Box 5

THE LINKS BETWEEN ECONOMIC ACTIVITY AND INFLATION IN THE EURO AREA

Euro area activity has fallen sharply over the past few quarters and is expected to remain weak in the near term, suggesting that the balance of demand relative to the potential supply, or the degree of economic slack in the economy, has widened – possibly substantially. At the same time, the profile of headline HICP inflation has been affected by movements in commodity prices, while HICP excluding energy is expected by virtually all available forecasts to follow an only slowly declining path this year and next. This box tries to shed light on the question why inflation is not falling more strongly in reaction to the sharp decline in economic activity.

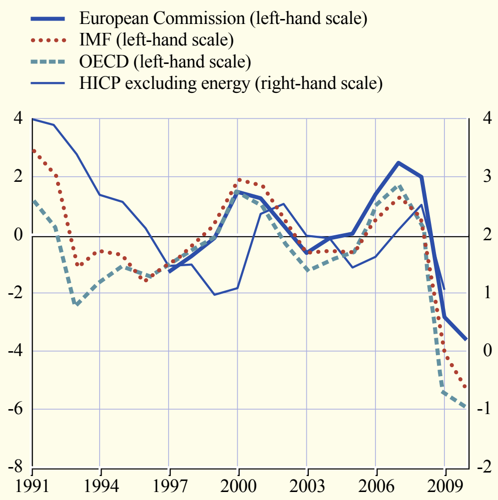
Although inflation is ultimately a monetary phenomenon, the balance between aggregate output and the supply potential is a key determinant of inflationary pressures in the short run. The pressure of demand on resources – the intensity with which companies use existing staff and capital, and the degree of tightness in the labour market – affects firms' production costs, their pricing power and their pricing decisions.

A standard framework for understanding these links is the so-called Phillips curve. In its original formulation, the Phillips curve presented a simple short-term relationship between inflation and the unemployment rate. Modern variants acknowledge that the potential supply can also vary over time and, therefore, relate inflation to deviations of economic activity from its potential level – the output gap.[1] They also acknowledge the influence of firms' and workers' expectations in price and wage-setting behaviour. They thus include measures of inflation expectations – either forward-looking (for example, expectations expressed in surveys) or more backward-looking (i.e. expectations expressed in terms of past inflation), reflecting that expectations can also form adaptively in response to recent developments in inflation. Finally, models of inflation also attempt to capture the influence of some supply-side factors such as changes in oil and other commodity prices. Since changes in these prices tend to pass through to headline HICP inflation fairly rapidly, abrupt movements can have a significant effect on inflation in the short run. That has been very apparent over the past few years, when the surge and decline of global commodity prices – particularly food and energy prices – was a driving factor behind the sharp rise and fall in euro area HICP inflation.

Over the past two decades, however, fluctuations in spare capacity have been relatively muted. That can make it difficult to use the Phillips curve framework to determine the impact on inflation precisely, and in particular to be confident how inflation might be affected by the current output gap in the euro area. However, historical experience tends to suggest that movements in the economic slack have played a fairly modest role in the inflation process in the euro area. As can be seen in the chart, the relationship between the output gap and price developments has been mixed in the past, and, on average, relatively large changes in the output gap are

Selected measures of the euro area output gap and HICP inflation excluding energy

(annual percentage changes; annual data)



Sources: European Commission, IMF, OECD and Eurostat.
Notes: Estimates of output gaps in 2009 and 2010 are projections. Data for the HICP excluding energy in 2009 are based on available monthly observations.

1 For more information on the various measures available, see the article entitled "Potential output growth and output gaps: concept, uses and estimates" in the October 2000 issue of the Monthly Bulletin. A related concept is capacity utilisation (discussed in more detail in Box 6 of this issue of the Monthly Bulletin), which measures spare capacity within firms. The output gap is a broader measure that summarises the extent to which current economic activity is above or below sustainable aggregate supply capabilities.

needed to affect euro area inflation.[2] That is one reason why euro area inflation might be expected to remain reasonably resilient despite the sharp deterioration in activity.

A further issue that clouds the assessment of the inflation-output relationship via the Phillips curve is that output gaps are difficult to measure precisely.[3] The overall supply capacity of the economy is unobserved and must be estimated, which inevitably introduces uncertainty. The chart, which shows the output gap estimates of various international institutions, illustrates that uncertainty – although the measures have tended to move broadly together, there have been periods of disagreement about the extent to which demand has outpaced supply.

Moreover, judgements about the potential of the economy and the degree of economic slack are particularly uncertain in real time. These concerns may be especially valid in the current circumstances, where it remains unclear how much of the abrupt slowdown in activity reflects the negative impact of supply-side factors that would significantly lower potential output. Indeed, it is possible that the current downturn has also involved a decline in the supply potential – either a downward shift in the level of potential, or slower future growth, or both. Such a downward shift in the level may have resulted from, for instance, the abrupt adjustment of excess capacity that had accumulated prior to the financial crisis through the scrapping of physical capital or a stronger discounting of previous investment. In the current environment, this argument may, for example, be relevant for the construction, automobile or financial sectors. Furthermore, very large increases in unemployment and the downsizing of some sectors may lead to an upward shift in the level of structural unemployment. To the extent that these factors imply that the euro area's potential output is lower, this would suggest that the degree of economic slack is smaller than shown by the estimates in the chart and that the disinflationary forces in the euro area are likely to be more muted than would be the case for a solely demand-driven slowdown.[4]

There are a number of other explanations why inflation is expected to remain relatively resilient despite the significant downturn in demand. A key factor, which is captured in the Phillips curve framework, is that inflation expectations play a strong role in shaping inflation developments. Over the past year, inflation expectations in the euro area have remained well anchored, with measures of medium-term inflation expectations staying close to 2%.

A further consideration is that some structural features of the economy may imply significant non-linearities or asymmetries in the response of prices to changes in activity. For example, firms may be more reluctant to move prices down than up, workers may particularly resist reductions in nominal wages, contracts may be re-negotiated at infrequent intervals, or wages indexed to past price developments.[5] These types of wage and price rigidities would mute the disinflationary response to the deterioration in economic conditions.

Overall, there are thus a number of reasons why inflation is expected to remain relatively resilient despite the sharp deterioration in economic conditions recorded in the euro area until recently.

2 See, for instance, A. Musso, L. Stracca and D. von Dijk, "Instability and nonlinearity in the euro area Phillips curve", *Working Paper series*, No 811, ECB, September 2007, as well as G. Fagan and J. Morgan, *Econometric models of the euro area central banks*, Edward Elgar Press, 2005.
3 See the box entitled "The (un)reliability of output gap estimates in real time" in the February 2005 issue of the Monthly Bulletin.
4 For a more detailed discussion, see Box 4, entitled "Potential output estimates for the euro area", in the July 2009 issue of the Monthly Bulletin.
5 For more on price-setting in the euro area, see the article entitled "Price-setting behaviour in the euro area" in the November 2005 issue of the Monthly Bulletin.

The projected slack in the economy is expected to play a minor role in the inflation process in the euro area in the coming quarters. Significant uncertainty remains about the degree of slack in the economy and the role of the output gap in shaping the inflation profile. In particular, it is unclear how much of the abrupt slowdown in activity reflects the negative impact of supply-side factors that might have lowered potential output. It is possible that the current downturn has also involved a decline in the supply potential, which would imply a smaller output gap and weaker disinflationary forces. Moreover, the Phillips curve framework underscores that, while economic slack may contribute to movements of inflation in the short run, well-anchored inflation expectations are also a crucial determinant of the inflation process.