

## Box 5

**A CROSS-CHECK OF OUTPUT GAP ESTIMATES FOR THE EURO AREA WITH OTHER CYCLICAL INDICATORS**

This box briefly compares output gap estimates for the euro area with developments in a number of survey-based cyclical indicators and business cycle indicators. Overall, while there is high uncertainty as regards the size of the output gap, a number of cyclical indicators suggest that the economic “slack” in the euro area economy may be smaller and may close faster than currently estimated by international institutions.

**Output gap estimates from international institutions**

The output gap, which is the difference between the actual and the potential level of output, is usually regarded as a measure of slack as well as an indication of price pressures in the economy. According to current estimates, the impact of the economic and financial crisis has led to a significant widening of the euro area output gap, with the average of estimates from a number of international institutions pointing to an output gap of about -4% in 2009, after a positive gap of 0.7% in 2008. While international institutions project a sizeable narrowing of the gap as the recovery continues, estimates of the euro area output gap for 2011 range between -2.3% and -3.5%, with an average value of close to -3%. Uncertainty regarding the size of the output gap is currently very high, since the possible adverse effects of the economic and financial crisis on potential output growth are difficult to estimate.<sup>1</sup>

**The capacity utilisation rate and supply-side constraints on activity**

Another indicator that can be used to measure the degree of slack in the economy is the capacity utilisation rate. Information on capacity utilisation in the euro area is collected in the European Commission business survey for the manufacturing sector on a quarterly basis. In that survey, manufacturing companies are asked at what capacity (measured as a percentage of full capacity) they are currently operating. In line with estimates of the output gap, the capacity utilisation rate also declined sharply during the latest recession, reaching a historical low in 2009 and standing 12 percentage points below its long-term

<sup>1</sup> For a discussion of factors which can lead to a longer-lasting downward shift in the level of potential output or even persistently lower growth rates of potential output, see the box entitled “Potential output estimates for the euro area”, *Monthly Bulletin*, ECB, July 2009, and the article entitled “Trends in potential output”, *Monthly Bulletin*, ECB, January 2011.

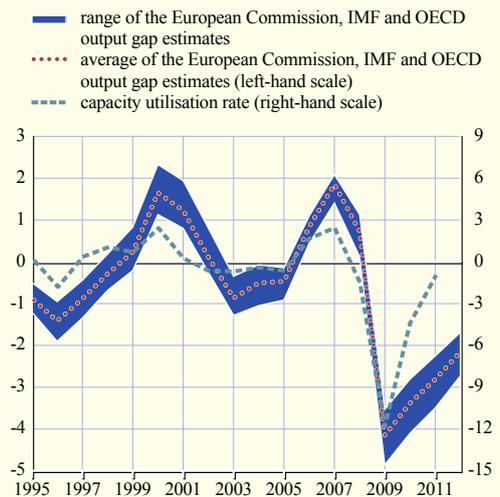
pre-recession average (see Chart A).<sup>2</sup> However, in contrast to the various estimates of the output gap, the capacity utilisation rate subsequently recovered strongly. The latest data point to a return to a virtually “normal” level of capacity utilisation in the euro area in April 2011, suggesting a sharper decrease in the slack in the euro area economy than signalled by the various output gap estimates from international institutions.

One feature of the capacity utilisation indicator is that, like most opinion surveys, it is normally not revised, while the degree of uncertainty surrounding real-time estimates of the model-based output gap is typically high and they are frequently revised.<sup>3</sup> However, when using the capacity utilisation rate to gauge the output gap, some limitations of this indicator must be borne in mind. First, the capacity utilisation indicator is only based on the manufacturing sector, while estimates of the output gap are based on the whole economy. Second, when survey respondents assess their capacity utilisation they do not necessarily take into account the slack in labour utilisation at the economy-wide level. Despite these limitations, however, there appears to be a strong empirical link between developments in the capacity utilisation rate and in estimates of the output gap (see Chart A).

Other survey-based indicators for the use of resources confirm the signals of the capacity utilisation rate for the manufacturing sector and provide information on the other two main economic sectors, i.e. services and construction (see Chart B). Regarding the manufacturing sector, constraints on production stemming from a lack of both equipment and labour have increased significantly in recent quarters. The indicator for lack of equipment has reached a new record high and that for shortage of labour has returned to a level above its long-term average. Both indicators therefore support the picture of a significant increase in the use of available resources in the manufacturing sector in recent quarters and are consistent with the evidence

**Chart A Output gap estimates from international institutions and the capacity utilisation rate**

(percentages; percentage point deviation from long-term pre-recession average)



Sources: European Commission Economic Forecast Spring 2011, IMF World Economic Outlook April 2011, OECD Economic Outlook May 2011 and ECB calculations.

Note: The output gap is measured as a percentage of potential GDP and the capacity utilisation rate is measured as a percentage of full capacity.

2 Figures for capacity utilisation are adjusted to make them comparable with figures for the output gap as follows. They are shifted backwards by one quarter since capacity utilisation data published early in a quarter largely reflect economic developments in the previous quarter. The average for the pre-crisis period (from the first quarter of 1985 to the fourth quarter of 2007) is subtracted, so that the value of zero indicates the “normal” level of capacity utilisation. Finally, annual figures are computed by averaging the quarterly figures for the year. The figure for 2011 is computed as the average value of figures for the first two quarters of 2011.

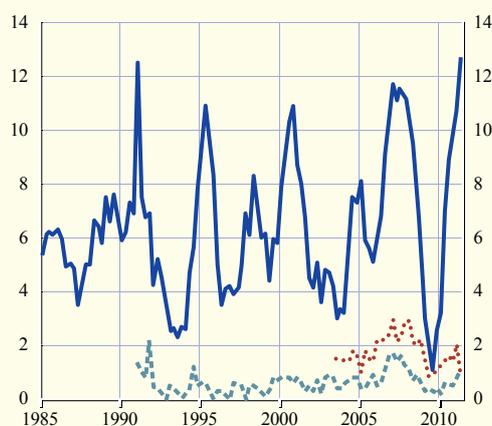
3 For a detailed description of the recovery of capacity utilisation, see the box entitled “The recovery of production capacity utilisation in the euro area”, *Monthly Bulletin*, ECB, October 2010. For a detailed discussion of the role of potential output estimates in macroeconomic analysis and the uncertainty surrounding its measurement, see the article entitled “Potential output growth and output gaps: concept, uses and estimates”, *Monthly Bulletin*, ECB, October 2000. See also the box entitled “Potential output estimates for the euro area”, *Monthly Bulletin*, ECB, July 2009, and Marcellino, M. and Musso, A., “The reliability of real-time estimates of the euro area output gap”, *Economic Modelling*, 2011, Vol. 28, No 4, pp. 1842-56 (in particular Figure 1 and Table 4). For evidence that the information contained in the capacity utilisation rate can be exploited to improve estimates of potential output and the output gap, see Graff, M. and Sturm, J.E., “The information content of capacity utilisation rates for output gap estimates”, *CESifo Working Paper Series*, No 3276, CESifo, December 2010, and Planas, C., Röger, W. and Rossi, A., “Does capacity utilisation help estimating the TFP cycle?”, *European Economy - Economic papers 410*, European Commission, May 2010.

Chart B Constraints on activity

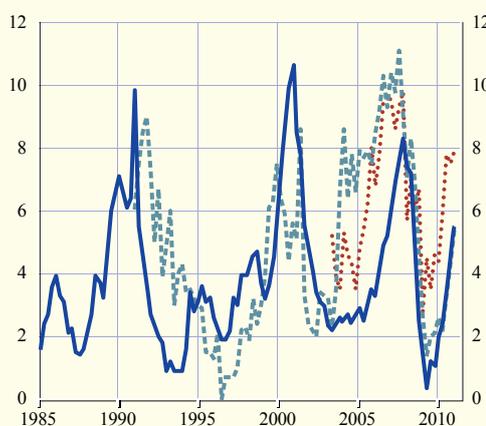
(percentages)

— manufacturing  
 ..... services  
 - - - construction

## a) Lack of equipment



## b) Shortage of labour



Source: European Commission.  
 Note: The latest observation refers to April 2011.

that capacity utilisation may have returned to its long-term average level. With regard to the services and construction sectors, the indicators for shortage of labour have increased for both of these sectors, to stand above their long-term averages, and the same is true of the indicator for lack of equipment in the construction sector. By contrast, the indicator for lack of equipment in the services sector has displayed some volatility recently and in April it fell below its long-term average, after exceeding it at the beginning of the year. Overall, the evidence on constraints on activity in the non-manufacturing sectors also supports the picture of increased resource use and, hence, of a reduction in the degree of slack in these sectors also. However, the levels of the indicators and the pace of reutilisation of resources appear to be less dynamic than in the manufacturing sector, suggesting some under-utilisation of resources in these sectors which may contribute to the size of the output gap for the economy as a whole.

### Business cycle indicators

Signals suggesting that the negative output gap may close faster than is indicated by estimates of the output gap from international institutions are also provided by business cycle indicators for the euro area.<sup>4</sup> Although the main purpose of these indicators is to signal the direction of and turning points in the euro area business cycle, they may also provide useful indications concerning the closing of the output gap. Chart C shows a rather close historical co-movement between two business cycle indicators – one based on data for industrial production (excluding construction) and the other based on real GDP – and the capacity utilisation rate. With regard to

<sup>4</sup> For more details, see the box entitled “The measurement and prediction of the euro area business cycle”, *Monthly Bulletin*, ECB, May 2011, which describes the area-wide leading indicator (ALI). See also the methodological notes for the OECD composite leading indicators, which are constructed in a similar way to the ALI. These notes define the business cycle phases in terms of whether the output gap is positive or negative and narrowing or widening (see the OECD’s website at [www.oecd.org](http://www.oecd.org)).

recent developments, the signals provided by the business cycle indicator based on industrial production excluding construction are very much in line with those provided by the capacity utilisation rate (see Chart C), pointing to an earlier closing of the negative output gap than is indicated by estimates of the output gap from international institutions.

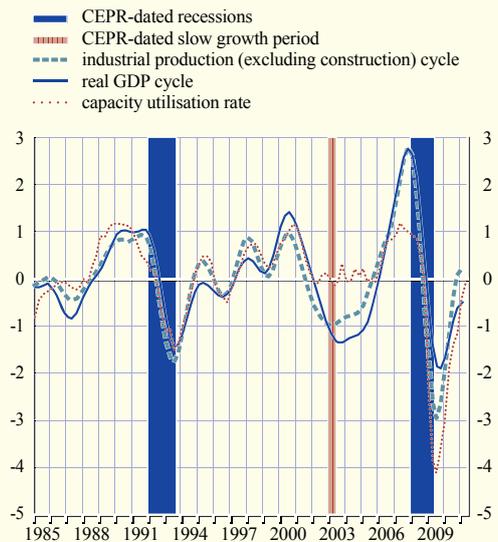
By contrast, the business cycle indicator derived from real GDP suggests that a slightly negative output gap remained in the first quarter of 2011. This is in line with the results for some sectors from the survey data on constraints on activity and similar differences between the two business cycle indicators were observed in previous recovery periods. However, the business cycle indicator based on real GDP still suggests that the output gap will close faster than is indicated by output gap estimates from international institutions.

Overall, there has been significant uncertainty regarding the magnitude of the output gap since the financial crisis. A number of cyclical indicators suggest that it could currently be somewhat less negative than implied by output gap estimates from international institutions and that it may close more rapidly than some estimates suggest. This could be due to an overestimation of potential output: if it grew at even lower rates during the crisis than currently projected, the output gap would be narrower and also close faster.<sup>5</sup>

If the output gap closes faster than anticipated, this may, in turn, imply higher inflation pressure than is currently expected, although it should be borne in mind that the impact of a change in the output gap on inflation in the euro area is assessed to be relatively small based on empirical evidence.<sup>6</sup> All in all, this analysis points therefore to possible upside risks to current inflation forecasts.

**Chart C Euro area business cycle indicators and the capacity utilisation rate**

(percentage deviations from trend; standardised; index level)



Sources: ECB, European Commission, Eurostat and ECB calculations.

Notes: The business cycle indicators are derived by applying a one-sided band pass filter and extend to the first quarter of 2011, whereas the capacity utilisation rate is available up to April 2011. The indicated recession and slow growth periods are based on dating by the Centre for Economic Policy Research (CEPR). The data have been standardised over the full sample period.

<sup>5</sup> See the references mentioned in footnote 1.

<sup>6</sup> See also the box entitled “Inflation in the euro area and the United States: an assessment based on the Phillips curve” in this issue of the Monthly Bulletin and the box on euro area Phillips curves in the article entitled “Trends in potential output”, *Monthly Bulletin*, ECB, January 2011.