Chapter 4

BEYOND THE CRISIS: MEDIUM-TERM CHALLENGES RELATING TO POTENTIAL OUTPUT, UNEMPLOYMENT AND FISCAL POSITIONS

Introduction and summary

Severe macroeconomic imbalances will remain in 2010

The economic crisis will cast a long shadow. The projections described in Chapters 1 and 2 imply that by the end of 2010, even though a recovery is under way, most OECD countries will still face severe macroeconomic imbalances including large output gaps, high unemployment, very low inflation or even deflation and wide fiscal deficits. This chapter considers how such macroeconomic imbalances might begin to be resolved over the medium term, as well as the main associated risks and uncertainties.

The effect of the crisis on the supply-side is uncertain but has major policy implications

A major uncertainty and a particular focus here is the magnitude of any adverse effects that the crisis may have on the level or growth rate of supply-side potential. Substantial and long-lasting effects would reduce growth in living standards, and could put additional long-term pressure on already strained public finances to the extent revenue growth is lower and not counter-balanced by reduced spending. Different paths for potential output will also have implications for monetary policy in terms of assessing inflation or deflation risks, as well as the timing for any re-normalisation of policy rates.[1]

The chapter reviews medium-term macro prospects, emphasising risks and uncertainties

The remainder of the chapter begins by considering how the financial crisis might impact on potential growth, summarising studies which have analysed the effect of previous financial crises and documenting recent changes to potential output estimates made by national authorities following the current crisis. The adjustments to the OECD's standard methods of estimating potential in the wake of the crisis are then described. The revised OECD estimates underpin a stylised medium-term scenario which is described in the subsequent section. The extent of the policy challenges facing OECD governments, including the scale of fiscal consolidation required to reduce fiscal imbalances, are illustrated by this scenario. Further variants highlight the policy implications of major risks and uncertainties, particularly those relating to potential output, interest rates and initial fiscal imbalances.

Main findings are:

The main findings of the chapter are as follows:

Potential output is likely to be reduced as a consequence of the crisis

● Based on existing empirical studies it is likely that potential output will be significantly reduced as a result of the crisis. Estimates described in this chapter imply a downward revision to the level of OECD potential

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1. The experience of stagflation in the 1970s and early 1980s illustrates how uncertainty about supply-side potential can lead to major policy errors. Thus, while real-time measures of economic slack provided apparently legitimate grounds for easing policy, *ex post* it appeared that capacity conditions were actually tighter than such estimates suggested and that policy easing had fuelled inflation (Orphanides *et al.*, 2000).

output in the wake of the current crisis of about 2% by the end of 2010. However, for some countries the revisions are much larger. In the medium term, the level of OECD potential output has been revised down by 2¾ percentage points compared to pre-crisis projections, although the long-term potential growth rate is unaffected. All the revised estimates come with the qualification that assessing supply-side potential is particularly difficult at present and subject to wider-than-usual margins of error. Indeed, reassessing potential output will require time and analysis and the present estimates should be seen only as a first output from this activity.

Capital intensity will continue to fall in response to higher capital costs

● Two-thirds of the projected fall in near-term potential growth in the OECD revisions comes from the collapse in investment and the associated slower growth of capital input to production. The decline in capital intensity may continue over the medium term in response to an increase in capital costs associated with a permanent increase in risk aversion.

The NAIRU may increase, particularly in European countries

● In addition, in the wake of past recessions structural unemployment has tended to rise in many countries, which may be partly a reflection of rising long-term unemployment and hysteresis-type effects. Past experience suggests that European countries may be more vulnerable than other countries to such effects and this is reflected in current projections.

Other effects on potential output are ambiguous

● The revisions to potential output here do not factor in effects from changes in labour force participation or changes in trend productivity. While such effects may be important, they are not only difficult to quantify but their sign is also uncertain. For example, recessions may raise aggregate productivity as the least productive activities are abandoned. On the other hand, to the extent that expenditure on research and development activities are cut back there may be an adverse effect on trend productivity. Similarly, labour force participation may fall due to difficult labour market conditions and the greater use of early retirement options. On the other hand, the loss in pension wealth implied by falls in equity prices may compel some workers to postpone their retirement.

Ambitious fiscal consolidation could restore balanced budgets

● Given the scale of projected fiscal imbalances in 2010, significant fiscal consolidation beyond the removal of temporary fiscal stimulus is inevitable in most countries. Indeed, many countries have already announced such plans with variable degrees of precision and certainty. However, rather than assuming country-specific consolidation measures, the medium-term projections beyond 2010 assume a stylised profile of fiscal consolidation. Thus, countries seen as in need of consolidation are assumed to undertake tightening by 1% of GDP for three or seven years depending on the size of initial imbalances. The scale of such consolidation, which comes on top of the removal of fiscal

stimulus packages, is ambitious but not unprecedented – except as regards its synchronisation across countries.

● The main message from such projections is that, under moderately optimistic assumptions and for the majority of countries, fiscal consolidation along the lines described would be sufficient to bring government budgets closer to balance or even into surplus, so that a snowballing of debt would be prevented. Area-wide gross government debt in 2017 would still rise by about 30% of GDP relative to pre-crisis (2007) levels. However, most of this increase would already have occurred by 2010.

Lower potential output and higher interest rates would aggravate fiscal imbalances

● The fiscal outlook would be worsened by lower potential output or higher interest rates. The fiscal implications of any reduction in potential output might be more serious if the latter is associated with a permanent decline in potential employment, rather than a decline in productivity. The risks of higher interest rates will be greater and the fiscal consequences more serious for those countries where debt burdens are already very high.

Structural policy reforms can ease the adjustment

● The likelihood that the current crisis will have permanent effects also underscores the importance of accelerating structural reforms, and avoiding the introduction of policies in the midst of the crisis that would risk reducing potential output even further. Accelerating structural reforms in the years ahead would not only improve longer-term growth prospects and enhance resilience to new adverse shocks, but would also contribute to easing fiscal pressures. At the same time, it is important that fiscal consolidation measures minimise adverse effects on supply potential, for example, by limiting any increases in the tax wedge on labour or cutbacks in growth-enhancing spending.

The effects of the economic crisis on supply-side potential

Recessions and financial crises are likely to reduce potential growth…

Deep recessions and financial crises can lower potential output through a number of mechanisms. During recessions investment often falls sharply, and firms go out of business which may accelerate the scrapping of capital or lead to its relocation, thus lowering the capital stock and its efficiency. Financial crises exacerbate these effects, by impairing financial intermediation, raising the cost of capital and forcing otherwise viable firms out of business.

… through various channels

In addition, in the wake of past recessions labour input has been reduced through a combination of lower labour force participation and higher structural unemployment as negative shocks have interacted with inflexible labour markets (Blanchard and Wolfers, 2001). However, by reducing pensions in some countries, the current crisis may in some cases increase the retirement age. The impact on the level and growth rate of total factor productivity (TFP) is also ambiguous. The financial crisis may lower TFP by reducing the research and development (R&D) intensity of

the economy as firms reduce such investment spending. On the other hand, recessions may lead to the abandonment of the least productive lines of activity and force the least productive firms out of business, increasing average productivity across the economy. The revisions to estimates of potential output presented here attempt to quantify the effect of the economic crisis on capital inputs and structural unemployment, as detailed below, but not through other channels. Hence, the estimates of potential growth underlying the current chapter should be seen as the result of preliminary analysis, likely to be revised in the light of future work focusing on other channels.

Empirical studies suggest recessions and financial crises permanently reduce the level of potential output…

The limited empirical literature examining the long-run implications of recessions suggests that they result in permanent output losses, and that losses from recessions associated with financial crises are even larger. For example, Kim *et al.* (2005) consider the output response to recessions in Australia, Canada, the United Kingdom, and the United States, and estimate that permanent losses to output levels range from 1¼ to 5¼ per cent. Cerra and Saxena (2008) demonstrate that large and persistent output losses are associated with financial crises, finding that a full recovery of output to the projected trend level of GDP prior to the crisis is rare. However, as these authors acknowledge, such estimates tend to overestimate the loss if there has been a boom prior to the crisis. Recent OECD research also finds evidence of persistent output losses from financial crises. Furceri and Mourougane (2009) estimate that financial crises permanently lower potential output by 1½ to 2½ per cent on average, and by up to 4% for severe crises.

… but the long-term growth effects are less clear

Fewer studies find evidence of a permanent effect of financial crises on potential output *growth*, although clearly this is inherently difficult to identify. Haugh *et al.* (2009) examine OECD estimates of potential output growth and their components around severe banking crises, but find little evidence of long-lasting effects on potential growth, although there are differences across episodes. For example, the 1990s' banking crisis in Japan was associated with lower potential growth mainly due to weaker productivity growth, which is attributed to the protracted nature of the banking problems and the resulting misallocation of capital. In contrast, they find that, perhaps because the Nordic banking crises of the early 1990s were resolved more quickly, the Nordic countries experienced only a temporary decline in potential growth which was better explained by a sharp rise in structural unemployment than a long-lasting deterioration in productivity performance.

National authorities are reducing current potential output estimates

A number of national authorities have revised down estimates of recent and prospective potential output growth (Box 4.1). The (simple) average cumulative downwards revision to the level of GDP by 2010 is almost 2¾ per cent, although there is wide variation across countries with the largest downward revision, for Ireland, of nearly 7%. The reasons most

Box 4.1. **Revisions to potential output growth by national authorities**

Several OECD countries have recently lowered their estimates of potential output growth over the 2009 to 2011 period, with some also reducing estimates over 2007-08. Over the 2009-10 horizon, the span of downward revisions to potential output growth has been wide, ranging from only 0.1 and 0.4 (for the United States in 2009 and 2010 respectively) to 2.9 percentage points per annum (for Ireland in both 2009 and 2010). The table below summarises the various revisions along with factors cited as motivating the change (where available), although the approach used to estimate potential output differs across countries and most stress that uncertainties surrounding their estimates are large.

In general, the revisions reflect expectations that weak demand and tight credit conditions will impair investment growth, thus slowing capital accumulation and labour productivity, while corporate downsizing is projected to raise levels of structural unemployment. The expected contributions from each factor differ across the countries, with Canada, Italy, Austria, Czech Republic, Finland and Hungary indicating that lower total factor productivity (TFP) plays the primary role in reducing potential output growth. Lower rates of capital accumulation are cited as the main driver behind revisions in the United States, Japan and Greece, while lower labour inputs appear most important for the euro area, Belgium, Ireland, Poland, Spain and Sweden.

Recent Revisions to Potential Output by National Authorities

	Institution	Growth Revisions (percentage points)					Components affected		
		2007	2008	2009	2010	2011	Capital	Labour	TFP
United States	Congressional Budget Office (2009)			-0.1	-0.4	-0.2	x		x
Euro Area	European Commission (2009)	-0.4	-0.4	-0.8	-0.8		x	x	x
Germany	Deutsche Bundesbank (2009)			-0.5	-0.1	0.0	x	x	x
Japan	Bank of Japan (2009)			-0.5	-0.5	-0.5	x		
United Kingdom	HM Treasury (2009)	Phased in 5% reduction level of potential output over 2007Q3-2010Q3					x	x	x
Italy	Italian Treasury	-0.4	-0.3	-1.0	-0.8	-0.9	x	x	x
Canada	Bank of Canada (2009)			-1.2	-1.0	-0.6	x	x	x
Austria	Ministry of Finance (2009)	-0.4	-0.5	-0.9	-0.9		x	x	x
Belgium[1]	Finance Ministry (2009)	-0.2	-0.2	-0.5	-0.6	-0.5		x	
Czech Republic	Ministry of Finance (2008)	-0.1	-0.3	-0.6	-0.9		x		x
Denmark	Ministry of Finance	Phased in 3.2% reduction level of potential output over 2007-2010					x		x
Finland	Ministry of Finance (2009)	-0.3	-0.5	-1.2	-1.4	-1.4	x		x
Greece	Ministry of Economy and Finance (2009)	-0.4	-0.8	-1.2	-1.6		x	x	x
Hungary	Government of Republic of Hungary (2008)	-0.9	-1.1	-1.2	-1.3	-1.4	x	x	x
Ireland	Department of Finance (2009)		-1.0	-2.9	-2.9		x	x	x
Luxembourg	STATEC (2009)	-1.2	-1.1	-1.2	-1.4				
Poland[2]	National Bank of Poland (2009)		0.1	0.4	-0.7			x	
Spain	Ministry of Economy and Finance (2009)	-0.3	-1.0	-0.9	-1.0		x	x	x
Sweden	Ministry of Finance	Phased in 3% reduction to level of potential output by 2012						x	x

1. The Federal Planning Bureau of Belgium (2009) has also recently revised estimates of potential output growth to 1.3% on average over 2009-14, compared to previous estimates of 2.1% over 2008-13. The changes were driven primarily by lower labour inputs, followed by lower total factor productivity.
2. The upward revisions to estimated potential output growth in Poland over 2008-09 are cited as being attributable to previous fiscal policy measures that have lowered labour costs.
Source: OECD.

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often mentioned for the revisions are declines in the capital stock and greater labour market weakness following the crisis.

Adapting the OECD's method of estimating potential output

Better incorporating the hit to capital

Changes to current methods of incorporating capital input...

An important change to the OECD's production function approach to estimating potential output is to represent capital input by actual capital series, rather than smoothed versions of these series.[2] Which measure of capital is appropriate depends partly on what purpose the measure of potential output is being used for (for example whether measuring the cyclical component of the fiscal balance or assessing inflationary pressure). A more practical problem in the current conjuncture is that, while it is clear that for most countries investment and growth in the capital stock is being severely affected by the crisis in the short term, it is more difficult to assess the longer-term consequences and, hence, the implications for smoothed capital services.[3]

... imply greater variability to potential growth...

As would be expected, switching to using the actual capital services series instead of a smoothed version leads to increased variability in potential output. For most countries, most of the time, the magnitude of difference is relatively small,[4] except in periods of deep recession and/or financial crisis.

... and a bigger hit to potential output in the current episode

This year and next are expected to be an exceptional period with growth in capital services projected to be much weaker compared with previous downturns. Indeed, for all the major seven countries, the projected growth rate of capital services over 2009-10 is lower than at any previous period for which comparable data are available, capital services growing about 2-3 percentage points *per annum* less than their average rate of growth since the start of the decade (Figure 4.1). In itself, this reduces potential growth by about ½ to ¾ percentage points over those years compared with the previous part of the decade.

2. The Congressional Budget Office (CBO) and European Commission also use a production function approach to estimate potential output and use actual, rather than a smoothed, capital series, see CBO (2001) and Denis *et al*. (2006). The CBO argues that "unlike the labour input, the capital input does not need to be cyclically adjusted to create a 'potential' level – the unadjusted capital input already represents its potential contribution to output. Although use of the capital stock varies greatly during the business cycle, the potential flow of capital services will always be related to the total size of the capital stock, not to the amount currently being used."
3. Given that smoothed measures of the capital stock are usually filtered over combined historical and projected values to reduce well-known end-point problems, such smoothing risks adding further uncertainty about both current and recent measures of potential output.
4. For the major seven OECD countries, the average absolute difference between the old and new estimates of potential output growth, which go back to the 1970s, is in the order of 0.1 to 0.2 percentage points, which appears well within the normal range of revisions for potential output (OECD, 2008a).

Figure 4.1. **Growth in capital services, 2000-10**

Quarter-on-quarter growth, annualised rate
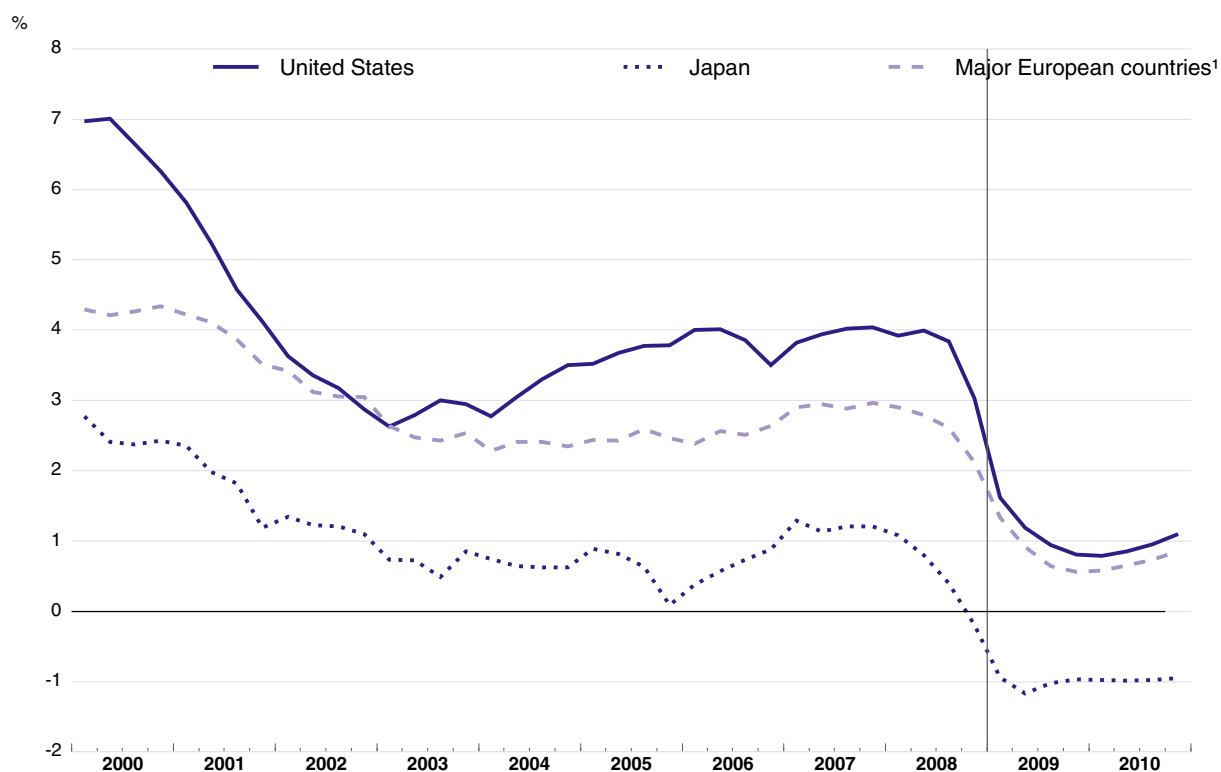
1. Weighted average of Germany, France, Italy and the United Kingdom.

Source: OECD Economic Outlook 85 database.

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Higher capital costs imply lower capital in the medium term

The sharp slowdown in the growth of capital services can be viewed as part of a longer-term adjustment to higher capital costs. To the extent that the financial crisis has led to a permanent increase in risk aversion – or perhaps more appropriately a return to levels of risk aversion that prevailed prior to the credit boom – there will be a permanently higher cost of capital. This in turn implies lower equilibrium output over the medium term (Box 4.2), which is incorporated in the medium-term projections beyond 2010.

Assessing effects on structural unemployment

Projecting NAIRUs is difficult given the massive shock to labour markets...

The OECD routinely produces estimates of the structural unemployment rate, defined as the rate of unemployment consistent with stable inflation (the so-called NAIRU, or non-accelerating inflation rate of unemployment).[5] For the purpose of projections, the NAIRU is normally held stable, or, if there are significant structural reforms being implemented, then these are evaluated and the profile of the NAIRU

5. The general background to and details of previous OECD work estimating time-varying NAIRUs via the estimation of a reduced-form Phillips curve equation using a Kalman filter procedure are given by Richardson *et al.* (2000).

Box 4.2. **Gauging the impact of the credit crunch on the capital stock and potential output**

A permanently higher cost of capital relative to output implies lower equilibrium output. The financial crisis has increased the cost of borrowing, and therefore the cost of capital for all businesses except the best-rated corporations. Real borrowing costs for US BBB-rated corporations have risen from about 3½ per cent in the first half of 2007 to above 5½ per cent in the first half of 2009. Part of this shock reflects financial stress that is expected to be temporary in nature. However, financing conditions are unlikely to revert to the low interest rates and compressed credit spreads during the credit boom of 2003-07. The previous US business cycle, which can be dated from end-1990 to end-2001 can be seen as a better gauge of real capital costs than the credit bubble period. US corporate bond yields deflated by expected long-term inflation, which are used as a proxy for real borrowing costs for a representative firm averaged 4½ per cent over the 1991-2001 business cycle.[1] They fell to below 3% on average through the credit boom of 2003-07, implying a shock of about 1½ percentage points (which is equivalent to an increase in the costs of capital of about 8%).

A rough estimate of the effect of this shock on capital accumulation and potential growth has been calculated using a production function to evaluate the output capacity of the business sector.[2] In a partial-equilibrium approach, the interest rate shock translates into an 8% increase in the real unit cost of capital.[3] Gauging the effect of the shock also requires taking into account that the capital stock had only partly adjusted to the artificially high levels induced by depressed real bond rates during the credit boom. This framework leads to estimating that as a result of the shock equilibrium US business sector capital lies 6½ per cent below its 2008 actual level. This in turn means a 2½ per cent fall in the level of US business sector potential output. Assuming that the equilibrium level of government capital is unaffected by the fall in business sector output, the shock implies a 2% fall in US economy-wide potential GDP.

If the scrapping rate of the capital stock remains constant despite the shock and investment is made at its "optimal replacement" level, 80% of the adjustment would have taken place by 2017, implying a 0.2 percentage point reduction in US potential growth per annum. In practice, however, investment has fallen well below "optimal" levels during the downturn, implying that the capital stock is adjusting to its equilibrium level at a faster rate during the short-term projection period. In the present set of projections, the capital stock adjustment reduces potential growth by 0.8 and 0.9 percentage points in the United States in 2009 and 2010, meaning that 85% of the adjustment takes place in these two years. As a result the shock merely reduces potential output growth by 0.04 percentage point *per annum* from 2011 to 2017 in the United States. In the 2011-17 period, the same small estimated effect has been applied to other countries because of lack of available historical data on BBB yields outside the United States.

1. Bond yields are taken from Datastream. Anticipated inflation is as expected for the CPI over the following ten years by the professional forecasters surveyed by the Federal Reserve Bank of Philadelphia.
2. A Cobb-Douglas specification has been used with a US business sector capital share of 37% based on the *OECD Economic Outlook 84* database.
3. The real unit cost of capital is equal to the real interest rate plus the depreciation rate, which is estimated at 16% for the United States on *OECD Economic Outlook 84* data

Source: Cournède, B. (2009), "Gauging the impact of higher capital and oil costs on trend growth", *OECD Economics Department Working Papers*, forthcoming.

adjusted accordingly. However, this procedure is likely to be inadequate for projecting structural unemployment over a period when labour markets experience such a severe adverse shock.

... and because of hysteresis-type effects in some countries

A particular concern is that much of the substantial increase in unemployment is transformed into higher structural unemployment as a result of so-called hysteresis' effects. Thus, following severe downturns in the major European economies over recent decades, even once output has returned to potential, there has been a rise in unemployment which is

typically proportional to the severity of the recession (Figure 4.2).[6] Conversely, for most non-European economies, and in particular the United States, no such relationship appears to hold, or otherwise is much

Figure 4.2.   **European unemployment ratchets up following severe recessions**

(a) Major European countries

(b) United States
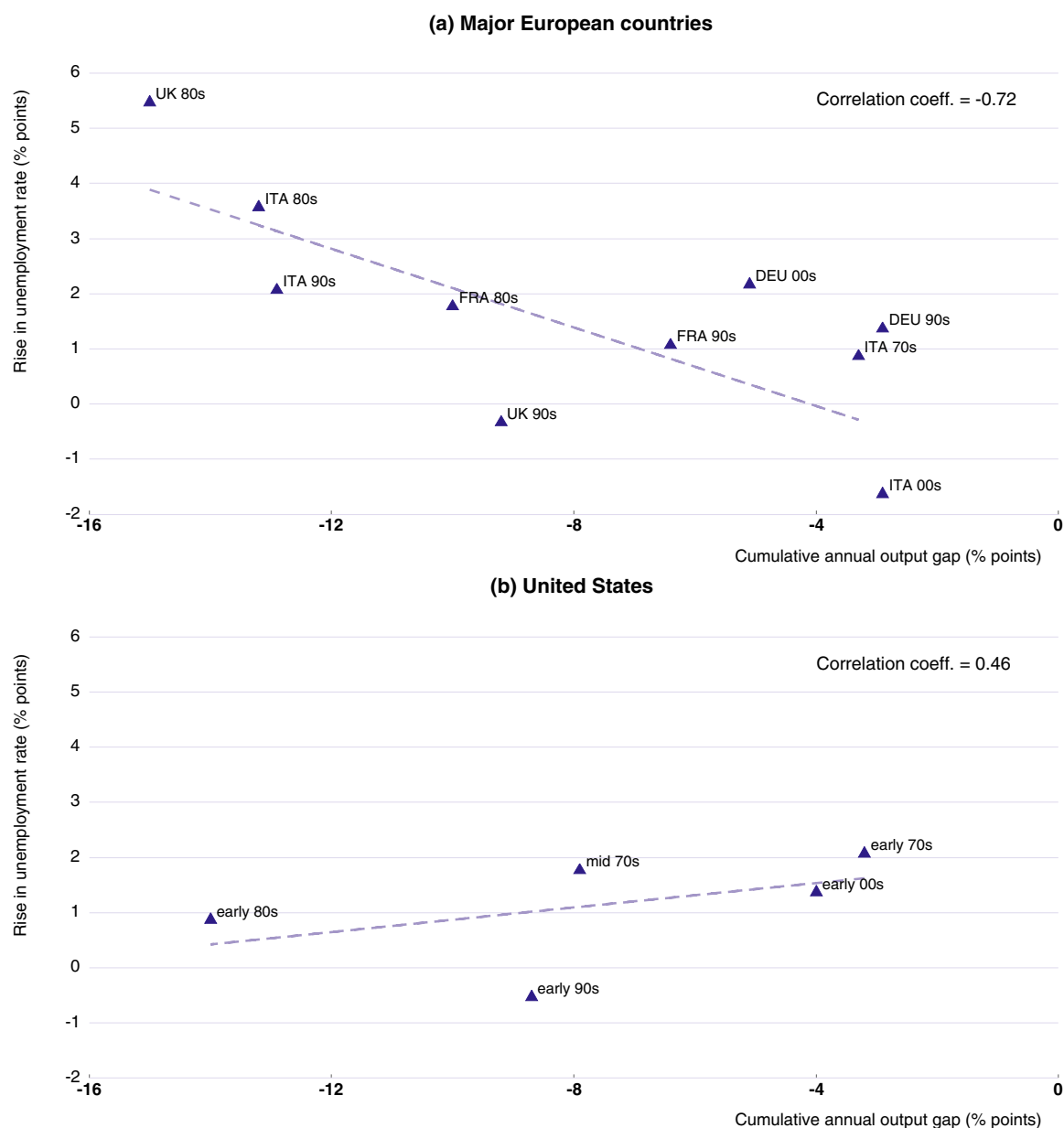
Note: The scatter plot shows the increase in the unemployment rate from the quarter when the output gap was closest to zero prior to a severe downturn to the quarter when the output gap was again closest to zero following it. Only downturns where the cumulative annual output gap exceeds 2 percentage points are considered.

Source: OECD Economic Outlook 85 database, OECD calculations.

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6. A notable exception is the United Kingdom which, as illustrated in Figure 4.2, experienced a major downturn during the early 1990s, but once output had recovered, the unemployment rate was no higher than prior to the downturn. This is likely to reflect relatively flexible labour markets (Kongsrud and Wanner, 2005).

weaker. Such effects might arise because workers that remain unemployed for a long period may become less attractive to employers, as a result of declining human capital or because their intensity of job search diminishes (Machin and Manning, 1998). As a result, the long-term unemployed put less downward pressure on wages and inflation and so can contribute to the persistence of unemployment.

The incidence of long-term unemployment rises with higher unemployment
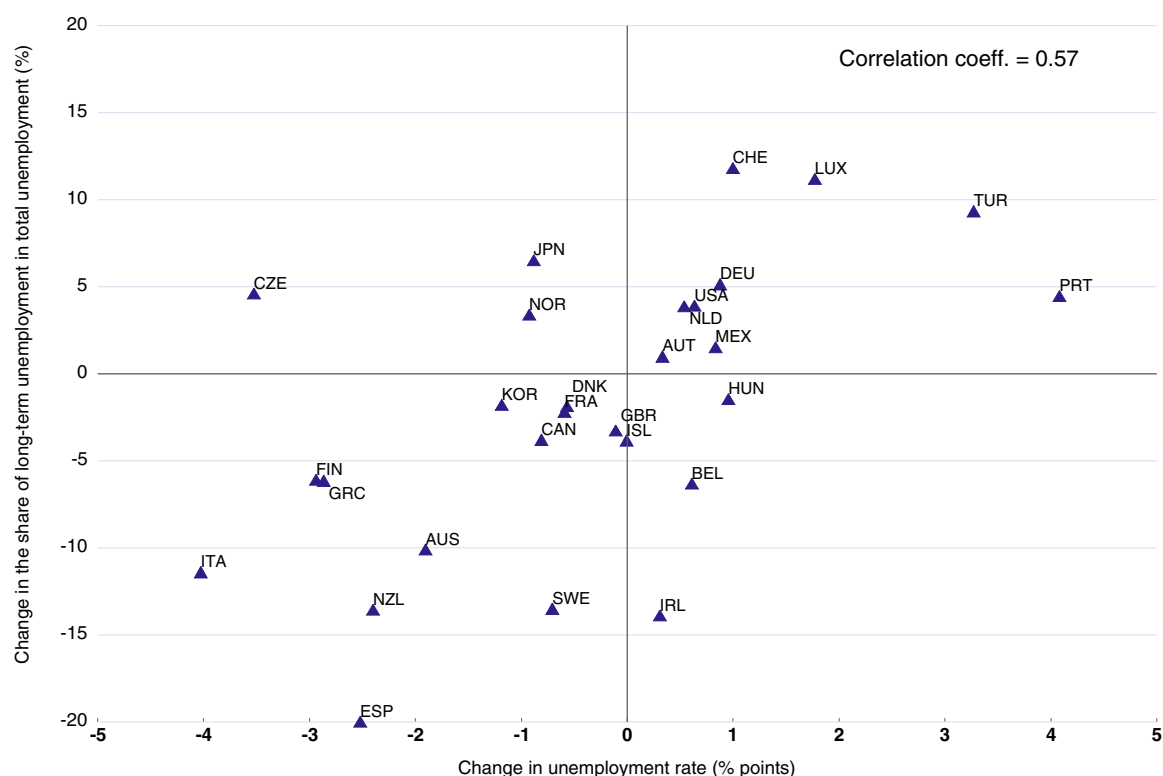
Long-term unemployment, which is thus a crucial element in hysteresis mechanisms, tends to rise with actual unemployment (after a little while). Indeed, a stylised feature of cross-country data is that changes in the incidence of long-term unemployment (*i.e.* the share of those unemployed for more than 12 months in total unemployment) are positively correlated with changes in the aggregate unemployment rate (Figure 4.3, see also OECD, 2002). This is also a general feature of a set of simple dynamic equations linking long-term unemployment to actual unemployment which are used to provide conditional projections of long-term unemployment, based on projections of aggregate unemployment.[7]

Long-term unemployment exerts less pressure on inflation

There is not, however, a one-to-one relationship between changes in long-term unemployment and changes in structural unemployment; the strength of this link depends *inter alia* on the relative effect of long- and short-term unemployment on wage bargaining and inflation. A number of studies suggest that across virtually all OECD countries the long-term unemployed exert significantly less pressure on wages than the short-term unemployed, but they do exert some effect. Llaudes (2005), which is the more recent of these studies, finds that the relative impact of the long-term unemployed on wages and prices varies across countries and is systematically much lower in continental Europe than in non-European countries. This implies that the share of the increase in long-term unemployment that is translated into structural unemployment is larger in Europe than elsewhere.[8]

7. Details of the equations used to project long-term unemployment can be found in a technical note "Adjustments to the OECD method of projecting the NAIRU" which is available online at *www.oecd.org/dataoecd/56/9/43098869.pdf*. This note also provides details of how the projections of unemployment have been translated into increases in long-term and structural unemployment.
8. For European countries, Llaudes (2005) typically finds that an increase in long-term unemployment only has one-quarter the inflationary effect of an equivalent increase in short-term unemployment. This result can be interpreted as showing that a 4 percentage point increase in long-term unemployment would be required to have the same effect on inflation as a 1 percentage point in short-term unemployment, so that three-quarters of the rise in long-term unemployment might be considered as increasing the NAIRU. To take into account that there have been important reforms in the European labour markets to increase their flexibility, NAIRU estimates in the present study are based on the assumption that the share of long-term unemployment that translates into increases in the NAIRU in Europe is two-thirds instead of three-quarters. In the case of the United Kingdom a lower share of one-third (similar to that for non-European countries) was used to take into account less tight employment protection and more flexible labour markets than in the rest of Europe.

Figure 4.3. **Changes in the incidence of long-term unemployment and aggregate unemployment, 2000-07**

Source: OECD Economic Outlook 85 database; OECD calculations.

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Projections of the NAIRU are derived from these results…

Based on this approach, increases in structural unemployment due to hysteresis-type effects were projected to 2010 and beyond. There are substantial cross-country differences in these projections resulting partly from different projections of the increase in actual unemployment, but also based on the differential responses of long-term unemployment and the proportion of the increase in long-term unemployment that becomes structural unemployment (Figure 4.4). In particular, on this basis, for the United States and Japan the expected increase in the structural unemployment rate is only 0.1-0.2 percentage points between the end of 2007 and end of 2010, while for the euro area as a whole the increase is much greater at 1½ percentage points, implying a structural rate of unemployment of 9%. To put the latter increase in perspective, on the basis of OECD estimates, it took more than a decade for the euro area structural unemployment rate to fall by a similar magnitude to a low of just over 7½ per cent in early 2008.

… but the size and timing of changes is uncertain

In practice there is of course great uncertainty not just about the magnitude of these effects but also about the speed with which they materialise. Thus, by 2010, while long-term unemployment will go up, the group of long-term unemployed may have been unemployed for a shorter

Figure 4.4. **Unemployment, long-term unemployment and NAIRUs, 1970-2010**

Source: OECD Economic Outlook 85 database; OECD calculations.

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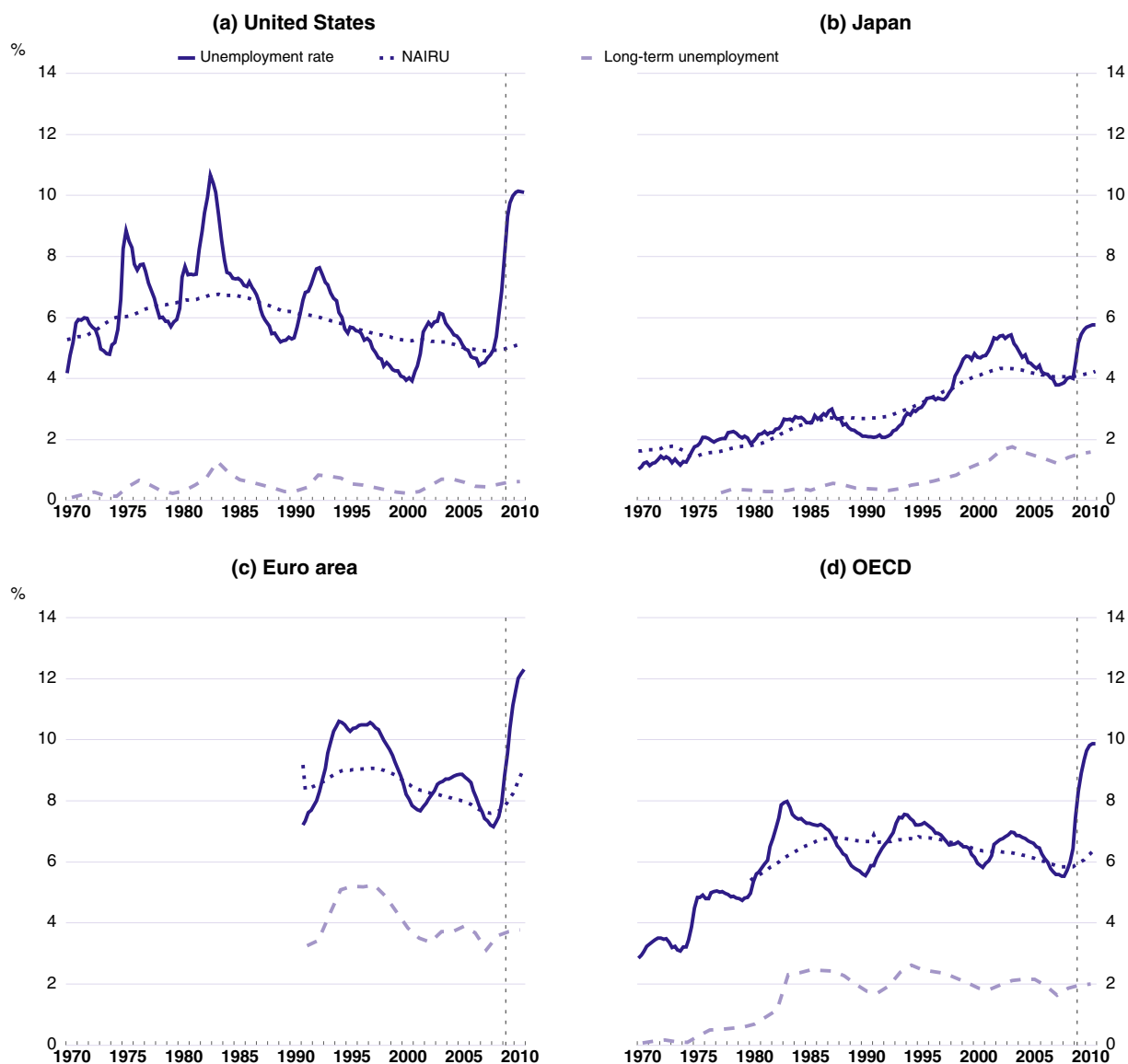
period on average than was the case for the period over which wage responses to long-term unemployment were estimated. Hence, the long-term unemployed could still play a significant role in wage bargaining, implying that structural unemployment may be overestimated in 2010, with the run-up coming later than assumed. Beyond 2010, and even if unemployment peaks in that year, given the lags in the operation of hysteresis effects there is a further increase in structural unemployment in 2011 and 2012. However, on average, three-quarters of the estimated total capital stock adjustment (see Box 4.2) and three-quarters of the rise

in structural unemployment due to hysteresis effects, will have already taken place.

Putting all the revisions together

The total effect of downward revisions to potential output since the previous *Economic Outlook* published in December 2008 are summarised and decomposed in Table 4.1.[9] For most countries the largest contribution to these revisions comes from changes to the contribution of capital,

Table 4.1. **Contributions to changes in potential output growth, 2009-10**

Percentage point pa differences in the potential growth rate

	2009				2010				Cumulative Contribution 2009-10
	from Potential Employment	from Total Factor Productivity	from Capital	Total	from Potential Employment	from Total Factor Productivity	from Capital	Total	
Australia	0.0	0.0	-0.1	-0.1	-0.2	0.0	-0.6	-0.7	-0.8
Austria	-0.2	-0.2	-0.8	-1.2	-0.3	-0.1	-1.2	-1.6	-2.8
Belgium	-0.1	0.0	0.3	0.1	-0.5	0.0	-0.1	-0.6	-0.5
Canada	-0.1	0.0	-0.4	-0.5	-0.1	0.0	-0.6	-0.8	-1.3
Denmark	0.1	0.0	-0.3	-0.1	-0.3	0.0	-0.5	-0.9	-1.0
Finland	0.1	0.0	-0.6	-0.5	-0.3	0.0	-1.2	-1.5	-2.0
France	-0.1	-0.1	-0.3	-0.5	-0.3	0.0	-0.5	-0.7	-1.2
Germany	0.0	0.0	-0.3	-0.3	-0.5	0.0	-0.6	-1.1	-1.4
Greece	-0.3	-0.2	-0.5	-1.0	-0.3	-0.2	-0.6	-1.1	-2.1
Ireland	-1.5	-1.1	-1.7	-4.3	-2.1	-1.1	-2.8	-6.1	-10.4
Italy	-0.3	0.0	-0.8	-1.1	-0.7	0.0	-1.0	-1.7	-2.7
Japan	-0.2	-0.1	-0.4	-0.6	-0.1	0.0	-0.5	-0.6	-1.2
Netherlands	-0.1	0.0	0.0	-0.1	-0.5	0.0	-0.3	-0.8	-0.9
New Zealand	0.0	0.0	-1.2	-1.2	0.0	0.0	-1.6	-1.6	-2.8
Poland	0.0	-0.3	-0.2	-0.4	-0.3	-0.1	-0.5	-0.9	-1.3
Portugal	-0.1	0.0	-0.4	-0.6	-0.5	0.0	-0.6	-1.1	-1.7
Spain	-1.4	0.0	0.1	-1.3	-1.3	0.1	-0.2	-1.4	-2.7
Sweden	-0.1	0.0	-0.3	-0.3	-0.3	0.0	-0.8	-1.1	-1.4
United Kingdom	-0.2	0.4	-0.2	0.0	-0.4	0.2	-0.7	-0.8	-0.8
United States	-0.1	0.0	-0.5	-0.6	-0.1	0.0	-0.8	-0.9	-1.5
Simple average	-0.2	-0.1	-0.4	-0.7	-0.4	-0.1	-0.8	-1.3	-2.0
Weighted average	-0.2	0.0	-0.4	-0.6	-0.3	0.0	-0.7	-1.0	-1.5

Note: Differences are between current projections and those of the previous Economic Outlook (No.84).

1. Weight reflecting size of GDP.

Source: OECD Economic Outlook 85 and 84 databases.

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9. For the *Interim Economic Outlook* published in March 2009 it was decided to keep estimates of potential output unchanged from those published in *Economic Outlook* of December 2008, although it was explicitly recognised that this probably implied an over-estimate of potential output.

which on average reduces potential output growth by about ½ and ¾ percentage point *per annum* in 2009 and 2010, respectively. The contribution of reduced potential employment growth (reflecting the higher NAIRU) to potential growth also tends to increase between 2009 and 2010 reflecting lags in the operation of hysteresis effects. As discussed, such effects are typically much larger for European economies; they are particularly large in Ireland and Spain, but for each of the largest European economies they reduce potential growth by ¼ to ½ per cent in 2010. The simple average across countries of the cumulative downward revision to the level of potential output in 2010 is about 2%, somewhat below the average of national authority revisions cited in Box 4.1. The implied downward revision to the level of OECD potential output in 2010 is about 1½ per cent, less than the simple average across all countries reflecting the smaller effect on potential employment in the larger non-European countries, especially the United States and Japan. By 2017 the reduction in OECD potential output is around 2¾ per cent (see below).

But there is great uncertainty surrounding these revisions

It should, however, be emphasised that not only is there great uncertainty surrounding the quantification of these reductions in potential output, but also that methodological issues concerning the use of statistical filters in the estimation of potential are particularly pertinent currently (Box 4.3). Furthermore, there are other mechanisms by which the crisis might impact on potential which have not been systematically considered at all, such as effects on labour force participation. As already mentioned, the fall in the value of their retirement pensions due to the financial crisis may induce some workers to stay longer than planned in the labour force

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Box 4.3. **The sensitivity of output gap estimates to the end-point treatment**

A pervasive problem in estimating potential output and the output gap is the "end-point problem" which arises because most methods, even those that rely on a production function framework, use statistical filters to smooth at least some of the input series to identify the underlying trend. This is the case for series including labour force participation, working hours, and total factor productivity. The end-point problem arises because if the last historical value of a series is at a cyclical peak or cyclical trough, the corresponding filtered series can give a misleading representation of the underlying trend. To overcome this, a common approach is to apply the filter to the historical series supplemented by projected values.

The treatment of the end-point is, however, of much greater importance than usual in the current conjuncture because of the abruptness of the collapse in output. Following the normal procedure (of filtering history supplemented with updated projections) drags down potential output estimates not only over the period when the crisis most affected output (*i.e.* from the fourth quarter of 2008) but also over preceding years, given the two-sided nature of the filter being used (as well as the severity of the downturn). If applied mechanically, this would imply a much larger positive output gap (*i.e.* output exceeding potential) in the period prior to the crisis than was previously estimated in the *March 2009 Interim Economic Outlook* (and previous *Economic Outlooks*), as illustrated by the "alternative output gap" in the Figure below. This scenario might be caricatured as a "pronounced global boom-bust", in contrast with the "bust without boom" view, which suggests a sudden crash in the global economy occurred at the end of 2008 following limited excess demand pressure (represented by the *March 2009 Interim Economic Outlook* output gap in the figure below).[1]

Box 4.3. **The sensitivity of output gap estimates to the end-point treatment** (*cont.*)

These two extreme hypotheses have different implications for the role of macroeconomic policy errors in the crisis.[2] On the "boom-bust" view, an unsustainable positive output gap clearly had built up prior to the crisis. However, this hypothesis sits uneasily with the limited signs of substantial upward pressure on core measures of consumer price inflation prior to the crisis. Nonetheless, it might be argued that inflationary pressures instead materialised in the form of credit and asset market bubbles and pressure on commodity prices. Under this interpretation, monetary policy would have been overly easy before the crisis,[3] whereas no such implication flows from the "bust without boom" hypothesis.

The current estimates of potential output fall somewhere in between the two extremes. Thus, for the current estimates of potential, the historical values of the input series in question were supplemented with a vintage of projections that were made prior to the crisis. This results in a more abrupt fall in potential output, but only since the onset of the crisis. Relative to the *March 2009 Interim Economic Outlook,* the current estimates imply a slightly larger excess demand gap in the period preceding the crisis, and a smaller excess supply gap following it (Figure).

The sensitivity of output gap estimates to the end-point treatment
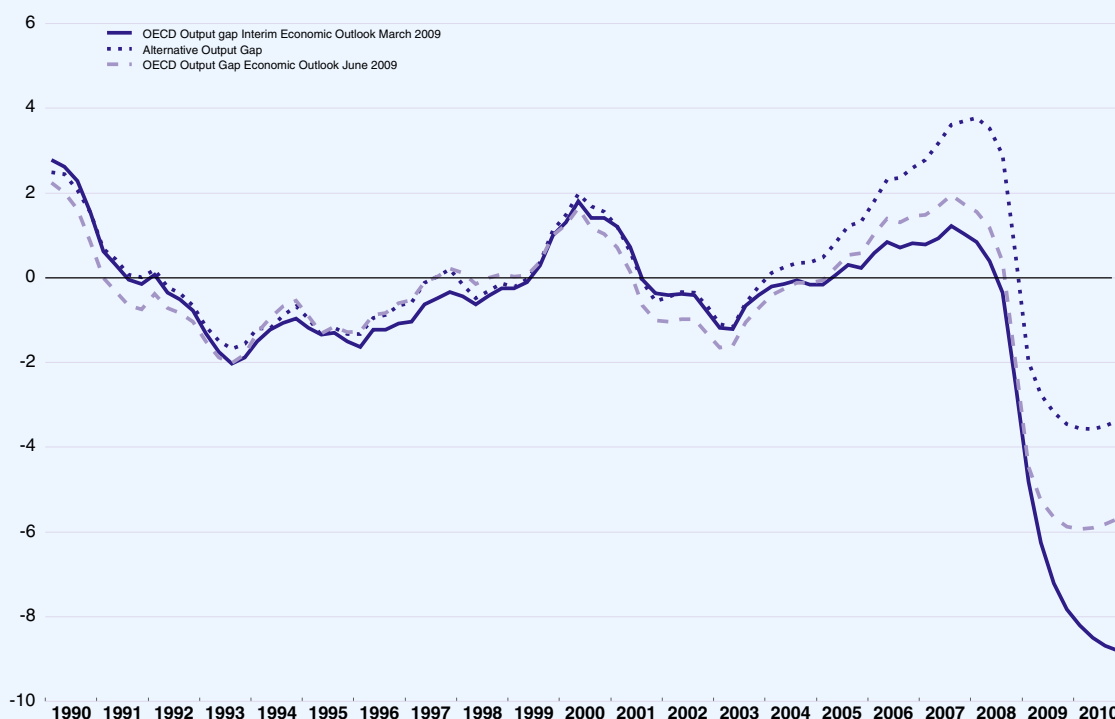
Source: OECD Economic Outlook database and OECD calculations.

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1. This comparison is similar to the one conducted by R. Chote (2009), "A bust without a boom?" Institute for Fiscal Studies, April, (*www.ifs.org.uk/publications/4513*).
2. Monetary policy implications of measurement error in output gaps are discussed in Orphanides *et al.* (2000). A related issue, examined by Orphanides and van Norden (2002), is the inferior reliability of output gap estimates based on real-time data for predicting inflation.
3. This view is supported by the findings of Ahrend *et al.* (2008) and Taylor (2008).

in some countries. On the other hand, with high unemployment, discouraged workers may exit – or not join – the labour force. Another factor creating uncertainty over the direction of labour force changes is the response of migration flows to the economic downturn. Since international migration tends to be cyclical, a global economic downturn may reverse the inflow of migrant workers into many OECD countries observed over recent history, with consequences on labour supply and the NAIRU.[10] The crisis is also likely to lead to a reallocation of labour across sectors with potential effects on productivity and, to the extent the reallocation is unsuccessful, unemployment. Finally, policy responses may either mitigate or further exacerbate some of the adverse effects on potential output of the crisis, as discussed further in the following section.

A medium-term scenario to 2017

The starting point of the medium-term scenario is far from equilibrium

A medium-term scenario has been constructed by extending the short-term projections using a stylised framework (Box 4.4) underpinned by projections of potential output. While such an exercise is routinely carried out, the current set of short-term projections makes it more difficult than usual because the starting position (in 2010) for most countries is so far from macroeconomic equilibrium, particularly because of large output gaps. For this reason the horizon beyond the short-term projections has been extended to seven years rather than the customary five. Most of the assumptions underlying the scenario, tend to err on the optimistic side, including that: the crisis itself has no permanent adverse effect on the rate of growth of total factor productivity or potential output; output gaps are closed as a result of sustained above-trend-growth (despite significant fiscal consolidation); and most countries do not experience deflation despite continued negative output gaps over this period, and eventually experience a smooth return to targeted inflation by the end of the period. This is consistent with inflation expectations remaining fairly well anchored and with the operation of "speed-limit" effects. A less optimistic assumption is that the slow decrease in actual unemployment does not translate into lower structural unemployment over the period.

The crisis explains only a small part of slowing potential growth beyond 2010

From 2011 onwards the growth rate of area-wide potential output, recovers to average about 1¾ per cent per annum, but this is still below the growth rates of 2-2¼ per cent per annum achieved over the seven years preceding the crisis (Table 4.2). Most of this difference is explained by slower growth in potential employment rather than lower productivity growth. This in turn is due to slower growth both in participation rates and in the working-age population, partly reflecting ageing populations.

10. The effects of immigration on the NAIRU are uncertain and depend on how well immigrants integrate in the labour market. Several studies find evidence suggesting that increased immigration has likely reduced the natural rate of unemployment. For example, see Borjas (2001) for the United Kingdom, and Blanchflower *et al.* (2007) for the United States.

Box 4.4. **Assumptions underlying the medium-term stylised scenario**

The medium-term stylised scenario is conditional on the following stylised assumptions for the period beyond the short-term projection horizon:

● The gap between actual and potential output is eliminated by 2017 in all OECD countries.

● Unemployment returns to its estimated structural rate in all OECD countries by 2017. Estimates of the NAIRU are based on Gianella *et al.* (2008), but over the projection period incorporate hysteresis effects as described in the main text.

● Oil and other commodity prices rise by 3% per annum in real terms beyond 2010.

● Exchange rates remain unchanged in nominal terms.

● Monetary policy rates remain low and are directed at avoiding deflation and, towards the end of the scenario, are normalised in order to bring inflation in line with medium-term objectives.

● Fiscal policies are based on the assumptions that fiscal stimulus packages in operation during 2010 are removed from 2011 onwards. Some further improvement in fiscal balances comes about as automatic stabilisers react to output gaps being closed. The scale of additional consolidation, over and above the removal of fiscal stimulus packages, is assumed to be dependent on the projected 2010 financial balance:

  ❖ Those countries (Denmark, Finland, Hungary, Korea, Norway, Switzerland, Mexico and Sweden) with a financial deficit of less than half of the OECD average in 2010 (*i.e.* 4½ per cent of GDP) are assumed to have no fiscal consolidation over and above the removal of temporary fiscal stimulus packages (as represented by a stable underlying primary fiscal balance).

  ❖ Those countries (United States, United Kingdom, Spain and Ireland) with a financial deficit of more than the OECD average of around 9% of GDP in 2010 are assumed to have a progressive fiscal consolidation of 1 percentage point of GDP (as reflected in an improvement in the underlying primary balance) each year from 2011.

  ❖ Finally all other countries, namely those with a financial deficit of more than 4½ but less than 9% of GDP in 2010, are assumed to have a progressive fiscal consolidation of 1 percentage point of GDP for three years from 2011. These consolidation assumptions are necessarily stylised and do not take into account either initial debt levels or the future fiscal implications of ageing populations, and do not incorporate any official medium-term fiscal consolidation plans beyond 2010.

It is further assumed that there are no further losses to government balance sheets as a result of asset purchases or guarantees made in dealing with the financial crisis.

● In those countries, where the usual cyclical rebound in corporate taxes from their depressed level in 2010 leaves them well still below historical norms, corporate taxes have been boosted to ensure that by 2017 the corporate tax-to-GDP ratio has at least reached the average experienced over the period 1998-2008.

● Consistent with the analysis set out in Box 4.2, potential growth has been adjusted down marginally from 2011 on for all member countries to reflect the remaining impact, over and above the adjustment in 2009-10, of higher financial risk premia on the supply side. As well, a further limited rise in NAIRUs above 2010 levels is implied by the assumed dynamic adjustment pattern.

The negative contribution to potential output growth from rising structural unemployment in Europe is small (about 0.1% per annum and only in 2011 and 2012). This might be contrasted with the decade prior to the crisis when falling structural unemployment, generally attributed to widespread labour market reforms (OECD, 2008a), was consistently making a (small) positive contribution to potential growth throughout the OECD. Taken together, these estimates of lower potential growth

Table 4.2. **Growth in total economy potential output and its components**

Annual averages, percentage points

| | Output gap | Potential GDP growth | | | Potential labour productivity growth (output per employee) | | | Potential employment growth | | | Components of potential employment[1] | | | | | | | | |
| | | | | | | | | | | | Trend participation rate | | | Working age population | | | Structural unemployment[2] | | |
	2010	2006-2008	2009-2010	2011-2017	2006-2008	2009-2010	2011-2017	2006-2008	2009-2010	2011-2017	2006-2008	2009-2010	2011-2017	2006-2008	2009-2010	2011-2017	2006-2008	2009-2010	2011-2017
Australia	-5.8	3.6	2.8	2.4	1.3	1.0	1.3	2.3	1.8	1.0	0.4	0.2	0.1	1.8	1.8	1.0	0.1	-0.2	0.0
Austria	-4.5	1.9	1.0	1.7	1.2	0.5	1.3	0.7	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.1	0.0	-0.4	0.0
Belgium	-7.6	2.5	1.8	1.0	1.3	1.2	1.2	1.2	0.6	-0.2	0.2	0.1	0.1	1.0	0.9	-0.1	0.0	-0.4	-0.1
Canada	-5.4	2.4	1.6	1.7	0.7	0.6	1.2	1.6	1.1	0.4	0.3	0.2	0.1	1.2	1.0	0.4	0.1	-0.1	0.0
Denmark	-5.2	1.7	0.5	1.1	0.8	0.7	1.3	0.8	-0.3	-0.2	0.4	0.0	0.0	0.3	0.0	-0.1	0.1	-0.3	-0.1
Finland	-7.3	3.2	1.8	1.7	2.0	1.6	2.3	1.3	0.3	-0.5	0.7	0.2	0.1	0.4	0.3	-0.5	0.2	-0.3	-0.1
France	-4.9	1.7	1.2	1.4	0.8	0.8	1.1	0.8	0.4	0.3	0.1	0.0	0.0	0.6	0.6	0.4	0.2	-0.3	0.0
Germany	-5.7	1.2	0.8	1.1	0.8	0.9	1.2	0.4	0.0	-0.1	0.7	0.4	0.2	-0.4	-0.1	-0.2	0.1	-0.3	-0.1
Greece	-6.2	3.6	2.7	2.9	2.3	2.3	2.8	1.2	0.4	0.2	0.6	0.5	0.4	0.5	0.3	-0.2	0.2	-0.4	0.0
Iceland	-9.0	5.0	0.8	1.5	2.1	0.8	1.2	2.8	0.0	0.4	-0.6	-0.1	0.0	3.4	0.5	0.4	0.0	-0.4	0.0
Ireland	-8.1	3.9	-1.9	1.6	1.0	-0.1	1.4	2.9	-1.8	0.2	0.5	0.3	0.0	2.4	-0.4	0.4	0.0	-1.7	-0.2
Italy	-5.8	0.9	-0.1	0.9	-0.2	0.3	1.0	1.1	-0.3	-0.1	0.5	0.4	0.2	0.5	0.1	-0.3	0.2	-0.8	-0.1
Japan	-6.1	1.0	0.6	0.8	1.3	1.2	1.6	-0.3	-0.6	-0.8	0.4	0.2	0.2	-0.8	-0.7	-0.9	0.0	-0.1	0.0
Mexico	-7.5	2.5	1.9	2.8	0.6	0.5	1.1	1.9	1.5	1.6	0.1	0.1	0.1	1.8	1.4	1.5	0.0	0.0	0.0
Netherlands	-5.8	2.0	1.3	1.3	1.2	1.1	1.2	0.8	0.1	0.1	0.6	0.4	0.4	0.2	0.2	-0.2	0.0	-0.4	-0.1
New Zealand	-5.1	2.6	1.0	1.8	0.7	-0.1	1.1	1.9	1.1	0.7	0.4	0.3	0.0	1.4	0.9	0.7	0.1	-0.1	0.0
Norway[3]	-3.8	4.0	3.2	2.9	2.2	2.5	2.5	1.7	0.7	0.4	0.2	0.3	0.1	1.3	0.6	0.3	0.2	-0.2	0.0
Poland	-3.8	4.6	4.4	2.1	2.5	2.6	2.7	2.1	1.7	-0.6	-0.5	-0.3	0.0	0.4	0.6	-0.6	2.3	1.4	0.0
Portugal	-5.7	0.8	0.2	0.7	0.3	0.3	0.7	0.5	-0.1	-0.1	0.4	0.2	0.0	0.1	0.1	0.0	-0.1	-0.4	-0.1
Spain	-8.2	3.1	1.2	2.1	0.3	1.7	1.7	2.8	-0.5	0.4	1.0	0.6	0.1	1.7	0.4	0.4	0.1	-1.4	-0.1
Sweden	-8.7	2.9	1.8	1.9	2.0	1.7	1.9	0.9	0.0	0.0	-0.3	-0.2	-0.1	1.1	0.4	0.1	0.1	-0.2	-0.1
Switzerland	-4.8	2.0	1.8	1.4	0.5	1.0	1.7	1.5	0.8	-0.3	0.5	0.1	-0.6	1.0	0.9	0.4	0.0	-0.1	0.0
United Kingdom	-6.4	2.2	1.3	1.7	1.4	1.3	1.6	0.8	0.0	0.1	0.0	0.0	0.0	0.8	0.3	0.2	0.0	-0.3	-0.1
United States	-5.4	2.4	1.5	2.0	1.7	1.0	1.5	0.7	0.5	0.5	-0.4	-0.6	-0.5	1.1	1.2	1.1	0.0	-0.1	0.0
Euro area	-6.0	1.7	0.9	1.3	0.7	0.9	1.2	1.1	0.0	0.1	0.5	0.3	0.2	0.4	0.2	0.0	0.1	-0.6	-0.1
Total of above OECD countries	-5.7	2.1	1.4	1.7	1.3	1.0	1.5	0.8	0.3	0.2	0.0	-0.1	-0.1	0.7	0.6	0.4	0.1	-0.2	0.0

1. Percentage point contributions to potential employment growth.
2. Estimates of the structural rate of unemployment are from Gianella *et al.* (2008), based on the concepts and methods described in OECD (2000).
3. Excluding the oil sector.
Source: OECD Economic Outlook 85 database.

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beyond 2010 than before the crisis embody effects which are mostly not new nor specifically related to the crisis. Compared to previous OECD medium-term projections (OECD, 2008b), the level of area-wide potential output is lower by about 2¾ per cent in 2017, but the growth rate by that year is little changed, as most of the hit to the level of potential output already took place in the crisis years.

But many underlying assumptions err on the cautious side

Given the assumption that large negative output gaps close, and despite slower potential growth, GDP growth is robust over the period 2011-17, with area-wide growth averaging 2¾ per cent per annum, compared to 2¼ per cent per annum over the period 2000-08 (Table 4.3). Unemployment is falling in all countries, from peaks in 2010, with the area-wide unemployment rate down from 9¾ per cent in 2010 to a rate of 6½ per cent by 2017. However, in most European countries the unemployment rate remains above pre-crisis levels. This stems from the assumption that hysteresis effects are asymmetric in the sense that they tend to raise the NAIRU when unemployment rises, but do not lower the NAIRU when unemployment falls.

Table 4.3. **Stylised medium-term scenario**

Per cent

	Real GDP growth	Inflation rate[1]		Unemployment rate[2]		Long-term interest rate	
	2011-2017	2010	2017	2010	2017	2010	2017
Australia	3.2	2.2	2.5	7.7	5.7	4.3	6.3
Austria	2.3	0.8	2.0	7.9	6.2	4.4	4.9
Belgium	2.2	0.9	2.0	10.6	9.6	4.7	5.0
Canada	2.5	0.9	2.1	9.8	6.9	3.9	5.1
Czech Republic	4.0	1.2	2.1	9.2	8.0	4.8	5.0
Denmark	1.8	1.4	2.0	7.9	5.2	4.2	4.9
Finland	2.9	1.7	2.0	10.8	8.4	4.1	4.8
France	2.1	0.5	2.0	11.2	9.0	4.1	4.8
Germany	1.9	0.4	2.0	11.6	9.7	4.0	4.7
Greece	3.9	1.8	2.0	10.3	9.7	5.6	5.5
Hungary	4.3	3.4	2.1	11.7	8.2	10.3	5.5
Iceland	2.9	2.4	2.8	9.9	3.9	7.7	7.0
Ireland	2.8	-1.4	2.1	14.8	9.4	5.0	5.2
Italy	1.7	1.2	2.0	10.2	8.5	4.8	5.1
Japan	1.7	-1.5	1.1	5.7	4.3	2.0	3.3
Korea	4.9	2.0	3.0	3.9	3.5	5.4	7.0
Luxembourg	5.5	1.2	2.0	7.2	4.4	4.4	4.9
Mexico	3.9	3.2	3.2	6.9	3.2	5.8	6.9
Netherlands	2.2	0.9	2.0	7.0	4.9	4.2	4.8
New Zealand	2.6	1.2	2.1	7.9	4.4	6.1	5.7
Norway	3.5[3]	1.3	2.1	4.3	3.9	3.9	4.7
Poland	2.6	1.7	2.1	11.6	10.2	4.9	5.6
Portugal	1.5	1.0	2.0	11.2	8.0	4.5	5.0
Slovak Republic	5.3	1.9	2.9	13.6	11.6	4.7	5.4
Spain	3.3	0.3	2.0	19.6	12.6	4.8	5.1
Sweden	3.2	0.9	2.0	11.4	7.8	4.0	4.8
Switzerland	2.1	0.6	1.1	5.1	4.1	2.9	3.1
United Kingdom	2.7	1.0	2.1	9.7	6.3	4.4	5.5
United States	2.8	0.8	2.0	10.1	5.2	4.1	5.2
Euro area	2.3	0.7	2.0	12.0	9.4	4.4	4.9
Total OECD	2.7	0.8	2.0	9.8	6.5	4.1	5.0

Note: For further details see *OECD Economic Outlook* Sources and Methods (*http://www.oecd.org/eco/sources-and-methods*).
1. Percentage change from the previous period in the private consumption deflator.
2. Per cent of labour force.
3. Including oil-sector.
Source: OECD Economic Outlook 85 database.

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For many countries fiscal consolidation is inevitable

In 2010 fiscal deficits in many countries are large, with a substantial component which is not explained by the cycle (Table 4.4). In these circumstances, the usual technical assumption that there is no further

Table 4.4. **Fiscal trends in the stylised medium-term scenario**

As a percentage of nominal GDP

	Consolidation incl. stimulus removal[1]	Financial balances[2]			Net financial liabilities[3]			Gross financial liabilities[4]		
	2010-2017	2007	2010	2017	2007	2010	2017	2007	2010	2017
No consolidation										
Denmark	2.2	4.5	-4.1	0.8	-4	2	3	32	51	53
Finland	1.7	5.2	-2.8	3.1	-71	-47	-44	41	52	55
Hungary	0.0	-4.9	-4.2	0.8	53	61	45	72	87	61
Korea	1.2	4.7	-2.3	1.1	-36	-31	-21	26	39	49
Norway	0.0	17.7	7.0	8.6	-143	-138	-142	58	72	66
Sweden	2.0	3.8	-4.5	1.5	-20	-6	-8	48	57	56
Switzerland	0.2	1.3	-2.5	-0.3	12	14	18	48	48	52
Three years of consolidation										
Australia	4.8	1.8	-5.0	1.4	-7	0	-1	15	21	21
Austria	3.3	-0.7	-6.1	-1.6	31	43	48	62	79	84
Belgium	3.7	-0.3	-6.1	2.6	73	86	61	88	106	81
Canada	5.0	1.6	-5.9	2.4	23	33	18	64	82	67
Czech Republic	4.2	-0.6	-4.9	2.3	-8	3	-5	38	39	18
France	3.2	-2.7	-7.9	-1.7	34	57	61	70	94	99
Germany	4.7	-0.2	-6.2	1.4	43	57	43	65	84	71
Greece	3.0	-3.9	-6.7	0.0	70	83	65	103	112	94
Iceland	3.0	5.4	-7.2	-0.2	-1	37	39	54	109	110
Italy	3.0	-1.5	-5.8	0.3	87	102	87	112	127	112
Japan	4.2	-2.5	-8.7	-3.2	80	107	114	167	200	208
Luxembourg	4.4	3.6	-4.9	2.7	-45	-42	-30	10	21	8
Netherlands	4.3	0.3	-7.0	3.3	28	38	24	51	77	63
New Zealand	4.5	5.0	-5.0	3.6	-13	-8	-17	26	33	24
Poland	3.3	-1.9	-7.6	-3.1	17	33	47	52	64	78
Portugal	3.0	-2.7	-6.5	-1.0	44	63	64	71	90	91
Slovak Republic	3.8	-1.9	-6.3	1.4	-1	7	1	32	41	21
Seven years of consolidation										
Ireland	7.0	0.2	-13.6	-5.0	0	38	82	28	80	125
Spain	7.9	2.2	-9.6	2.7	19	43	40	42	68	66
United Kingdom	7.1	-2.7	-14.0	-5.6	29	61	97	47	89	125
United States	9.4	-2.9	-11.2	-0.5	43	69	74	63	98	103
Euro area		-0.7	-7.0	0.7	44	58	53	71	89	85
Total of above countries		-1.4	-8.8	-0.5	39	60	63	74	100	104

Note: For further details see *OECD Economic Outlook* Sources and Methods (*http://www.oecd.org/eco/sources-and-methods*).
   The projections assume that fiscal stimulus packages in operation during 2010 are removed from 2011 onwards.The scale of additional consolidation, over and above the removal of fiscal stimulus packages, is assumed to be dependent on the initial financial balance. Those countries with a financial deficit of less than 4½ per cent of GDP in 2010 are assumed to have no additional fiscal consolidation. Those countries, with a financial deficit of more than 9% of GDP in 2010 are assumed to have a progressive additional fiscal consolidation of 1 percentage point of GDP (as reflected in an improvement in the underlying primary balance) each year from 2011, lasting seven years to 2017. Finally all other countries, namely those with a financial deficit of more than 4½ but less than 9% of GDP in 2010, are assumed to have a progressive additional fiscal consolidation of 1 percentage point of GDP each year from 2011, lasting three years. No attempt has been made to incorporate any official medium-term fiscal consolidation plans beyond 2010.
1. Assumed fiscal consolidation in terms of percentage points of GDP improvement in the underlying balance, including the removal of fiscal stimulus packages in operation in 2010.
2. General government fiscal surplus (+) or deficit (-) as a percentage of GDP.
3. 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 government, state and local government and the social security sector.
4. 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 government, state and local government and the social security sector. The definition of gross debt differs from the Maastricht definition used to assess EU fiscal positions.
Source: OECD Economic Outlook 85 database.

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fiscal consolidation over the medium term seems inappropriate. Indeed, fiscal consolidation is inevitable for many countries, as is already recognised by many OECD governments which have announced plans for moving back towards more sustainable fiscal positions (Box 4.5).

Box 4.5. **Medium term fiscal consolidation plans**

In reaction to the widening fiscal deficits and rising government debt resulting from policy responses to the financial crisis, governments of several countries have announced medium term plans to consolidate budget balances, which are not reflected in the current medium-term baseline scenario. Information provided on the specific measures proposed to achieve these plans varies by country, as well as the certainty with which they will be implemented, and are described below where available.

United States: Administration plans to consolidate fiscal balances aim to reduce the federal budget deficit to 3.5% of GDP in 2012. The proposed measures include the scheduled expiry of tax provisions originating in 2001 and 2003, an increase in tax rates on capital gains and dividends, an extension of estate taxes, and a reduction in itemised deductions.

Germany: A reformed fiscal rule has been adopted by Parliament and is to be implemented in 2011, requiring the structural budget deficit to not exceed 0.35% of GDP for the central government, and balanced structural budgets for the *Länder*. The planned transition path will allow higher, but steadily decreasing structural deficits until 2015 for the central government, and until 2019 for the *Länder*.

Italy: Fiscal plans intend to keep the underlying fiscal deficit constant at 2.9% of GDP in 2011, and increase the underlying primary surplus from 2.5% of GDP in 2010 to 2.8% of GDP in 2011, although no specific measures have been communicated.

United Kingdom: The UK Government foresees an annual average fiscal consolidation of 1⅓ per cent of GDP from 2010 to 2014, towards a target of reducing the structural deficit by 8¾ per cent of GDP by 2018. Specific consolidation measures announced up to date include tax increases on fuel, alcohol and tobacco, an increase in the top income tax rate, higher social security contributions, lower growth in current spending and reductions in public net investment.

Australia: A commitment to hold real growth in government spending below 2% per year has been announced, aiming to halve the budget deficit by 2012-13 and achieve a surplus by 2015-16.

Austria: An intention to reduce the budget deficit below 3% of GDP by 2012 has been announced.

Belgium: The medium term objective of a balanced budget in 2015 has been specified, involving a structural tightening of about 1% of GDP per year from 2010 onwards. The tightening in each individual year is to remain growth-dependent and no concrete measures to achieve the objective have been proposed.

Denmark: The tax reform package aims to begin removing fiscal stimulus in 2011, with measures phased in gradually to ensure the package is budget neutral by roughly 2013. Measures include higher taxes on pollution and energy consumption, and cuts to the tax deductibility of employment-related expenses and mortgage interest payments.

Ireland: Planned consolidation measures aim to achieve a fiscal deficit of 3% of GDP by 2013. A combination of spending and revenue measures amounting to over 2.5% of GDP is planned for each of 2010 and 2011, and further consolidation is planned for 2012 and 2013.

Netherlands: An announced spending cut is planned in 2011, conditional on growth, with plans to reduce the deficit by at least 0.5% of GDP per year beyond 2011. Expenditure reductions will in part affect childcare and health subsidies.

Box 4.5. **Medium term fiscal consolidation plans** (*cont.*)

New Zealand: Plans to achieve fiscal sustainability involve overall savings of 4% of GDP, in large part over 2011-13. Proposed measures include a delay of the planned personal income tax cut over 2010-11 (until economic and budget conditions allow reconsideration), and a reduction of the operating allowance for new spending in future budgets.

Portugal: Fiscal consolidation plans (suspended since the financial crisis) are planned to resume upon the recovery of economic conditions, with the objective of reducing the structural budget deficit by 0.5% of GDP per year. Intentions include reforms to public administration, primarily through reducing public sector employment, as well as using public sector resources more efficiently.

Spain: An intention to reduce the budget deficit to 3% of GDP by 2012 has been announced. No specific decisions have yet been taken, but measures have been proposed to impose ceilings with respect to household income on the deductibility of interest and amortisation of new mortgages from owner occupiers' income tax liabilities, beginning in 2011.

The scale of action needs to be ambitious…

The extent of future fiscal consolidation depends, by assumption, on the initial financial balance.[11] Those countries with a financial deficit of less than half of the OECD average (*i.e.* 4½ per cent of GDP in 2010) are assumed to have no fiscal consolidation (as represented by a stable underlying primary fiscal balance after 2011) apart from the removal of stimulus packages introduced in response to the crisis. Those countries with a financial deficit of more than 4½ per cent of GDP but less than the OECD average (*i.e.* around 9% of GDP in 2010) are assumed to have a progressive fiscal consolidation, by which the underlying primary balance is strengthened by an additional 1 percentage point of GDP for three years. Finally, those countries with a financial deficit of more than the OECD average of around 9% of GDP in 2010 are also assumed to have a progressive fiscal consolidation of 1 percentage point of GDP each year, but for seven years. The form of these consolidation assumptions is necessarily stylised and does not take into account either initial debt levels or the future fiscal implications of ageing populations, and does not incorporate any official medium-term fiscal consolidation plans beyond 2010.[12] Furthermore, it is assumed that fiscal stimulus packages in operation during 2010 are removed and that there are no further losses to government balance sheets as a result of asset purchases or guarantees made in dealing with the financial crisis. Likewise, effects on public budgets from population ageing and continued upward pressures on health spending are not explicitly included or, put differently, implicitly assumed to be offset by other budgetary measures.

11. These fiscal consolidation assumptions are in addition to the removal, from 2011 onwards, of the effect of any fiscal stimulus package in 2010.
12. In those countries, where the usual cyclical rebound in corporate taxes from their depressed level in 2010 leaves them well still below historical norms, corporate taxes have been boosted to ensure that by 2017 the corporate tax-to-GDP ratio has at least reached the average experienced over the period 1998-2008.

... but is not unprecedented...

The scale of the assumed fiscal consolidations, judged by historical experience, is ambitious but not unprecedented. Most of the 85 fiscal consolidation episodes among 24 OECD countries identified by Guichard *et al.* (2007), were of short duration (the median duration was two years) and involved only modest gains (the median improvement of the underlying primary balance was 2.8% of potential GDP). Nevertheless, 31 lasted for at least three years including three lasting for at least seven years. 39 episodes involved an improvement of the underlying primary balance by at least 3% of potential GDP, including nine episodes involving an improvement of the underlying primary balance by at least 7% of potential GDP. Two episodes lasted for at least seven years and involved an average effort of 1% point per year; they both took place in Sweden after the second oil shock and then the banking crisis of the early 1990s. The assumed fiscal consolidation does, however, deviate from past patterns in being highly synchronised across countries, involving little compensatory effects from external demand during the adjustment, even in countries most open to trade.

... with an emphasis on expenditure cuts rather than higher taxes...

The assumed fiscal consolidation takes the form of lower government primary expenditures, partly because there is some evidence that this is more likely to achieve substantive and sustained fiscal consolidation, but also because raising tax revenues is likely to have adverse consequences on supply-side potential. Previous OECD work suggests that more successful fiscal consolidation episodes tend to be associated with clear prior commitment, for example embodied in credible fiscal targets or expenditure rules.[13] There is also evidence that the composition of fiscal consolidation is important for saving and growth, with spending based consolidation resulting in lower household saving and higher GDP growth (Bassanini *et al.*, 2001; Ardagna, 2004 and 2007). Cournède and Gonand (2006), in the context of a dynamic general equilibrium model with overlapping generations, argue that tax increases are a more costly way of achieving fiscal sustainability than spending restraint. However, given the size of the required adjustment in many countries, assuming that it will happen only through spending cuts alone, and that these will have no negative supply-side consequences, probably errs on the optimistic side. Insofar as tax increases may also become necessary, recent OECD evidence (Johansson *et al.*, 2008) finds that among taxes, corporate taxes are the most harmful for growth, followed by personal income taxes, then consumption taxes, with recurrent taxes on immovable property having the least impact.

13. For evidence regarding the relative effectiveness of previous fiscal consolidation efforts see Guichard *et al.* (2007), who find that fiscal rules with embedded expenditure targets tended to be associated with larger and longer adjustments. This could reflect that well designed fiscal rules are effective or, alternatively, that countries supplementing the objective to achieve fiscal balance with expenditure rules are in general more committed to pursuing fiscal consolidation, and in particular to addressing issues regarding spending control.

... and would contain the increase in debt levels

Under the assumptions made – including no further losses related to financial rescue programmes and health and ageing-based spending pressures being offset from within budgets – fiscal consolidation as described would be sufficient to return budgets to surplus or at least move a substantial part of the way. Moreover, virtually all countries would be running a surplus on the primary balance (the fiscal balance excluding net interest receipts) by 2017. For about half of all OECD countries it would also be sufficient to contain the increase in the gross government debt-to-GDP ratio to within 10 percentage points of pre-crisis (2007) levels. Important exceptions where gross debt increases by 40% of GDP or more include Iceland, Ireland, Japan, the United Kingdom and the United States. In Japan, even after fiscal consolidation, gross government debt would remain above 200% of GDP. Area-wide gross government debt in 2017 would rise by 30% of GDP relative to pre-crisis levels, but most of this increase would already have taken place by 2010, so that the fiscal consolidation outlined here would be sufficient to contain any further increase in OECD-wide debt during the recovery period.

Variants around the stylised medium-term scenario

Variant scenarios focus on the fiscal position and potential output

Given the uncertainties surrounding medium-term prospects, a number of variants are considered, with a focus on the sensitivity of the fiscal position to alternative assumptions concerning long-term interest rates, the underlying fiscal starting point and potential output (Table 4.5).

Higher long-term interest rates

Higher interest rates would further worsen fiscal positions

The sensitivity of interest rates to fiscal imbalances carries the risk that higher fiscal deficits and government debt will provoke an increase in long-term interest rates. A variant simulation, in which long-term interest rates rise by an additional 1 percentage point, focuses just on the effect that higher interest rates would have on government finances through higher debt service (a reduction in long-term interest rates by a similar amount would have the opposite effect). Hence, no supply-side ramifications are taken into account. Those countries that are more highly indebted are more vulnerable to any given rise in interest rates (and, by the same token, would have more to gain from any reduction in interest rates). Thus among the more heavily indebted countries, each additional percentage point rise in interest rates would add about 1¼ percentage points to fiscal deficits by 2017 with gross debt up by 5-6% of GDP. Of course, the effects would be more serious if there were adverse consequences for output, particularly if potential output was reduced. In practice some countries are likely to be more vulnerable than others to higher interest rates. Evidence reviewed in OECD (2009) suggests that for a given worsening in the fiscal position, effects on interest rates may be larger in those countries with a poor fiscal track record and for those countries which start from a weaker fiscal position, particularly those

Table 4.5. **Sensitivity of fiscal projections to alternative assumptions**

2017, as a percentage of nominal GDP

	Financial balance							Gross financial liabilities						
		Higher interest rates[1]		Higher initial balance[2]		Lower NAIRU[3]			Higher interest rates[1]		Higher initial balance[2]		Lower NAIRU[3]	
	Stylised scenario	Effect	New level	Effect	New level	Effect	New level	Stylised scenario	Effect	New level	Effect	New level	Effect	New level
Australia	1.4	-0.2	1.2	1.0	2.4	0.4	1.8	21.2	0.7	21.9	-5.7	15.6	-1.7	19.5
Austria	-1.6	-0.7	-2.3	1.4	-0.2	0.5	-1.1	84.2	2.7	86.9	-7.6	76.5	-2.5	81.6
Belgium	2.6	-0.9	1.8	1.3	3.9	0.4	3.1	81.3	4.0	85.3	-7.3	74.0	-1.9	79.4
Canada	2.4	-0.7	1.6	1.6	4.0	0.3	2.7	67.3	2.6	70.0	-8.5	58.8	-1.9	65.4
Czech Republic	2.3	-0.1	2.3	1.4	3.8	0.3	2.6	17.8	0.0	17.8	-7.4	10.4	-2.0	15.8
Denmark	0.8	0.1	0.9	1.0	1.8	0.4	1.2	52.7	-0.2	52.4	-5.8	46.8	-2.2	50.5
Finland	3.1	0.4	3.4	1.1	4.1	0.2	3.3	55.2	-2.1	53.0	-6.2	48.9	-1.3	53.8
France	-1.7	-0.8	-2.5	1.2	-0.5	0.5	-1.2	98.7	3.4	102.1	-6.9	91.8	-2.8	95.9
Germany	1.4	-0.7	0.8	1.2	2.7	0.3	1.8	70.8	2.9	73.7	-7.0	63.7	-2.1	68.7
Greece	0.0	-1.0	-1.0	1.3	1.3	0.4	0.4	93.6	4.2	97.8	-6.8	86.9	-2.2	91.4
Hungary	0.8	-0.7	0.1	1.1	1.9	0.5	1.3	60.6	2.6	63.2	-5.9	54.7	-3.1	57.5
Iceland	-0.2	-0.9	-1.1	1.9	1.6	0.6	0.4	110.2	3.1	113.3	-10.1	100.2	-3.0	107.2
Ireland	-5.0	-0.8	-5.8	1.3	-3.7	0.4	-4.6	124.5	2.8	127.4	-7.3	117.2	-2.1	122.4
Italy	0.3	-1.2	-0.8	1.3	1.7	0.4	0.8	112.0	5.3	117.3	-7.4	104.5	-2.9	109.1
Japan	-3.2	-1.3	-4.6	1.2	-2.1	0.3	-2.9	207.7	5.9	213.6	-6.7	201.0	-2.3	205.4
Korea	1.1	0.1	1.2	1.0	2.2	0.0	1.2	49.4	-0.6	48.8	-5.6	43.8	-0.4	49.0
Luxembourg	2.7	0.2	2.9	1.0	3.7	0.2	2.9	7.9	-1.5	6.4	-5.5	2.4	-1.5	6.4
Netherlands	3.3	-0.6	2.8	1.4	4.7	0.3	3.6	63.2	2.2	65.4	-7.8	55.4	-1.9	61.3
Norway	8.6	1.0	9.6	1.0	9.6	0.2	8.8	65.5	-5.0	60.6	-4.0	61.5	-0.3	65.3
Poland	-3.1	-0.6	-3.7	1.3	-1.8	0.3	-2.7	77.8	2.4	80.2	-7.3	70.5	-1.9	75.9
Portugal	-1.0	-0.9	-1.9	1.3	0.3	0.5	-0.5	91.3	3.6	95.0	-7.3	84.0	-3.0	88.3
Slovak Republic	1.4	-0.4	1.0	1.4	2.8	0.6	2.0	21.1	1.1	22.2	-7.4	13.7	-2.9	18.2
Spain	2.7	-0.8	2.0	1.2	3.9	0.4	3.1	66.0	3.0	69.0	-6.7	59.4	-2.2	63.8
Sweden	1.5	0.0	1.6	1.0	2.5	0.1	1.6	56.1	-0.2	56.0	-5.8	50.3	-0.9	55.2
Switzerland	-0.3	-0.2	-0.5	1.5	1.2	0.3	0.0	51.6	1.0	52.6	-8.4	43.2	-1.5	50.1
United Kingdom	-5.6	-1.3	-6.9	1.3	-4.3	0.4	-5.2	125.2	4.8	130.0	-7.3	118.0	-2.4	122.8
United States	-0.5	-1.2	-1.7	1.2	0.7	0.3	-0.2	102.6	5.1	107.7	-6.6	96.0	-2.0	100.6

1. The higher interest rate scenario calculates the effect of an increase in long-term government bond rates by 100 basis points on government finances otherwise ignoring effects on the real economy.
2. The higher initial balance scenario assumes the initial underlying primary balance is 1 per cent of GDP higher than in the reference scenario in 2010.
3. The lower NAIRU scenario assumes a fall in the NAIRU by one percentage point.
Source: OECD calculations.

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where expected future fiscal deficits over the medium term are large and (again) those where initial debt levels are high.

Sensitivity to initial fiscal balances

Medium-term fiscal projections are sensitive to the starting point

There is considerable uncertainty about the magnitude of fiscal deficits over the next two years. Moreover, the assessment of the underlying fiscal position in 2010 does have important implications for how the fiscal situation evolves in the medium term, particularly in respect of the accumulation of debt. This is underlined by a variant simulation in which the underlying primary balance in 2010 is assumed to be better (*i.e.* more positive) by 1 percentage point of GDP. Reflecting the

accumulation of reduced net interest payments the different starting position typically improves the financial balance by about 1¼ to 1½ per cent of GDP, with an improvement in the gross debt position by around 6-8% of GDP by 2017. Of course, there is uncertainty in both directions so the signs of the variant simulation could equally be reversed to consider the effect of a worse initial underlying balance.

Differences in potential output

Uncertainty about potential output has implications for fiscal positions

Given the uncertainty surrounding the long-term effects of the crisis, a third variant scenario considers the effect of different levels of potential output. The discussion here, as well as the reported simulation, is couched in terms of the effects of higher potential output, but might equally well be applied to the effects of lower potential (reversing the signs of the simulation results in Table 4.5). Clearly, a primary effect would be to raise future living standards, but higher potential output will also improve the state of government finances. The magnitude of the latter effect would depend on the cause of the change in potential output. In particular, if it was caused by a fall in structural unemployment it might have a larger impact than if it occurred as a consequence of a rise in labour productivity. In the latter case, higher productivity might be expected to be reflected in higher wages, including those of government employees, and transfers so that there might be some offset on the expenditure side to the extra tax revenues resulting from permanently higher output.[14] Conversely, if the rise in potential arose from a fall in structural unemployment there would be no induced rise in government wages and transfers and fiscal balances would further improve due to lower expenditure on welfare benefits.[15] Against that background, the potential output variant is assuming a fall in structural unemployment by 1 percentage point, translating into a corresponding rise in potential output.

Structural policy responses to the crisis matter…

As well as uncertainty about the permanent effects of the crisis, a further reason for considering the effect of a fall in structural unemployment on fiscal positions is to gauge the scale of possible effects that structural policy responses to the crisis might have. In particular, policy changes that result in tighter labour and product market regulations could amplify the impact of the crisis on structural unemployment while an easing of such regulation could help to mitigate

14. Even if government wages were to fully adjust to higher productivity, it is likely that the adjustment would take several years, during which time the fiscal balance would temporarily improve, implying a permanent reduction in the government debt burden. In the simulations considered here it is assumed that government wages fully adjust to any change in (whole-economy) productivity, and non-wage government expenditures (excluding welfare benefits) fully adjust to any change in GDP, but that these changes occurs gradually over a period of five years.
15. To quantify the effect of permanent fall in unemployment on welfare expenditure, the variants reported here use the elasticities reported in Andre *et al.* (2005).

the impact of the crisis, including on fiscal positions. More effective active labour market policies could also reduce structural unemployment but to the extent additional spending is involved the impact on government budgets is unclear. As a necessary short-term response to the crisis, unemployment benefits have been made more generous in coverage and, sometimes in level but were such policies to remain in place over the longer term both government spending and structural unemployment would be durably higher. Finally, the need for future fiscal consolidation raises the possibility that the tax wedge might rise, with negative effects for structural unemployment.

... although to address fiscal imbalances other measures would be needed

For most countries, a fall in structural unemployment by 1 percentage point generates an improvement in government fiscal balances on the order of ¼ to ½ per cent of GDP, with improvements in gross debt of up to 3% of GDP by 2017. This implies that structural reform measures (which do not in themselves imply direct savings on public finances), on their own, are unlikely to be the solution to the major fiscal imbalances which many countries face. On the other hand, the medium-term effects of ambitious structural reforms on public finances are not trivial either and could make some contribution as part of a wider package of more conventional fiscal consolidation measures. In addition, structural reform may help to boost living standards and so facilitate fiscal consolidation.

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