

# The Effectiveness and Transmission Mechanism of Unconventional Monetary Policies

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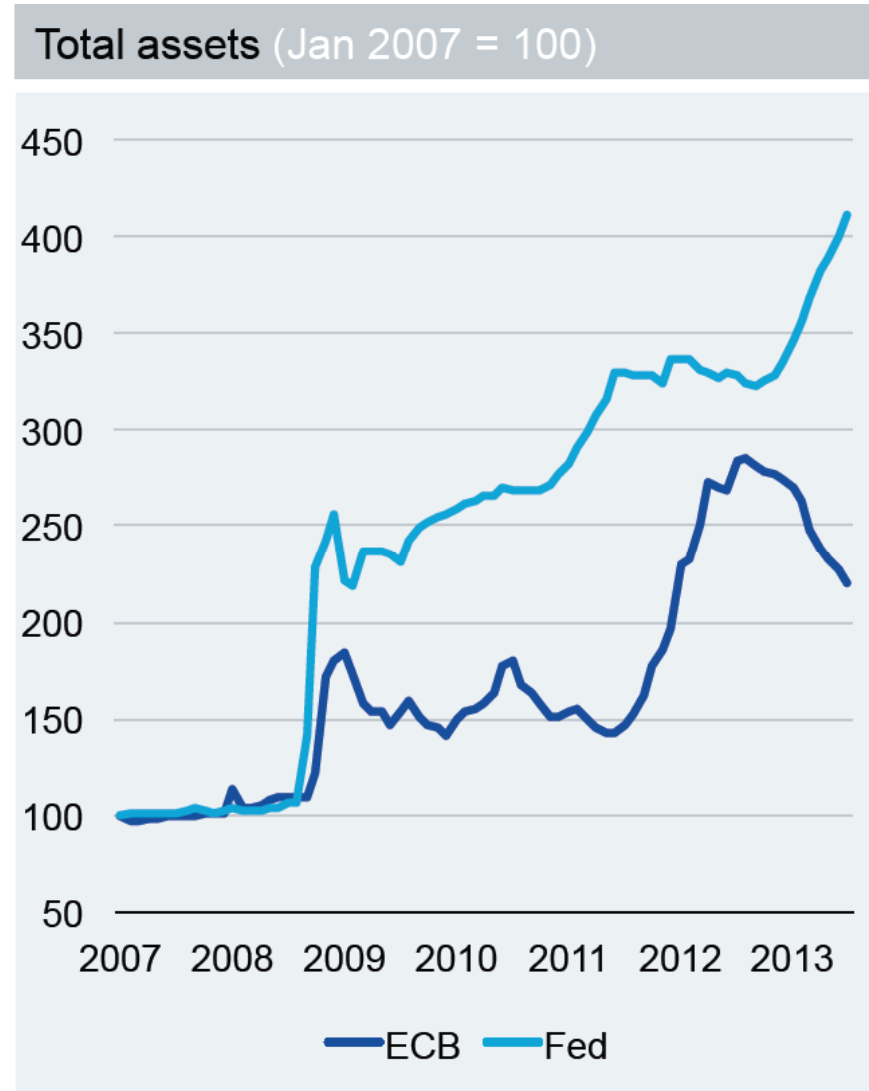


# Motivation

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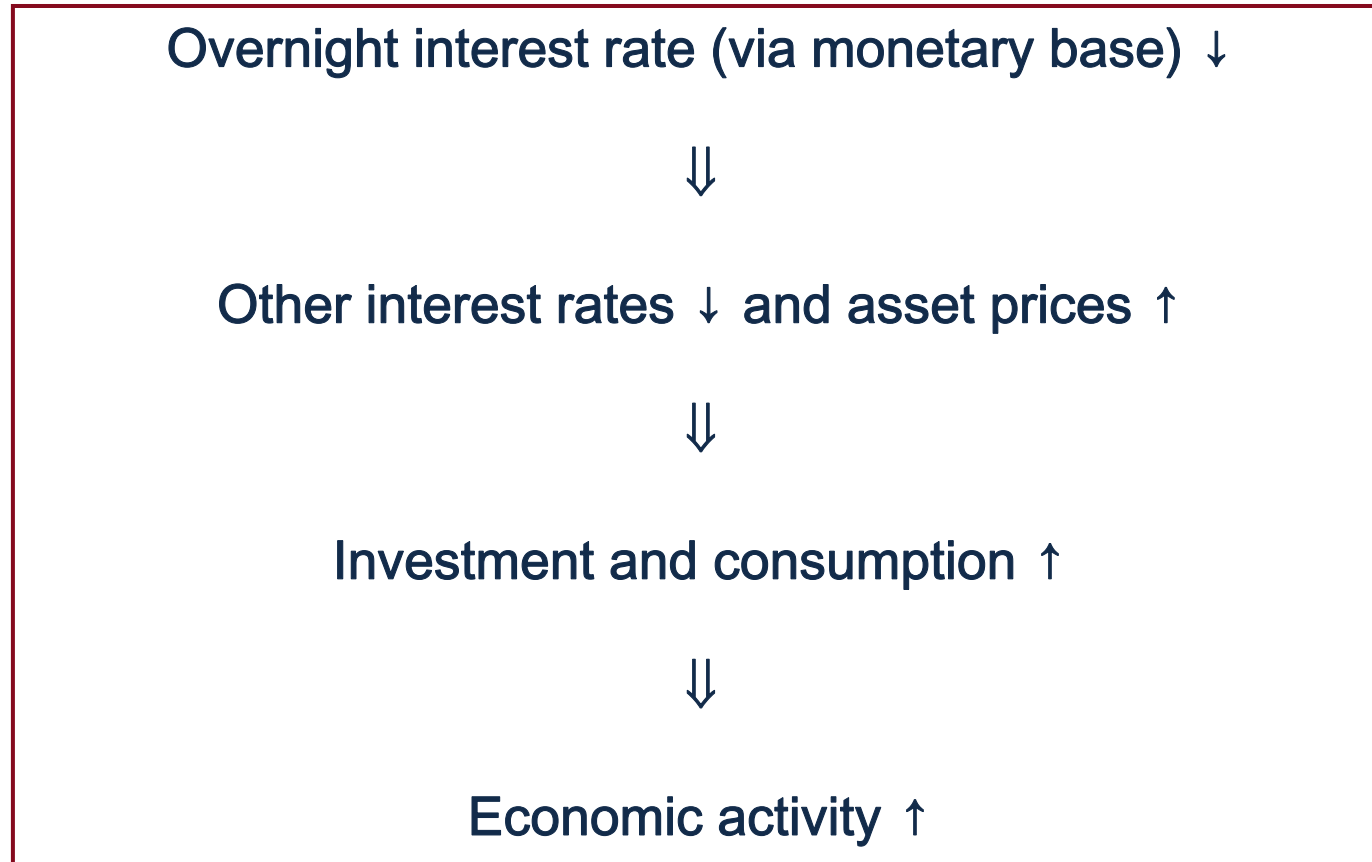
- As policy rates reached their effective lower bounds after the collapse of Lehman, monetary authorities adopted a variety of non-standard measures to provide further stimulus and counter risks to financial stability
  - Operations that change the size and composition of their balance sheets, and actions that try to guide longer-term interest rate expectations
- This lecture: the effectiveness of such policies, the macroeconomic effects of the accompanying increases in the balance sheets, and the exit strategy
  - Focus on Fed and ECB: differences closely related to financial structures: Euro area centers on commercial banks, while US primarily based on capital markets

# Motivation



# Conventional transmission mechanism in a nutshell

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- Does not work anymore when overnight interest rates are constrained by the zero lower bound

# Shaping interest rate expectations

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- Not overnight rate, but anticipated path of short-term rates determines longer-term interest rates, asset prices and ultimately spending decisions
- Expectations theory of the yield curve:

$$\left(1 + i_t^{(n)}\right)^n = \left(1 + i_t^{(1)}\right)\left(1 + E_t i_{t+1}^{(1)}\right) \dots \left(1 + E_t i_{t+n-1}^{(1)}\right) + \sigma_n + \eta$$

- $\sigma$  = term premium
  - $\eta$  = risk/liquidity premium
- Additional stimulus possible by explicitly communicating a commitment to keep policy rate low for a **longer period than previously expected**
  - Markets have to believe this, even if this is not consistent with price stability

# Forward guidance of the Fed

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- December 2008: target FF-rate likely to remain unchanged “for some time”
- March 2009: language strengthened to “an extended period”
- August 2011: “exceptionally low levels until at least mid-2013”, extended to “late 2014” and “mid-2015”
- Since September 2012: “at least as long as the unemployment rate remains above 6.5%, and inflation forecast below 2.5%”

# Forward guidance of the Fed

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- Notice: Fed has always been careful by offering federal funds rate forecasts, and not any explicit commitments
- Each statement nevertheless resulted in significantly reduced expectations by financial markets, for example:
  - December 2008: 90bp decline in market expectations FF-rate the following year
  - August 2011: 15-20bp impact on 10 year government bond yield (similar as 75-100bp decline in FF-rate in normal times)
- Not clear whether this is (solely) result of communication policies

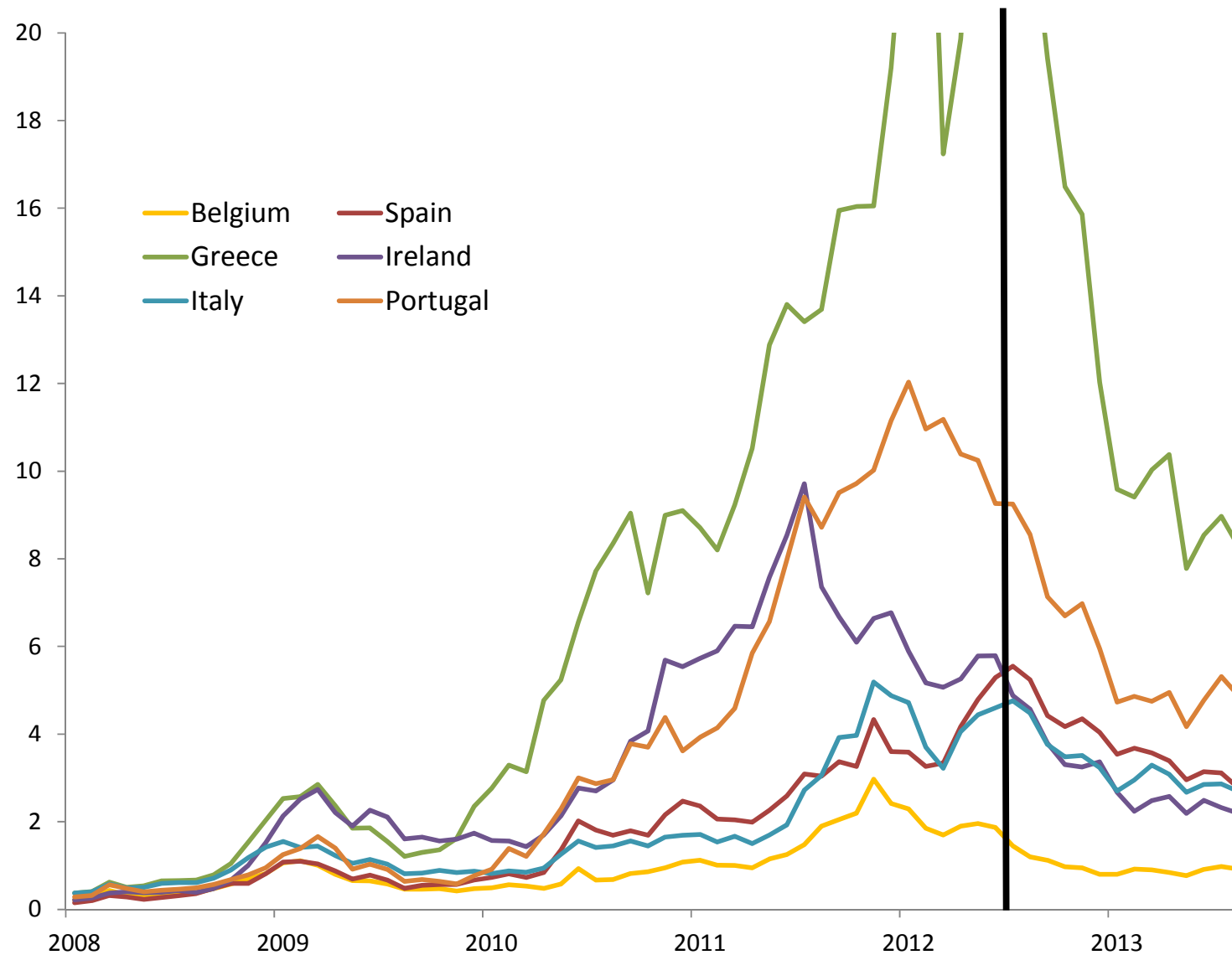
# Outright Monetary Transactions (OMT) of the ECB

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- ECB has been more careful with its communications
  - July 2013: expect key interest rates “to remain at or below their current levels for an extended period of time”
  - Is more interpreted as a clarification of its reaction function
- OMT-bazooka: unlimited purchases of short-term government bonds from countries that have agreed to strict policy conditions (no seniority claims)
  - September 2012 (Draghi in July: “do whatever it takes to save the euro”)
  - Can be considered as a game changer in the euro crisis



# Outright Monetary Transactions (OMT) of the ECB



# Central bank balance sheet policies

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- Further stimulate economy by altering the composition of balance sheet, or by buying securities beyond the level to hold the overnight rate at zero
  - Quantitative Easing versus Credit Easing
- Complements communication policies as concrete action to signal intended future policies, because it is costly to reverse large asset purchases
- If QE is sufficiently aggressive and long-lived, it could have expansionary fiscal policy effects, because government is only shareholder of Fed
  - Replacing interest-bearing government debt with non-interest-bearing currency or bank reserves

# Portfolio rebalancing effect

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- If financial markets are perfect: no effect on asset prices or the economy
  - Asset prices and long-term interest rates solely depend on expected future returns, adjusted for risk

$$\left(1 + i_t^{(n)}\right)^n = \left(1 + i_t^{(1)}\right) \left(1 + E_t i_{t+1}^{(1)}\right) \dots \left(1 + E_t i_{t+n-1}^{(1)}\right) + \sigma_n + \eta$$

- Other investors simply sell their holdings and rebalance their portfolios with money or securities sold by central bank: asset prices and long-term rates remain constant
- Is a critique that several economists have on QE programs: economy is essentially in a liquidity trap

# Portfolio rebalancing effect

- If money/securities sold by central bank are imperfect substitutes for asset purchases, investors will rebalance portfolios by buying assets which are better substitutes
  - For example: pension funds or insurance companies prefer long-term securities and will try to restore duration of their portfolios
  - If financial markets are incomplete or segmented, it is possible to influence term, risk and liquidity premiums

$$\left(1 + i_t^{(n)}\right)^n = \left(1 + i_t^{(1)}\right) \left(1 + E_t i_{t+1}^{(1)}\right) \dots \left(1 + E_t i_{t+n-1}^{(1)}\right) + \sigma_n + \eta$$

Forward guidance

QE government bonds

QE ABS

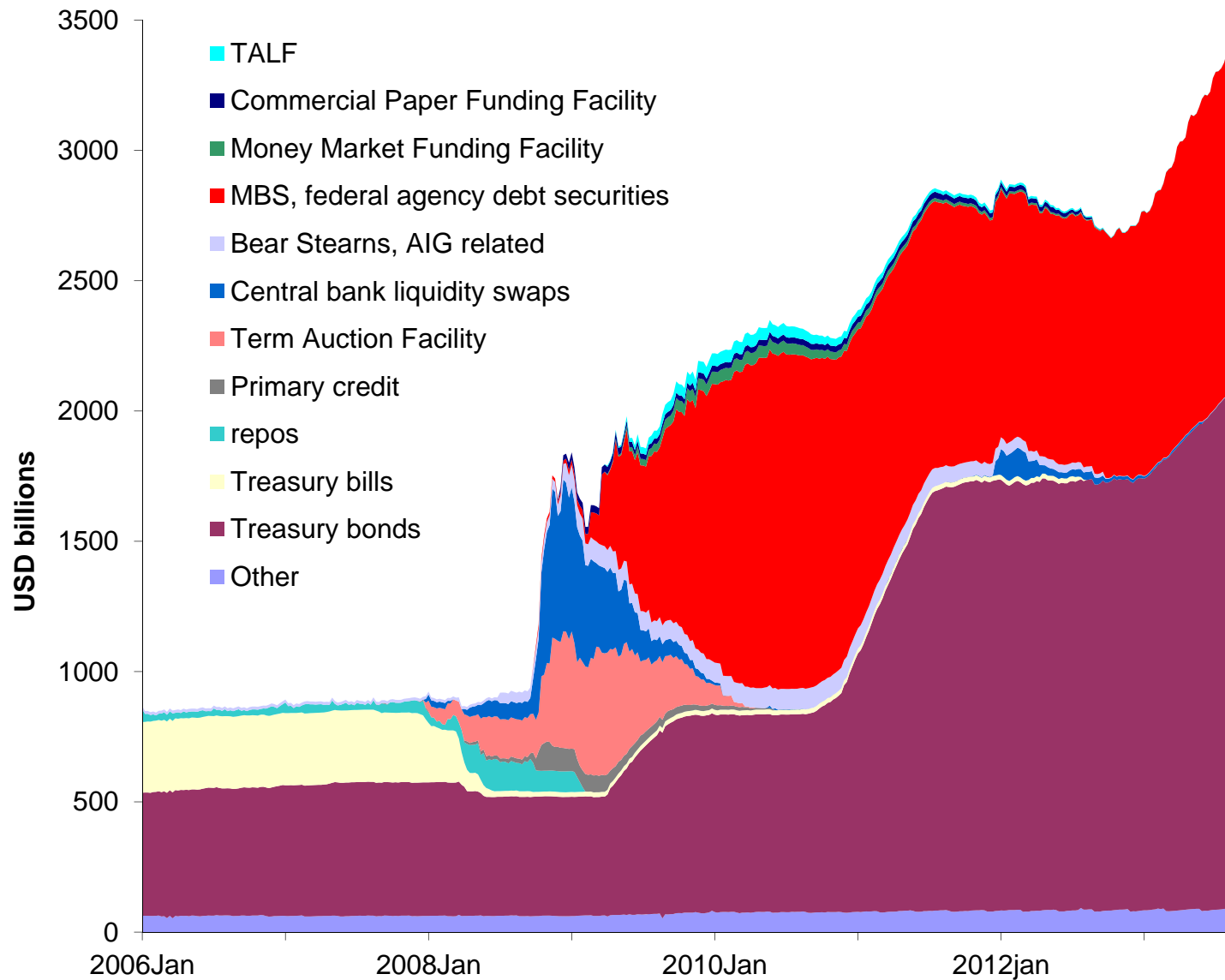
- Note: term premium is common across countries (spill-over effect of QE)

# LSAP & ME Programs of the Fed

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- QE1 (11/08 & 3/09): \$1450 billion ABS + \$300 billion government securities
- QE2 (11/10): \$600 billion government securities
- Operation twist/MEP (9/11): \$667 billion switch between short-term and long-term securities
- QE3 (9/12): open-ended monthly \$40 billion ABS + \$45 billion government securities
- Some other (smaller) programs after the collapse of Lehman

# LSAP & ME Programs of the Fed



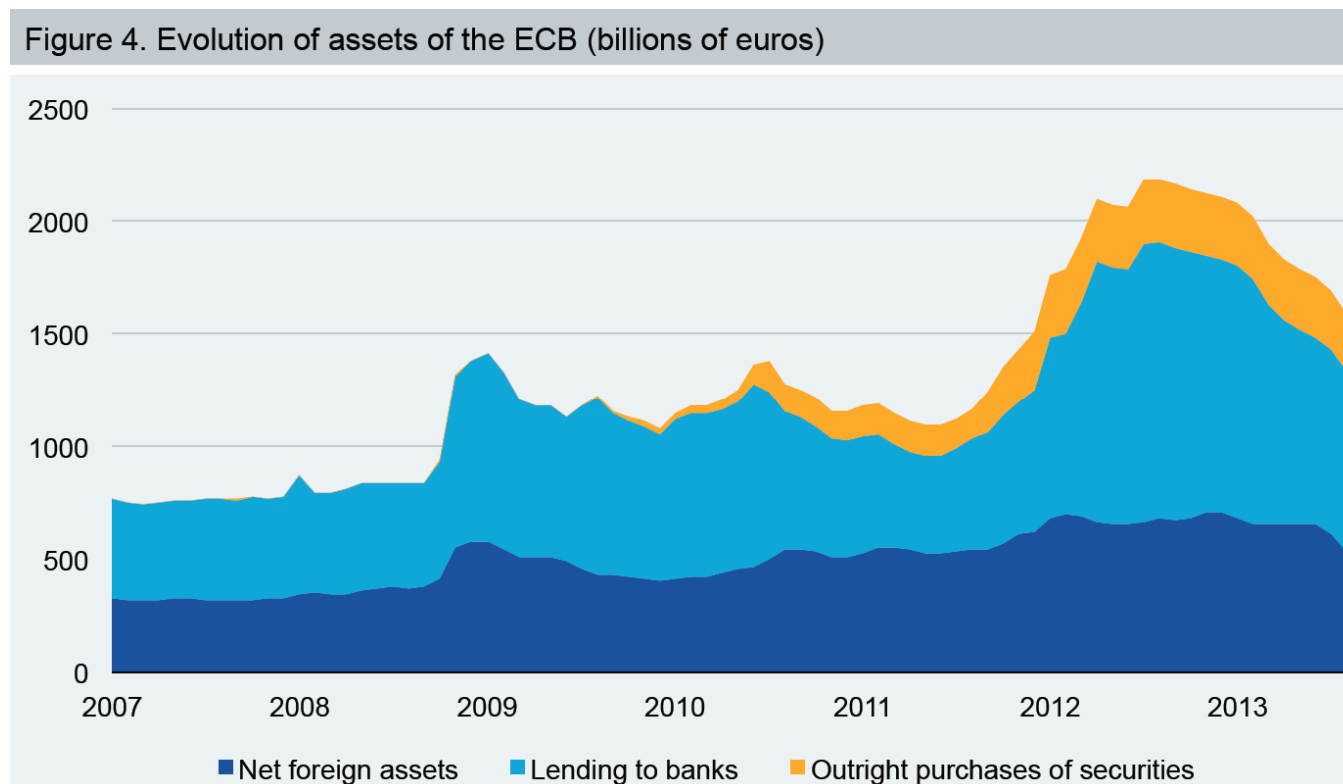
# LSAP & ME Programs of the Fed

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- Programs did manage to reduce long-term interest rates
- Estimated effects bigger in event studies, relative to econometric analysis
- Gagnon et al. (2011): QE1 lowered 10 year government bond, agency debt and agency MBS respectively 91, 156 and 113 basis points
  - Also Baa corporate bonds 67 basis points
- QE2 and MEP less effective (anticipated?)
- Also impact on foreign interest rates, dollar exchange rate, and no effect on inflation expectations

# Full allotment strategy of the ECB

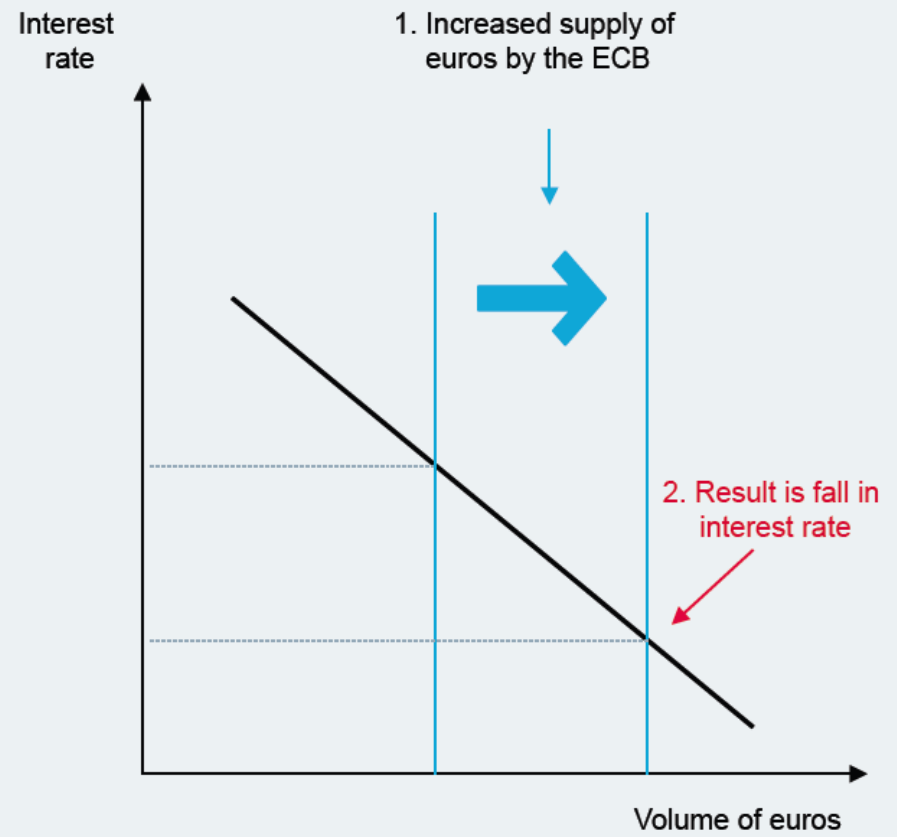
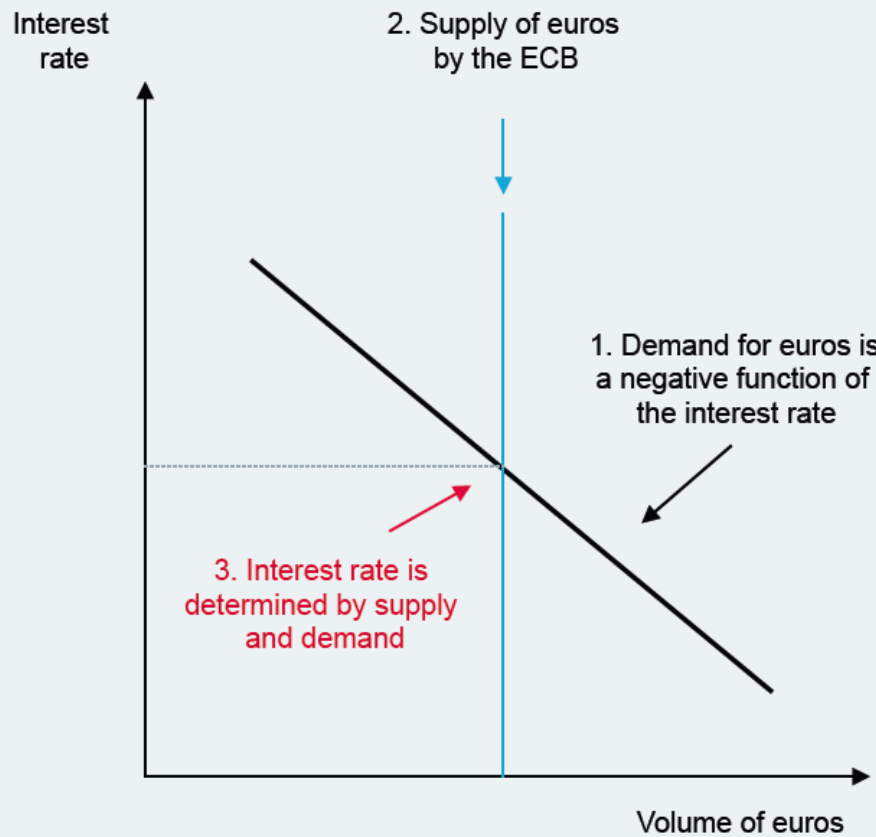
- Only 1/5<sup>th</sup> of balance sheet increase due to outright asset purchases: two covered bond purchase programs (€76,4 billion) and Securities Markets Program (€219,5 billion)
- Remaining expansion is essentially “demand-driven”





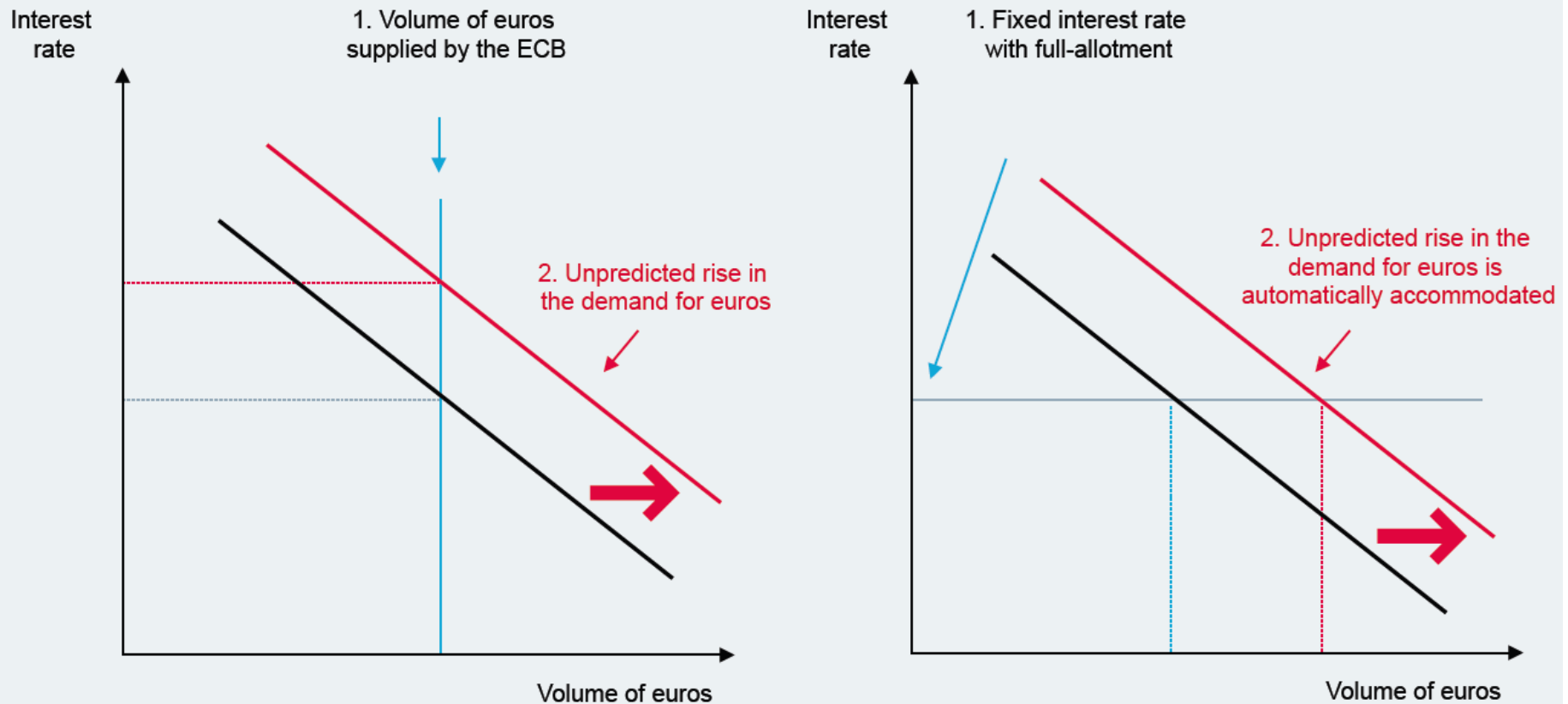
# Full allotment strategy of the ECB

Panel A: Monetary policy on the ECB in normal times



# Full allotment strategy of the ECB

Panel B: Full allotment strategy of the ECB and demand-driven expansion of balance sheet



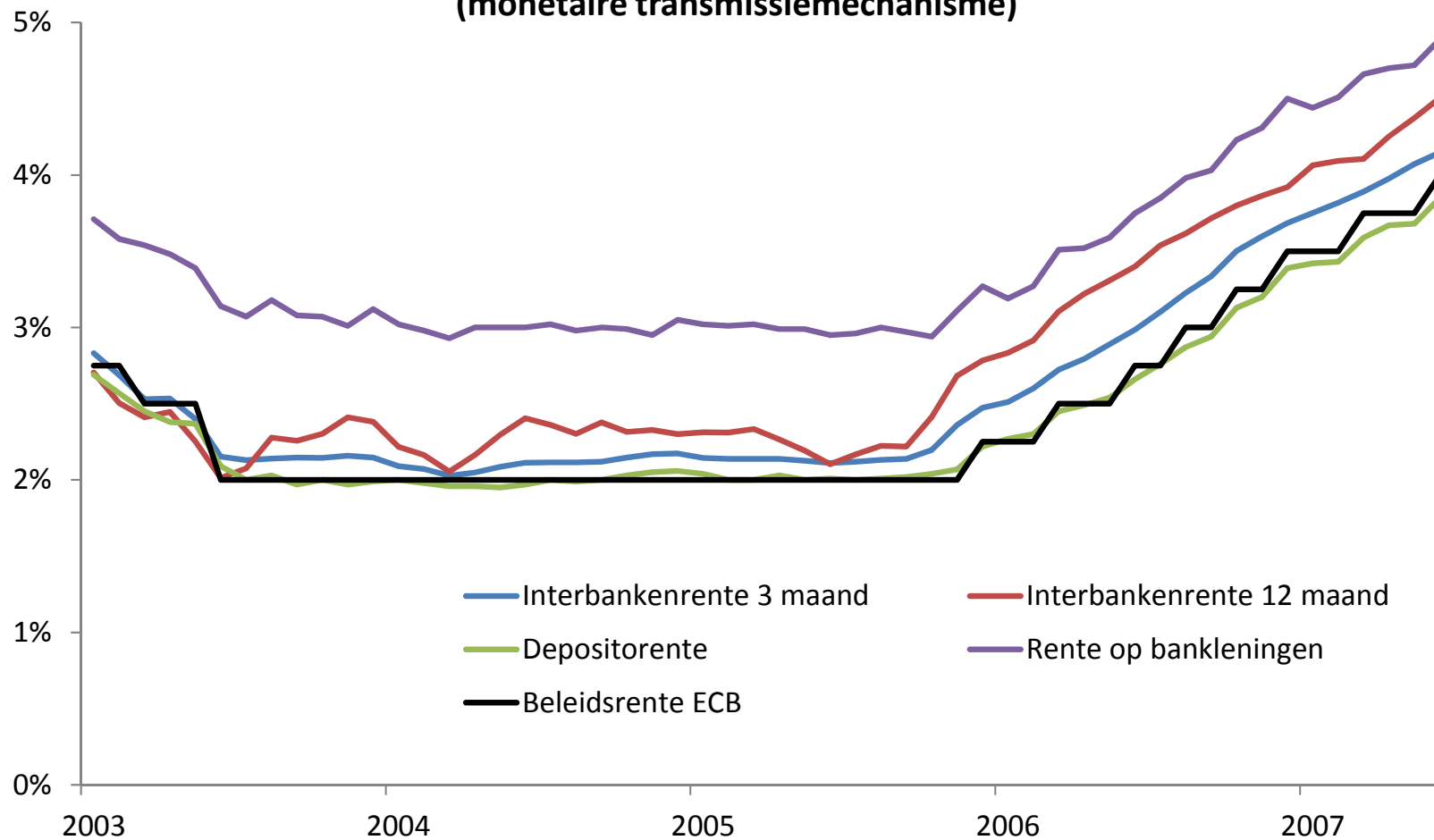
# Full allotment strategy of the ECB

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- Balance sheet expansion by stimulating liquidity demand by banking sector
  - List of eligible collateral accepted in refinancing operations has been extended several times
  - Maximum maturity of long-term refinancing operations extended from 3 months to 6 months (2/09), 12 months (6/09) and 36 months (12/11)

# LTRO's and term structure of interest rates

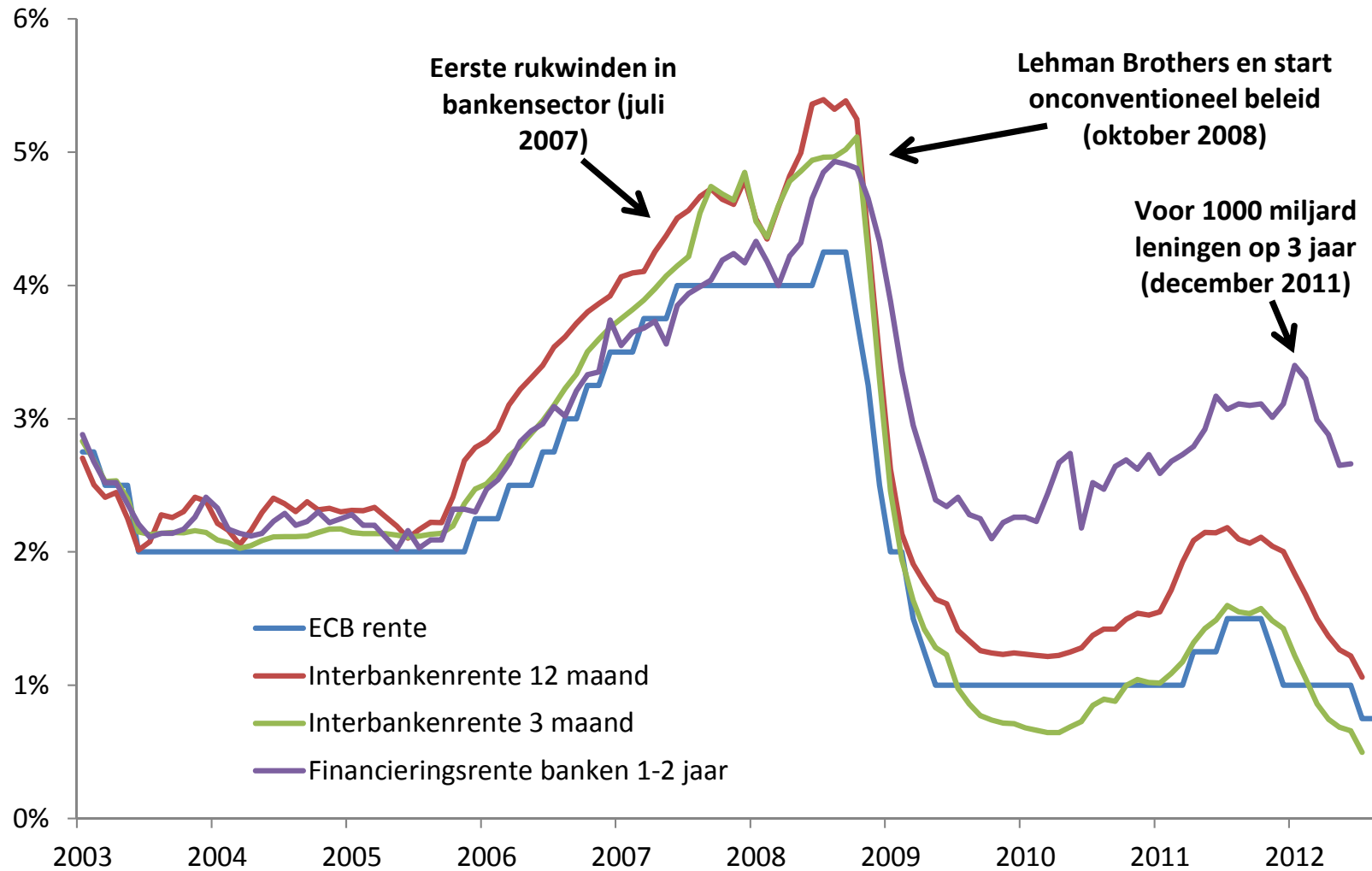
Samenhang tussen ECB rente en andere rentevoeten in normale tijden  
(monetaire transmissiemechanisme)



bron: ECB

# LTRO's and term structure of interest rates

Het wegvallen van de link tussen ECB rente en andere rentevoeten



bron: ECB

# Macroeconomic effects of balance sheet policies

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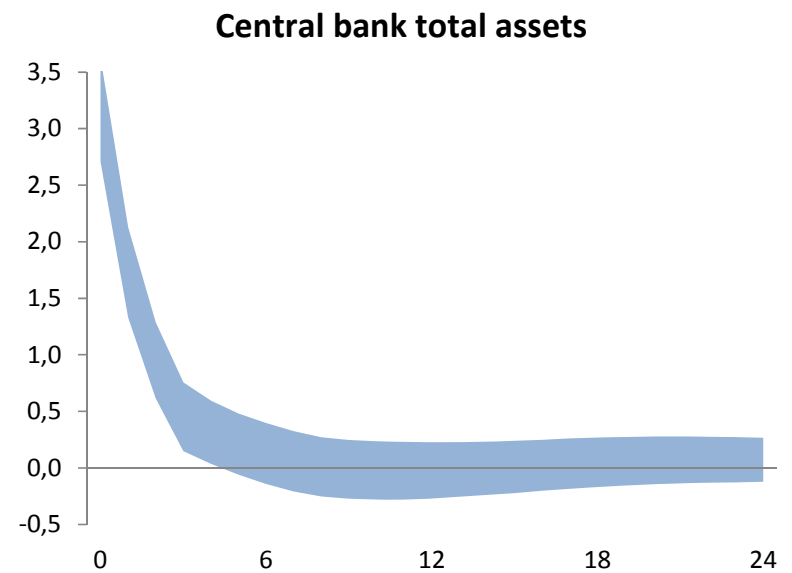
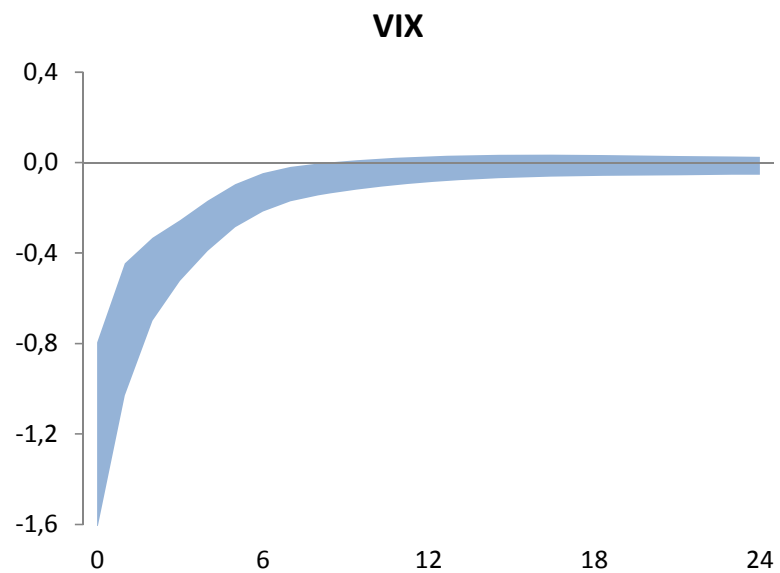
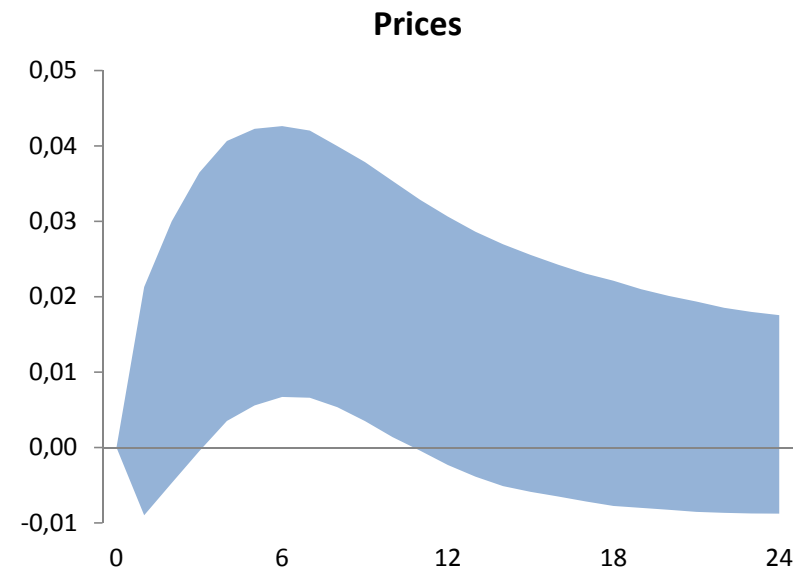
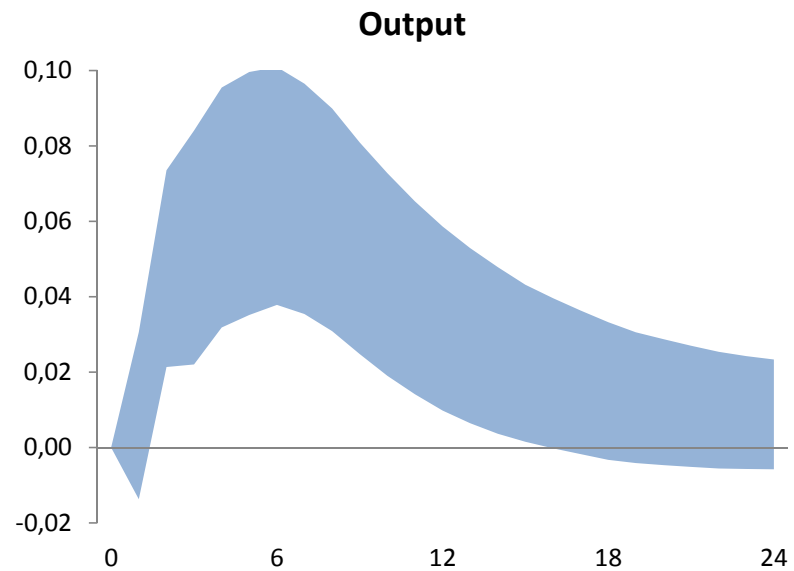
- In order to properly assess the macroeconomic effects, the challenge is to identify exogenous innovations to the central bank balance sheets
  - Disentangle from endogenous responses to fluctuations in economic activity and financial markets
  - Structural Vector Autoregressive (SVAR) models: multivariate representation of macro variables (including lagged effects), where structural exogenous shocks that drive the variables are identified by imposing a minimum set of restrictions
- Peersman (2011): ECB responses not fully “unconventional” in their essence
  - Innovations to balance sheet in pre-crisis period (for a given policy rate) had a similar effect on output, prices and credit supply as conventional shifts in the policy rate

# Macroeconomic effects of balance sheet policies

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- Gambacorta, Hofmann and Peersman (2013): exploit cross-sectional dimension of unconventional monetary policies during the crisis
  - Panel SVAR for eight countries (US, EA, UK, JP, CA, CH, SE, NO) that reached the zero lower bound, estimated over sample period 2008M1-2011M6
  - Implied stock market volatility (VIX) as a proxy for financial risk/uncertainty
  - Note: panel estimations reveal that there are no major differences of the effects of balance sheet increases across countries, despite the heterogeneity of the measures that were taken (note: bigger impact on prices in Euro area)

# Macroeconomic effects of balance sheet policies





# Macroeconomic effects of balance sheet policies

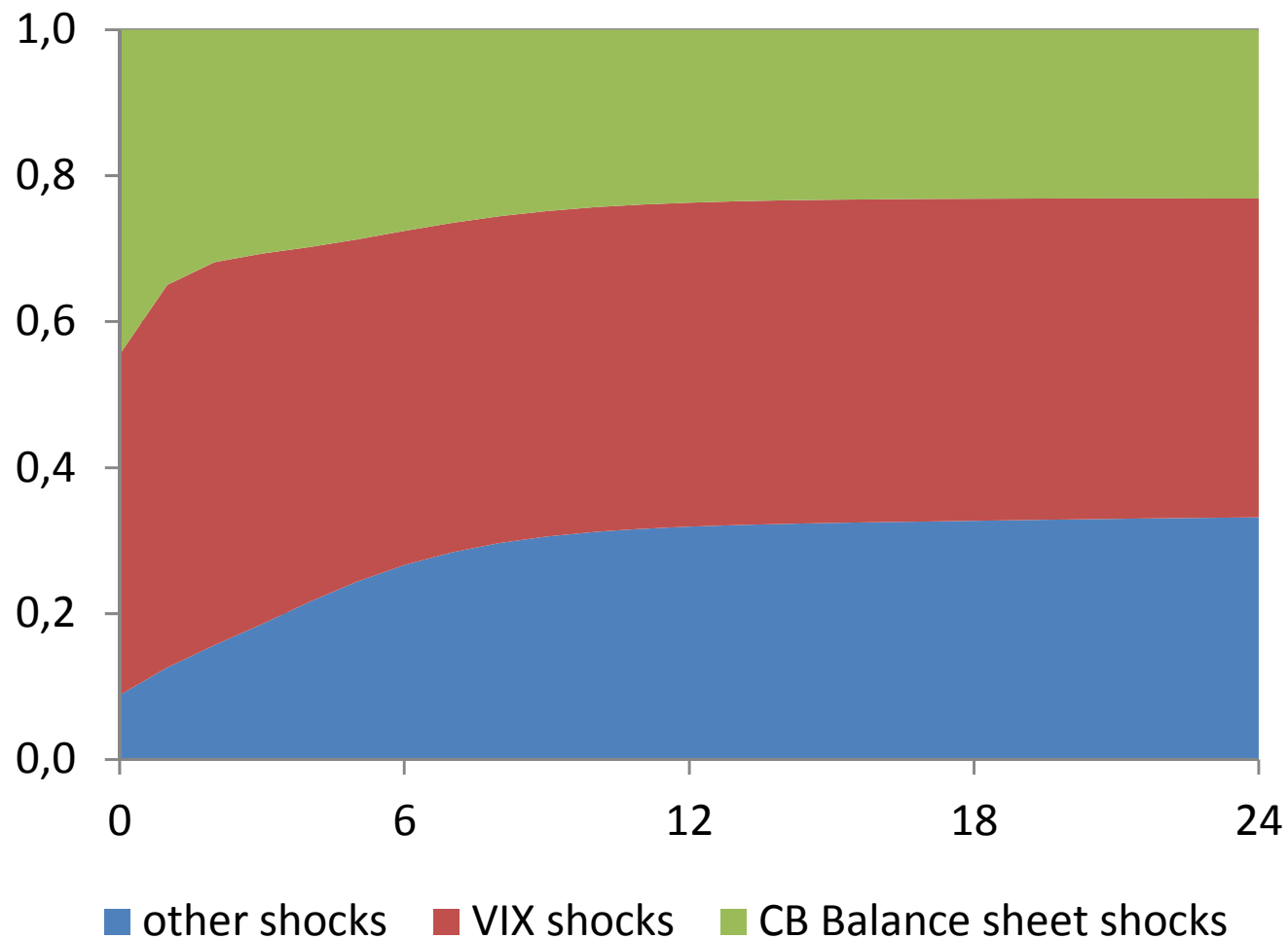
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- Output and prices display a significant temporary increase
  - Response pattern of output is qualitatively very similar to conventional monetary policy shock (e.g. Christiano *et al.* 1999; Peersman and Smets 2003)
    - Back-of-the-envelope calculation: exogenous doubling of balance sheet has similar effect as 300bp interest rate cut
  - Impact on consumer prices less persistent compared to conventional shocks
  - Peak effect of balance sheet shock about three times larger than peak effect on prices (for interest rate shock is this typically 1,5 times)
    - Potentially due to convexity of AS-curve (e.g. Ball and Mankiw 1994)

# Macroeconomic effects of balance sheet policies

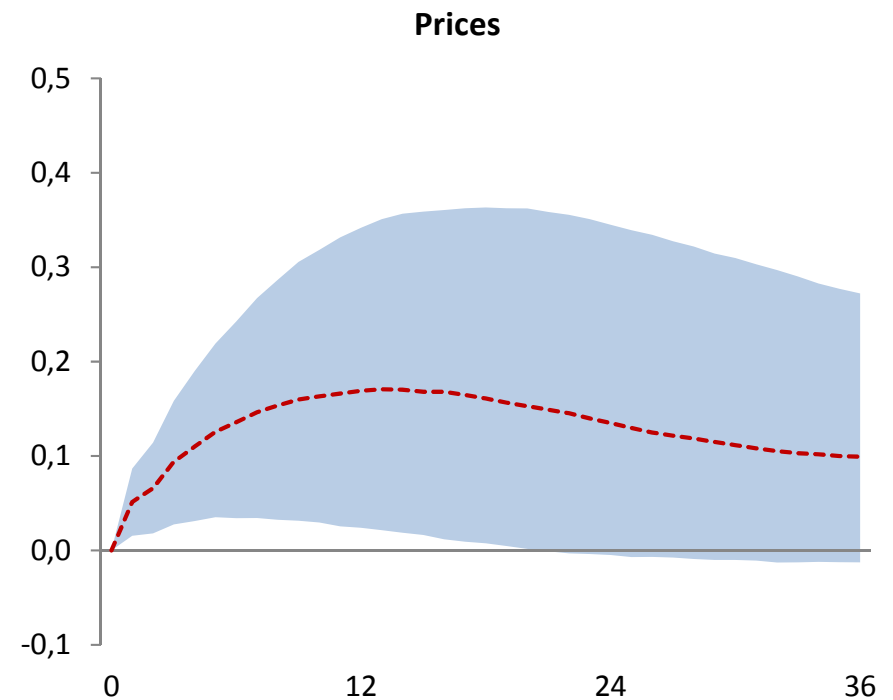
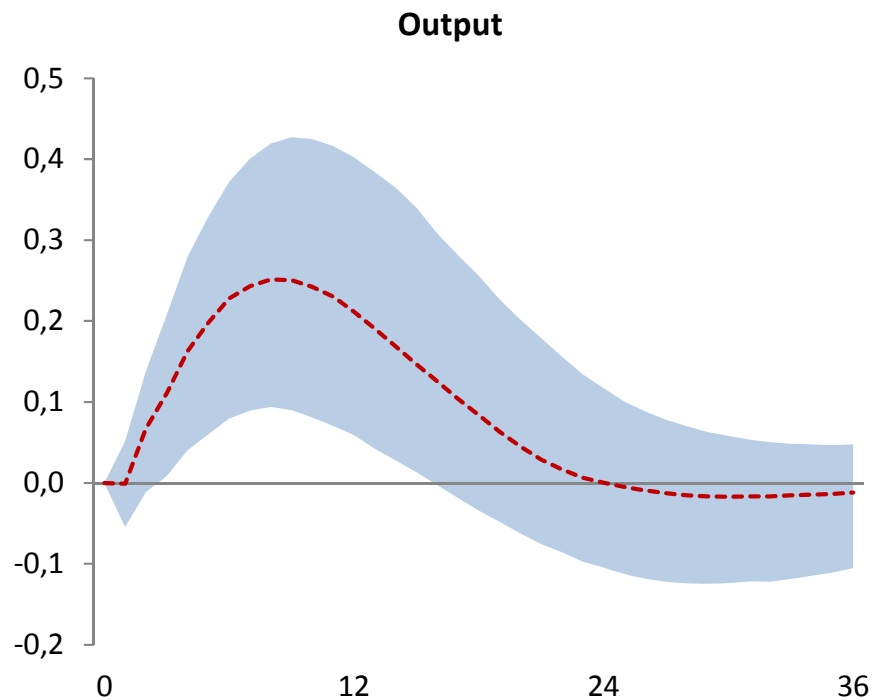
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- Balance sheet fluctuations mainly endogenously driven by other shocks

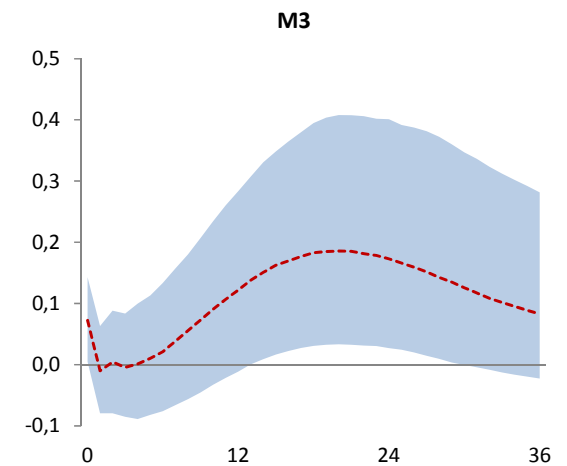
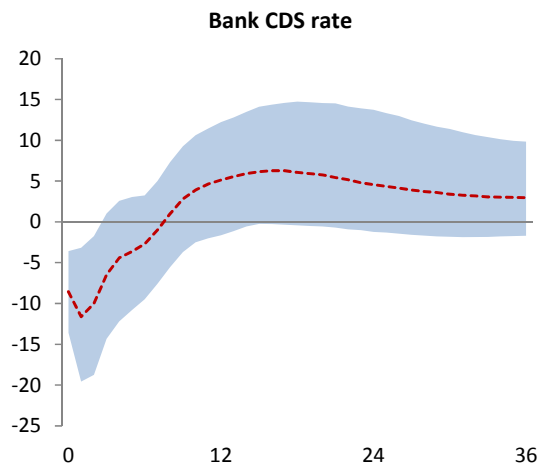
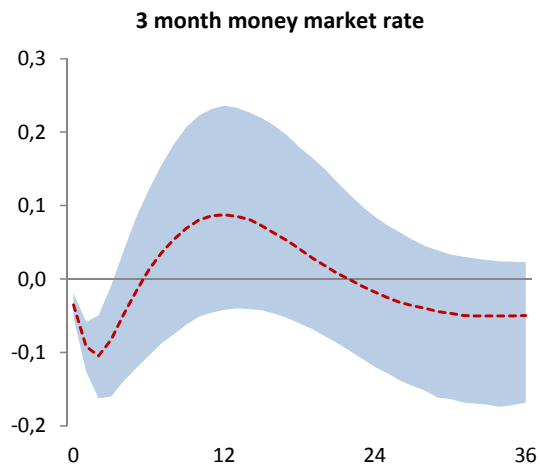
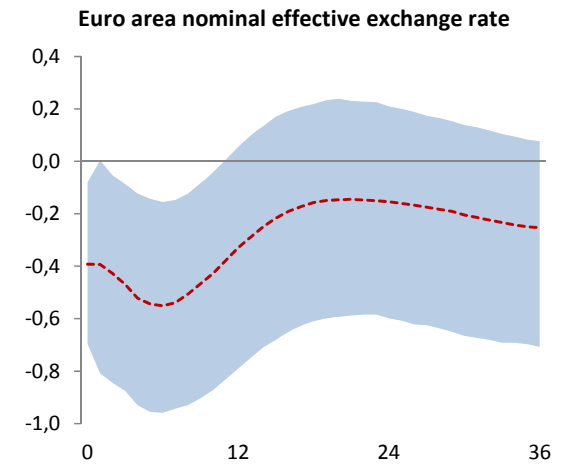
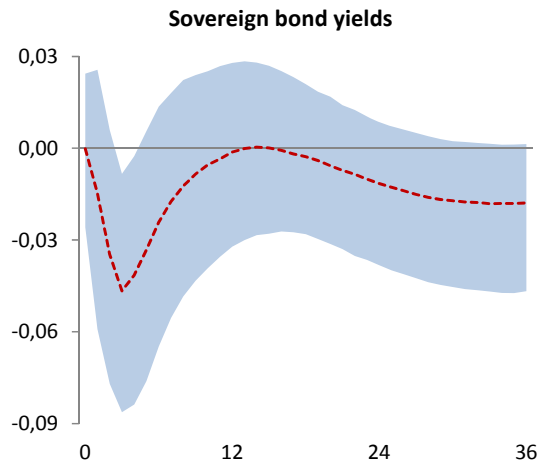
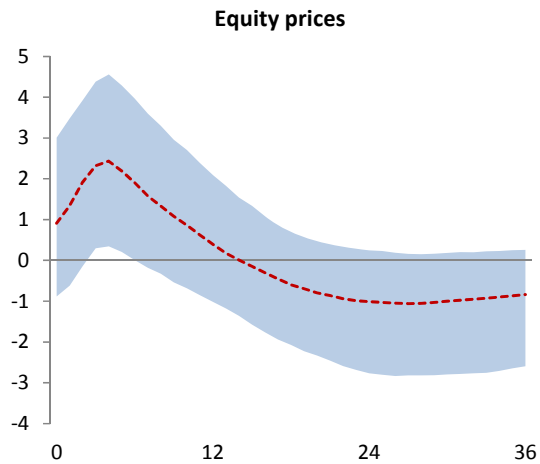


# Macroeconomic effects of balance sheet policies

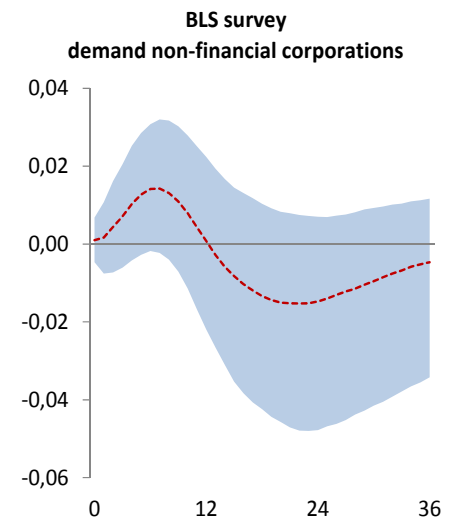
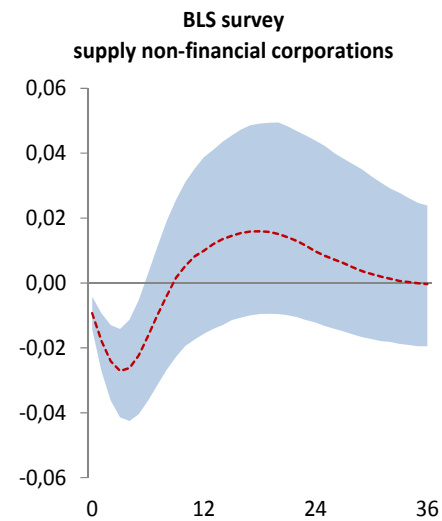
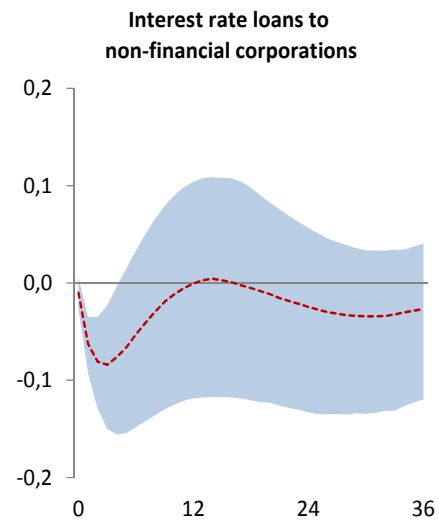
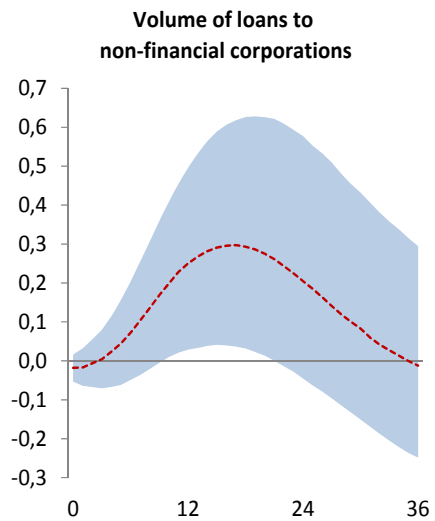
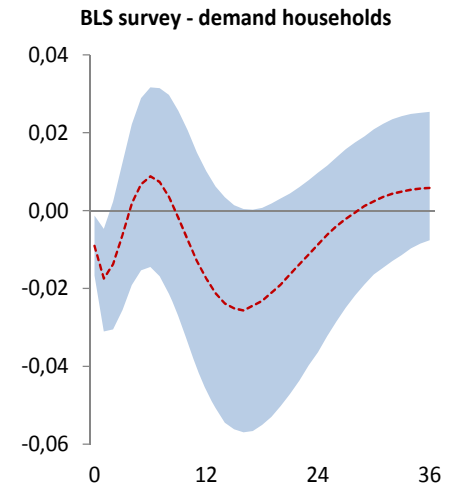
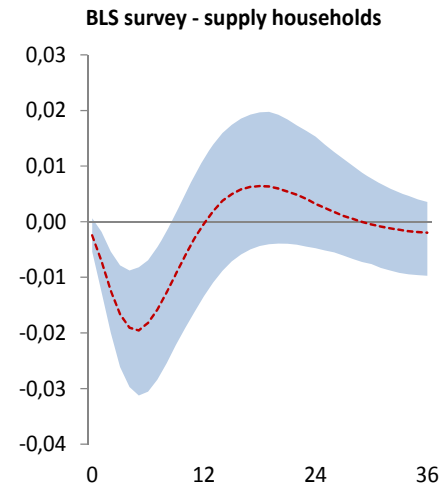
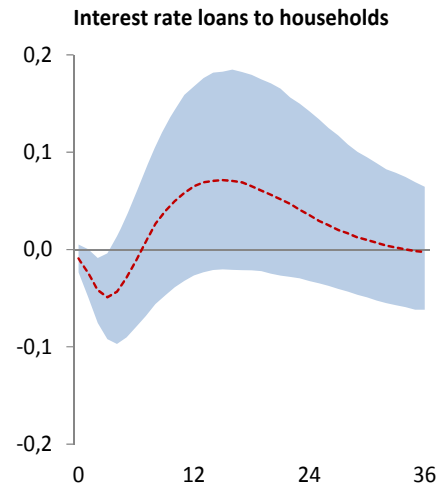
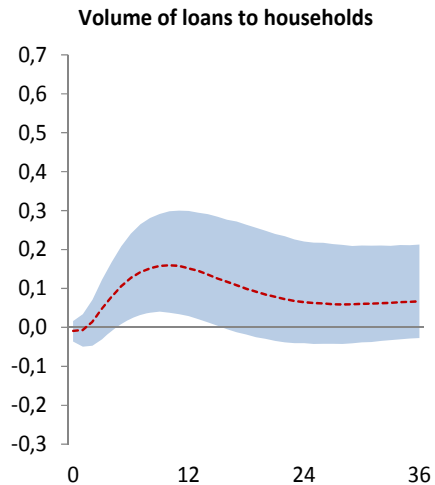
- Boeckx, Dossche and Peersman (2013): Time series estimation for the Euro area over crisis period (2008M1-2012M9) using Bayesian techniques



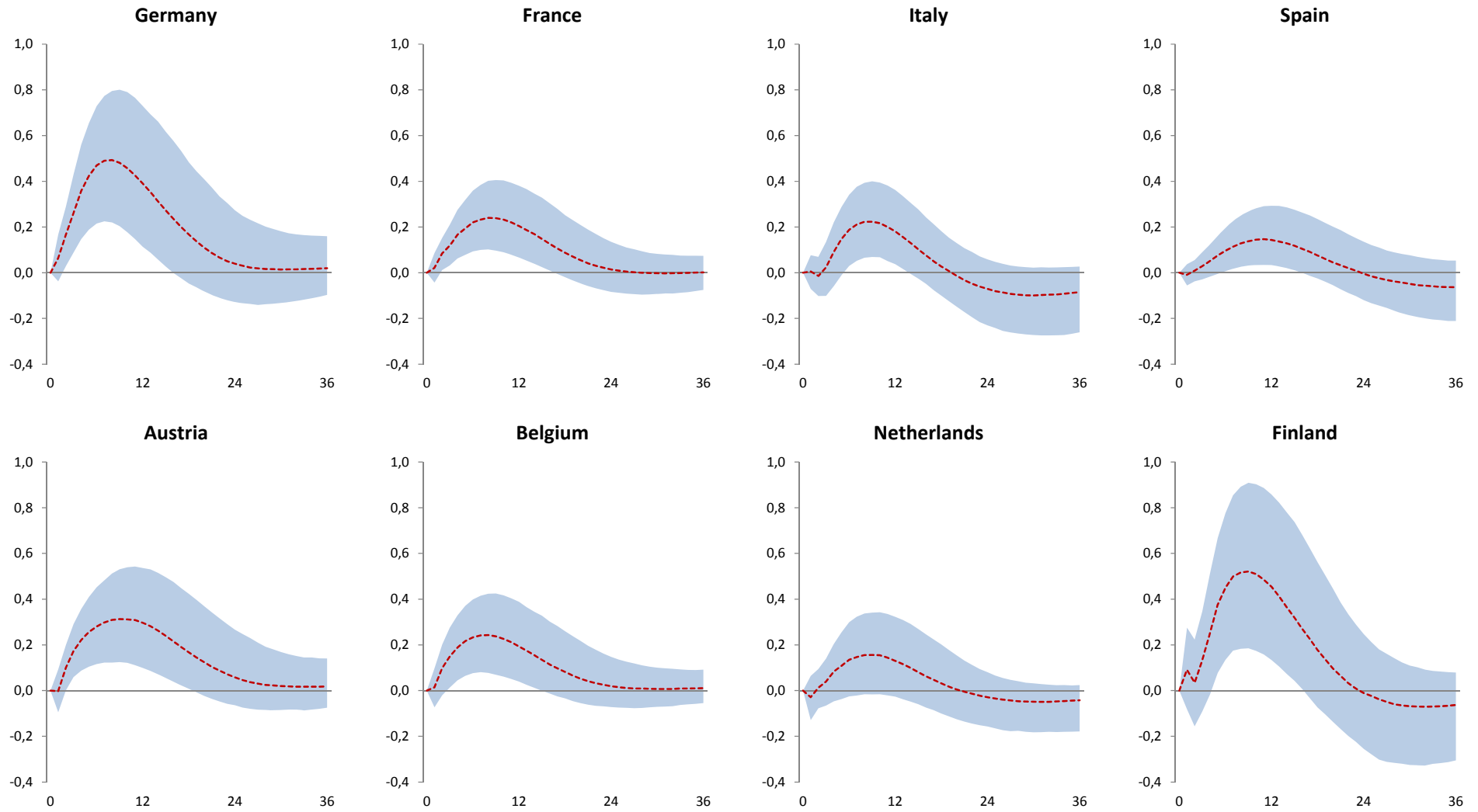
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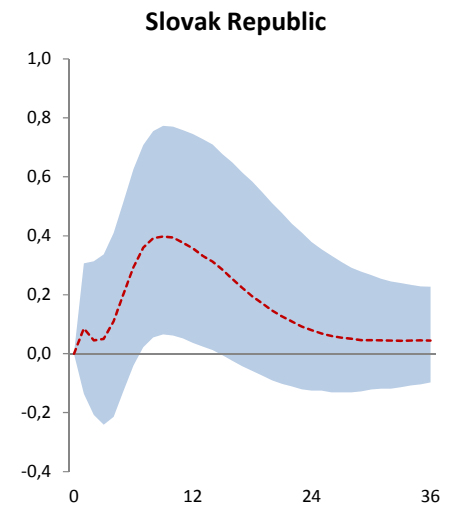
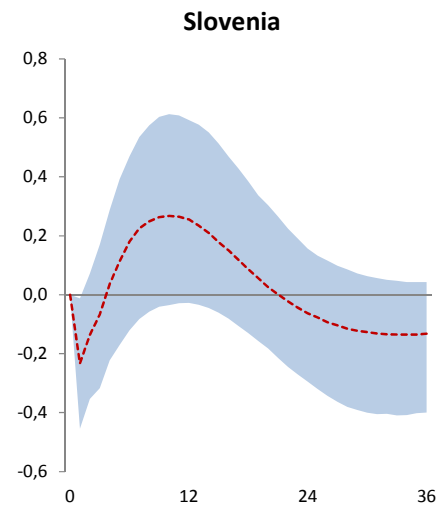
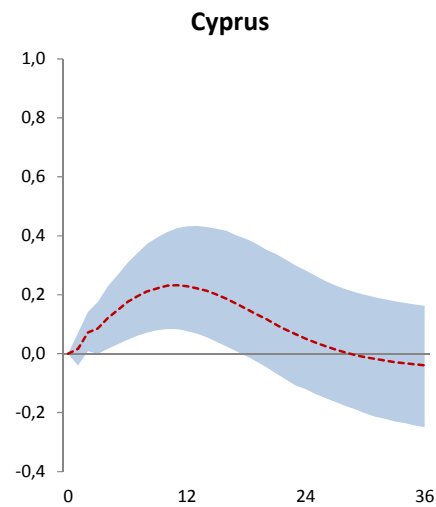
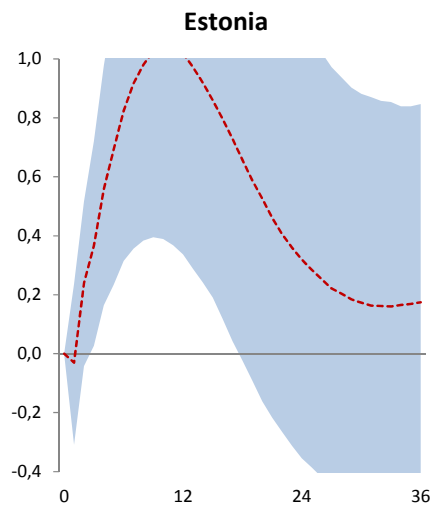
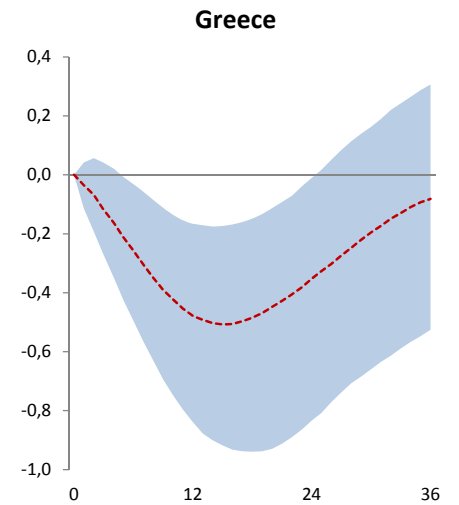
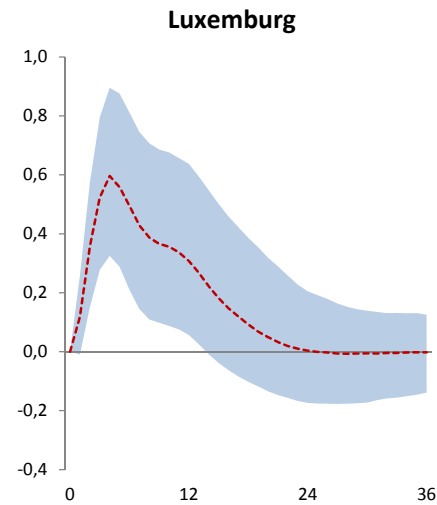
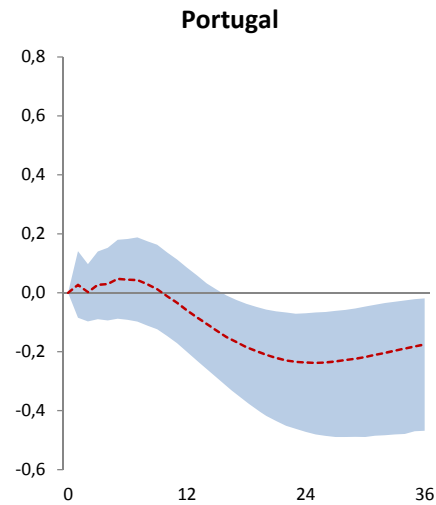
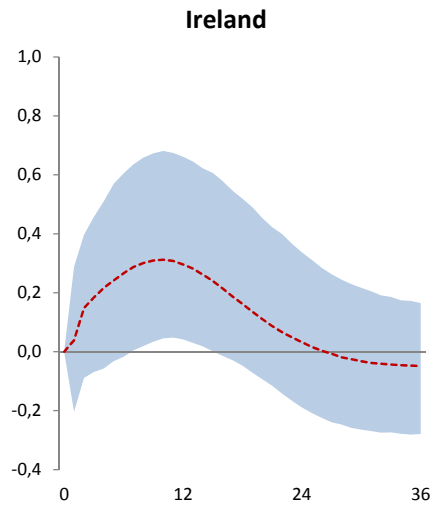
# Macroeconomic effects of balance sheet policies



# Macroeconomic effects of balance sheet policies

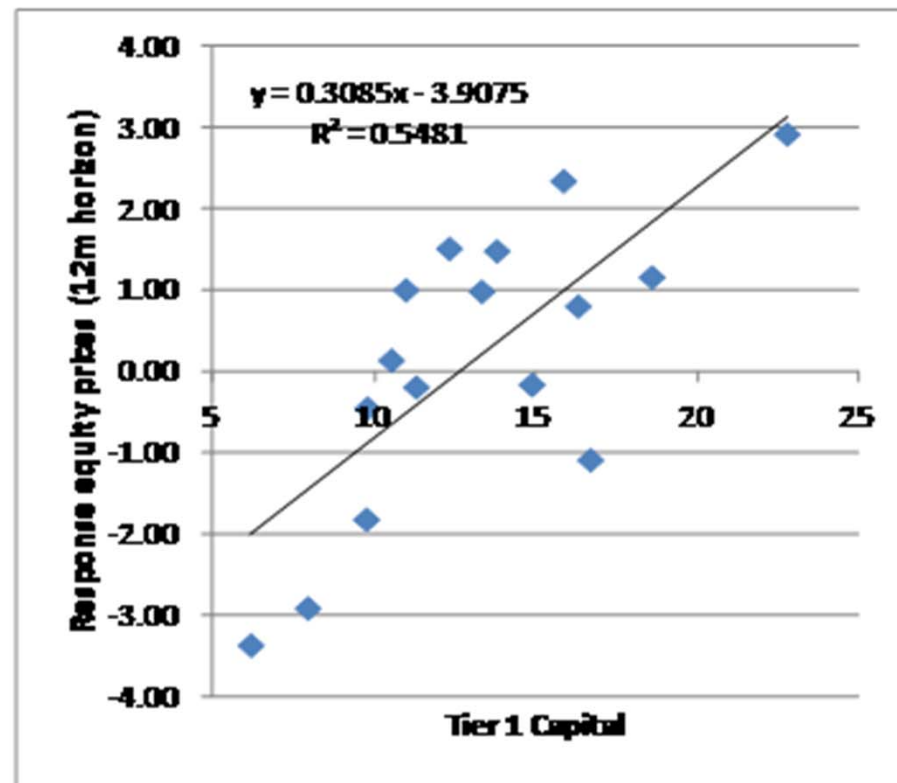
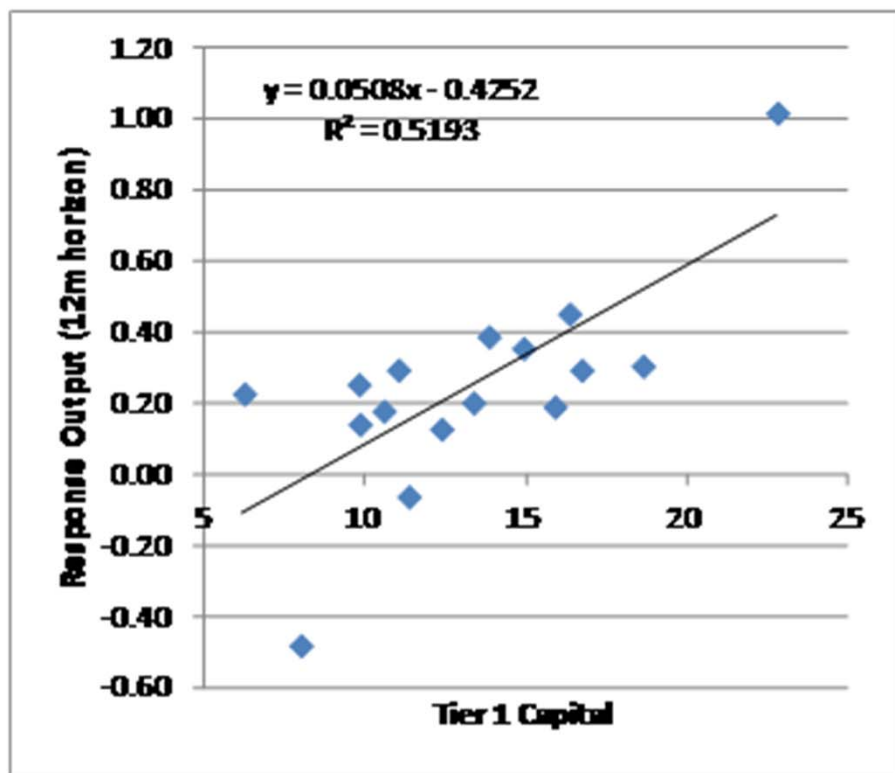


# Macroeconomic effects of balance sheet policies



# Macroeconomic effects of balance sheet policies

- Countries where banks have more capital seem to react more to liquidity measures of the ECB





# Exit strategy

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- Note: careful with long-run effects such as excessive risk-taking in financial markets, delayed public and private sector balance sheet repair
- As long as the economy is sufficiently below full capacity (and inflation expectations well anchored): no inflationary pressures
  - Most of liquidity currently held as excess reserves by banks at the central bank
  - Firms will only raise prices when demand is strong and production costs rise
  - A scenario of secular stagnation is even possible
  - But: if the economy recovers and banks have more opportunities to lend, we clearly need an exit strategy

# Exit strategy

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- Some measures have built-in and self-correcting mechanisms
  - E.g. full-allotment strategy, securities and lending which mature, ...
- Increasing reserve requirements
- Raising interest rates, in particular rate on excess reserves
  - Market rates will never fall below interest rate on excess reserves: policy stance
- Offering term deposits or conduct large-scale reverse repo's
- Selling assets into the open market in exchange for liquidity

# Too little, too late?

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- Although exit is theoretically perfectly possible, inflation could be relatively high for a while and/or strong asset inflation once the economy recovers (especially in US)
- Little historical experience to determine optimal timing
  - Prompt withdrawal could distort recovery and have undesired consequences
  - Brainard (1967): if shift in policy tool has uncertain effects, it should be used more cautiously than a shift in policy tools that have more certain effects
  - Note: delayed response is part of forward guidance

# Too little, too late?

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- Shrinking balance sheets will harm economic activity in a similar way that it stimulated the economy during the crisis
  - Could trigger another recession + strong political opposition to do so
- Balance sheet normalization could lead to considerable losses for central banks: falling asset prices and/or high interest payments on reserves
  - Every dollar central banks lose is the taxpayers' money (more capital might be needed): political pressure against it and difficulties to maintain independence
- Financial repression: policymakers do not mind higher inflation because it contributes to debt normalization
  - Note: in Euro area, this will rather be in the North, whereas debt overhang problem of the South

# Questions?

