

# **Monetary Policy in Difficult Times: Lessons and Challenges from the European Central Bank Experience**

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**Global Economy Lecture  
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# Outline

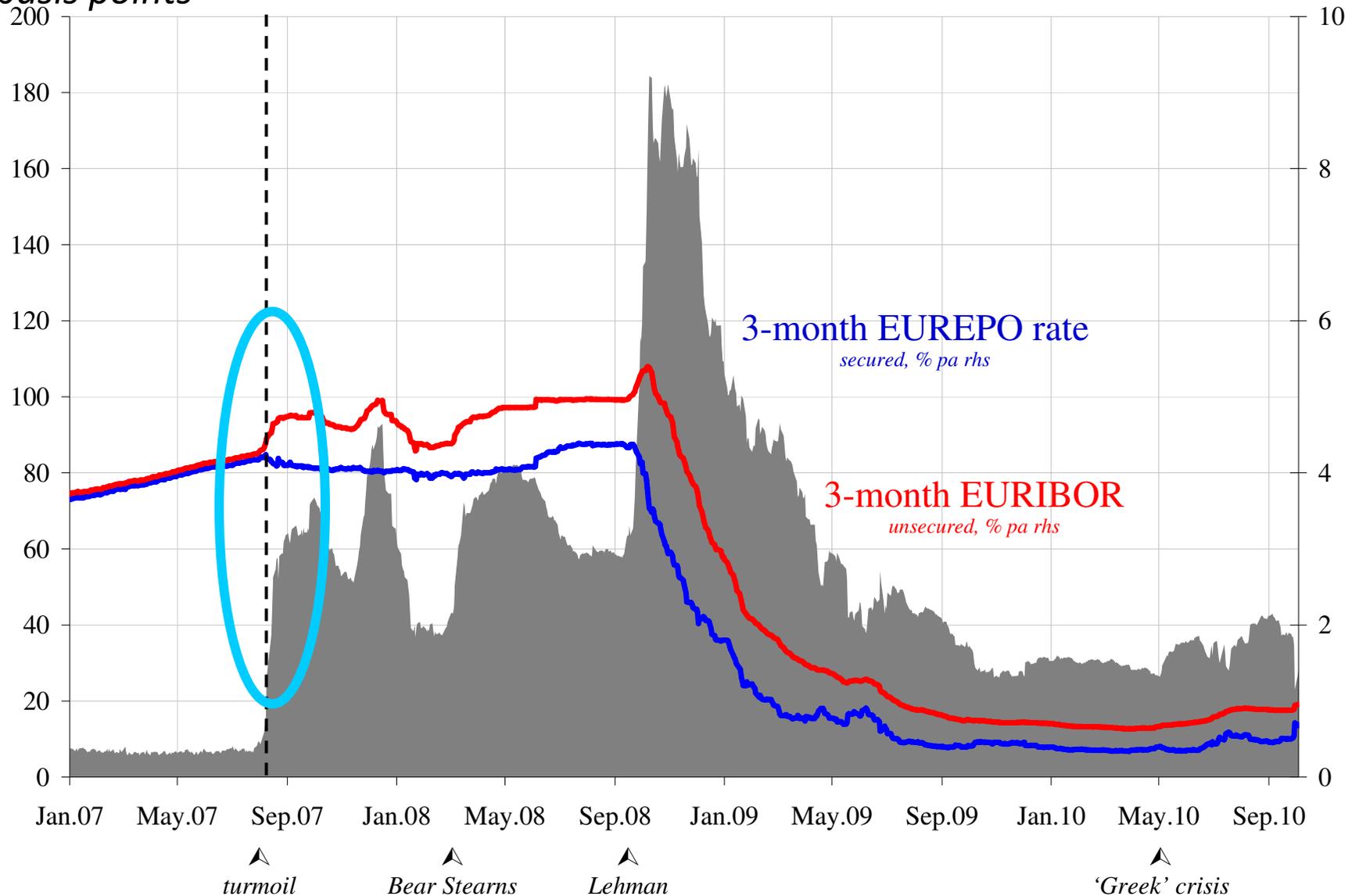
1. The crisis: symptoms and policy response
2. Has and how ECB policy worked?
3. Some key Issues
4. Is there any lesson to learn?

# Outline

1. The crisis: symptoms and policy response
2. Has and how ECB policy worked?
3. Some key issues
4. Is there any lesson to learn?

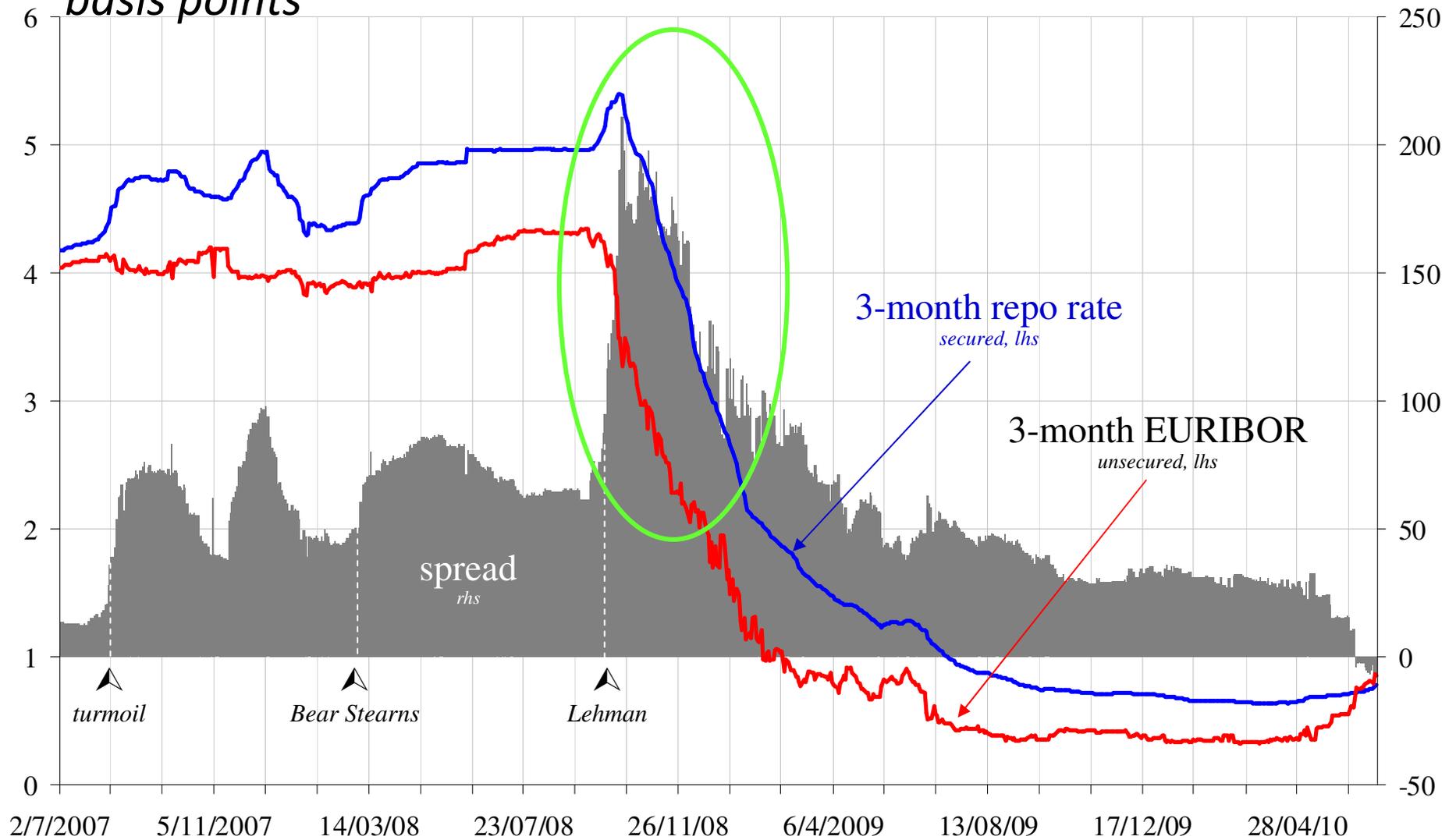
# Symptoms : Turmoil – August 2007 to September 2008

money market rates and spreads, lhs: percent per annum; rhs: basis points



# Symptoms : Crisis – Lehman Failure September 2008

money market rates and spreads, lhs: percent per annum; rhs: basis points



# Diagnosis

- Failure of Lehman increased perceived counterparty risk.
- Adverse selection led to a freezing of the interbank money market : *heterogeneity, 'red-lining' of some banks in interbank market*
- Banks are unable to refinance positions and maintain flow of loans to the private sector.
- Governments take various actions:
  - Fiscal stimulus
  - Support for financial sector (*re-capitalisation, guarantees for bank bonds, etc.*)

# Monetary policy response

**Standard monetary policy response** : lower interest rates

**Non standard measures:**

- Aim at restoring market functioning ...
- In the money market, replace interbank transactions with transactions across the central bank balance sheet (i.e. act as an ‘intermediary-of-last-resort’);
- Improve the availability of bank funding, facilitating securitization and improve functioning of covered bond market ...

*monetary policy and financial stability policies go hand in hand*

# Monetary Policy Response: non-standard measures

## Various measures which expanded central bank intermediation ...

### Measures taken in October 2008:

- Operations at fixed rates with full allotment (FRFA)
  - Weekly MROs (until the end of the year)
  - Introduction of supplementary LTROs at 1, 3 and 6-month maturity
  - USD and CHF liquidity providing operations
- Symmetric narrowing of standing facilities corridor
- Expansion of the list of eligible collateral

### in June 2009:

- Introduction of LTRO at 1-year maturity with FRFA
- **Covered Bond Purchase Programme**

# Covered bond purchase programme

- Improve funding conditions for financial institutions
- Improve risk profile of institutions holding covered bonds
- Improve market liquidity in important segments of the private debt security market
- Encourage new issuances in the primary market contribute to activity in secondary market

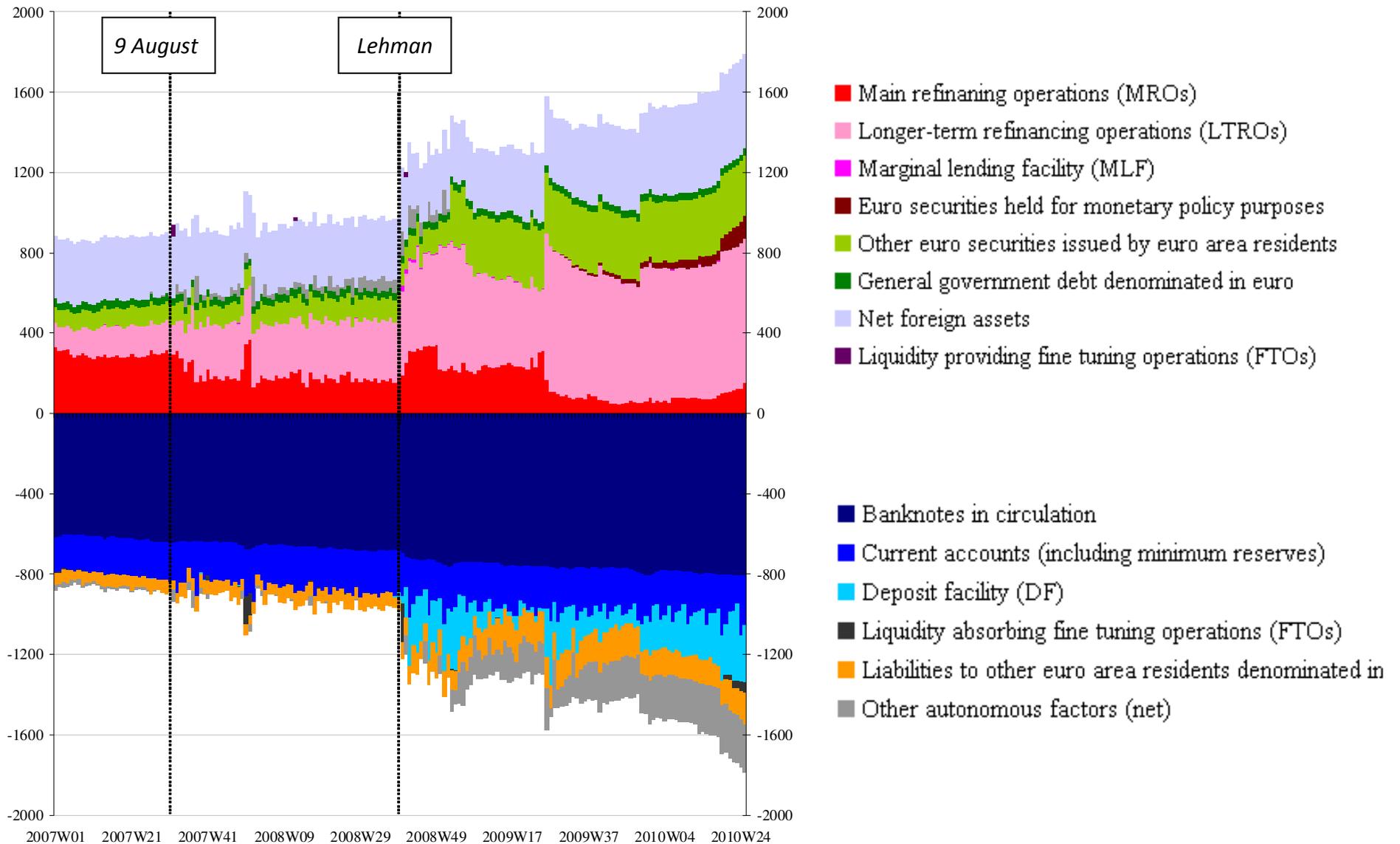
# Non standard policies led to expansion of ECB balance sheet after Lehman

- Asset side: expand scope of repo operations
- Liability side: allow increasing recourse to deposit facilities

While the ECB has not adopted the rhetoric of “quantitative easing”, it has expanded its balance sheet, increasing reserves on the liabilities side of its balance sheet against (largely) conventional assets (repos) on the asset side

# Eurosystem balance sheet

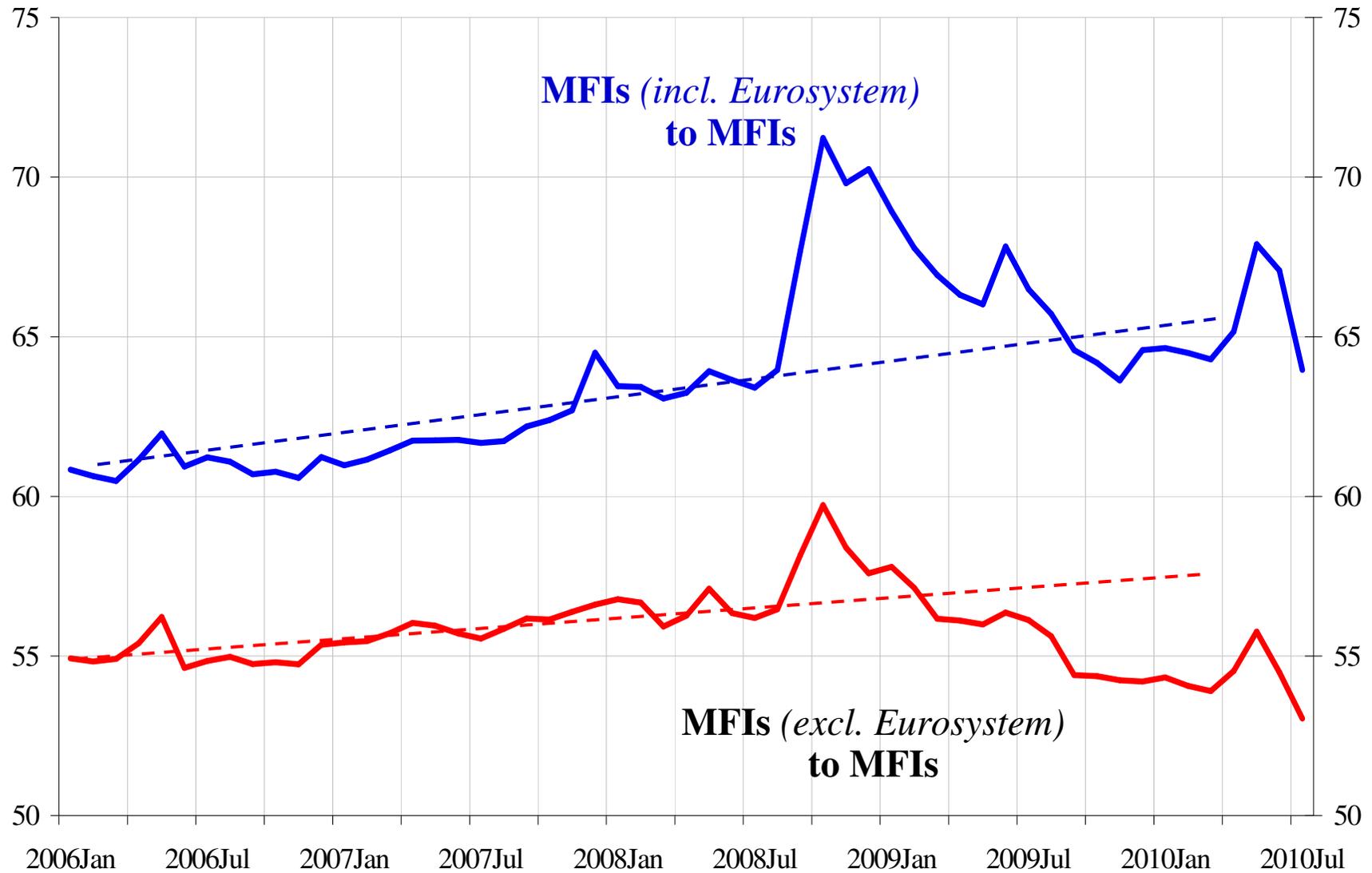
EUR billions



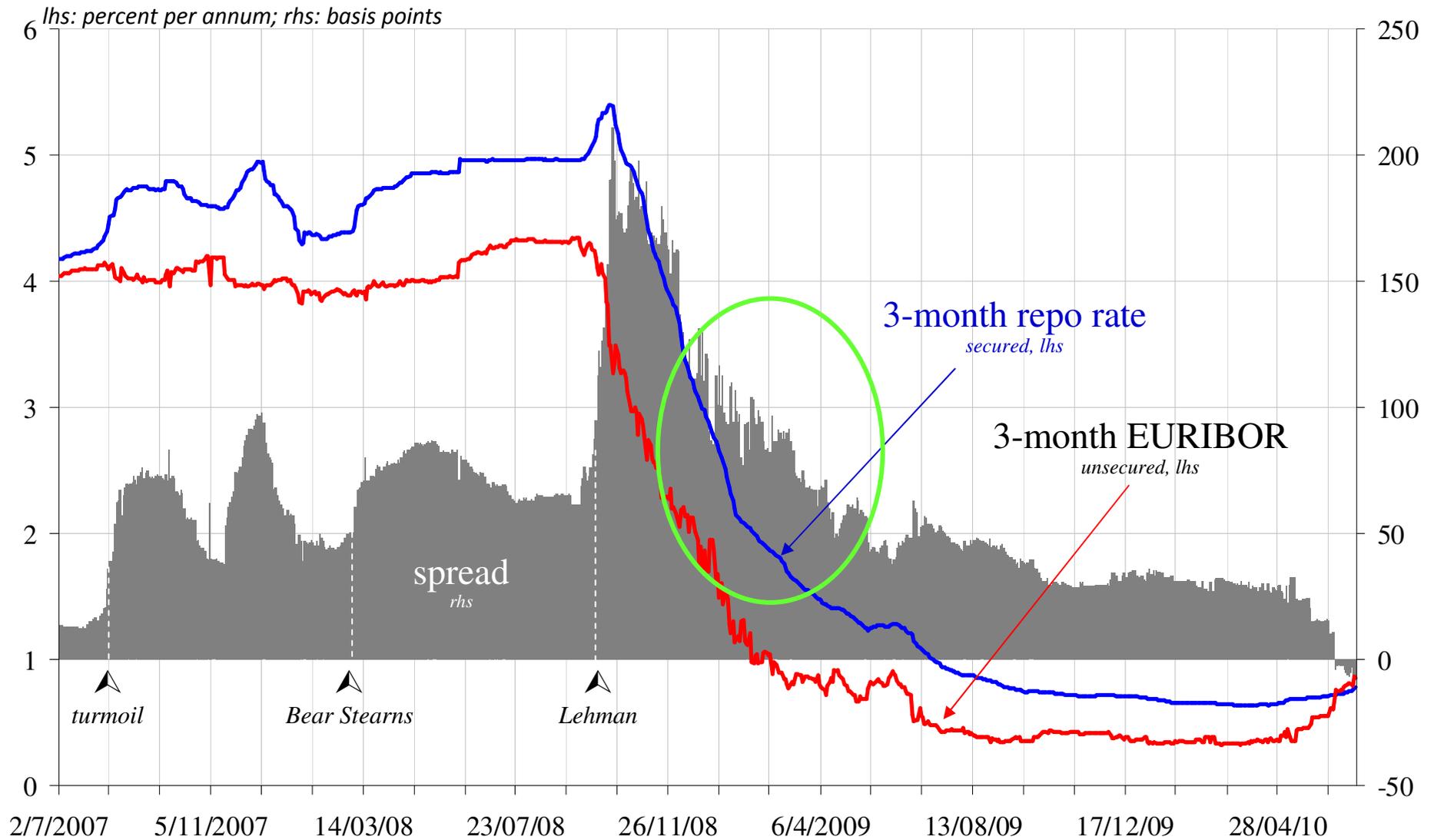
Source: ECB

# Intra-MFI (bank) sector credit

as a percentage of credit to the non-financial sector



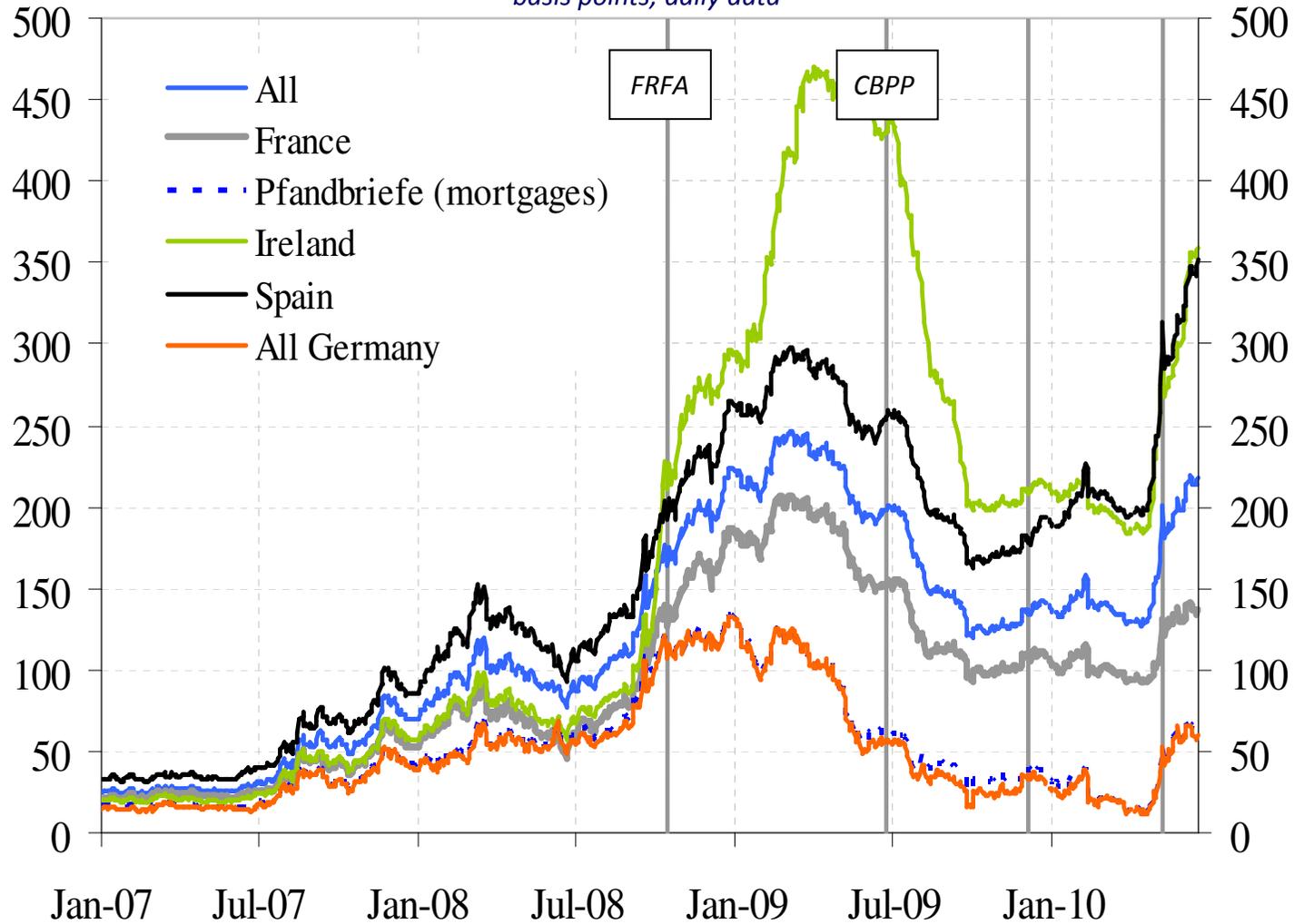
# The effect was a decrease in spreads: secured-unsecured rates



# Covered bond purchase programme

## Covered bond spreads against 5-year bunds

*basis points; daily data*



## Excess Liquidity

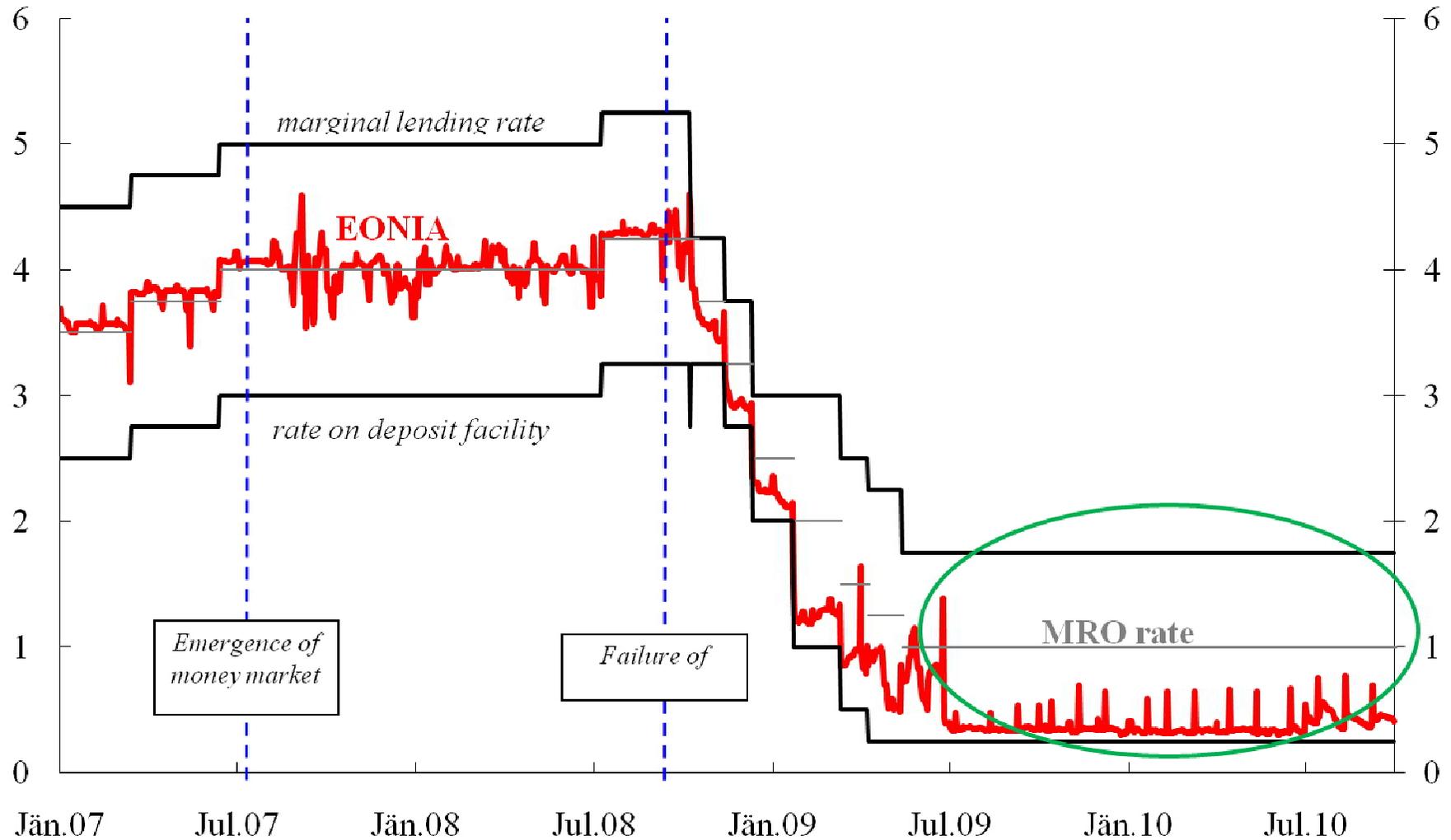
- As a result of excess liquidity: **the overnight money market interest rate (EONIA) moved systematically away from the policy rate (Main Refinancing Operation rate) and fell towards the rate on the deposit facility.**

*(ECB chose to reabsorb this excess liquidity by having banks with excess cash make recourse to the (remunerated) deposit facility)*

- Money market rates at all maturities adjusted downward

# Impact on overnight interest rate: wedge between policy rate and eonia

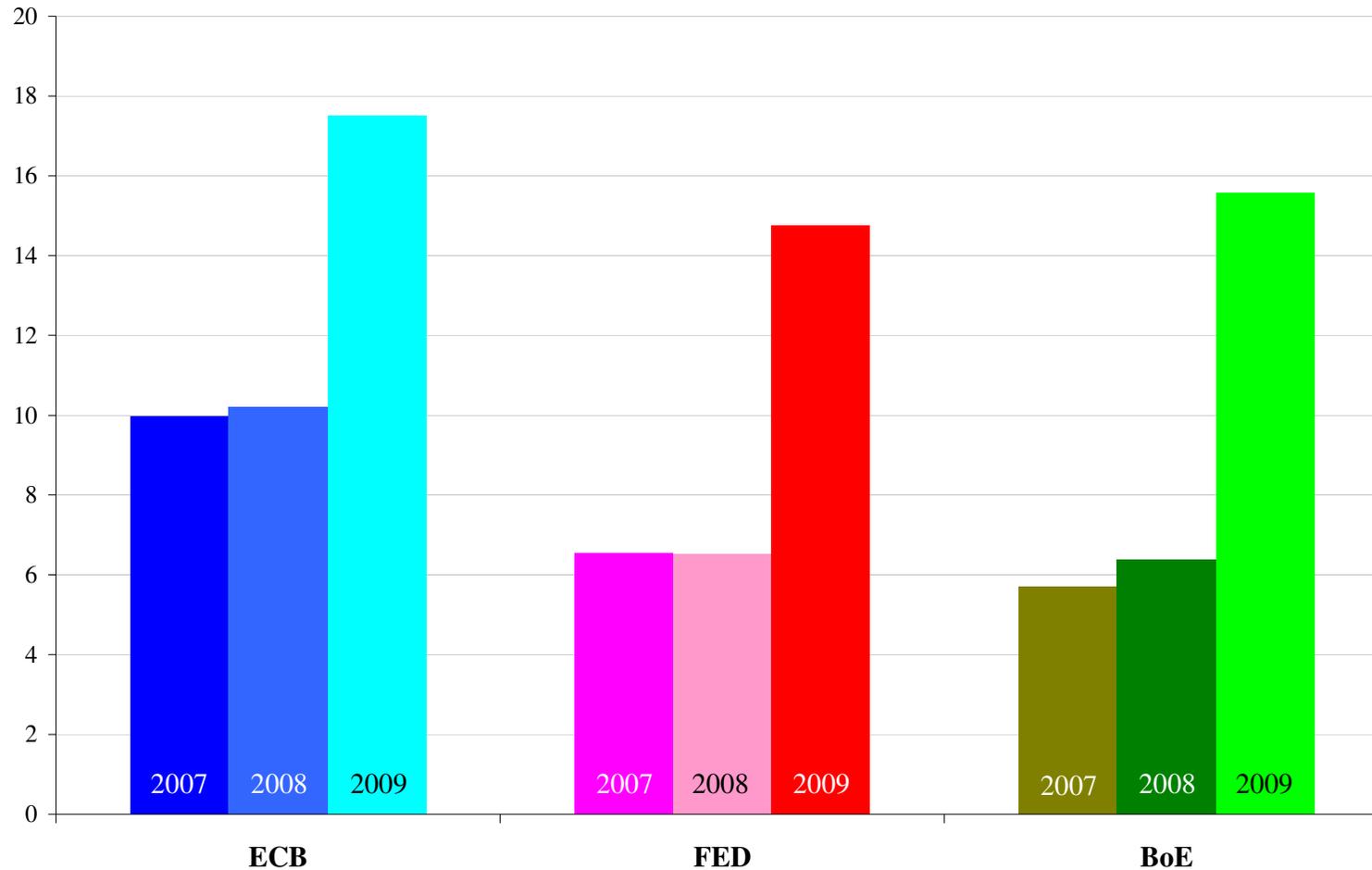
percent per annum



# Standard and non-standard measures: how does the ECB compare with other Central Banks? (1)

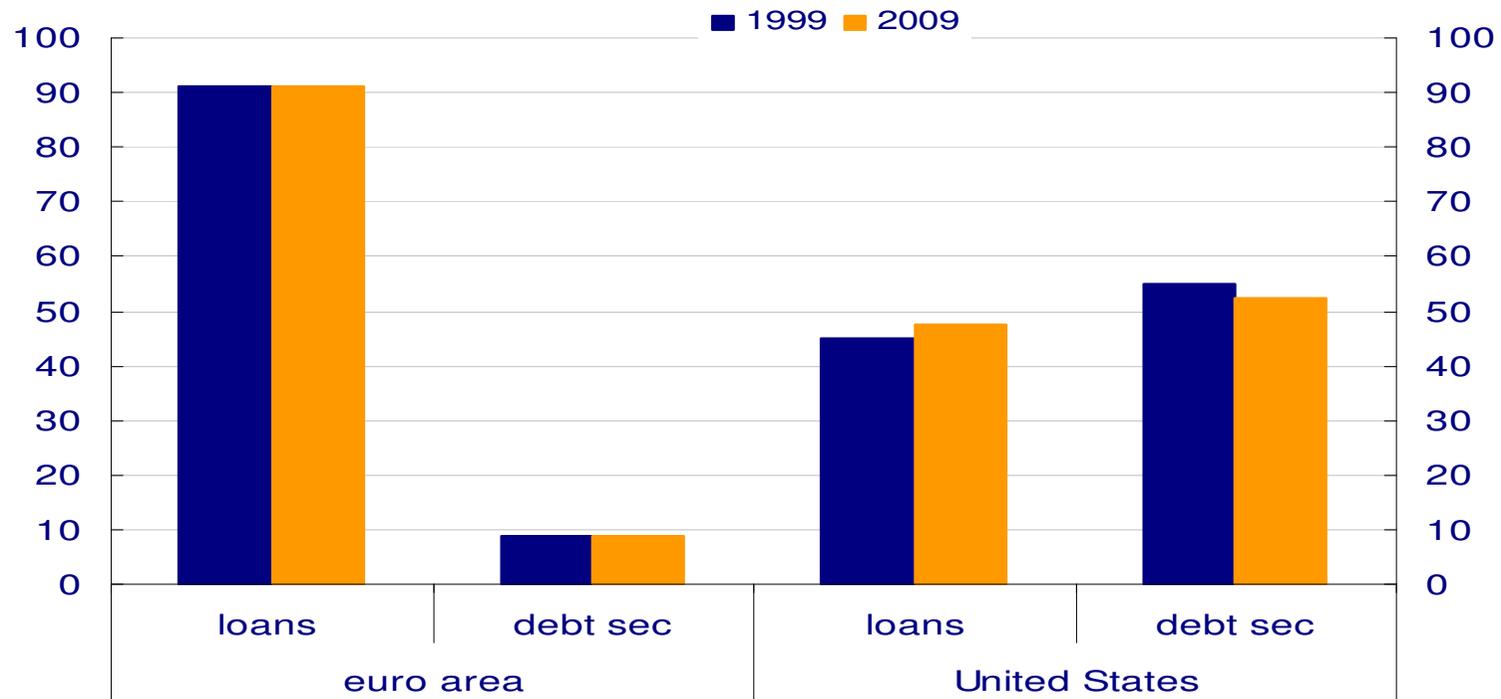
- During turmoil period, arguably *less* active than the ECB (*e.g. Northern Rock*)
- After failure of Lehman, **aim** of measures taken was **similar** ...
  - Avoid collapse of financial system;
  - Maintain market functioning and flow of financing to households and firms, etc.
- ... but **means** to achieve these objectives were somehow **different**, reflecting
  - Different starting points in terms of operational framework for the implementation of monetary policy and structure of central bank balance sheets
  - Different financial structures (*market-based vs. bank-based financial systems*)

# Comparison of central bank balance sheet size *percent of GDP, June of each year*



# Bank versus market centered financial systems

*percent of total debt financing of corporate sector*



## Standard and non-standard measures: how does the ECB compare with other Central Banks? (2)

- Through Spring 2009 non standard monetary policies seen as **complements** in *all* jurisdictions – beyond rhetoric policies of ECB and Fed similar
- But as:
  - Macroeconomic conditions have varied across countries;
  - Central bank mandates / objectives differ (*at least to some extent*);
  - Relevance of ‘zero lower bound’ (ZLB) on nominal interest rates has not been uniform ...
- Some CBs (FED, BoE) have adopted non-standard measures as an alternative / **substitute** for lower interest rates, since at ZLB
  - Quantitative easing, ‘QE 2’
- The ECB is away from ZLB and continue to see as complement
  - Support market functioning and underpin transmission of monetary policy

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# Has it worked? Exercise 1

Lenza, Pill and Reichlin, Economic Policy 2010

- Characterize the effect of the introduction of non-standard measures in terms of its impact on a variety of money market spreads:
  - *Narrowing of the spread between secured and unsecured term rates;*
  - *Reduction of market overnight rate relative to the “policy” MRO rate;*
  - *Flattening of the money market yield curve through 1-year LTRO.*
- Characterize the (partial) macroeconomic impact of non-standard measures as the difference between two counter-factual exercises (conditional forecasts) constructed using a model of the euro area economy, based on different interest rate assumptions

# The model

- Developed and evaluated by Giannone, Lenza and Reichlin (2009, 2010): establishes and documents ‘stylised facts’ about monetary dynamics in the euro area.
- The model is a Bayesian vector autoregressive model (B-VAR), estimated over the sample period January 1991 to August 2008 using monthly data.
- The model consists of 40 macroeconomic variables:
  - Macro variables – *economic activity (IP); prices (HICP); unemployment; etc.*
  - Monetary and credit variables – *monetary aggregates; sectoral credit by use / maturity; and*
  - Money market rates and bond yields ...
- We avoid the “curse of dimensionality” by using Bayesian shrinkage techniques (*see De Mol, Giannone and Reichlin, 2008, Banbura, Giannone and Reichlin, 2010, Giannone, Lenza and Primiceri, 2010 for setting of priors*)

## Some words about the econometrics

- The model is very large: it is a VAR with 40 variables and 13 lags!
- The problem of estimating such large models is that estimation uncertainty makes results unstable/unreliable
- To reduce estimation error we use the Bayesian idea of combining the likelihood function with some informative prior distribution. Our contribution is to study setting of the prior in relation to the dimension of the model

## Basic Idea: Mixed Estimation

Data + Prior  
(Complex/Rich) (Parsimonious/Naïve)

What weight should we give to the prior?

- a. *De Mol, Giannone and Reichlin J of Ec 2008* show that we should give more weight (shrink more) as the size of the model increases (asymptotic analysis).
- b. *Banbura, Giannone and Reichlin, J of App Ec 2010* apply this idea in a VAR: control for over-fitting by choosing the shrinkage parameter that yield the desired in-sample fit.
- c. *Giannone, Lenza and Primiceri, mimeo 2010* use the marginal data density to set shrinkage parameter

*Here we do b and c*

## Exercise 1 (*Lenza, Pill and Reichlin Ec Pol 2010*)

### Policy scenario (P) *with non-standard measures*

- Euribor 3 and 12 month rates as observed between November 2008 and August 2009
- Simulation  $\rightarrow E_{A(L)}(X_{t...T} \mid X_{0...t-1}; P)$

### No Policy scenario (NP) *without non-standard measures*

- Euribor 3m = MRO + [Spread Euribor 3m/MRO 10/2008 level +   
[Spread MRO/EONIA from 11/08 to 08/09]
- Euribor 12m = MRO + [Spread Euribor 12m/MRO(10/08)] + **Flattening of the yield curve due to non-standard policy**
- Simulation  $\rightarrow E_{A(L)}(X_{t...T} \mid X_{0...t-1}; NP)$

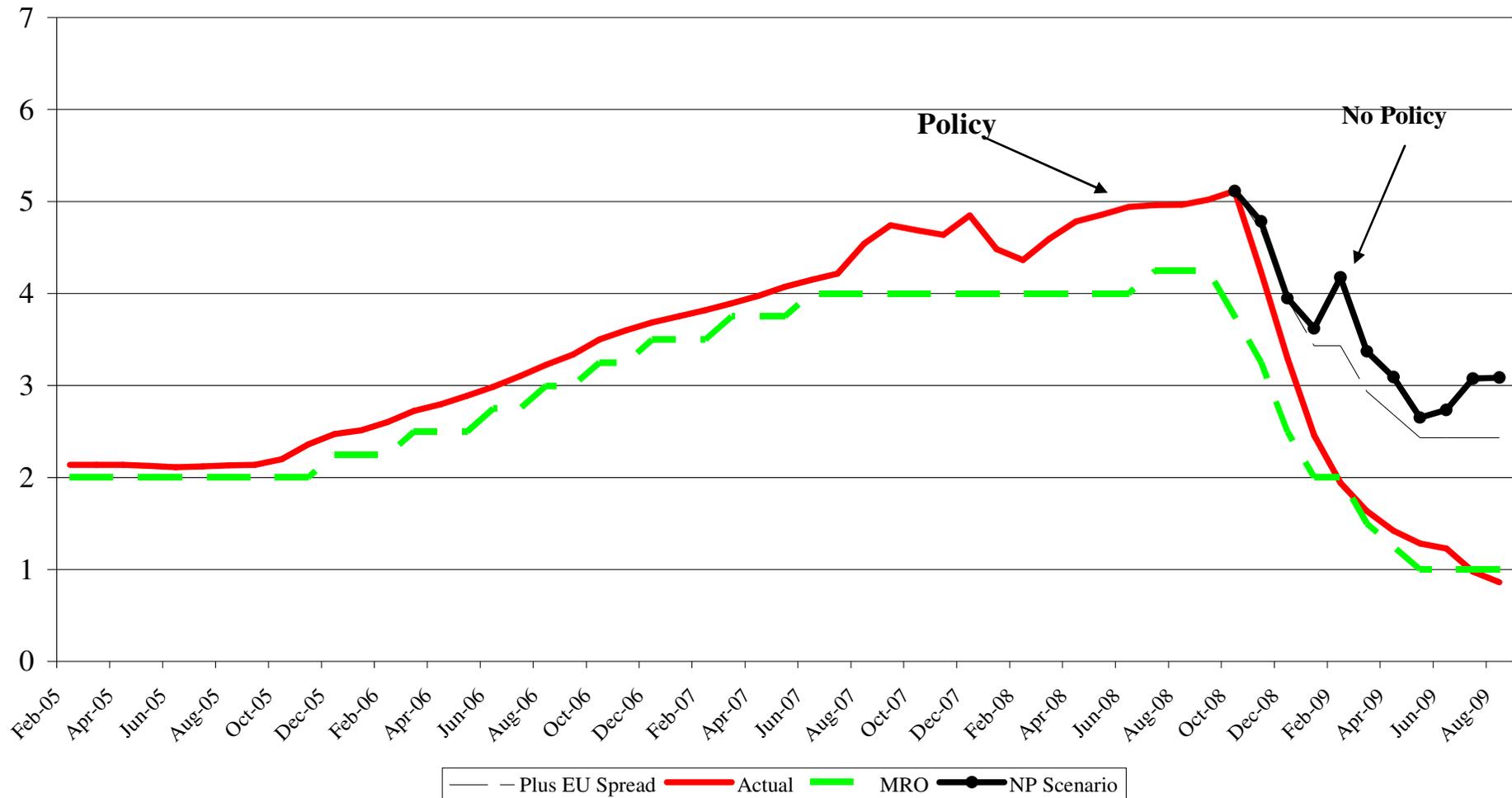
### ➤ Effect of non-standard measures

$$\text{Impact}_{ns} = E_{A(L)}(X_{t...T} \mid X_{0...t-1}; P) - E_{A(L)}(X_{t...T} \mid X_{0...t-1}; NP)$$

*Of course, this all assumes model is stable (we come back to that) ...*

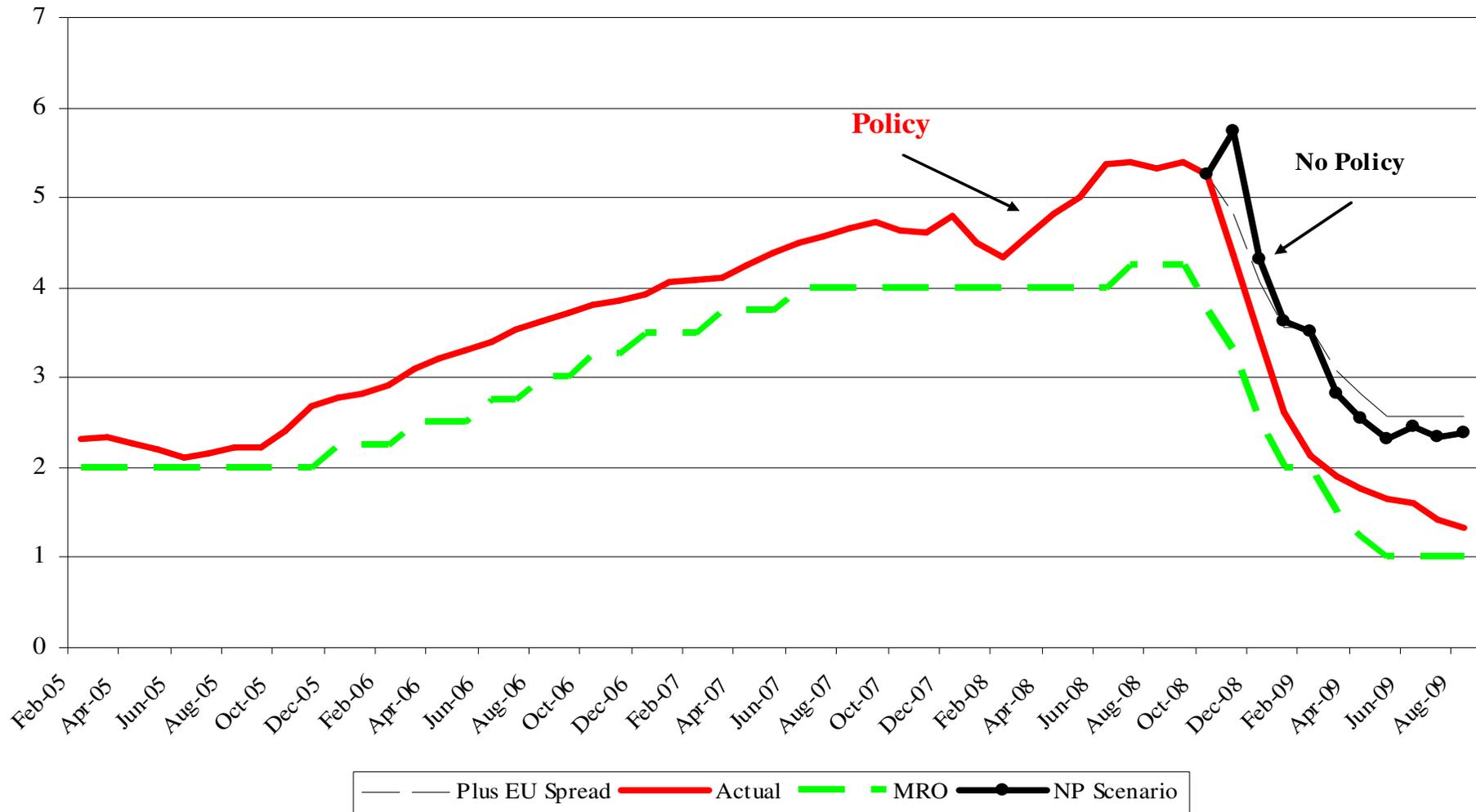
# The macro effects of non-standard measures: scenarios

## Euribor Three months



# The macro effects of non-standard measures: scenarios

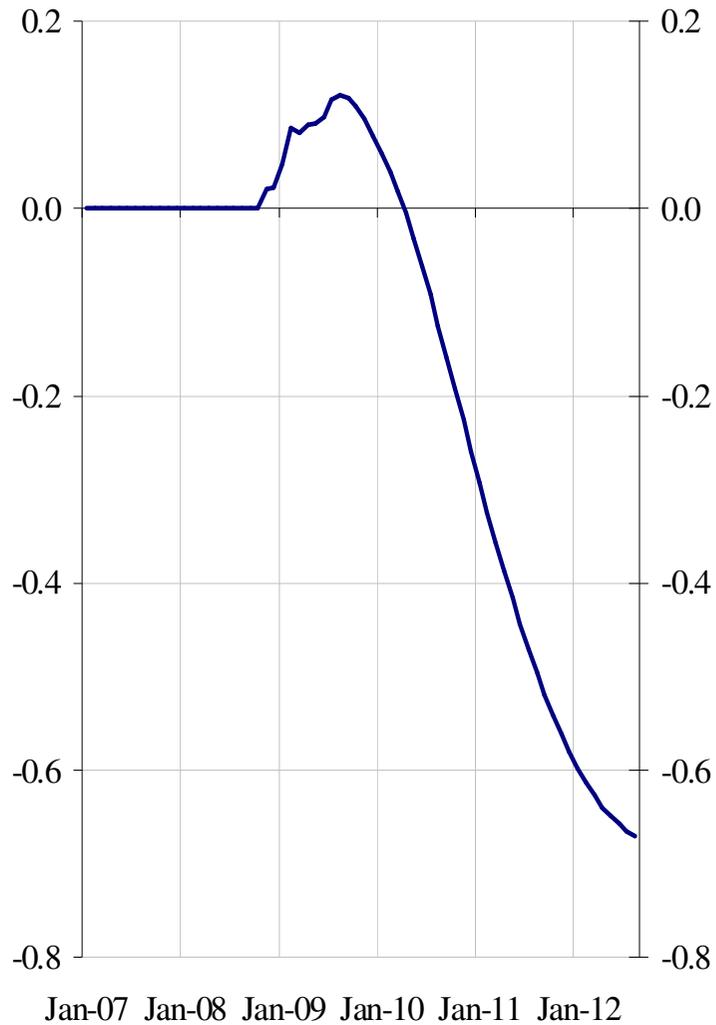
Euribor Twelve months



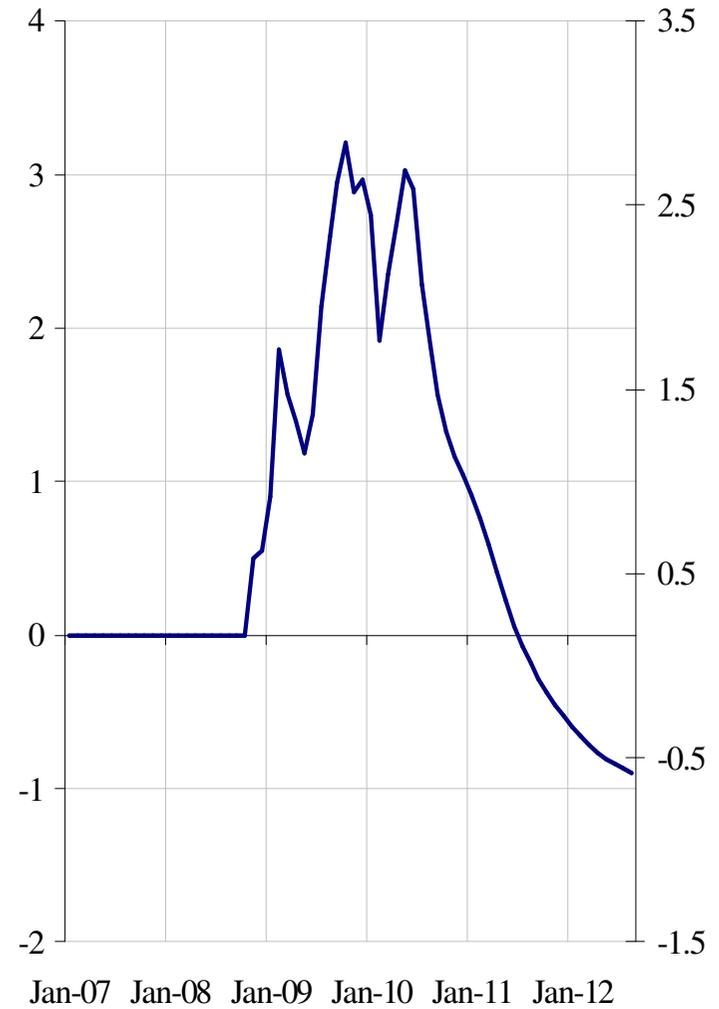
# Exercise 1 - Results

impact of non-standard measures ( $EA(L)(X_{t...T} | X_{0...t-1}; P) - EA(L)(X_{t...T} | X_{0...t-1}; NP)$ , percentage points on annual growth rates (excl. unemployment)

## Unemployment rate



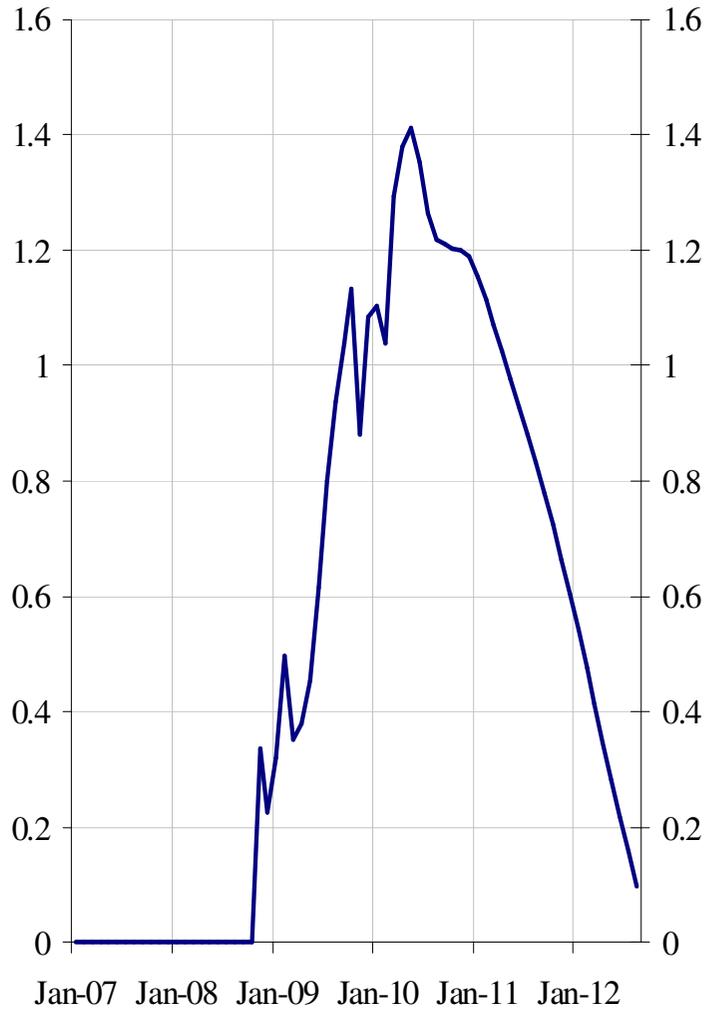
## M1



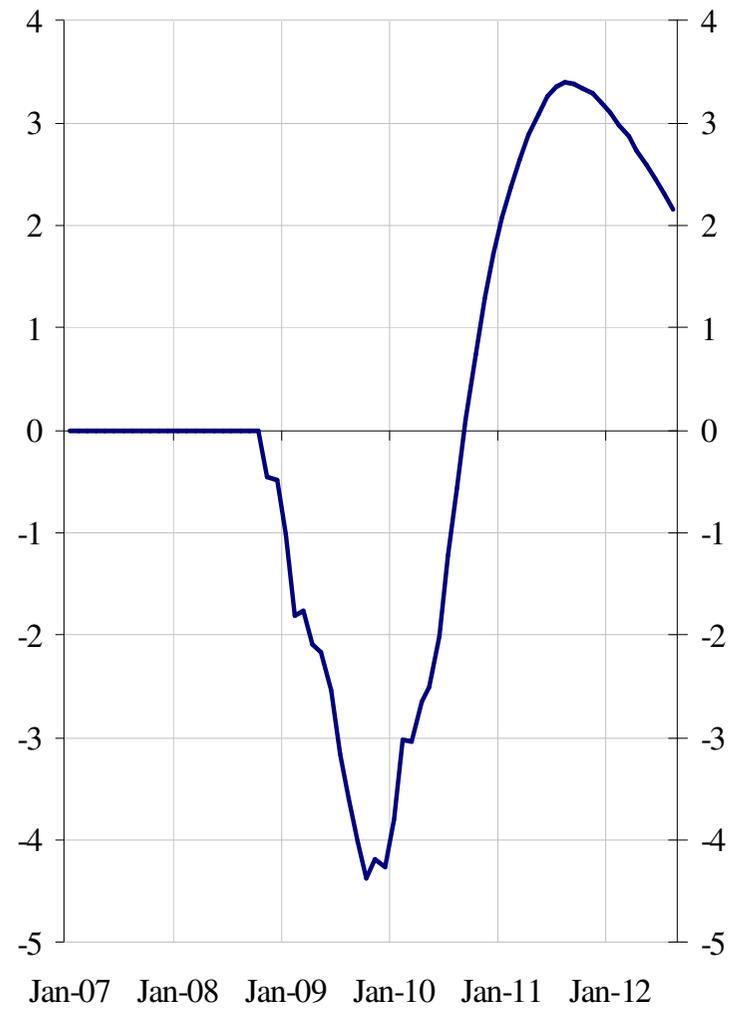
# Exercise 1 - Results

impact of non-standard measures  $(EA(L)(X_{t...T} | X_{0...t-1}; P) - EA(L)(X_{t...T} | X_{0...t-1}; NP))$ , percentage points on annual growth rates

## Loans for house purchase



## Loans to non-financial corporations

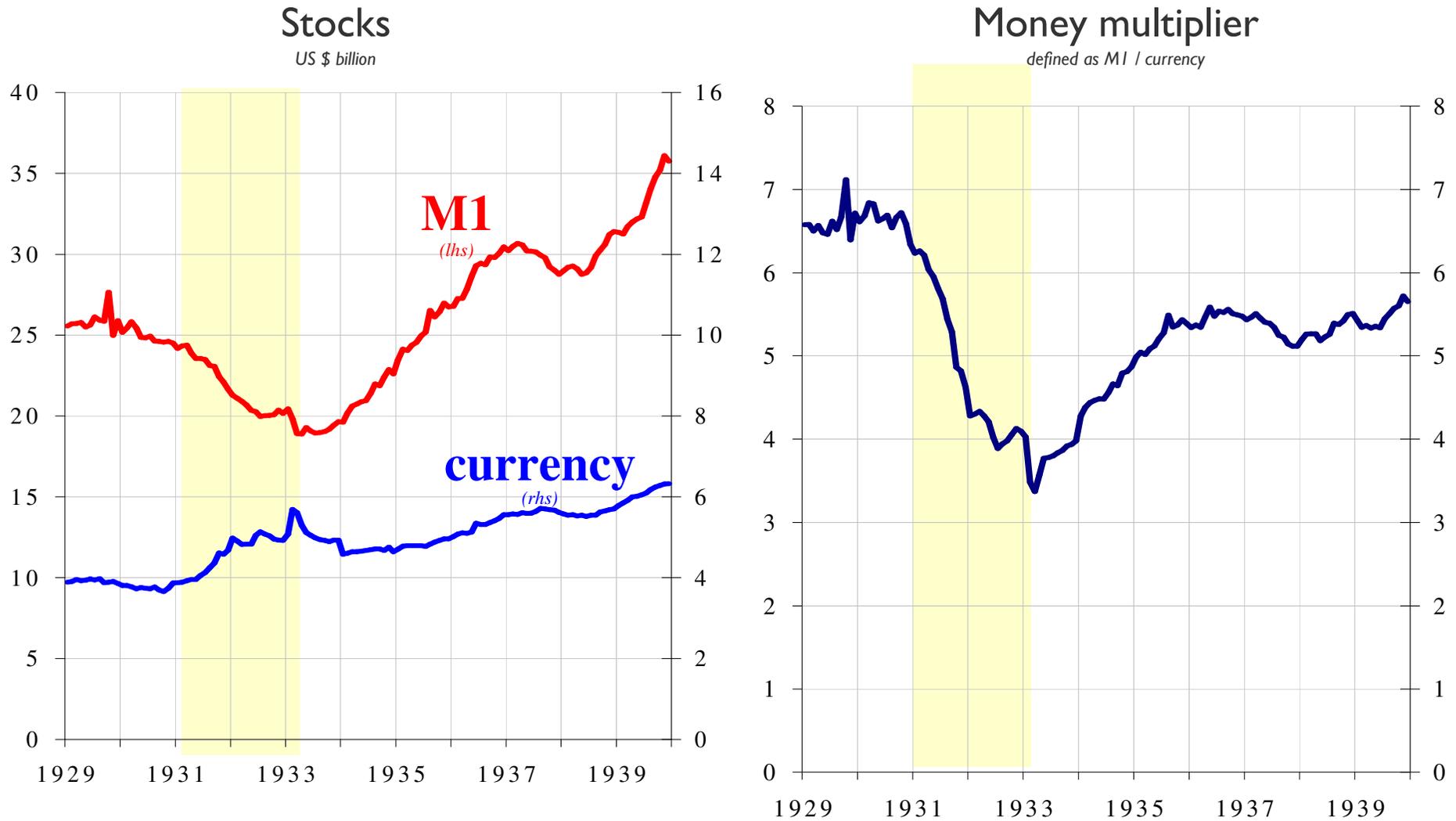


# Comments on exercise 1

- Not surprisingly effects on real economy consistent with what we know about the effect of monetary policy shocks (Lenza, Giannone and Reichlin, 2009, 2010)
- Strong effect on M1 suggests that M1 multiplier did not collapse (see next slides): overnight market preserved with ECB replacing the market (intermediary of last resort)

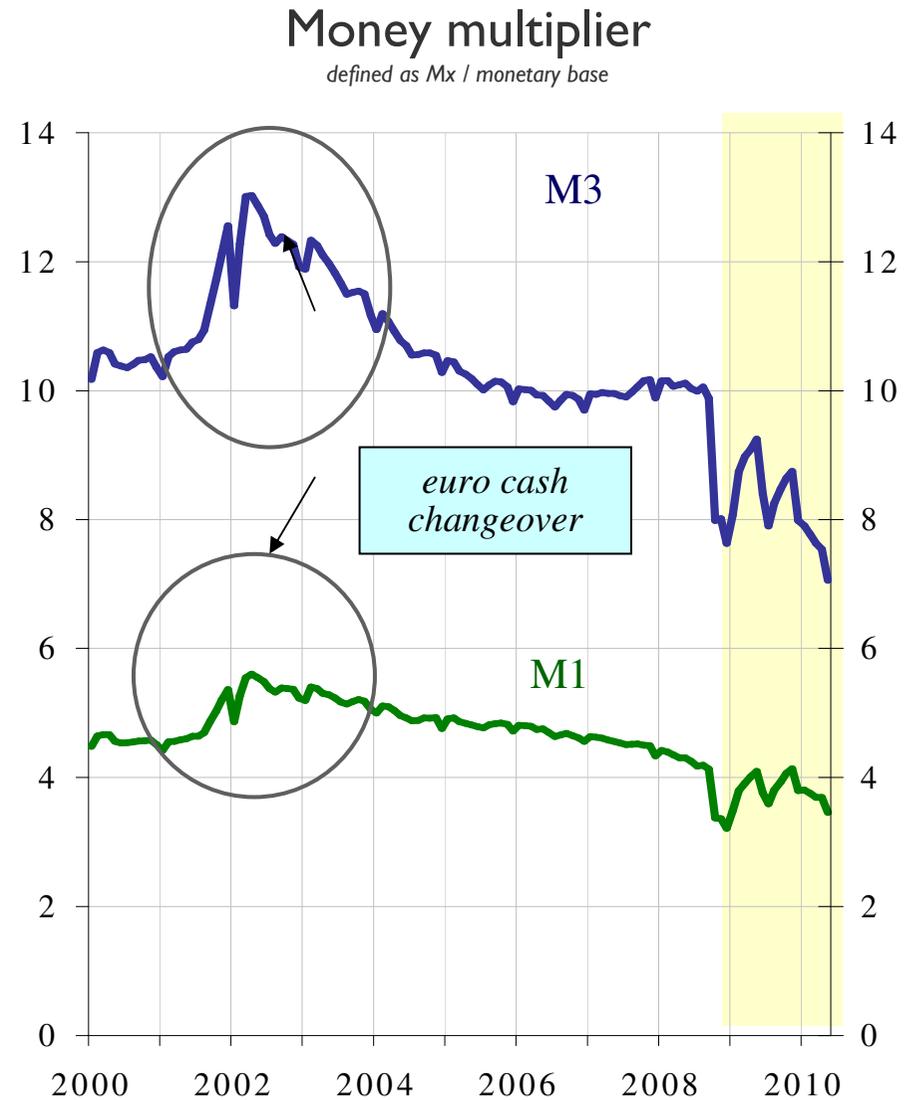
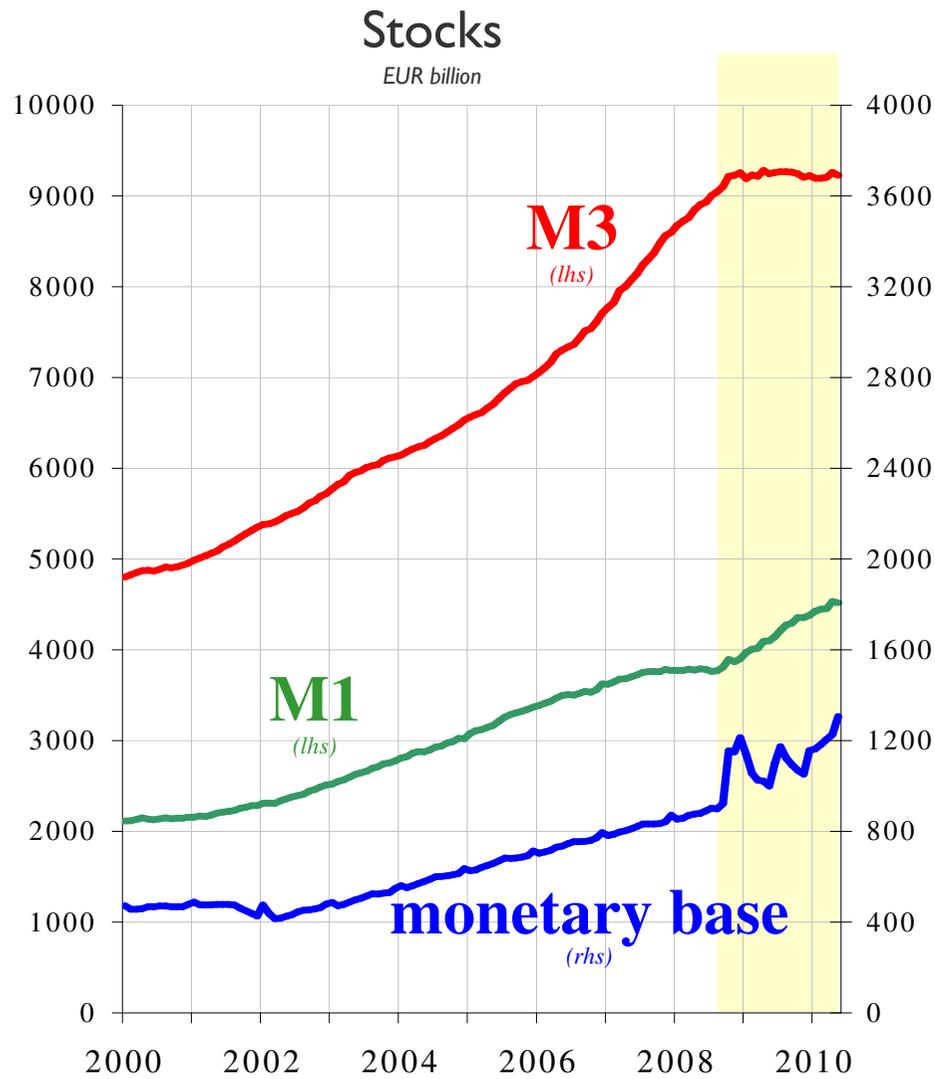
# M1 multiplier - Now versus Then

## The thirties



# M1 multiplier - Now versus Then

## 2008-2010



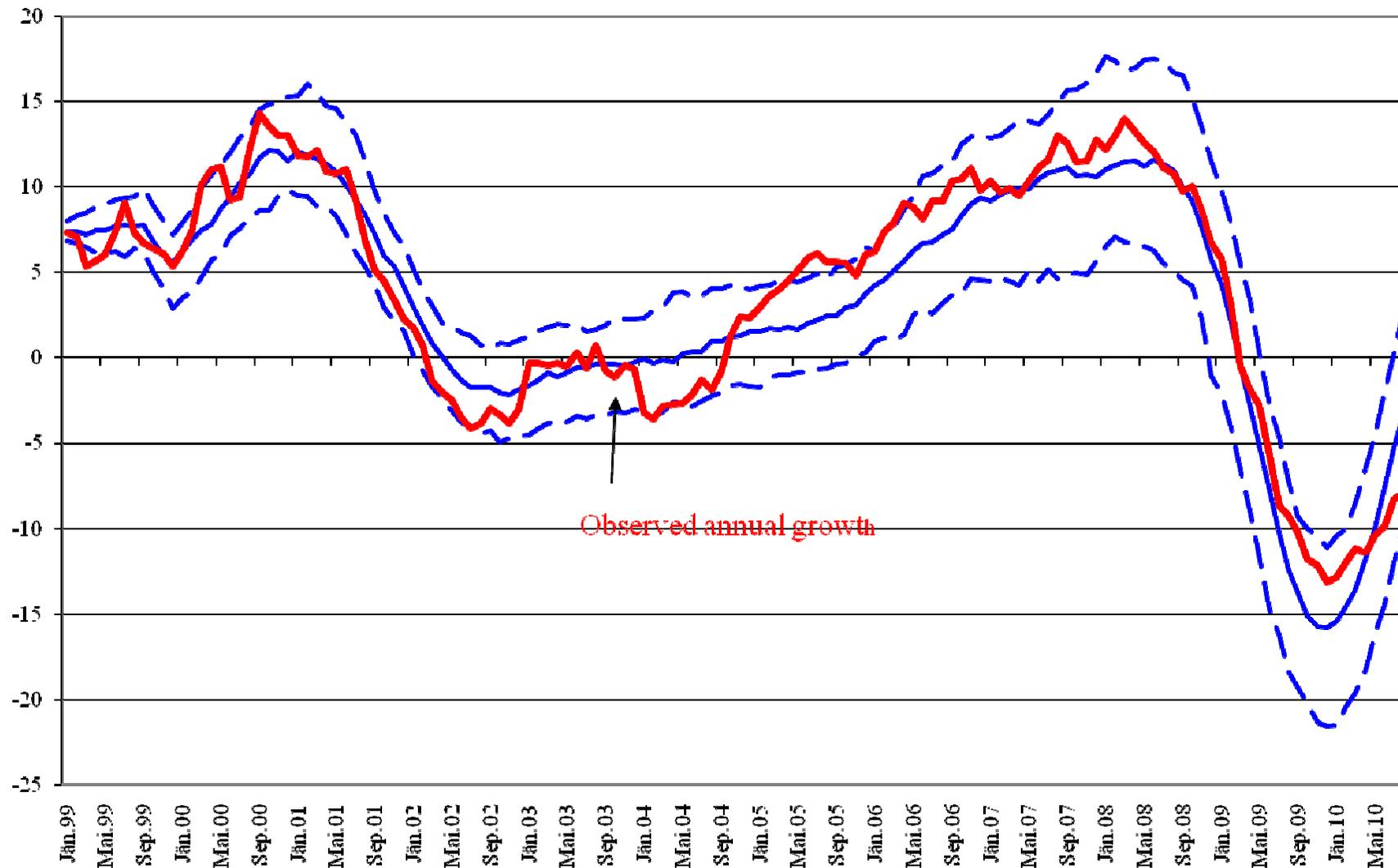
## **Exercise 2** (*Giannone , Lenza and Reichlin, ECB 2009 and 2010*)

### ***Same model as exercise 1***

- Compare actual path of macroeconomic variables with those of model forecasts conditional on the observed path of economic activity (*as captured in the evolution of the IP series*);
- Addresses question: *Have the non-standard measures prevented a “breakdown” / disruption to the pre-crisis regularities seen in the data (and, by implication, the behaviour of the economy)?*
- Conditional forecasts start in Jan. 1999 (but the model is estimated using sample to August 2010) ...

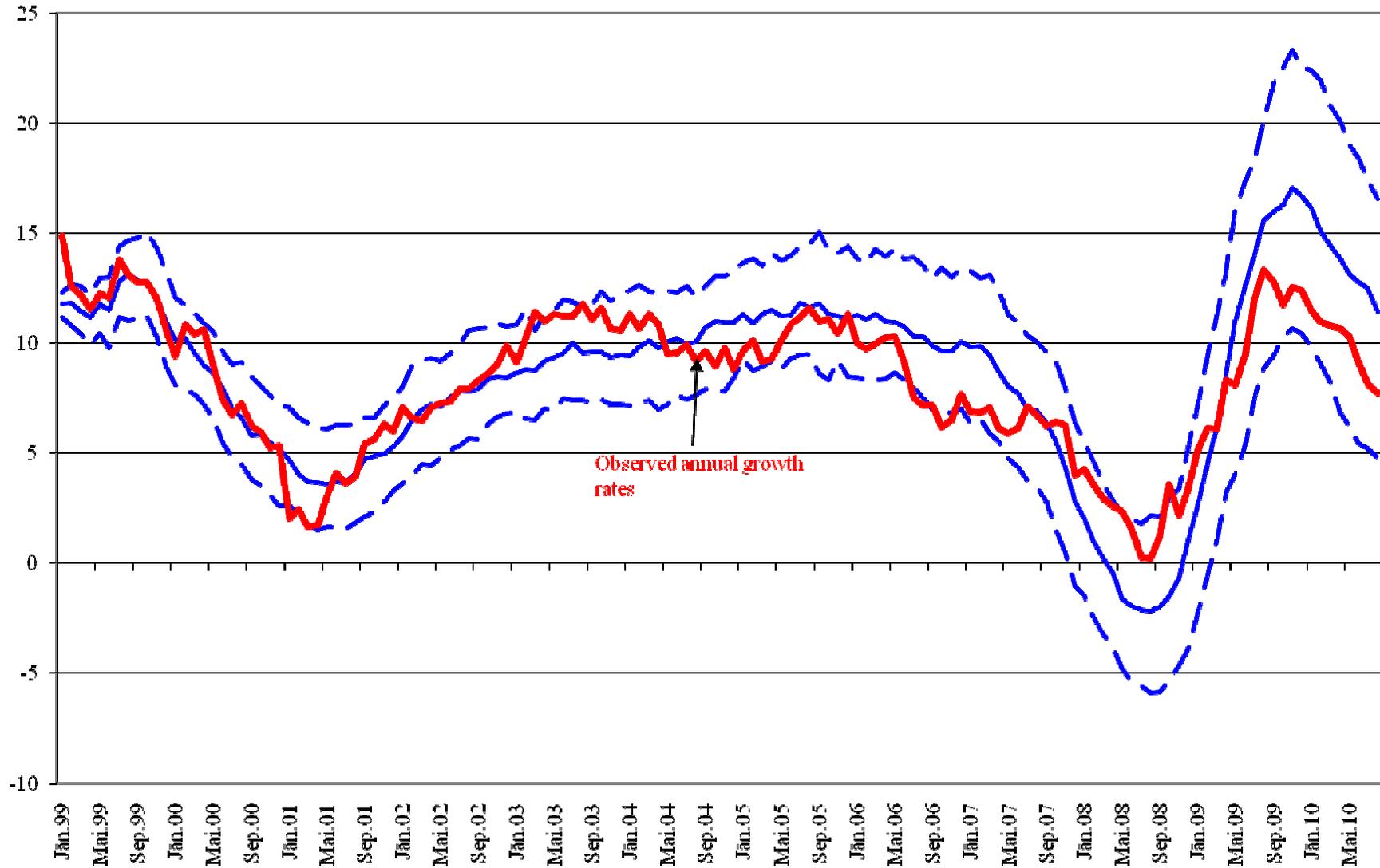
# Exercise 2 – Loans to NFC stable - “business as usual”

*annual growth rates, sa; 87% confidence interval*

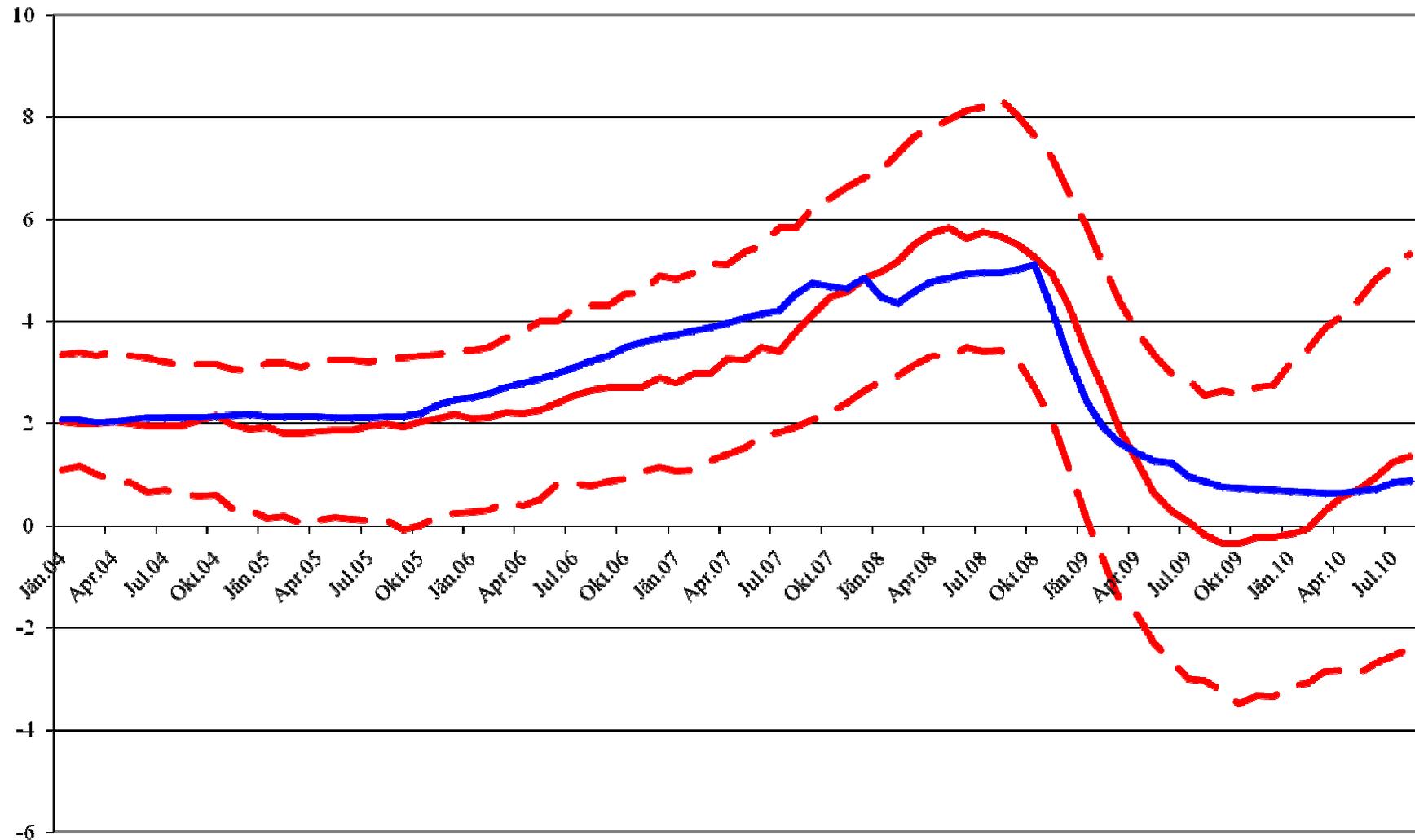


# Exercise 2 – M1 stable - “business as usual”

*annual growth rates, sa; 87% confidence interval*



## Exercise 2 – 3-month-euribor stable - “business as usual”



## Remark

The result that the observed path of the euribor during the crisis does not deviate from the historical ECB rule suggests ZLB is not such a big issue in EA

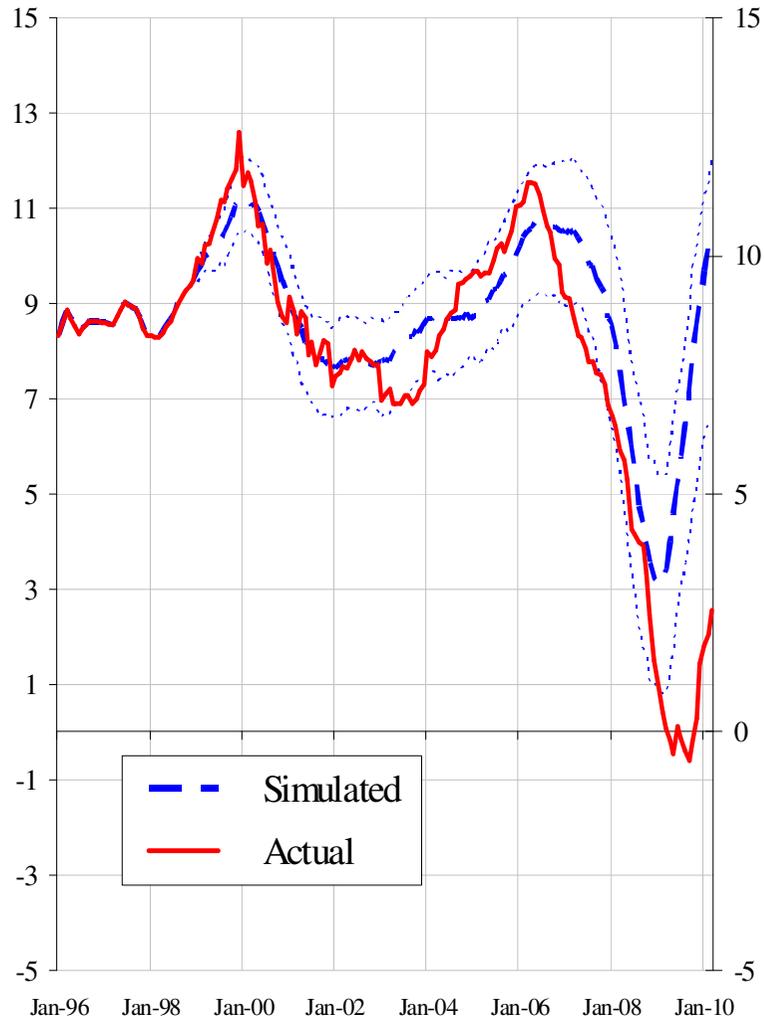
Therefore no need to substitute NSMs for lower rates (as is the typical motivation for QE at present).

Rather NSMs are complements to lowering interest rates, designed to support transmission. (This represents a key distinction with the current FED, BoE, BoJ discussion.)

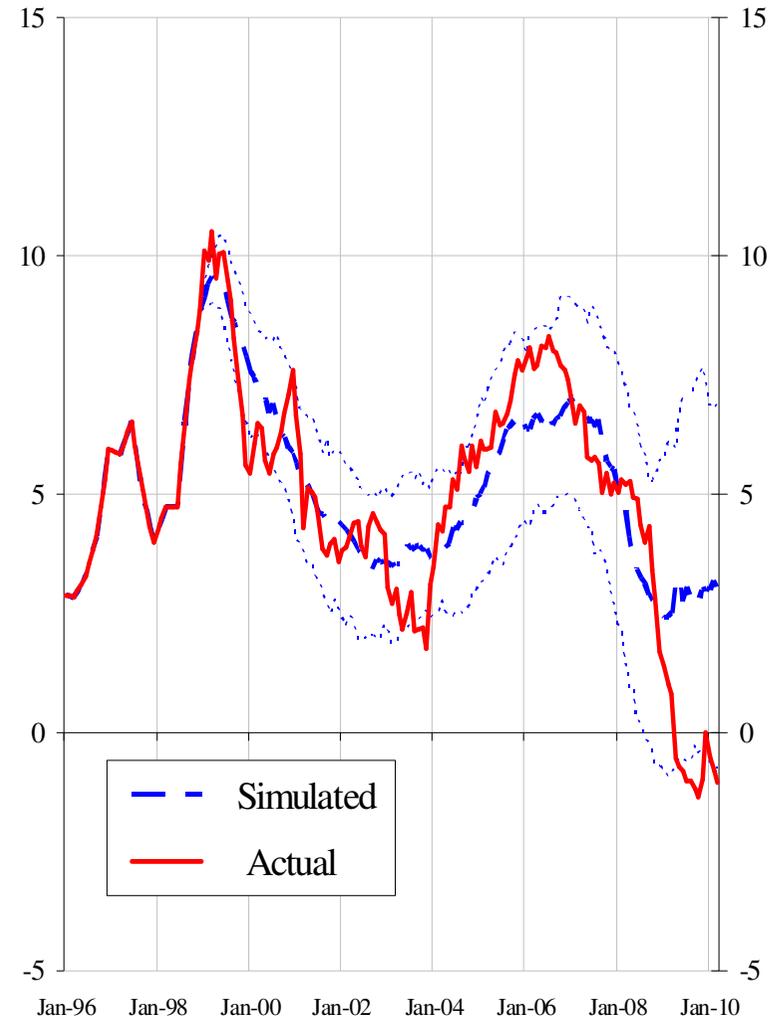
# Exercise 2 – some heterogeneity in loans

annual growth rates, sa; 68% confidence interval

## for house purchase



## for consumption



## Comments on exercise 2

1. Loans to corporate, 3-month euribor and M1 remarkably stable [same message as exercise 1 – this is “indication” that ECB policy worked to some extent]
2. The euribor path is evidence of stability of ECB policy rule – ZLB not big issue in EA
3. Some heterogeneity on loans behaviour

## Remarks on the exercise

It is a counterfactual exercise: no clean interpretation in terms of causality

But if you are willing to assume that no large financial shock materialized from 1992 to 2007, this is sort of a natural experiment: we are conditioning on past correlations (no financial crisis) and business conditions observed during the crisis

## What does this say?

- ECB has achieved some results without massive QE and no recourse to zero bound
- Has done so by manipulating spreads and using more than an instrument in a situation of pervasive frictions
- The stated ECB objective has been the preservation of the transmission mechanism – non standard monetary policies have acted as complements to lowering interest rates

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## A. The corridor and liquidity policy: has the ECB done the right thing ?

The ECB has used two instruments, policy rate and deposit rate

*Why introducing a costly wedge between the money market rate and the "policy rate"?*

- this reflects the existence of excess liquidity in aggregate (which drives EONIA towards DF rate) and the desire of the CB not "penalise" banks making recourse to the (perfectly elastic) supply of liquidity at the MRO with FRFA

## The right thing to do during normal times

- If  $i_t^{RR} = i_t^P$  and  $RR \gg m^d(normal)$  (the demand by banks for CB liquidity to settle net interbank positions), then arbitrage at the margin will ensure that  $i_t^D = i_t^{RR} (= i_t^P)$
- This is the case in a “well-functioning” money market
- In other words, sufficiently high remunerated RRs can satiate the banks demand for CB liquidity at zero cost to the banks (Friedman rule)

## Frozen money market

- Say the money market “freezes”
- (In extremis,) banks have to settle all gross positions in CB money
- By implication  $m^d(\textit{exceptional}) \gg m^d(\textit{normal})$
- ... and it is possible that  $m^d(\textit{exceptional}) > RR$

# Frozen money market

- In that case:

- with unchanged supply of CB liquidity

$$i_t^D \gg i_t^{RR} (= i_t^P)$$

- with increased / elastic supply of CB liquidity (to re-establish satiation)

$$m^s(\text{exceptional}) \geq m^d(\text{exceptional}) > RR$$

$$i_t^D < i_t^{RR} (= i_t^P)$$

falls to zero or to rate on deposit facility in a corridor system

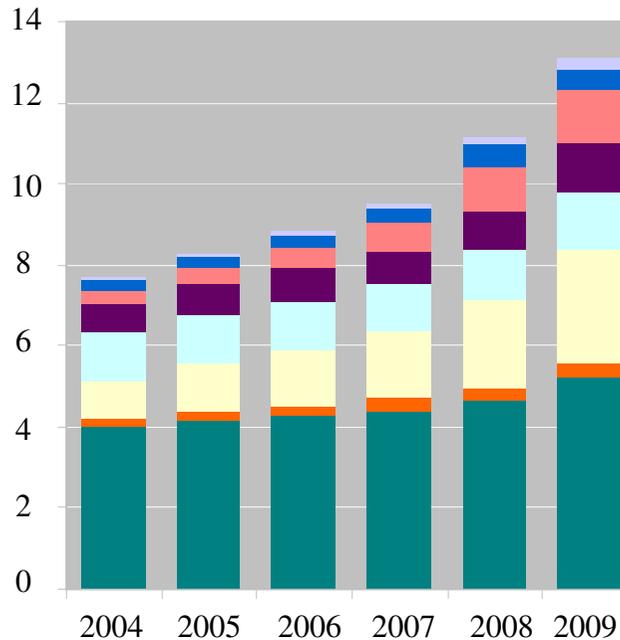
# Problem 1

- Situation just described mimics the Bagehot rule -  
- lend freely against good collateral at a penalty rate.
- But is the collateral really "good" and is the penalty sufficiently large to create an incentive to correct underlying structural problems?
- That is what the problem of "dependence" from CB liquidity is about.
- Collateral quality is also a policy variable

# Collateral eligibility and use

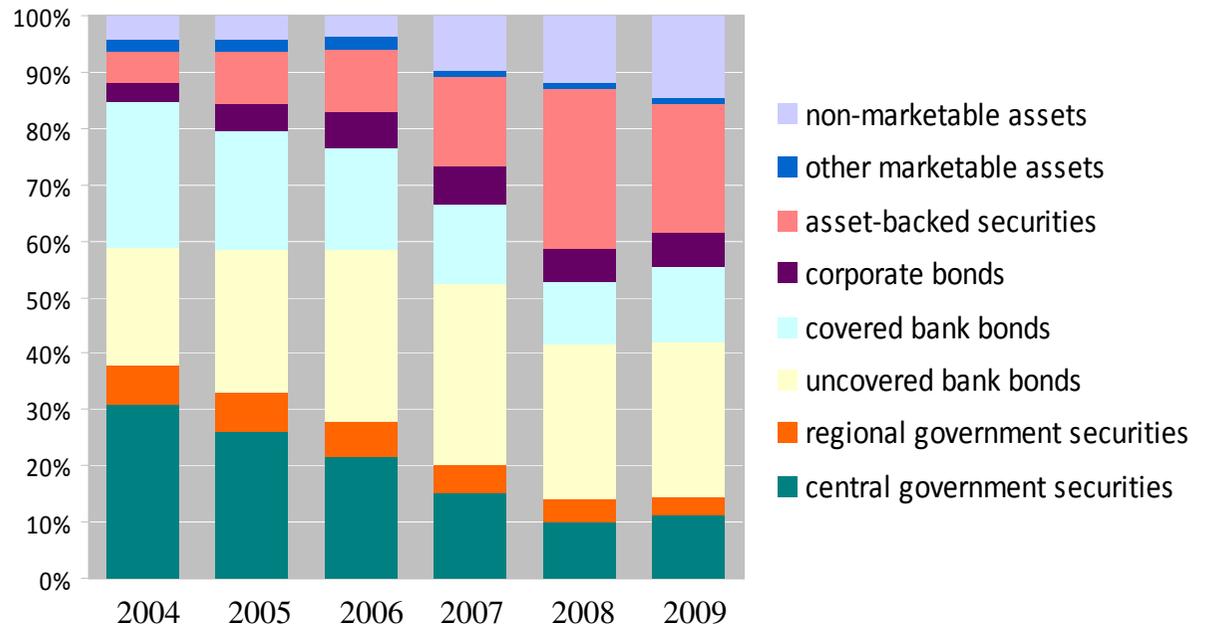
## Eligible collateral

EUR trillions



## Collateral submitted

% of total

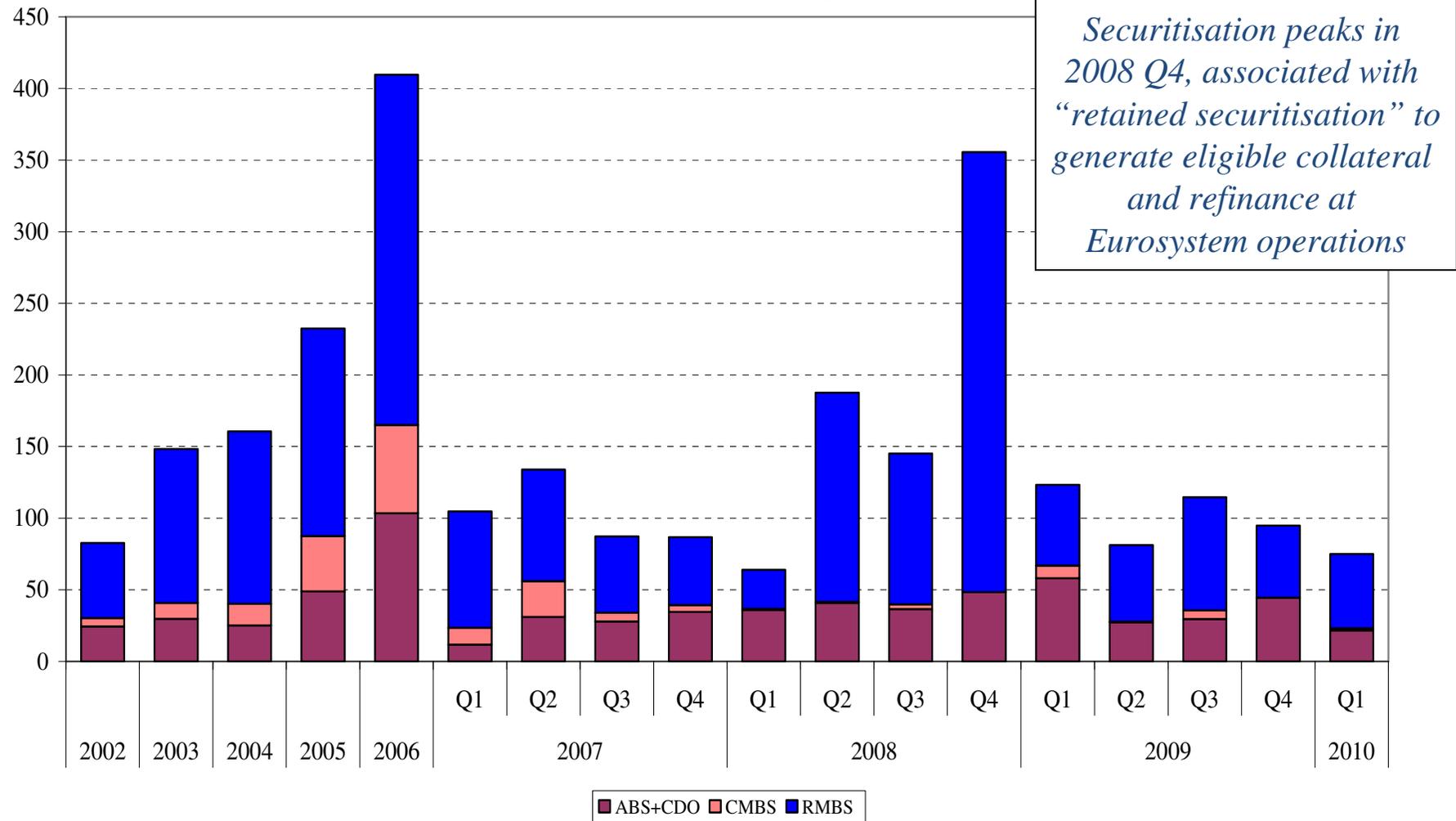


In October 2008, list of eligible collateral extended to BBB- (other than for ABS) ...

# Securitisation

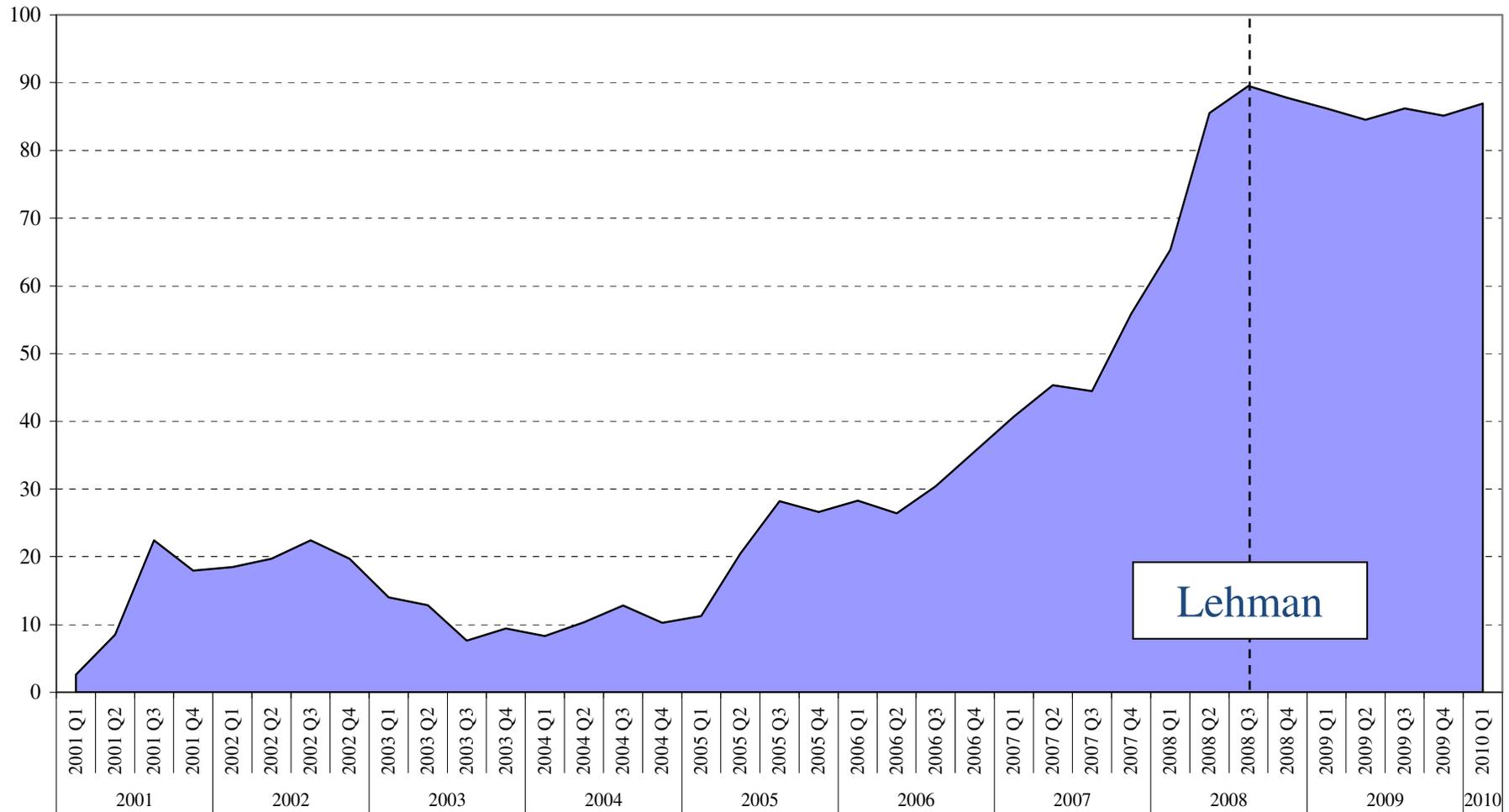
## Evolution of securitisation instrument use in Europe

(in EUR Billions, 2002-20010Q1)



# Retained securitisation

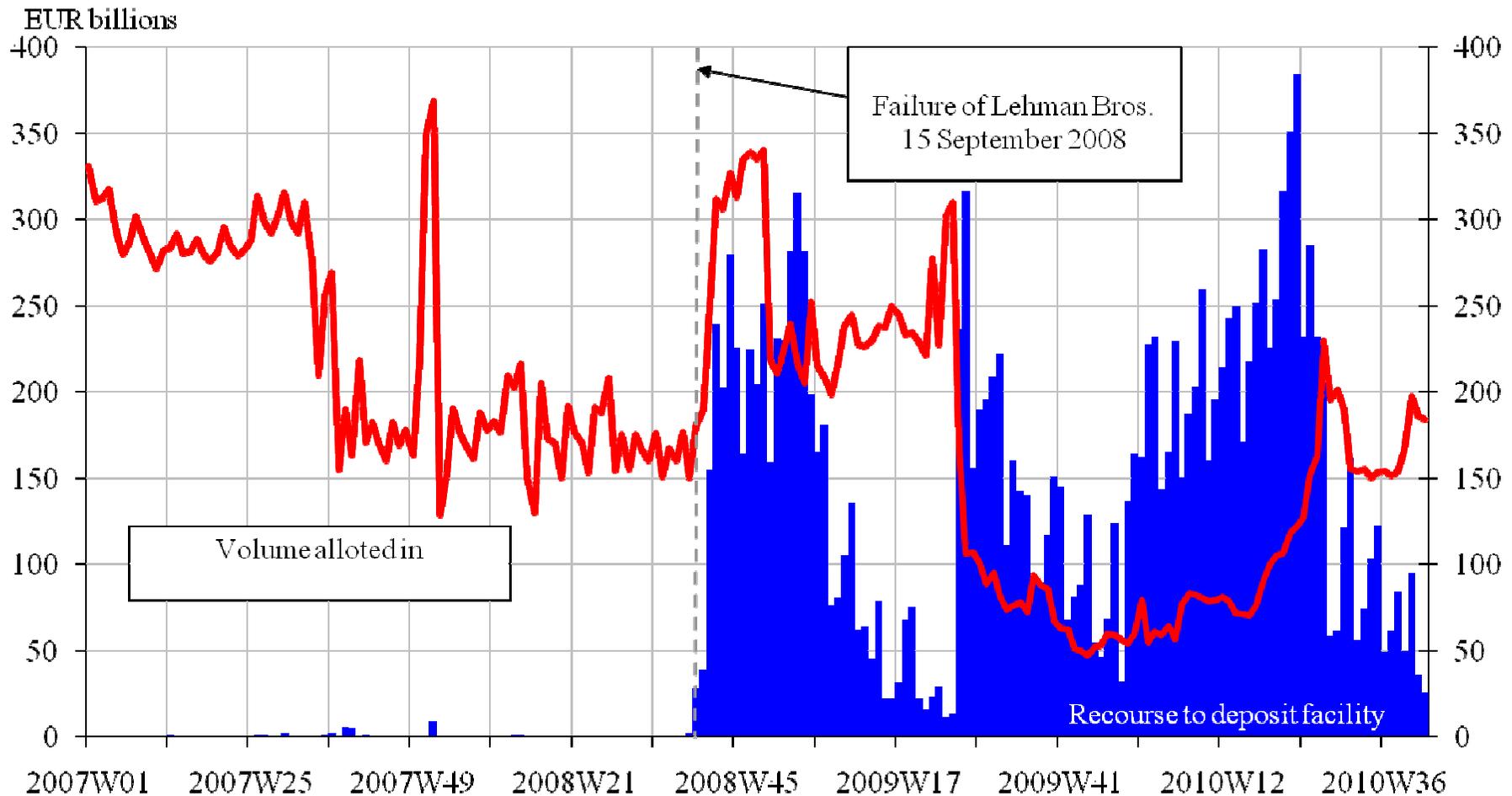
**ABS/MBS securitisation in the euro area retained by the issuer**  
*(in percentages of total securitisation)*



## Problem 2

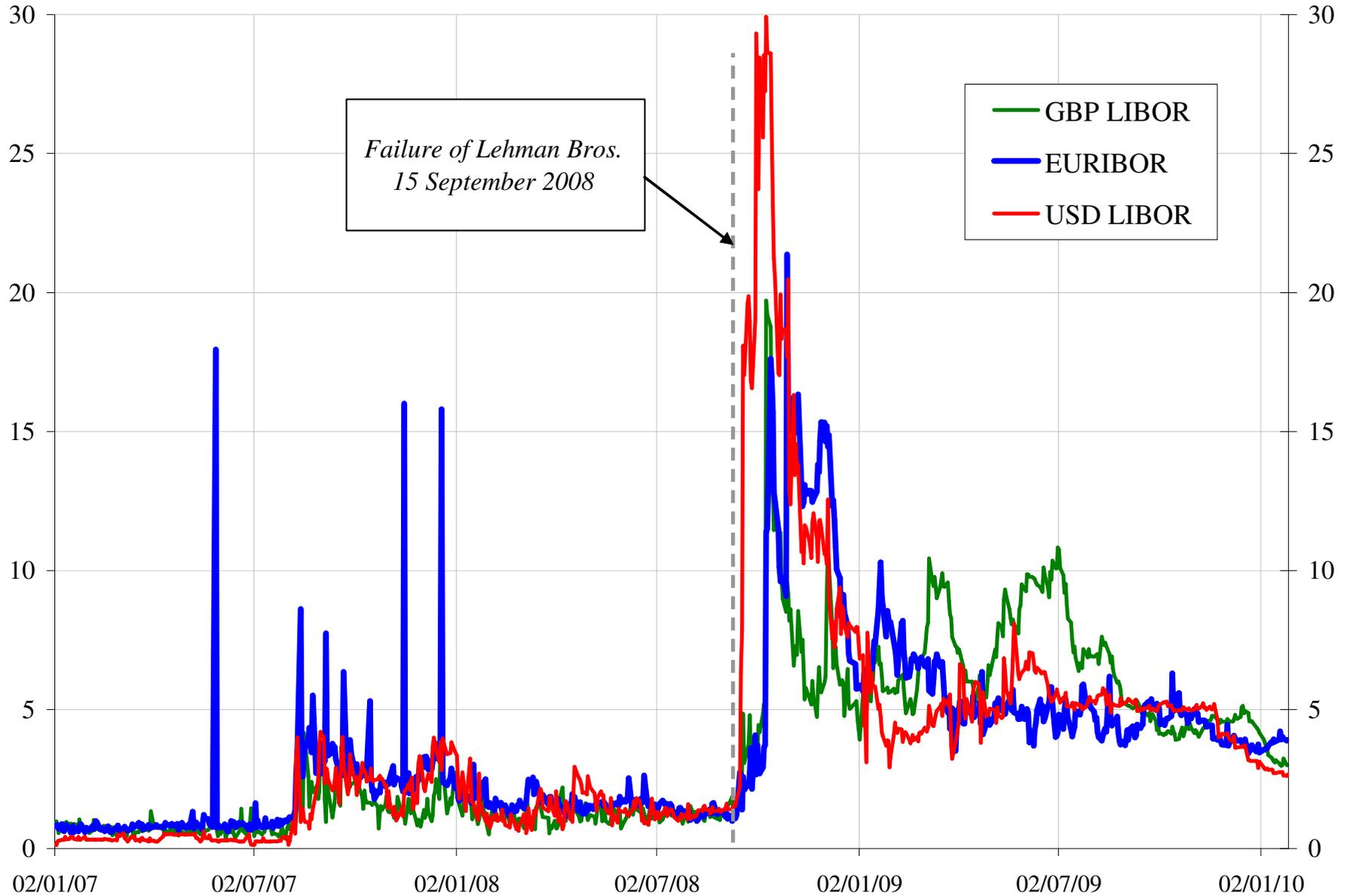
- The idea of using the corridor is motivated by banks' heterogeneity
- Evidence .....
- But if it is the value of the instrument that matters and not the value of the institution, better to use the collateral to discriminate rather than the corridor

**The existence of excess liquidity in aggregate (as reflected in recourse to DF) co-exists with individual bank demand for liquidity at MRO, which points to (severe) segmentation given the difference in rates (width of the corridor).**



# Dispersion of individual bank contributions to EURIBOR

average mean absolute deviation from fixing, basis points



## **Problem 3: liquidity and monetary policy**

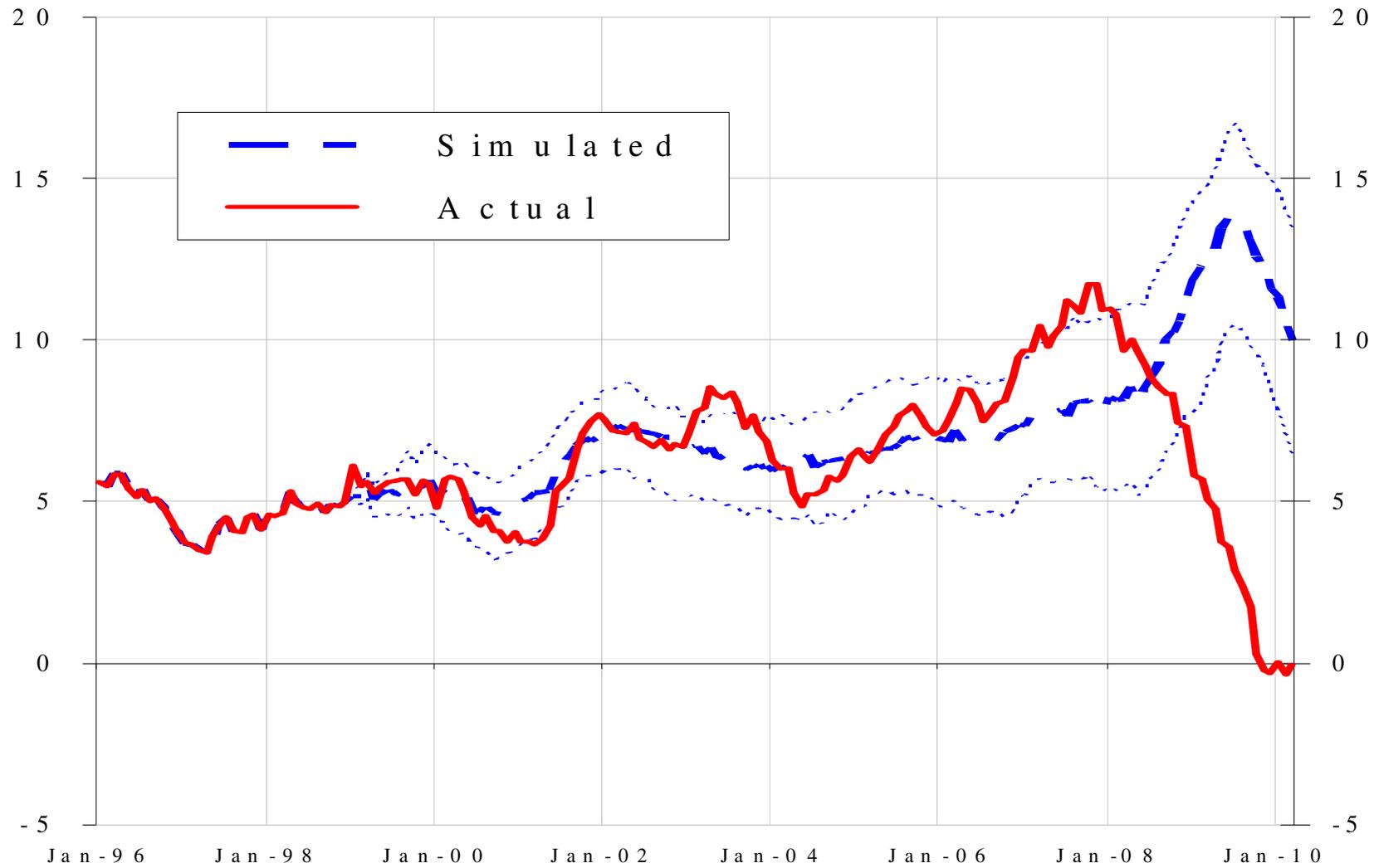
1. Eonia lower than policy rate implies that effective stance is more accommodative than what revealed by MRO
2. Difficult to separate between liquidity and monetary policy objectives [recent: eg euribor/eonia are creeping up now – what is the macroeconomic effect?]

**Communication challenge**

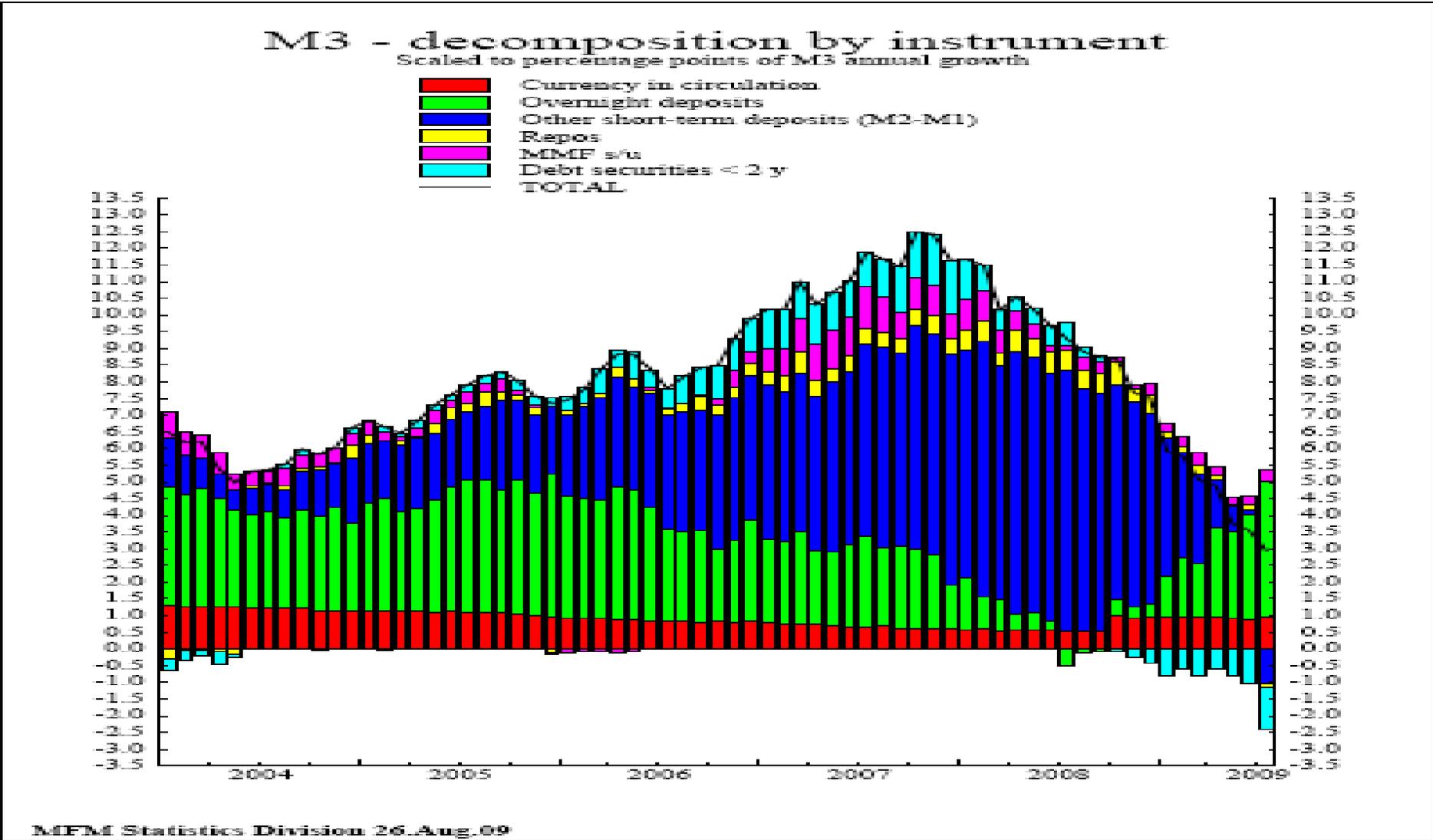
## **B. Banks' funding – some puzzling facts**

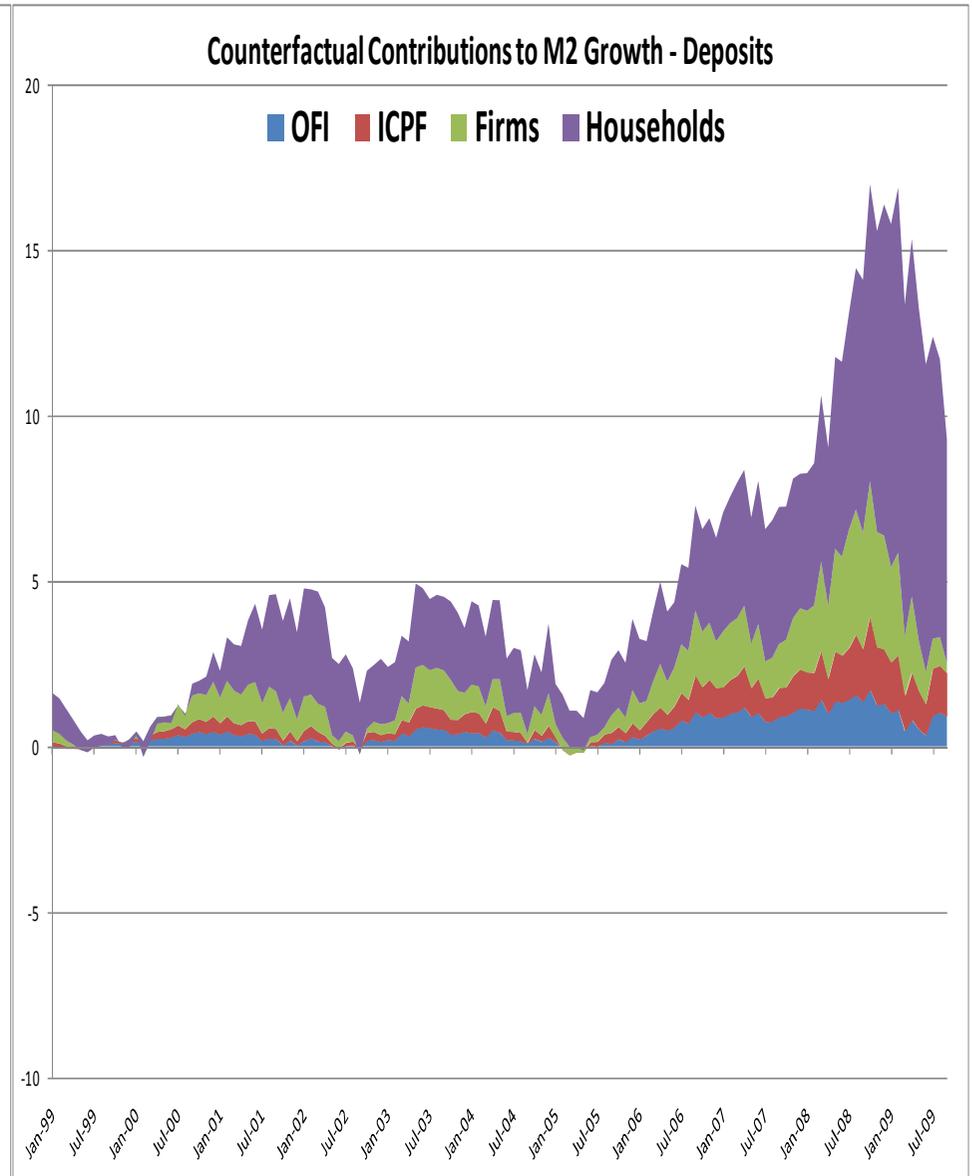
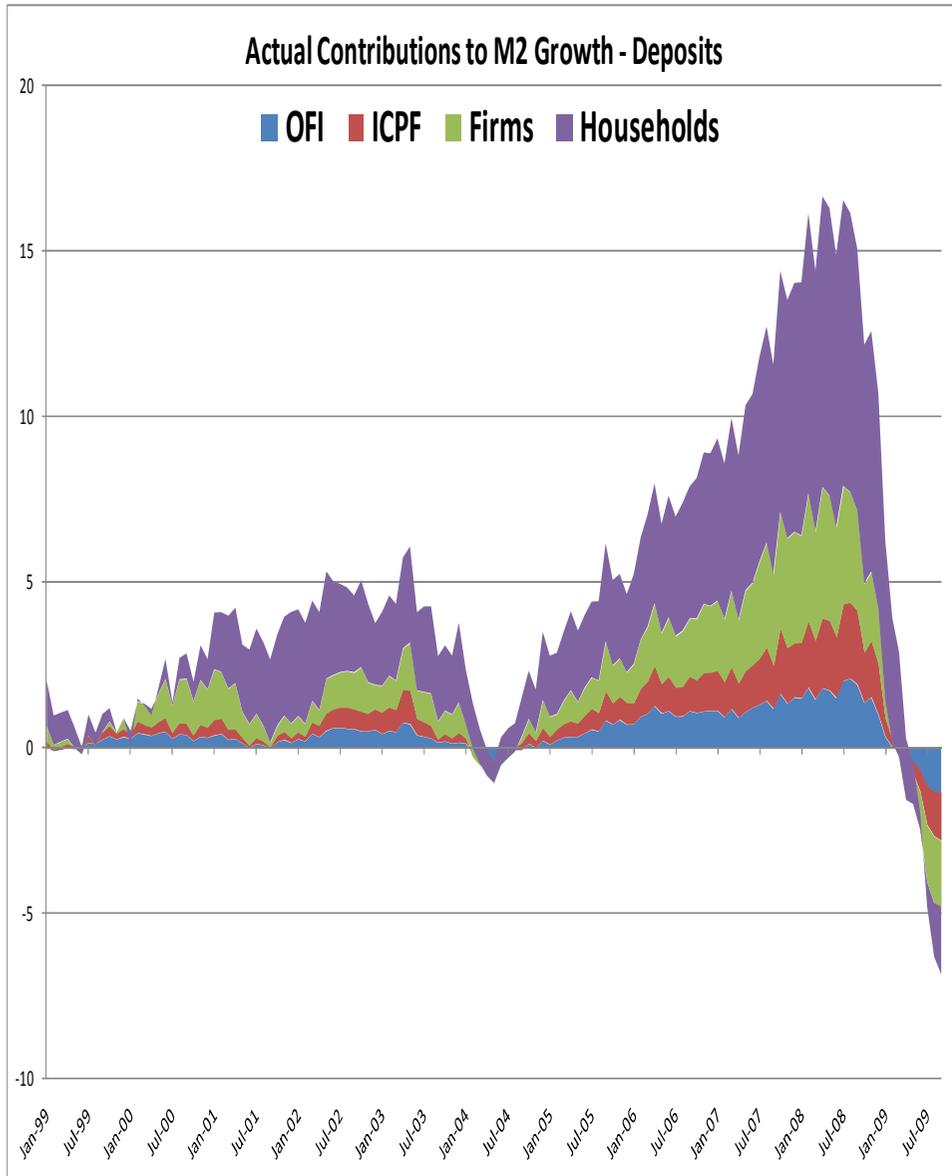
- In the crisis collapse of saving deposit beyond what explained by business cycle conditions
- This reflects the “unusually” steep yield curve  
*(M3 and yield curve not stable unlike euribor and M1)*
- This must have implications for banks' funding

# 2006-08 surge of M3 and its collapse in the crisis is not “business as usual” (difference with M1)

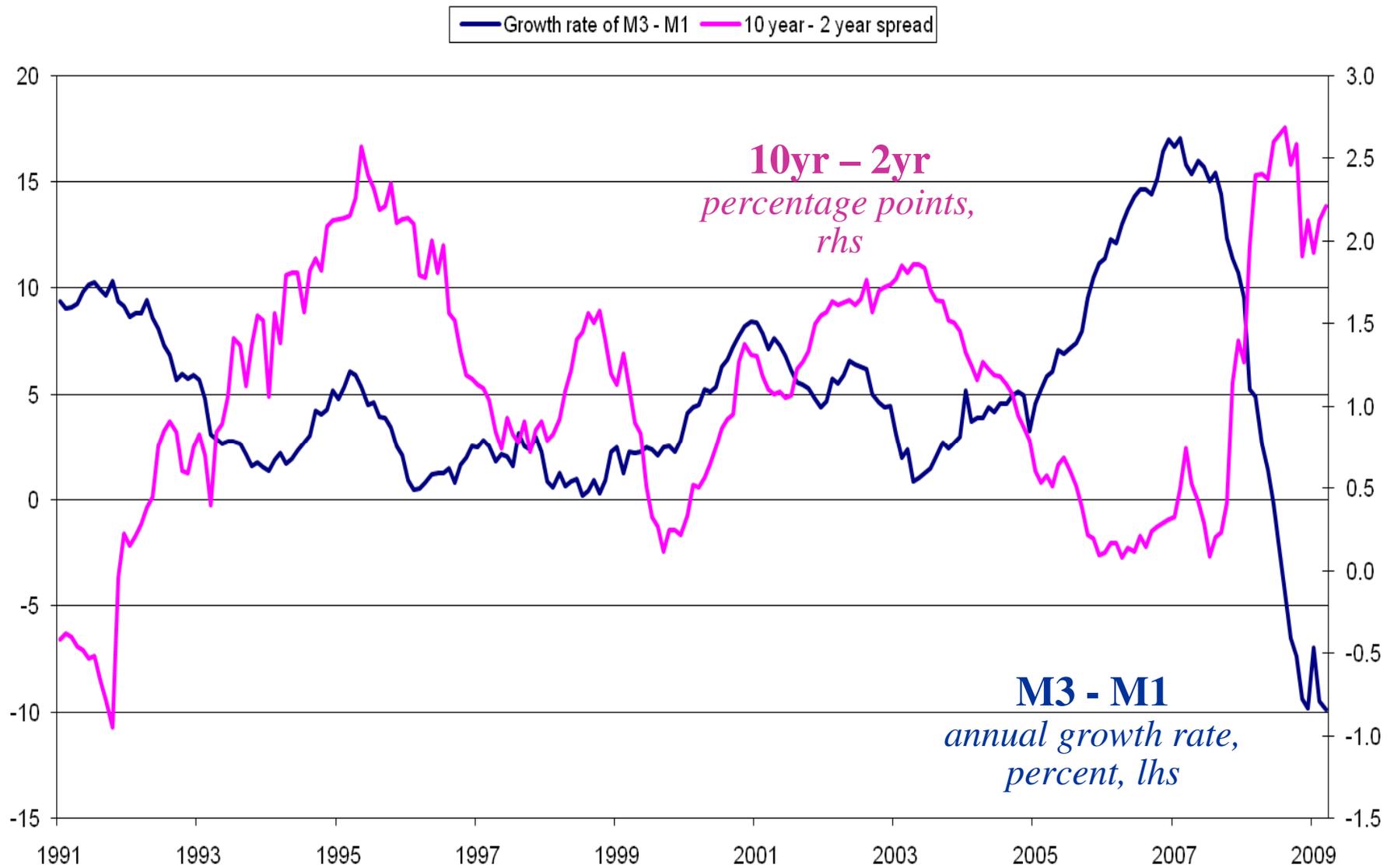


# This is explained by time deposits (M2-M1 component of M3)

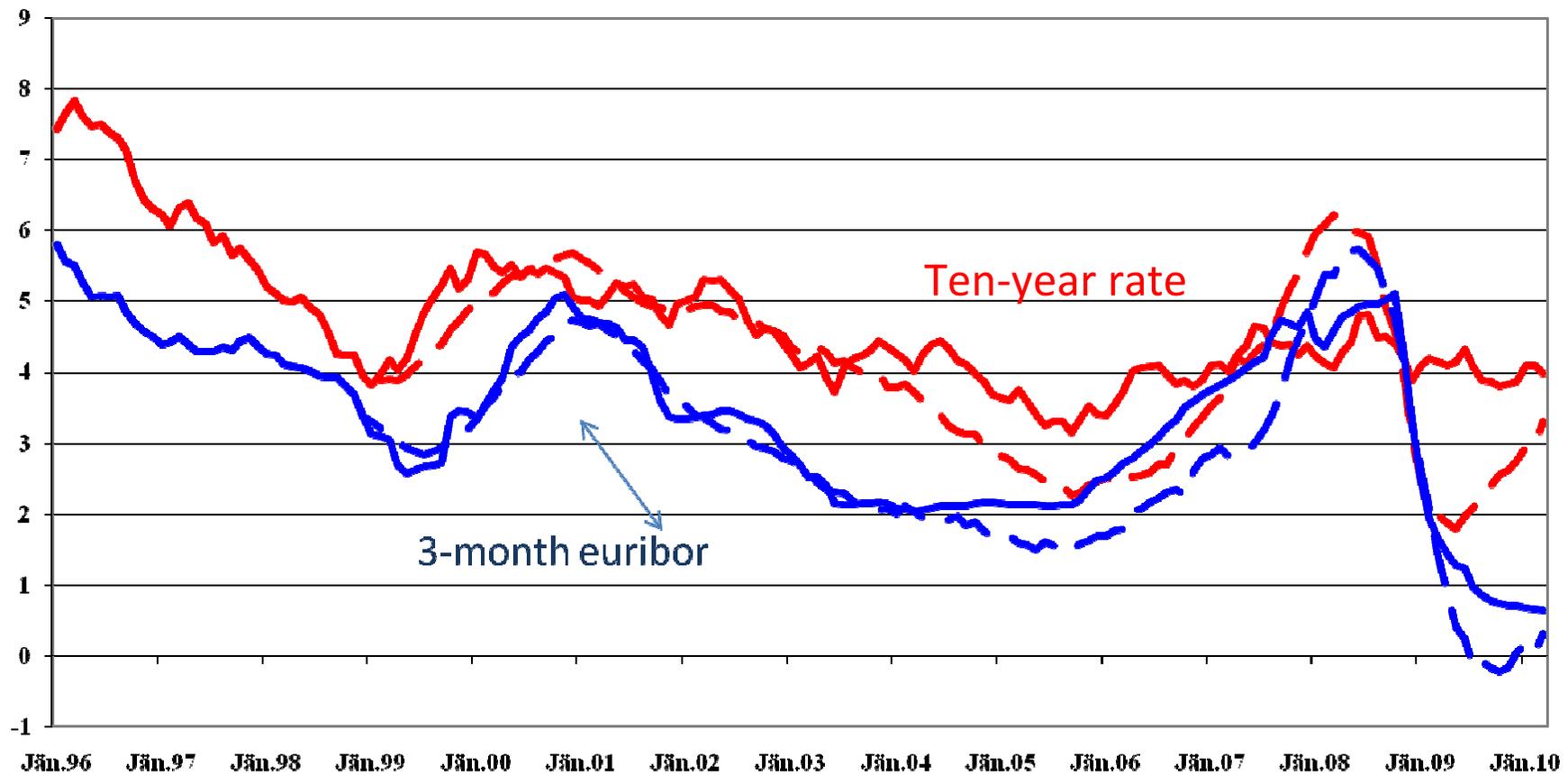




# (M3-M1) versus slope of yield curve: stable relation



# Actual (solid line) and Counterfactual (dashed line) interest rates: 3-month and 10-year interest rate



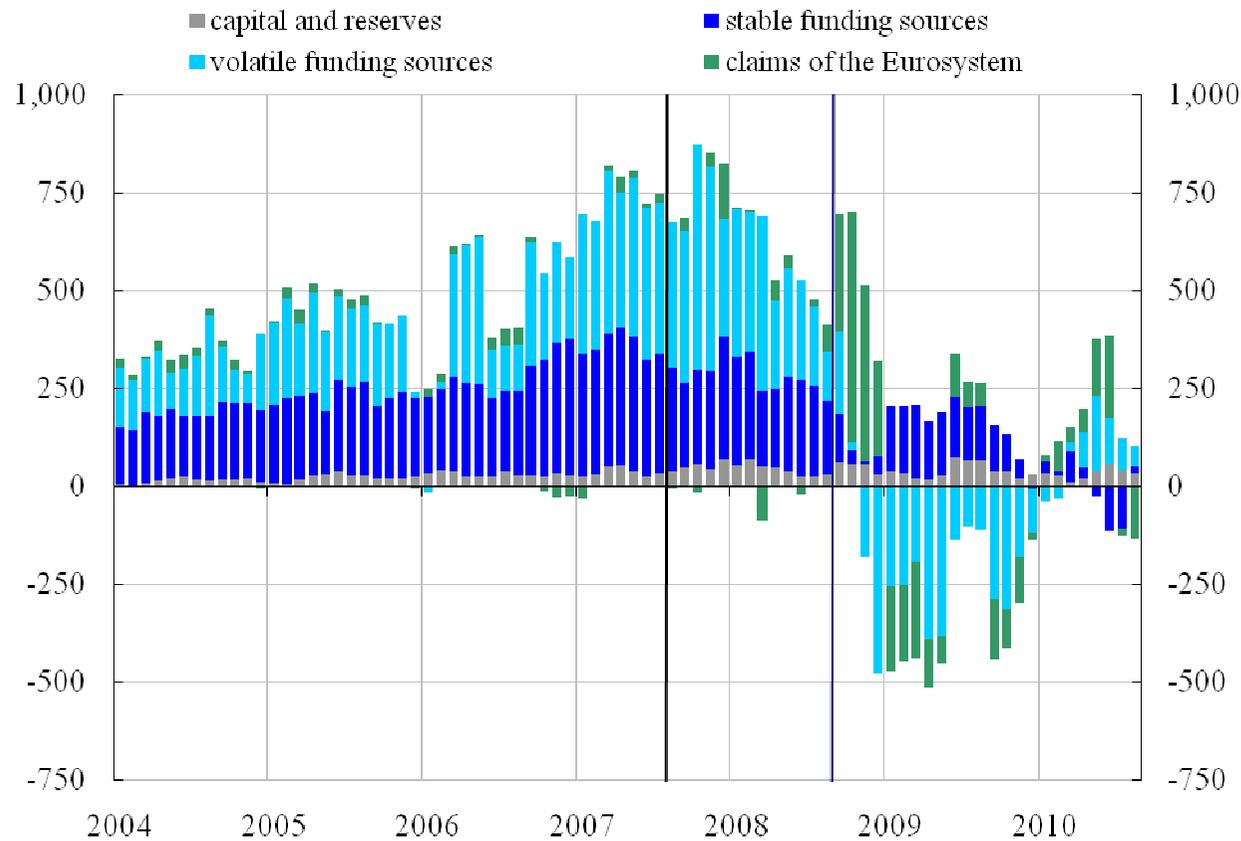
## Comments

- This is different issue of transmission mechanism – long term interest rate stickiness not well understood
- This has implications for banks' funding over the cycle
- More research needs to be done here

# Flow data: ain liabilities of banks

3-months flows (bns)

**Aberrant behaviour of stable fundings (non financial sector deposits-M3), switching from volatile fundings (wholesale/interbank) to Eurosystem**



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# Wrapping up

- We have seen an experiment of monetary policy in presence of *financial frictions*
- *Main friction is in interbank market*
- If frictions more than one interest rate matters for monetary policy
- CB has more than one interest as tool – therefore can cope with some financial stability issues but not all
- When main friction in money market and financial system is banked based QE ECB style makes sense and some evidence that it has worked
- However, beyond the short run, need to understand incentives in presence of *banks' heterogeneity* and *bank funding strategies* in relation to term spread behaviour

Extra slides

# Normalization and recent tensions

