Bank Lending Shocks and the Euro Area Business Cycle

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Motivation

• SVAR framework to examine macro consequences of disturbances specific to bank lending market in euro area
  – Are effects dependent on underlying source of shock?
  – What is exact relevance for macroeconomic fluctuations (e.g. Great Recession)?
  – How are shocks transmitted to the real economy?

• SVARs can be used to establish some relevant stylized facts
  – Not only essential for policymakers, should also improve construction of theoretical models with financial intermediaries

• Euro area particularly interesting
  – Prominent role of banking sector
  – Since launch of euro: expansion of securitization markets, credit derivatives, ...
Structure of presentation

1. Baseline VAR model for euro area economy & identification strategy
2. Dynamic effects of different types of bank lending shocks
3. Macroeconomic relevance (and in-sample historical decomposition)
4. Closer inspection of source “lending multiplier shocks” (loan supply shocks which are independent of monetary policy action)
5. Related literature
6. Policy implications and conclusions
Baseline VAR model and data

- Monthly data over sample period 1999-2010

- Six variables
  - $y$: output (industrial production)
  - $p$: prices (HICP)
  - $l$: volume of loans to private sector adjusted for sales and securitization
  - $i_l$: lending rate (weighted average of rates on loans to households and non-financial corporations)
  - $b$: central bank money (monetary base)
  - $s$: monetary policy rate (EONIA)

- VAR is estimated in (log) levels with 4 lags
Identifying different types of bank lending shocks

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- Mixture of zero and sign ($\geq 0$ or $\leq 0$) restrictions
  - Bank market shocks have no immediate (within month) effect on output and prices: to differentiate from shocks outside banking market

- Exogenous loan demand shocks: positive co-movement between volume of lending and bank lending rate
  - Shocks that lead to negative co-movement of lending rate and volume of loans are considered as shocks at supply side of lending market

- Volume of loans: restriction only imposed after 3 months to allow that firms draw in short-run more on their credit lines at a pre-specified rate when the interest rate on new loans increases
Identifying different types of bank lending shocks

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- Loan supply shocks caused by monetary policy: triggered by shift in EONIA
- Lending multiplier shocks: volume of loans generated by financial sector with specific amount of central bank money (= L/B)
  - Restrictions help to disentangle from (non-standard) monetary policy
  - Disturbances to possibilities for banks to securitize their loans, shocks to risk-taking by banks or fluctuations in derivatives markets
  - Traditional textbooks: substitution between deposits and currency influences the capacity of banks to supply loans
Impulse response functions

- **Monetary policy shock**
- **Lending multiplier shock**
- **Loan demand shock**
Impulse response functions

**EONIA**

- **Monetary policy shock**
- **Lending multiplier shock**
- **Loan demand shock**

**Monetary base**

- **Monetary policy shock**
- **Lending multiplier shock**
- **Loan demand shock**
Forecast error variance decompositions

- Macro relevance considerable, in particular innovations to lending multiplier
- Contribution to consumer prices variability in line with implied horizons of economic and monetary analysis of two-pillar strategy
  - Note: much more information in lending aggregates than money aggregates
Bank lending disturbances and economic activity

Lending multiplier shocks and industrial production growth

- Note: Loan demand and policy shocks never dominating driving force
Source of lending multiplier shocks

- Re-estimation of benchmark VAR model, adding each time an additional variable of interest which is left unrestricted
- Currency substitution, securitization versus risk-taking shocks?

**Currency - M3 ratio**

**Loans adjusted for securitization - on-balance loans ratio**
Asset-side components of MFI balance sheets

Loans
Non-MFIs excl. government

Securities
Non-MFIs excl. government

Loans and securities
General government

Loans and securities
Total

Shares and equity
Non-MFIs excl. government
Liabilities-side components of MFI balance sheets

**Overnight deposits**

**M2 - M1**

**M3 - M2**

**LT financial liabilities excluding capital**

**Capital and reserves**
Interest rates and spreads

10 year government bond yield  Bank lending rate  Policy rate (EONIA)

Lending rate - bond yield spread  Lending rate - EONIA spread  Term spread
Related literature

• This paper: (exogenous) decline in long-term government bond yields triggers risk-taking appetite of banks
  – Substitution between volume of loans to private sector and less risky lending to government sector

• Ioannidou et al. (2009) and Jiménez et al. (2009): low policy rates triggers changes in composition of loans to the private sector
  – Jiménez et al. (2009): less or no such behavior for changes in long rates

• Rajan (2005): low returns on risk-free securities could create incentives for banks to search for higher yields in more risky projects

• Borio and Zhu (2008), Adrian and Shin (2009): lower interest rates raise value of outstanding loans leading to more risk appetite of banking system
  – But they consider monetary policy and short-term interest rates as source
Policy implications

- Term structure as a predictor of economic activity?
  - Results at odds with literature that examines the role of the yield curve as a predictor of economic activity (e.g. Estrella and Hardouvelis 1991)
  - Fall in term spread typically associated with future decline in economic activity
    - Adrian et al. (2010): "one of the most robust stylized facts in macroeconomics"
    - Fall in term spread captures lower expected inflation and expectations of easy monetary policy, which are in turn associated with lower economic activity
  - But I find exactly the opposite for lending multiplier shocks...
  - Estimation of following regression equation for euro area over 60-months rolling window

\[ Y_{t,t+12} = \alpha_0 + \alpha_1 SPREAD_t + u_t \]
Policy implications

- Term structure as a predictor of economic activity?
Policy implications

• Potential channel of quantitative easing policies at given policy rate
  – Purchases of long-term government bonds reduce long-term interest rates
  – Portfolio shifts at bank level: reduce the on-balance volume of government bonds in order to increase supply of lending to private sector, which in turn stimulates economic activity
Conclusions

• Macro consequences of bank lending disturbances are considerable
  – Account for more than half of output variation and up to 75 percent of long-run inflation variability
  – Dominant driving force: innovations to the lending multiplier
    • Explain almost exclusively strong output growth above trend between 2005 and beginning of 2007
    • Unfavorable shocks since summer of 2007 made significant contribution to the recession
    • Represent mainly shocks to risk-taking appetite of banks which are probably triggered by (exogenous) shifts in long-term interest rates
  – Underlying source is crucial to determine the effects
    • In contrast to lending multiplier and monetary policy shocks, surges in the volume of lending which are driven by exogenous lending demand shocks have a significant negative impact on output and consumer prices