

Box 6

THE IMPLICATIONS OF EXTERNAL PRICE PRESSURES FOR EURO AREA HICP INFLATION

Up to the beginning of 2011 rising oil and non-oil commodity prices led to increasing inflationary pressures in both advanced and emerging economies. In a number of emerging economies, this added to the domestic price pressures being generated in the context of strong economic growth. Against this background, this box examines how the rise in external price pressures spilled over to inflation in the euro area.

Developments in global inflation

Between early 2009 and early 2011 there was a broad-based surge in the prices of oil and other commodities, such as food. Measured in euro, commodity prices returned to, and in some cases exceeded, the high levels seen during the inflation peak of 2008 (see Chart A). This pushed up headline inflation in both advanced and emerging economies (see Chart B). However, the rise was stronger in emerging economies, owing to the fact that commodity-related items, in particular food items, account for a larger share of their consumption expenditure. In turn, the robust activity growth in emerging economies in the past three years drove up commodity prices, as these economies are major commodity consumers.

Chart A Oil and non-energy commodity prices

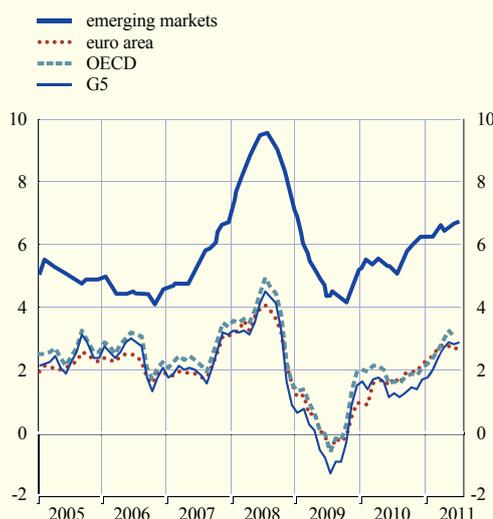
(daily data in euro; index 2010 = 100)



Source: HWWI.
Note: Last observation refers to 19 August 2011.

Chart B Headline inflation rates

(monthly data; annual percentage changes)



Sources: OECD, Haver Analytics and ECB staff calculations.
Note: the G5 aggregate is a weighted average of the inflation rates in the euro area, the United States, the United Kingdom, Japan and Canada, using GDP at PPP weights. The emerging economies aggregate includes Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela, China, Hong Kong, India, Indonesia, South Korea, Malaysia, Pakistan, Philippines, Singapore, Taiwan, Thailand, Vietnam, Ukraine, Russia, Egypt, Israel, Nigeria South Africa, Turkey and Saudi Arabia. Weights are based on nominal GDP weights (from the IMF World Economic Outlook database).

Transmission to euro area HICP inflation

There are different channels through which rising external price pressures can spill over to euro area inflation. First, they can be channelled through global commodity prices, which have a direct bearing on specific components of consumer prices, such as energy and food. Global commodity prices tend to rise on the back of greater demand for commodities in an environment of strong global activity and ample liquidity.

Second, they may be passed on through import prices, as dearer manufactured goods in an exporting country lead to higher import prices in the receiving country. In this respect, extra-euro area import prices of manufactured goods (measured in euro) rose sharply from the beginning of 2010 (see Chart C). The fact that they increased more strongly than during the inflation peak of 2008 partly reflects the dampening impact of the appreciation of the euro at the time. Price hikes in exporting countries are usually due to higher global commodity prices or domestic inflationary pressures stemming, for example, from wages. In theory, floating exchange rates should prevent inflationary shocks from spreading across countries, but in practice this adjustment mechanism may not function properly. Third, there may be more indirect spillovers if, in globally integrated markets, inflation in the rest of the world influences domestic price and wage setting through second-round effects.

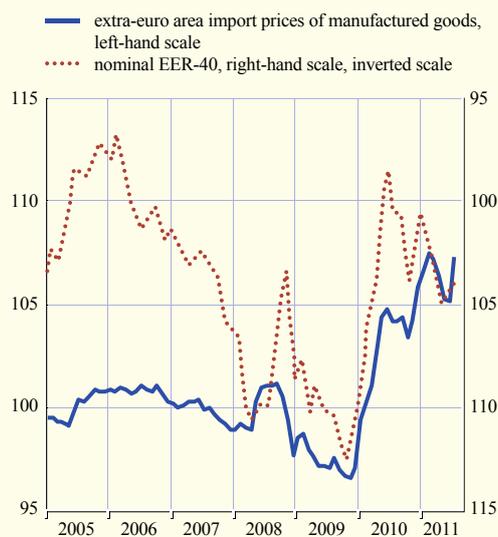
A model-based decomposition of spillover effects

The extent to which euro area inflation may be affected by global inflation developments through the channels mentioned above is an empirical question.¹ In this box, a time series model of the vector autoregression (VAR) type is applied to gauge the relative importance of the shocks responsible for the spillover effects via the various channels. In particular, the model allows for euro area inflation to be affected by oil and non-oil commodity prices, import prices and global consumer prices more generally. Control variables such as output, interest rates and exchange rates are included to capture domestic and global factors that – like euro area activity and interest rates – can have a direct influence on euro area inflation, or – like exchange rates and global activity – work through the various global price developments. Each variable is treated as endogenous in the VAR.²

Chart D shows the contributions made by the various shocks to the deviation of HICP inflation from the model's estimated mean of approximately 2%.³ The results indicate that oil and non-oil commodity price shocks played a relatively prominent role in driving inflation away from its mean. By contrast, import prices and global inflation shocks, which capture the more indirect spillovers from external price pressures, contributed only mildly to the dynamics of HICP inflation during the period. Looking at the recent pick-up in inflation, the upward impact of oil price shocks was comparable to that in 2008. As the size of the oil price shocks was comparable in the two episodes, this is not surprising. By contrast, non-oil commodity price shocks had very little impact, although – as in the case of oil

Chart C Euro area import prices of manufactured goods and nominal effective exchange rate

(monthly data; index level, 2005 = 100)



Source: Eurostat.

Note: The latest observations refer to July 2011 for import prices and August 2011 for the EER. An increase in the nominal EER amounts to an appreciation of the euro in nominal effective terms.

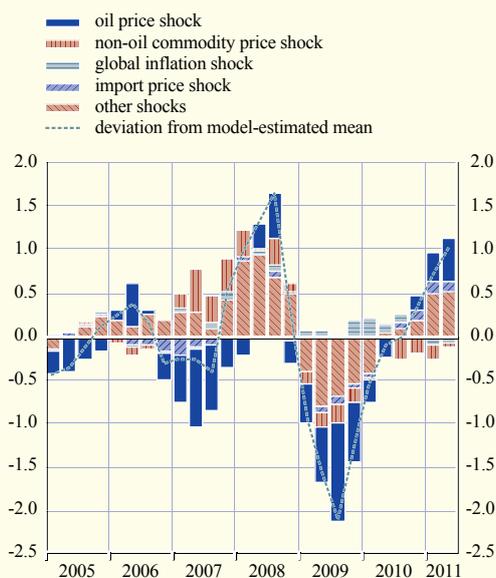
1 See, for instance, Ciccarelli, M. and Mojon, B., "Global Inflation", *Review of Economics and Statistics*, Vol. 92, No 3, 2010, pp. 524-535; Ball, L. "Has Globalization Changed Inflation?", *NBER Working Paper*, No 12687, November 2006; and Calza, A., "Globalisation, domestic inflation and global output gaps: Evidence from the euro area", *International Finance*, Vol. 12, No 3, 2008, pp. 301-320. Ciccarelli and Mojon find strong evidence that inflation is a global phenomenon, whereas Ball and Calza find that domestic factors dominate.

2 Formally, the model is an extension of that used by Ciccarelli and Mojon, namely a VAR model with a constant, four lags and the following variables: a measure of global prices, oil prices in US dollars, non-oil commodity prices in US dollars, an index of extra-euro area import prices of manufactured goods in euro, a measure of global activity, euro area real GDP, euro area HICP, the term spread between the yield of a ten-year government bond and that of a three-month bond, and the bilateral exchange rate between the euro area and the United States. In the model, global prices are measured by the OECD index reported in Chart B. Global activity is measured by the OECD indicator of world trade in goods and services. The VAR is estimated using quarterly data for the period from the first quarter of 1989 to the second quarter of 2011. Activity and price variables enter the model in the form of annual growth rates.

3 The identification of the shocks is based on a standard Cholesky decomposition and the ordering assumes that external variables are exogenous with regard to domestic factors. Within domestic factors, real variables are assumed not to be contemporaneously affected by any other factor; nominal factors are assumed to be contemporaneously affected only by real factors; and financial factors are assumed to be contemporaneously affected by both real and nominal factors. Results are robust to a change in the ordering of the various factors. The decomposition of shocks in each quarter is technically performed by using the estimated VAR to project the inflation rate over the period from the first quarter of 2005 to the second quarter of 2011, and decomposing the difference between the realised value and the projection into the sum of the shocks to all variables. By construction, all shocks are orthogonal, so each component measures what the inflation rate would have been if all the other shocks had been zero, rather than what was actually observed.

Chart D Shock decomposition of the deviation of euro area annual HICP inflation from a model-estimated mean

(quarterly data; percentage point contribution)



Source: ECB calculations.

the pass-through of import prices to the final selling prices is weakened by domestic factors such as marketing and distribution costs, or the use of domestically produced goods in refining or complementing the imported goods. Furthermore, upward import price pressures have to be seen against the backdrop of the continued downward pressures on manufacturing import prices resulting from the rising share over time of euro area imports of manufactured goods from low-cost countries, such as China and the new EU Member States.⁴ Compared with the 2008 pick-up in inflation, the upward impact of import prices and global consumer prices during the recent pick-up was somewhat stronger, albeit remaining small overall.

Overall, the results of the simulation confirm that oil price shocks play a crucial role in euro area inflation, while the impact of other global price developments on euro area inflation has generally been small. The prominent role played by oil price shocks also highlights the importance of accurately determining the nature of oil price movements, in particular whether they are driven by temporary supply shortages, such as those due to geopolitical tensions or natural disasters, or by changes in demand, notably in emerging economies, that occur more slowly but are more persistent. The appropriate monetary policy response to the inflationary consequences of a temporary rise in the oil price that does not lead to higher longer-term inflation expectations might be different from the response to a more persistent increase that contributes to inflation over the longer run and even threatens to generate second-round effects.

⁴ See the box entitled "Recent developments in extra-euro area trade prices and price competitiveness", *Monthly Bulletin*, ECB, May 2009; and the box entitled "Are recent wage increases in China putting upward pressures on euro area import prices?", *Monthly Bulletin*, ECB, July 2011. See also the article entitled "Globalisation, trade and the euro area macroeconomy", *Monthly Bulletin*, ECB, January 2008. The finding is also in line with the empirical literature. See, for example, *World Economic Outlook*, IMF, April 2006, Chapter 3 and the references therein.

prices – the size of the shocks was also equivalent to that during the previous inflation peak. One reason the recent increase in inflation was less pronounced than during the 2008 peak is that relatively contained growth in other input costs – such as wages – and competition-related pressures to absorb commodity price increases by decreasing margins helped to dampen the pass-through. Moreover, the recent rise in commodity prices was driven by price increases in a more limited number of commodities, as opposed to the broad-based rises in prices that were observed three years ago. Notably, within food commodity prices, dairy commodity prices rose by significantly less than three years ago, and these prices typically have a stronger pass-through to food consumer prices than other food commodity prices.

Shocks to manufacturing import prices and global consumer prices explain only a small part of the deviation of euro area inflation from its mean. In part, this reflects the fact that