International Food Commodity Prices and

Missing Dis(Inflation) in the Euro Area

Gert Peersman

UGent
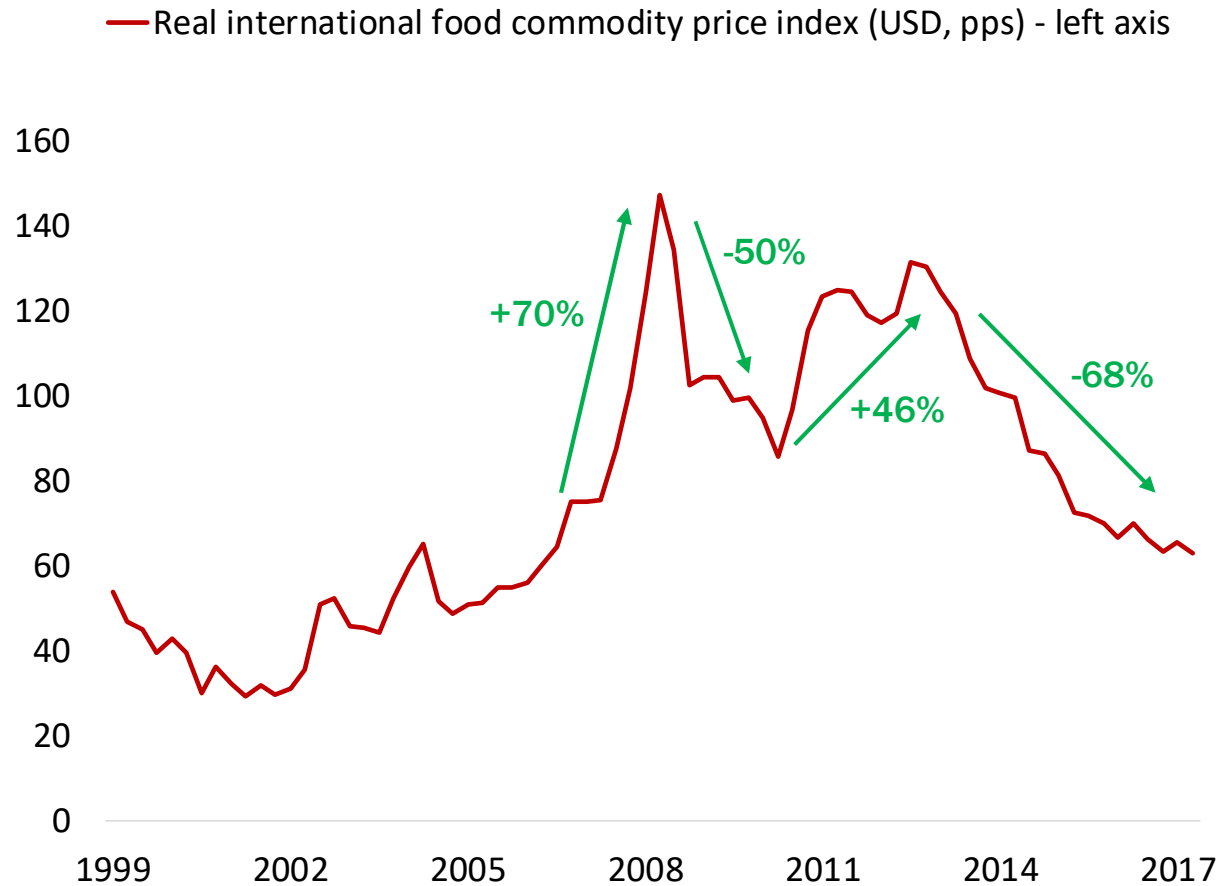
Motivation

- **Food related items have very large share in Harmonized Index of Consumer Prices**

HICP – Food related items	**27.4%**
Processed food	12.1%
Unprocessed food	7.5%
Catering services	7.8%
HICP – Industrial goods excluding Energy	**26.3%**
HICP – Energy	**9.7%**
HICP – Services excluding catering	**36.6%**
HICP – Overall index	**100.0%**

- **Are even more important for formation of inflation expectations of households**

  - **Survey of Norges Bank: 61% of households consider "prices of food" as factor that influences inflation expectations most**
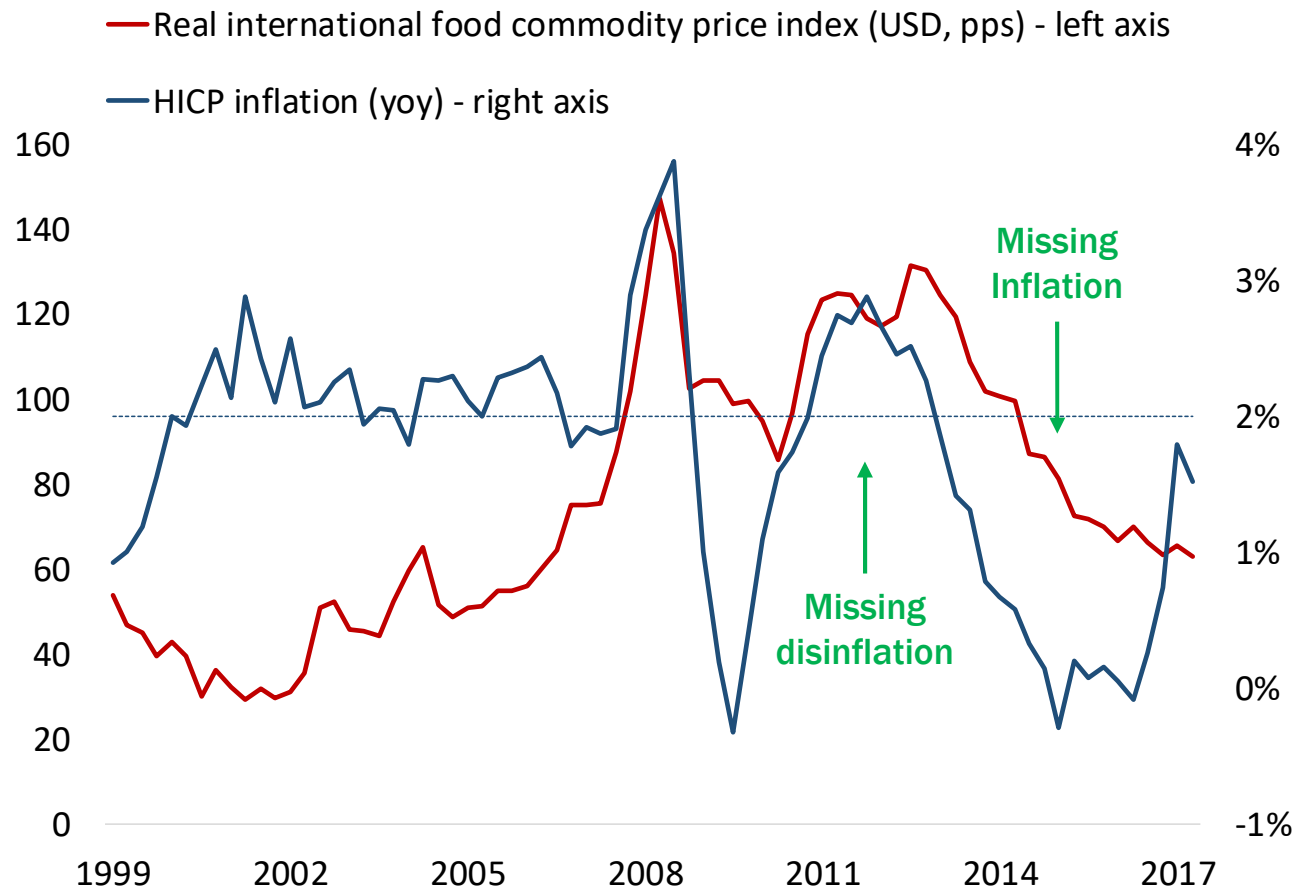
Motivation

- **Very little is known about causal effects of fluctuations in international food commodity prices on euro area inflation dynamics, despite being critical input factor in food production function and substantial price swings**

—— Real international food commodity price index (USD, pps) - left axis

Motivation

- **Swings international food commodity prices could have contributed to so-called "twin puzzle" of missing disinflation/inflation after Great Recession**

Real international food commodity price index (USD, pps) - left axis

HICP inflation (yoy) - right axis

Missing Inflation

Missing disinflation

Motivation

- Existing studies (e.g. Fed, ECB, IMF) are reduced-form time series models that only explore unconditional co-movement in data: *pricing chain assumption*

Food commodity prices ⟶ Consumer prices

  – In essence, these studies regress changes in consumer prices on contemporaneous and lagged changes in food commodity prices

  – Can be informative about signaling role (correlation) of food commodity prices for future inflation, but cannot be given causal interpretation

Motivation

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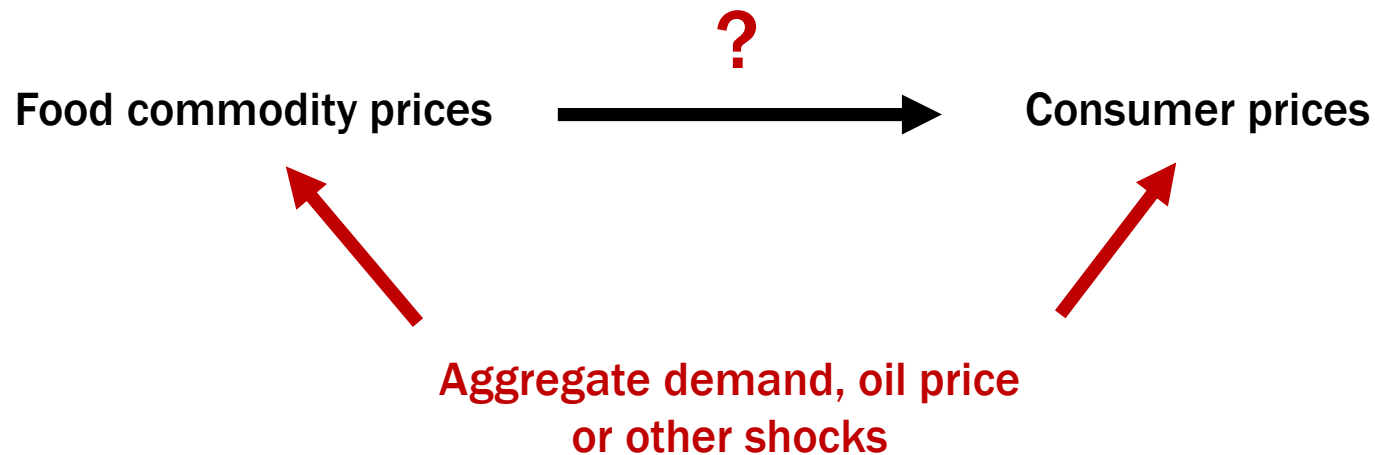
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This paper

- Estimation of **causal effects** of shifts in international food commodity prices on euro area inflation dynamics for period 1970Q1–2016Q4 **using SVAR-IV methods** in spirit of Stock and Watson (2012) and Mertens and Ravn (2014)

International variables

✓ International real food commodity prices (USD)

✓ International real crude oil prices (USD)

✓ Real exports euro area

✓ Euro/USD exchange rate

Euro area variables

✓ Real GDP

✓ Real personal consumption

✓ Short-term interest rate

✓ HICP

- **Identification with external instrumental variable**: not full shock series, but reflects an exogenous component of target shock

Unanticipated harvest shocks

- Explore fact that harvests cannot respond within quarter to economic shocks due to time lag of 3-10 months between planting and harvest of cereal commodities

  - While actual harvests are subject to unanticipated autonomous shocks: e.g. caused by weather variation, pests or diseases

- Estimate series of unanticipated (non-European) harvest shocks

$$Q_t = c + trend + C(L)X_t + D(L)Q_t + v_t$$

Prediction errors are unanticipated harvest shocks

  - Q_t: two-thirds of global (non-European) harvest volume of corn, wheat, rice and soybeans constructed as in De Winne and Peersman (2016)

  - X_t vector of control variables that may influence harvests with a lag of 1 or more quarters: food commodity prices, global economic activity, oil price

Unanticipated harvest shocks

- Variability of harvest volumes has been substantial

Global (non-European) harvest volume

Unanticipated harvest shocks
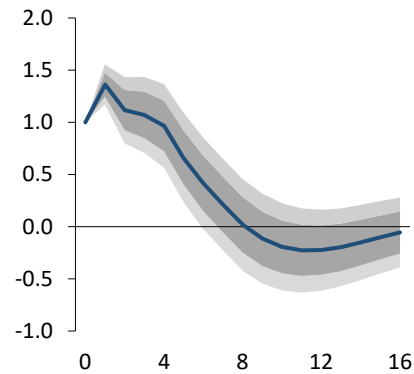
Average = 0.0%
Stdv = 4.3%
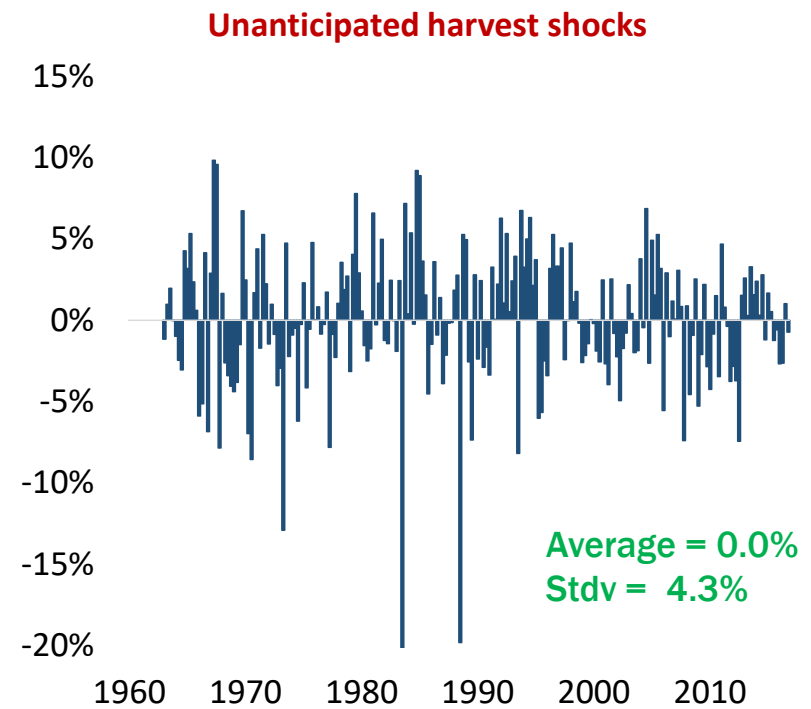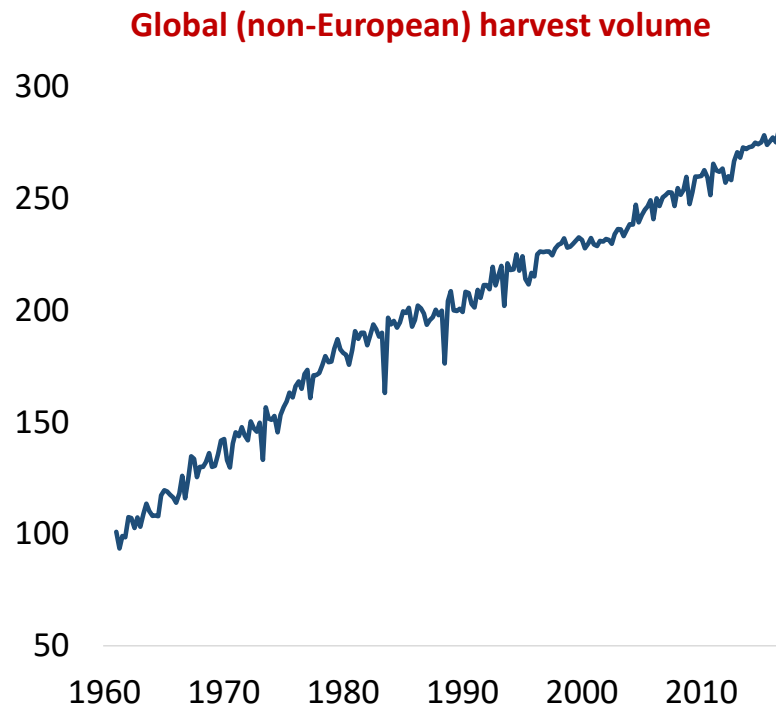
- Harvest shocks turn out to be strong instrument for food commodity price innovations: F-statistic and robust F-statistic are respectively 13.9 and 17.4
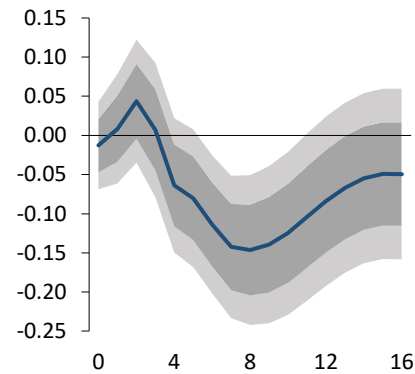
Baseline VAR results

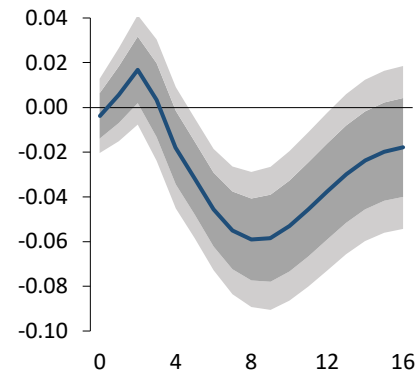- Effects of 1% increase in real international food commodity prices
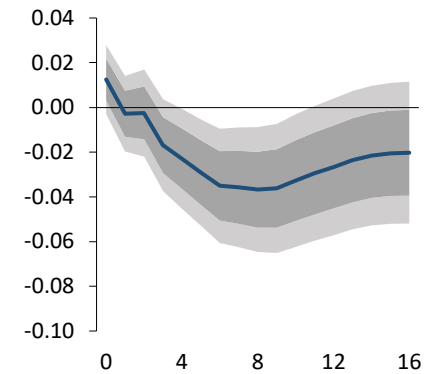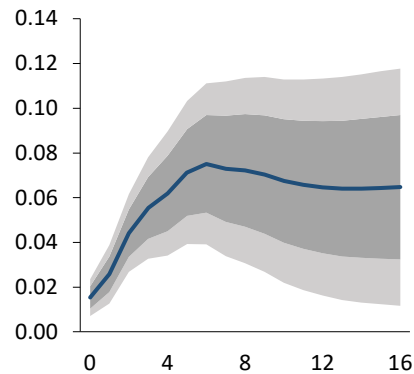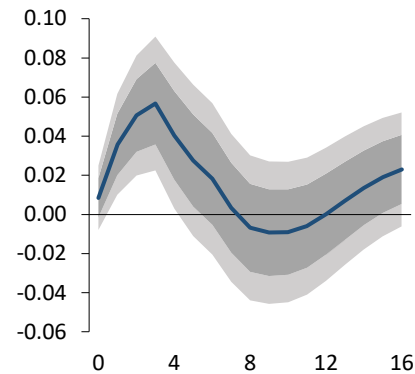

Food commodity prices (USD)   **Real export**   **Real GDP**   **Real personal consumption**
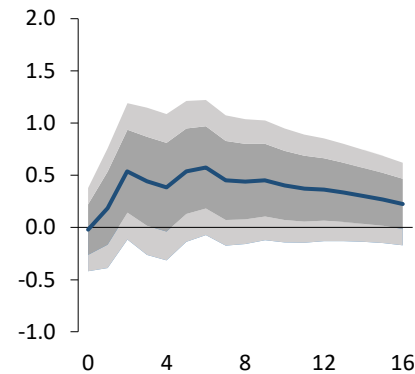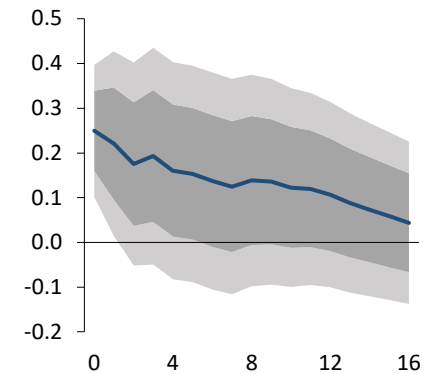
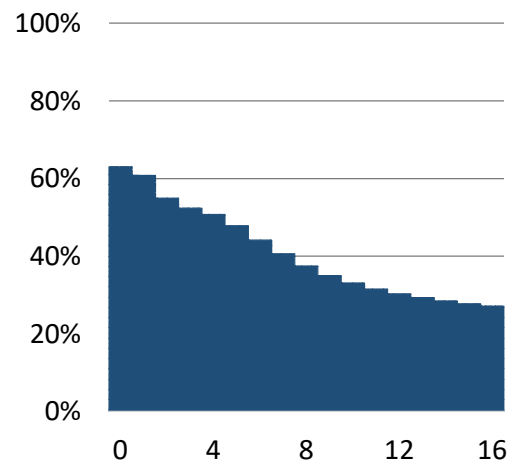**HICP**   **Short-term interest rate**   **Real crude oil prices (USD)**   **Euro-per-USD exchange rate**
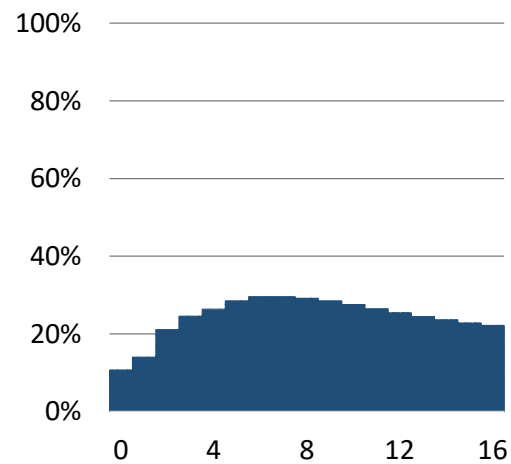
Contribution to forecast error variances

- Exogenous international food commodity price shocks explain 25% - 30% of the forecast error variance of the HICP
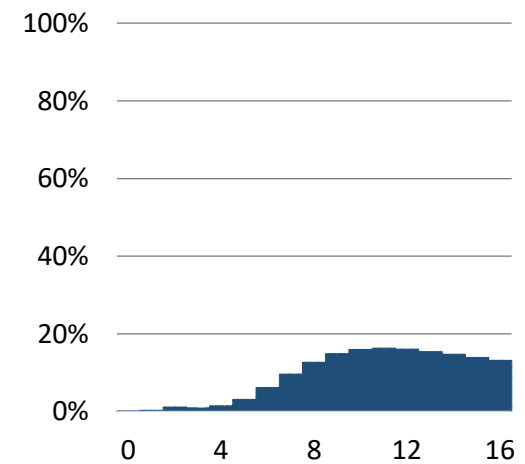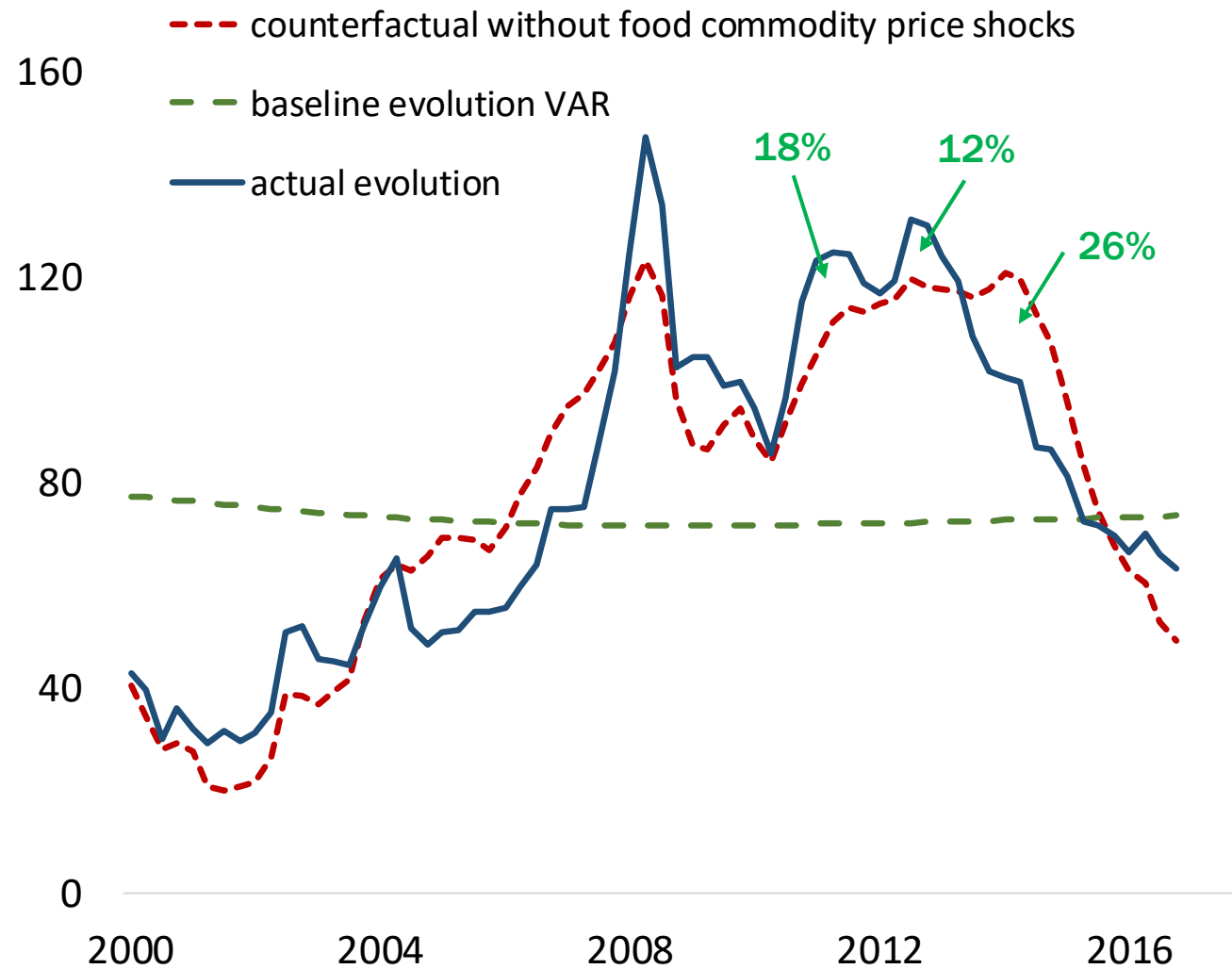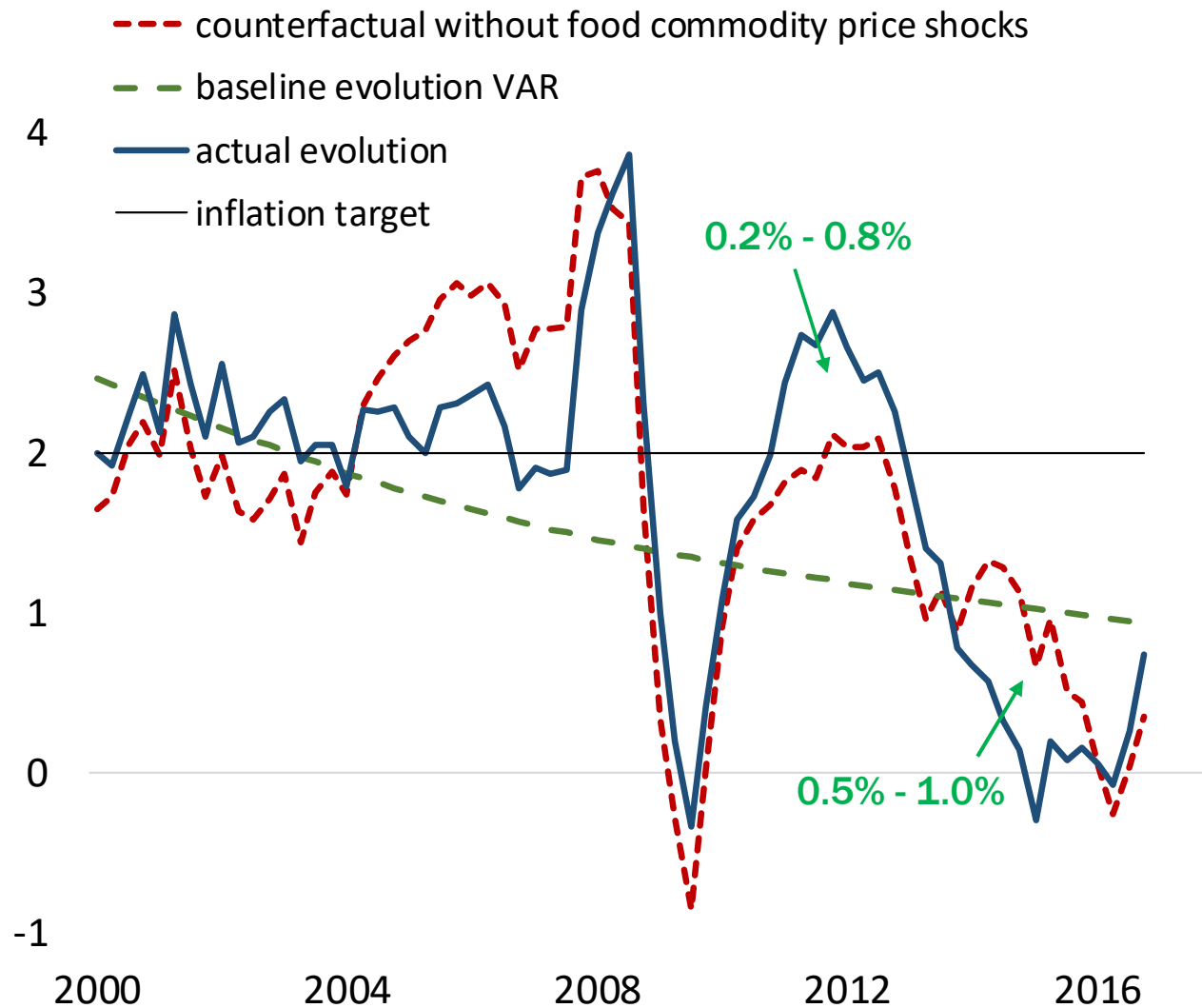

Food commodity prices (USD)

HICP

Real GDP

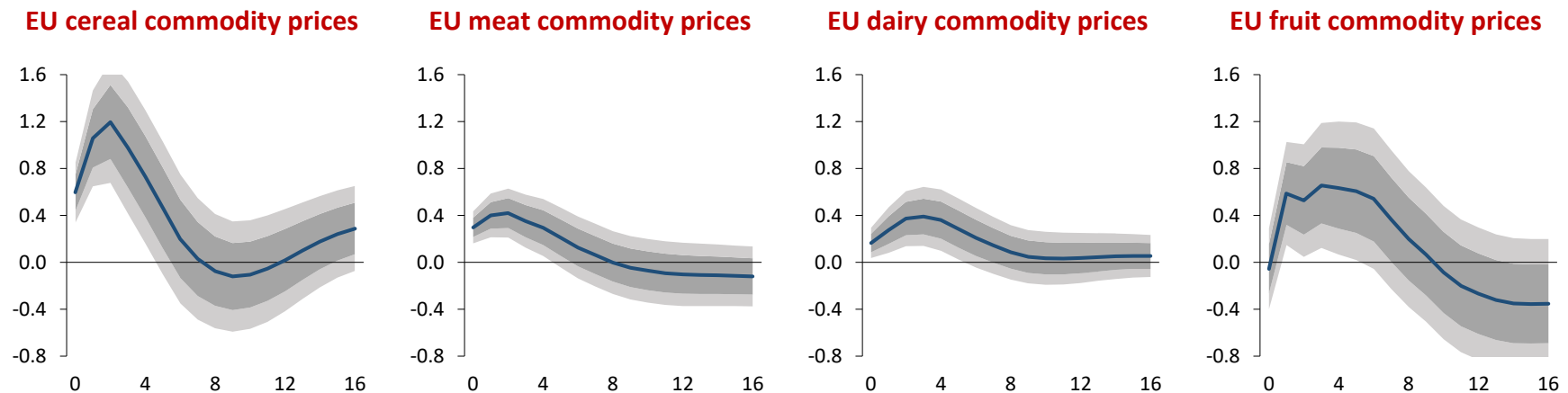# Impact on food commodity prices: counterfactual analysis

Impact on annual HICP inflation: counterfactual analysis

Effects through the food production chain

- Construction of (sub)indexes for EU farm-gate and internal market prices

EU cereal commodity prices   **EU meat commodity prices**   **EU dairy commodity prices**   **EU fruit commodity prices**
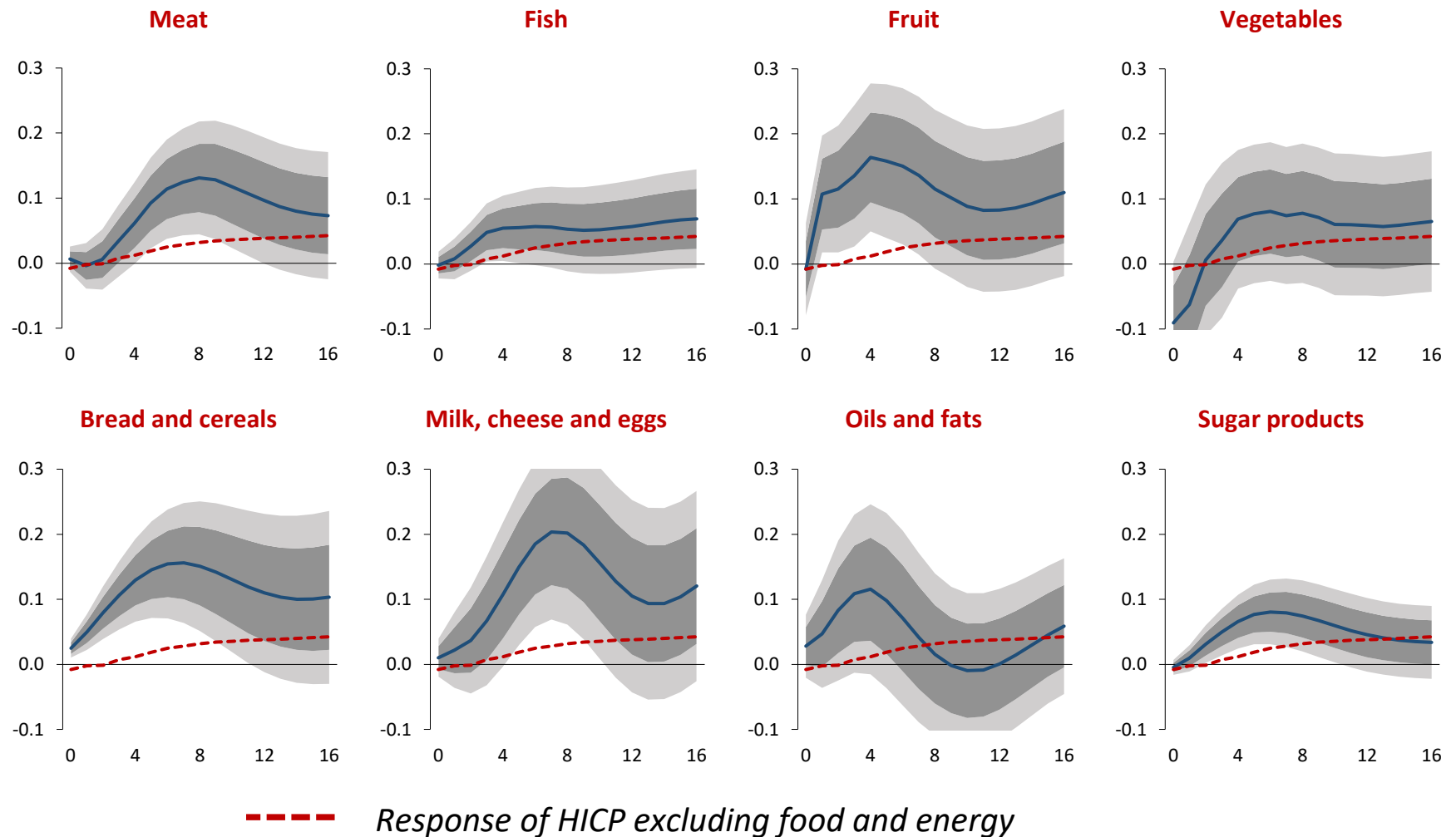

– Not only a rise of international food commodity prices (=import prices), also a (less than proportional) rise of EU internal market and farm-gate prices

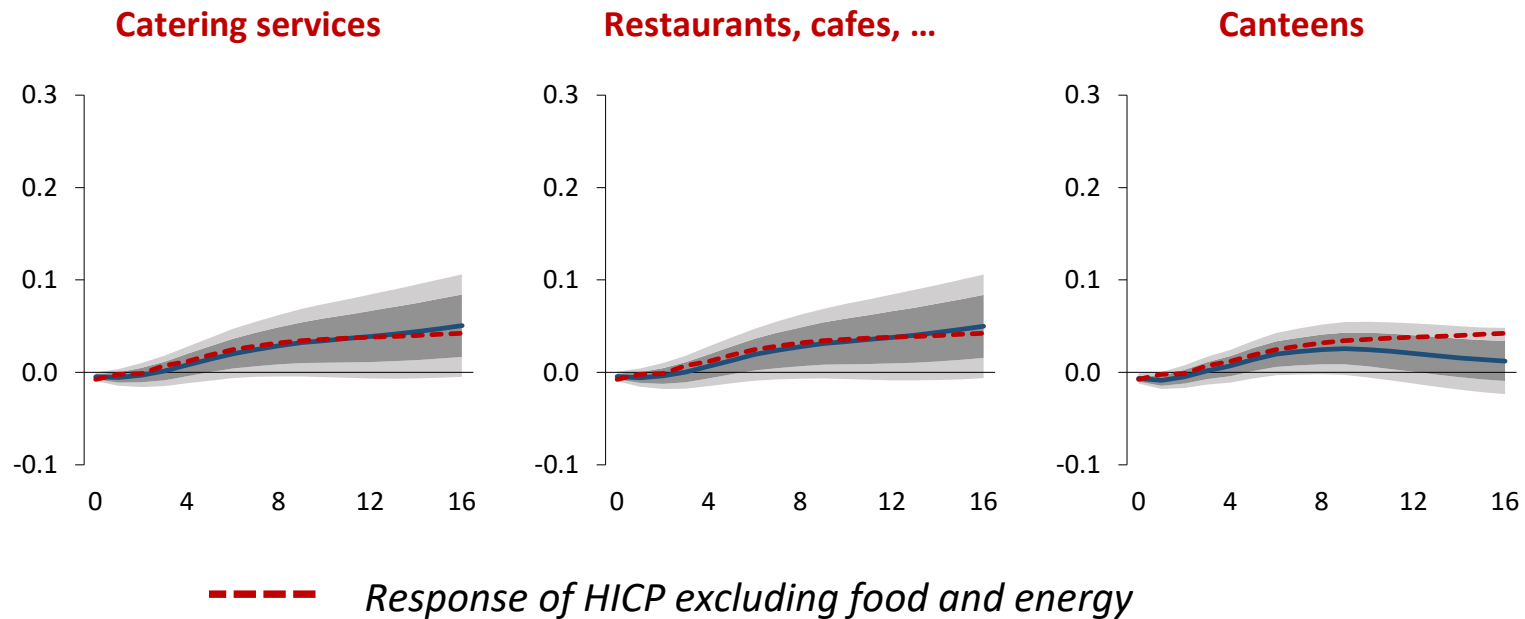- Note: large fraction of cereal commodities are used to feed animals, which augments production costs of meat and dairy products

Effects through the food production chain

- Significant (less than proportional) pass-through to retail prices of food in HICP

Meat **Fish** **Fruit** **Vegetables**

Bread and cereals **Milk, cheese and eggs** **Oils and fats** **Sugar products**

- - - - **Response of HICP excluding food and energy**

Effects through the food production chain

- Impact on food *services* is, however, not larger than impact on non-food products

Catering services   **Restaurants, cafes, …**   **Canteens**

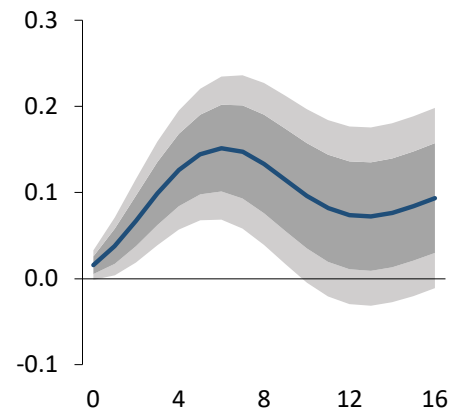- - - - *Response of HICP excluding food and energy*

Indirect effects of international food price shocks

- There is also significant increase of HICP excluding food and energy, as well as HICP energy...
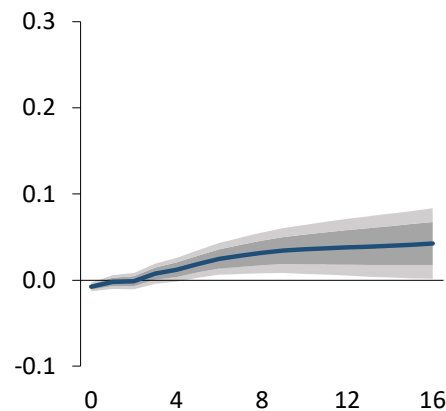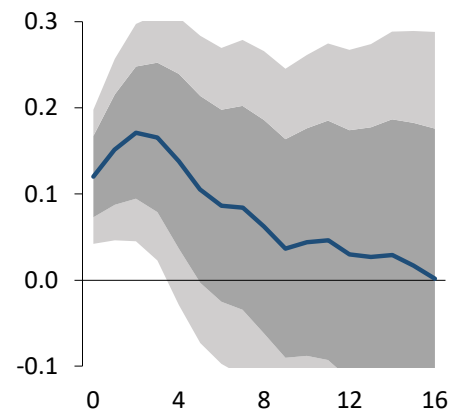

HICP - unprocessed food
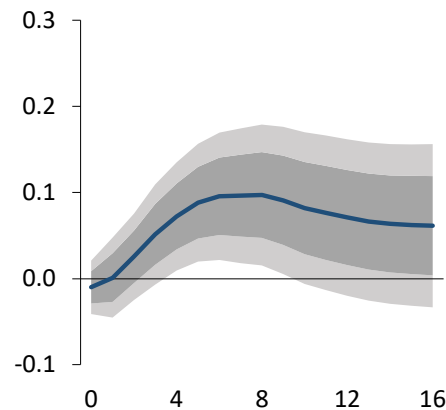
HICP - processed food

HICP - excl energy and food

HICP - energy

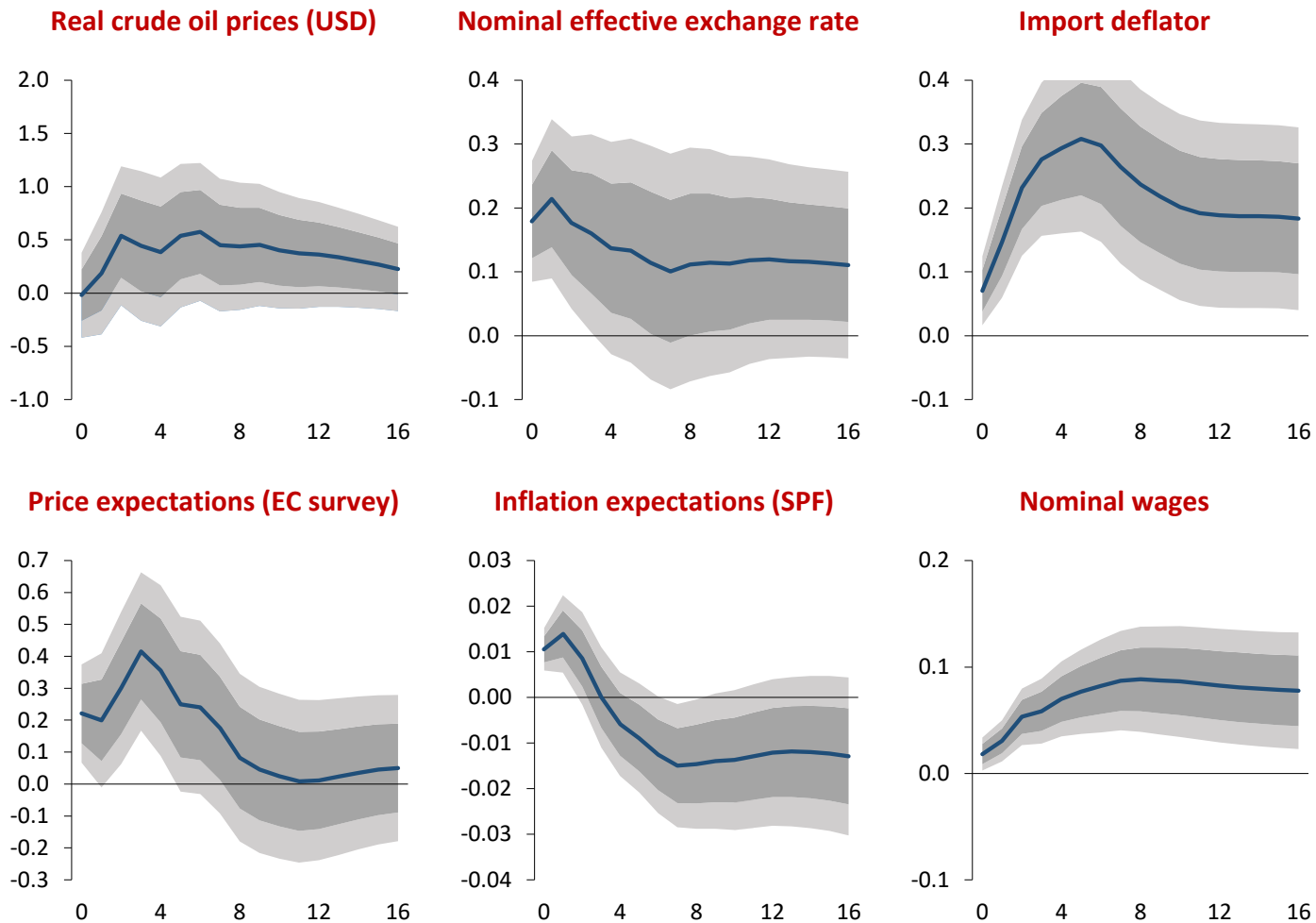# Indirect effects of international food price shocks

- Can be explained by depreciation of euro (higher import prices, including oil prices in euro's) and second-round effects via rising inflation expectations and wages

Real crude oil prices (USD)

Nominal effective exchange rate

Import deflator

Price expectations (EC survey)

Inflation expectations (SPF)

Nominal wages

Post-1990 sample period
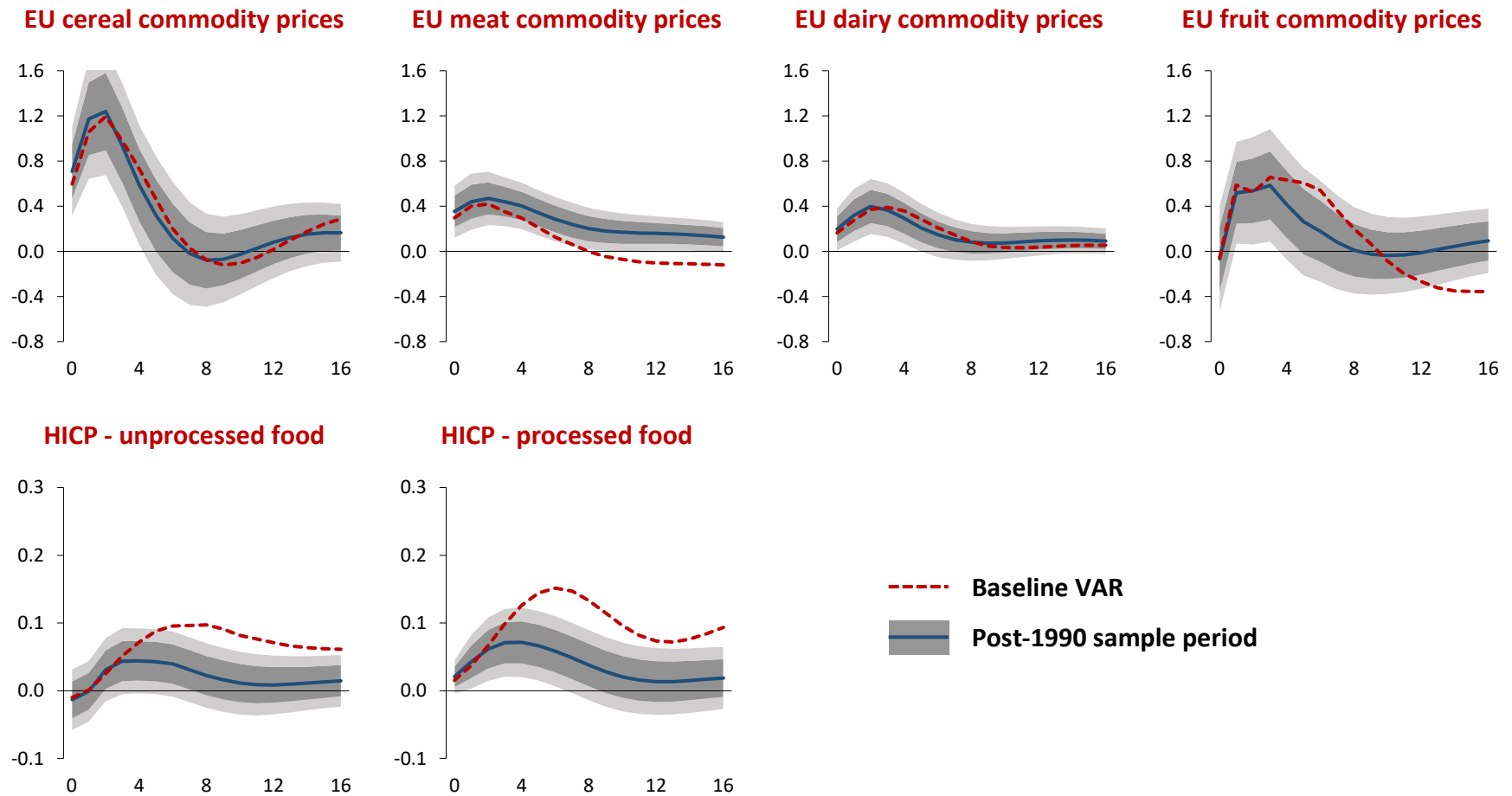
- **There appears to be time-variation in the effects: smaller and less persistent impact on HICP in more recent sample period (1990Q1–2016Q4)**

  – **Does not matter for variance decomposition and contribution to twin puzzle after Great Recession**

Impact on HICP　　**Variance decomposition HICP**　　**Historical contribution to HICP**

- - - Baseline VAR　　　　　▇ Post 1990 sample period
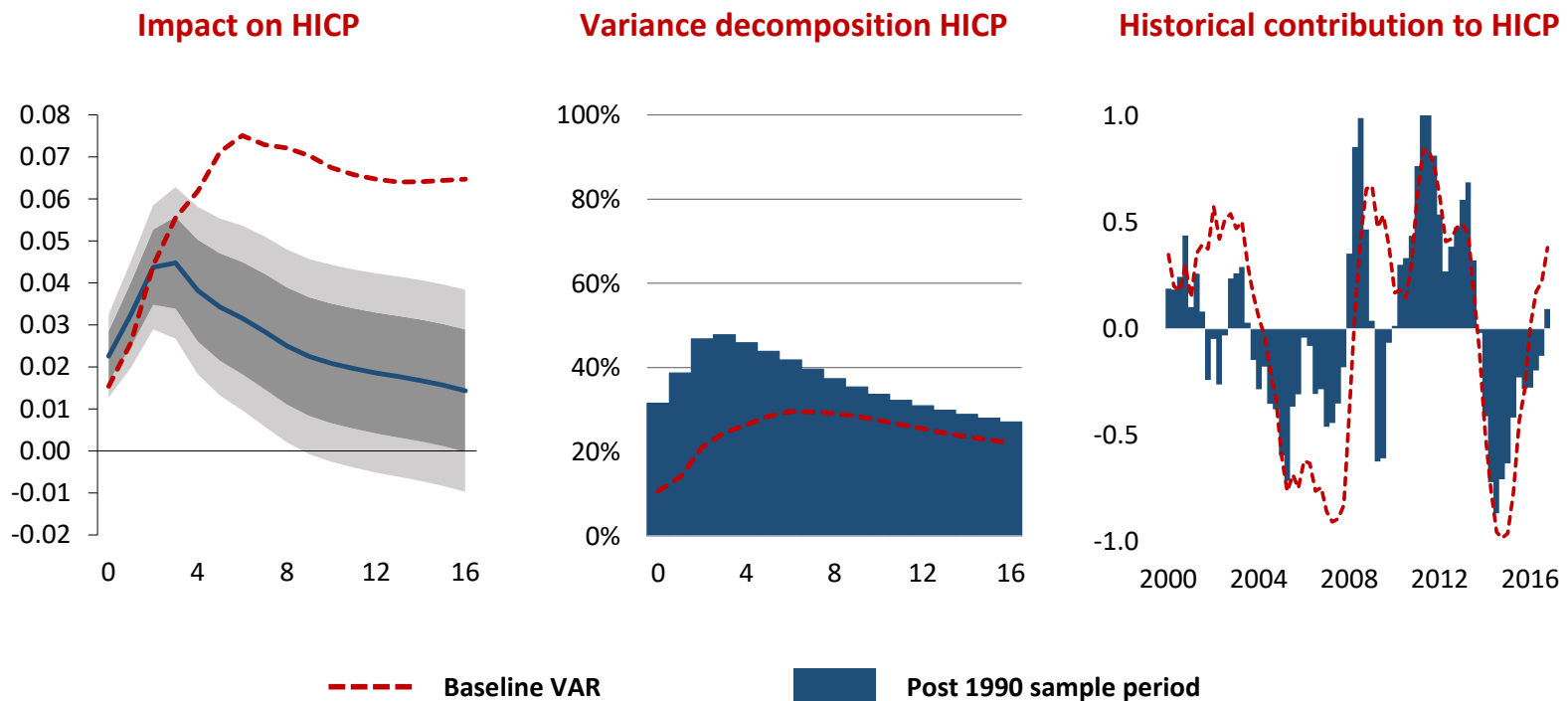
Post-1990 sample period

- **Effects through food production chain are quite similar in post-1990 sample**

EU cereal commodity prices · EU meat commodity prices · EU dairy commodity prices · EU fruit commodity prices · HICP - unprocessed food · HICP - processed food

- - - - Baseline VAR
- ■ Post-1990 sample period

Post-1990 sample period

- Indirect effects on HICP excluding energy and food have changed: more subdued depreciation and much less second-round effects via rising wages
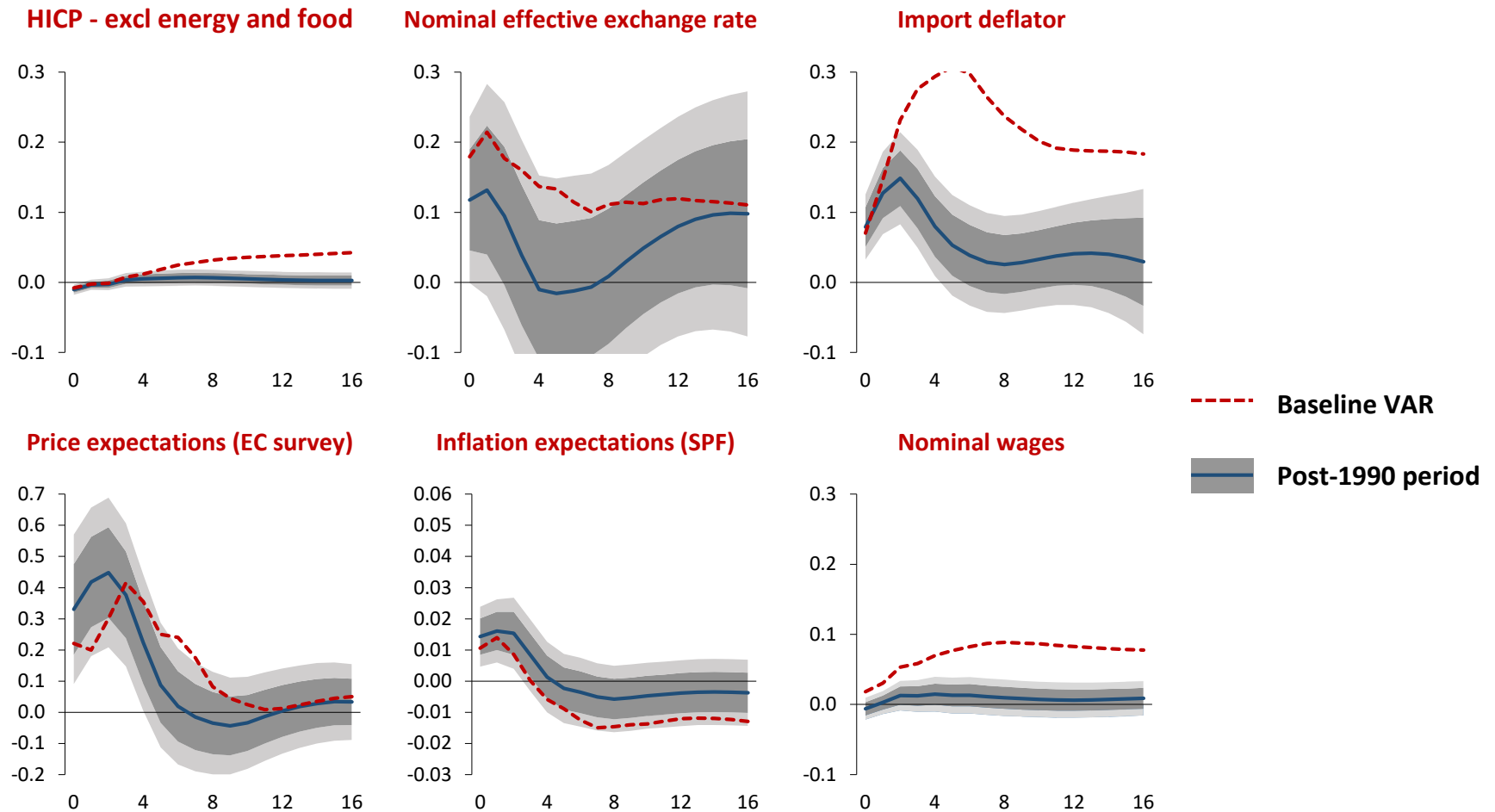
Post-1990 sample period

- On other hand: there have been spillover effects of food commodity price shocks on oil prices in recent sample period, resulting in stronger impact on HICP energy

  - Consistent with literature on biofuels (substitute for oil to produce energy) and financialization of commodity markets (spillovers between commodity prices)

Real crude oil prices (USD)

HICP - energy

- - - - - Baseline VAR

Post-1990 sample period
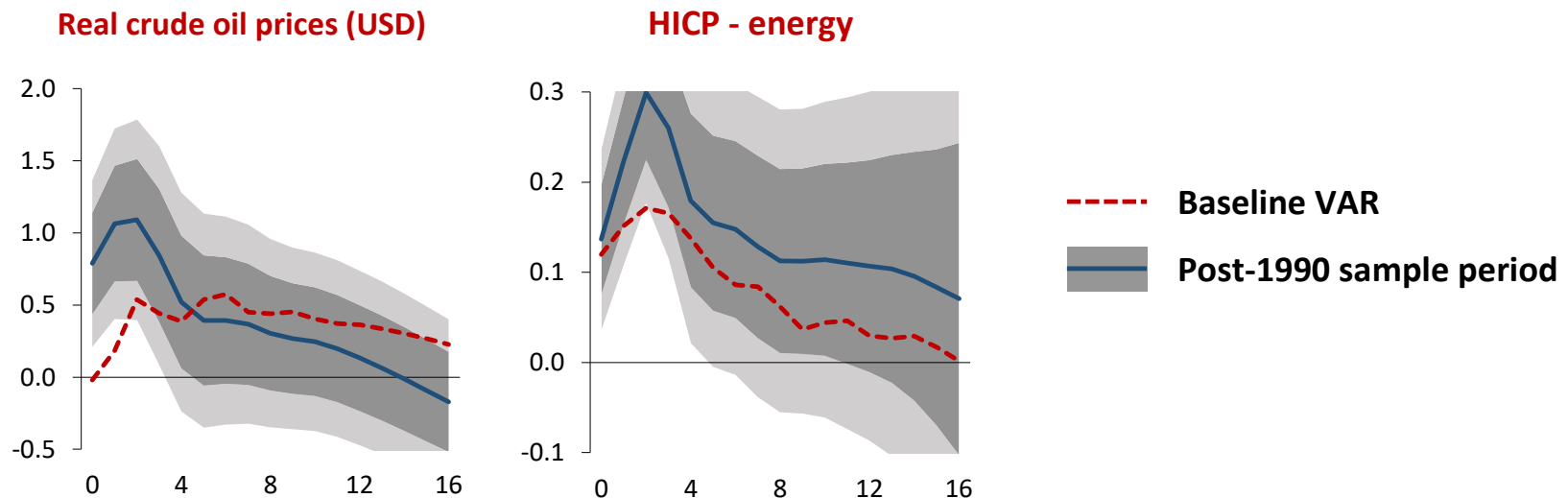
Conclusions

- Fluctuations in food commodity prices matter for euro area inflation dynamics

    – Relatively strong impact on HICP, explaining 25%-30% of forecast variance

    – Economic relevant influence on both missing deflation and inflation in aftermath Great Recession

- Direct transmission channel through the food production chain, but also indirect effects via depreciation of euro and second-round effects of rising wages

- There appears to be time-variation in the pass-through: smaller and less persistent effects due to reduction of the indirect effects

- Might become more important in future as consequence of climate change!