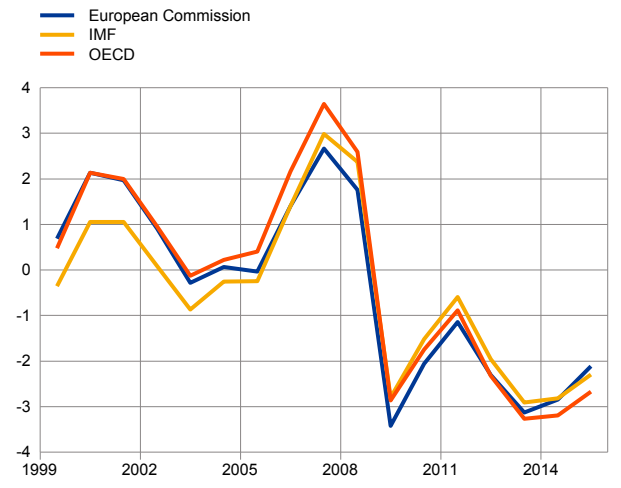
Box 6
A survey-based measure of slack for the euro area

Measures of economic slack, such as the output gap, are an important element of economic policy analysis, as they represent the interaction between demand and supply. However, slack is unobserved and has to be estimated. Indeed, estimates of slack are very uncertain, tend to be revised and, therefore, need to be interpreted with caution.[1] This box presents a tool that draws on information about demand from available survey indicators, in order to estimate slack in the economy. The measure described tends to be revised less frequently, and can thus complement output gap estimates of structural models.

Chart A

Estimates of the euro area output gap

(percentage shares of potential output)



Sources: European Commission Spring 2015 Economic Forecast, IMF World Economic Outlook April 2015 and OECD Economic Outlook May 2015.

Several methods exist to assess the degree of slack in the economy. Estimates of slack based on a production function have the advantage that they are consistent with economic theory and are able to explain developments in potential output via its components (labour, capital and total factor productivity). Estimates of this type are produced by the European Commission[2] and the Organisation for Economic Co-operation and Development (OECD)[3], while the International Monetary Fund (IMF) uses different approaches depending on the country assessed. Chart A depicts the recent estimates by these institutions for the euro area. The output gap in the euro area is estimated to stand between -2.1% and -2.7% in 2015, suggesting that a considerable amount of slack remains. One drawback of such estimates, however, is that they tend to be revised quite significantly, due to changes to data, parameters and the model setup.[4]

To assess the amount of slack, analysts also turn to surveys such as capacity utilisation in the manufacturing sector, or the perceived degree of insufficient demand as a constraint on businesses. These surveys have the advantage of being revised less frequently, thus performing better in real time, and are known

1 See, for example, the box entitled "Recent evidence on the uncertainty surrounding real-time estimates of the euro area output gap", *Monthly Bulletin*, ECB, November 2011

2 See Havik, K. et al., "The production function methodology for calculating potential growth rates and output gaps", *European Economy – Economic Papers,* No 535, European Commission, November 2014.

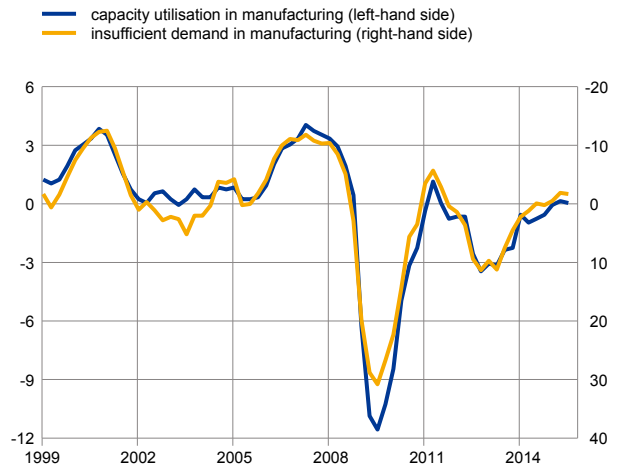
3 See Beffy, P. O. et al., "New OECD methods for supply-side and medium-term assessment: a capital services approach", *OECD Economics Department Working Papers,* No 482, OECD, July 2006.

4 On the revisions and uncertainty of estimates by international institutions, see Section 2.2 of Anderton, R. et al., "Potential output from a euro area perspective", *Occasional Paper Series,* No 156, ECB, November 2014.

Chart B

Capacity utilisation and demand limiting production in manufacturing

(percentage point deviations from historical average)

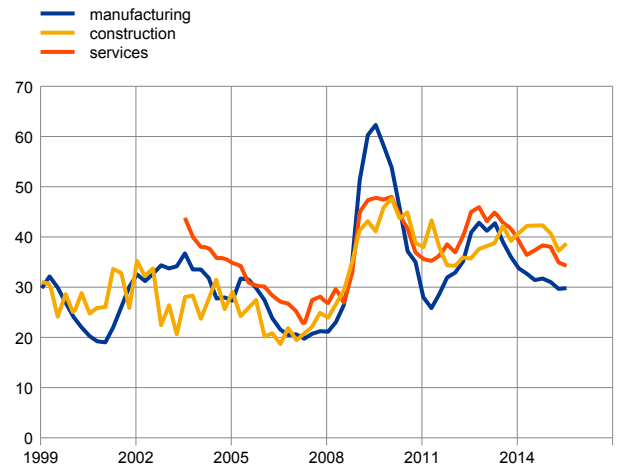


Source: European Commission.

Chart C

Insufficient demand limiting production

(percentage shares of total responses)



Source: European Commission.

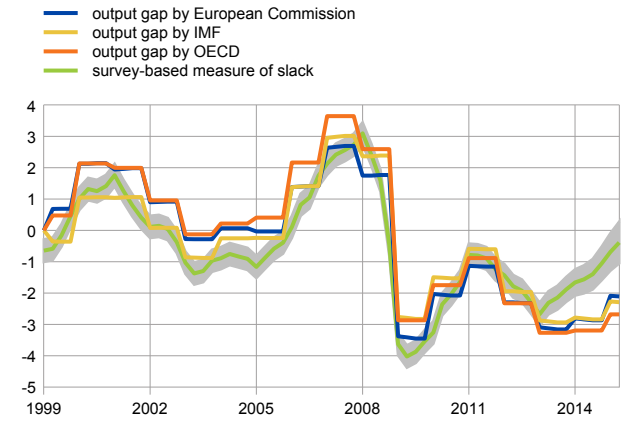
for better identifying turning points in the cycle. Survey indicators are also released with a short delay following the reference period. However, survey measures based on manufacturing capture less than a fifth of the economy and do not take into account the development of slack in the labour market. Surveys of capacity utilisation or insufficient demand in manufacturing indicate that, in mid-2015, slack in the euro area is close to its historical average (see Chart B).

A new survey-based measure of slack maps the results of the European Commission's "factors limiting production" survey to GDP dynamics. In this survey, managers are asked about the main factors currently limiting their production. The answer "insufficient demand limiting production" was selected as the indicator of slack for the model. The survey indicator, which combines information on the manufacturing, construction and services sectors, where available (see Chart C), is used in a bivariate unobserved components model. In the model, actual output is equal to the sum of (unobserved) trend output and the measure of slack. The growth rate of trend output is modelled as a random walk, and slack is determined by developments in the aggregate survey indicator.

Chart D

Slack in the euro area

(percentage point deviation from trend)



Sources: ECB staff calculations, European Commission Spring 2015 Economic Forecast, IMF World Economic Outlook April 2015 and OECD Economic Outlook May 2015.
Note: The grey area represents a +/-2 standard deviation uncertainty band around the survey-based measure.

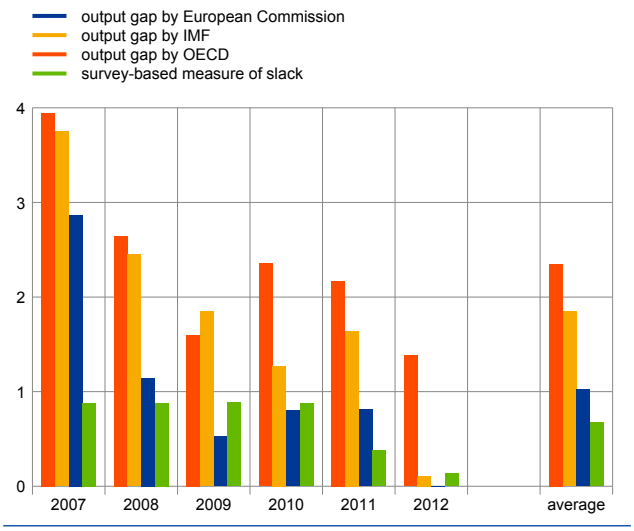
For most of the period since 1999, the survey-based measure shows an estimate of slack similar to the latest estimates by the European Commission, the OECD and the IMF. However, according to the survey-based measure, the amount of slack in the period 2014-15 is declining relatively fast. As a result, the amount of slack according to this measure is currently smaller than that estimated by international institutions (see Chart D). Since the survey-based measure draws

information from firms' assessments of insufficient demand limiting their production, the decline in slack could suggest that growth in the euro area since 2014 reflects an improvement in demand, rather than in supply conditions.

Chart E

Revisions of estimates of slack

(percentage points)



Sources: OECD, IMF, European Commission and ECB staff calculations.

The survey question relating to "insufficient demand limiting production" helps to pin down developments in slack in the model, and this also results in smaller revisions. Recursive estimates show that, over most of the period 2000-14, the survey-based measure produces smaller differences between quasi real-time and ex post estimates than output gap estimates by international institutions. Using GDP vintages to create real-time estimates shows that, for the most volatile period of 2007-12, revisions are the smallest for the (annualised) survey-based measure of slack. Revisions of the European Commission's output gap estimates are somewhat larger. The largest revisions are seen for the OECD and IMF estimates (see Chart E).

Overall, the survey-based measure of slack indicates a smaller amount of slack in the euro area in 2015 than the published estimates of international institutions. While the measure of slack indicated by the survey-based approach is surrounded by uncertainty, and cannot be broken down into labour, capital and total factor productivity developments, it tends to be revised less frequently. Thus, using such measures to complement output gap estimates of production function-based models could be worthwhile.