

The Fall of Bagehot: An Inductive Approach to Understanding Monetary Policy Implementation

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Please note that the views expressed here do not reflect those of my present or future employers.

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Motivation

*"The end is to stay the panic; and the advances should, if possible, stay the panic. And for this purpose there are **two rules: First, that these loans should only be made at a very high rate of interest.** This will operate as a heavy fine on unreasonable timidity, and will prevent the greatest number of applications by persons who do not require it. The rate should be raised early in the panic, so that the fine may be paid early; that no one may borrow out of idle precaution without paying well for it; that the Banking reserve may be protected as far as possible. **Secondly, that at this rate these advances should be made on all good banking securities, and as largely as the public ask for them.** The reason is plain. The object is to stay alarm, and nothing therefore should be done to cause alarm. But **the way to cause alarm is to refuse some one who has good security to offer.** The news of this will spread in an instant through all the money market at a moment of terror; no one can say exactly who carries it, but in half an hour it will be carried on all sides, and will intensify the terror everywhere."*

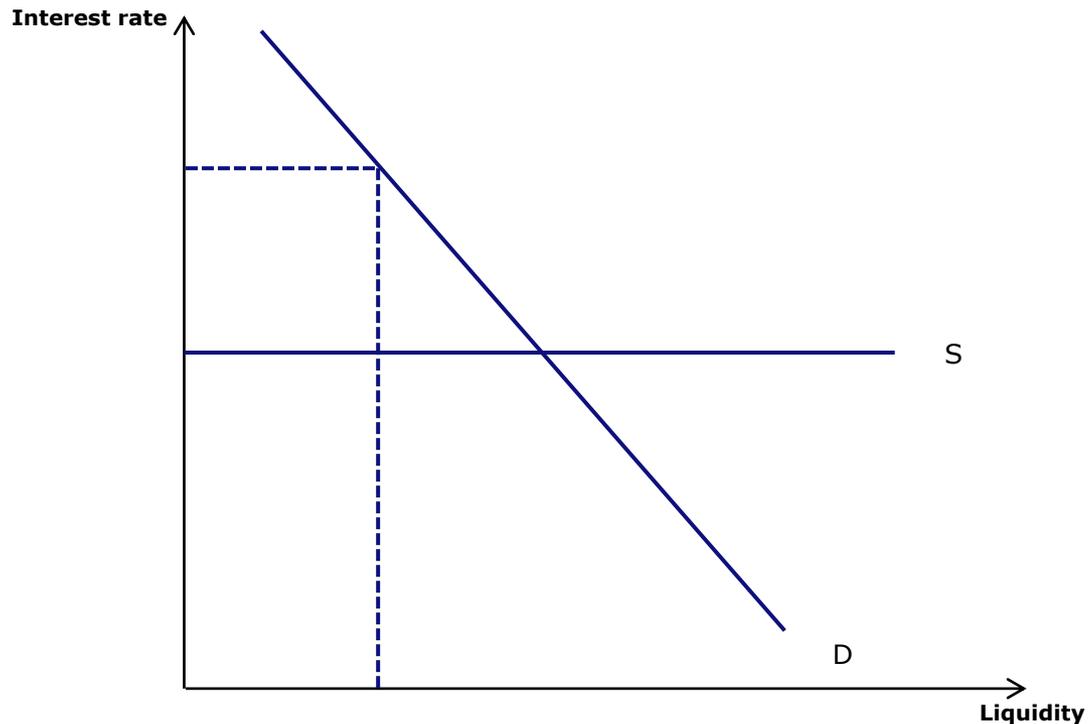
- **Bagehot (1873) on how central banks should act as lenders of last resort.**



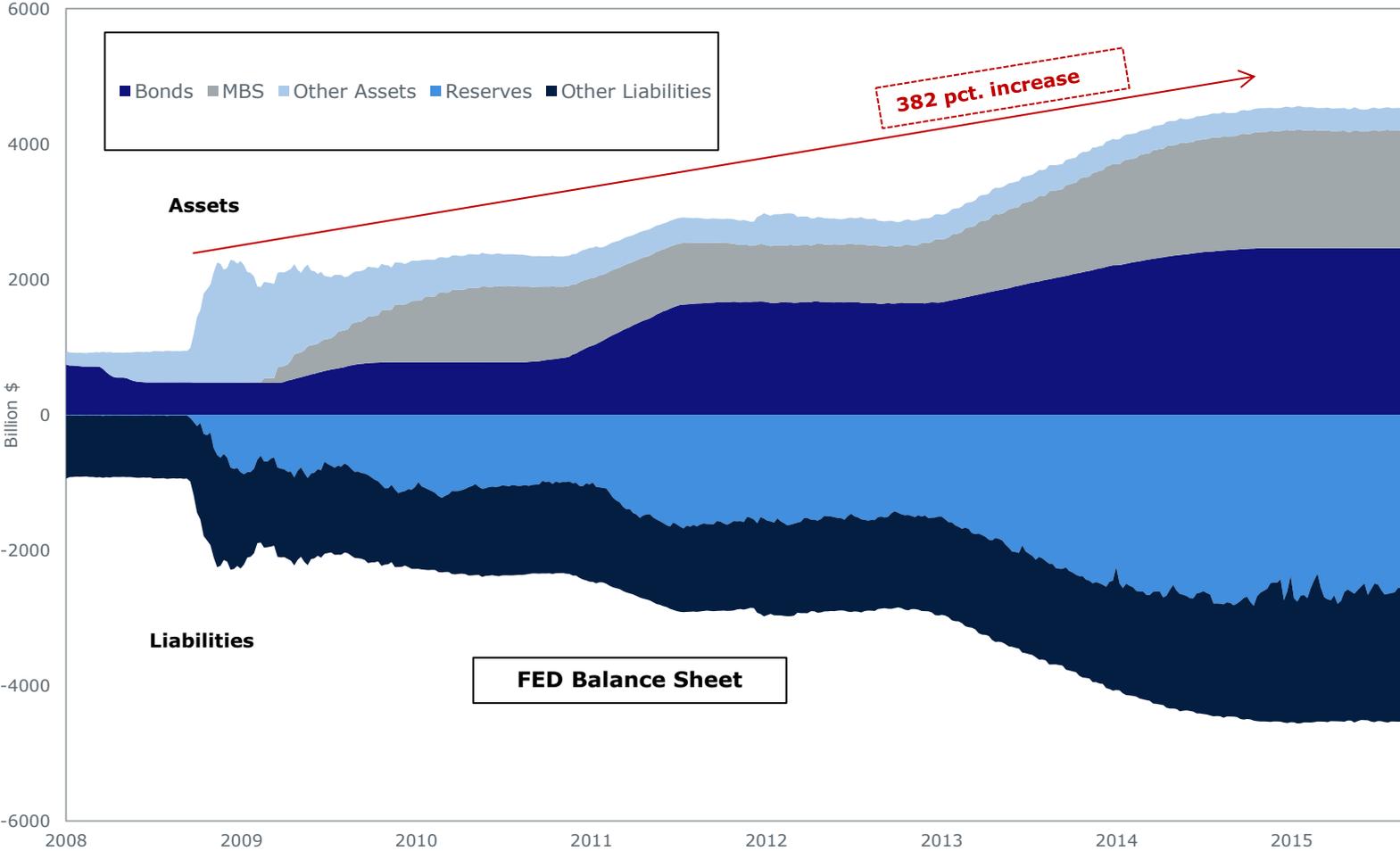
Motivation

"This paper provides the causes and symptoms of special repo rates in a competitive market for repurchase agreements. A repo rate is, in effect, an interest rate on loans collateralized by a specific instrument. **A "special" is a repo rate significantly below prevailing market riskless interest rates. This paper shows that specials can occur when those owning the collateral are inhibited**, whether from legal or institutional requirements or from frictional costs, from supplying collateral into repurchase agreements. Specialness increases the equilibrium price for the underlying instrument by the present value of savings in borrowing costs associated with the repo specials."

- Abstract of Duffie (1996)



Motivation



Source: Federal Reserve and own calculations.

Agenda

- Introduction
- The generic problem of monetary policy and a simple operating procedure
- The setting of other parameters
- Adjustments to the operational frameworks during the crisis
- Final considerations

Introduction

- Research question
- Related literature
- An inductive approach
- Preview of conclusions

Introduction

- Research question

Why is implementation of monetary policy not a trivial problem?

Introduction

- Related literature

Abildgren, K. (2010): *Dansk Pengehistorie 6 – 1990-2005*, Danmarks Nationalbank.

Berg, J. and M. Bech (2009): *Finansernes Fald*, Gyldendal.

Bindseil, U. (2005): *Monetary Policy Implementation Theory, Past, and Present*, Oxford University Press, 2005.

Bindseil, U. (2014): *Monetary Policy Operations and the Financial System*, Oxford University Press, 2014.

Borio, C. and Disyatat, P. (2009): *Unconventional monetary policies An appraisal*, BIS Working Paper No. 292.

Danmarks Nationalbank (2009): *Pengepolitik i Danmark, 3. udgave*.

Duffie, D. (1996): *Special Repo Rates*, Journal of Finance, Vol. 51, No. 2.

Introduction

- An inductive approach

- **Deduction**

- Assumptions → Results

- **Induction**

- Observations → Generalizations

- **Iterative process**

- Hypothesis ↔ Observations

- **Learning process**

- Teaching of MBA's

Introduction

- Preview of conclusions

- Additional objectives to setting interest rate make monetary policy implementation a non-trivial problem
- Wide divergence in implementation prior to crisis
- Convergence during crisis
- Ordinary operations were not enough "to stay panic"

The generic problem of monetary policy and a simple operating procedure

- Two objectives of monetary policy
- Central banks' control of base money
- Can central banks control the economy?
- Setting price or quantity?
- A simple operating procedure
- Arguments against the model
- Amended version of the simple model
- Arguments against same deposit and lending rates
- Adding a spread to the amended model

The generic problem of monetary policy and a simple operating procedure

- Two objectives of monetary policy

1. The perceived wisdom today is that monetary policy should aim at securing some form of price stability through setting short term interest rates
 - *Based on New Keynesian Paradigm*
 - *Applying the Taylor Rule*
2. Some countries, including Denmark, have chosen to target a fixed exchange rate towards a currency in a bigger economic area that pursues inflation targeting and thus importing price stability
 - *Different decision making process*

The generic problem of monetary policy and a simple operating procedure

- Central banks' control of base money

Price stability regime

Only the central bank (and possibly the government) is capable of changing net position towards the banking system.

Fixed exchange regime

Banking system can impose a change to the net position. The central bank can, however, sterilize it.

=> Banking system can always be brought into a situation, where they have to borrow from the central bank!

The generic problem of monetary policy and a simple operating procedure

- Can central bankers control the economy?

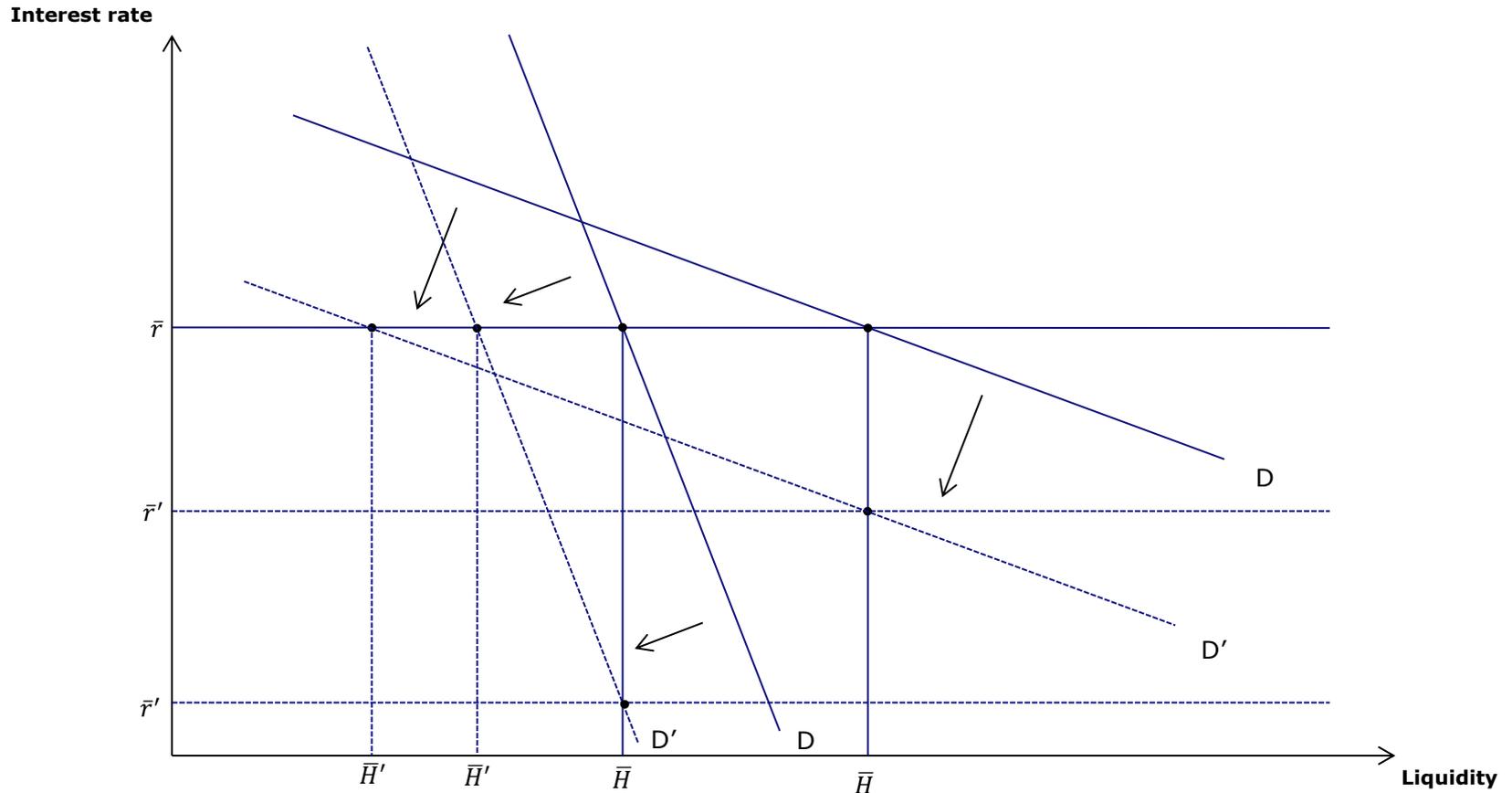
Prior to the financial crisis, there was a perception that central bankers had become a lot better at the art of conducting monetary policy and that the art had become more of a science.

The great moderation reflected that we had also had our share of luck.

Friedman (1968): *"Experience suggests that the path of wisdom is to use monetary policy explicitly to offset other disturbances only when they offer a clear and present danger"*

The generic problem of monetary policy and a simple operating procedure

- Setting price or quantity?



The generic problem of monetary policy and a simple operating procedure

- A simple operating procedure

One central bank facility, where **anybody** in the economy could borrow against good **collateral**, at any time of the day, **all days** of the week, and **however much** they wanted. The central bank would set one short term interest rate, say an overnight rate.

The generic problem of monetary policy and a simple operating procedure

- In reality there are more than one interest rate

Central Bank facilities, July 1st, 2007

	Danish Central Bank	ECB	Federal Reserve	Bank of England
Lending facilities	1	2	2	1
Deposit facilities	2	1	1	2

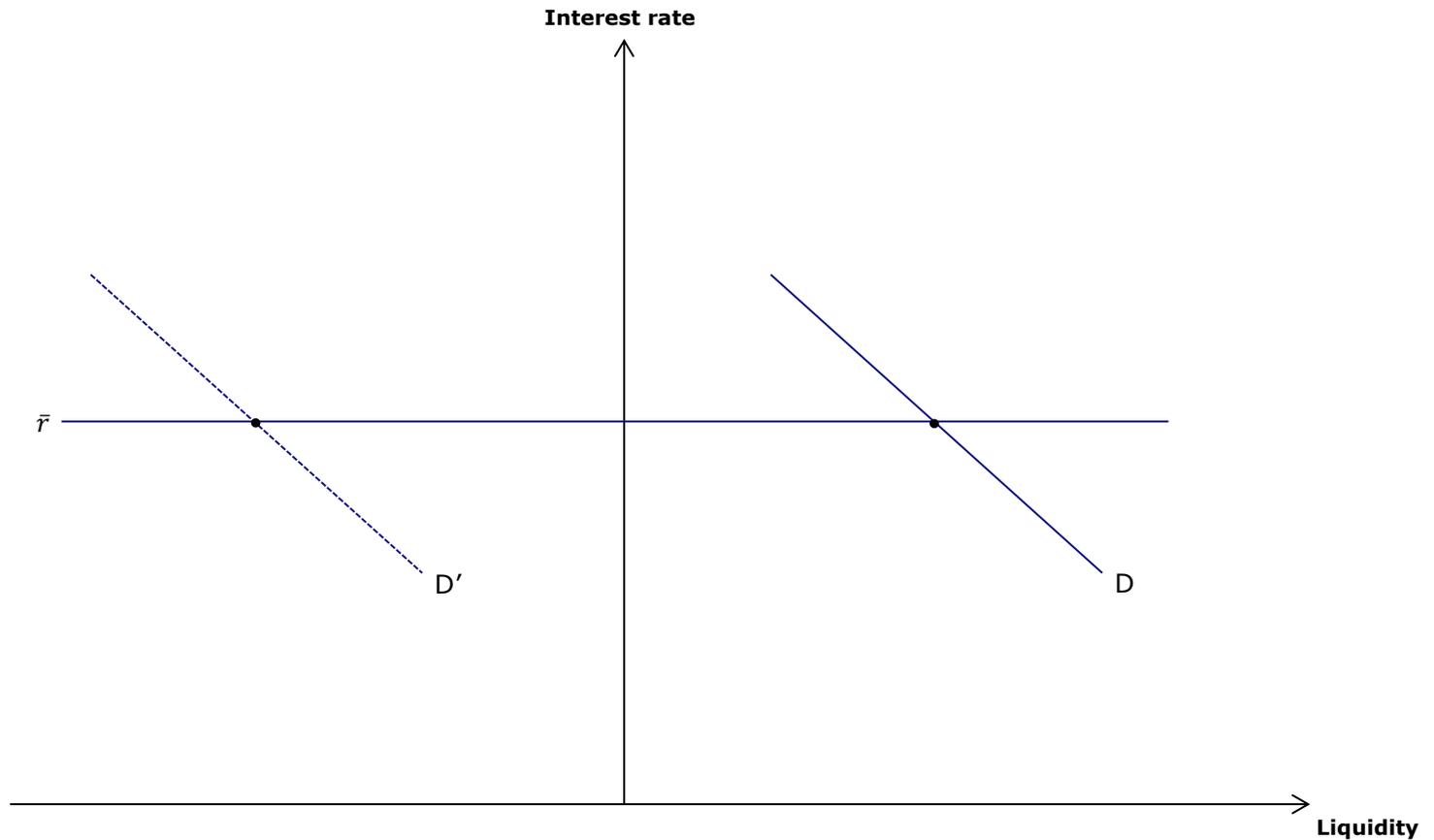
The generic problem of monetary policy and a simple operating procedure

- Arguments against the model

1. Central banks want to operate through banks
2. If the banking system has more central bank liquidity than it needs, then the central bank cannot control interest rates through a lending facility. It will also need a deposit facility or other instruments to alter the liquidity position of the banking system

The generic problem of monetary policy and a simple operating procedure

- Amended version of the simple model



The generic problem of monetary policy and a simple operating procedure

- In reality the lending and borrowing rates differ in most cases

Rates on Central Bank facilities (pct.), July 1st, 2007				
	Danish Central Bank	ECB	Federal Reserve	Bank of England
Lending facilities	Lending Rate (4.25)	Marginal Lending Facility (5) Refi-Rate (4)	Primary Discount Rate (6.25) Federal Funds Rate (5.25)	Standing Lending Facility (5.75/6.5)
Deposit facilities	Certificates of Deposit Rate (4.25) Current-account Rate (4)	Deposit Facility Rate (3)	Excess Reserves Rate (0)	Official Bank Rate (5.5) Standing Deposit Facility (4.5/5.25)

Source: Danish Central Bank, ECB, Federal Reserve and Bank of England.

The generic problem of monetary policy and a simple operating procedure

- Arguments against same deposit and lending rates

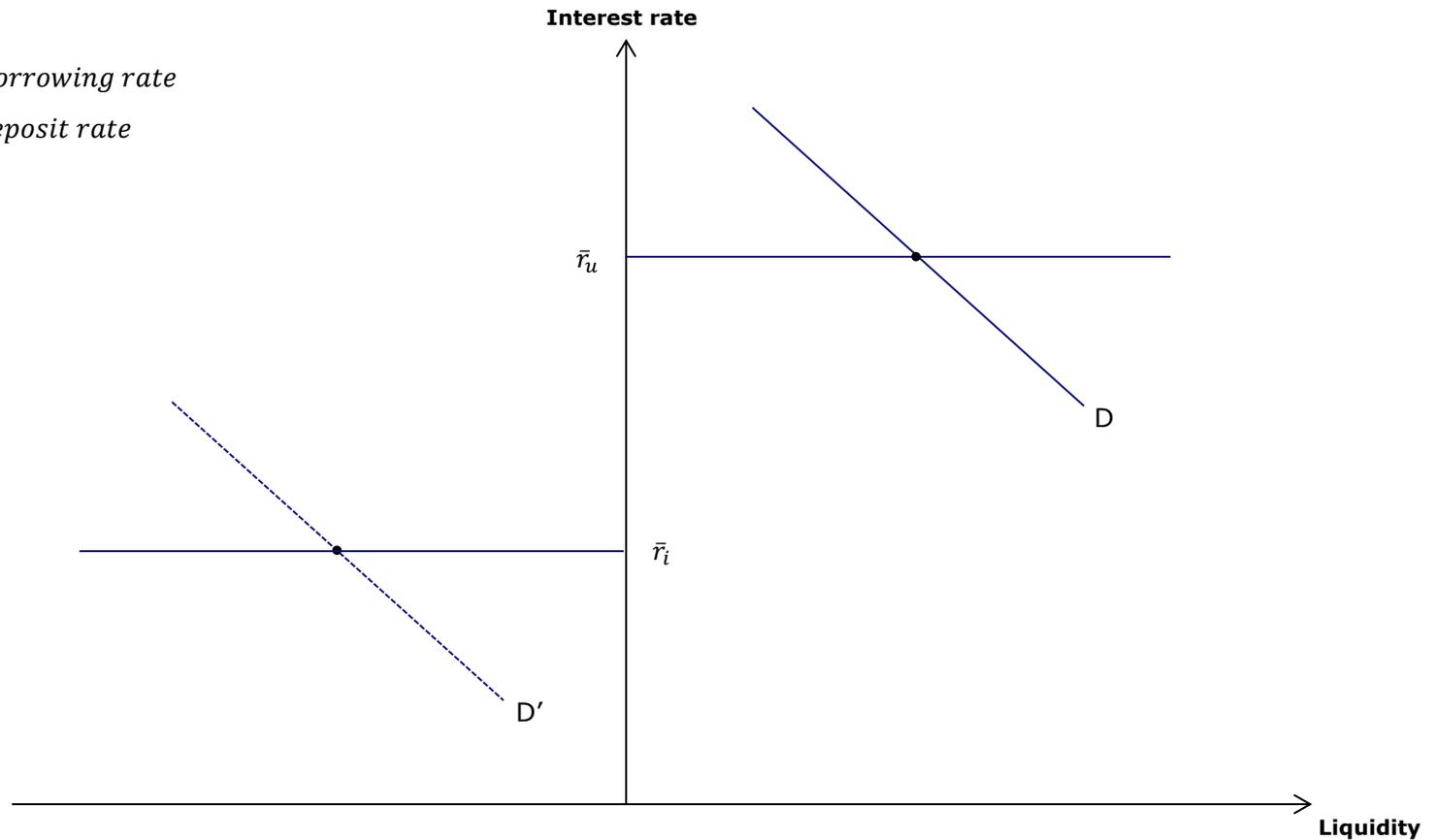
1. Central banks want to have a functioning money market
2. A spread is necessary to create incentives for trading between banks with liquidity surplus and liquidity deficits

The generic problem of monetary policy and a simple operating procedure

- Adding a spread to the amended model

$\bar{r}_u = \text{borrowing rate}$

$\bar{r}_i = \text{deposit rate}$



The generic problem of monetary policy and a simple operating procedure

- Trade-off in relation to spread

- Spread differs across central banks
- Interest rate volatility (e.g. when net position shifts)
- Money market efficiency

The setting of other parameters

- Three types of central bank lending
- Pre-crisis the additional parameters varied across institutions
- Collateral
- Timing of operations
- Counterparties
- Quantitative restrictions on supply of liquidity

The setting of other parameters

- The simple model involved additional parameters

One central bank facility, where **anybody** in the economy could borrow against good **collateral**, at **any time of the day, all days** of the week, and **however much** they wanted. The central bank would set one short term interest rate, say an overnight rate.

The setting of other parameters

- Three types of central bank lending

The three generic central bank lending functions

	Generally available	Ad hoc availability
Intraday	Payment system liquidity	N/A
Term finance	Monetary policy operations	Individual lender of last resort

The setting of other parameters

- Pre-crisis the additional parameters varied across institutions

Different parameter choices in the operational framework, pre-crisis

	Danish Central Bank	ECB	Federal Reserve	Bank of England
Accepted collateral	Government bonds and mortgage bonds	Government bonds and mortgage bonds, bank bonds, and certain bank loans	Government bonds and mortgage bonds	Government bonds
Frequency of operations	Normally weekly	Normally weekly	Daily	Normally weekly
Counterparties	All banks	All banks	Only primary dealers	All banks
Quantity restrictions	No	Yes	Yes	Yes

The setting of other parameters

- Of how high quality should collateral be?

ECB reasoning behind wide set accepted collateral

"Somewhere on the cost schedule between the least and the most costly collateral types, the costs associated with additional collateral types will be equal to the declining marginal value of one more unit of collateral"

- Bindseil and Papadia (2006)

BoE reasoning behind narrow set of accepted collateral

"The provision of large liquidity facilities penalizes those financial institutions that sat out the dance, encourages herd behavior and increases the intensity of future crises"

- Mervin King (2007)

The setting of other parameters

- Collateral

"Banking has always been a confidence game"

- Bagehot and Diamond and Dybvig (1983)

1. Lender of last resort → stability, but less liquid banks
2. Constructive ambiguity vs. time consistency
3. Bagehot's rule on lending – penalty rate

The liquidity of banks must be regulated through other means:

- *Liquidity Coverage Ratio (LCR)*
- *Net Stable Funding Ratio (NSFR)*

The setting of other parameters

- Collateral



The setting of other parameters

- Timing of operations

- Mostly weekly operations
- Minimize intervention
 - Longer operations and more need for marginal facilities
- Other stabilizing elements
 - E.g. reserve averaging

The setting of other parameters

- Who has access?

The Federal Reserve stood out pre-crisis by restricting the *participation* of banks in their main operations to a narrow set of banks, or more precisely, investment banks, *the primary dealers*.

What happened?

1. This limited set of banks needed all the liquidity they could get to cover liquidity guarantees they had given to off-balance sheet vehicles
2. These off-balance sheet vehicles had a maturity and credit mismatch as they funded inter alia structured securities with the issuance of asset backed commercial paper
3. As buyers of asset backed commercial paper of between USD 1 and 2 trillion threatened to run, the banks had to reserve whatever liquidity they had access to
4. Stopped lending abroad → liquidity crisis began

The setting of other parameters

- Quantitative restrictions on supply of liquidity

- Most central banks restricted access
- ECB fixed allotment
 - Supply enough liquidity so that the banking system is more or less in balance over reserve maintenance period
- Supplemented by reserve averaging plus end of period operations
 - Expected rate on last day of period determines rate on other days

The setting of other parameters

- Restricting supply of liquidity – the ECB example

A stylized central bank balance sheet	
Assets	Liabilities
Net domestic assets on the private non-bank sector (NDAP)	Notes and coins (NC)
	Government deposits (G)
Net foreign assets (NFA)	Bank liquidity (H)
	Equity of central bank (E)

$$H = NDAP + NFA - NC - G - E$$

$$\sum H \geq \sum \text{Required Reserves}$$

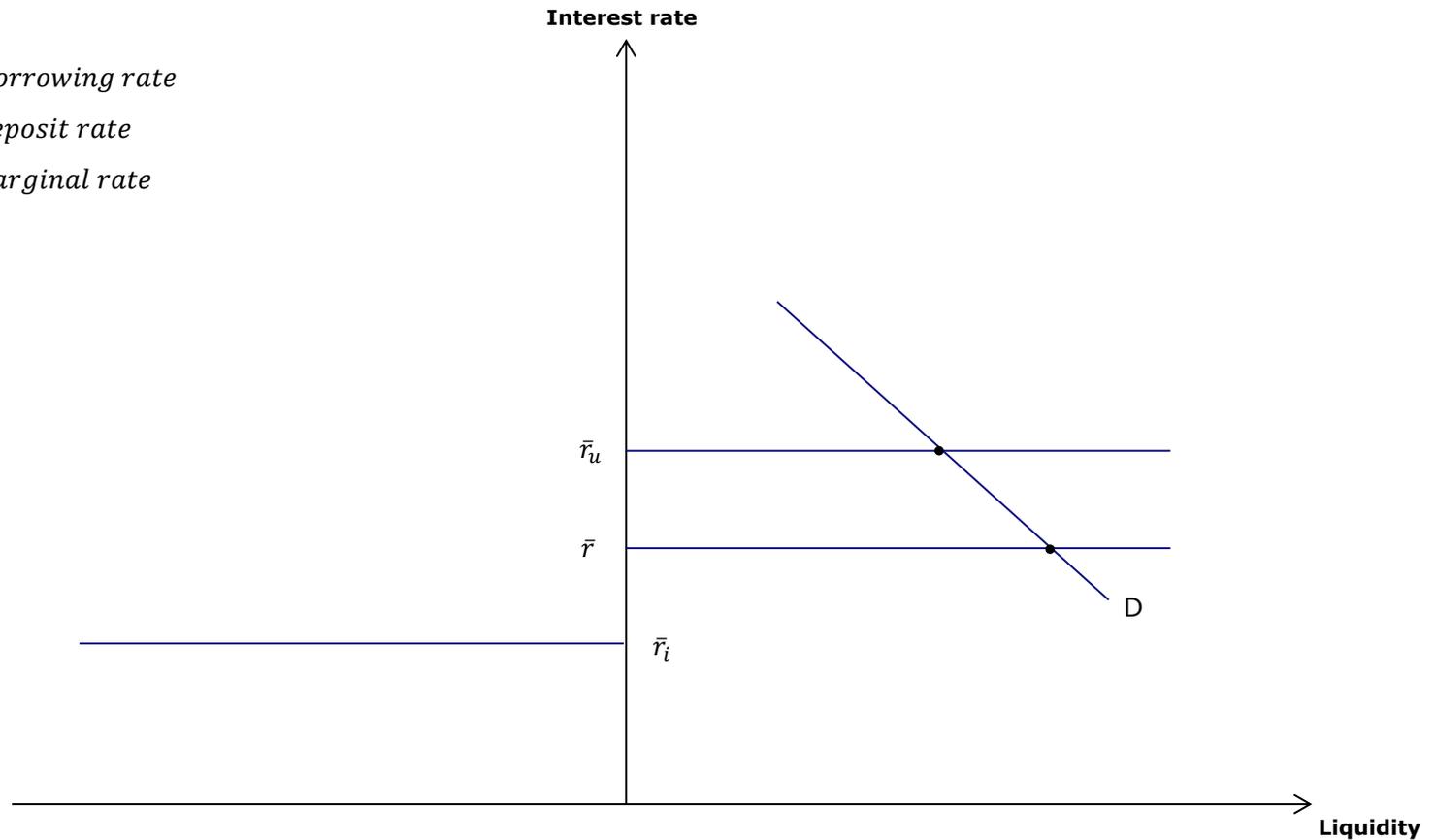
The setting of other parameters

- The interest rate corridor

\bar{r}_u = borrowing rate

\bar{r}_i = deposit rate

\bar{r} = marginal rate



Adjustments to the operational frameworks during the crisis

- How operating procedures converged
- The disconnect between monetary policy rates and funding conditions
- Extending monetary policy; the two dimensions

Adjustments to the operational frameworks during the crisis

- Change in parameters

- Collateral → everything
 - Frequency of operations → more often
 - Counterparties → all banks and other institutions
 - Quantity restrictions → no
- **Convergence!**

Adjustments to the operational frameworks during the crisis

- The disconnect between monetary policy rates and funding conditions

ECB



FED

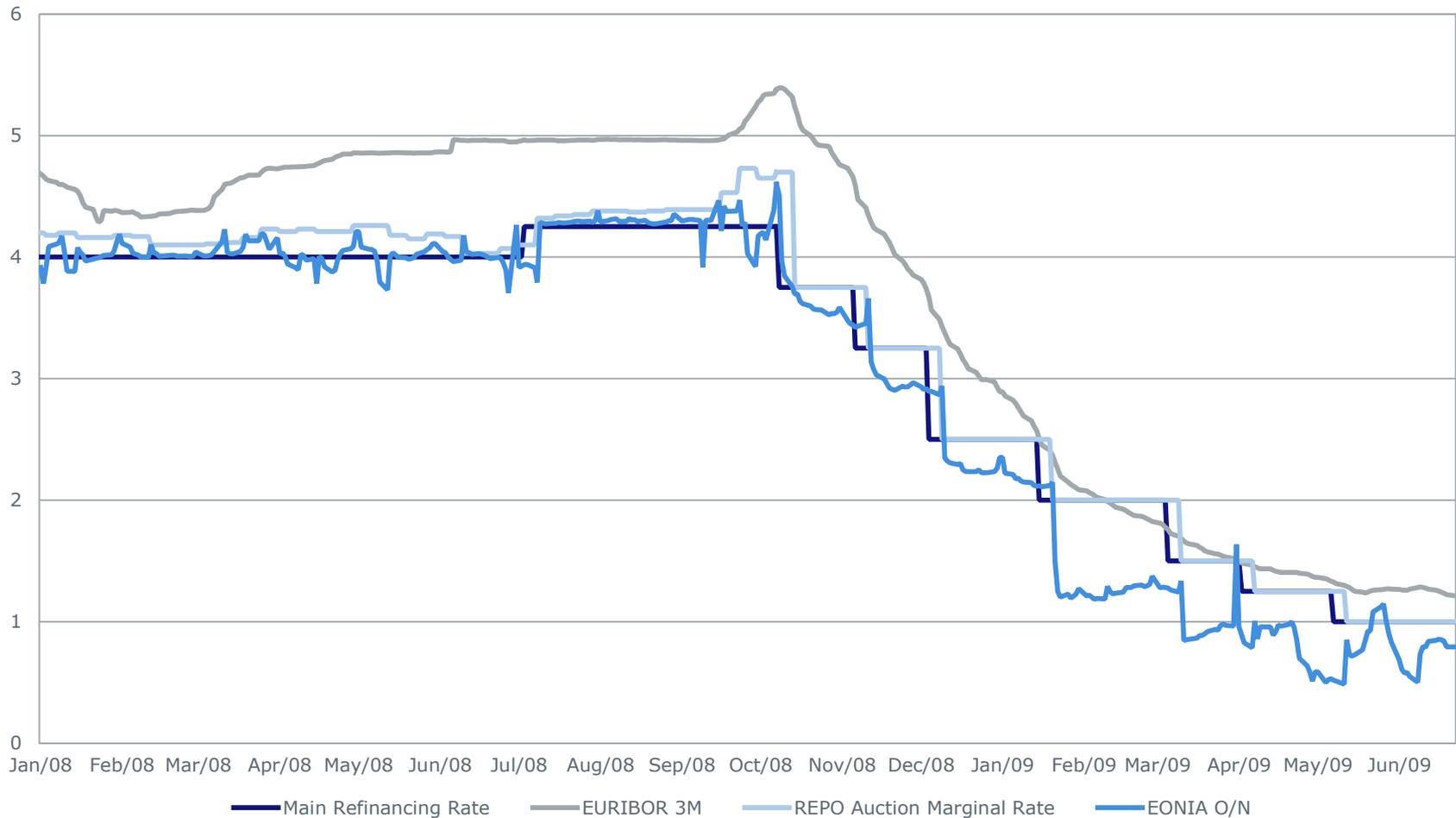


Source: Bloomberg.



Adjustments to the operational frameworks during the crisis

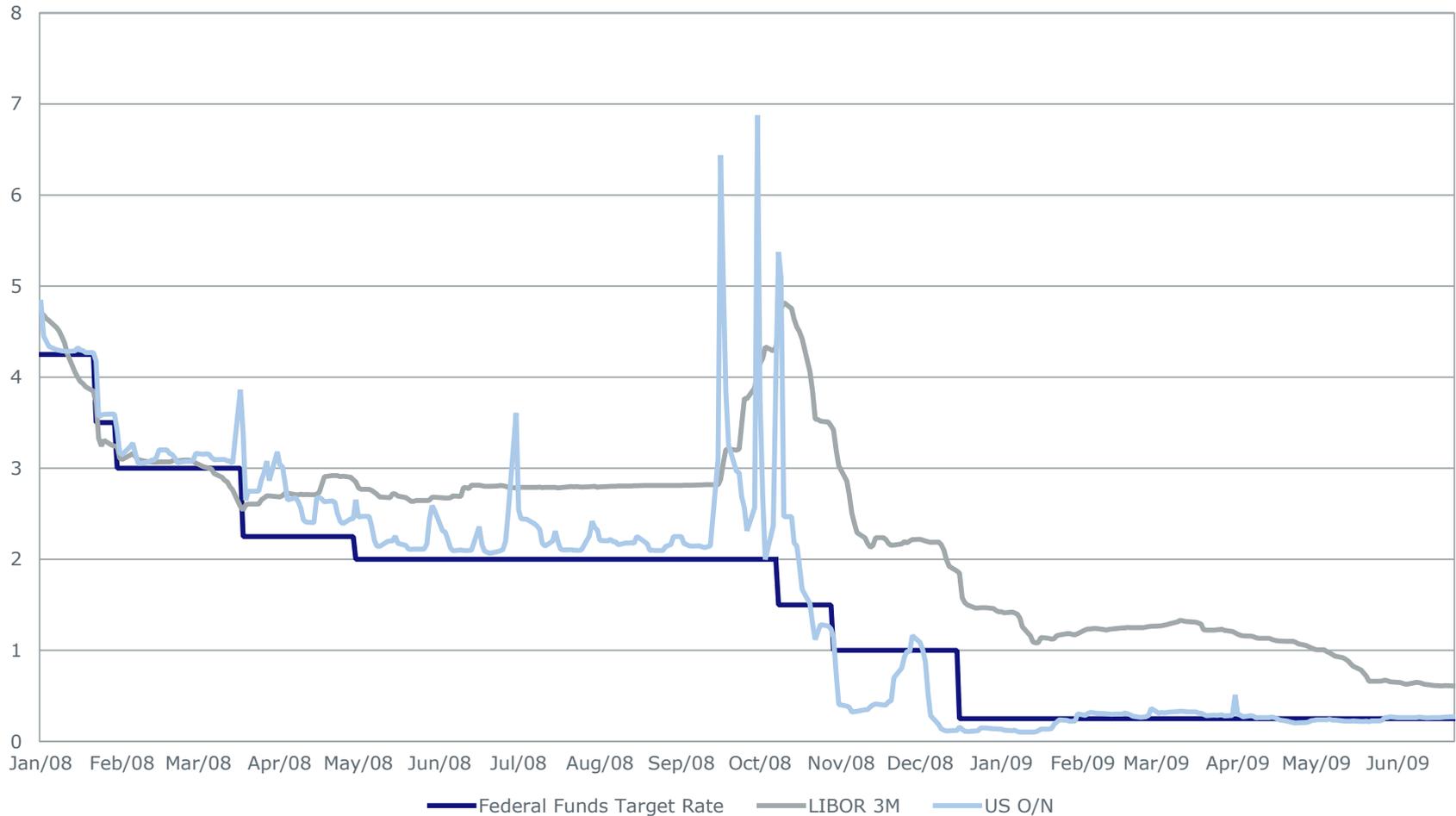
- the ECB's problem in controlling two short term rates



Source: Bloomberg.

Adjustments to the operational frameworks during the crisis

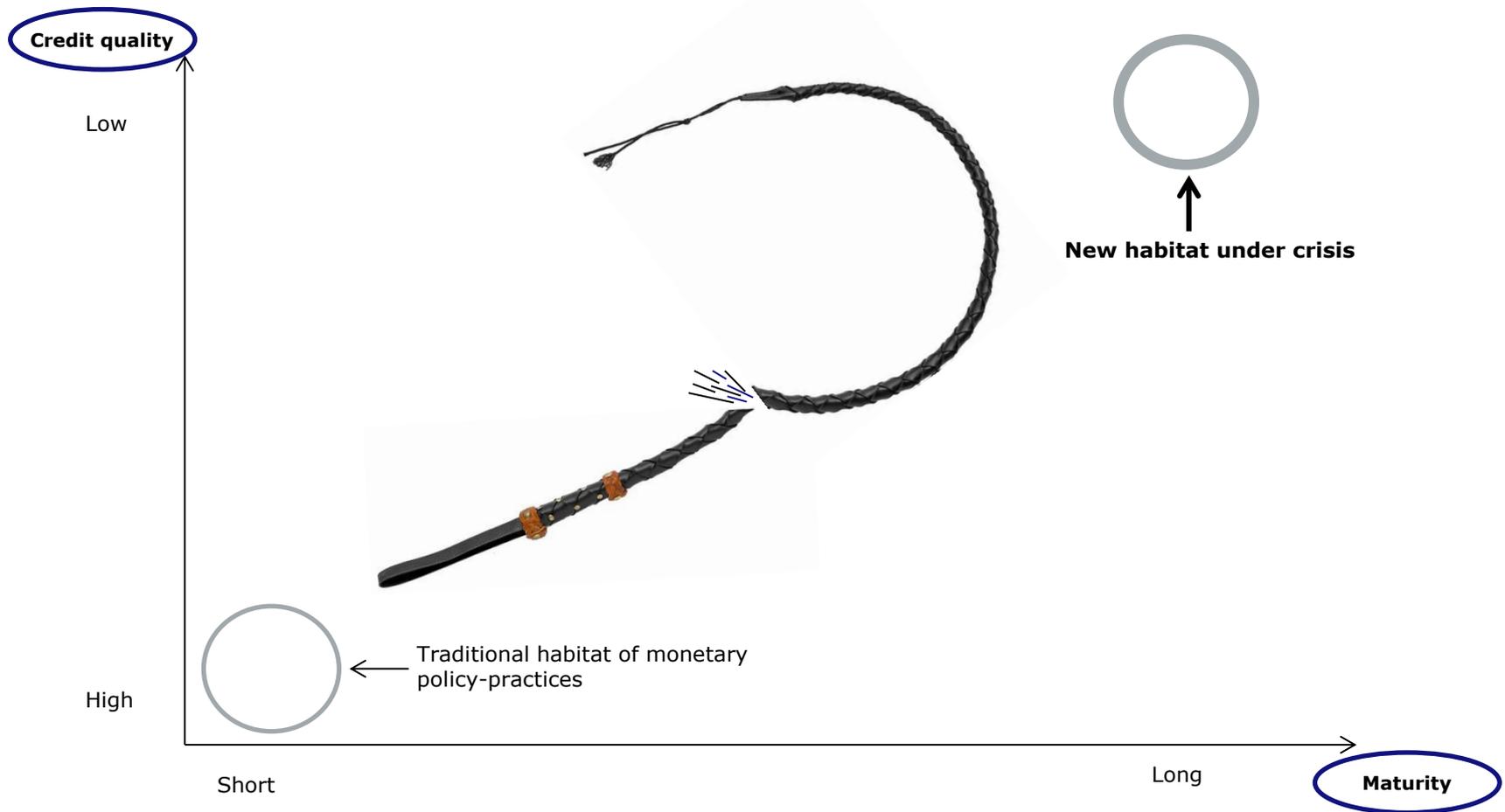
- ... the FED could not do it either



Source: Bloomberg.

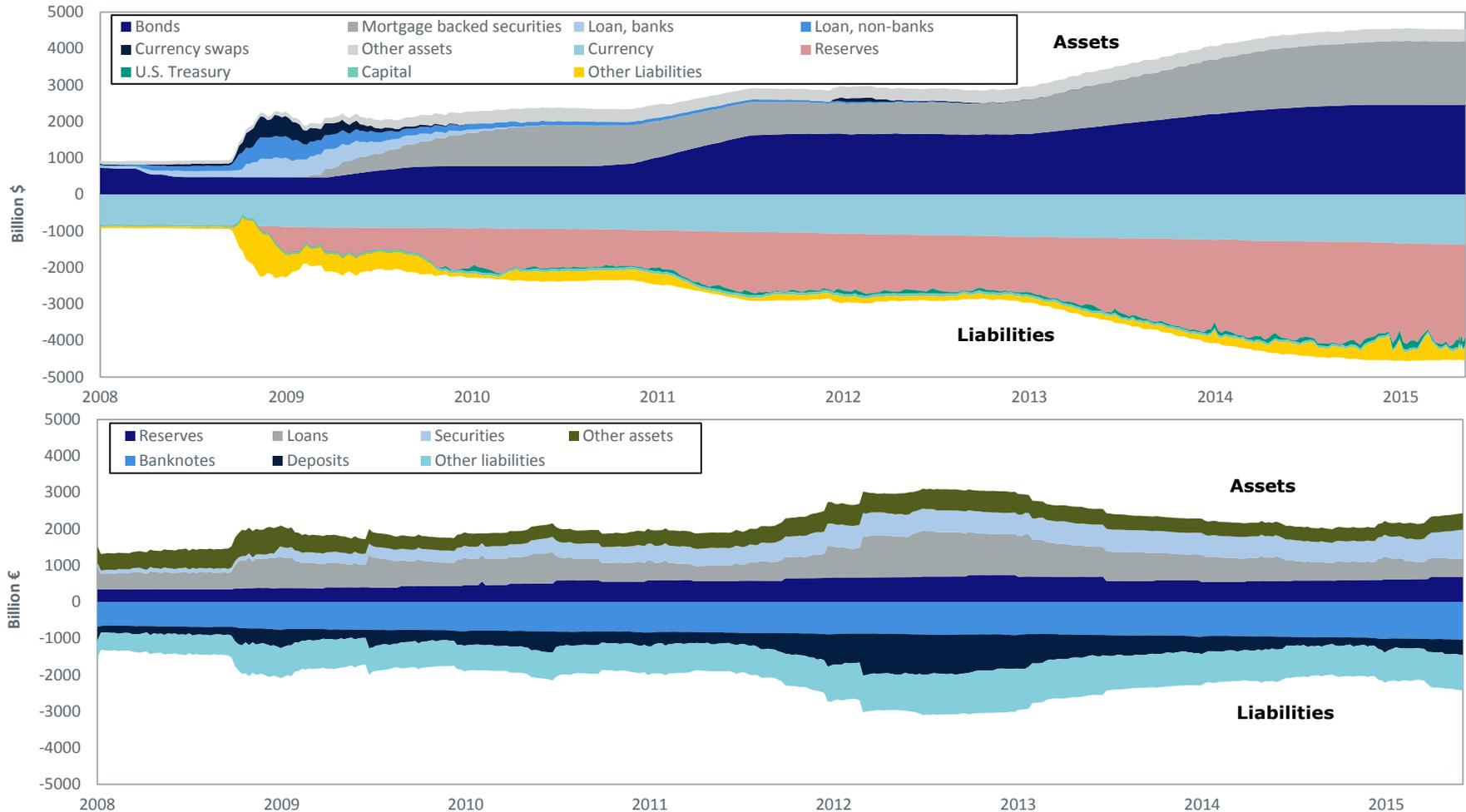
Adjustments to the operational frameworks during the crisis

- Extending monetary policy operations; the two dimensions



Adjustments to the operational frameworks during the crisis

- the development in balance sheets of the FED (top) and the ECB (bot.)



Source: Federal Reserve and ECB.



Final considerations

- 1/2

1. Central banks had to give up controlling quantities in order to control prices
2. The initial increase in central banks' balance sheets reflected that banks hoarded liquidity and were scared by counterparty risk
3. Operational frameworks converged
4. But ordinary monetary policy was not enough "to stay panic"

Final considerations

- 2/2

- *“ Central bank operational frameworks should be sufficiently flexible in terms of **potential frequency** and **maturity of operations**, **available instruments**, and the **range of counterparties** and **collateral**, to deal with extraordinary situations.”*

– Financial Stability Forum (2008)

- Path dependency or deliberate design?
- Simplicity?

VALUED MEMBERS

Kindly be informed that during
absence of water in the gym,
swimming is not allowed.

27/02/14



Thank you!