

Box 5

THE RESPONSIVENESS OF HICP ITEMS TO CHANGES IN ECONOMIC SLACK

Underlying inflation, as measured by changes in the Harmonised Index of Consumer Prices (HICP) excluding energy and food, has hovered at low levels since October last year. At the same time, a moderate recovery of the euro area economy has got under way, and measures of the euro area output gap have begun to narrow from substantial amounts of economic slack. Historical relationships suggest that turning points in HICP inflation excluding energy and food follow those in the output gap with some lag. However, they also suggest that the turning point in inflation may initially remain unclear due to the limited strength of co-movement between the two series.

Against this background, this box reviews the responsiveness of underlying inflation to changes in economic slack at the level of the individual items of the HICP excluding energy and food. A “sub-index” made up of HICP items that have been closely correlated with the output gap in the past could provide clearer signals of a turning point in inflation in response to actual economic developments.

The output gap is an indicator of developments in underlying inflation

Output gaps measure how much actual output deviates from the economy’s potential output. A narrowing of the output gap should be associated with either less downward pressure or more upward pressure on prices in the domestic economy and would thus be expected to lead to a rise in inflation.

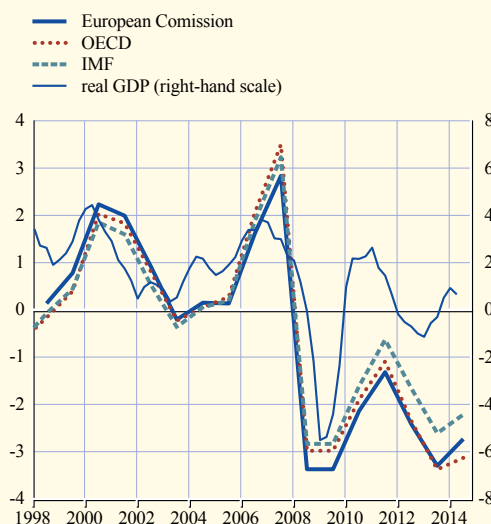
Leaving aside the well-known difficulty of estimating output gaps in real time,¹ recent estimates by international organisations all suggest that the euro area output gap started to narrow in 2013, when real GDP growth rebounded to levels above the potential growth rate. These estimates also suggest that this narrowing took place from a substantial amount of slack, of around 3% of potential output (Chart A).

As a measure of intensity of use of domestic production resources, the output gap may not always be a reliable indicator for developments in overall HICP inflation, since the prices of some items, such as energy and food, tend to be more heavily influenced by external factors, such as commodity prices and exchange rates. In monitoring the relationship between the output gap and inflation the focus tends to be placed on measures of underlying inflation,

¹ See the article entitled “Potential output growth and output gaps: concept, uses and estimates”, *Monthly Bulletin*, ECB, October 2000 and Box 5 entitled “Slack in the euro area economy”, *Monthly Bulletin*, ECB, April 2014.

Chart A Estimates of the euro area output gap

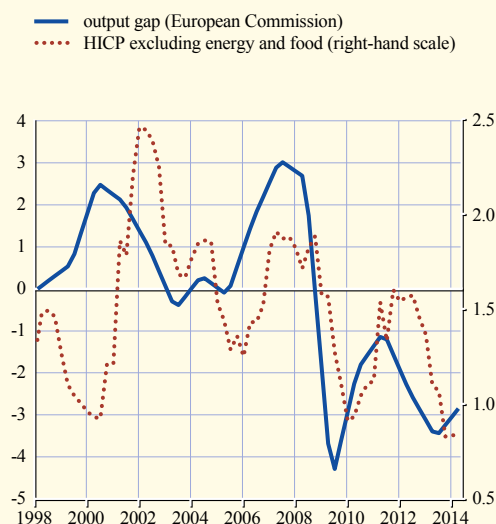
(percentages of potential output and annual percentage changes)



Sources: Eurostat, European Commission's European Economic Forecast (spring 2014), IMF World Economic Outlook (April 2014) and OECD Economic Outlook (May 2014).

Chart B Output gap and HICP excluding energy and food in the euro area

(percentages and annual percentage changes)



Sources: Eurostat and European Commission's European Economic Forecast (spring 2014). Note: The quarterly output gap observations have been obtained by interpolating annual data.

such as HICP excluding energy and food.² For the euro area, this relationship has a maximum correlation of 0.6 (when a lag of three quarters between changes in the HICP excluding energy and food and the output gap is considered). Looking specifically at the lead and lag pattern during turning points, in the period since 1998 sustainable turnarounds in HICP inflation excluding energy and food have taken place on average some four quarters after peaks and troughs in the output gap, but with substantial differences across cycles (Chart B).

Not all items of underlying inflation measures are responsive to the output gap

HICP inflation excluding energy and food includes 33 non-energy industrial goods items and 39 services items. Some of these items are not expected to react to short-run developments in economic activity and should thus be relatively resilient to the changes in the output gap. These relate mainly to the HICP services component and include utilities, insurance and health care. However, there are also items, in particular of the HICP non-energy industrial goods component, which would normally react to movements in domestic activity and income, but for which, owing to high import content, this relationship is blurred by the influence of global factors. Notable examples of this are products such as computers and certain other electronic goods.

An item by item regression analysis confirms that only a few HICP items have a statistically significant and positive link with the output gap.³ More precisely, only about one-third of the

2 See the article entitled "The Phillips curve relationship in the euro area", *Monthly Bulletin*, ECB, July 2014.

3 Phillips curve relationships for each of the 72 items included in non-energy industrial goods and services components (quarter-on-quarter inflation rates) were estimated for the period since 1998, including in each case a lagged inflation term and the European Commission's estimate of the euro area output gap (lagged by one quarter). This type of equation has been used in previous Phillips curve analysis (see footnote 2).

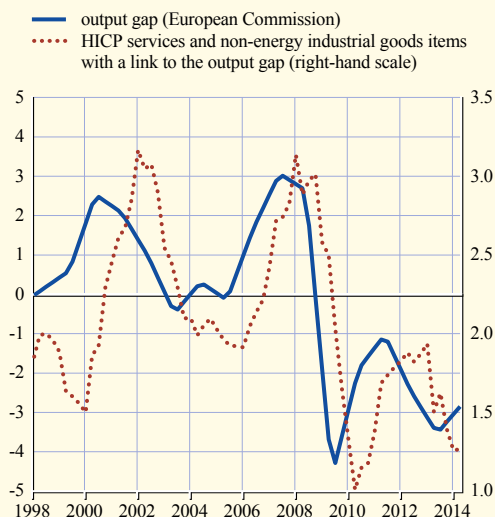
items (with a weight of 45%) of the HICP excluding energy and food displayed this link. Some notable examples for non-energy industrial goods include furniture, carpets and household appliances, and for services items, package holidays, restaurant and café services, and repair services for dwellings. For some items, for instance certain transport services, the missing statistical significance might reflect a relatively low elasticity of demand or factors related to market structures. The items found to have a significant link or not may change depending on the Phillips-curve specification, the output gap estimate and the sample period.

The sub-index made up of those HICP items which are responsive to the output gap has a correlation of 0.9 (at a four quarter lag) with the output gap (Chart C). It is also smoother than the HICP excluding energy and food, which makes it easier to gauge turning points. In the period since 1998 the turning points in the sub-index-based inflation series lagged those of the output gap by around five quarters. Naturally, there is some divergence across cycles, with, for instance, the longer lag following the output gap peak in 2011 partly reflecting the upward impact from indirect taxes at the time, which kept inflation higher for longer than would have been commensurate with the real economic developments.

Overall, assuming that a turning point in the output gap occurred in the latter part of 2013, historical regularities would suggest a turnaround in underlying inflation later on this year, which should be discernible earlier in the sub-index of HICP items that are responsive to the output gap. Such a turnaround would be consistent with the inflation profile in the latest ECB staff projections, which envisage a gradual increase during the latter part of the year.

Chart C The output gap and output gap-responsive HICP in the euro area

(annual percentage changes; quarterly data)



Sources: ECB and European Commission's European Economic Forecast (spring 2014).
Note: The quarterly output gap observations have been obtained by interpolating annual data.