International Food Commodity Prices and Missing Dis(Inflation) in the Euro Area

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UGent
Motivation

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

<table>
<thead>
<tr>
<th>HICP – Food related items</th>
<th>27.4%</th>
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</thead>
<tbody>
<tr>
<td>Processed food</td>
<td>12.1%</td>
</tr>
<tr>
<td>Unprocessed food</td>
<td>7.5%</td>
</tr>
<tr>
<td>Catering services</td>
<td>7.8%</td>
</tr>
<tr>
<td>HICP – Industrial goods excluding Energy</td>
<td>26.3%</td>
</tr>
<tr>
<td>HICP – Energy</td>
<td>9.7%</td>
</tr>
<tr>
<td>HICP – Services excluding catering</td>
<td>36.6%</td>
</tr>
</tbody>
</table>

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.
Swings international food commodity prices could have contributed to so-called “twin puzzle” of missing disinflation/inflation after Great Recession.
Existing studies (e.g. Fed, ECB, IMF) are reduced-form time series models that only explore unconditional co-movement in data: \textit{pricing chain assumption}

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

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


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<th>International variables</th>
<th>Euro area variables</th>
</tr>
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<tbody>
<tr>
<td>✓ International real food commodity prices (USD)</td>
<td>✓ Real GDP</td>
</tr>
<tr>
<td>✓ International real crude oil prices (USD)</td>
<td>✓ Real personal consumption</td>
</tr>
<tr>
<td>✓ Real exports euro area</td>
<td>✓ Short-term interest rate</td>
</tr>
<tr>
<td>✓ Euro/USD exchange rate</td>
<td>✓ HICP</td>
</tr>
</tbody>
</table>

- **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

\[ Q_t = c + trend + C(L)X_t + D(L)Q_t + v_t \]

- \( Q_t \): 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

- 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

![Graphs showing the effects of a 1% increase in real international food commodity prices on various economic indicators.](image-url)
Exogenous international food commodity price shocks explain 25% - 30% of the forecast error variance of the HICP.
Impact on food commodity prices: counterfactual analysis

- counterfactual without food commodity price shocks
- baseline evolution VAR
- actual evolution

18%  12%  26%
Impact on annual HICP inflation: counterfactual analysis

- counterfactual without food commodity price shocks
- baseline evolution VAR
- actual evolution
- inflation target


0.2% - 0.8%
0.5% - 1.0%
Effects through the food production chain

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

### Response of HICP excluding food and energy

- **Meat**
- **Fish**
- **Fruit**
- **Vegetables**
- **Bread and cereals**
- **Milk, cheese and eggs**
- **Oils and fats**
- **Sugar products**
Effects through the food production chain

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

![Graph showing the response of HICP excluding food and energy for different categories of food services.](image)
Indirect effects of international food price shocks

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

\[ \begin{align*}
\text{HICP - unprocessed food} & \quad \text{HICP - processed food} \\
\text{HICP - excl energy and food} & \quad \text{HICP - energy}
\end{align*} \]
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.
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
Post-1990 sample period

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

![Graphs showing various economic indicators](image-url)
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).
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!