How liquidity crisis has changed the monetary policy operations

Presentation at SUERF/BoF Conference
3.7.2015
Contents

1. Pre-crisis monetary policy implementation

2. Changes in implementation during the crisis
   - Financial market crisis
   - Sovereign debt crisis
   - Risks of deflation

3. Future of the monetary policy implementation
1. Pre-crisis monetary policy implementation
Demand for central bank reserves: interest rate corridor and reserves averaging

Theoretic demand function with averaging provision

Marginal lending rate

Main refinancing rate

Deposit rate

0 excess liquidity
Bank i’s profit maximization problem:

\[
\max_{b_{i,t}} \mathbb{E} [\Pi_i] = r_t^m \int_{-\infty}^{\infty} (OB_{i,t} + b_{i,t} + \varepsilon_t)f(\varepsilon_t)d\varepsilon_t + \mathbb{E} [r_f^T] \int_{-\infty}^{\infty} (OB_{i,t} + b_{i,t} + \varepsilon_t)f(\varepsilon_t)d\varepsilon_t \\
+ (r_t^d - \mathbb{E} [r_f^T]) \int_{IB_{i,t} - b_{i,t}}^{\infty} (-IB_{i,t} + b_{i,t} + \varepsilon_t)f(\varepsilon_t)d\varepsilon_t \\
+ \sum_{j=t-1}^{T-1} \left( \mathbb{E}_t [r_f^{\pi_j} - r_f^T] \int_{-\infty}^{\frac{-\varepsilon_0 B_{i,j}^*}{\varepsilon_0 B_{i,j}^*}} (\varepsilon_0 B_{i,j}^* + \nu_j)g(\nu_j)d\nu_j \\
- \int_{-\infty}^{\frac{-\varepsilon_0 B_{i,j}^*}{\varepsilon_0 B_{i,j}^*}} (\varepsilon_0 B_{i,j}^* + \nu_j)g(\nu_j)d\nu_j \\
+ \mathbb{E}_t [r_f^{\pi_j} - r_f^T] \int_{-\infty}^{\frac{-\varepsilon_0 B_{i,j}^*}{\varepsilon_0 B_{i,j}^*}} (-JB_{i,j}^* + \nu_j)g(\nu_j)d\nu_j - \\
\int_{-\infty}^{\frac{-\varepsilon_0 B_{i,j}^*}{\varepsilon_0 B_{i,j}^*}} (-JB_{i,j}^* + \nu_j)g(\nu_j)d\nu_j \right) - r_t^m b_{i,t}.
\]
Demand for central bank reserves: interest rate corridor and reserves averaging

### Theoretic demand function with averaging provision

- **Marginal lending rate**
- **Main refinancing rate**
- **Deposit rate**

**SUPPLY**

(VRT + minimum bid rate)

0 excess liquidity
Pre-crisis intra period liquidity provision:
average reserve deposits / requirements in cumulative terms

Source: Bank of Finland
Precision of the monetary policy implementation: EONIA – minimum bid rate (average and +/- 2 standard deviations)

March 2004 – August 2007

Source: Papadia & Välimäki 2011
Pre-crisis EONIA and liquidity:
Liquidity provision by regular operations: liquidity deficit EUR 150-450 billion
Pre-crisis money market risk premia: EURIBOR - EUREPO

Source: Bloomberg.
2. Monetary policy implementation during crisis
Market turmoil landed in euro area 9.8.2007: EURIBOR - EUREPO

Source: Bloomberg.
How the liquidity crisis changed the Eurosystem monetary policy implementation:

1. As an early reaction: a series of fine-tuning operations from 9.8.2007 onwards, to guarantee banks’ liquidity positions

2. Lengthening of the average maturity of the CB liquidity provision

3. Increased flexibility in the timing of the liquidity provision

4. Monetary policy stance (MRO or standing facility rates) was not adjusted
Frontloading the reserve holdings: (cumulative) reserve deposits / reserve requirements

Source: Papadia & Välimäki 2011
Demand for central bank reserves: frontloading

Theoretic demand function with averaging provision

- Marginal lending rate
- Main refinancing rate
- Deposit rate
- Excess liquidity

EONIA spread
- Excess liquidity


- 0.5
- 0.75
- 1

- -100
- -50
- 0
- 50
- 100
- 150
- 200
From market turmoil to systemic crisis
Lehman failure in September 2008 resulted in a dramatic jump in money market term premia.
Changes in Eurosystem monetary policy implementation during financial market crisis:

- Change in the tender procedure (Aug 2008):
  - from variable rate tenders (VRT) to fixed rate full allotment (FRFA)

- A series of rate cuts (2008-2009)
  - incl. a coordinated rate cut

- Provision of 1 year central bank liquidity (June 2009)

- Covered bond purchase programme, CBPP(1)
  - to unlock a major segment in European financial markets
Surplus liquidity in the banking system

EUR bn.

30-day moving average

Source: Bank of Finland.
Current accounts - reserve requirements + the net use of standing facilities.
Demand for central bank reserves: interest rate corridor and reserves averaging

Theoretic demand function with averaging provision

Marginal lending rate
Main refinancing rate
Deposit rate

0 excess liquidity


EONIA spread

excess liquidity
FRFA’s impact on money market risk premia

- EURIBOR - EUREPO spread (12m)
- Best bank CDS

Liquidity risk

Credit risk
Improved sentiment and money market functioning was reflected in the excess liquidity.
Decreasing excess liquidity brings overnight rate from floor towards the policy rate:
The 1-year lending operations resulted in significant excess liquidity, but this time to ease the monetary policy stance.

Source: Bank of Finland.
Current accounts - reserve requirements + the net use of standing facilities.
Demand for central bank reserves:
interest rate corridor and reserves averaging

Theoretic demand function with averaging provision

Marginal lending rate

Main refinancing rate

Deposit rate

0 excess liquidity
Changes in the policy and term market rates

%  

1mo euribor  12mo euribor  main refinancing rate

full allotment
rate cuts
liquidity surplus

Source: Bloomberg.
3. Sovereign debt crisis
Selected 10 year sovereign yields

convergence to single monetary policy

great moderation

spreads re-emerging

Source: Bloomberg.

%
Central banker’s problem: bank/sovereign nexus

Spain

Italy

Source: Bloomberg and Bank of Finland calculations
Changes in the Eurosystem monetary policy implementation during sovereign debt crisis:

• Securities Markets Programme (2010 - 2012):
  - to facilitate the functioning of impaired market segments that were deemed essential for monetary policy transmission

• Provision of 3-year funding (2011)
  - CB funding for banks in order to facilitate bank lending

• Outright Monetary Transactions, OMT (2012-)
  - aim at safeguarding appropriate monetary policy transmission and the singleness of the monetary policy
Securities Markets Programme:

- First monetary policy outright purchases of government debt
- Leaning against the wind intervention
- Liquidity impact was sterilized
- After Greek PSI, perceived preferred creditor status for the Eurosystem

Source: Bloomberg
3-year operations and the surplus liquidity

Source: Suomen Pankki
Outright Monetary Transactions

- ECB President Draghi in Lanchaster House, London, July 2012:
  - ”Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough.”

- In August 2012, the ECB Governing Council:
  - *ECB is ready undertake outright monetary transactions (OMT) in secondary sovereign bond markets*
  - N.b. strict and effective conditionality attached by an appropriate EFSF/ESM programme
Spread between weighted Eurosystem* average and German and 10-year yields

Source: Bloomberg, Bank of Finland calculations.
Impaired monetary policy transmission and risk of deflation
Impaired monetary policy transmission

New corporate loan agreements, average interest

- Highly rated countries*
- GIIPS**
- Interest on the main refinancing operations

Source: European Central Bank.
* Germany, France, Netherlands, Belgium, Austria and Finland.
** Greece, Ireland, Italy, Portugal and Spain.
Strong deleveraging especially in corporate sector

Growth rate of euro area loan stocks

Corrected for securitization.
Source: ECB.
Markets’ inflation expectations fell sharply in late 2014

Source: Bloomberg.
Latest changes to the Eurosystem monetary policy operational framework:

- **Targeted longer term refinancing operations (2014-15):**
  - to facilitate bank lending to non-financial corporates

- **Asset backed securities purchase programme, ABSPP (2014-):**
  - to facilitate lending to SMEs in particular

- **Public sector purchase programme, PSPP (2015-16):**
  - quantitative easing
Eurosystenm purchase programmes 2010-

EUR, billion

EUR 1140bn until September 2016

Source: Bloomberg
Credit operations and purchase programmes

EUR, billion

Source: ECB.
What was not changed:

- **Counterparty framework:**
  - Eurosystem accepted all financially sound banks as its counterparty for monetary policy operations even before the crisis

- **Collateral framework:**
  - Eurosystem accepted wide range of private and public assets even before the crisis (exception ACC framework)
  - Yet, credit rating rules were adjusted as a policy parameter
  - Some risk control measures were tightened during the crisis
3. Future of monetary policy implementation: 

**two myths on liquidity management**
Myth #1: CB’s control over interest rates is tighter when operating in liquidity deficit

Myth #2: FRFA is a non-standard monetary policy measure
However, overnight rate depends on…

- …the central bank rates and the probabilities at which the standing facilities will be used;

- These probabilities depend on the prevailing level of central bank reserves, not on the way the liquidity got into the system.
On the tender procedure

- In case of FRFA, banks’ optimum is to bid for an amount at which the o/n-rate (i.e. the probability weighted average of standing facility rates) equals the MRO rate (see e.g. Välimäki 2003)

- Similarly, in case of a VRT, the central bank (tries to) provides the banks with liquidity at which the SF-probabilities equals the MRO rate
Precision of CB’s control on short term rate with different tender procedures:

- The (stochastic) volatility of the o/n-rate can be larger with FRFA, if banks aggregate bids do not result in liquidity being at the flat part of the demand curve.

- However, VRT can result in variations in o/n-rate, if the CB cannot project the neutral liquidity correctly, and more importantly.

- whereas the deviations of the o/n-rate away from the policy rate resulting from central bank actions may be interpreted containing policy signals, it’s clear that stochastic liquidity shocks and o/n-rate volatility do not contain any policy signals.

Hence, short term rate volatility under VRTs is more likely to transmit along the yield curve to maturities more relevant for monetary policy pass through.
Suomen Pankki’s experience from the 1990s

Volatilities of some money market rates of interest

1 Month Hibor Spread

Before averaging

Averaged system; bids scaled back

Averaged system; all bids accepted

Overnight Spread
Myths #1: CB’s control over interest rates is tighter when operating in liquidity deficit

Myths #2: FRHA is a non-standard monetary policy measure

BUSTED
Fixed rate full allotment -tender procedure as a standard monetary policy tool:

- CB’s control over the market rates can be maximized by FRFA-operations in which terms and conditions are set to meet those of the operational target:
  - the maturity of the operation should be close to the maturity of the operational target
  - collateral eligibility rules applied by the CB should be similar to those applied in the secured interbank money market, or
  - in case of a liquidity surplus, liquidity could be drained by selling ECB’s CDs or collecting fixed term deposits by FRFA-procedure.
Monetary policy implementation in liquidity surplus

Theoretic demand function with averaging provision

Marginal lending rate
Main refinancing rate
Deposit rate

as long as the banking sector operates with a very large liquidity surplus, \( r_{DF} \) is the de facto policy rate

when the liquidity surplus reduces, steering of the policy stance could be returned to OMOs.

Here, liquidity draining FRFAs would be the perfect solution
Changing the stance by adjusting CB rates

Controlling interest rate volatility by the width of the corridor
Thank you!