Discussion of
“Macroeconomic Implications of Oil Price Fluctuations: A Regime-Switching Framework for the Euro Area”
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What Does the Paper Do?

• Macroeconomic effects of oil price shocks depend on prevailing regime
  ⟷ estimate regime-switching VAR model for the Euro area over the period 2004-2015
  ➢ “normal” regime: moderate responses of macroeconomic variables
  ➢ “adverse” regime: economic conditions worsen after oil price decline

• Role of second-round effects
A Monetary Policy Perspective

• How does the ECB react to oil prices and inflation expectations?
  ⟷ systematic part of monetary policy

• Does this model provide an informational advantage to setting policy?
  ⟷ “early” warning system of inflation expectation unanchoring
The ECB’s Reaction Function

Structural model of interest:

\[
\begin{align*}
A y_t &= \lambda + B_1 y_{t-1} + \cdots + B_m y_{t-m} + u_t \\
&\quad (n \times n)(n \times 1)
\end{align*}
\]

\[u_t \sim \text{i.i.d. } N(0, D)\]

\[D \text{ diagonal}\]

\[y_t = \{ip_t, \pi_t, \text{brent}_t, s_t^{\$/$\text{€}}, \pi_t^{\text{swap}}, i_t\}\]

\[\iff A \text{ contains the contemporaneous structural coefficients (e.g. systematic response of monetary policy)}\]
Choleski Identification

Recursive identification implies:

\[
A = \begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 \\
-a_{21} & 1 & 0 & 0 & 0 & 0 \\
-a_{31} & -a_{32} & 1 & 0 & 0 & 0 \\
-a_{41} & -a_{42} & -a_{43} & 1 & 0 & 0 \\
-a_{51} & -a_{52} & -a_{53} & -a_{54} & 1 & 0 \\
-a_{61} & -a_{62} & -a_{63} & -a_{64} & -a_{65} & 1
\end{bmatrix}
\]

\[\rightarrow A^{-1} \text{ is the impact matrix}\]
Bayesian Estimation

• Bayesian algorithm (Baumeister and Hamilton, 2017) nests Choleski as a special case
   I put absolutely zero possibility on any $A$ unless the upper-triangular elements are all zero.
   I have no information at all about the lower-triangular elements

\[ p(a_{ij}) \sim \text{Student } t \text{ density with location 0, scale 100 and 3 degrees of freedom} \]

\[ \Rightarrow \text{ Posterior distribution for coefficients in policy rule} \]
The ECB’s Policy Rule

Response to inflation

\[ a_{62} \]
The ECB’s Policy Rule

Response to inflation $a_{62}$

Response to oil prices $a_{63}$
The ECB’s Policy Rule

Response to inflation

Response to oil prices

Response to inflation expectations
Impulse Responses to Oil Price Shock

- Overall less persistent?
- Resemble more “adverse” regime in terms of magnitudes?
Measures for Inflation Expectations

• Market-based measure of inflation expectation:
  - 5-year/5-year forward break-even inflation rates
    ✓ Closely monitored by policymakers
    ✓ Readily available at high frequency
  BUT
    ➢ Could be distorted by financial factors: risk premia, liquidity premia, flight to quality, institutional distortions, supply and demand effects (e.g. QE programs) …
    ➢ Only start in 2004 for Euro area

• Inflation swaps 5-year/5-year forward rates
  ➢ Similar caveats apply
Measures for Inflation Expectations

• What about survey expectations?
  ✓ Inflation expectations of household and firms are more directly tied to wage developments $\Rightarrow$ second-round effects
  ✓ Longer samples are available, but different horizon
    ➢ Monthly:
      ▪ European Commission consumer survey (since 1985)
      ▪ Consensus Economics (1-year ahead)
    ➢ Quarterly:
      ▪ ECB Survey of Professional Forecasters (since 1999)
A Note of Caution

Measures of inflation expectations differ substantially
A Note of Caution

Market-based measures are highly correlated with oil prices, survey-based measures not so much.

Is inflation risk premium responsible for this?
A 10% decline in oil prices leads to a 2 basis point decrease in inflation expectations
Information Value for Policymakers

• Time-varying probabilities serve as “real-time signal” for policymakers to decide which action is called for in response to oil price fluctuations
  ➞ smoothed vs filtered
  ➞ what’s the information?
Time-Varying Probabilities

- Gray area: time-varying probability of being in normal regime
- Black line: conditional probability of staying in that regime
- Blue line: nominal Brent oil price

Gradual vs abrupt?
Time-Varying Probabilities

- Gray area: time-varying probability of being in normal regime
- Black line: conditional probability of staying in that regime
- Red line: year-over-year log change of nominal Brent oil price

Tracking oil price changes?
More Thoughts on Regimes

• Time-varying transition probabilities between regimes depend on state of the economy

• Driver of regime switches: oil price changes
  ➢ Why is a low-oil-price environment an “adverse” regime?
  ➢ What characterizes a “normal” regime?

• Why not an “adverse” economic environment?
  ➢ Low growth
  ➢ Low inflation
  ➢ Zero lower bound
More Thoughts on Regimes

• Breakdown of real GDP into its components to explain differences between regimes more fully

\[\rightarrow\] Baumeister and Kilian (BPEA 2016):

- Oil price decline stimulates consumptions spending
- Investment in the oil sector declines sharply
Conclusions

• Nice paper

• Thinking about how the transmission of oil price shocks might change depending on economic environment is promising to better understand the response of the real economy and to provide useful insights to policymakers

• Main challenges:
  ➢ Need to sort out relevant measure of inflation expectations
  ➢ More interpretation how to think about regimes and macroeconomic implications thereof