Effectiveness and Transmission of the ECB’s Balance Sheet Policies

Jef Boeckx  
_NBB_

Maarten Dossche  
_NBB_

Gert Peersman  
_UGent_
Motivation

• There is a large literature that has used SVAR models to examine the macroeconomic effects of changes in policy-controlled interest rates


  – Decline in policy rate leads to hump-shaped temporary rise in economic activity, while prices increase persistently

  – Effects are typically used as benchmark for construction of monetary general equilibrium models of business cycle

• In contrast, little is known about macroeconomic effects of monetary policy measures that expand central bank balance sheet for given policy rate
This paper

• Applies SVAR methodology to estimate the macro effects of exogenous shocks to ECB balance sheet that are orthogonal to the policy rate

• Focuses exclusively on the period since the onset of the financial crisis: 2008M1–2013M12

• Examines the transmission channels to the real economy and the effects in individual euro area countries
Balance sheet of the ECB and the financial crisis

• Identifying changes in the balance sheet that could be interpreted as exogenous monetary policy decisions is main challenge of the paper
  
  – Fixed interest rate with full allotment (FRFA) since October 2008: fluctuations in volume of liquidity distributed to banking sector are essentially demand-driven

• Shifts in the volume of lending that are consequence of deliberate policy decisions are nevertheless possible and did happen during sample period
  
  – Alterations to collateral requirements, extending maximum maturity of LTRO’s, lending to banks in foreign currency: policy induced shifts to liquidity demand

• Outright asset purchases of ECB: Covered Bond Purchase Programs (CBPP), and Securities Markets Program (SMP)
Balance sheet of the ECB and the financial crisis

[Graph showing changes in the balance sheet from 2008 to 2013, with different colored areas representing different asset categories: Other assets, SMP and CBPP, 1-year operations, 3-year operations, Other OMO, and Total assets.]
Benchmark VAR model for the euro area during crisis

\[ Y_t = c + \sum_{i=1}^{n} A_i Y_{t-i} + B \varepsilon_t \]

- **Endogenous variables (4 lags, 2008M1-2013M12):**
  - log real GDP (interpolated using industrial production)
  - log HICP
  - (MRO) policy rate
  - log central bank total assets
  - EONIA-MRO spread
  - CISS economic risk and financial stress indicator of Holló et al. (2012)
ECB Balance sheet and financial stress in euro area
### Identification of ECB balance sheet shocks

<table>
<thead>
<tr>
<th>Output</th>
<th>Prices</th>
<th>CB Total Assets</th>
<th>CISS indicator</th>
<th>EONIA-MRO spread</th>
<th>MRO-rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>≥ 0</td>
<td>≤ 0</td>
<td>≤ 0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Lagged impact balance sheet shocks on output and prices: to disentangle from innovations to output and prices
- Balance sheet shocks do not increase CISS indicator: to disentangle from endogenous (+ demand-driven) response of balance sheet to financial stress
- Balance sheet shocks do not increase EONIA-MRO spread: to disentangle from (non-policy-induced) liquidity demand shocks
- Balance sheet shocks are orthogonal to shifts in policy rate
- (weak) sign restrictions imposed on impact and first month after shock
Identified balance sheet shocks

- ECB offered US dollar funding to European banks
- Full allotment decision + easing of collateral
- 1-year LTROs + start first covered bond purchase program
- Extension of full-allotment tenders
- More restrictive collateral rules + lack interventions sovereign debt crisis
- Continuation full-allotment "for as long as necessary" + easing collateral requirements
- Several modifications to risk control framework
- Early repayments 3-year LTROs (desire of banks to show repayment capacity)
- Maturing 1-year LTROs and completion first covered bond purchase program
- Start second covered bond purchase program
- Lack of policy interventions + communication that measures will be unwound as soon as possible

Cumulative shocks (standard deviation)

2008 2009 2010 2011 2012 2013 2014

(100%) Lower + upper bound cumulative shocks

Median of cumulative shocks
Macroeconomic effects of balance sheet shocks

Output

Prices

Policy (MRO) rate

CISS

ECB total assets

EONIA - MRO spread
Transmission channels

• How do balance sheet shocks affect bank lending and financial market variables?

\[
\begin{bmatrix}
Y_t \\
Z_t
\end{bmatrix} =
\begin{bmatrix}
c \\
\gamma
\end{bmatrix} +
\begin{bmatrix}
A(L) & 0 \\
C(L) & D(L)
\end{bmatrix}\begin{bmatrix}
Y_{t-1} \\
Z_{t-1}
\end{bmatrix} +
\begin{bmatrix}
B & 0 \\
E & F
\end{bmatrix}\begin{bmatrix}
\varepsilon_t \\
v_t
\end{bmatrix}
\]

– Near-VAR system with block diagonal structure: identified shocks are the same across specifications (comparability)

– \(Z\) is vector containing the banking or financial variables of interest (included two by two)
Impact on loans to non-financial corporations

Volume of loans to non-financial corporations

Interest rate loans to non-financial corporations

BLS survey - supply non-financial corporations

BLS survey - demand non-financial corporations
Impact on loans to households

Volume of loans to households

Interest rate loans to households

BLS survey - supply households

BLS survey - demand households
Impact on bank market variables

![Graphs showing changes in M3, Bank CDS rate, Euribor, and Euribor - OIS rate over time.]
Impact on financial market variables

- **Equity prices**
- **Nominal effective exchange rate**
- **Euro area sovereign bond yield**
- **Spread euro area - German sovereign bond yield**
Impact on output in individual member countries
Impact on output in individual member countries

![Graphs showing the impact on output in various member countries.](image-url)
• There seems to be correlation between (maximum) impact of ECB balance sheet shocks on output (bank lending) and Tier 1 Bank Capital ratio’s
Conclusions

• Exogenous expansion in ECB’s total assets leads to a significant but temporary rise in economic activity and prices
  
  – Effects are very similar to conventional interest rate innovations

• Expansionary balance sheet shock stimulates bank lending, stabilizes financial markets and leads to a depreciation of the euro

• Effects on bank lending and output are smaller in member countries where banking system is less well-capitalized
  
  – Next step: do we observe similar story for individual banks within countries?