Macroeconomic Effects of Unconventional Monetary Policy in the Euro Area

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Motivation

• Monetary authorities have been responding to the financial crisis by embarking on a series of unconventional policy actions
  – Operations that change the composition or size of central bank balance sheets or actions that try to guide longer term interest rate expectations

• Little is known about the macroeconomic consequences
  – What are the effects on economic activity and inflation?
  – Is the pass-through different from conventional interest rate changes?

• Better understanding is not only essential for policymakers, it is also important for the construction of monetary models
Motivation

• This paper attempts to address this issue for the Euro area
  – SVAR framework to examine the effects of traditional interest rate innovations and unconventional policies on a set of macro variables since launch of the euro
  – SVARs impose very little theoretical structure on the data and can be used to establish some relevant stylized facts

• Important: focus on the effects of both policy instruments via the banking sector
  – Borrowing and lending in Euro area predominantly via banking sector
  – Non-standard policy measures of Eurosystem primarily aimed at fueling the banking system
  – Different from Gertler and Karadi (2009) who define unconventional monetary policy as "direct lending by central bank in private markets"
Baseline VAR model for Euro area economy

- Monthly data over sample period 1999M1-2009M12
- Six variables
  - $y$: output (industrial production)
  - $p$: prices (HICP)
  - $c$: credit (loans to private sector adjusted for sales and securitization)
  - $i$: lending rate (weighted average of rates on loans to households, non-financial corporations and non-MFI financial intermediaries)
  - $s$: monetary policy rate (MRO rate)
  - $b$: central bank money (monetary base)
- VAR is estimated in (log) levels with 4 lags
Identification of three possible sources of disturbances at the supply side of the credit market

- Credit market shocks have no immediate (within month) effect on output and prices: to differentiate from shocks outside credit market

- Shocks that lead to negative co-movement of lending rate and volume of credit are considered as shocks on supply side of credit market

- Volume of credit: 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

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• Innovations to credit supply independently of a policy action
  – Credit multiplier shocks: volume of credit generated by the financial sector with a specific amount of central bank money
    • Disturbances to possibilities for banks to securitize their loans
    • Shocks to risk-taking by banks or fluctuations in derivatives markets if banks are able to obtain extra funding in market to finance new loans
  – Peersman (2011): these disturbances explain more than 30 percent of Euro area output fluctuations since introduction of the euro
  – Central bank reacts to the shock by tightening the policy stance
Credit supply shocks due to monetary policy decisions

- Interest rate innovations: change in credit supply caused by a shift in the monetary policy rate
- Non-standard policy actions: credit supply shocks with zero contemporaneous impact on the policy rate

- Sufficient to differentiate from credit multiplier and interest rate shocks

3 identified credit market shocks and 4 credit market variables
- Remaining innovation captures all other possible credit market shocks

Identification strategy

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Some remarks about identified unconventional shocks

• Unconventional policies are only captured by this shock if they successfully affect credit supply
  – Not necessarily economic activity and consumer prices, which will be determined by the data
  – Non-effective measures not identified, as well as policies that influence the economy beyond financial intermediaries (cfr remaining innovation)
    • Notice: also the case for traditional interest rate innovations

• Shocks could be "demand-induced"
  – Shocks are not credit demand nor multiplier shocks, but could be credit supply driven by extra liquidity that banks obtain from ECB
  – However: accommodation of demand is still a policy decision, and particularly the decision to keep the interest rate constant (e.g. full allotment decision)
Some remarks about identified unconventional shocks

• Can be considered as a combination of several possible actions aimed at influencing flow of credit beyond the main policy rate
  – Response to crisis: liquidity at longer maturities, more eligible collateral, full allotment policy, outright purchases of covered bonds
  – Also in normal times, such shocks could have occurred: ECB responses not fully "unconventional" in their essence (Borio and Disyatat 2009)
    • A specific level of MRO may always be associated with varying monetary conditions (e.g. communication of future policy intentions)
    • Changes in allocated volume of liquidity and estimation errors of autonomous liquidity needs in main and LT refinancing operations
    • Even composition of balance sheet (MRO versus LTO) has not been constant
  – In the end, a generic series of such shocks is estimated: results should help to interpret source more carefully
    • Dynamic effects could be used as a benchmark to learn more about the effectiveness of extraordinary measures (some caution obviously required)
Baseline results

Output

Prices

Credit

Policy rate (MRO)

Monetary base

Lending rate

Interest rate innovations
Non-standard policy actions
Sensitivity analysis

- Results robust for several alternative specifications
  - Central bank money measures: volume of bank reserves, volume of liquidity providing operations and overall size of ECB's balance sheet
  - A VAR model with money market variables instead of credit market variables
  - Alternative identification strategy: no zero contemporaneous restriction on the response of output and consumer prices
  - Extra variables in VAR estimations: European Sentiment Indicator, oil prices, stock market volatility, ...
  - A shorter sample period that excludes the enhanced credit support period: policy response to turmoil was not fully unconventional in its essence
Inspecting the source of unconventional policy shocks

- Shocks mainly represent measures aimed at expanding or reducing the size of the central bank's balance sheet
  - Are not "interest rate" innovations within the corridor of the standing facilities: results also hold for VAR with EONIA
  - Confirmed by the responses of some other variables

**Spread 12m - 1m Euribor**

**Ratio MRO-LTO liquidity**

**Spread 3m Euribor - OIS rate**
Inspecting the source of unconventional policy shocks

Confirmed by VAR with two types of unconventional shocks
Monetary Transmission Mechanism

- **Unconventional policy action**
  - Extra liquidity reduces lending rates and hence also the interest rate spread charged by banks (difference between policy rate and lending rate)
  - Credit multiplier declines significantly in short-run (returns only after 1 year)

- **Traditional interest rate innovation**
  - Policy easing increases the interest rate spread (incomplete pass-through)
  - Hardly a change in credit multiplier
• Different response of multiplier could be due to the risk-taking channel
  
  – Traditional textbooks: expansionary policy has downward effect on multiplier
  
  – RTC1: expansionary policy increases value of outstanding bank loans and hence also bank's marked-to-market equity, leading to an increased balance sheet capacity and risk appetite of banking system, resulting in greater loan supply
  
  – RTC2: profitability, marked-to-market equity and risk-taking capacity are more directly affected by interest rate spreads
  
  – Risk taking channel very likely stronger for interest rate innovation: value of collateral probably more affected and response of spread is very different
Monetary Transmission Mechanism

- Not even a liquidity effect for bank reserves after interest rate shock: bank reserves decline after a fall in the policy rate
  - Due to stronger balance sheets, it is much easier/cheaper for banks to find liquidity in the market and expand their balance sheets without the need of central bank money (Borio and Zhu 2008; Adrian and Shin 2010)
  - Liquidity effect is often used to identify monetary policy shocks with sign restrictions (e.g. Uhlig 2005)…
Monetary Transmission Mechanism

- Confirmed by VAR with two types of unconventional shocks
Conclusions

• More than one instrument can be used for policy purposes
  – Impact on output and consumer prices similar for 25bp decline in policy rate and 10% rise of monetary base that is orthogonal to the policy rate
  – Pass-through is more sluggish compared to traditional interest rate shift
  – Transmission mechanism of both instruments is different
    • Spreads increase after expansionary interest rate innovation, but decrease following an unconventional policy shock that raises central bank liquidity
    • There is no significant short-run (bank reserves) liquidity effect for an interest rate shock, i.e. the rise in credit is generated by a greater multiplier, whereas the multiplier declines for an unconventional policy shock
    • Potential explanation is a much stronger risk-taking channel of monetary transmission after an interest rate innovation