The Effect of Central Bank Liquidity Injections on Bank Credit Supply

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Central Bank Liquidity Provision During Crises

Central banks providing extraordinary liquidity during crises
- Fed (TAF), ECB (LTRO), BoE (FLS)
- Goal: restore bank credit supply following a negative shock

Theory
- Banks are fragile because of liquidity transformation
- Banks hit by a negative shock reduce credit supply
- Central bank liquidity provision restores bank credit supply

Empirical evaluation is difficult
- Recent episodes
- Data limitation
- Even with data, not obvious how to use
This Paper

Analyze the effectiveness of central bank liquidity injections
• ECB December 2011 liquidity provision
• Official goal of “supporting bank lending”

The intervention
• The 3-Year Long Term Refinancing Operation
• Provision of collateralized loans to banks
• Largest liquidity provision in history (€1 trillion)

Effect on Italian bank credit supply
• Banks hit by a dry-up before the intervention
• Regulatory intervention to identify the transmission channel
• Combine loan credit registry and bank holdings of securities
Contribution

Central bank liquidity is effective in restoring bank credit supply following a wholesale funding dry-up

• Banks hit by the dry-up:
  - reduce credit supply during the dry-up
  - restore credit supply after the intervention
• Firms benefit from the intervention
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2) Central bank liquidity encourages reaching-for-yield
• Banks not hit by the dry-up use central bank liquidity to buy high-yield securities
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**What’s new? Central banks can restore bank credit supply**

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**What’s new? Transmission varies in the cross-section**
Empirical Setting and Data
Sovereign CDS Spreads (bps)
The ECB 3-Year LTRO

3-Year Long Term Refinancing Operation (LTRO)
• Largest LOLR intervention in history
• Turning point of the crisis
• Italian and Spanish banks largest users (2/3 total uptake)

Simple design
• 3-year maturity collateralized cash loans
• Banks can choose how much to obtain in two allotments
• Need to pledge collateral (government bonds, ABS, ...)

Our laboratory: Italian economy
Italian Banks Suffer a Dry-Up
Data on the Entire Intermediation Chain

Central Bank to Banks
• Bank-level borrowing at ECB
• Bank-level borrowing at the 3-Year LTRO

Banks
• Standard balance-sheet characteristics
• Detailed composition of funding
• Security-level holdings (incl. collateral)

Bank to Firms
• All outstanding loans €30,000 (credit registry)
• Term loans, credit lines, trade credit

Firms
• Profitability and balance sheet characteristics
• Large subset (55%) of firms
Empirical Strategy
Two Empirical Challenges

1) Borrowers are not randomly assigned to banks
   - Stock of credit is an *equilibrium quantity* (demand, supply)

2) Negative funding shock is *non-random* and banks *choose* how much to borrow from the central bank
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Solution: Compare credit growth from different banks within firms (Khwaja and Mian (2008))

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**Solution 1:** Reliance on the foreign wholesale market to capture the exposure to the dry-up (Iyer et al. (2014))
**Solution 2:** Regulatory experiment to capture the exposure to the intervention
Exposure to the Dry-Up

\[ \text{Exposure}_j = \frac{\text{ForeignWholesale}_{j,\text{Jun11}}}{\text{Assets}_{j,\text{Jun11}}} \]
Exposure to the Dry-Up

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Exposure to the Dry-Up

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75% of loans belong to banks with exposure > 5%
## Summary Statistics and Bank Exposure

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<td>Total Assets</td>
<td>billion €</td>
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→ Need to control for bank characteristics
Three Time Periods, Two Comparisons

We identify three periods from the evolution of bank funding and compare bank credit supply between
- the normal and the dry-up period
- the dry-up and the intervention period
Bank Credit Supply: Contraction and Restoration

![Graph showing the difference in credit growth percentage over time from December 2010 to June 2012.]
Transmission Channel
Banks Borrow ≈10% Total Assets at the LTRO
Reconciling Our Findings

Need to reconcile two findings:
1) Exposed banks restore their credit supply after the LTRO
2) All banks take advantage of the attractive ECB loans
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Exploit regulatory intervention by the Italian government
• Govt-guaranteed assets are eligible collateral at the ECB
• Dec11: Govt offers a guarantee on securities for a fee
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Large use of the government program
• 28 banks create €102.8 billion collateral
• Govt-guaranteed collateral backs 57% of total ECB loans
• Exposed banks are the largest users (1Q 68% Vs. 4Q 17%)
1) Transmission to Bank Private Credit

\[ \Delta \text{Credit\_Granted}_{ijt} = \alpha + \beta U_{\text{take}\_j} \times I_{\text{LTRO}} + \mu_{it} + \gamma_{ij} + \phi' X_{jt} + \epsilon_{ijt} \]
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** indicates significance at 1% level.
2) Transmission to Holdings of Govt Bonds
Quantitative Results

Of total €181.5 billion
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- €82.7 billion in government bonds
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€1 to banks that suffered the dry-up:
€0.13 to firms and €0.44 in government bonds

€1 to banks that did not suffer the dry-up:
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Counterfactual exercise (Chodorow-Reich (2014)):
with no LTRO bank credit-5.6% instead of observed -3.6%
Final Thoughts

Bagehot: “Central banks should require good quality collateral”
- Banks hit by the dry-up are likely collateral constrained
- Italian government guarantee: fiscal side of the intervention

More theory work is needed to understand the optimal collateral policy of central banks during crises