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Subject : Some stylized facts about external effects on the euro area  
economy

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Some months ago, R. Kroszner, a member of the Councils of Economic Advisors of President Bush, visited DG ECFIN and presented the U.S. Economic Outlook. As he explained, the process leading to the outlook has the domestic economy as the focal point, and only looks at external conditions in order to introduce some final marginal correction, if any. The contrast between this approach and the approach underlying DG ECFIN forecasting rounds is sharp, to express it mildly. Our DG places a great deal of attention and effort on the external assumptions, which are a focal point of the Position Paper.

This contrast motivates the simulation exercises presented in this note. The exercises aim at assessing the importance and evolution over the last three decades of the oil price and external output effects on the euro area inflation and growth, with a closer look at recent years. Two main tentative conclusions are put forward:

- The central role often assigned to the oil price in the euro area projections does not seem justified. The importance of its effects has decreased over time and mainly depend on domestic macroeconomic policy and wage reaction.
- External output evolution has been and may continue to be important for the euro area. This may continue to be the case until policy (e.g. structural reforms and deregulation favoring IT penetration) makes its way in helping to develop higher domestic autonomy.

Despite these mixed results, it seems appropriate to suggest that the time may be ripe for a reassessment of the role of external assumptions in “normal” (i.e. not dominated by geopolitical factors) forecasting rounds.

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## **I. INTRODUCTION**

The fact that the external assumptions play such an outstanding role in the Commission forecasting process is in a sense shocking. It reflects a view of the euro area economy as a collection of single-country economies highly sensitive to external events, an area that has not yet developed the necessary elements as to rely much more on its domestic strength.

An alternative view calling for a downsizing in the role of external assumptions would be that the euro area economy is in fact a large economy with an export/import activity that only accounts for a small proportion of its GDP. In this view, the forecasting process should be much more centered around domestic prospects, as is the case in the US.

This note presents some aggregate evidence that may shed some light on the interesting open question of which of these two views is closer to reality. As described in the next section, the evidence comes from a euro area wide model and consist of simulation results over the periods 1970-1980, 1980-1992, and 1992-2001 regarding the effect of oil prices and rest-of-the-world output evolution on the euro area inflation and growth rates. The aim is to provide a quantification of the effects and to track its evolving importance over the last three decades.

## **II. THE MODEL AND THE SIMULATION EXERCISES**

A critical trade-off in econometric modeling is that between economic interpretability and goodness of fit. Highly structural models tend to incorporate a clear-cut economic interpretation but also tend to be characterized by a poor fit. This type of models may provide useful qualitative guidance, but in general they do not perform well in terms of quantification of effects. Models that are more statistical in spirit are harder to interpret but tend to have a good fit, and therefore tend to deliver more accurate quantitative assessment, including confidence bands.

The model used for the simulations reported in this note is of the latter type. It has been calibrated to minimize the forecasting mean squared error and contains 11 euro area wide macroeconomic indicators grouped into four blocks: (i) External block, which includes the oil price, the rest-of-the-world GDP and the short run interest rate of the US, (ii) EMU monetary block, including short and long run interest rates, the M3 monetary aggregate and the nominal \$/€exchange rate, (iii) EMU fiscal block, including the fiscal deficit, and (iv) EMU internal block, containing wages, consumer prices and GDP.

Two simulation exercises are performed, taking as baseline the 12 quarters ahead forecast of the model. The first imposes a 10% increase above baseline in oil prices during the first year of the forecasting period, and then compares the differences in terms of EMU inflation and GDP growth with respect to baseline. The second exercise imposes a 2% increase above baseline in the rest-of-the-world GDP during the first year of the forecasting period and look at the effects in terms of EMU GDP growth with respect to baseline. Each of these simulations is performed for the periods 1970-80, 1980-1992 and 1992-2001. Besides, the splitting of the last period in the sub-periods 1992-1998 and 1998-2001 is discussed.

### **III. RESULTS**

The simulation results are reported in Figures 1 through 6.

A general characteristic of the results is that uncertainty is large, as it is usually the case when properly accounted for. In fact, given the uncertainty surrounding the simulations, the 90% confidence bands (not reported) of the potential external effects on EMU inflation and growth contain the zero line in most cases<sup>1</sup> and clearly overlap across the three sample periods analyzed. Therefore, the only clear-cut statistical conclusion that can be reached at typical 5% significance levels is that there are neither significant external effects nor significant differences across periods<sup>2</sup>.

But if the strict statistical standpoint is left aside, results can be compared in terms of average effects, width of confidence bands, and the extent to which the distribution of effects is tilted towards the negative or positive side. This is done next using the 70% confidence bands reported in the Figures 1 through 6, which make the visual perception of the tilt easier.

#### **III.1. Oil price effects on EMU inflation and GDP growth**

A main feature of the reaction of EMU inflation and output growth to the 10% increase in oil prices is the contrast between the 70s and the 80s-90s.

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<sup>1</sup> The only clear exception is the strong reaction of EMU GDP to external GDP reported in the third panel of Figure 6.

<sup>2</sup> It is worth clarifying that the statistical significance of the results may be sensitive to the size of shocks analyzed. In particular, a much higher oil price increase may display statistically significant effects (average effects would be proportional, as the model is linear). However, enhancing the credibility of the simulation results requires one to look at shocks which are compatible with sample variability in each of the four sub-periods analyzed. The 10% increase during 4 quarters in a row is an appropriate compromise between this latter aspect and a reasonable size.

More specifically, with regard to inflation (Figure 1), there is basically no difference between the 80s and the 90s, with the distribution of effects tilted towards the positive side (specially during the first two years following the initial oil price increase) and a modest estimated reaction that moves within the range [0.86%, -0.42%] over the 12 quarters simulation period. One really needs to look at the 70s to see a clear shift upwards in the distribution of the inflationary effects, with maximum average reactions of 0.89% in quarters 6 and 7 and a confidence band range of [2.23%, -0.70%] in quarter 7.

Regarding growth effects (Figure 2), there is also a similar reaction in the 80s and 90s. The confidence band is wider in the 80s, but both cases display close average values and a distribution of effects tilted towards the positive side. This positive correlation may reflect reverse causation. That is, it would signal that during the last 20 years oil prices may have been responding to output fluctuations rather than being a source of fluctuations. Again, one has to look at the 70s to see a shift in the distribution of effects, this time downwards with maximum average effects of -0.39% in quarter 8.

### **III.2. Rest-of-the-world GDP effects on EMU GDP growth**

The contrast regarding these effects (Figure 3) is between the 70s-80s and the 90s.

In the 70s-80s the effects on EMU GDP growth of a 2% increase above baseline in the rest-of-the-world GDP are very similar. The distribution is clearly tilted towards the positive side during the first two years following the initial increase in external GDP, and the maximum average effect is in quarter 4, with values 0.8% and 0.95% in the 70s and 80s, respectively.

In the 90s the distribution of effects is also tilted toward the positive side during the first two years, but the average effect is clearly lower and the band width much narrower. Besides, the timing of the effects is delayed, with the maximum average effect of 0.48% taking place in quarter 6.

### **III.3. A closer look at recent evidence**

The results so far suggest that the impact of external events on the euro area economic performance has decreased over the last decades. For oil price effects this seems to be the case since the 80s, whereas for external output the 90s appear to be the turning point.

Specially this external output result motivates a closer look at the 90s to investigate whether the weaker external effects are mainly a characteristic of most recent sample evidence. To this end, the period 1992-2001 is split in the sub-periods 1992-1998 and 1998-2001 in order to see whether the result obtained for the entire decade is mainly determined by one of the sub-periods. If so, this could be interpreted as evidence of a more autonomous domestic euro area economy, as European integration keeps making its way. As it turns out, however, recent evidence (Figures 4 through 6) appears to signal a renewed sensitivity to external events.

Regarding oil price effects on EMU inflation (Figure 4), the sub-period 1998-2001 (3<sup>rd</sup> panel) is the one determining the positive tilt estimated for the decade (1<sup>st</sup> panel). The

estimated effects for the sub-period 1992-1998 (2<sup>nd</sup> panel) are negligible. As for the oil price effects on EMU GDP growth (Figure 5), there is basically no difference between both sub-periods.

The most striking result is obtained for the rest-of-the-world effects on EMU growth performance (Figure 6). The positive tilt obtained for the decade turns out to be a combination of two very different pictures: A weak estimated effect in 1992-1998 and a strong effect in 1998-2001. In the first sub-period the effect is closed to zero on average over the three year simulation period, whereas in the second sub-period the average effect over the first two years of the simulation is even stronger than that estimated for the 70s and the 80s.

#### IV. INTERPRETATION AND POLICY IMPLICATIONS

Does the evidence for recent years reported in the last subsection change the message that the importance of external effects for the euro area seems to have decreased substantially over the last two decades? A probably fair answer to this question is *no* for oil price effects, and *maybe yes* for external output effects.

With regard to oil price, the fact that its effects in the 90s are more pronounced during the last years does not affect the basic message that its quantitative impact is still clearly lower than that estimated for the 70s.

Actually, the reduced importance of oil price effects should probably come at no surprise. On the one hand, the euro zone economy has undergone during the last decades a strong adjustment in terms of its structural energy dependence: Since the beginning of the 70s up to nowadays the oil and energy intensity of the euro area GDP has decreased by more than 50%. On the other hand, the policy mistakes of the 70s are well remembered as a painful lesson regarding the dangers associated with accommodative macroeconomic policy and its feedback on wages. So those mistakes are unlikely to be reproduced.

In fact, regarding policy and wage reaction, the simulation evidence for recent years adds some interesting similarities and differences between 1998-2001 and the 70s. As it turns out, the oil price increase above baseline comes with an increase above baseline in both sample periods in nominal wages. This is not the case either in the 80s or in the 1992-1998 sub-period, which may help to explain why the impact on inflation is statistically less visible in those periods. On the other hand, and in contrast with the 70s, in the 1998-2001 period the oil price increase above baseline also comes with a decrease in real wages (so the effect on prices outweighs the effect on nominal wages) and with an M3 deceleration. This may indeed explain why negative output effects are observed in the 70s but not in the 1998-2001 sub-period, and why the inflationary impact in the latter sub-period is lower than in the 70s.

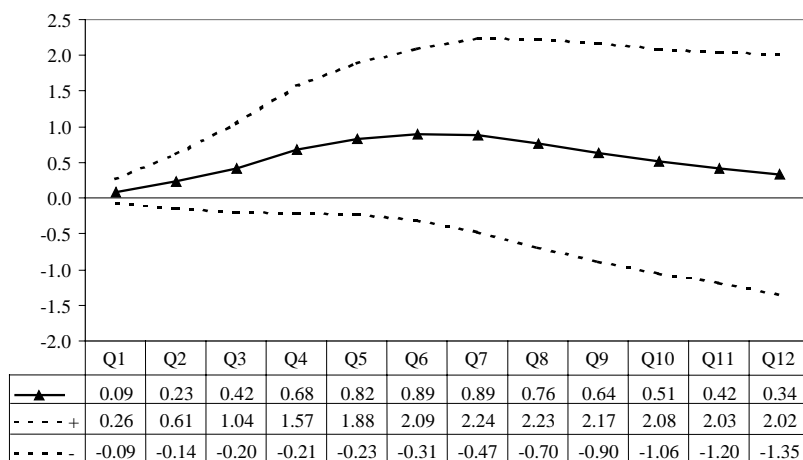
What all this suggests is that when discussing oil price matters we are basically dealing with domestic policy issues, namely, macroeconomic policy and wage reaction. So domestic rather than external factors should be the focus.

Matters may certainly be less favorable with regard to external output effects. In this case, the strong estimated impact for the sub-period 1998-2001 casts serious doubts on the claim that the 90s may have placed the euro area economy in a situation of lower dependence with respect to external economic activity. It rather suggest that the period 1992-1998 may have been a parenthesis in a historical pattern characterized by a clear dependence of the euro area performance on external output evolution. This parenthesis could be explained as an episode of unusually good external growth performance led by the IT impact in the U.S. economy, while the euro area remained IT-stagnant. Under this interpretation, the dominant historical pattern could be back in place once the IT process is embedded in the normal functioning of the external economy, as the simulation results for the last sample years seem to suggests.

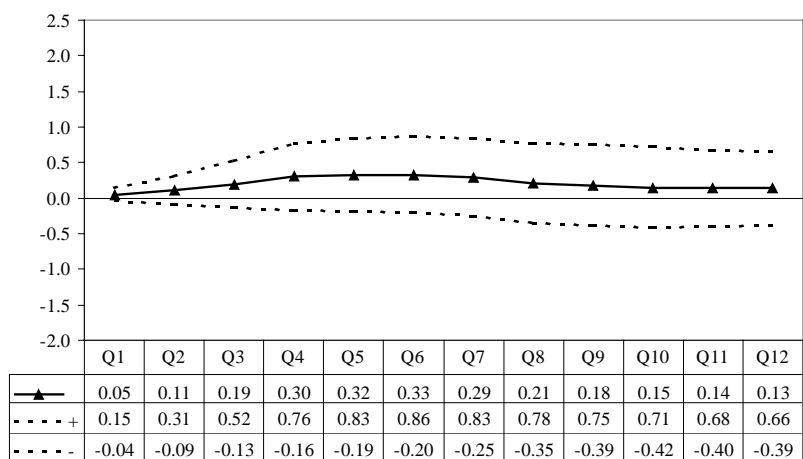
Although less favorable for the euro area domestic strength prospects, this interpretation still leaves open room for a key domestic policy role, namely, do whatever feasible to spur IT-led domestic growth.

**Figure 1. Oil price effects on euro area inflation**

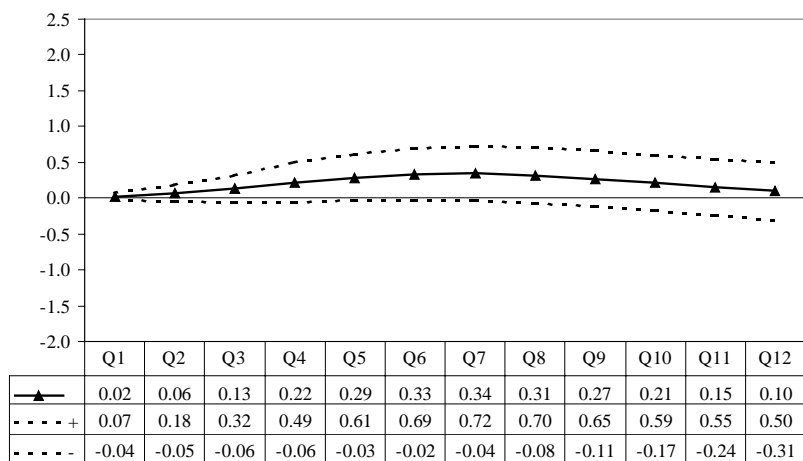
1970-1980



1980-1992

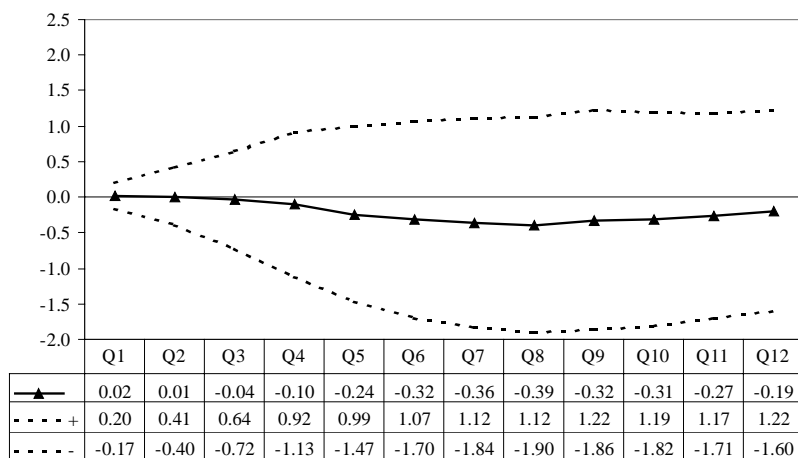


1992-2001

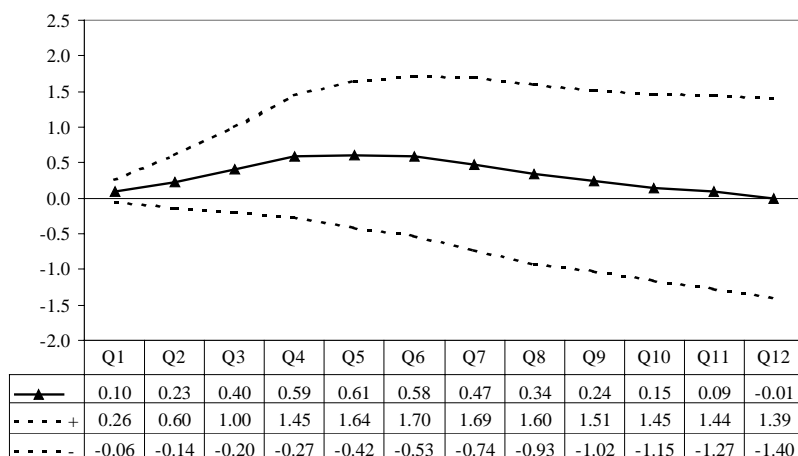


**Figure 2. Oil price effects on euro area growth**

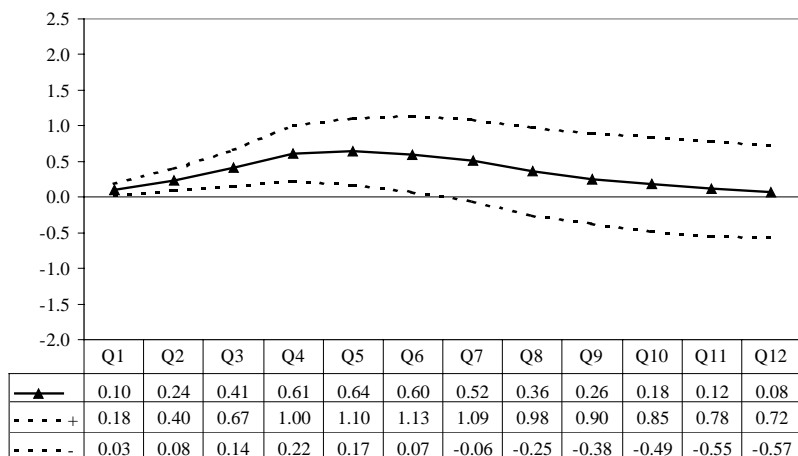
1970-1980



1980-1992



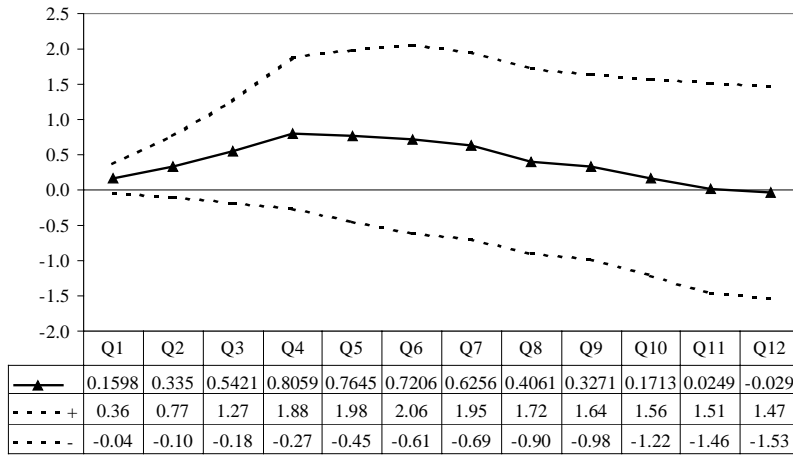
1992-2001



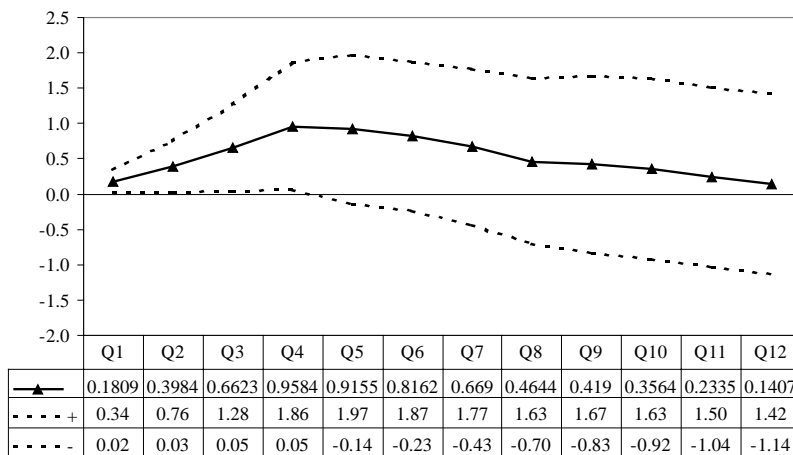


**Figure 3. External output effects on euro area growth**

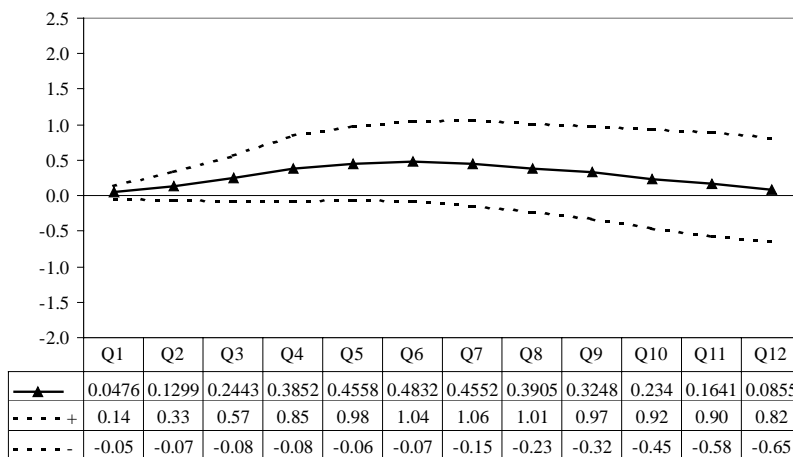
1970-1980



1980-1992

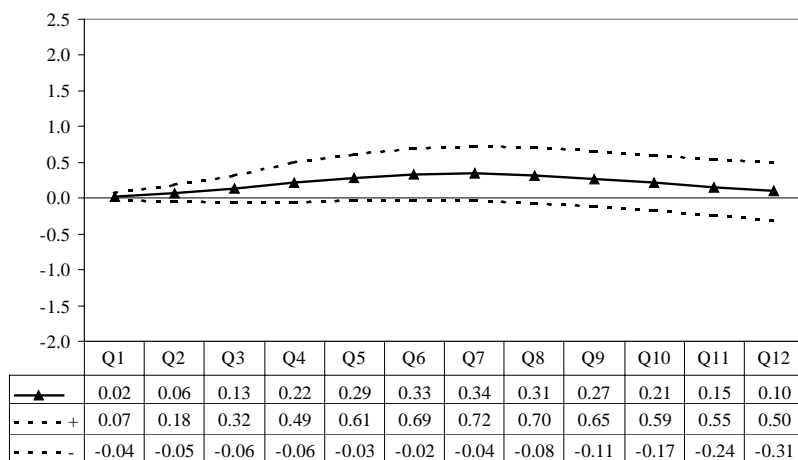


1992-2001

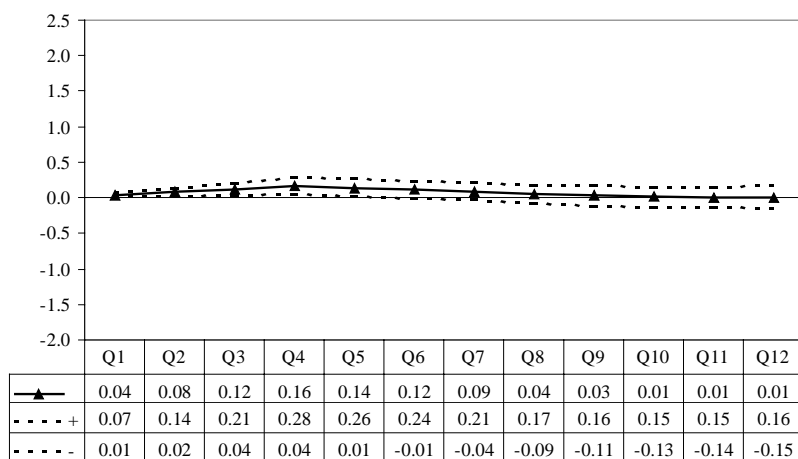


**Figure 4. Oil price effects on euro area inflation**

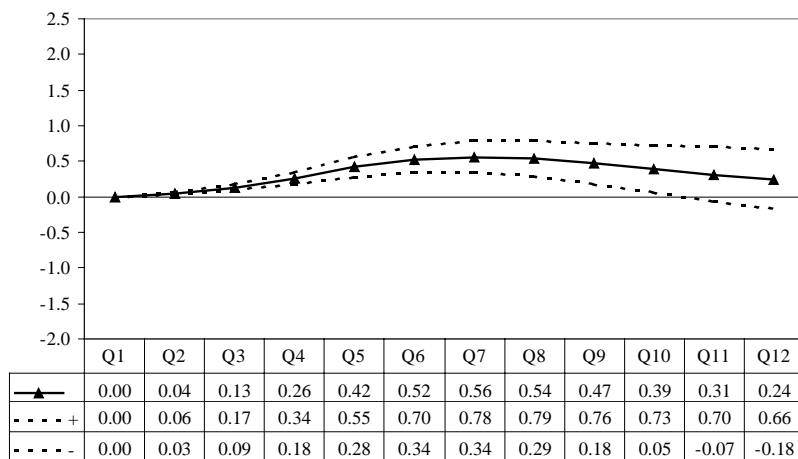
1992-2001



1992-1998

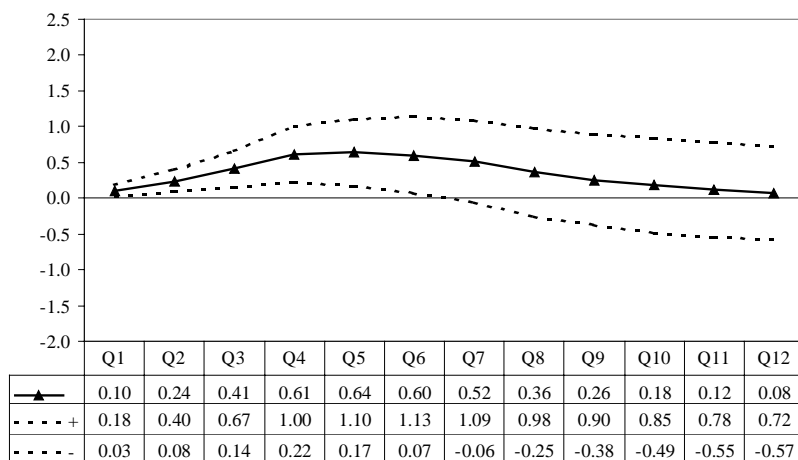


1998-2001

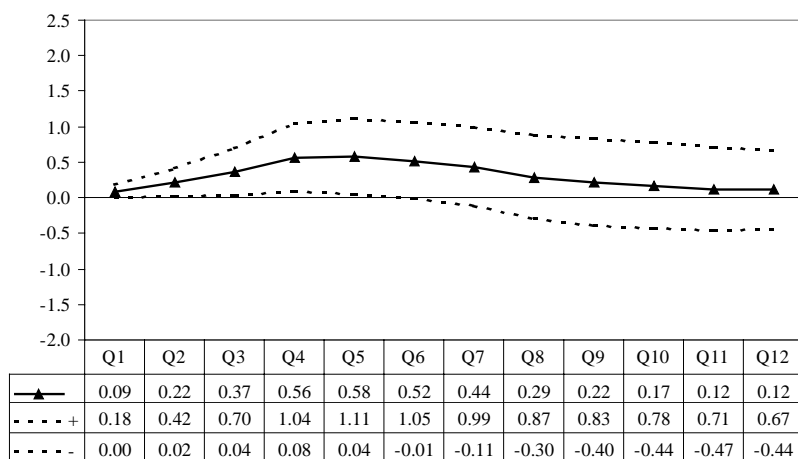


**Figure 5. Oil price effects on euro area growth**

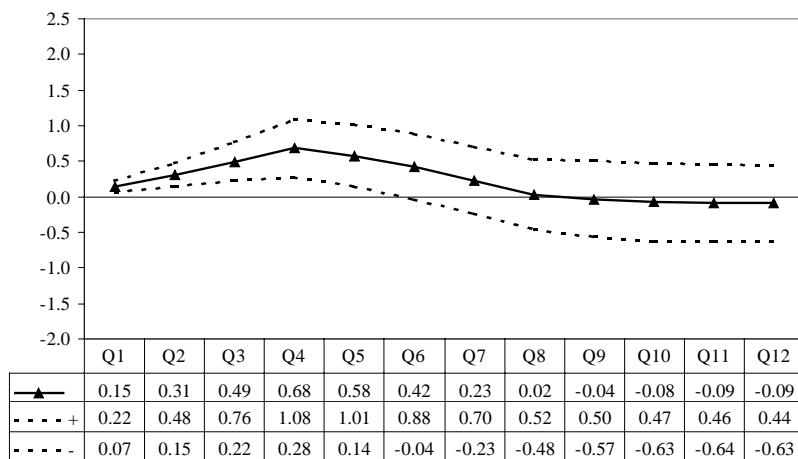
1992-2001



1992-1998

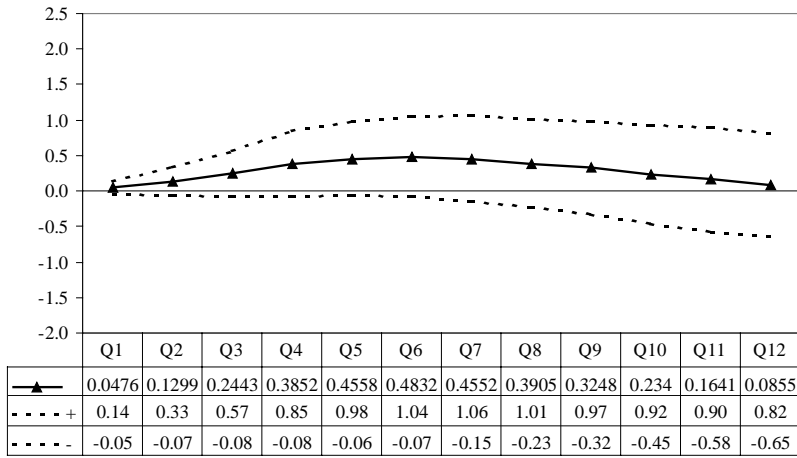


1998-2001

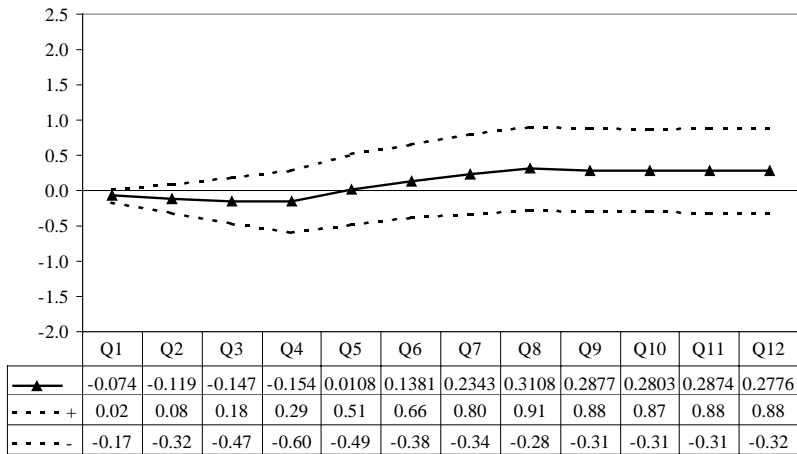


**Figure 6. External output effects on euro area growth**

1992-2001



1992-1998



1998-2001

