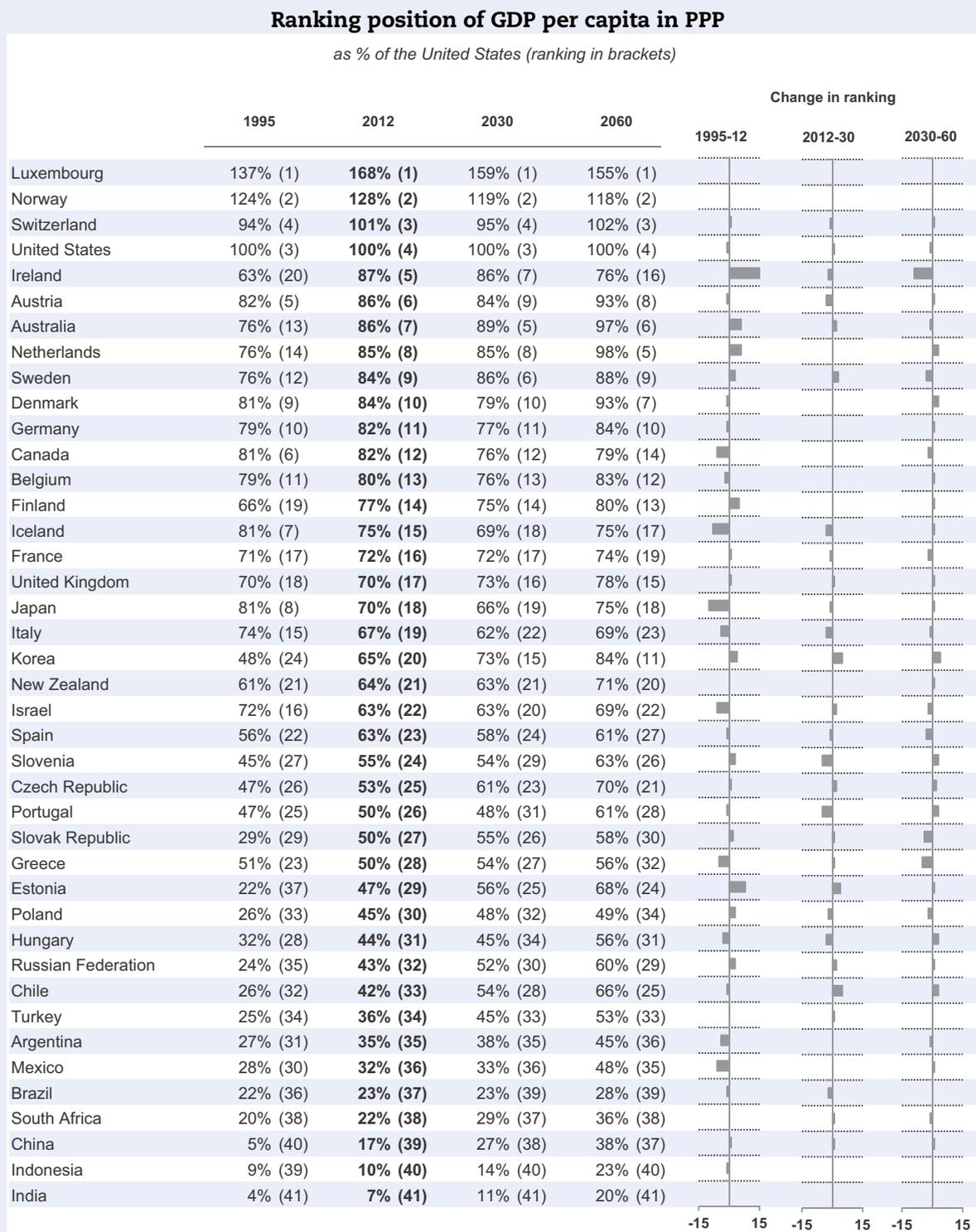
Countries starting with similar levels of GDP per capita can, nevertheless, experience different degrees of projected catch-up (and so change rankings) for a variety of reasons, including momentum from initial labour efficiency growth and because changes in GDP per capita also arise because of changes in the employment rate, capital intensity or human capital. Differences in employment rate projections are in turn influenced by demographics as well as by assumptions about labour market policies, including those relating to retirement.

Korea is among the countries which gain most in terms of GDP per capita ranking over the period 2012-30, due to momentum from recent rapid labour efficiency growth which carries over into the medium term as well as a strong contribution from human capital. (Korea is also one of the countries which has been boosted most by the recent SNA08 revision; the level of GDP was increased by about 8% and estimates of recent historical potential growth by about  $\frac{1}{4}$  percentage point per annum.) Otherwise, China gains most in terms of the absolute catch-up in GDP per capita (against the United States), which is a consequence of momentum from historically rapid labour efficiency growth as well as a further increase in capital intensity. While labour efficiency growth for China is projected to decline relative to its average growth rate over the last decade, over the period to 2030 it will still be faster than for any other country and about three times the average growth rate of the technology frontier.

Among the countries which lose most in terms of GDP per capita ranking over the period 2012-30 are Italy, Portugal and Slovenia due to the inertia from a prolonged period of historically low labour efficiency growth compounded, in the cases of Portugal and Slovenia, by a decline in capital intensity which is a legacy of higher capital costs incurred during the euro area crisis.

Countries which gain most in terms of GDP per capita ranking over the period 2030-60 include Chile, Portugal and Slovenia. This is mostly due to faster labour efficiency growth (boosted in the case of Portugal by stronger catch-up in human capital) and a more favourable development of the employment rate relative to their immediate peers, due to less pronounced ageing. Conversely, among the countries which lose most in terms of GDP per capita ranking over the period 2030-60 are Greece and the Slovak Republic (mainly because of unfavourable demographics) and Ireland (where labour efficiency levels are initially very high compared to most other countries).

Box 4.5. Changes in the country rankings of GDP per capita (cont.)



Source: OECD Economic Outlook 95 long-term database.

StatLink  <http://dx.doi.org/10.1787/888933051814>

Table 4.2. **Growth in trend productivity and its components**

Average annual percentage change

	Trend productivity (1) = (2) + (3) + (4)				Trend labour efficiency (2)				Human capital (3)				Capital output ratio <sup>1</sup> (4)			
	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060
Australia	1.1	1.2	2.0	1.5	1.0	0.0	1.4	1.4	0.2	0.3	0.3	0.2	-0.1	1.0	0.3	0.0
Austria	1.2	0.7	1.7	1.6	1.0	0.8	1.5	1.5	0.3	0.2	0.2	0.2	-0.2	-0.3	0.0	-0.1
Belgium	0.9	0.4	1.6	1.6	0.1	-0.4	1.1	1.4	0.7	0.5	0.4	0.2	0.1	0.3	0.1	-0.1
Canada	0.9	0.6	1.5	1.4	0.2	-0.3	1.0	1.3	0.3	0.2	0.1	0.1	0.4	0.8	0.4	-0.1
Chile	1.6	2.0	3.0	1.9	-0.8	-0.7	1.8	1.7	0.8	0.7	0.6	0.3	1.6	2.1	0.6	-0.2
Czech Republic	3.4	1.4	2.9	2.1	2.9	0.4	2.6	1.9	0.7	0.4	0.3	0.2	-0.3	0.6	0.0	-0.1
Denmark	1.0	0.6	1.5	1.8	0.2	-0.1	1.0	1.7	0.3	0.2	0.2	0.2	0.5	0.5	0.1	-0.1
Estonia <sup>2</sup>	4.4	2.1	3.1	2.2	2.1	0.9	3.2	2.0	0.3	-0.1	-0.1	0.2	2.0	1.3	-0.2	0.0
Finland	1.6	0.2	2.1	1.4	1.5	-0.6	1.9	1.4	0.6	0.4	0.2	0.2	-0.5	0.5	0.0	-0.1
France	0.9	0.9	1.9	1.3	0.1	0.0	1.2	1.2	0.7	0.7	0.5	0.2	0.1	0.2	0.1	-0.1
Germany	0.9	0.8	1.6	1.6	1.0	1.0	1.5	1.5	0.1	0.0	0.0	0.2	-0.2	-0.3	0.1	-0.1
Greece	1.8	-0.4	2.0	1.6	0.1	-1.8	1.8	1.3	1.0	0.7	0.5	0.3	0.6	0.7	0.0	-0.1
Hungary	3.0	0.4	1.5	2.4	1.9	-1.1	1.5	2.1	0.6	0.4	0.3	0.3	0.5	1.1	-0.2	0.0
Iceland	2.3	0.8	1.2	1.6	0.5	0.2	0.8	1.4	0.7	0.7	0.6	0.3	1.1	-0.1	0.1	-0.1
Ireland	2.3	1.6	1.1	0.6	1.4	0.4	0.8	0.6	0.7	0.6	0.4	0.2	0.1	0.6	0.0	0.0
Israel	1.0	1.0	1.3	1.4	0.4	0.6	0.9	1.2	0.3	0.0	0.0	0.2	0.3	0.4	0.3	-0.1
Italy	0.2	-0.1	1.2	1.7	-1.1	-1.0	0.7	1.5	0.9	0.6	0.4	0.4	0.5	0.4	0.1	-0.2
Japan	0.9	0.8	1.5	1.9	0.2	0.5	1.2	1.7	0.6	0.5	0.3	0.1	0.2	-0.2	0.0	0.0
Luxembourg	0.4	-0.7	0.8	1.2	-0.4	-1.2	0.4	0.9	0.3	0.3	0.3	0.4	0.5	0.2	-0.1	-0.1
Mexico	0.6	0.2	0.9	2.4	-1.4	-1.4	0.7	1.9	1.0	0.7	0.6	0.5	1.1	0.9	-0.5	0.0
Netherlands	0.9	0.4	1.9	1.8	0.9	0.0	1.6	1.6	0.4	0.3	0.3	0.2	-0.3	0.1	0.0	-0.1
New Zealand	0.8	0.7	1.7	1.6	0.2	-0.1	1.1	1.4	0.5	0.3	0.3	0.2	0.0	0.4	0.2	-0.1
Norway	1.7	0.9	1.4	1.2	1.4	0.2	1.1	1.1	0.2	0.3	0.2	0.2	0.1	0.5	0.1	0.0
Poland	3.6	3.0	2.8	1.7	3.5	2.5	2.5	1.4	0.3	0.2	0.2	0.4	-0.1	0.3	0.1	-0.1
Portugal	1.3	1.0	1.1	2.3	-1.2	-0.9	0.9	1.7	1.0	0.8	0.8	0.6	1.6	1.2	-0.5	-0.1
Korea	3.2	2.5	2.4	1.9	1.6	1.5	1.7	1.8	1.0	0.7	0.5	0.1	1.2	0.6	0.4	-0.1
Slovak Republic	4.1	2.8	3.0	1.9	4.5	2.5	2.7	1.5	0.3	0.2	0.2	0.4	-0.6	0.1	-0.1	-0.1
Slovenia <sup>2</sup>	2.6	1.1	2.0	2.1	1.4	-0.1	2.0	1.5	0.4	0.4	0.4	0.5	0.7	0.9	-0.3	0.0
Spain	0.5	1.2	0.6	1.6	-1.2	-0.8	0.4	1.3	1.0	0.7	0.5	0.3	0.8	1.3	-0.4	0.0
Sweden	2.1	1.1	2.1	1.3	2.2	0.8	1.8	1.1	0.2	0.3	0.2	0.2	-0.3	0.0	0.1	-0.1
Switzerland	0.9	0.4	1.7	1.6	0.8	0.4	1.4	1.5	0.2	0.2	0.2	0.2	-0.1	-0.3	0.1	-0.1
Turkey	2.6	2.1	2.4	1.6	1.7	1.1	1.4	1.1	1.1	0.9	0.8	0.6	-0.2	0.1	0.1	-0.1
United Kingdom	1.7	0.2	2.0	1.5	0.8	-1.0	1.5	1.3	0.4	0.3	0.3	0.2	0.5	0.9	0.3	-0.1
United States	1.8	1.5	1.9	1.1	1.8	1.6	1.6	1.0	0.1	0.1	0.1	0.2	-0.1	-0.2	0.2	0.0
Euro area <sup>2</sup>	0.8	0.7	1.5	1.6	0.0	-0.1	1.2	1.4	0.5	0.4	0.3	0.3	0.2	0.3	0.0	-0.1
OECD <sup>2</sup>	1.4	1.1	1.8	1.5	0.9	0.7	1.4	1.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	-0.1
Argentina	0.5	2.6	2.1	2.0	1.2	2.0	1.3	1.6	0.7	0.6	0.5	0.5	-1.4	-0.1	0.1	-0.1
Brazil	0.6	1.4	1.6	2.4	0.0	0.0	0.6	2.1	1.0	0.9	0.7	0.4	-0.4	0.5	0.3	-0.1
China	8.9	8.6	5.1	3.2	8.1	6.8	3.7	2.6	0.8	0.8	0.7	0.6	-0.1	0.9	0.7	0.0
India	5.3	5.3	4.0	3.8	4.4	3.0	2.4	2.8	0.6	0.8	1.0	1.0	0.2	1.5	0.5	0.0
Indonesia	2.1	3.3	4.0	3.6	1.7	3.0	3.5	3.1	0.8	0.4	0.5	0.6	-0.4	-0.1	0.1	-0.1
Russia	4.5	3.8	3.7	2.1	4.6	2.1	3.0	1.7	0.2	0.0	0.1	0.5	-0.3	1.7	0.6	-0.1
South Africa <sup>2</sup>	1.9	2.3	2.9	2.0	1.6	1.5	1.9	1.4	0.8	0.7	0.8	0.6	-0.5	0.1	0.1	0.0
Non-OECD <sup>2</sup>	5.5	6.1	4.3	3.2	4.9	4.3	3.0	2.5	0.7	0.7	0.7	0.7	-0.2	1.0	0.5	0.0

1. Computed as the annual average growth divided by 2.

2. Starting year is 2001 for Slovenia, South Africa and non-OECD total; and 2002 for Estonia, the euro area and OECD total.

Source: OECD Economic Outlook 95 long-term database.

Table 4.3. Growth in the employment ratio and its components

Average annual percentage change

	Potential employment ratio (1) = (2) + (3) + (4)				Participation rate <sup>1</sup> (2)				Active population ratio <sup>2</sup> (3)				NAIRU <sup>3</sup> (4)			
	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060	2000- 2007	2008- 2013	2014- 2030	2031- 2060
Australia	0.7	0.3	0.0	0.1	0.3	0.3	0.2	0.2	0.1	0.0	-0.2	-0.1	0.2	0.0	0.0	0.0
Austria	0.5	0.7	-0.1	0.0	0.3	0.4	0.1	0.2	0.1	0.2	-0.2	-0.2	0.1	0.1	0.0	0.0
Belgium	0.5	0.0	-0.2	0.1	0.6	0.1	0.0	0.2	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.0
Canada	0.7	0.1	-0.3	0.0	0.3	0.1	0.0	0.2	0.2	0.1	-0.3	-0.2	0.1	0.0	0.0	0.0
Chile	1.1	1.5	0.7	0.2	0.5	1.0	0.7	0.4	0.7	0.5	0.0	-0.2	-0.1	0.0	0.0	0.0
Czech Republic	0.2	-0.1	-0.1	-0.2	0.0	-0.1	0.2	0.1	0.2	-0.1	-0.3	-0.3	0.0	0.2	0.0	0.0
Denmark	0.2	-0.4	-0.1	0.1	0.0	-0.6	0.1	0.2	-0.1	0.2	-0.3	-0.1	0.2	0.0	0.1	0.0
Estonia <sup>4</sup>	1.0	0.0	0.0	-0.1	0.7	0.9	0.1	0.1	0.3	-0.4	-0.2	-0.3	0.0	-0.4	0.0	0.0
Finland	0.8	0.0	-0.4	0.1	0.3	-0.3	0.0	0.2	0.0	0.0	-0.4	-0.1	0.6	0.3	0.0	0.0
France	0.2	-0.2	-0.1	0.1	0.2	0.2	0.0	0.2	-0.1	-0.2	-0.2	-0.1	0.1	-0.2	0.0	0.0
Germany	0.3	0.6	-0.3	0.0	0.3	0.8	0.0	0.2	0.1	-0.2	-0.2	-0.3	-0.1	-0.1	0.0	0.0
Greece	0.8	-0.7	0.1	-0.2	0.7	0.4	-0.1	0.1	-0.1	-0.4	0.0	-0.4	0.1	-0.7	0.2	0.1
Hungary	0.0	0.2	0.3	-0.3	0.5	0.8	0.5	0.0	0.1	0.0	-0.2	-0.3	-0.5	-0.6	0.0	0.0
Iceland	0.2	-0.7	-0.2	0.0	0.1	-0.6	-0.2	0.1	0.2	0.2	-0.1	-0.2	-0.1	-0.2	0.1	0.0
Ireland	1.2	-0.8	0.3	0.0	0.6	0.3	0.1	0.2	0.3	-0.5	0.0	-0.2	0.2	-0.6	0.2	0.0
Israel	0.6	1.0	0.6	0.2	0.6	0.6	0.4	0.2	0.0	-0.1	0.2	0.0	0.0	0.5	0.0	0.0
Italy	0.5	-0.5	0.0	0.0	0.2	0.1	0.0	0.3	-0.3	-0.2	-0.1	-0.3	0.5	-0.4	0.1	0.0
Japan	-0.4	-0.2	-0.1	-0.1	0.0	0.2	0.4	0.2	-0.3	-0.4	-0.5	-0.3	-0.1	0.0	0.0	0.0
Luxembourg	2.2	1.3	0.3	-0.1	0.8	0.8	0.3	0.1	0.0	0.2	-0.1	-0.3	1.5	0.3	0.0	0.0
Mexico	0.6	1.0	1.0	0.5	0.0	0.0	0.5	0.6	0.5	0.6	0.4	-0.1	0.1	0.3	0.1	0.0
Netherlands	0.6	0.2	-0.1	0.0	0.5	0.1	0.2	0.2	0.0	0.1	-0.3	-0.2	0.2	0.0	0.0	0.0
New Zealand	1.1	0.1	0.1	0.1	0.4	0.2	0.1	0.2	0.2	0.1	-0.1	-0.1	0.5	-0.2	0.1	0.0
Norway	0.6	0.2	-0.1	0.0	0.3	-0.1	0.0	0.1	0.1	0.3	-0.2	-0.1	0.2	0.1	0.0	0.0
Poland	0.6	0.3	-0.5	-0.4	-0.2	0.4	-0.2	0.0	0.5	0.0	-0.2	-0.4	0.3	-0.1	-0.1	0.0
Portugal	-0.1	-0.8	0.2	-0.1	0.3	0.0	0.0	0.3	-0.1	-0.2	0.0	-0.4	-0.3	-0.6	0.2	0.0
Korea	0.8	0.5	0.2	-0.1	0.3	0.2	0.4	0.5	0.4	0.3	-0.3	-0.6	0.1	0.0	0.0	0.0
Slovak Republic	0.5	0.1	-0.5	-0.4	0.0	-0.1	-0.3	-0.1	0.6	0.1	-0.2	-0.4	-0.1	0.1	0.0	0.0
Slovenia <sup>4</sup>	0.5	-0.8	-0.4	-0.1	0.6	-0.3	-0.3	0.2	0.1	-0.3	-0.2	-0.4	-0.1	-0.2	0.1	0.0
Spain	1.3	-1.4	0.5	-0.2	1.7	0.5	-0.1	0.2	-0.1	-0.3	0.0	-0.4	-0.3	-1.5	0.5	0.1
Sweden	0.2	0.1	-0.1	0.0	0.0	0.0	0.2	0.1	0.3	0.1	-0.3	-0.1	-0.1	0.0	0.0	0.0
Switzerland	0.3	0.3	-0.2	-0.1	0.1	0.0	0.0	0.2	0.2	0.1	-0.2	-0.3	0.0	0.1	0.0	0.0
Turkey	-0.1	1.4	0.8	0.3	-0.4	1.0	0.5	0.5	0.5	0.4	0.3	-0.2	-0.1	0.0	0.0	0.0
United Kingdom	0.4	0.1	0.0	0.1	0.1	0.3	0.2	0.2	0.2	0.0	-0.2	-0.1	0.1	-0.2	0.1	0.0
United States	-0.1	-0.4	-0.3	0.1	0.0	-0.4	-0.1	0.2	0.2	0.1	-0.2	-0.1	-0.3	-0.2	0.0	0.0
Euro area <sup>4</sup>	0.5	-0.2	-0.1	0.0	0.5	0.3	0.0	0.2	-0.1	-0.2	-0.1	-0.3	0.0	-0.4	0.1	0.0
OECD <sup>4</sup>	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.1	0.0	-0.1	-0.2	0.0	-0.1	0.0	0.0
Argentina	2.0	1.3	0.5	-0.1	..	..	..	..	0.3	0.3	0.1	-0.1	..	..	..	..
Brazil	1.0	1.0	0.3	-0.4	..	..	..	..	0.5	0.5	0.2	-0.2	..	..	..	..
China	0.5	-0.1	-0.4	-0.5	..	..	..	..	1.1	0.2	0.0	-0.2	..	..	..	..
India	0.1	0.4	0.8	0.1	..	..	..	..	0.6	0.5	0.4	0.1	..	..	..	..
Indonesia	0.4	1.0	0.5	-0.2	..	..	..	..	0.2	0.2	0.5	0.0	..	..	..	..
Russia	1.1	-0.3	-0.6	-0.2	..	..	..	..	0.5	-0.4	-0.1	-0.2	..	..	..	..
South Africa <sup>4</sup>	-0.3	0.1	1.0	0.2	..	..	..	..	0.4	0.1	0.3	0.1	..	..	..	..
Non-OECD <sup>4</sup>	0.3	0.1	0.1	-0.2	..	..	..	..	0.7	0.3	0.2	-0.1	..	..	..	..

1. Participation rate of people age between 15 and 74.

2. Active population ratio is the population age between 15 and 74 divided by the total population.

3. Includes any divergence between labour force survey and national account measures of employment.

4. Starting year is 2001 for Slovenia, South Africa and non-OECD total; and 2002 for Estonia, the euro area and OECD total.

Source: OECD Economic Outlook 95 long-term database.

**Non-OECD trend productivity is growing faster but decelerating**

There is much greater variation in labour efficiency growth among non-OECD countries. China is projected to experience a halving in labour efficiency growth to 2030 compared to the staggering 7-8% per annum growth rate it experienced since 2000, but this will still be faster than for any other country and three times the growth rate of the frontier. Labour efficiency growth for Indonesia and India is expected to be more stable at more than double the growth rate of the frontier over the entire period to 2060. In comparison, the growth rates of labour efficiency for other non-OECD countries, while eventually picking up to growth rates above that of the frontier, are less impressive, reflecting a weaker historical performance.

**Changes in capital intensity have little impact on growth except in a few countries**

The additional contribution to trend productivity growth from changes in (physical) capital intensity is relatively modest for most countries. However, for euro area countries (Estonia, Ireland, Greece, Portugal, Slovenia and Spain), which have been most severely affected by the crisis, the projected decline in capital intensity reduces potential growth over the period to 2030 by between 0.1 to 0.5 percentage points per annum. Conversely, rising capital intensity (implying some continuation of recent trends) contributes to stronger productivity growth in Australia, Brazil, Canada, Chile, China, India and Russia to 2030 by between 0.3 to 0.7 percentage points per annum. Beyond 2030, rising global interest rates (discussed in a later section) reduce capital intensity in all countries, typically subtracting 0.1 percentage points from annual trend productivity growth.

**Human capital makes a larger contribution to non-OECD growth**

Among OECD countries, the further contribution to trend productivity growth from human capital is typically stable at about 0.2 to 0.4 percentage points per annum, although there are a few countries (notably Greece, Portugal, Korea, Spain and Turkey), for which there is a pronounced slowdown in the contribution, either because of demographics (smaller younger cohorts) or as countries approach the educational attainment frontier. Human capital makes a much stronger contribution to productivity growth in most non-OECD countries, given the typically greater scope for catch-up in schooling as well as more youthful populations; for Brazil, China, India and South Africa it contributes between  $\frac{3}{4}$  and 1 percentage points per annum over the entire projection horizon.

**But convergence in productivity levels is far from complete**

While growth is generally more rapid in low-income countries, a complete catch-up in productivity levels does not occur. This is not only because it would take longer for those countries which start furthest from the productivity frontier, but also because differences in structural policies and other structural factors matter and can prevent complete catch-up. In the present modelling framework, important differences in underlying productivity levels are attributed to differences in structural policy settings as represented by the degree of competition-friendly product market regulation. Furthermore, differences in GDP per capita will persist because of differences in labour utilisation due to different structural characteristics of the labour market, including structural policy settings, as well as demographic differences.

**Labour utilisation trends do not subtract from OECD growth despite ageing**

For the OECD as whole, labour utilisation makes no contribution to GDP per capita growth to 2030 and only a modest contribution of 0.1 percentage points per annum over the period 2030-60 (Table 4.3).<sup>6</sup> However, this should be interpreted in the context of ageing populations, represented by a decline in the ratio of the working age to total population, which for the majority of OECD countries, might be expected to subtract 0.1-0.2 percentage point from the growth of labour utilisation over the period to 2030 and 0.2-0.4 percentage point over the period 2030-60. This demographic effect is, on average across all OECD countries, offset by rising labour force participation mainly due to a continuation of rising participation rates for women and older workers (Figure 4.2). Increasing old-age participation rates reflect a combination of: the effect of a more educated workforce; legislated retirement reforms to 2030 (Box 4.6); and, beyond 2030, the assumption that the length of active life in the labour market rises in proportion with increasing life expectancy (which would be roughly similar to indexing retirement ages to life expectancy). Exceptions to the OECD-aggregate trend, where changes in labour utilisation make a more pronounced positive contribution to GDP per capita growth, are Chile, Israel, Mexico and Turkey, for which there is a rise in the share of the population of working-age to total population and for which participation rates are rising more strongly, especially boosted by strongly increasing female participation. Conversely, countries where there is a significant decline in labour utilisation include Poland, Slovak Republic and Slovenia.

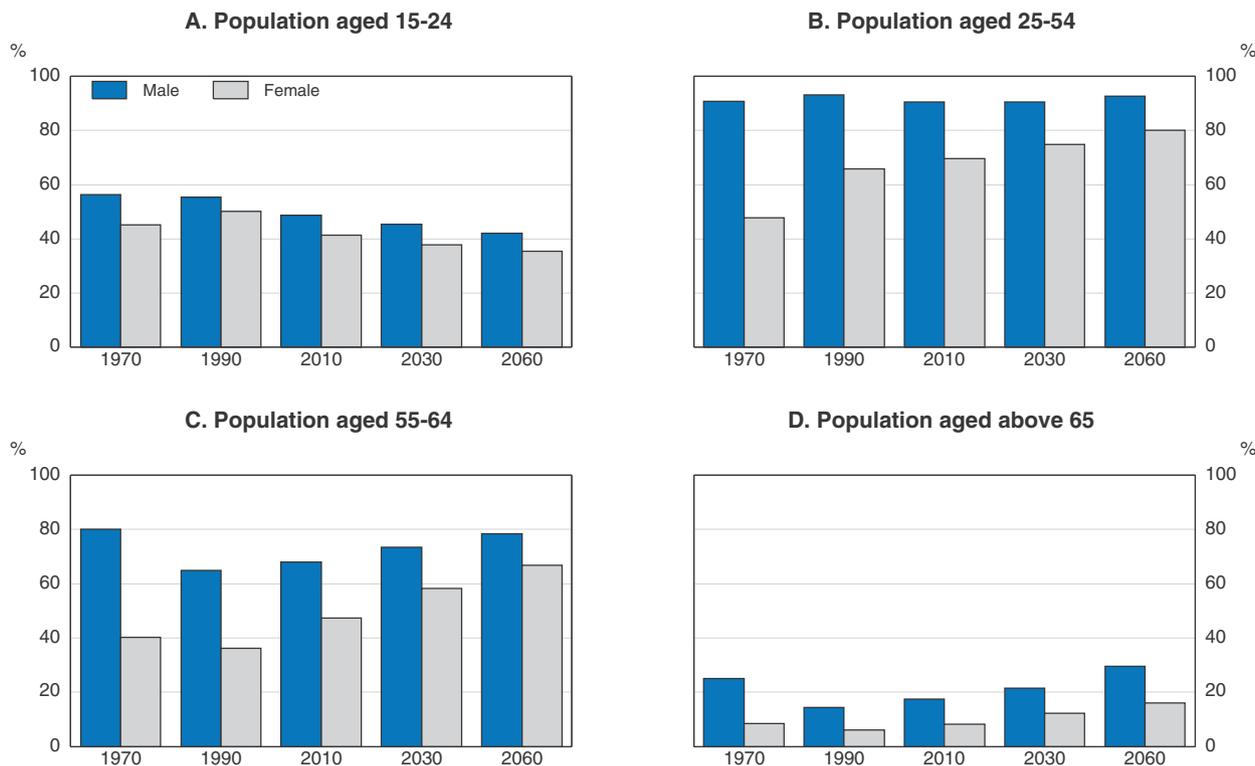
**Fiscal sustainability and implications for interest rates and global imbalances**

**Government debt is reduced to 60% of GDP in the baseline**

In the baseline scenario, consistent with previous exercises of this kind, it is assumed that for those countries with gross general government debt in excess of 60% of GDP in 2015, fiscal policy is directed towards achieving that level, although the choice of this particular level is somewhat arbitrary. The target is specified in terms of gross government debt partly because this may be more comparable across countries than net debt,<sup>7</sup> although differences in the treatment of public pension liabilities mean that not even gross measures of government debt are fully comparable (Box 4.7). This debt target is achieved through a gradual

6. It is, however, possible that the population projections over-estimate the contribution that migration will give to offset the fall in the working age population, as they do not factor in that income-related incentives for migrants decline as incomes per capita converge (OECD, 2014a).
7. The focus here is on the concept of gross government debt on a national accounts basis (rather than Maastricht basis), but net debt (net of financial assets held by government) is arguably conceptually preferable when considering long-run debt sustainability as it represents the amount of debt that would remain if the government were to liquidate all the financial assets it holds. The gap between gross and net debt is particularly large for Norway, Japan, Sweden, Finland and Canada so that for these countries a gross debt target of 60% may appear unduly stringent. Gross debt is, however, preferable when looking at the immediate borrowing needs of governments and has the practical advantage of being more cross-country comparable because data on financial assets are of unequal quality across countries.

Figure 4.2. **Evolution of the labour force participation rate in the OECD area**  
In percentage of the respective population



Source: OECD Labour Force Statistics database; UN demographic projections; and OECD calculations.

StatLink <http://dx.doi.org/10.1787/888933050104>

#### Box 4.6. The evolution of OECD pensionable ages

In the last decade, many OECD countries have passed pension reforms aimed at increasing the financial sustainability of their public pension systems or to adjust pension parameters to improvements in life expectancy. As a result, in a clear majority of countries the retirement age that earns entitlement to full pension benefits will increase over future decades.

The estimates presented here take account of the pension reforms legislated until January 2014. An unweighted OECD average of the statutory age at which a full pension becomes eligible (hereafter referred to as the “pensionable age”) is expected to rise from just under 64 years for men and 62½ for women in 2012, to just over 65 for men and just under 65 for women in 2030. In most OECD countries, a pensionable age of 65 applies already, especially for men. However, for a large number of OECD countries, a common trend will be to move towards 67 years or over. Today only Norway and Iceland have retirement ages set at 67 for both sexes, but in 2050 about 18 OECD countries will have reached or surpassed that retirement age.

The increase in retirement age will follow country-specific pathways (see table below). In Canada and Germany, for instance, the transition from 65 years to 67 will be gradual and completed by around 2030. Conversely, in Australia, Poland and the United States the adjustment will be accomplished by the first half of the 2020s. Ireland and the United Kingdom have legislated increases in the pensionable age up to 68, to be reached by 2028 and 2048, respectively.

### Box 4.6. The evolution of OECD pensionable ages (cont.)

Some major economies have linked the future evolution of their statutory retirement ages to trends in life expectancy (Italy, Greece, Spain, the Netherlands and Denmark). The Czech Republic has implemented a quasi-indexed system by increasing the pension age for men by two months per birth cohort, without any upper limit. In 2044, the pension age of women will catch up to that for men, after which a single retirement age will apply for all.

An important component of many recent reforms is the move towards gender parity in retirement conditions. While 14 OECD countries had different retirement ages across gender in 2012, by 2030 this number will be halved and by 2050 only Israel, Chile and Switzerland are expected to have different retirement ages between men and women.

#### The evolution of OECD pensionable ages: history and projections to 2030

	Men's pensionable ages 1989-2030					Women's pensionable ages 1989-2030				
	1989	2002	2012	2020	2030	1989	2002	2012	2020	2030
Australia	65.0	65.0	65.0	66.2	67.0	<b>60.0</b>	<b>62.0</b>	<b>64.0</b>	66.2	67.0
Austria	65.0	65.0	65.0	65.0	65.0	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>63.5</b>
Belgium	65.0	65.0	65.0	65.0	65.0	<b>60.0</b>	<b>62.0</b>	65.0	65.0	65.0
Canada	66.0	65.0	65.0	65.0	67.0	66.0	65.0	65.0	65.0	67.0
Switzerland	65.0	65.0	65.0	65.0	65.0	<b>62.0</b>	<b>62.0</b>	<b>64.0</b>	<b>64.0</b>	<b>64.0</b>
Chile	65.0	65.0	65.0	65.0	65.0	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>
Czech Republic	60.0	60.5	62.3	63.5	65.0	<b>57.0</b>	<b>58.0</b>	<b>61.0</b>	<b>63.2</b>	65.0
Germany	63.0	63.5	65.1	65.8	67.0	<b>60.0</b>	<b>60.5</b>	65.1	65.8	67.0
Denmark	67.0	67.0	65.0	66.0	68.0	<b>62.0</b>	67.0	65.0	66.0	68.0
Spain	65.0	65.0	65.0	65.8	67.0	65.0	65.0	65.0	65.8	67.0
Estonia	..	63.0	63.0	63.8	65.0	..	<b>58.0</b>	<b>61.0</b>	63.8	65.0
Finland	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
France <sup>1</sup>	60.0	60.0	62.0	62.0	63.3	60.0	60.0	62.0	62.0	63.3
United Kingdom	65.0	65.0	65.0	65.2	66.4	<b>60.0</b>	<b>60.0</b>	<b>61.0</b>	65.2	66.4
Greece <sup>2</sup>	57.0	57.0	60.0	62.0	63.8	57.0	57.0	60.0	62.0	63.8
Hungary	60.0	60.0	62.5	64.3	65.0	<b>55.0</b>	<b>55.0</b>	<b>60.0</b>	64.3	65.0
Iceland	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Ireland	65.0	65.0	65.0	66.0	68.0	65.0	65.0	65.0	66.0	68.0
Israel	65.0	65.0	67.0	67.0	67.0	<b>60.0</b>	<b>60.0</b>	<b>62.4</b>	<b>64.0</b>	<b>64.0</b>
Italy <sup>3</sup>	55.0	57.0	66.0	67.0	68.1	55.0	57.0	<b>62.0</b>	67.0	68.1
Japan	60.0	61.0	64.6	65.0	65.0	<b>56.0</b>	<b>60.0</b>	<b>62.8</b>	65.0	65.0
Korea	..	60.0	60.0	62.0	64.0	..	60.0	60.0	62.0	64.0
Luxembourg	65.0	60.0	60.0	60.0	60.0	65.0	60.0	60.0	60.0	60.0
Mexico	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Netherlands	65.0	65.0	65.0	66.4	67.0	65.0	65.0	65.0	66.0	67.0
Norway	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
New Zealand	60.0	64.1	65.0	65.0	65.0	60.0	64.1	65.0	65.0	65.0
Poland	65.0	65.0	65.0	67.0	67.0	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>62.0</b>	<b>64.5</b>
Portugal	65.0	65.0	65.0	65.0	65.0	<b>62.0</b>	65.0	65.0	65.0	65.0
Slovak Republic	60.0	60.0	62.0	62.5	63.8	<b>57.0</b>	<b>57.0</b>	<b>59.8</b>	62.5	63.8
Slovenia	..	63.0	63.0	63.0	65.0	..	<b>57.3</b>	<b>61.0</b>	<b>61.0</b>	65.0
Sweden	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Turkey <sup>4</sup>	45.0	44.0	45.5	48.6	53.1	45.0	<b>40.0</b>	<b>42.1</b>	<b>45.2</b>	<b>50.4</b>
United States	65.0	65.0	66.0	66.5	67.0	65.0	65.0	66.0	66.5	67.0
<b>OECD</b>	<b>63.0</b>	<b>62.9</b>	<b>63.8</b>	<b>64.4</b>	<b>65.2</b>	<b>60.9</b>	<b>61.1</b>	<b>62.4</b>	<b>63.7</b>	<b>64.8</b>

Note: Data for women are shown in bold face when they differ from men's pensionable age. See OECD Pensions Outlook 2012, Tables A1 and A2 for country-specific footnotes.

1. Based on the "âge légal de départ à la retraite" assuming the worker enters the labour force at age 20 and contributes regularly and that the contribution parameter will grow according to the currently legislated evolution of the contribution requirement; namely, 3 months per age cohort.
2. The pension age shown is based on a full-career worker starting at age 20 allowing for both the evolution of the minimum pension age and the contribution requirement in line with longevity.
3. Up to 2002, the pensionable age reflects the availability of the "seniority" pensions. From 2012 onward, the evolution of the pension age is based on the normal old-age pension scheme.
4. The pension age will increase to 65 years by 2050.

Source: updates from OECD (2012), *OECD Pensions Outlook 2012*, OECD Publishing, Paris.

StatLink  <http://dx.doi.org/10.1787/888933051833>

#### Box 4.7. Pension systems and their impact on government debt measures

Differences in the institutional set-up and the recording of government sponsored pension schemes can have a substantial impact on reported levels of government debt. Using a recent survey of pension plan assets and liabilities, this box shows the impact of these differences and how they would affect the measure of gross debt which is regularly published in the *Economic Outlook* (column 3 in the table below).

The way in which pension systems are organised varies significantly across countries. In some cases, pensions are based on a pay-as-you-go (PAYG) system, pension benefits being paid from current contributions. In other cases, (partially) funded systems are in place, in which contributions are accumulated and invested, and from which future benefits will (partially) be paid. Ideally, all pension liabilities, whether funded or unfunded, would be recorded. However, such estimates, especially those affecting government debt levels, will only become available for all EU countries in the course of 2017. For some non-EU OECD countries it may take even longer.

Currently, the organisation and the recording of pension systems in national accounts have a direct impact on the comparability of reported government debt measures. This is especially true of the way in which governments have organised pension systems for civil servants. Generally, pension liabilities of unfunded PAYG-systems are not counted as part of government debt. On the other hand, liabilities of (partially) funded schemes are usually counted, but not necessarily as part of government debt. If the relevant pension funds are operating autonomously, their assets and liabilities are recorded as part of the financial corporations' sector and, therefore, do not impact government debt. However, if the pension funds are underfunded, countries have some flexibility in the recording of the unfunded part of the liabilities. Sometimes these are not recorded as a debt of the sponsor, in this case the government, and thus do not feature as part of government debt.

One option for international comparisons is to use total liabilities of general government according to the System of National Accounts (first column of the table below). This measure includes, in some countries, unfunded liabilities associated with partially funded government employee pension plans (second column). Because countries that include such liabilities in their government accounts appear to have inflated public debt levels relative to countries that do not or that have PAYG systems, the *Economic Outlook* reports only adjusted figures that leave out these liabilities from government gross debt statistics (column 3). The adjustment has a considerable impact in some countries, lowering public debt estimates for Australia, Canada, Iceland and the United States by some 15-25% of GDP.

But even after this adjustment, countries with (partially) funded government employee pension plans, classified in either the government sector or the financial corporations' sector, are arguably still somewhat disadvantaged in international comparisons, because accumulated assets in the relevant pension schemes (the funded part) are partly the product of previous government expenditures that in the past gave rise to higher government deficits, and consequently higher debt levels, all else equal. Such assets may have been accumulated inside the general government sector, as in the case of Australia, Japan and Portugal (column 4), or outside of it (column 5). Taking into account assets accumulated for the payment of future pension benefits can have a significant impact on international rankings of government indebtedness (column 6). Canada and the Netherlands have funds amounting to more than 40% of GDP, whereas Iceland, Switzerland and the United States have accumulated assets worth around 30% of GDP.

In addition to pension plans for civil servants, governments also operate more generic, social security type schemes for the population at large. These may provide a minimum pension benefit for the whole population, or they may relate to more extended arrangements. Presently, no country records the corresponding pension liabilities as part of government debt, although some have made estimates in view of the mandatory requirement in the EU to provide this information in 2017. A few countries have established dedicated funds for these future pension benefits (column 7). In Sweden, these funds amount to more than 25% of GDP. Less significant funds, worth between 5% and 11% of GDP, exist in Canada, Portugal, Spain and Switzerland. Beyond dedicated funds for the payment of future pension benefits within the general government, the amount of financial assets accumulated by governments more generally, also differs across countries. For example, social security funds in Finland have accumulated substantial assets equal to about 78 percentage points of GDP.

**Box 4.7. Pension systems and their impact on government debt measures (cont.)**

The above analysis shows that, depending on the treatment of pension systems, gross government liabilities can vary by as much as 70 percentage points of GDP (comparing columns 1 and 8 in the case of Canada), with variations of 40–50 percentage points for Iceland, Netherlands, Sweden and the United States. These findings call for care and transparency when presenting government debt figures, and especially when making comparisons between countries.

**Pension systems and their impact on government debt, 2012**

*Percentage of GDP*

	Total liabilities (1)	Unfunded pension liabilities (2)	Total liabilities excluding unfunded pension liabilities (3=1-2)	Accumulated funds related to employment related pension schemes, inside GG (4)	Accumulated funds related to employment related pension schemes, outside GG (5)	Total liabilities, after full adjustment for employment related funds (6=3-4-5)	Accumulated funds related to social security pension schemes, inside GG (7)	Total liabilities, after full adjustment for employment related and social security funds (8=6-7)
Australia <sup>1</sup>	57.9	25.8	32.1	5.4	..	..	0.0	..
Austria	86.0	0.0	86.0	0.0	0.0	86.0	0.0	86.0
Belgium	106.4	0.0	106.4	0.0	0.0	106.4	0.0	106.4
Canada	109.7	13.6	96.1	0.0	44.4	51.7	12.8	38.9
Chile	18.6	0.0	18.6	..	..	..	2.2	..
Czech Republic	55.7	0.0	55.7	0.0	0.0	55.7	0.0	55.7
Denmark	59.3	0.0	59.3	0.0	0.0	59.3	0.0	59.3
Estonia	13.3	0.0	13.3	0.0	0.0	13.3	0.0	13.3
Finland	64.0	0.0	64.0	0.0	0.0	64.0	0.0	64.0
France	109.3	0.0	109.3	0.0	0.0	109.3	1.8	107.5
Germany	88.5	0.0	88.5	0.3	0.0	88.2	0.0	88.2
Greece	167.5	0.0	167.5	0.0	0.0	167.5	0.0	167.5
Hungary	90.0	0.0	90.0	0.0	..	..	0.0	..
Iceland	129.5	25.8	103.7	0.0	31.9	71.8	0.0	71.8
Ireland	127.8	0.0	127.8	0.0	0.0	127.8	0.0	127.8
Israel	68.2	0.0	68.2	0.0	..	..	0.0	..
Italy	142.2	0.0	142.2	0.0	0.0	142.2	0.0	142.2
Japan	216.5	0.0	216.5	9.8	..	..	2.2	..
Korea	34.8	0.0	34.8	0.0	..	..	0.0	..
Luxembourg	30.2	..	30.2	..	..	..	..	..
Mexico	..	0.0	..	0.0	0.0	..	0.0	..
Netherlands	82.7	0.0	82.7	0.0	47.8	34.9	0.0	34.9
New Zealand	47.6	5.2	42.4	0.0	1.4	41.0	0.0	41.0
Norway	34.7	0.0	34.7	0.0	13.5	21.2	0.0	21.2
Poland	62.3	0.0	62.3	0.0	0.0	62.3	1.0	61.3
Portugal	134.6	0.0	134.6	3.3	0.1	131.2	6.5	124.7
Slovak Republic	56.9	0.0	56.9	0.0	0.0	56.9	0.0	56.9
Slovenia	61.6	0.0	61.6	0.0	0.0	61.6	0.0	61.6
Spain	92.6	0.0	92.6	0.0	0.0	92.6	6.1	86.5
Sweden	49.0	2.3	46.7	0.0	18.9	27.8	27.0	0.8
Switzerland <sup>2</sup>	46.3	0.0	46.3	0.0	31.1	15.2	5.4	9.9
Turkey	..	0.0	..	0.0	0.0	..	0.0	..
United Kingdom	101.6	0.0	101.6	0.0	13.7	87.9	0.0	87.9
United States	122.2	20.1	102.1	0.0	30.0	72.1	0.0	72.1

1. Based on Government Finance Statistics. Data not fully consistent with SNA but the difference in total liabilities excluding unfunded pension liabilities is less than 1% of GDP.

2. 2011 data for Switzerland.

Source: National accounts and country answers to one-time survey.

StatLink  <http://dx.doi.org/10.1787/888933051852>

improvement in the underlying primary balance (at a maximum of ½ percentage point of GDP each year), over and above the improvement in the fiscal balance that results from the operation of the automatic stabilisers as output gaps close.

### *Fiscal consolidation requirements*

#### **Public debt exceeds 60% of GDP in around two-thirds of OECD countries**

Around one-third of OECD countries have maintained gross public debt below 60% of GDP through the crisis and its aftermath. In the remaining OECD countries, there is a range of further consolidation requirements beyond 2013. Some of that required change includes commitments made by governments to improve budget positions by 2015, which are incorporated in the short-term projections described in previous chapters. The remainder is measured here as the *average* projected underlying primary balance after 2015 that is required to stabilise debt at 60% of GDP (Table 4.4).<sup>8</sup> The average consolidation requirement is a robust measure of consolidation needs as it is little affected by the timing of consolidation (see Box 4.5 of OECD (2013a)) and is conceptually similar to, and empirically closely correlated with, measures of the so-called “fiscal gap”, which measures the immediate increase in the underlying primary balance, which if sustained, will ensure a particular debt target is reached in a particular year.

#### **Many countries need little further consolidation to reduce debt**

For nearly all countries, with the most obvious exception of Japan, the further consolidation that would be required to hit the 60% debt target is less, and mostly much less, than that already projected to have been achieved between 2010 and 2015 (Figure 4.3). This does rely on substantial consolidation efforts in 2014 and 2015 of between 2 and 3½ percentage points of GDP for Finland, Ireland, Japan, Portugal, Slovenia and Spain. Beyond 2015, countries can be grouped according to further consolidation requirements as follows.

#### **Some only need a little consolidation to achieve a 60% debt ratio**

- A large group of countries require little further average consolidation (1 percentage point of GDP or less) beyond 2015 to achieve the 60% target by 2030: Belgium, Finland, Germany, Greece, Israel, and Slovenia. Austria and the Netherlands require no additional consolidation to reduce debt to 60%. Most of these countries have debt ratios which are already not far from 60%, or where this is not the case (Belgium), went into the crisis already running an underlying primary surplus.

8. The measure of average consolidation is taken as the difference between the underlying primary balance in the initial year (here 2015) and the average of the underlying primary balance in each year up to 2030, except for those countries where the debt target is reached after 2030 for which the average is taken to the year in which government debt reaches the 60% target.

Table 4.4. Fiscal trends in the projection targeting a debt ratio of 60% of GDP

As percentage of nominal GDP (unless otherwise specified)

	Consolidation <sup>1</sup>		Consolidation over 2016-30 to achieve debt target: <sup>2</sup>		Financial balances <sup>3</sup>			Net financial liabilities <sup>4</sup>			Gross financial liabilities <sup>5</sup>			Long-term real interest rates <sup>6</sup>		
	2010-13	2014-15	Average	Peak	2013	2020	2030	2013	2020	2030	2013	2020	2030	2013	2020	2030
Australia	3.4	0.7	0.2	0.5	-1.4	-0.8	-0.8	12	15	14	33	36	36	1.7	4.3	4.1
Austria	2.9	0.5	-0.1	1.6	-1.5	2.4	-0.7	48	33	20	83	73	60	0.2	1.2	1.8
Belgium	2.0	1.3	0.2	2.4	-2.7	2.9	-1.4	84	59	37	107	82	59	0.6	1.4	1.8
Canada	0.2	1.5	1.5	3.0	-3.0	2.1	0.1	40	28	7	94	81	60	0.1	2.4	2.3
Czech Republic	6.9	-1.4	0.8	1.5	-1.5	-0.6	-0.7	13	18	16	57	62	60	1.4	3.6	4.2
Denmark	2.9	-1.6	-0.2	-0.1	-0.9	-0.3	-0.4	6	12	11	55	62	60	0.4	1.1	1.8
Estonia	2.1	0.7	-0.2	-0.1	-0.2	1.6	1.2	-31	-27	-28	13	14	13	-2.7	1.3	1.9
Finland	0.3	1.9	1.1	1.7	-2.5	4.2	2.5	-60	-58	-65	66	67	60	-0.7	1.4	2.2
France	3.9	1.6	2.5	4.6	-4.3	1.2	0.5	74	63	23	113	102	62	0.9	2.2	2.3
Germany	0.3	-0.4	0.4	1.3	0.0	1.3	-0.7	49	33	26	86	67	60	0.0	1.0	1.8
Greece	17.2	0.8	1.6	5.2	-12.7	3.7	3.5	123	88	5	186	148	65	10.4	6.9	3.2
Hungary	1.9	-1.0	1.7	3.5	-2.3	-0.1	-1.1	63	56	33	89	83	60	3.1	3.9	2.0
Iceland	9.1	-0.6	2.2	4.0	-2.1	1.0	0.7	31	25	0	98	85	60	3.1	6.6	4.4
Ireland	7.8	2.9	1.8	4.3	-7.0	2.5	0.3	90	71	22	135	110	60	3.2	3.1	1.8
Israel	0.5	0.7	0.9	1.4	-4.3	-2.0	-2.7	-	-	-	68	63	60	1.0	3.3	3.1
Italy	4.1	0.4	1.3	4.2	-2.8	3.2	0.6	116	93	32	146	122	61	2.9	3.1	2.3
Japan	-0.9	2.4	10.7	19.5	-9.3	-5.5	-4.9	138	152	158	225	239	245	1.9	1.4	2.6
Korea	1.4	0.3	-0.3	-0.2	-0.4	2.1	1.7	-34	-31	-33	37	40	38	2.1	3.1	2.8
Luxembourg	2.3	-1.5	0.1	0.2	0.1	2.1	1.7	-47	-41	-44	30	36	34	-2.0	0.9	1.8
Netherlands	4.0	1.5	-0.2	1.4	-2.4	2.1	-0.8	44	31	20	86	71	60	0.7	1.4	1.8
New Zealand	2.5	0.6	-1.2	-0.9	-0.3	-0.7	-0.4	7	6	8	41	39	41	2.3	4.8	4.3
Poland	2.6	1.1	1.9	2.4	-4.3	-1.5	-1.2	37	33	32	64	60	59	1.8	4.5	3.0
Portugal	7.2	2.3	1.9	5.0	-5.0	2.4	1.9	92	77	17	139	123	63	5.8	5.4	2.4
Slovak Republic	4.5	0.2	1.1	1.6	-2.8	-1.3	-1.1	28	32	30	59	62	60	2.0	2.0	2.2
Slovenia	3.6	2.8	0.9	2.5	-14.7	3.1	0.3	19	17	-2	80	78	59	5.0	2.1	1.9
Spain	6.9	2.7	3.5	6.3	-7.1	-0.4	1.4	71	73	31	104	107	64	4.4	4.2	2.0
Sweden	-2.2	0.2	0.7	1.4	-1.3	0.3	0.6	-24	-15	-15	47	53	54	1.1	2.3	2.6
Switzerland	-0.6	-0.2	-0.7	-0.2	0.1	-0.4	-0.3	8	7	8	46	45	46	0.8	1.3	2.0
United Kingdom	3.9	2.1	4.2	6.9	-5.9	-2.0	2.0	65	67	38	99	101	72	0.6	3.7	3.7
United States	4.5	1.5	3.3	5.6	-6.4	-1.4	0.6	81	77	43	104	99	65	0.6	2.7	2.4
Euro Area	3.6	0.9	1.4	2.6	-3.0	1.7	0.2	69	54	23	107	92	61	1.6	2.2	2.1
OECD	3.2	1.3	2.1	3.8	-4.9	-0.6	0.1	69	64	39	109	103	77	1.1	2.6	2.5

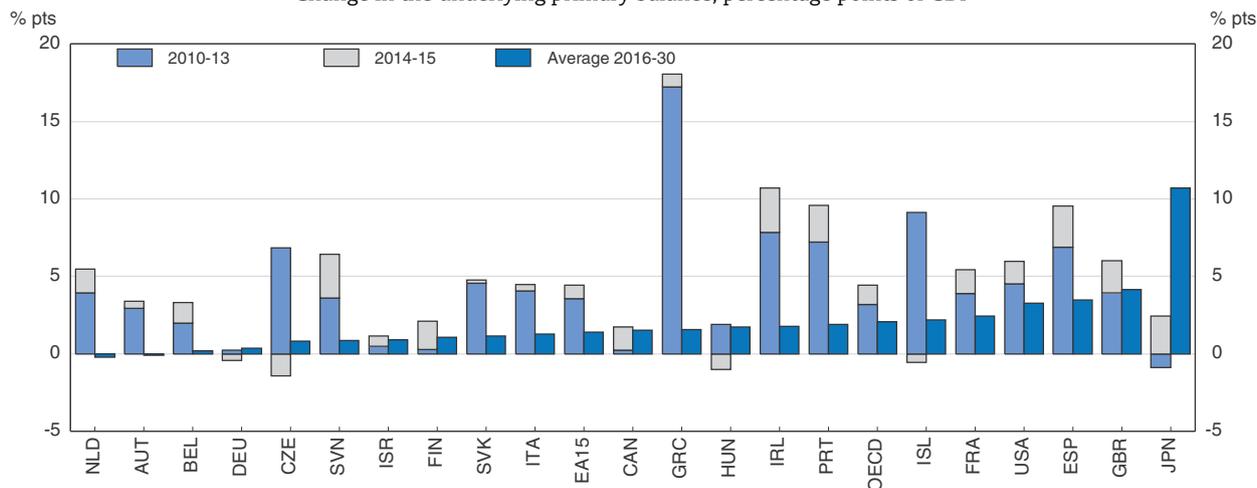
Note: These fiscal projections are the consequence of applying a stylised fiscal consolidation path and should not be interpreted as a forecast.

- Consolidation is measured as the change in the underlying primary balance as a percentage of potential GDP.
- Over the projection period, countries with gross government debt ratios in excess of 60% of GDP are assumed to gradually reduce debt to this level, whereas other countries stabilise debt ratios at their current levels. Consolidation requirements from 2015 to achieve these objectives are measured as the difference between the underlying primary balance in 2015 and its average or its peak over the period to 2030 (or until the debt ratio stabilises).
- General government fiscal surplus (+) or deficit (-) as a percentage of GDP.
- Includes all financial liabilities minus financial assets as defined by the system of national accounts (where data availability permits) and covers the general government sector, which is a consolidation of central, state and local governments and the social security sector.
- Includes all financial liabilities as defined by the system of national accounts (where data availability permits) and covers the general government sector, which is a consolidation of central, state and local governments and the social security sector. The definition of gross debt differs from the Maastricht definition used to assess EU fiscal positions.
- Nominal 10-year government bonds adjusted by the GDP deflator.

Source: OECD Economic Outlook 95 long-term database.

StatLink  <http://dx.doi.org/10.1787/888933051757>

Figure 4.3. **Consolidation requirements to reduce government debt to 60 per cent of GDP**  
Change in the underlying primary balance, percentage points of GDP



Note: The average measure of consolidation is the difference between the underlying primary balance in 2015 and the average underlying primary balance between 2016 and 2030, except for those countries for which the debt target is only achieved after 2030, in which case the average is calculated up until the year that debt target is achieved.

Source: OECD Economic Outlook 95 long-term database.

StatLink <http://dx.doi.org/10.1787/888933050123>

**Another group requires more consolidation but much has already been front-loaded**

- A second group of countries require average consolidation of between 1 and 3 percentage points of GDP: Canada, France, Hungary, Iceland, Ireland, Italy, Poland and Portugal. Most of these countries (but not Canada and Hungary) have also front-loaded consolidation so that this average requirement beyond 2015 is less than one-third of what will have already been achieved by then.

**A few countries require substantial further consolidation**

- A third group of countries all have debt ratios exceeding 100% of GDP and require larger average consolidation of between 3 and 5 percentage points of GDP: Spain, the United Kingdom and the United States. Of these, the United Kingdom and United States will have completed about two-thirds of the required post-crisis consolidation by 2015, whereas Spain will have completed about three-quarters.

**Japan is a special case requiring a combination of policies to reduce debt**

- For Japan, a massive consolidation requirement of nearly 11 percentage points of GDP is required beyond 2015 and even that barely stabilises debt by 2030 and does not quite achieve the 60% target by 2060. This latter result can be interpreted to mean that reducing Japan's government indebtedness more decisively will require a combination of substantial fiscal consolidation (and probably at a more urgent pace than in the stylized calculations presented here), structural measures to raise potential growth and expansionary monetary policy that raises inflation (Guillemette and Strasky, 2013).

**A peak measure of consolidation requirements exceeds the average measure**

The preceding calculations are likely to understate overall fiscal consolidation requirements for a number of reasons. Firstly, because the required profile of the underlying primary balance is likely to involve an intermediate *peak* increase which is greater than the *average* increase

referred to above (see Box 4.5 in OECD (2013a)). This is because of the need to put debt on a declining path towards the target. Once on that path, declining debt interest payments allow for some relaxation of effort while achieving a gradual convergence to the target. Among the countries that require most consolidation (but excluding Japan), the peak measure in these projections is typically 2-3 percentage points of GDP higher than the average measure of consolidation.<sup>9</sup>

**Health spending adds pressure to consolidation requirements**

Required fiscal efforts are also understated because increased pressures on public spending from health and pensions are not explicitly incorporated into the fiscal projections, but will need to be offset or counteracted to contain government indebtedness.<sup>10</sup> Recent OECD work (Oliveira Martins and de la Maisonnette, 2014) suggests that even under a “cost containment scenario” (as in Table 4.5) in which future policies act more strongly than in the past to rein in expenditure growth, average OECD public expenditure on health and long-term care is expected to rise by about 1½ percentage points of GDP between now and 2030. On top of this, the average increase in public pension expenditures across OECD countries is expected to be just over 1 percentage point of GDP to 2030, although in some countries (Belgium, Finland and Luxembourg) the increase is three to four times higher.

**Slower closure of output gaps would raise consolidation needs**

A further risk concerns those countries with large consolidation requirements and a large initial output gap in 2015. If instead of closing smoothly over the next 4-5 years, as assumed in the baseline scenario, the closing of the output gap is delayed by a further three years, then consolidation requirements would be exacerbated; the average consolidation needed by Greece would rise by more than 1½ percentage points of GDP, whereas for Portugal, Ireland and Italy the increase would be about ¾ percentage points of GDP, and in all cases reaching the debt target would be delayed by several years.

**The effects of OECD-wide fiscal consolidation on interest rates**

**Interest rate premia will decline as government and external debt fall**

Real long-term interest rates for the median OECD country are projected to rise by about 1¾ percentage points over the next 4-5 years as output gaps close and policy rates normalise (Table 4.4). Lower government indebtedness is projected to dampen the rise in interest rates through a number of channels at least until 2030. Firstly, lower government indebtedness reduces fiscal risk premia, as the number of OECD countries with government debt levels above the threshold of 75% of GDP, at which fiscal risk premia are assumed to be incurred, falls from

9. The peak measure is, however, more dependent on the particular fiscal adjustment profile used to achieve the debt target, of which the baseline represents one specific case.

10. Additional fiscal pressures may come from education spending as governments strive to ensure equal opportunities and support knowledge-based growth (OECD, 2014a).

Table 4.5. **Changes in public spending on health and pensions for selected OECD countries**

Change 2015-30, percentage points of GDP

	Health care <sup>1</sup>	Long-term care <sup>1</sup>	Pensions	Total
Australia	1.2	0.2	0.7	2.1
Austria	1.3	0.2	2.3	3.9
Belgium	1.1	0.3	3.6	5.0
Canada	1.4	0.2	1.2	2.9
Chile	1.4	0.5	-0.7	1.2
Czech Republic	1.1	0.2	0.3	1.7
Denmark	1.3	0.2	0.3	1.8
Estonia	0.9	0.2	0.4	1.5
Finland	1.2	0.2	2.8	4.2
France	1.2	0.2	0.5	1.9
Germany	1.3	0.3	1.5	3.1
Greece	1.2	0.3	0.0	1.5
Hungary	0.9	0.3	-0.8	0.4
Ireland	1.2	0.1	0.7	2.0
Iceland	1.2	0.2	1.1	2.5
Israel	1.3	0.3	0.5	2.1
Italy	1.3	0.3	-0.4	1.2
Japan	1.4	0.3	na	1.7
Korea	1.7	0.4	1.4	3.5
Luxembourg	1.4	0.3	4.1	5.8
Mexico	1.3	0.4	0.4	2.1
Netherlands	1.4	0.3	2.3	4.0
Norway	1.3	0.2	2.0	3.5
New Zealand	1.1	0.1	1.9	3.1
Poland	1.1	0.2	0.2	1.6
Portugal	1.3	0.2	-0.1	1.4
Slovak Republic	1.2	0.3	1.4	2.9
Slovenia	1.3	0.3	1.5	3.1
Spain	1.3	0.4	0.2	1.8
Sweden	1.0	0.1	0.4	1.6
Switzerland	1.3	0.2	1.5	3.0
Turkey	1.2	0.3	1.5	3.0
United Kingdom	1.1	0.2	0.3	1.6
United States	1.2	0.1	0.1	1.5
<b>OECD (unweighted) average</b>	<b>1.2</b>	<b>0.3</b>	<b>1.0</b>	<b>2.5</b>

Note: Where projections are not available over the period 2015-30, linear interpolation has been applied.

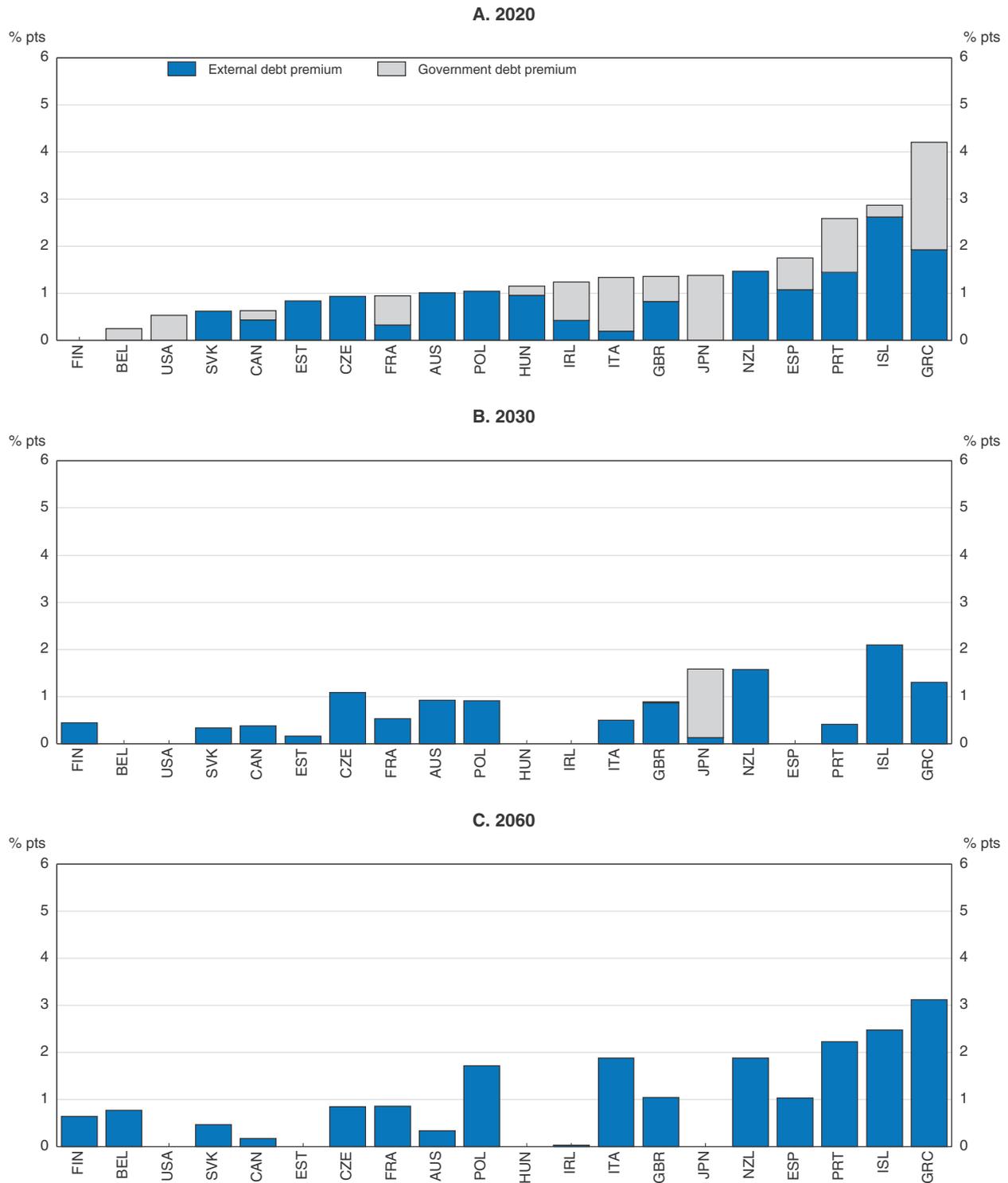
1. Based on "Cost-containment scenario", (Oliveira Martins and de la Maisonneuve, 2013).

Source: European Commission (2012), OECD Pensions at a Glance (2011), Merola and Sutherland (2012), Bank of Israel.

StatLink  <http://dx.doi.org/10.1787/888933051776>

17 now, to 13 by 2020 and only one (Japan) by 2030 (Figure 4.4). Among these countries, consolidation is projected to reduce the fiscal risk premium on average by about 1 percentage point to 2030. Secondly, to the extent that higher public debt is often associated with higher external debt and lower government debt reduces net external debt, it will also reduce country-specific risk premia on domestic interest rates; the (unweighted) average risk premium associated with net external debt among all OECD countries is projected to halve by 2030 from its current estimated level of  $\frac{3}{4}$  of a percentage point now. Nevertheless, OECD countries which are still expected to incur risk premia associated with external debt of more than one percentage point in 2030 include Iceland, Greece and New Zealand.

Figure 4.4. Interest risk premium from public and external debt for OECD countries



Note: There is no debt premium for Austria, Denmark, Germany, Israel, Korea, Luxembourg, the Netherlands, Slovenia, Sweden and Switzerland for any of the three periods shown.

Source: OECD Economic Outlook 95 long-term database.

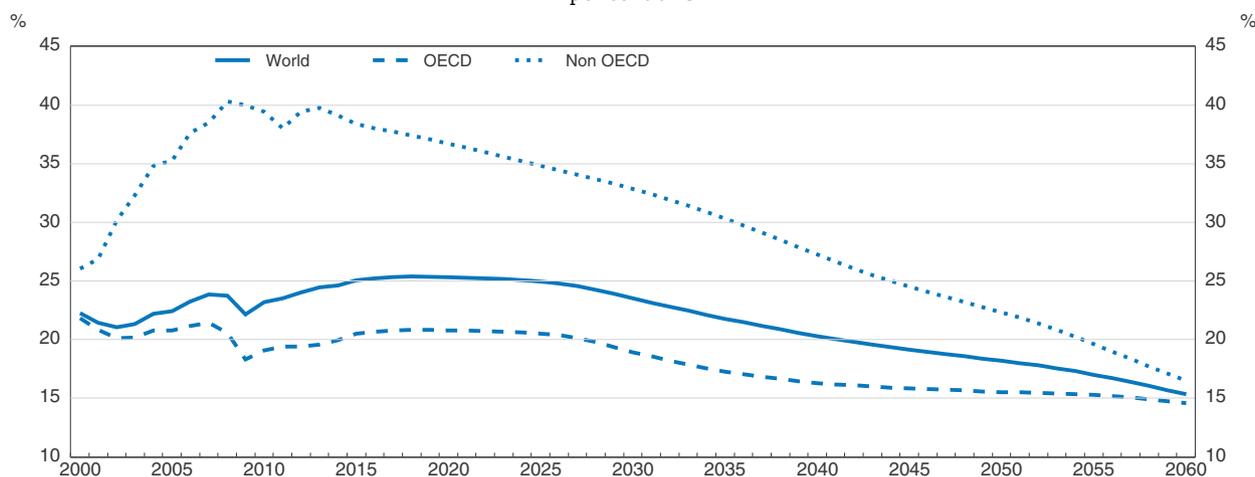
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### OECD-wide fiscal tightening will affect global saving and interest rates

Fiscal consolidation will also boost OECD and global saving, which will tend to reduce interest rates in all countries. However, a dominant influence tending to reduce national saving in both OECD and non-OECD countries will be population ageing, which in the case of non-OECD countries will be re-enforced by increased access to credit and the wider provision of social safety nets. Nevertheless, despite saving rates falling in nearly all countries, the global saving rate remains relatively stable to 2030 because of a compositional effect as the share of high-saving countries (especially China and India) in global output rises (Figure 4.5). Indeed, the *ex ante* balance between global savings and investment tends to reduce global interest rates by up to 1 percentage point to 2030, reflected by a fall in the “global balancing premium” (Figure 4.6), about half of which can be attributed to OECD fiscal consolidation.

Figure 4.5. Trends in global saving

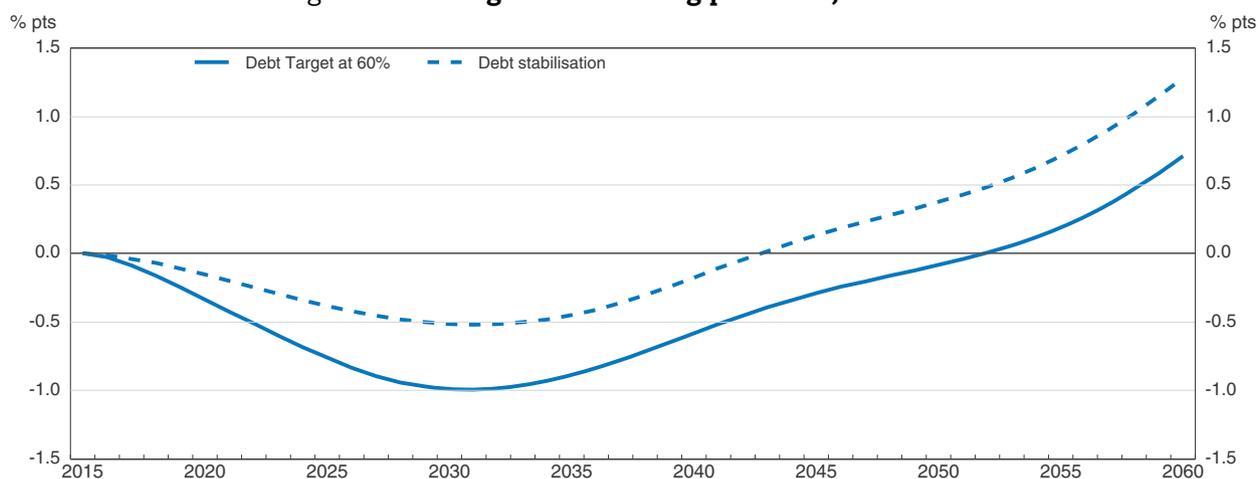
In per cent of GDP



Source: OECD Economic Outlook 95 long-term database.

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Figure 4.6. The global balancing premium, 2015-2060



Source: OECD Economic Outlook 95 long-term database.

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**Demographic trends may dominate long-run global saving and interest rate trends**

Beyond 2030, however, the country compositional effect is out-weighted by the trend decline in saving rates in all countries, and there is a switch in the direction of the premium. By the 2050s, it has moved from an anticipated global *ex ante* saving glut towards a growing global saving shortage, which puts progressively upward pressure on global interest rates, raising them by about  $\frac{3}{4}$  of a percentage point in 2060. This projection is, however, particularly sensitive to developments in China and India (because together they account for more than one-third of global saving) as well as to the magnitude of the demographic influence on saving.<sup>11</sup>

**Consolidation boosts medium-term growth**

Apart from improving resilience to cope with future shocks, OECD-wide fiscal consolidation would boost saving and lower interest rates as illustrated by comparison with an alternative variant in which OECD fiscal policy is directed to stabilise government debt only at 2013 levels (Table 4.6).

**Table 4.6. The effects of lowering government debt to 60% of GDP**

*In 2030, or when debt target achieved if later*

	Public debt premium % pts	External debt premium % pts	Government debt service % of GDP	GDP growth 2016-30 % pts
Austria	-0.2	0.0	-1.2	0.1
Belgium	-0.5	-0.2	-2.0	0.1
Canada	-0.4	-0.2	-2.0	0.1
Czech Republic	0.0	0.0	-0.3	0.0
Denmark	0.0	0.0	-0.2	0.1
Estonia	0.0	0.1	0.0	0.0
Finland	0.0	0.0	-0.6	0.1
France	-0.8	-0.3	-3.2	0.2
Germany	-0.1	0.0	-0.9	0.1
Greece	-3.8	-0.9	-12.8	0.6
Hungary	-0.3	0.0	-1.8	0.1
Iceland	-0.3	-0.2	-2.5	0.1
Ireland	-1.1	-0.2	-3.6	0.2
Italy	-1.9	-0.4	-5.7	0.3
Japan	-1.3	-0.9	-10.8	0.1
Korea	0.0	0.0	-0.1	0.1
Luxembourg	0.0	0.0	0.0	0.0
Netherlands	-0.3	0.0	-1.3	0.1
New Zealand	0.0	0.0	-0.1	0.0
Portugal	-1.5	-0.3	-5.1	0.3
Slovak Republic	0.0	0.1	-0.1	0.1
Slovenia	-0.2	0.0	-1.3	0.1
Spain	-0.7	0.0	-2.5	0.2
Sweden	0.0	0.0	-0.1	0.1
Switzerland	0.0	0.0	-0.1	0.0
United Kingdom	-0.7	-0.4	-3.7	0.1
United States	-0.6	0.0	-2.6	0.1

*Note:* Table shows the effect of reducing government debt to 60% of GDP compared to an alternative counterfactual in which fiscal policy is directed towards stabilising government debt at 2013 levels.

*Source:* OECD Economic Outlook 95 long-term database.

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11. In the model, demographic effects on saving are captured by fixed age-dependency rates, although this creates some tension where retirement ages are increasing, and particularly beyond 2030 when it is assumed that retirement ages rise in line with life expectancy for all countries.

Reducing government debt to 60% of GDP would, for the 10 OECD countries for which government debt is currently highest, lower combined fiscal and net external debt risk premia by an average of 1½ percentage points, reduce government debt service by an average of 4 percentage points of GDP and boost medium-term growth by 0.2 percentage points per year (all by 2030, relative to a counter-factual in which current debt levels are maintained). This boost to GDP ignores the Keynesian effects that further consolidation might have in delaying the closure of output gaps with possible detrimental hysteresis effects on potential output (De Long and Summers, 2012), although the pace of further consolidation is assumed to be modest (a maximum of ½ per cent of GDP per annum).

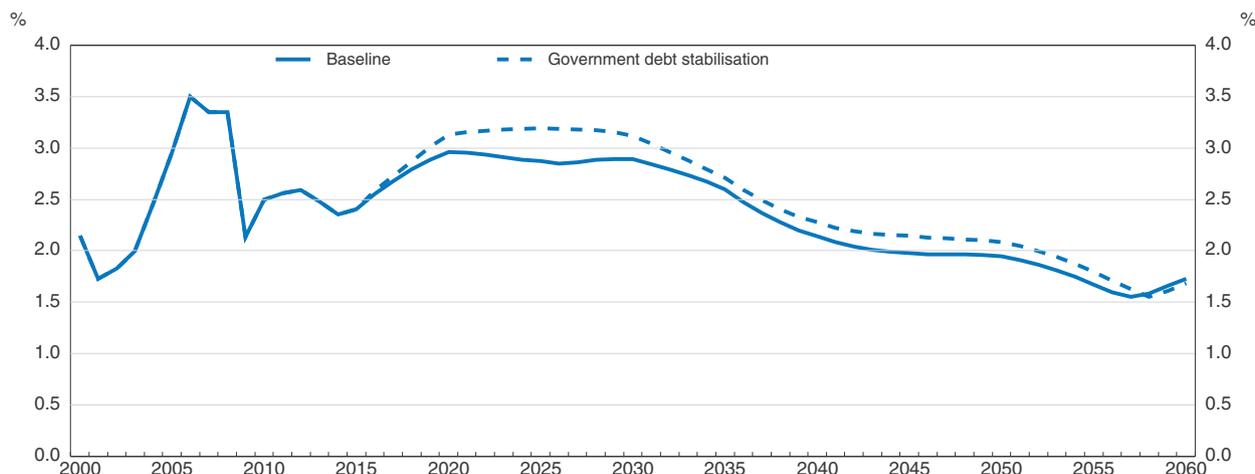
### Global current account imbalances

#### Fiscal consolidation also reduces global imbalances

The overall scale of global current account imbalances, measured as the absolute sum of all nominal current account balances normalised on global GDP, is currently around one-third lower than pre-crisis peaks, but is expected to rise to around 2020, before broadly stabilising to 2030 (Figure 4.7). Given that the majority of OECD countries with high government debt are also projected to be running current account deficits, OECD-wide fiscal consolidation will also relieve pressure on global imbalances. Judged relative to a variant scenario in which OECD fiscal policy only stabilises government debt at 2013 levels, fiscal consolidation in the baseline projections reduces global imbalances by up to 15% over the period to 2030.

Figure 4.7. **Global current account imbalances will increase until 2020**

Sum of absolute current account balances, divided by 2, in per cent of world GDP



Note: 'Government debt stabilisation' is a scenario in which OECD countries target a stable government-debt-to-GDP ratio at current levels, rather than reduce it to 60% of GDP as in the baseline.

Source: OECD Economic Outlook 95 long-term database.

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## The effect of structural reforms on employment, growth and fiscal positions

**There is substantial scope for further structural improvements**

A recent survey of structural performance of OECD and BRIICS economies (OECD, 2014b) called for “ambitious and comprehensive structural reform” to facilitate a return to healthy and sustainable growth. Structural reforms, particularly if they boost employment, can also ease fiscal constraints. While some structural reform is built into the current projection baseline, there remains ample scope for further enhancement as illustrated in a range of scenarios considered here: firstly, raising potential employment, either by reducing structural unemployment or promoting female labour force participation; secondly, improving product market regulation to facilitate competition and so boost productivity; and finally to promote human capital by better access to quality education.

### *The fiscal effects of higher potential employment*

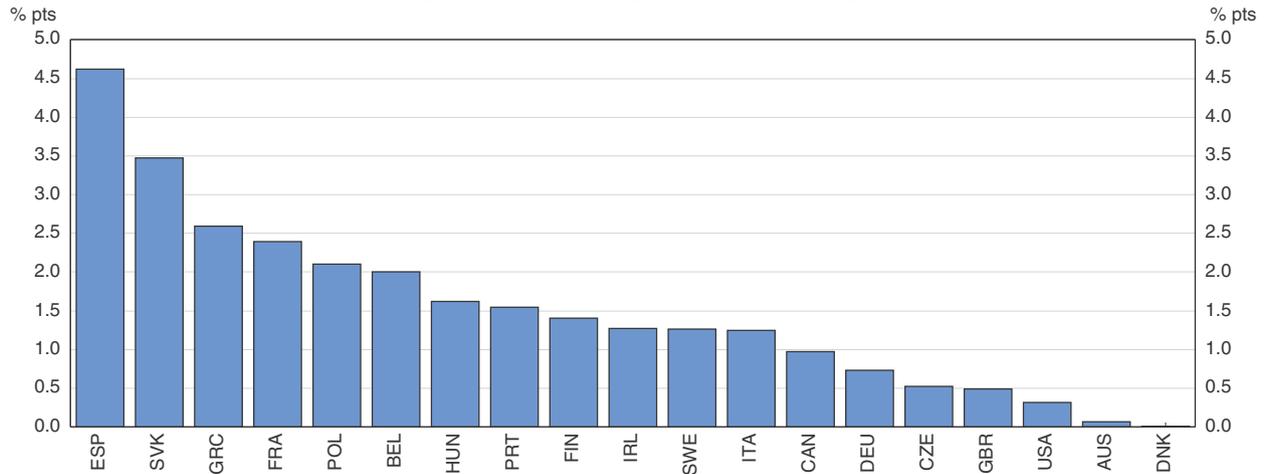
**Lower structural unemployment relieves fiscal pressures**

In a reform scenario, labour market reforms are assumed to reduce structural unemployment to 5% in all OECD countries where it currently exceeds this level.<sup>12</sup> Higher potential employment increases tax revenue and reduces unemployment-related welfare benefits. Furthermore, if the additional employment is in the private sector, implying a rise in the tax base relative to expenditure on public sector wages, then total government expenditure will fall as a share of GDP.<sup>13</sup> On this basis, the scope for the largest falls in structural unemployment relative to the baseline projection are for Spain (down by 10 percentage points), Greece (7½ percentage points), the Slovak Republic (9 percentage points) and Portugal (4 percentage points). The biggest permanent improvements in the primary balance are for these countries as well as others, such as France or Belgium, for which the fall in structural unemployment may be less, but unemployment-related benefits are relatively high and public sector employment is a relatively high share of total employment (Figure 4.8). For these six countries, the reduction in structural unemployment would permanently improve the primary balance by more than 2 percentage points of GDP and for Spain the improvement would be more than double that. To put the magnitude of these effects in context, the pressures from increased public spending on health and pensions are expected to amount to just under 3 percentage points of GDP for the median OECD country to 2030. As well as reducing the extent of required

12. A structural unemployment rate of 5% was achieved by almost one-third of OECD countries in the immediate pre-crisis period. In the baseline projection, structural unemployment is slowly converging to the level observed before the crisis in each country.

13. Structural reforms are more likely to positively affect fiscal balances if they generate higher potential employment rather than result in higher trend productivity. The total estimated improvement in the underlying primary balance from an increase in potential employment by 1 percentage point ranges from between 0.3 and 0.8 per cent of GDP, with the effect largest in countries where the initial ratio of public to private sector employment and the initial proportion of primary public expenditure to GDP are highest (OECD, 2010).

**Figure 4.8. The fiscal gains from a fall in structural unemployment**  
Change in the underlying primary balance compared to the baseline, percentage points of GDP



Note: The numbers represent the effect on the primary balance of a fall of the structural unemployment to 5 per cent. Countries where unemployment is already below 5 per cent are not shown.

Source: OECD Economic Outlook 95 long-term database; and OECD Calculations.

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consolidation to achieve any given debt target, falling structural unemployment would also enable that target to be achieved earlier;<sup>14</sup> the 60% debt target in the baseline would be reached 5 years earlier for the Slovak Republic, 4 years earlier for Greece and 3 years earlier for France and Portugal.

**Promoting female participation should be a priority in many countries...**

Raising the participation of women should be a structural policy priority, particularly for countries in which rapidly ageing populations are most likely to be a drag on the employment rate (OECD, 2013b and 2014b). While social trends have played a key role in the rise in female participation, policies can also have an impact (Thévenon, 2013). This is particularly true as regards the availability of reliable and affordable day-care, which significantly increases the ability of either spouse to remain in the workforce after child-birth – but most often impacts on women. A related issue is whether parental leave that can be taken by either parent. Other policies that have significant impacts on female participation include facilitating part-time employment, which at present is still subject to significant penalties relative to full-time employment in most countries (OECD, 2010), including lack of basic levels of job security, training and promotion, less access to unemployment benefits or re-employment assistance.

14. Fiscal consolidation in the baseline takes place through a gradual improvement in the underlying primary balance with a maximum cap on consolidation in any single year of ½ percentage point of GDP, but the effect from the reduction in unemployment is assumed to come in addition to the cap as the improvement is an indirect effect of labour market reforms.

**... and the gains could be large for some countries**

In a further variant scenario, the participation rate of women in 2030 is raised to that of the full-time equivalent currently prevailing in the median OECD country (54%). For Turkey, Poland and Italy this results in aggregate participation gains large enough to increase GDP by over 10% in 2030. Increases of 5% or more also result for Belgium, the Czech Republic, France, Greece, Hungary and Japan. Given the likely boost to private employment, this could also deliver substantial fiscal savings; estimated to be about 6% of GDP for Italy and Poland; and 2-3% of GDP for Belgium, the Czech Republic, France, Greece, Hungary, Japan and the Slovak Republic.<sup>15</sup>

**The growth effects of product market reforms**

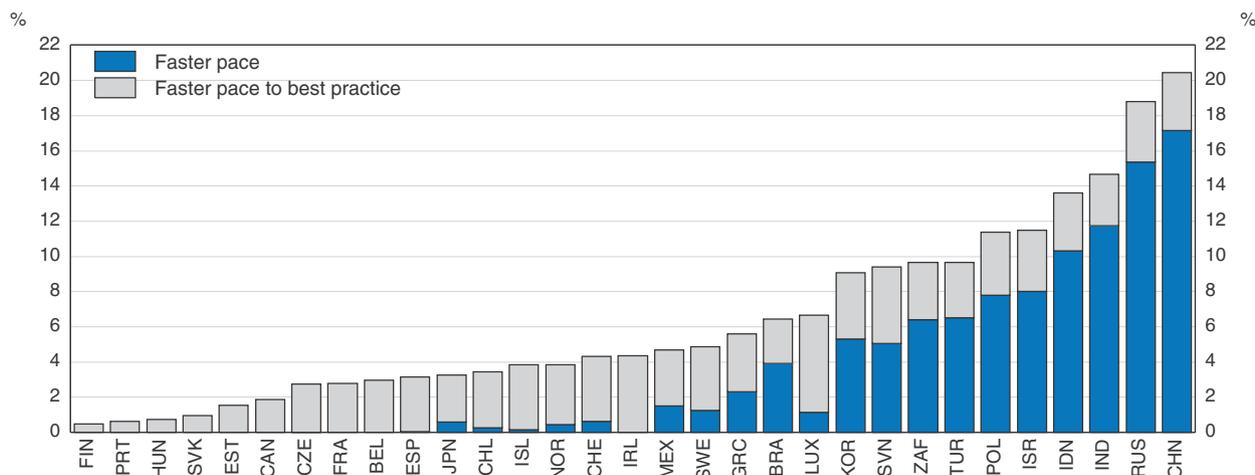
**A faster pace of product market reform would boost GDP**

There is a substantial body of evidence at the firm, industry and macro-level, linking competition-friendly product market regulation (as quantified by the OECD's PMR index) with better productivity performance, a link which is embodied in the modelling framework underlying the current projections.<sup>16</sup> In the baseline scenario, a gradual improvement in product market regulations (as quantified by the PMR index) is assumed so that all countries improve to at least the current average across OECD countries at a speed which is consistent with the average rate of improvement observed over recent history. This speed of improvement has slowed over the past 5 years, although there are some exceptions – notably Greece, Italy, Poland, Portugal and the Slovak Republic – where there have been more substantial reforms (OECD, 2014b). In a variant scenario, designed to reflect a faster pace of reform, the rate of improvement in product market regulations in all countries is set equal to the average pace of this fast-reforming group of countries. The faster speed of product market reform boosts trend productivity most in those countries where there is greatest scope to catch-up in terms of competition-enhancing regulation (and not at all for those countries for which the PMR indicator is already better than the current OECD average). Thus, gains are typically larger for non-OECD economies, with GDP increasing by an average of 9% by 2030, and for the six OECD countries in which regulations are currently most stringent, where GDP is boosted by an average of 6% by 2030 (Figure 4.9). In a further scenario, in which the level of product market regulation is also assumed to improve to at least the best quartile currently observed among OECD countries, rather than just the current OECD average (as in the baseline and first scenario), the

15. The fiscal savings from higher female participation could be offset if there were significant fiscal costs from higher public support for child-care needed to bring this about.

16. A link between firm, industry and macro-level growth performance and competition-enhancing product market regulation is found by Bourlès *et al.* (2010), Bouis *et al.* (2011), Conway, *et al.* (2006) and Griffith, *et al.* (2004). In the empirical work underlying the current modelling framework (Johansson *et al.*, 2013) more pro-competition product market regulation, as quantified by the OECD's product market regulation index, was found to boost long-term productivity and thus affect the pace at which countries converge towards the international technological frontier.

Figure 4.9. **The effect of improved product market regulation on GDP**  
In 2030, per cent



Note: The 'Faster pace' shows the effect of an increase in the speed of product market reform which roughly matches the average rate of improvement in the PMR index observed over the period 2008-13 for Greece, Italy, Poland, Portugal and Slovak Republic. The 'Faster pace of reform to best practice' shows the effect of the same increased speed of product market reform, but to a level which matches the current best quartile among OECD countries rather than the current OECD average as in the baseline and first scenario.

Source: OECD Economic Outlook 95 long-term database; and OECD Calculations.

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GDP gains would be even larger and spread among a much wider group of countries. Such a reform effort would also come close to meeting the G20's target to raise collective GDP by 2% within 5 years.

### **The gains from improving access to education in emerging market economies**

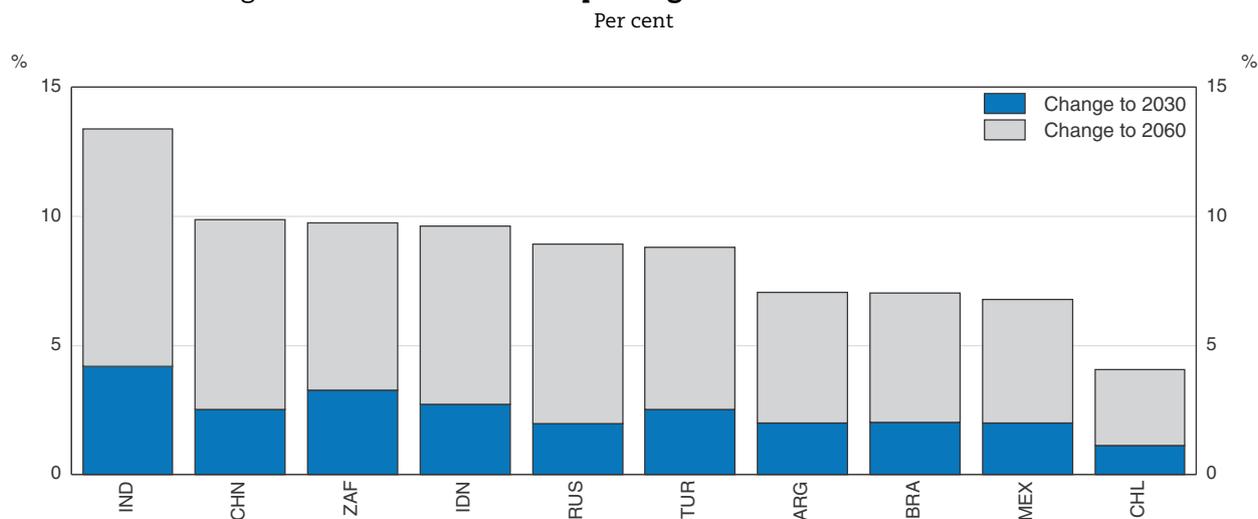
#### **Education reforms in emerging market economies could boost human capital**

Improving access to quality education is a priority recommendation in many emerging economies, including the BRIICS, as well as Turkey, Mexico and Chile (OECD, 2013b and 2014b). Education increases human capital and so makes workers more productive and has been among the most important drivers for increasing long-run living standards (Cohen and Soto, 2007; Bouis et al, 2011). There is likely to be a larger benefit to reforms where average years of schooling are initially low, as empirical evidence suggests that the returns from boosting coverage and performance in primary and secondary education are greater than for tertiary education.<sup>17</sup> In order to simulate the effect of ambitious education reforms in emerging economies, a variant scenario with faster improvement in educational attainment was constructed based on historical episodes in low-income countries in which major reforms enhanced primary and secondary coverage and performance. Brazil, Chile, Indonesia, Korea, Mexico, and Russia all experienced periods of a decade or more in which there was above average growth in educational

17. This is reflected in the current modelling framework whereby human capital improvement is modelled as a decreasing function of additional years of schooling

attainment of the 25 to 29 year-old group. During these episodes, the annual speed of convergence in educational levels was on average around 60% higher than assumed in the baseline. Applying a similar rate of improvement, the variant scenario highlights the long-term gains in productivity that faster improvements in educational attainment can bring in emerging economies. There are likely to be long lags before there are major GDP effects because the primary beneficiaries will be those who are currently young, but over the long-term (to 2060) the GDP gains could be around 10% or more for China, India, Indonesia and South Africa (Figure 4.10).<sup>18</sup>

Figure 4.10. **The effect of improving access to education on GDP**



Note: The bars report the impact on GDP that increased access to quality-education will have through improvements in human capital.  
Source: OECD Economic Outlook 95 long-term database; and OECD calculations.

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18. The Turkish government recently approved a reform programme aimed at increasing the average schooling attainment of the cohort age 25 to 29 to about 13 years by 2025, which is not incorporated in the baseline projection reported here, but the possible effects on GDP are considered in OECD (2012).

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