

Box 4

POTENTIAL OUTPUT ESTIMATES FOR THE EURO AREA

Measures of potential output growth reflect the rate of growth which can be achieved using available production factors without creating inflationary pressures. The output gap, defined as the percentage deviation of the actual level of output from the potential level, measures the degree of utilisation of production factors in the economy and can be regarded as an indicator of the state of the business cycle and of inflationary pressures. Measures of potential output are also used to derive additional indicators, such as cyclically adjusted government budget balances, to assess the fiscal policy stance.

Uncertainty in the measurement of potential output

There are different approaches to estimating potential output.¹ Many of them are based on the concept of the macroeconomic production function which allows the growth in potential output to be broken down into contributions from the aggregate input factors, labour and capital, and from the residual item of total factor productivity.

Measures of potential output growth fluctuate substantially from year to year, reflecting, for instance, changes in the rate of capital accumulation over time. Annual data on potential output growth should therefore be distinguished from the long-run trend rate of potential output growth, which has traditionally been estimated for the euro area to amount to around 2%-2.5%.²

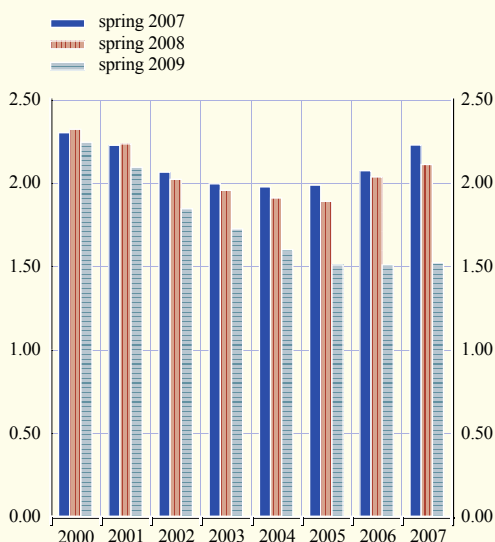
Since measures of potential output are unobservable, they can only be estimated with uncertainty.³ Consequently, measures of potential output and potential output growth can be substantially revised ex post. This is shown in Chart A which depicts annual growth rates of potential output in the euro area in the period 2000-07 as estimated by the European Commission in the spring forecasts in 2007, 2008 and 2009. In the forecast of 2007, the available estimates of potential output growth were still in the trend range of 2%-2.5%. In the most recent forecast of spring 2009, however, measures of potential output growth have been significantly revised downwards even for years in the distant past.⁴ Thus, while the average rate of growth of potential output over the period 2000-07 has been estimated to amount to 2.1% in past forecasts, this figure fell to 1.7% in the forecast of spring 2009.

Current estimates of potential output growth and the output gap

The table shows the most recent estimates of international institutions for potential output growth. At the current juncture, annual rates of potential output growth are estimated to be even lower than in recent years and are forecast to fall below 1% in the period 2009-10. This is in line with assumptions of weaker investment activity giving rise to lower contributions from the

Chart A Measures of potential output rates of growth in the euro area

(annual percentage changes)



Source: European Commission.

1 For an overview of different approaches of estimating potential output, see the article entitled "Potential output growth and output gaps: concept, uses and estimates" in the October 2000 issue of the ECB's Monthly Bulletin.

2 See European Central Bank (2004), "The monetary policy of the ECB", Frankfurt am Main, and Box 5 entitled "Trends in euro area output growth" in the July 2005 issue of the ECB's Monthly Bulletin.

3 For a more detailed discussion of the uncertainty in measures of potential output and the output gap, see the box entitled "The (un)reliability of output gap estimates in real time" in the February 2005 issue of the ECB's Monthly Bulletin.

4 The production function approach to the computation of potential output essentially provides a smoothed trend of real GDP over an extended period of time, including past years. The downward revision in the real GDP outlook for the period 2009-10 against previous forecasts is so sizeable that not only are current and future rates of growth of potential output dragged down by a significant amount, but historical growth as well. See European Commission (2009), "Economic Forecast Spring 2009", *European Economy* 3/2009, Brussels, p. 31.

Measures of potential output and the output gap in the euro area

(annual percentage changes; percentage points)

| Potential output growth | 2007 | 2008 | 2009 | 2010 |
|-------------------------|------|------|------|------|
| European Commission | 1.6 | 1.3 | 0.7 | 0.7 |
| OECD | 1.7 | 1.9 | 1.2 | 0.6 |
| IMF | 1.9 | 1.5 | 0.8 | 0.7 |
| Output gap | | | | |
| European Commission | 2.5 | 2.0 | -2.8 | -3.6 |
| OECD | 1.8 | 0.4 | -5.5 | -6.0 |
| IMF | 1.4 | 0.7 | -4.3 | -5.4 |

Sources: European Commission, OECD, and IMF.

Note: The output gap is defined as the percentage deviation of the actual level of output from the potential level. Differences in measures of the output gap between institutions derive, inter alia, from differences in estimated levels of potential output.

capital stock to potential output growth. Furthermore, the labour input is estimated to contribute less to potential output growth over the period 2009-10, inter alia owing to higher structural unemployment and lower participation rates.

Possible effects of the economic downturn on potential output

The estimates shown in the table are based on production function approaches employed by the various institutions. Typically, these models do not incorporate structural breaks but are estimated with unchanged specifications over the forecast horizon. However, there are several reasons why the current crisis may be associated with structural shocks which may lead to a persistent downward shift in the level of potential output or even persistently lower growth rates of potential output.

A downward shift in the level of potential output may come about, for instance, through the abrupt adjustment of excess capacity which accumulated during the period preceding the current financial crisis. In this respect, the capital stock may be affected by the scrapping or stronger discounting of previous investments. In the current downturn, this argument may, for example, be relevant for the construction, automobile and financial sectors. Furthermore, very large increases in unemployment and the downsizing of some sectors may lead to a loss of work-related skills and experience which would shift the level of structural unemployment upward as it impedes successful matches in the labour market.

A shift in the level of potential output can also be accompanied by a change in the future rate of growth of potential output. A longer-term moderation in the rate of growth of potential output may emerge in the current downturn. For instance, real and nominal rigidities in labour markets may hinder the reallocation of labour resources and limit the adjustment of wages, leading to weak labour demand and a persistent pattern of lower employment growth. While a mild recession would not affect the pace of labour force growth in the long run and would leave the rate of potential output growth unaffected, a protracted and deep recession may cut potential labour force growth by discouraging groups in the labour force from participating in the labour market and by reducing immigration flows. With regard to capital accumulation, a lasting increase in credit risk premia⁵ and more restrictive lending practices or persistently

5 The impact of higher credit risk premia on potential output has been discussed in more detail in Box 7, entitled "Developments in potential output in the light of changes in oil prices and credit risk premia", in the December 2008 issue of the ECB's Monthly Bulletin.

less efficient operation of the financial system would slow investment and moderate potential output growth. A prolonged recession may also depress total factor productivity drivers, such as investment in research and development. Furthermore, the adjustment of sectors to new demand patterns may lead to a lasting moderation in the rate of potential output growth to the extent that sectors which previously contributed strongly to productivity growth – e.g. the manufacturing sector – are downsized. However, the opposite would be true if low productivity growth sectors, such as construction, shrink.

Finally, the impact on the long-run trend rate of potential output growth will very much depend on policy factors. For example, if the crisis were to lead to a long-run increase in the size of the public sector, taxes would sooner or later have to be raised, and the higher tax burden would dampen potential output growth. Additionally, there is a risk that intensifying protectionist measures would give rise to a less efficient international allocation of capital. Conversely, if the crisis were to trigger more structural reforms, making euro area labour and product markets more flexible and open to competition, this could have the opposite effect of strengthening productivity growth in the long run. Therefore, it is clear that the impact on long-run productivity will depend very much on the policy response to the current crisis.

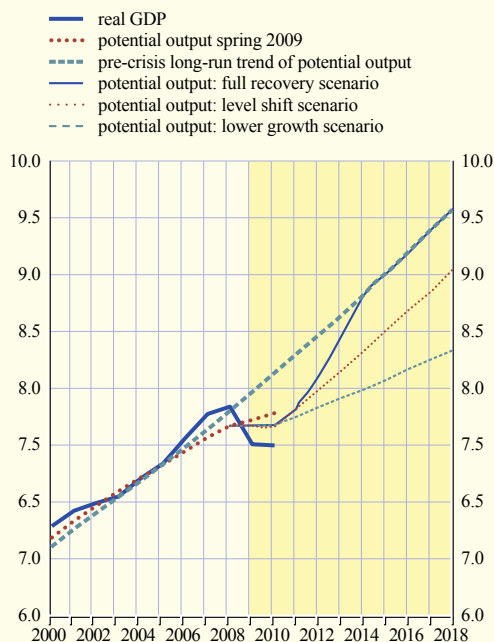
Possible scenarios for potential output

The implications of such different scenarios are illustrated in Chart B, which depicts real GDP and the European Commission's measure of potential output in the euro area between 2000 and 2010, including the Commission's spring forecasts of real GDP and potential output for the period 2009-10. Furthermore, the chart shows four hypothetical paths of potential output. The pre-crisis long-run trend path assumes that the level of potential output is not affected by the crisis and continues to grow at 2% per year. This path would be broadly in line with potential output growth in many available projections until early 2008.

Furthermore, three possible alternative scenarios of the path of potential output for the years after 2008 are shown.⁶ All of them assume that the slump in potential output growth in the period 2009-10 is more pronounced than currently projected, in line with the above arguments for a stronger adverse impact of the crisis on potential output.

Chart B Euro area potential output

(EUR trillions at 1995 market prices)



Sources: European Commission and ECB calculations.
Note: The shaded area indicates the forecast period.

⁶ Similar scenarios have been proposed by the European Commission, see European Commission (2009), "Quarterly report on the euro area", Vol. 8 No 2/2009, p. 28, Brussels, and European Commission (2009), "Impact of the current financial and economic crisis on potential output", European Economy Occasional Papers 49, June 2009, Brussels.

After 2010 the three alternative scenarios diverge: first, the “full recovery scenario” assumes that the decline in potential output is only of a short-term nature and that a post-crisis acceleration in potential growth would quickly realign the level of potential output to its long-term pre-crisis path. This would, of course, require potential output to grow for a number of years at rates significantly above its long-term trend rate. Second, in the “level shift scenario”, potential output will grow at its long-run rate of 2% after the end of the downturn but not return to its long-term path. There have been episodes in history when such a scenario materialised, for instance the period after the banking crisis in Finland in the early 1990s. It should be noted that in order to re-gain the pre-crisis rate of potential growth in these episodes, very strong structural adjustment measures were necessary, aiming at enhancing the flexibility and competitiveness of the economy.⁷ Finally, the “lower growth scenario” assumes not only a downward shift in the level but also a persistent slowdown in the rate of growth of potential output. An example of such a scenario is the case of Japan in the 1990s, where potential output was estimated to grow at significantly lower rates after the financial crisis in the mid-1990s than before.⁸ As illustrated by the arguments above, it is currently very uncertain which of the scenarios the euro area will experience in the coming years.

Implications for economic policy

The large degree of uncertainty about potential growth at the current juncture also implies an exceptionally large degree of uncertainty about output gap measures. As shown in Table 1, international institutions currently estimate the output gap to be in the order of -3% to -6% in the period 2009-10. However, to the extent that potential output in the euro area may be subject to a downward shift in the level or to slower growth in the future, output gaps may prove to be less negative than in current estimates.

The uncertainty about measures of potential output and output gaps has significant implications for economic policy. Regarding monetary policy, a sizeable downward shift in the level of potential output would imply significantly less negative estimates of the output gap, which can be understood as an indication of less pronounced downward pressures on prices. Regarding fiscal policy, such a scenario would imply that a larger part of the current fiscal deficit should be regarded as being of a structural nature. This would call for even more forceful consolidation of public finances in order to return to sound fiscal positions.

Overall, in view of the large downward swings in potential output growth at present, but also taking into account the future downward effect on potential output related to demographic developments in the euro area,⁹ structural economic reform efforts are needed more than ever in the euro area to support a lasting increase in production and employment. Such efforts should aim at strengthening the adjustment capacity and flexibility in labour and product markets. This can best be achieved by facilitating wage-setting and labour mobility across sectors and regions. Fostering competition and strengthening investment incentives would speed up the process of restructuring and boost productivity.

7 See Haugh, D., P. Ollivaud and D. Turner (2009), “The Macroeconomic Consequences of Banking Crises in OECD Countries”, OECD Economic Department Working Paper No 683, OECD, and European Commission (2009) “Impact of the current financial and economic crisis on potential output”, European Economy Occasional Papers 49, June 2009, Brussels.

8 See references in footnote 6.

9 See Box 7 entitled “The 2009 Ageing Report: updated projections for age-related public expenditure” in the June 2009 issue of the ECB’s Monthly Bulletin.