Pass-through of energy prices to inflation in the euro area: implications for current modelling practices?

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*Challenges and recent advances in modelling and forecasting inflation*

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Quarterly projections (up to 8 quarters ahead) for the euro area HICP inflation

Eurosystem staff macroeconomic projections
Recent projections by Eurosystem and ECB staff have substantially underestimated the surge in inflation, largely due to exceptional developments such as unprecedented energy price dynamics and supply bottlenecks. […]

Errors in the conditioning assumptions, particularly for energy prices, explain about three-quarters of the recent Eurosystem and ECB staff projection errors for inflation. […]

Nevertheless, the current context [...] means that inflation developments are likely to remain very challenging to forecast in the near term. In this context, complementing the Eurosystem and ECB staff baseline projections with scenario and sensitivity analyses can help provide a richer representation of the inflation outlook. »
An exceptionally large and «thick» energy shock

- Wholesale gas and electricity prices rose to record levels, driving energy inflation
- They also started to display a considerable amount of volatility, typical in the oil market

Wholesale prices of energy commodities

Contributions to euro area energy inflation rate
The pass-through of a persistent energy shock

- Using euro area data from 2002 to 2022, we find a sizable pass-through to food inflation, and a more limited transmission to core components (WP forthcoming, Corsello and Tagliabracci, 2022)
- The responses of food and core inflation rates are lagging, persistent and hump-shaped…
- … but non-linearities might be at play (potential underestimation)

Impulse response analysis from a SVAR model: an exogenous energy shock

Median posterior and credible regions
Direct and indirect effects to inflation rates

- Sizable portions of food and core inflation rates are estimated to be driven by the energy shock
- Direct and indirect energy contributions account for an increasing share of EA headline inflation, at around 60 per cent in September 2022

Model based contributions to euro area food and core inflation rates

Headline inflation: contribution of indirect effects
Components of energy inflation, what’s new across the continent?

- Electricity and, to a lesser extent, gas inflation rates have been generally less common than fuels’ ones.
- Differences have typically been explained by national regulations and market structures.
- …but have been exacerbated by different policy interventions to mitigate the shock in 2021-2022.
Important heterogeneity in energy inflation across both components and countries
Heterogeneous transmission may play a role

- Empirical evidence shows some heterogeneity over the transmission mechanism

Standardized responses to an exogenous energy shock
Median posterior, SVAR model

Energy inflation
Food inflation
Core inflation
Indirect effects more likely to reflect the shock’s size and timing

- Shock’s size and timing may be crucially driving the heterogeneity of this inflationary phase within the euro area

Model based contributions to countries’ food inflation rates
The disaggregated picture: record correlations within the HICP

- Dispersion of inflation rates within the HICP basket has reached its historical maximum
- As well as rolling correlations, especially with energy components

Euro area headline inflation and 3 digits COICOP subcomponents

Rolling correlations (24m horizon) and inflation rates
The Pass-Through is heterogeneous also across subcomponents

- Food items generally display a higher cumulated response (PT) to the energy shock
- But also some core components display a PT similar to food components

Pass through of an exogenous energy impulse (over 30 months; SVAR model)
Overall assessment and forecasting challenges

- Given the exceptional size and nature of this shock, **non-linearities can be at play**
- **Sizable degree of country heterogeneity** (shocks’ size/transmission, policy interventions)
- The pass-through looks different also across inflation components
- Nevertheless, ESCBs used to work with disaggregated inflation ➔ **bottom-up forecasting approach** of the Eurosystem projections where:
  - predictions are made by NCBs for each country
  - especially for short-term forecasting, inflation tend to be predicted using fine disaggregations

**FORECASTING CHALLENGES**

- **Deepen/increase knowledge&monitoring of (non-fuels) energy prices and markets** (gas/ele are now considered in ESCB assumptions)
- **Innovate and enhance modeling:** we could…
  - account for some time variation and other non-linearities, especially in extraordinary times
  - consider energy dynamics in modeling inflation components that display a sizable PT
  - make use of new data sources (e.g., high frequency data)
Thank you for your attention.

<<Don't lose your grip on the dreams of the past>>

Over 60 years of consumer inflation rates in the G7