EUROPEAN CENTRAL BANK
EUROSYSTEM

20 years ECB

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European Central Bank

The First 20 Years of the European Central Bank: Monetary Policy

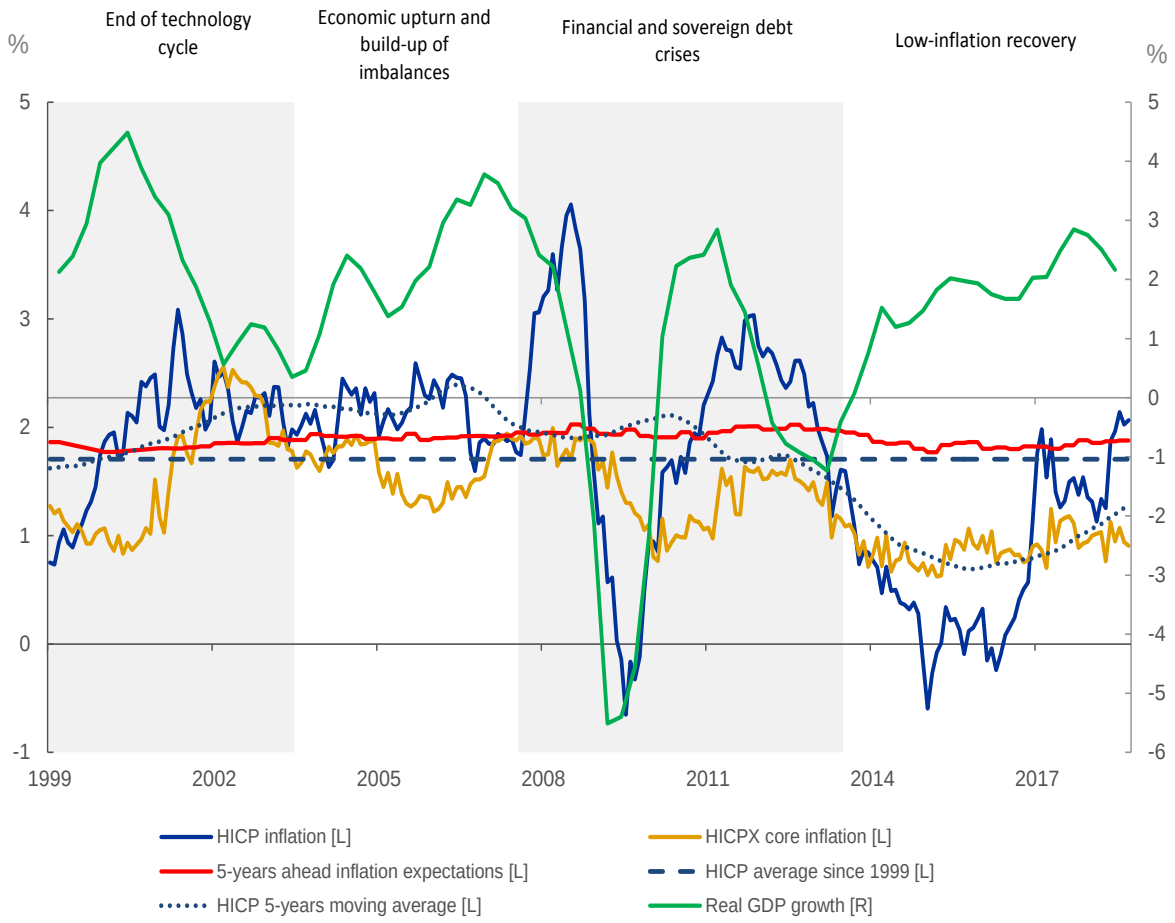
(ECB Working Paper no. 2,219)

Frankfurt am Main
1 July 2019

ECB Central Banking Seminar

ECB delivered price stability, with major effort to fight disinflationary pressures after sovereign crisis

Four cyclical phases, inflation and growth record



- Average headline inflation 1.7%
- Fluctuations between 4.1 and -0.7%
- Longer-term expectations anchored (between 1.8 and 2%)
- Protracted low-inflation period after sovereign-debt crisis
- HICP reading end of sample: 2% (Aug 2018)
- Core inflation still more muted

Sources: Authors and ECB.

Jan1999-Jun2003: The technology bubble and the ECB's first interest rate cycle

- A new stability-oriented monetary policy strategy (robustness)
  - Definition of price stability (medium term; symmetry?)
  - Two-pillar framework (with prominent role for money)
  - Communication and accountability (press conference, projections in 2000; minutes?)
- A broad operational framework
  - Weekly main refinancing operations (overbidding episodes)
  - Corridor system through standing facilities
  - Broad set of collateral
  - Large number of counterparties

- Early policy rate surprises but good predictability soon
- First test of anti-inflation credibility as euro depreciates and inflation peaks above 3% (+225bp)
- Concerted FX interventions in Sep 2000
- Breakdown of dot-com bubble triggers discussion on lower bound of interest rates (-275bp to MROR=2% in Jun 2003)
- Decoupling of money and credit growth (flight to safety) undermines M3 reference value

Jul2003-Jul2007: Economic upturn and growing imbalances without "leaning against the wind"

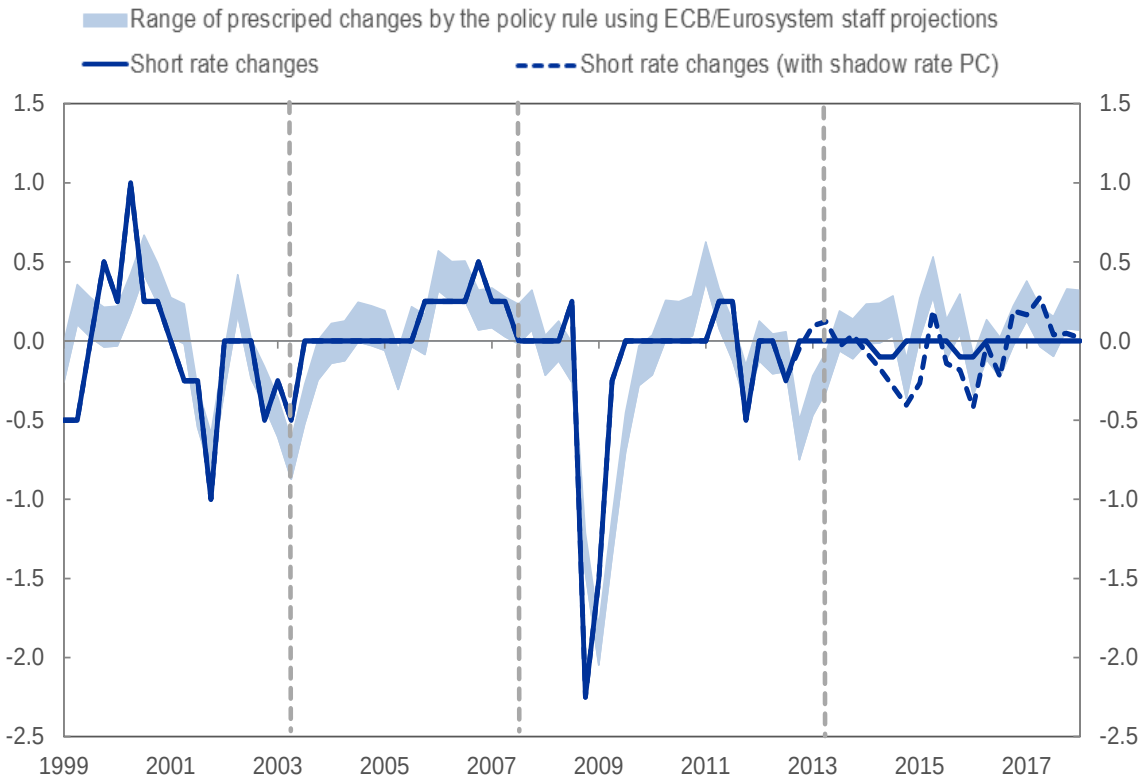
- 2003 review of the strategy
  - "below, but close to, 2 percent" (clarification)
  - Annual review of reference value stopped
  - Monetary analysis as a "cross check" goes second in introductory statement (medium-to-long term)
- Applauded, but debate about monetary analysis continues
  - 2006 ECB symposium on the role of money
  - Research program broadening it
- And so does asymmetry discussion
- Stable rates for 2.5 years
- Discussion about money, asset prices and financial stability
- 200bp rate increases starting in Dec 2005 (monetary analysis)
  - Rate policy not too lose according to interest rate rule
  - No evidence of "leaning against the wind"
- Growing imbalances between euro area countries
  - Diverging intra-euro area current account balances
  - Accompanied by diverging competitiveness, credit and house price developments
  - Some countries private or public debt overhangs

Aug2007-Jun2013: The financial crisis, the double-dip recession and non-standard monetary policy

- Operational framework takes centre stage with “separation principle”
- Well suited for LLR addressing bank funding problems
- Did separation principle contribute to premature tightening in 2008 or 2011?
- Conventional loosening: -400bp in 7 months
- FRFA: DFR=25bp in Apr 2009
- Sovereign debt crisis and double-dip recession special to EA
- SMP: limited; temporary; no credible conditionality
- Could ECB have reacted more decisively to sovereign crisis?
  - Lingering fiscal and banking problems major obstacles for monetary policy
  - Severe propagation mechanisms (sovereign-bank nexus, re-denomination risk)
  - Collective action problems in incomplete EMU
  - Balance transmission repair with “prohibition of monetary financing”
- Turning point: around June 2012 Council (ESM, Banking Union…)
- New context: OMT etc. possible

Above the zero bound a standard policy rule explains most ECB interest rate moves well

Orphanides rule for the euro area with inflation and output taken from ECB/Eurosystem projections



Notes: Short rate is the interest rate in main refinancing operations (MROs) until 2008Q3 and the deposit facility rate (DFR) from 2008Q4 onwards.
Sources: Authors, ECB, ECB staff projections and European Commission.

$$\Delta i = 0.5(E\pi_{t+1} - \bar{\pi}) + 0.5(E\Delta y_{t+1} - \Delta\bar{y})$$

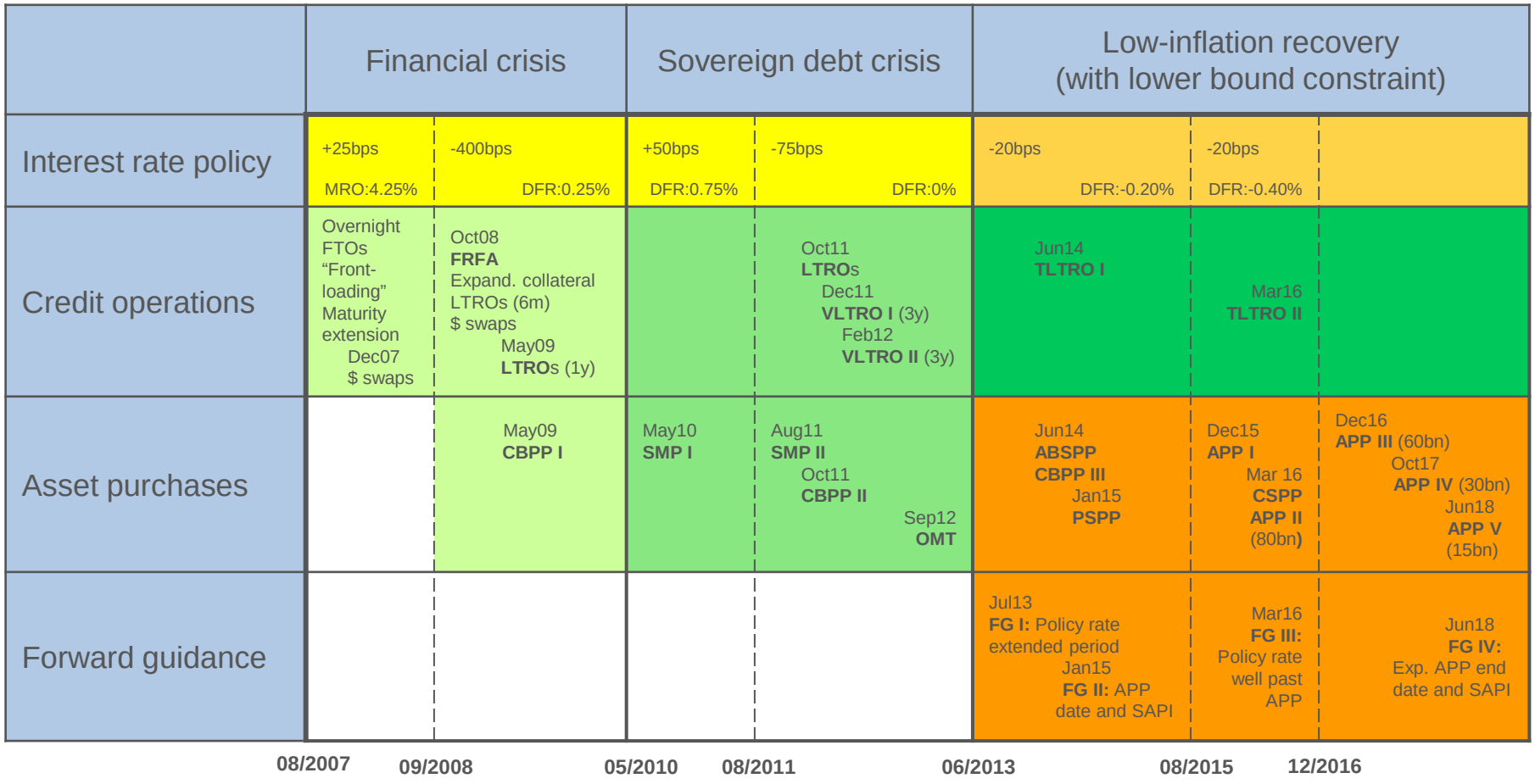
- Estimated goal: 1.8%
- Headline, not core
- No asymmetry in policy
- No additional info from money or credit ("cross-checking")
- Largest cumulative errors
  - A bit loose in 2002
  - Somewhat tight in 2009 and 2013
  - But then non-standard!
- Good fit vanishes when DFR hits 0 in Jul 2012

Jul2013-Jun2018: Addressing the lower bound of interest rates and the low-inflation recovery

- Moderate recovery but damage of sovereign debt crisis: Very low inflation, de-anchoring risks and even deflation risks, with DFR having reached 0 in Jul 2012
- "Three-pronged" approach to dispel doubts that ECB has tools to fight them close to the lower bound (as of Jun 2014)
  1) Negative rates (first major CB) up to -40bp
  2) Targeted LTROs
  3) Expanded asset purchase programme ("Quantitative Easing")
- Communication changes in complex non-standard context
  - Explicit forward guidance (Jul 2013)
  - Publication of the account
- Debate on rationale, sequencing, costs and benefits of non-standard measures
  - Evidence on effectiveness
  - Negative rates and bank profitability
  - Low for long, risk taking and financial stability
  - APP and distributional effects
  - Low interest rates and fiscal incentives
- ECB now more similar to other major central banks

Framework for non-standard monetary policy since the crisis: different purposes and effectiveness

Timeline



- Standard interest rate policies
- Negative Deposit Facility Rate
- Non-standard policies to address lower bound of rates
- Impaired interbank and bank funding markets and later also bank lending channel
- Sovereign-bank nexus and re-denomination risk
- Heterogeneous pass-trough in bank lending markets

Sources: Authors and ECB.

Concluding remarks 1

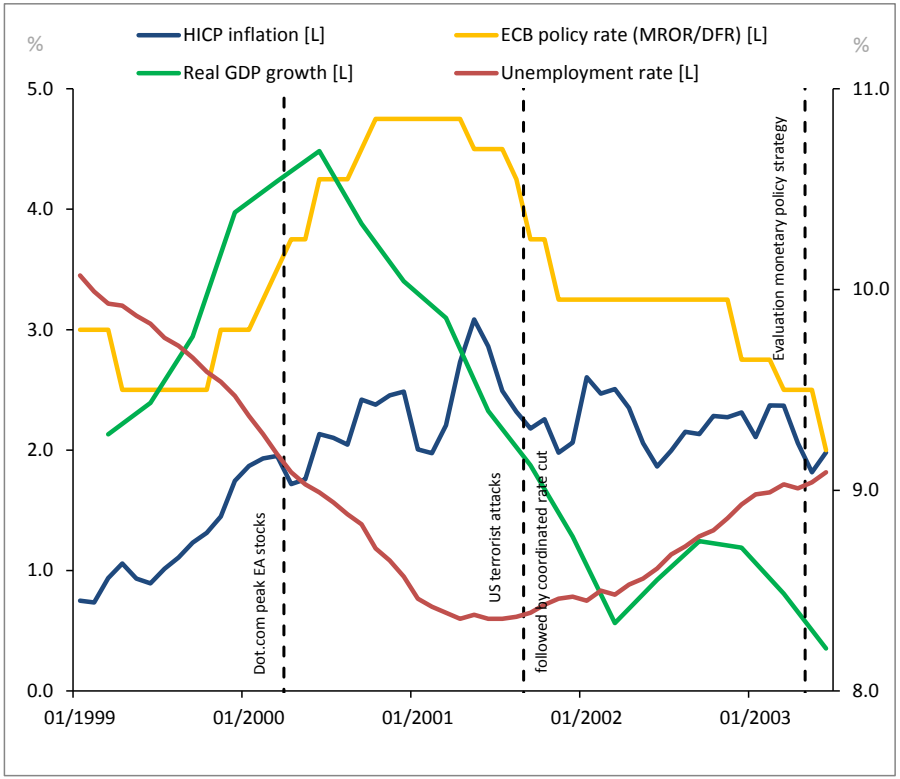
- Overall, ECB delivered on its price stability mandate
- Could it have responded more proactively to the sovereign debt crisis?
- Its monetary policy strategy and framework served it well, also because it was adapted to new challenges when needed
  - Initial policy strategy with a prominent role for money helped dispel early questions about the ECB's anti-inflationary resolve
  - When interest rates became low for the first time the inflation aim was clarified
  - The economic analysis and quarterly projections gained prominence when monetary aggregates were harder to interpret in the short-to-medium term ("cross-checking")
  - The breadth of the ECB's market operational framework allowed it to react quickly in the early phases of the financial crisis
  - After the sovereign debt crisis, when the effective lower bound became increasingly a constraint, the ECB significantly expanded its non-standard tools (to quantitative easing, funding for lending, negative rates and forward guidance policies), proving its anti-deflationary resolve
  - The extension of the monetary analysis to a broad perspective on financial intermediation and bank lending allowed assessing impairments in monetary transmission during the crises and the effectiveness of some non-standard measures
- ECB broadened its overall toolkit, resembling now closer to its peers

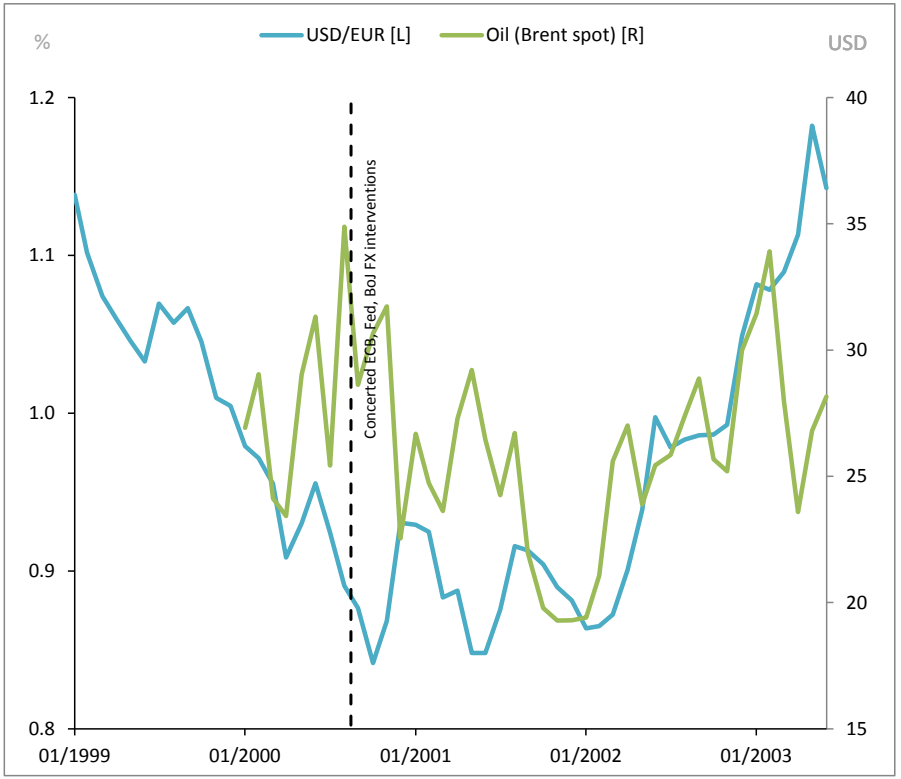
Concluding remarks 2

- Some aspects of the ECB policy framework inspired other central banks
  - Medium-term orientation of the price stability aim
  - Monetary policy press conference
  - Broad and flexible operational framework
- But the incompleteness of EMU and imperfections in fiscal and prudential policies could continue to cause significant “headwinds” to monetary policy
- Some issues have been addressed in a series of important reforms
  - European Stability Mechanism
  - European Banking Union (Single Supervisory and Resolution Mechanisms)
  - European Semester and Macroeconomic Imbalance Procedure
- ECB monetary policy benefits tremendously from a thorough implementation of these reforms and from compliance with their objectives and rules
- It would also benefit enormously from further progress with completing EMU

Annex

Jan1999-Jun2003: The technology bubble and the ECB's first interest rate cycle





Sources: Authors and ECB.

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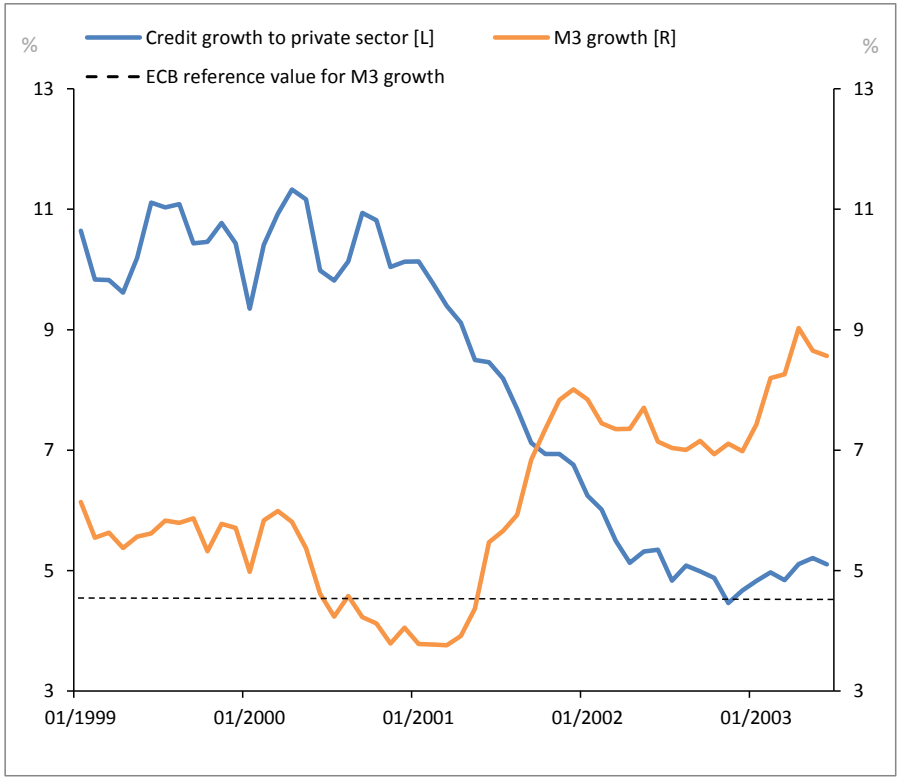

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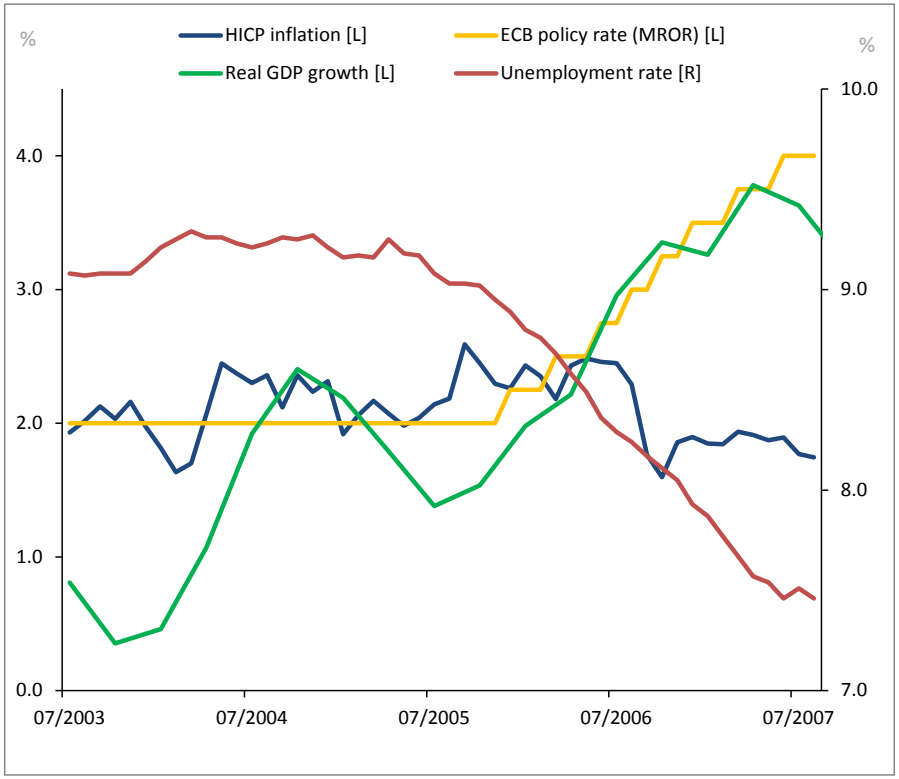
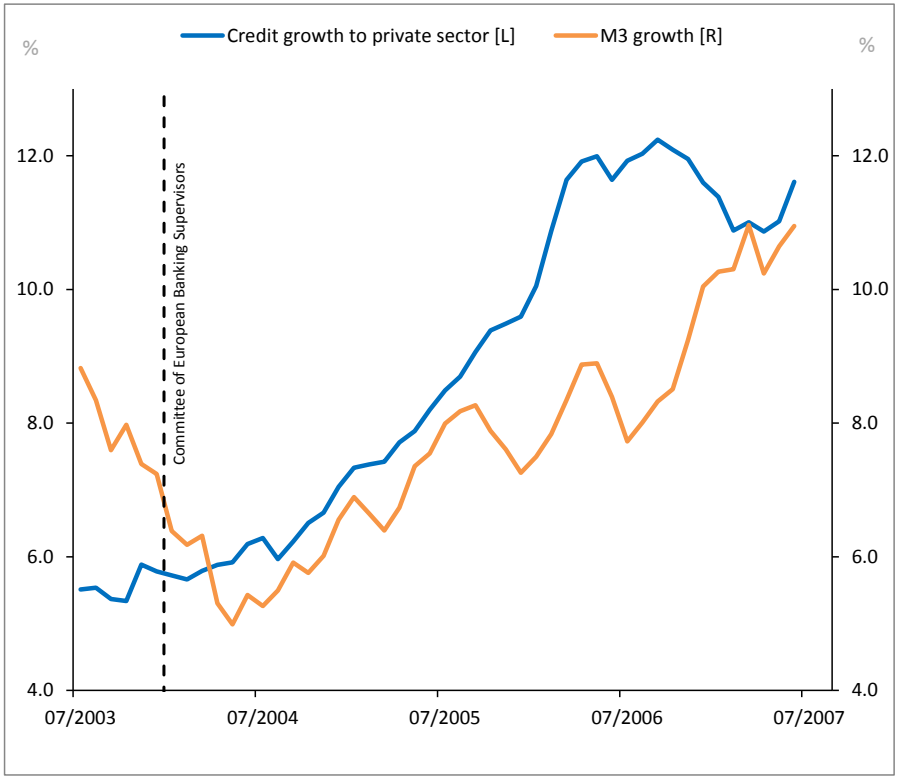
Jul2003-Jul2007: Economic upturn and growing imbalances without “leaning against the wind”





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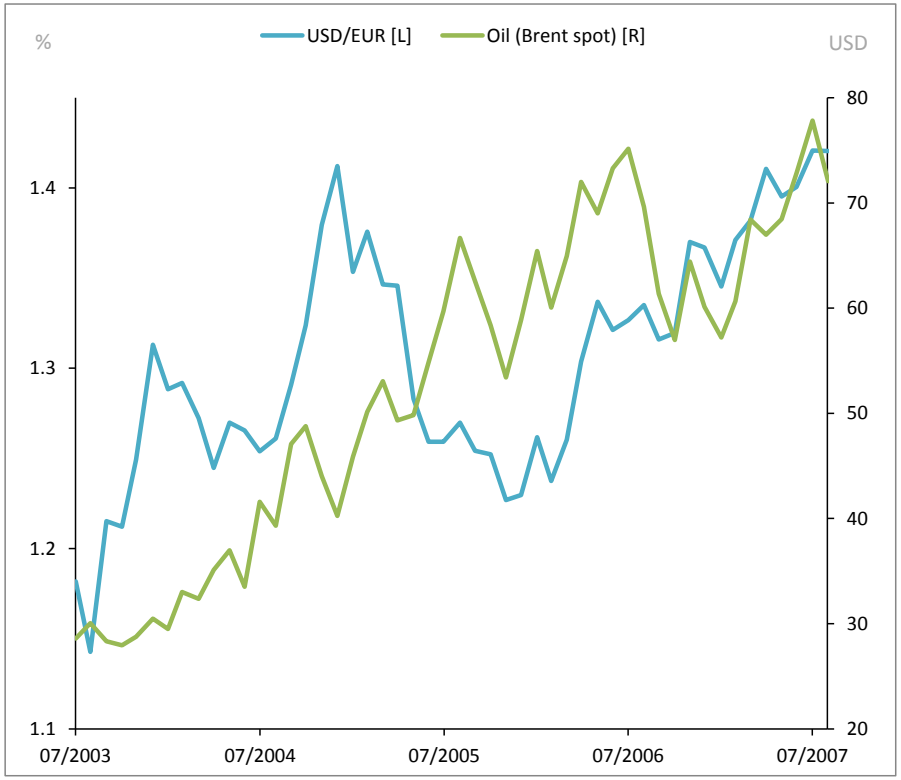

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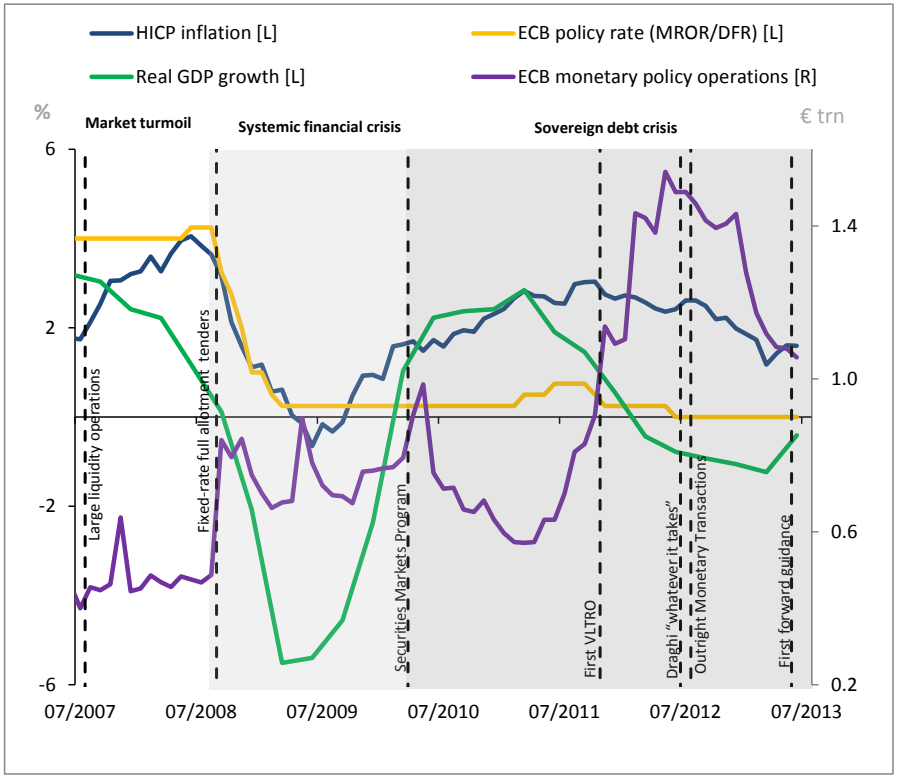

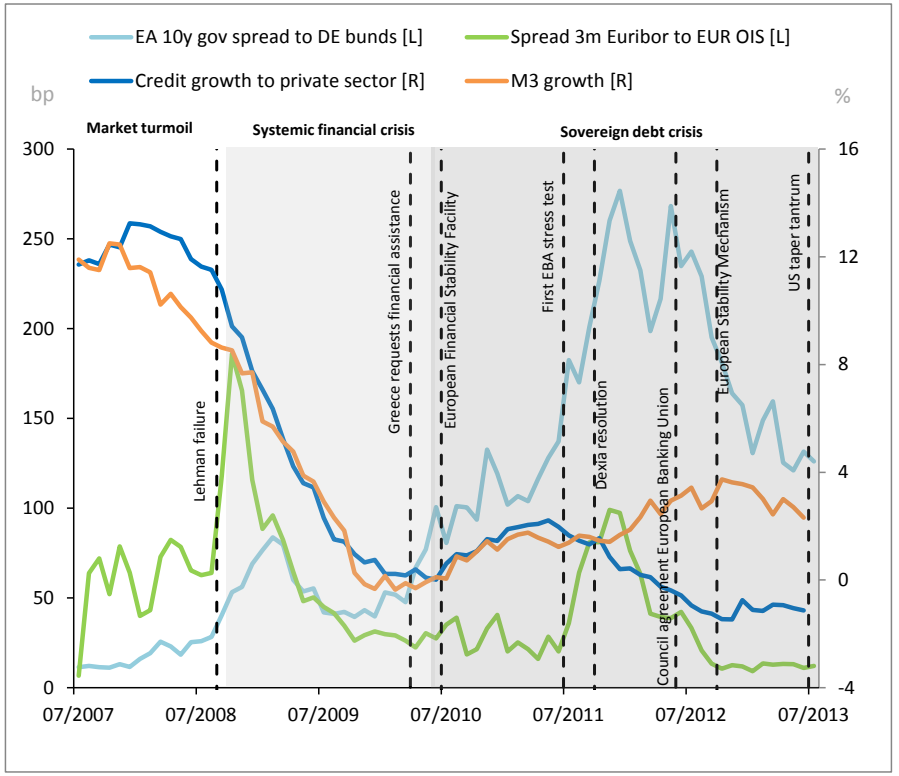

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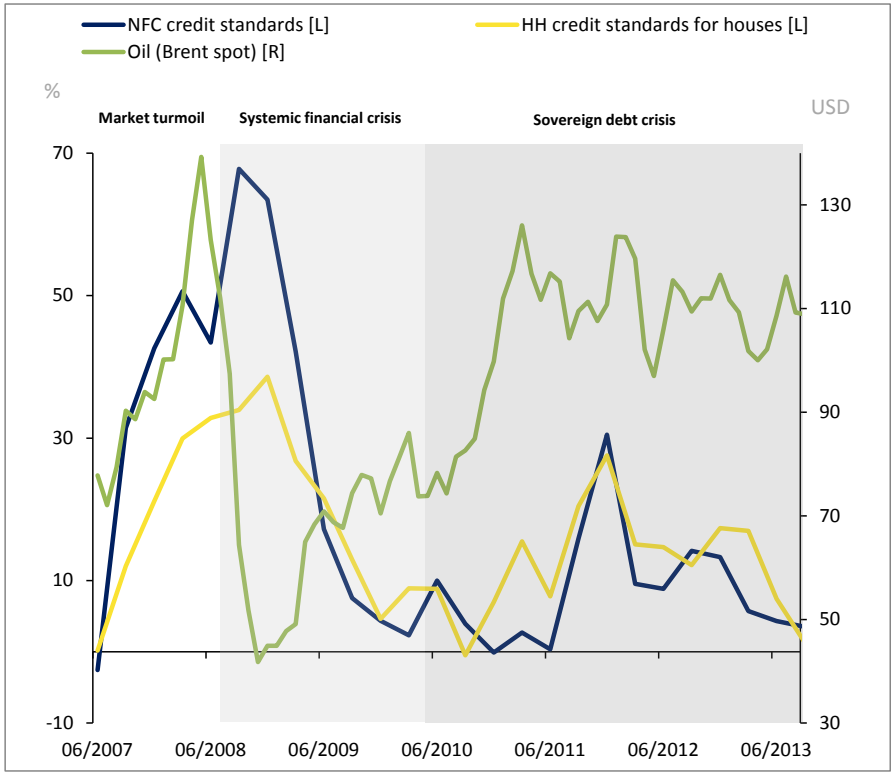

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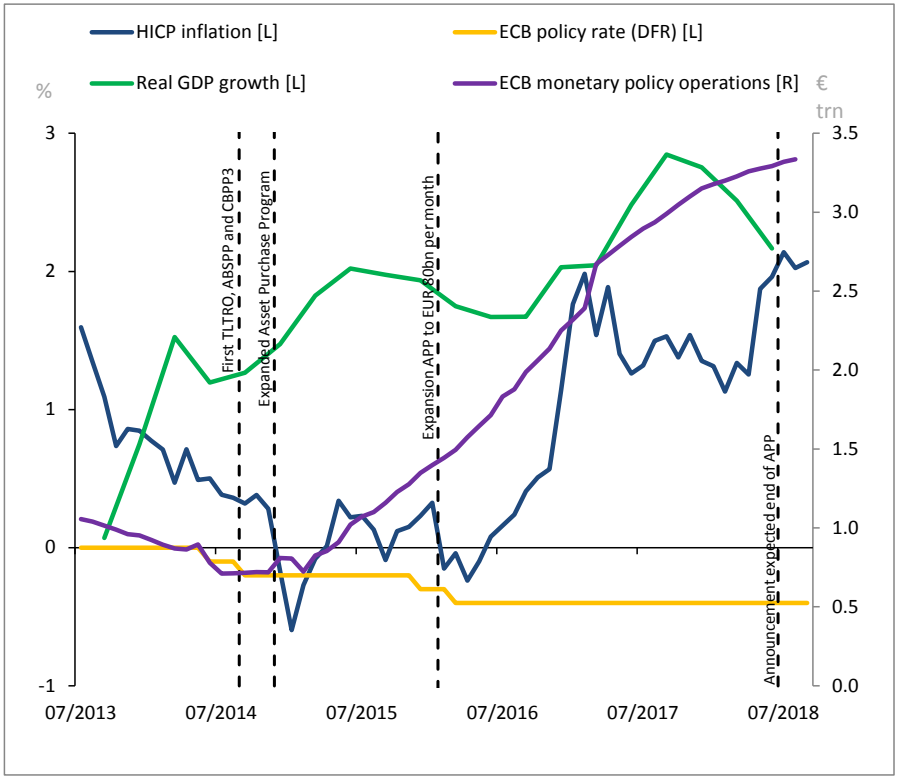
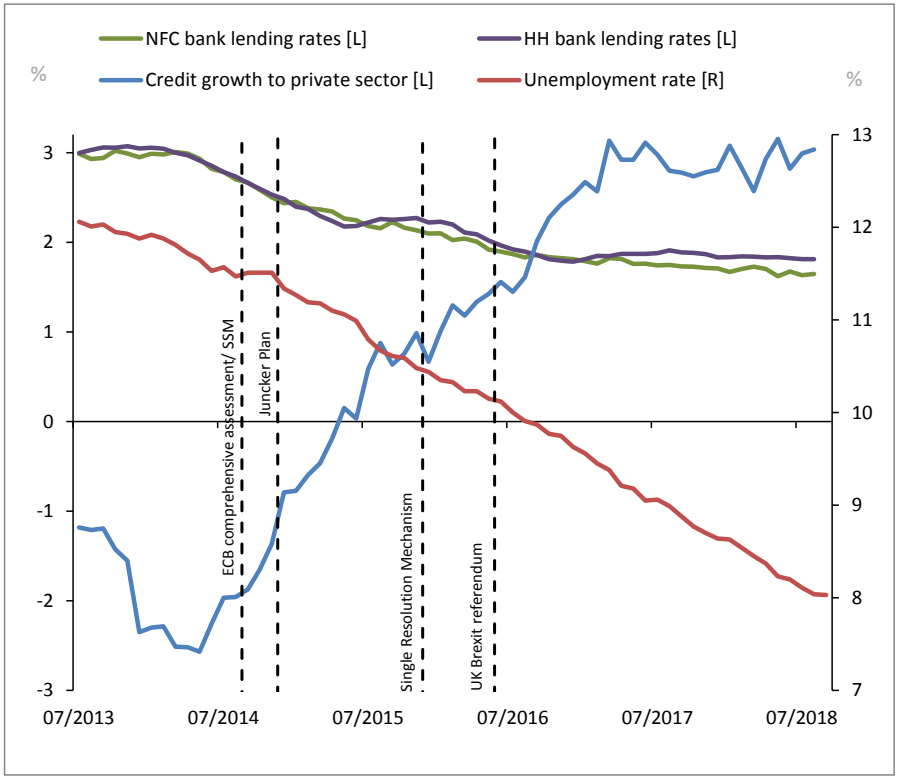
Jul2013-Jun2018: Addressing the lower bound of interest rates and the low-inflation recovery





Sources: Authors and ECB.

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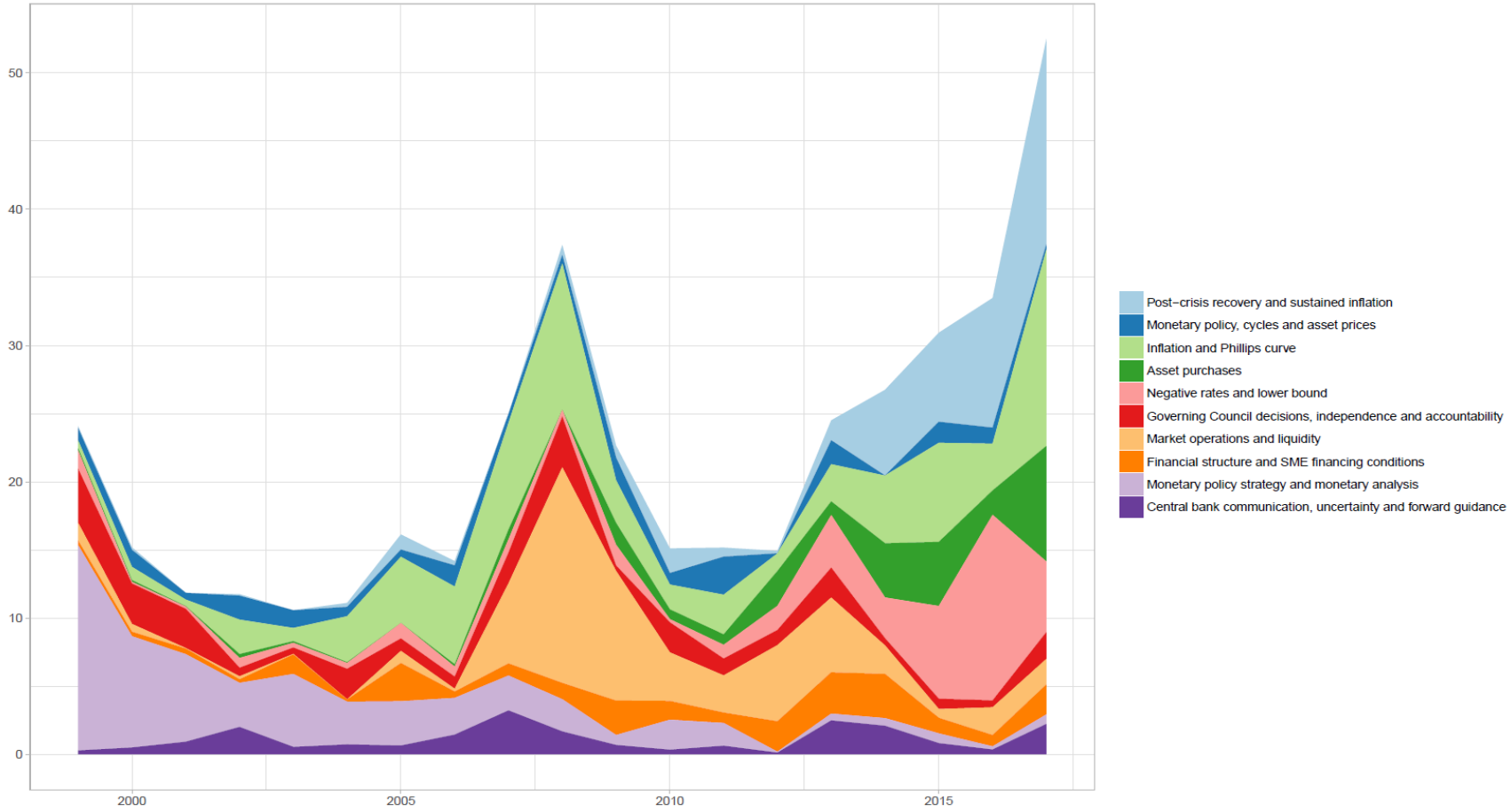
Sources: Authors and ECB.

Introduction

- European Economic and Monetary Union (EMU) is an unprecedented historical project
- Single currency and central bank for 19 (quite diverse) countries (without a fiscal or political union)
- Euro area: 340 million people producing 11% of world GDP
- ECB started with a strong and self-contained monetary policy mandate to pursue price stability as primary objective
- Only indirect or contributing role in prudential or financial stability matters, but SSM as of November 2014
- Motivation for the paper: ECB turned 20 this year
- We review the monetary policy experience since the start, with some emphasis on how the challenges of the European twin crises and subsequent slow recovery were met

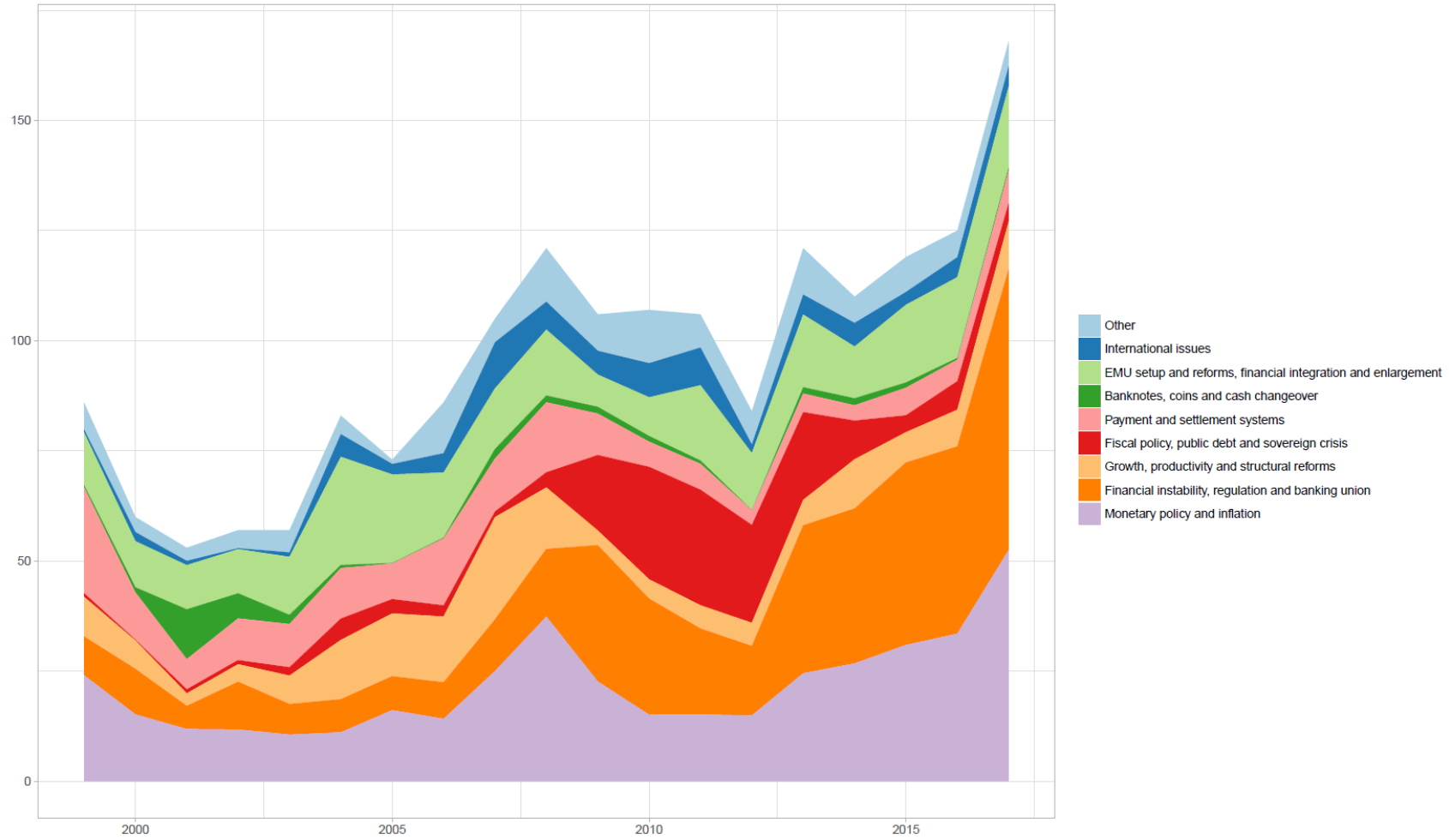
20 years of ECB monetary policy through the lens of Board Members' public speech topics

Speeches by ECB Executive Board members on monetary policy and inflation and their decomposition in topics (number of speeches per annum)



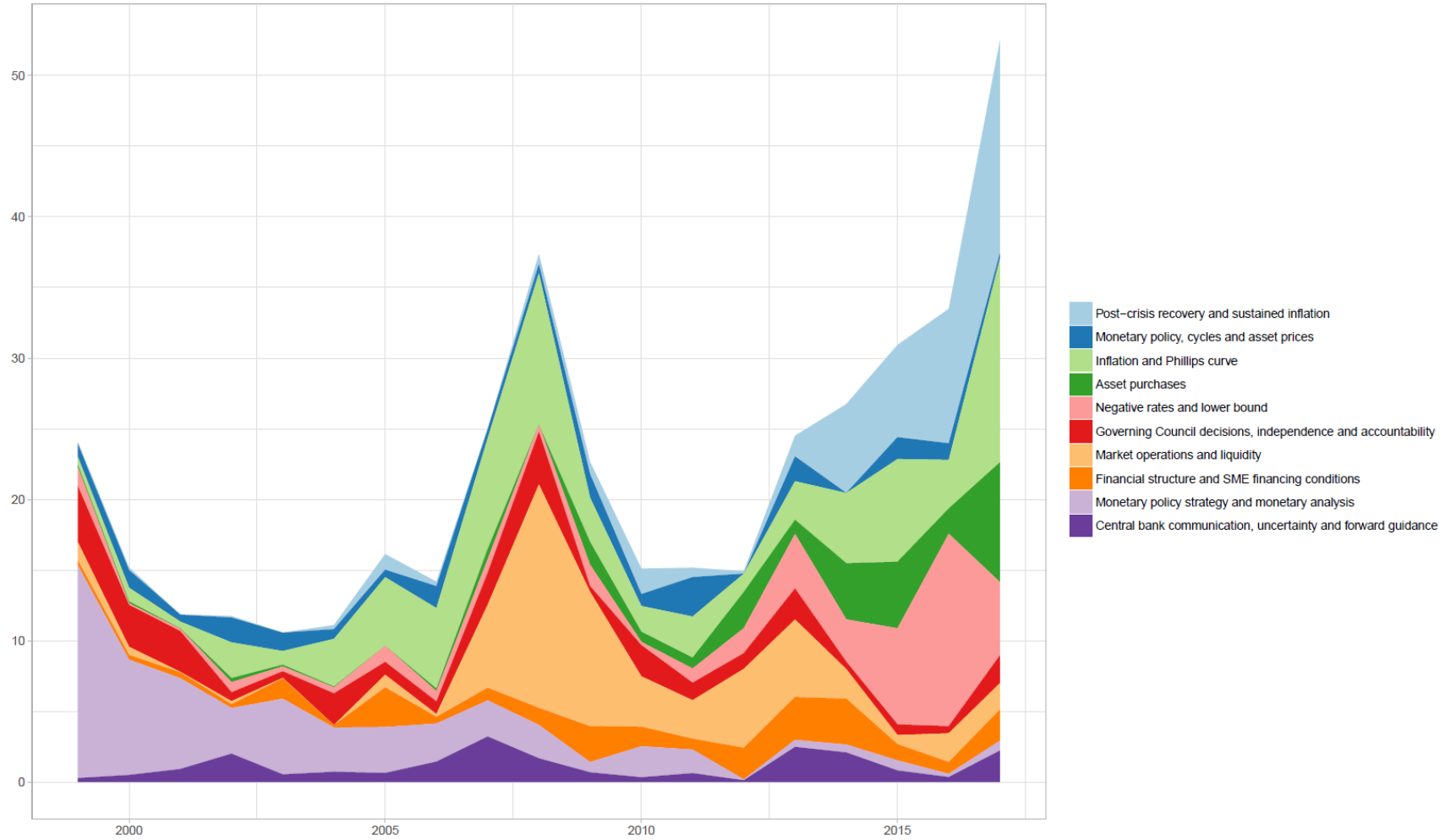
Sources: Authors and ECB.

Figure 1: Speeches by ECB Executive and Supervisory Board members and their decomposition in general themes (number of speeches per annum)



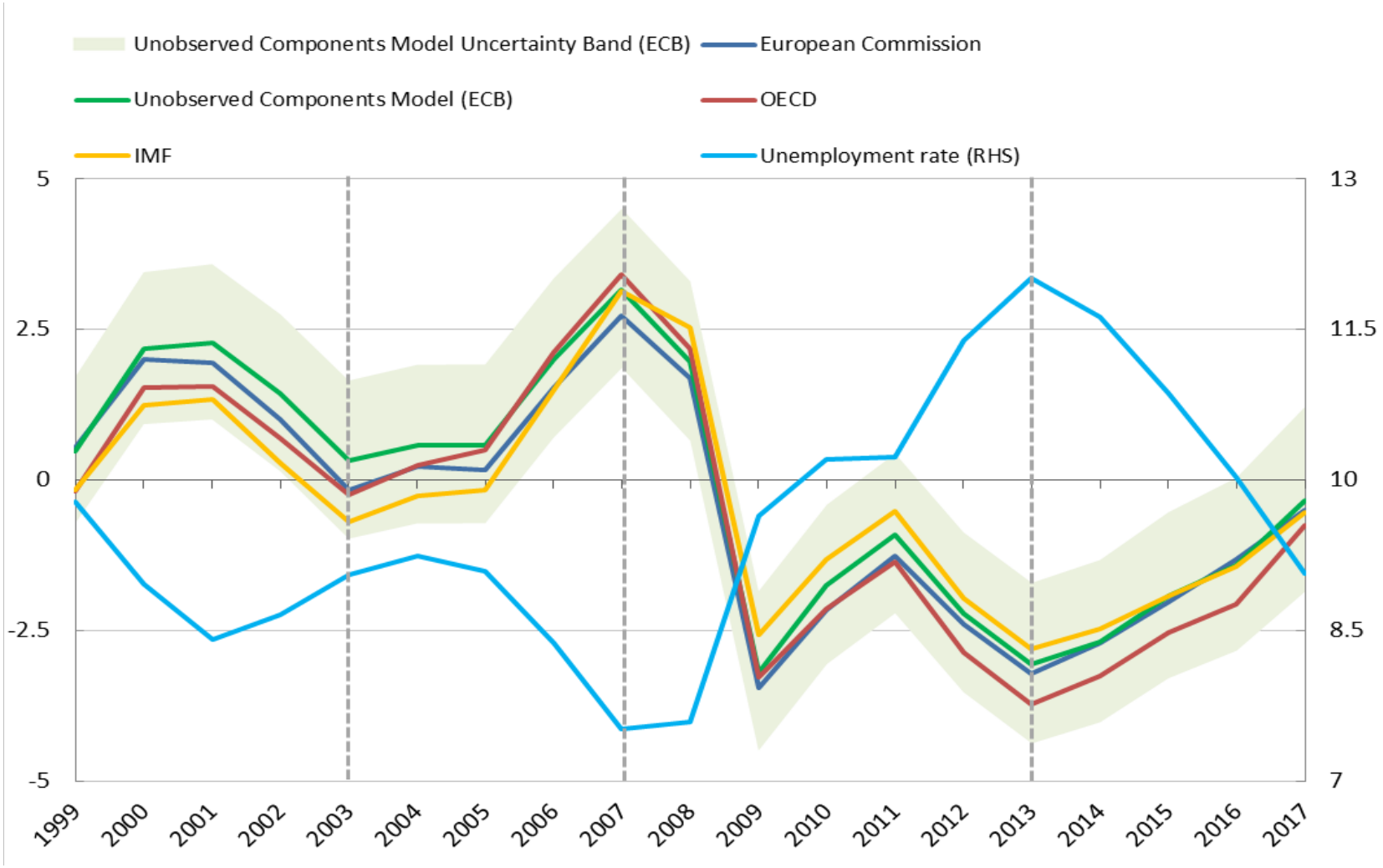
Sources: Authors and ECB.

Figure 2: Speeches by ECB Executive Board members on monetary policy and inflation and their decomposition in topics (number of speeches per annum)



Sources: Authors and ECB.

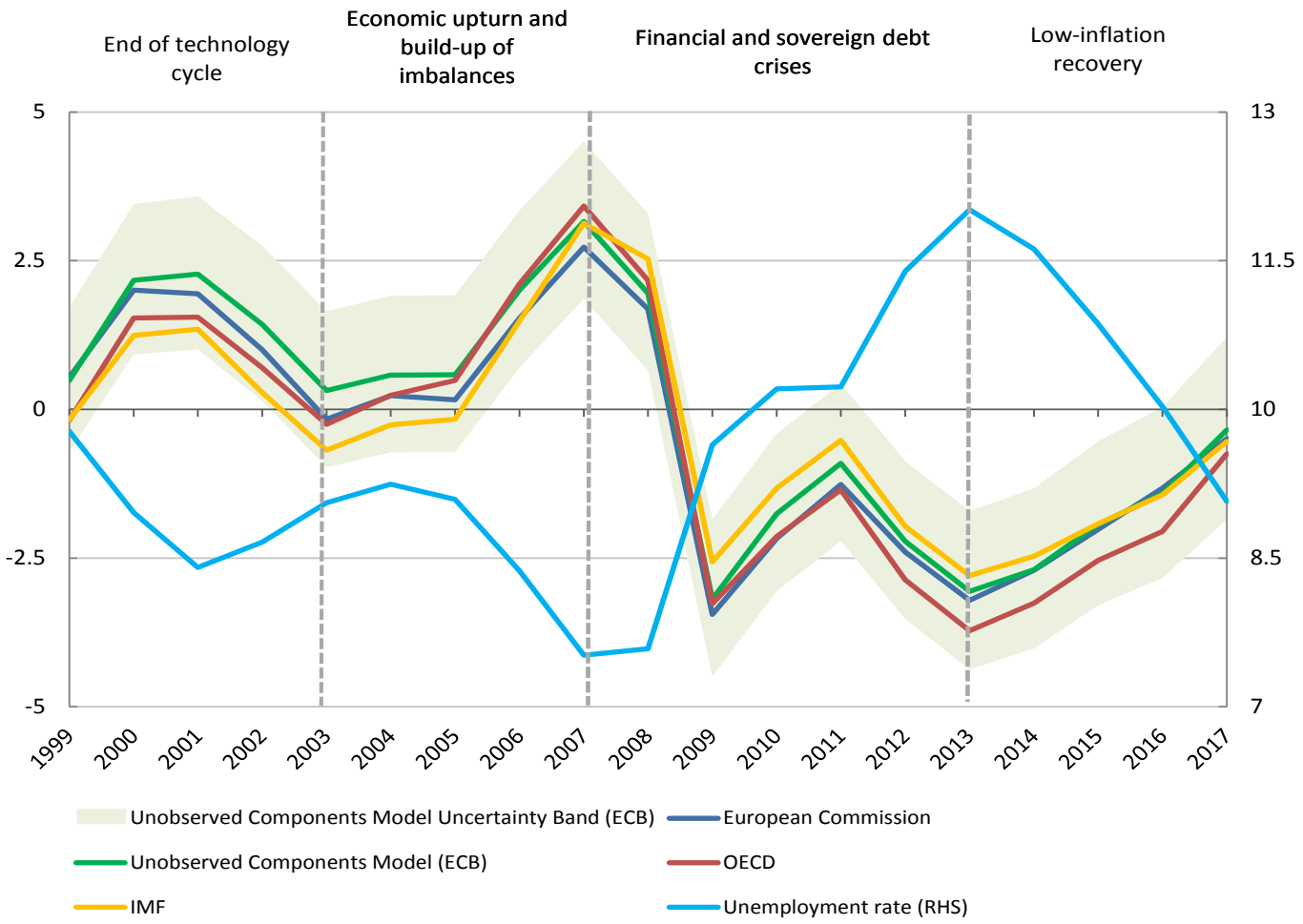
Figure 3: Euro area output gap estimates and the unemployment rate (LHS: percentage points, RHS: percent of labour force)



Sources: European Commission spring 2018 forecast; IMF World Economic Outlook April 2018; OECD Economic Outlook May 2018; ECB.

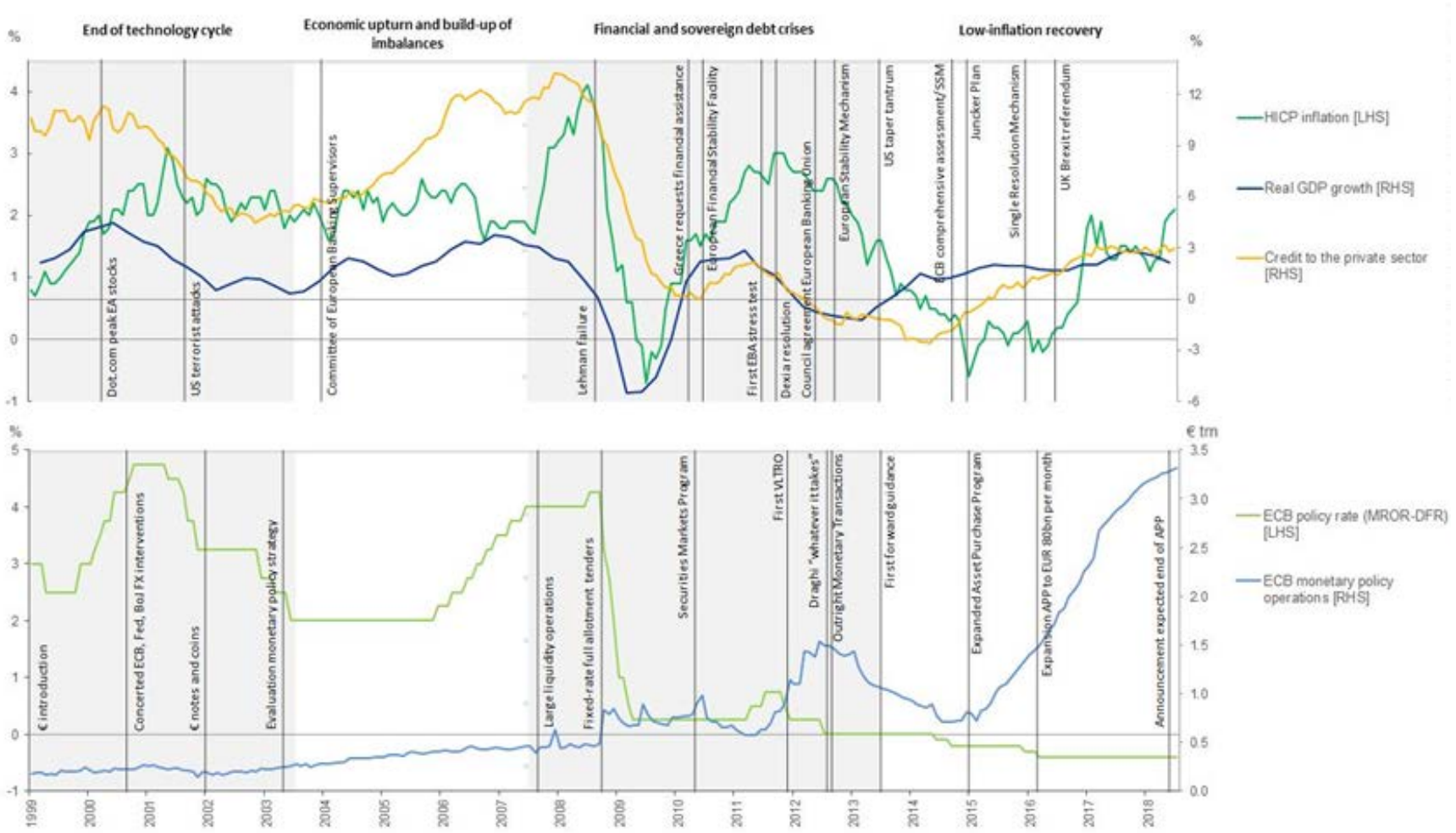
Chronological overview in four sub-periods

Figure 3a:



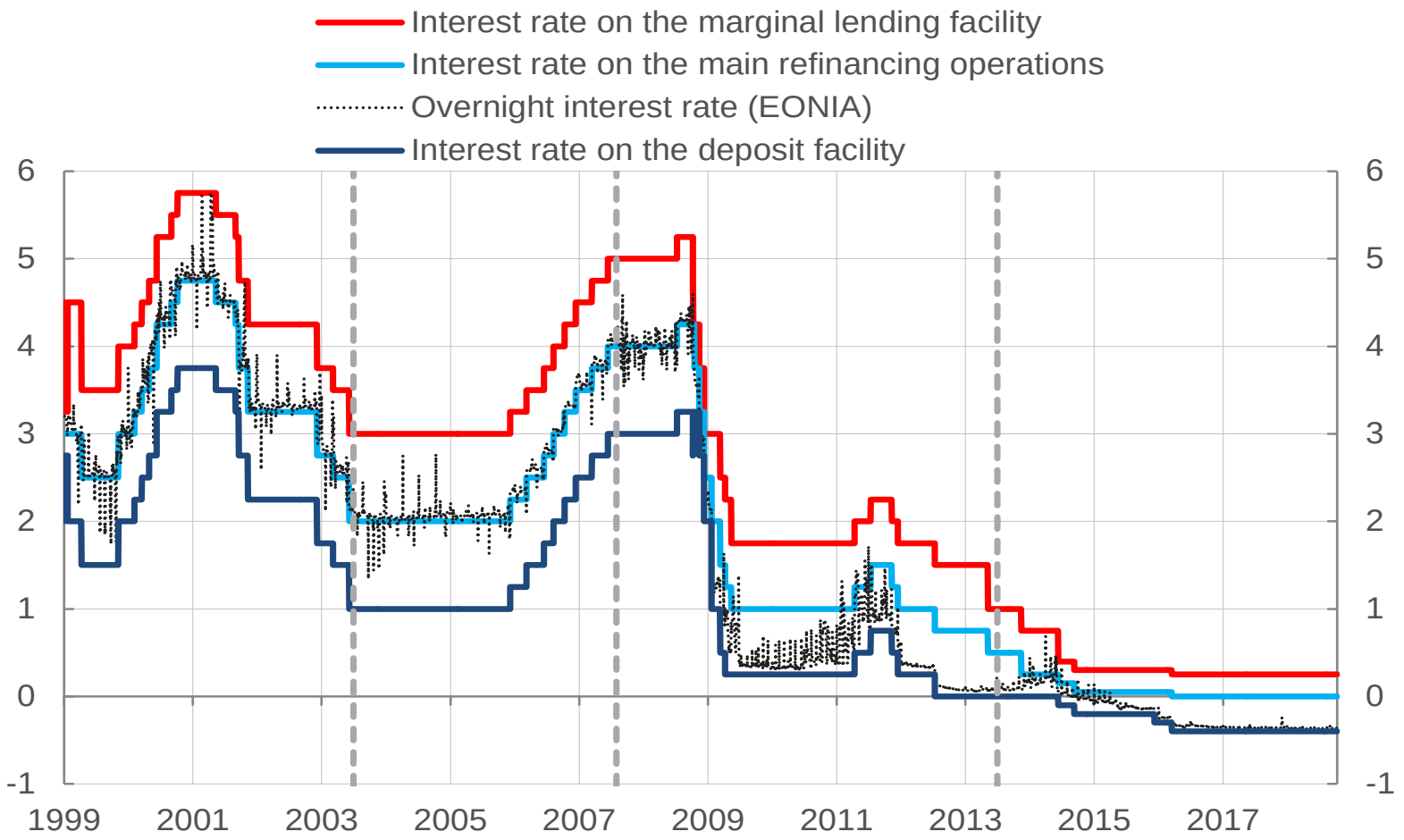
Sources: European Commission spring 2018 forecast; IMF World Economic Outlook April 2018; OECD Economic Outlook May 2018; ECB.

Figure 4: Four cyclical phases during the first twenty years of the euro – key macroeconomic and monetary policy variables and major events



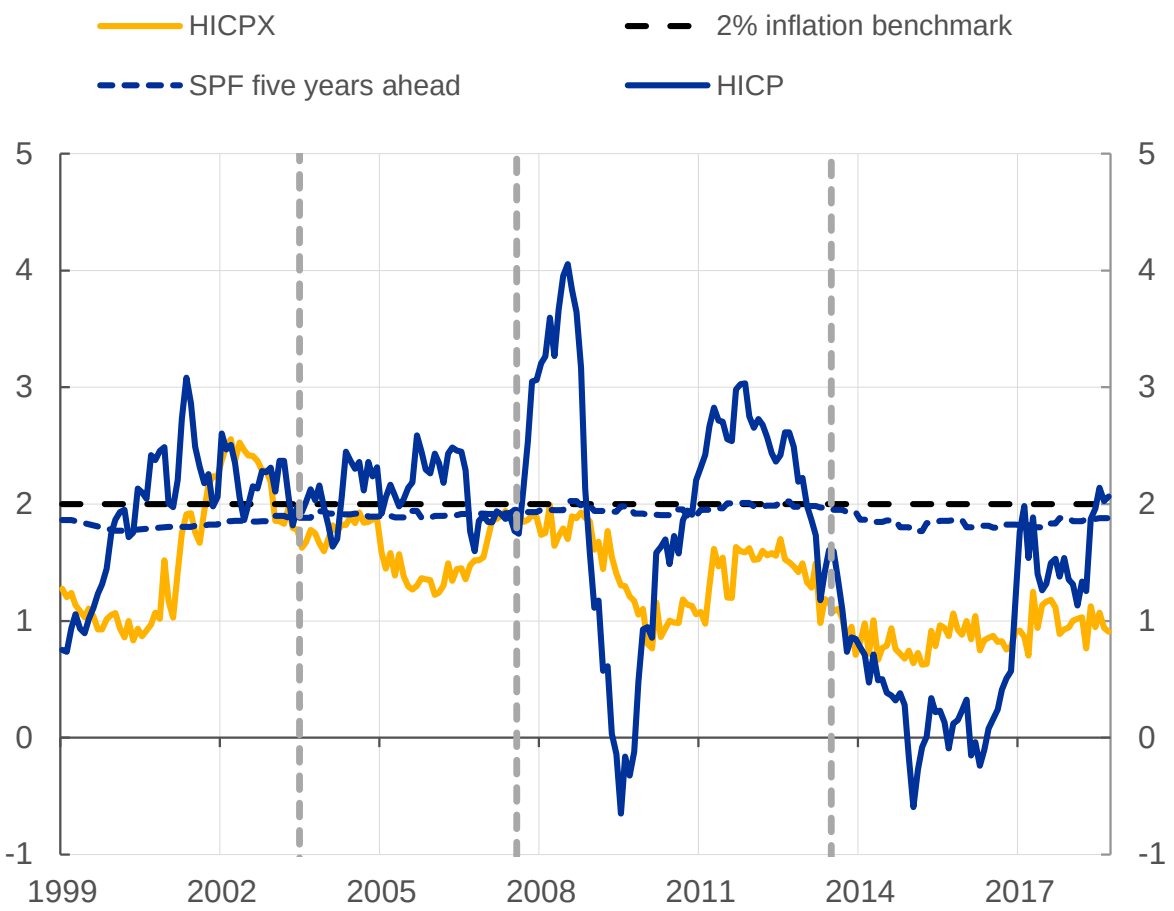
Sources: Authors and ECB.

Figure 5: ECB policy interest rates and EONIA (percentages per annum)



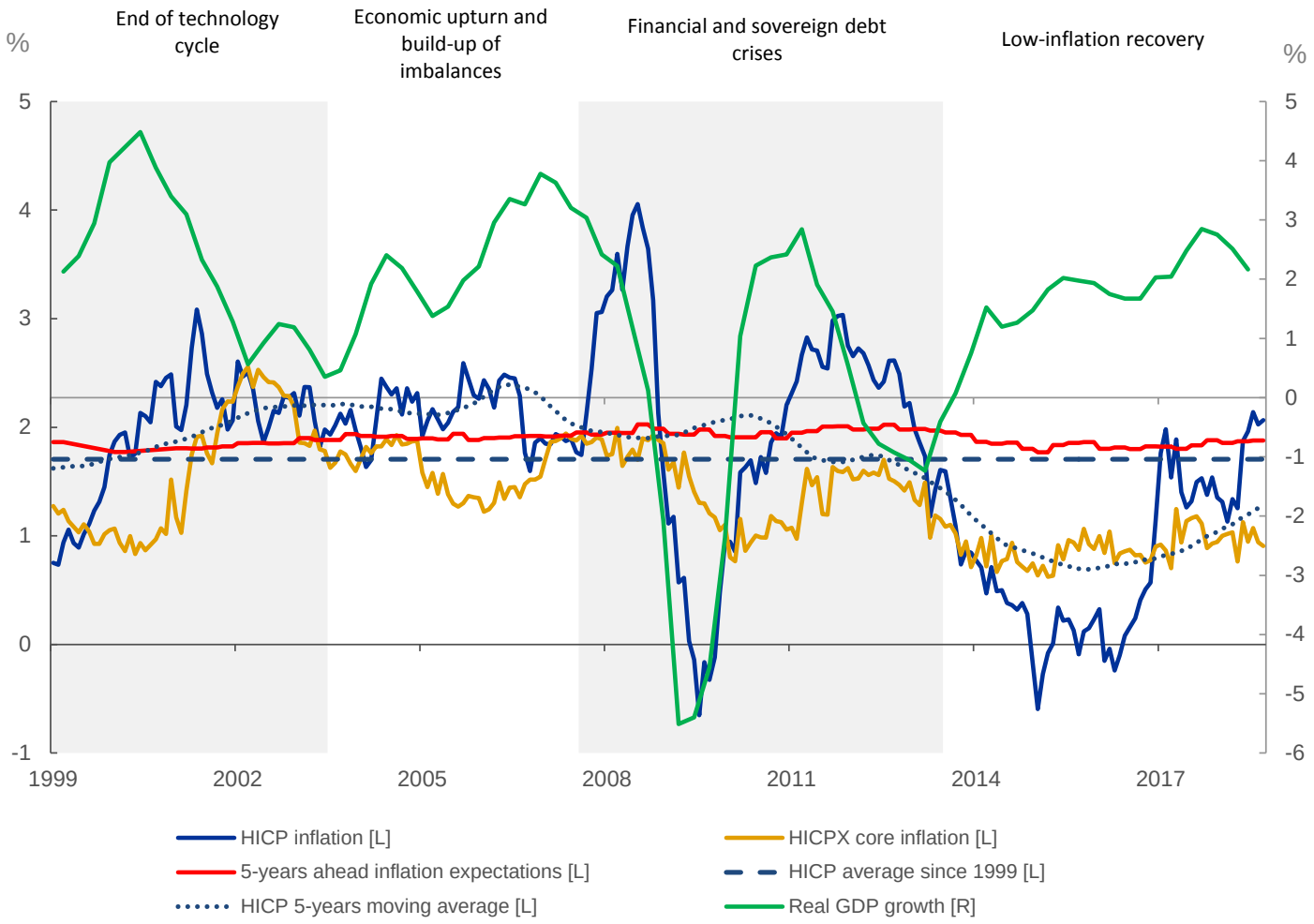
Sources: ECB

Figure 6: Euro area headline inflation, core inflation and longer-term inflation expectations (SPF; year on year percentage change)



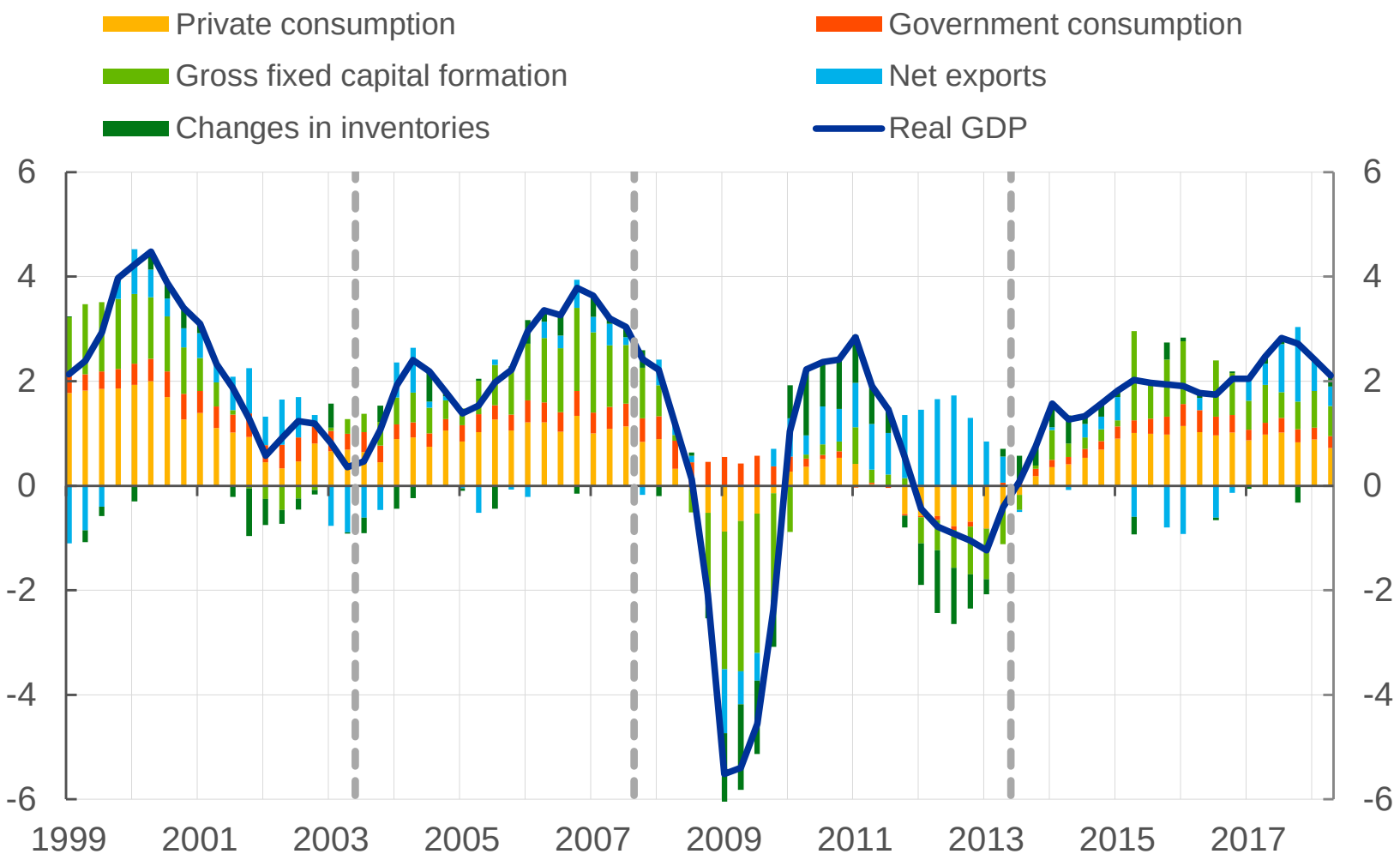
Sources: ECB and survey of professional forecasters (SPF).

Figure 6a:



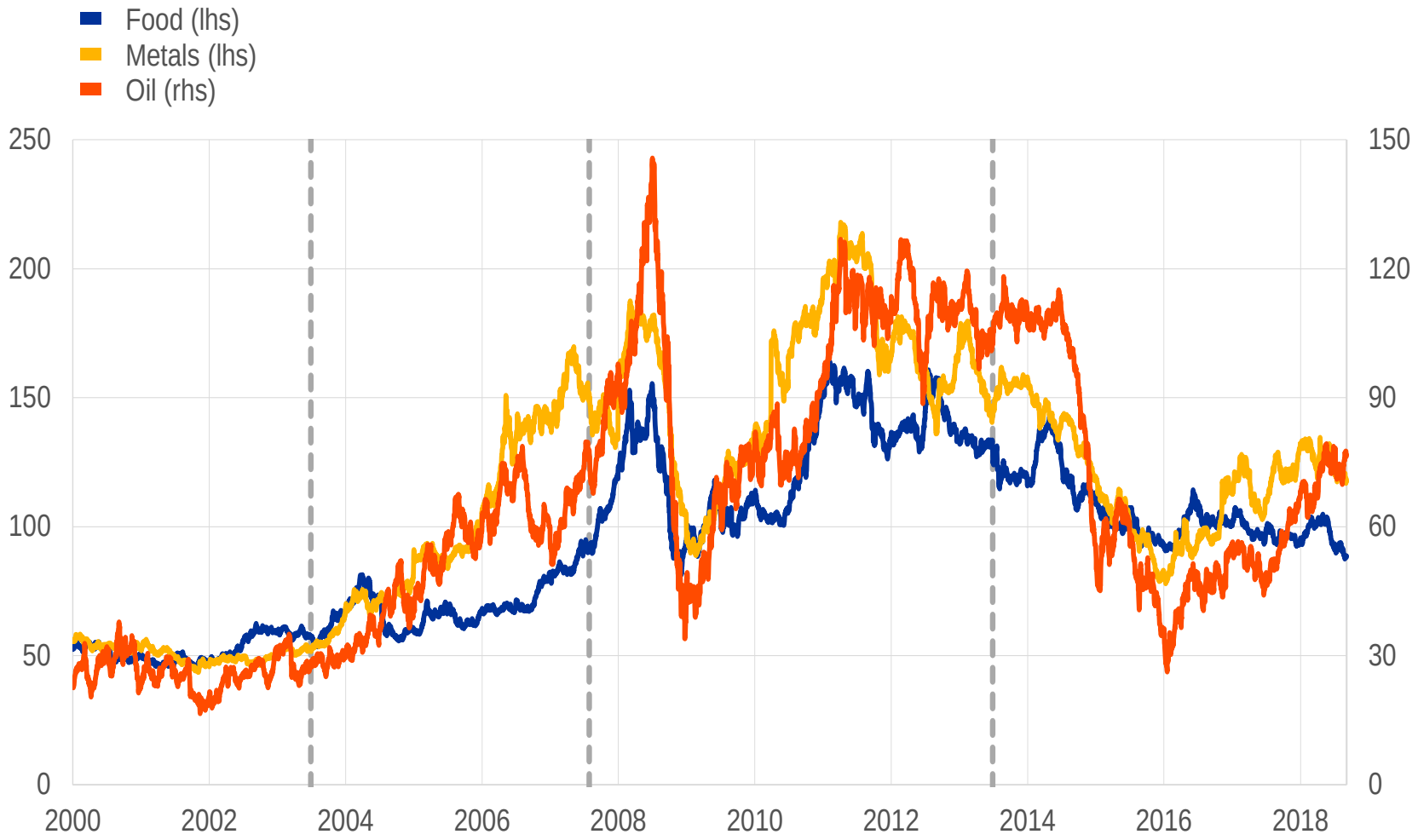
Sources: ECB.

Figure 7: Euro area real GDP growth and its components (annual percentage changes and percentage point contributions)



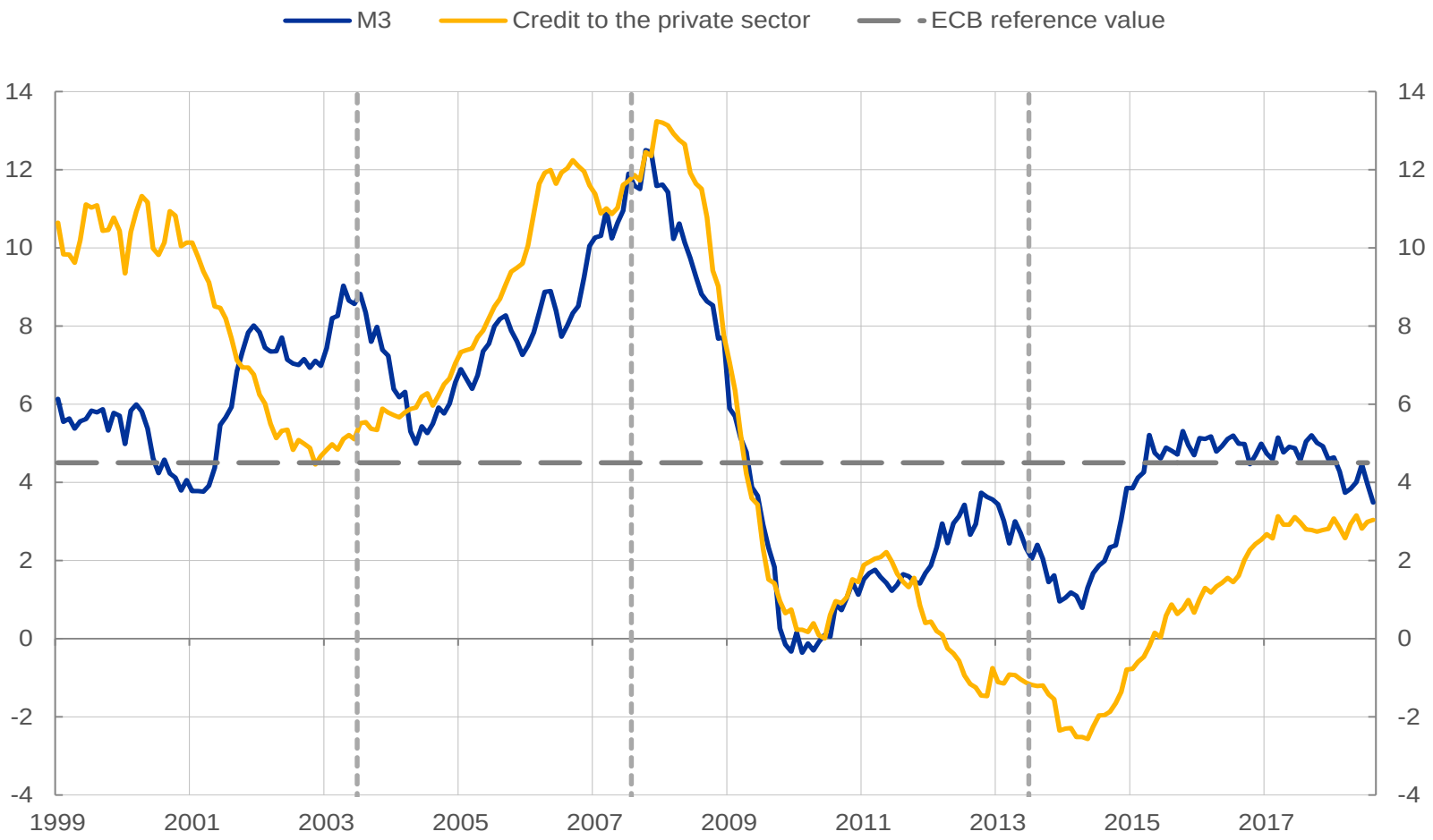
Sources: ECB.

Figure 8: Global food, oil and metals prices



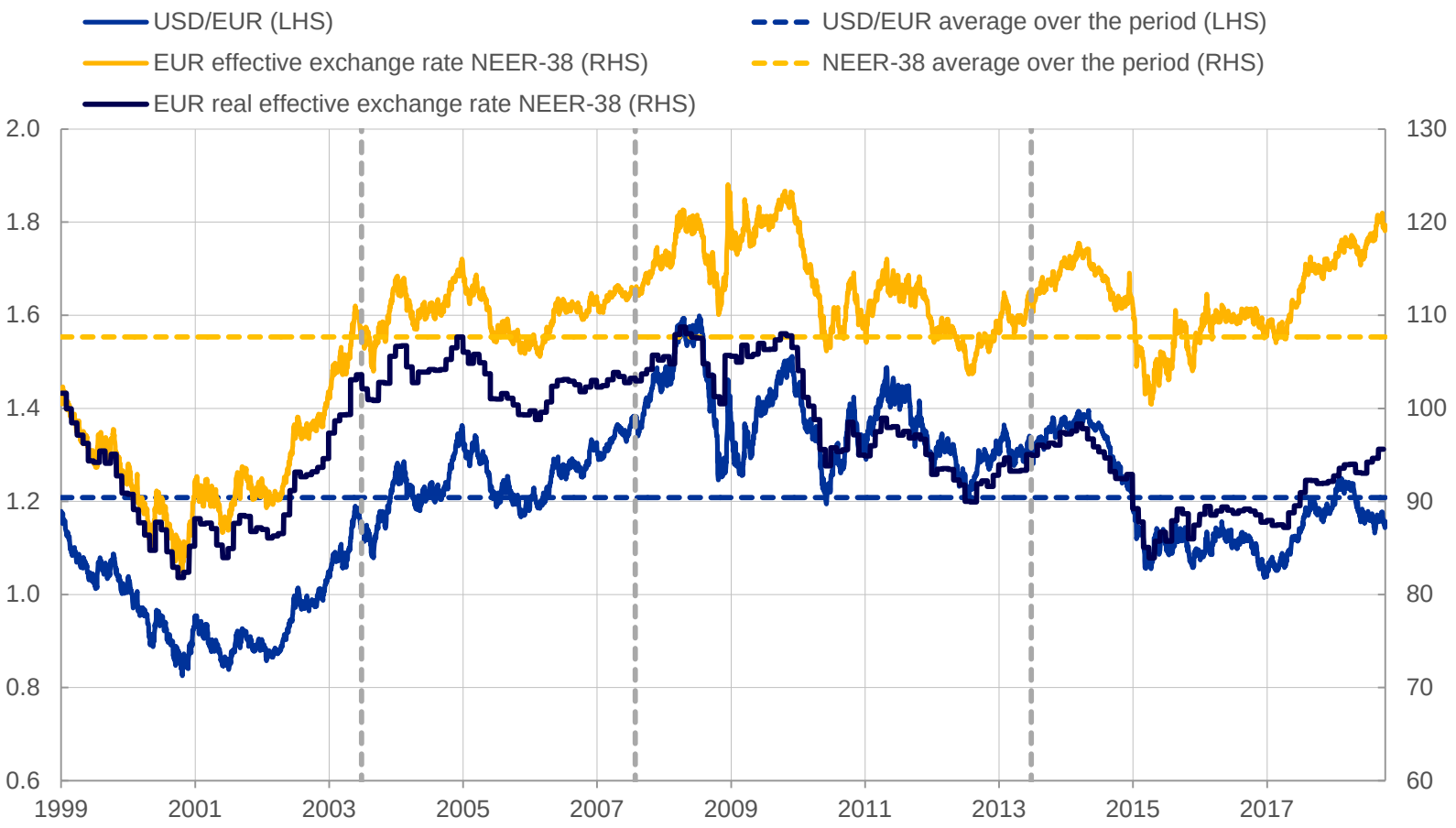
Sources: Bloomberg, HWWI and ECB staff calculations.

Figure 9: Growth of M3 and Monetary Financial Institutions' credit to the private sector for the euro area (percentages per annum)



Sources: ECB.

Figure 10: Euro exchange rate against the US dollar and in effective terms (LHS: US dollar, RHS: indexed at 1999Q1=100)



Sources: ECB.

Figure 11a: Current account balance *(2007, in % of GDP, y-axis)* and unemployment rate *(2013, in % of labour force, x-axis)*

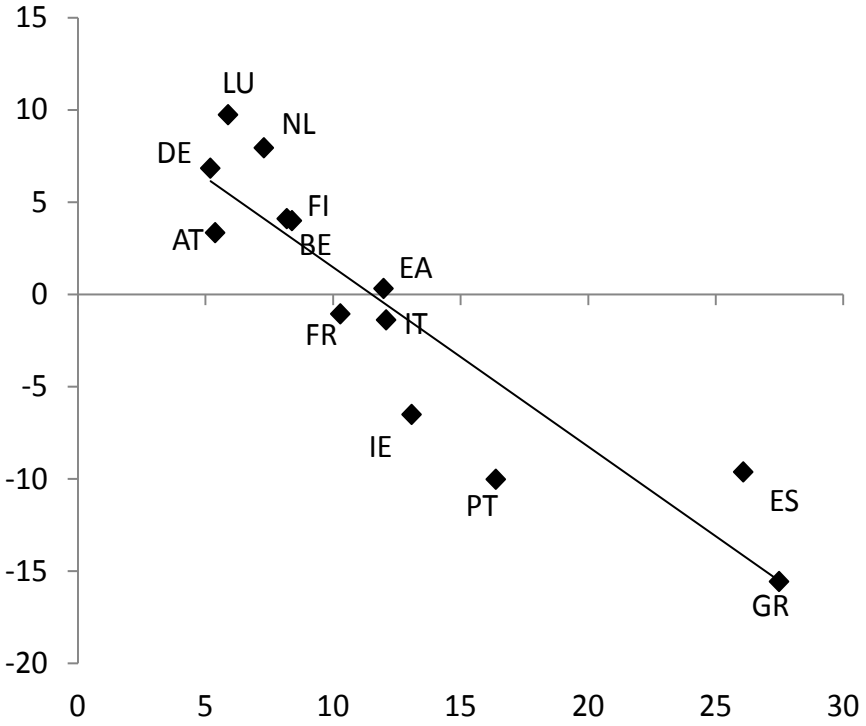
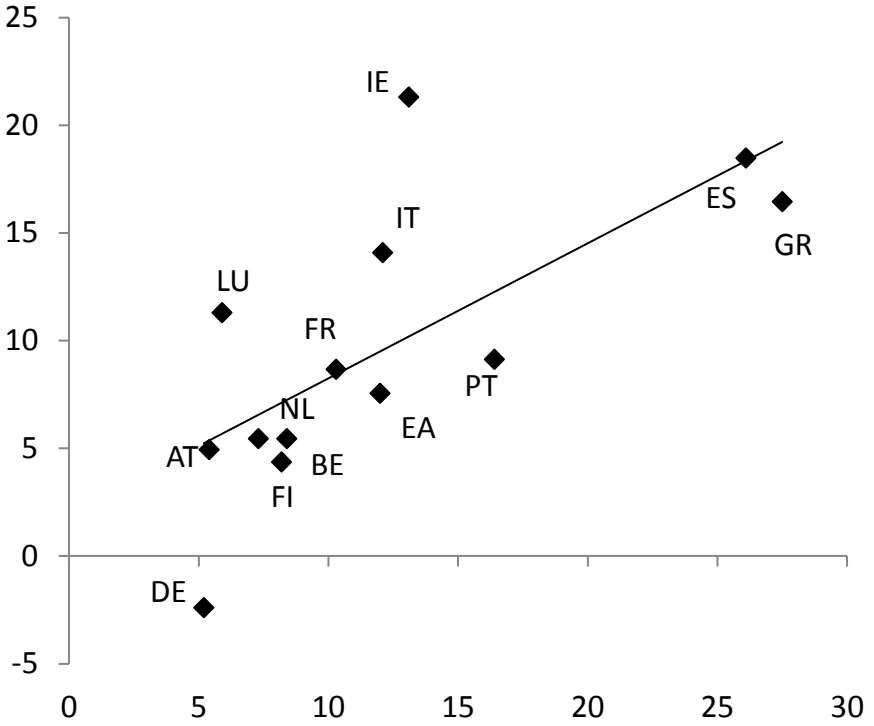


Figure 11b: Unit labour cost *(cumulated growth 2002-2007 in %, y-axis)* and unemployment rate *(2013, in % of labour force, x-axis)*



Sources: Eurostat and authors' calculations.

Figure 11c: Credit growth *(average per annum 2002-2007 in %, y-axis) and* unemployment rate *(2013, in % of labour force, x-axis)*

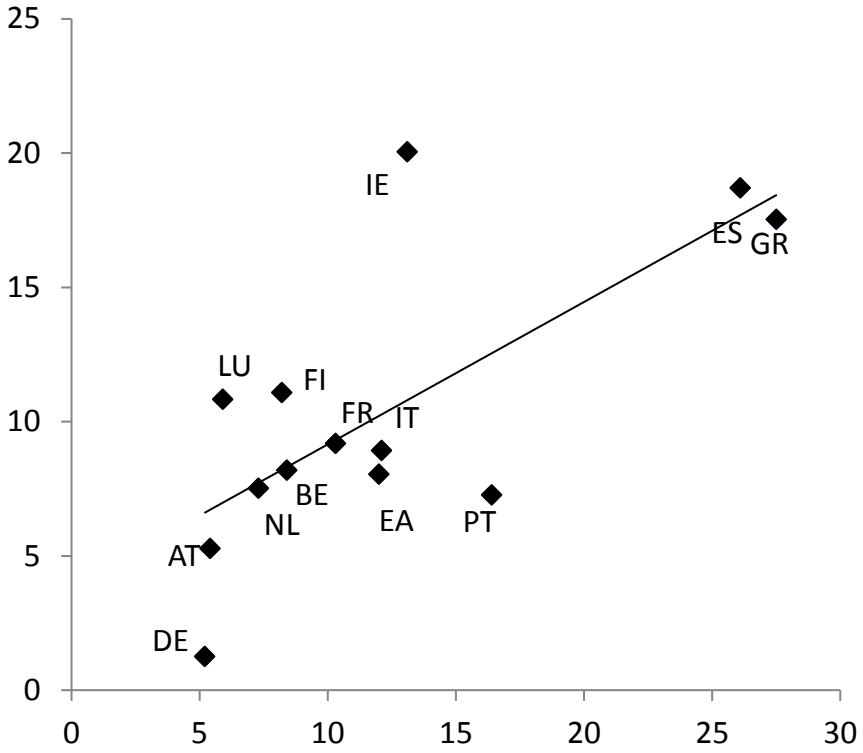
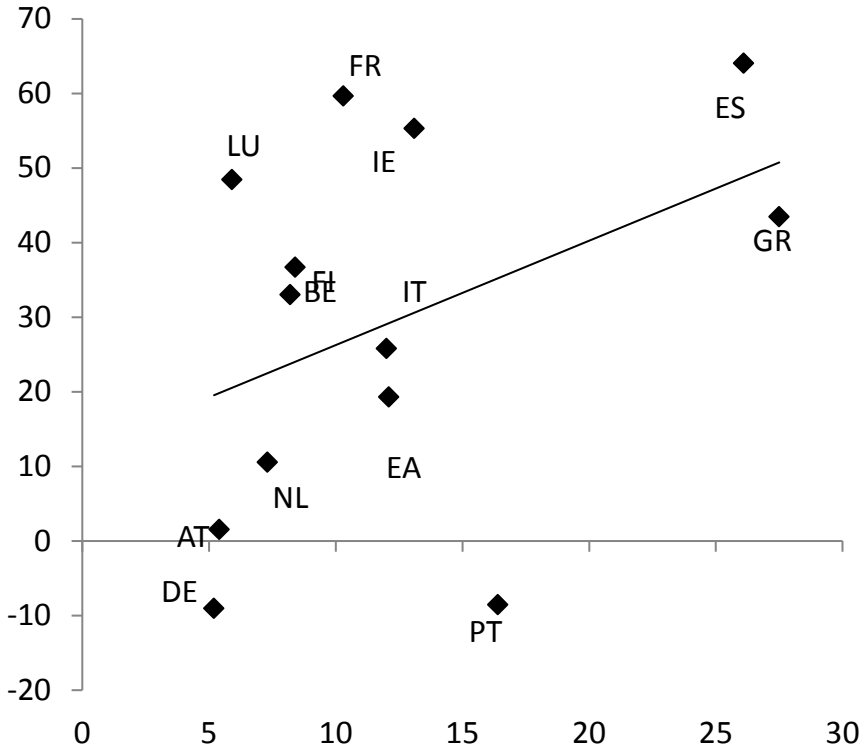
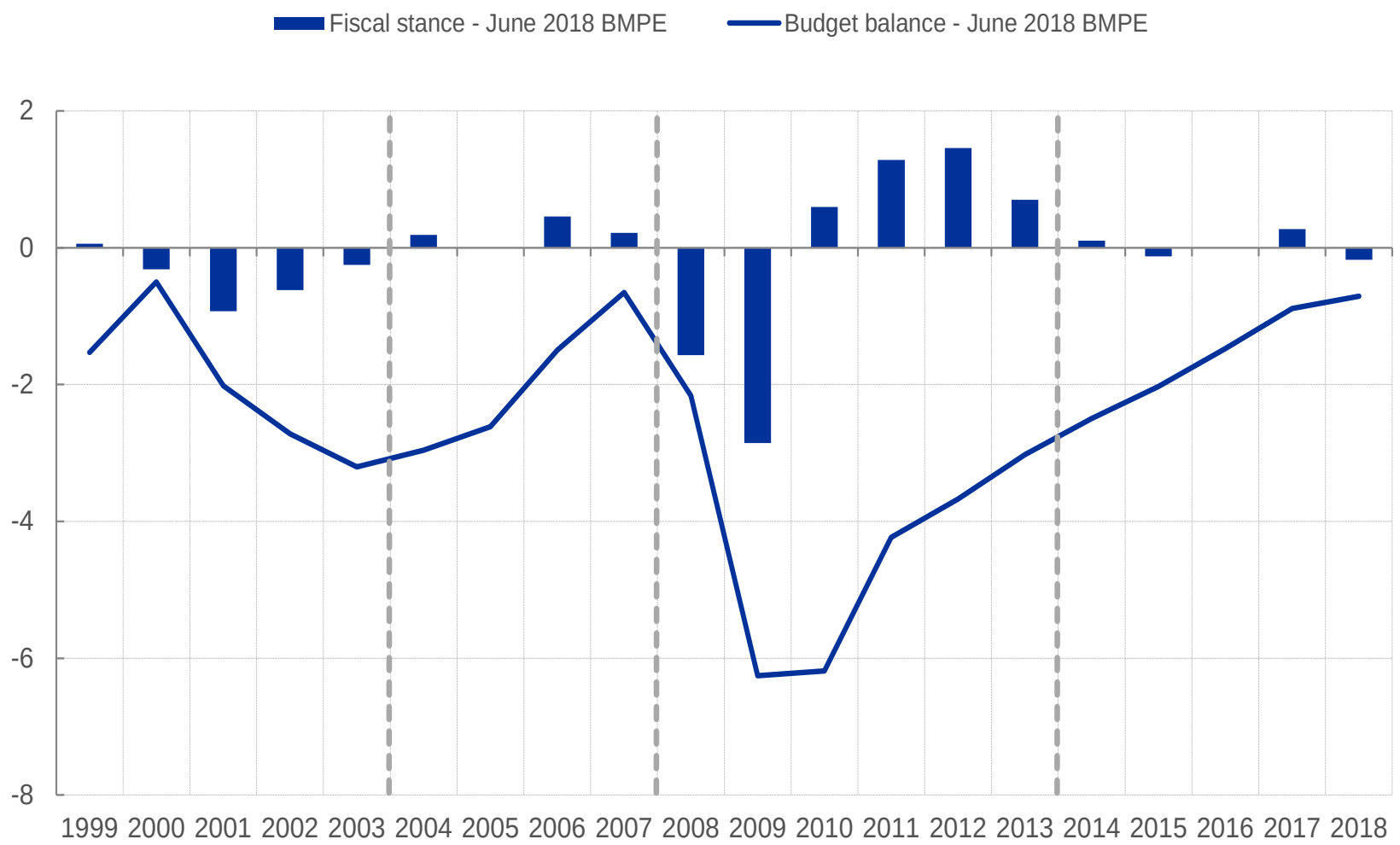


Figure 11d: House prices *(cumulated growth 2002-2007 in %, y-axis) and* unemployment rate *(2013, in % of labour force, x-axis)*



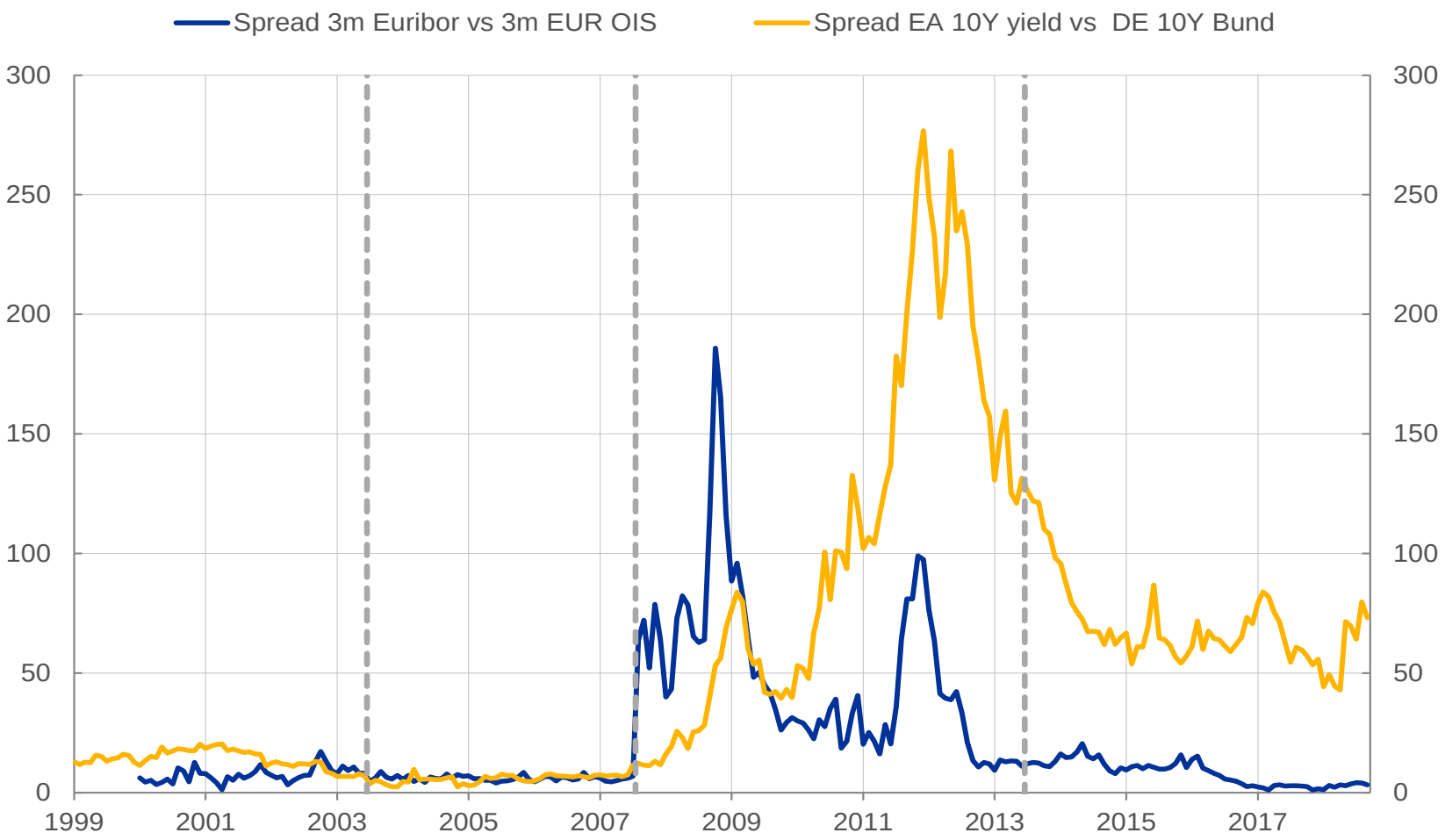
Sources: Eurostat and authors' calculations.

Figure 12: Aggregate of euro area member countries' fiscal policies (percent of GDP)



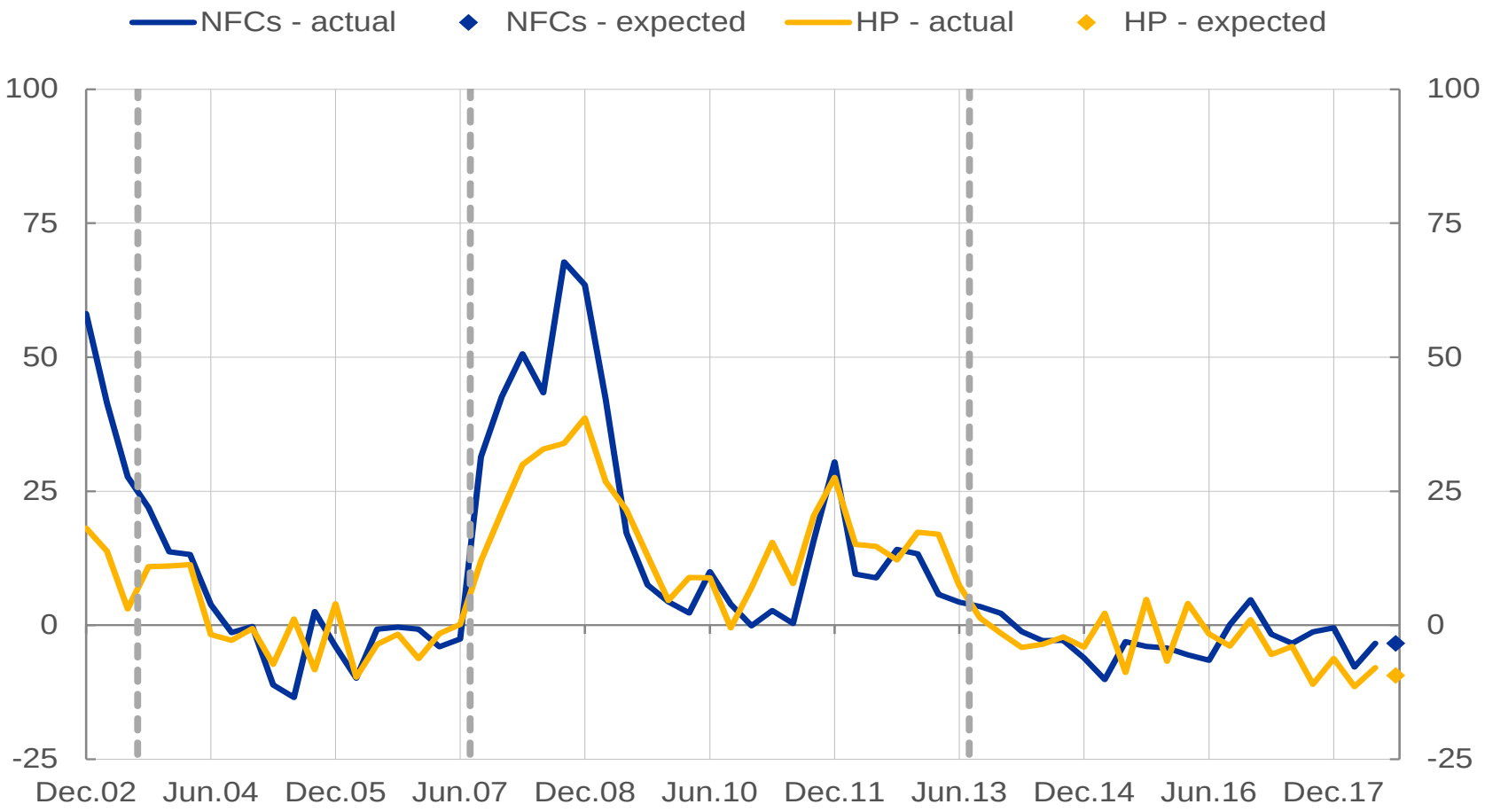
Sources: ECB.

Figure 13: Euro area money and government bond market spreads (basis points)



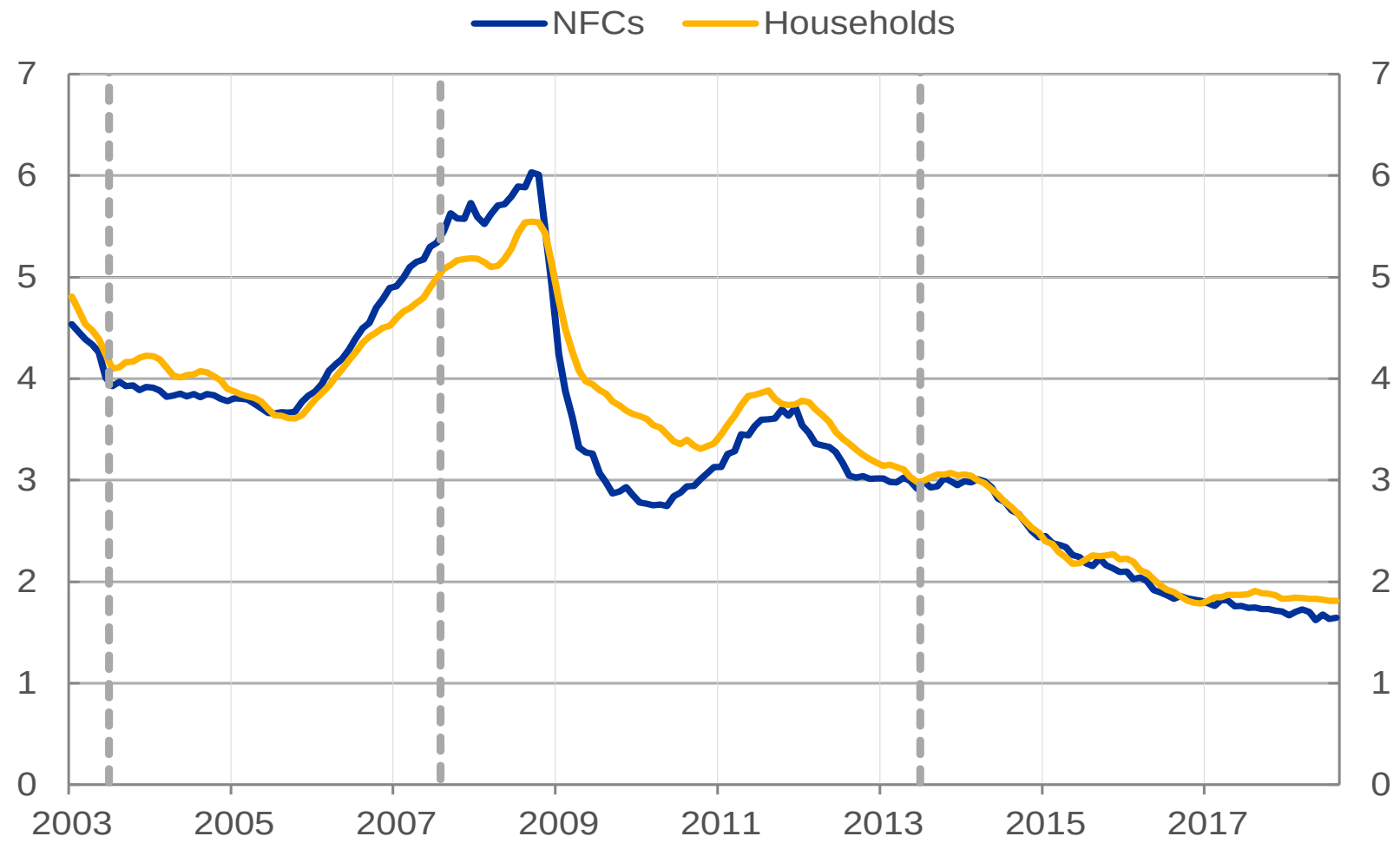
Sources: ECB.

Figure 14: Changes in euro area bank credit standards applied to the approval of loans or credit lines to enterprises and households for house purchase (net percentage of banks reporting tightening credit standards)



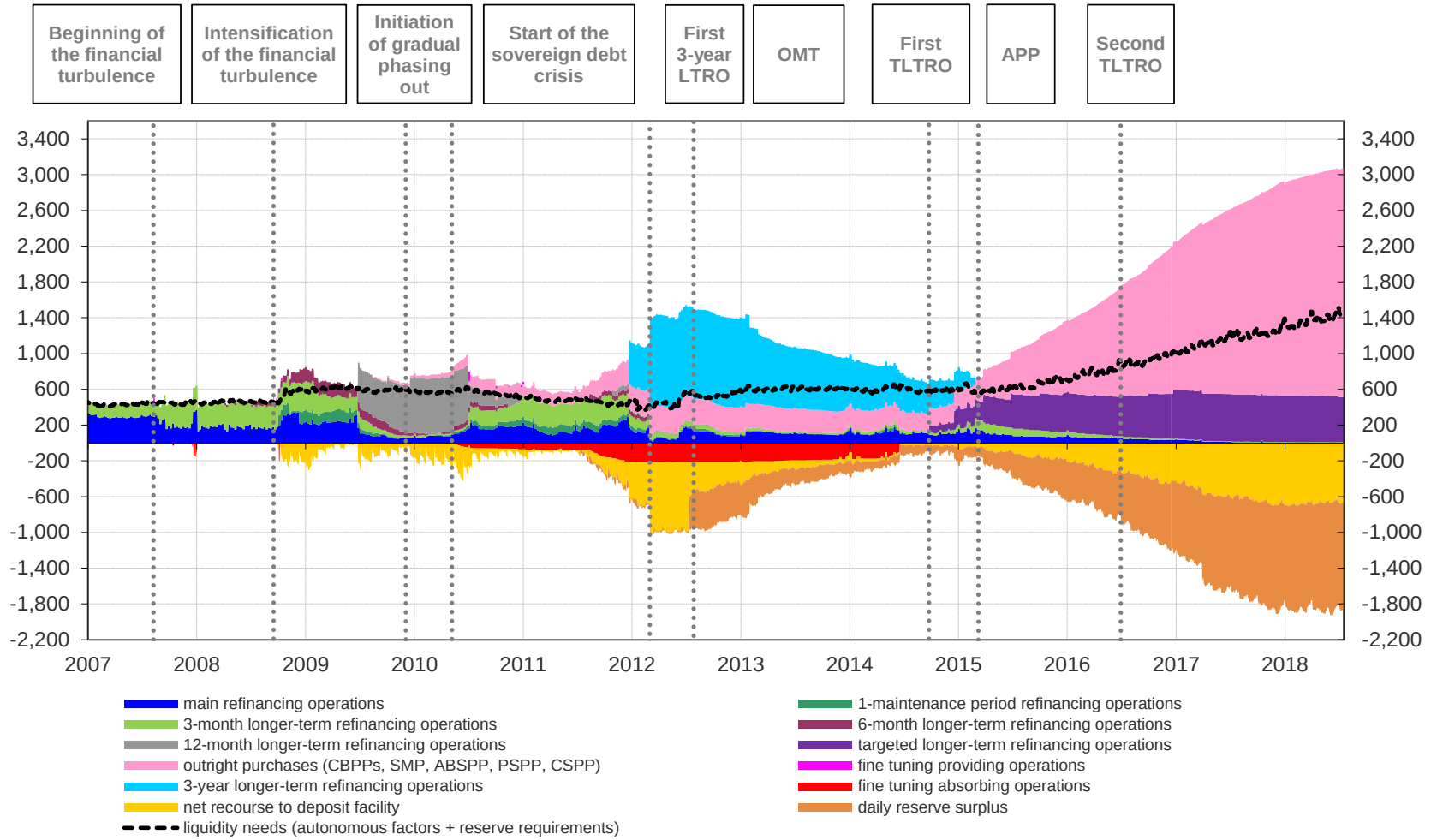
Sources: July 2018 ECB Bank Lending Survey.

Figure 15: Composite bank lending rates for NFCs and households for house purchase in the euro area (percentages per annum)



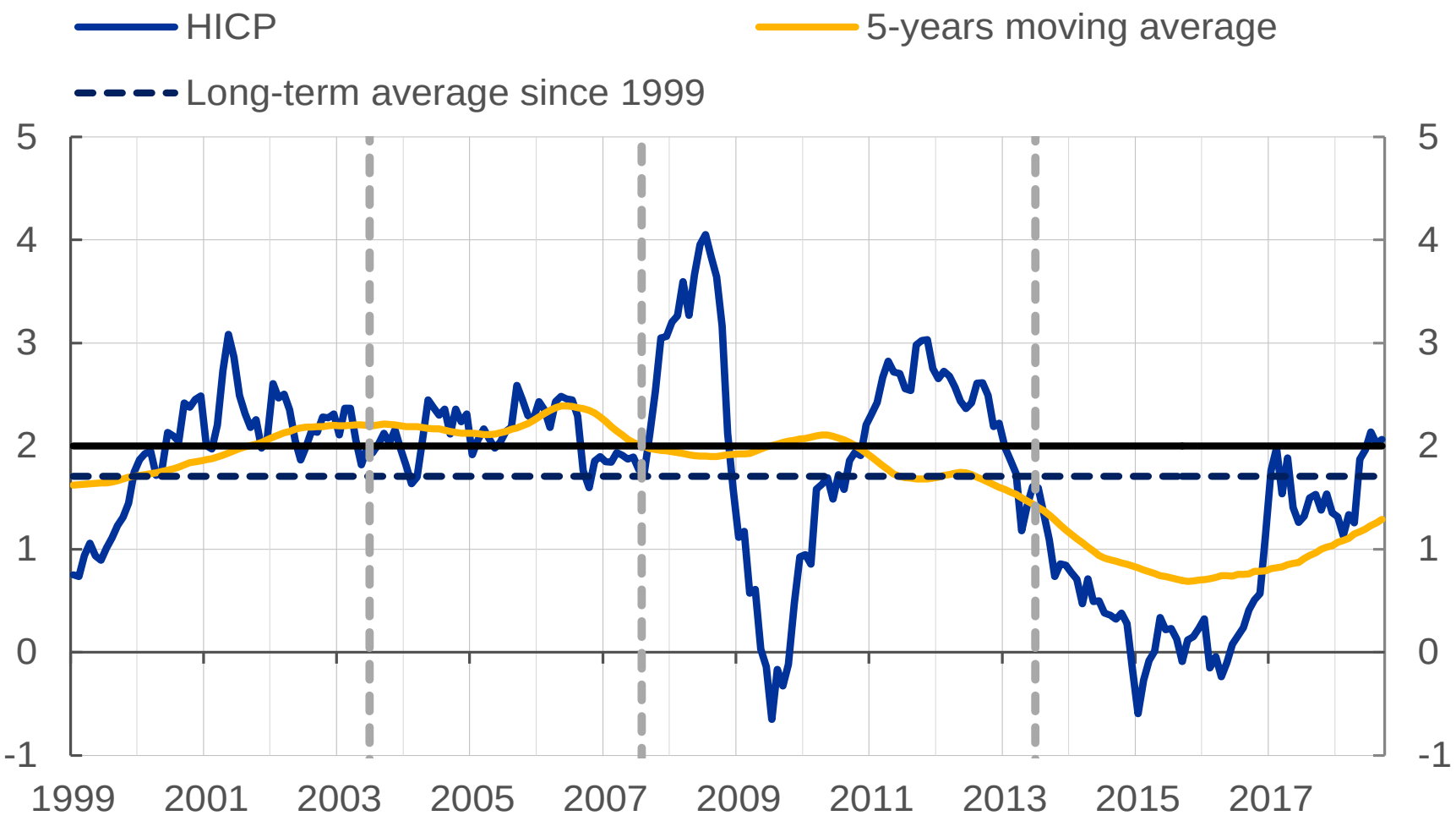
Sources: ECB.

Figure 16: Quantities of ECB market operations from a balance-sheet perspective (€ bn)



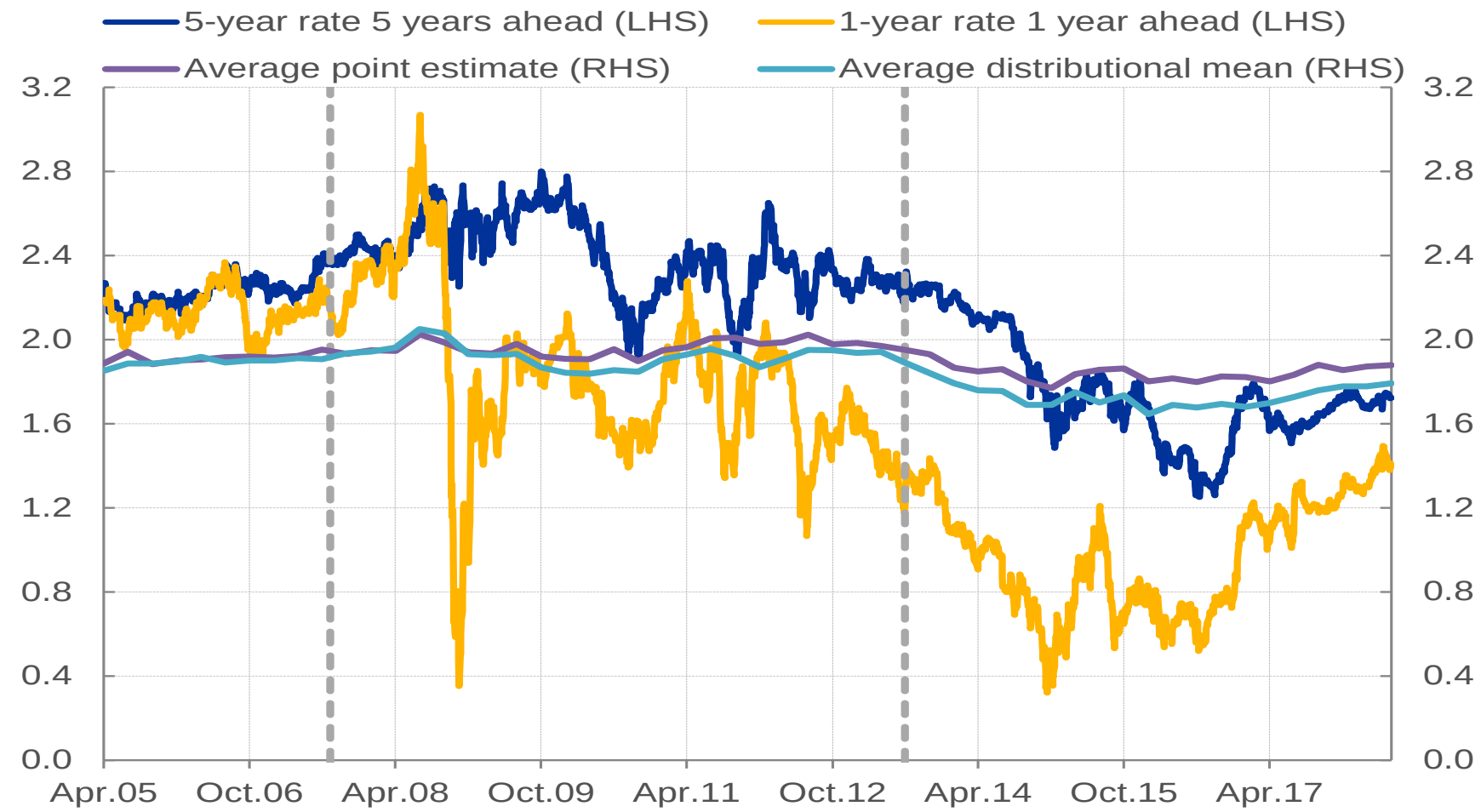
Sources: ECB.

Figure 17: Euro area headline inflation and a 5-year moving average (year on year percentage change)



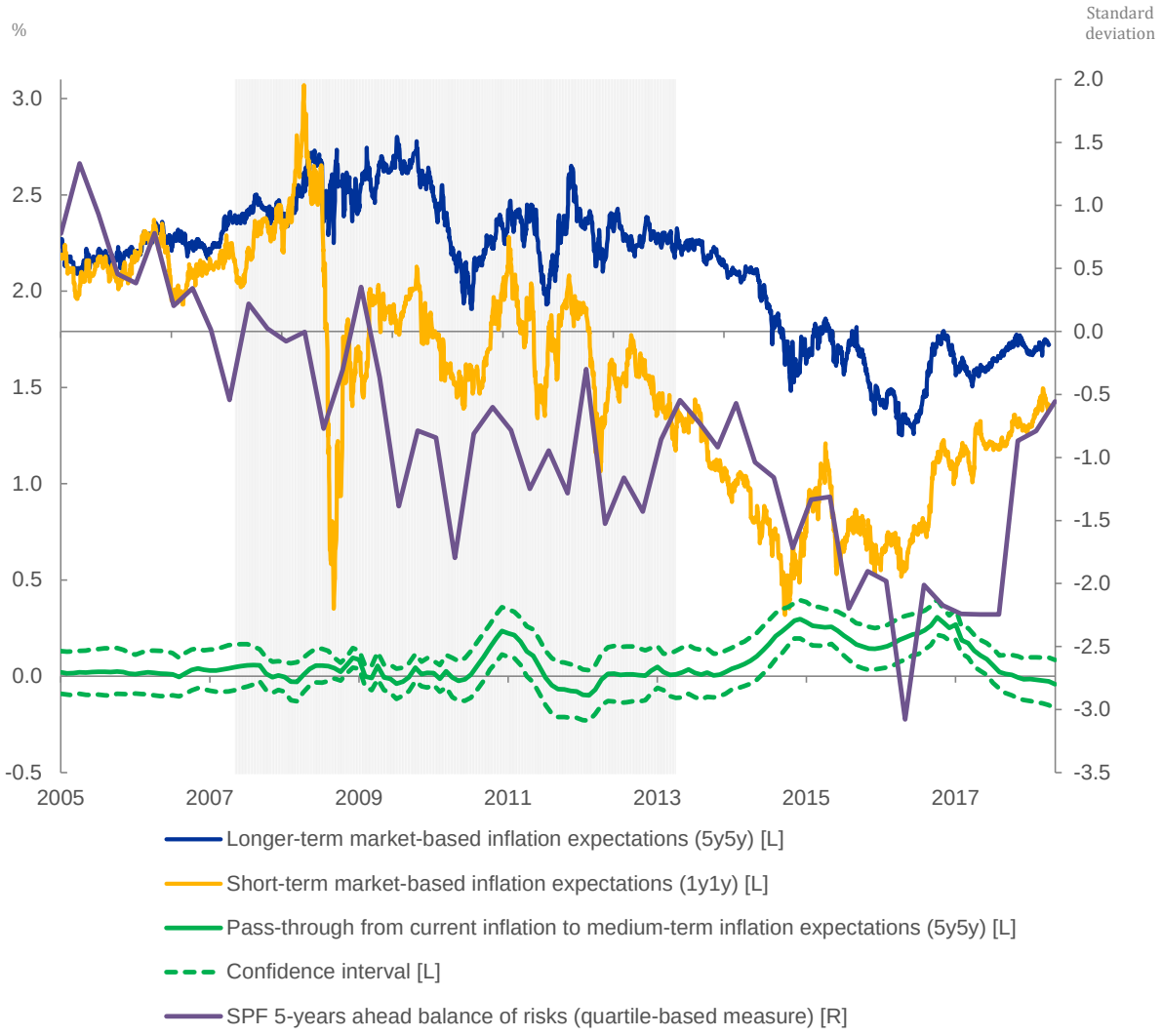
Sources: ECB.

Figure 18: Average five-year ahead inflation expectations in the euro area (SPF) (LHS: percentages per annum, RHS: year-on-year percentage change)



Sources: ECB and survey of professional forecasters (SPF).

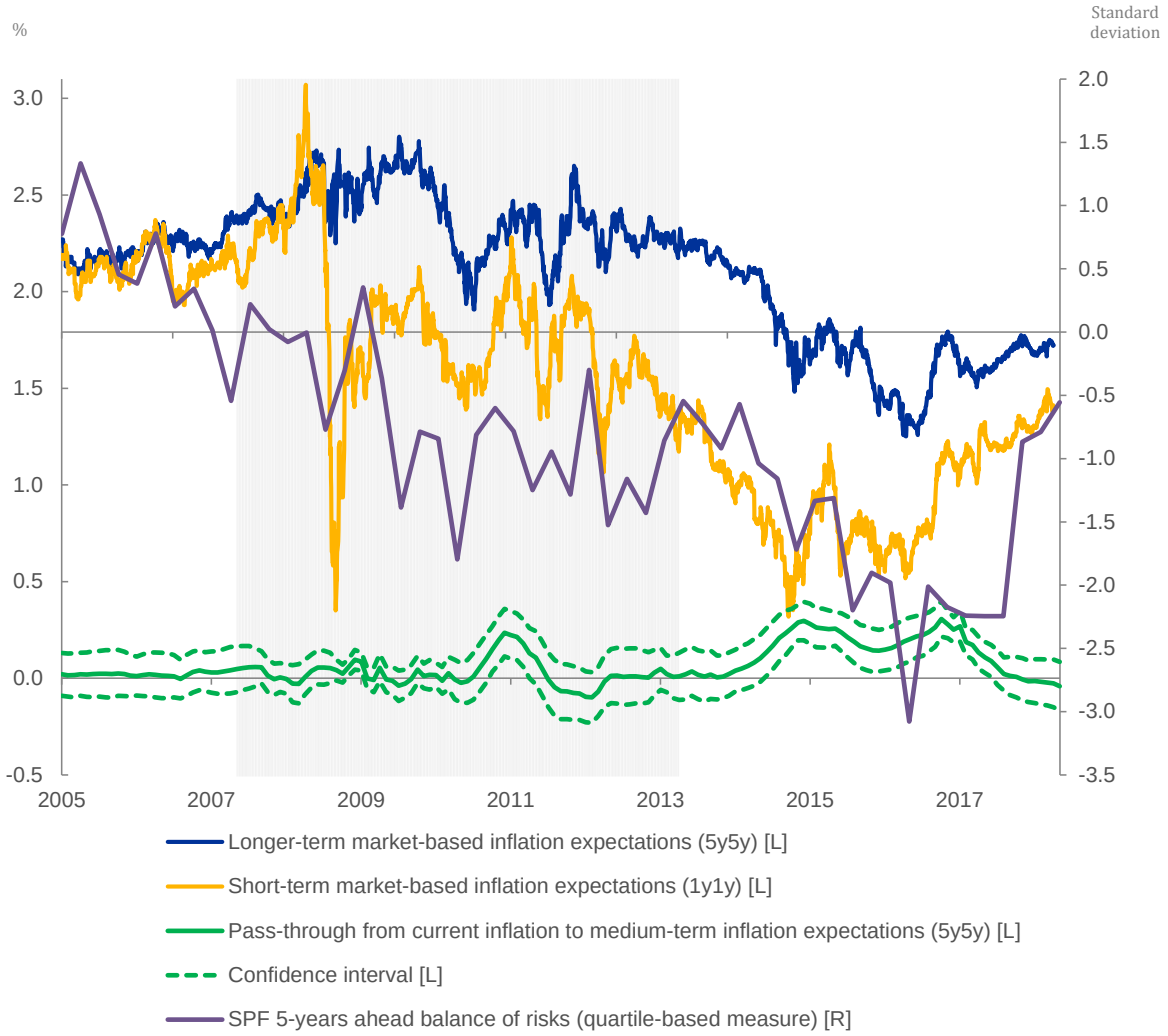
What happened with inflation expectations in 2014?



- Headline (and core) inflation declining since 2013
- Indicators of inflation expectations declining (Draghi digression in Aug 2014 Jackson Hole speech)
- Risk of deanchoring inflation expectations (Japan?)
- Proof of toolkit for fighting deflationary risks at/close to lower bound needed

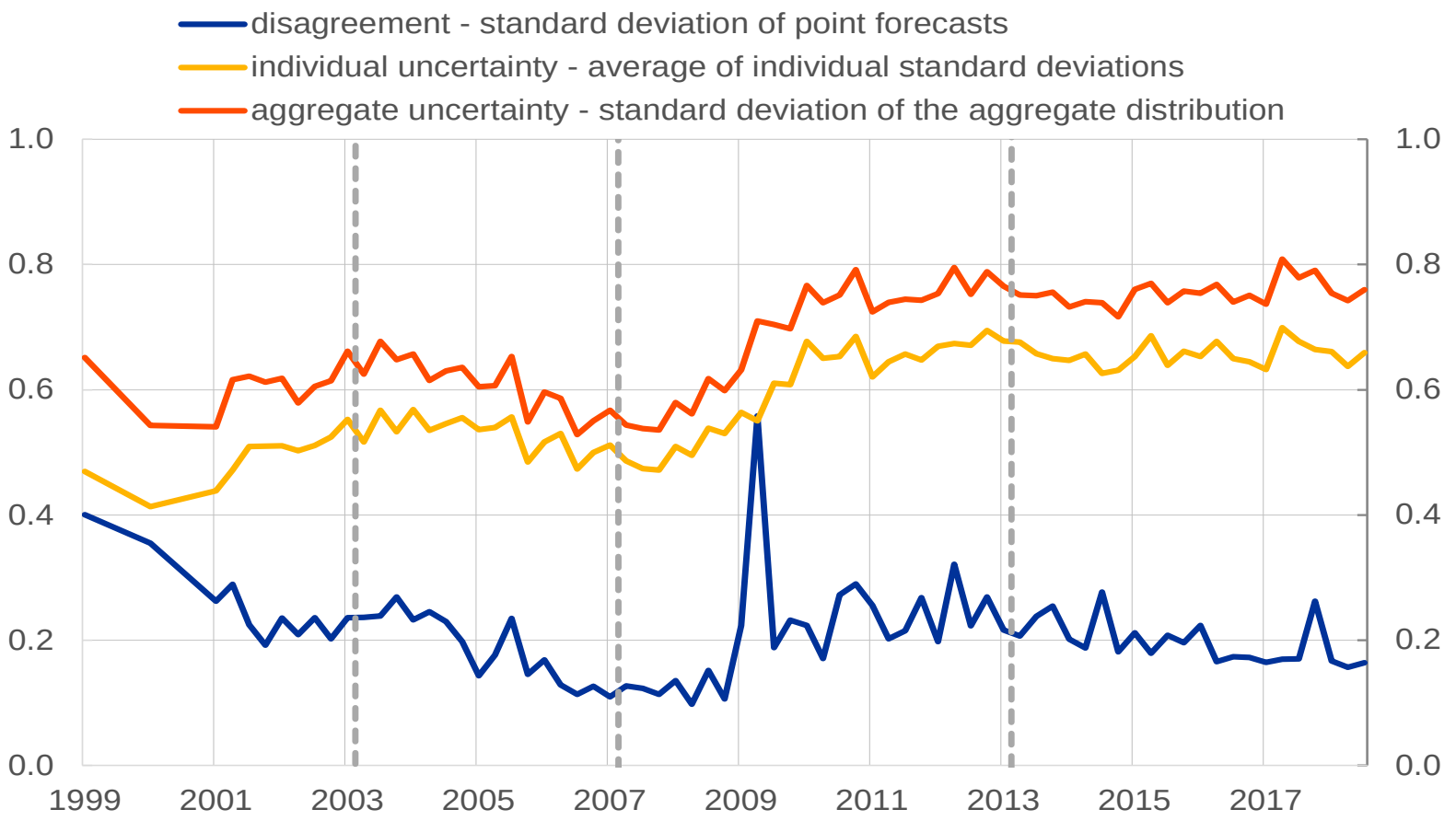
Sources: Authors, ECB, Ciccarelli and Osbat (2017).

Figure 18a:



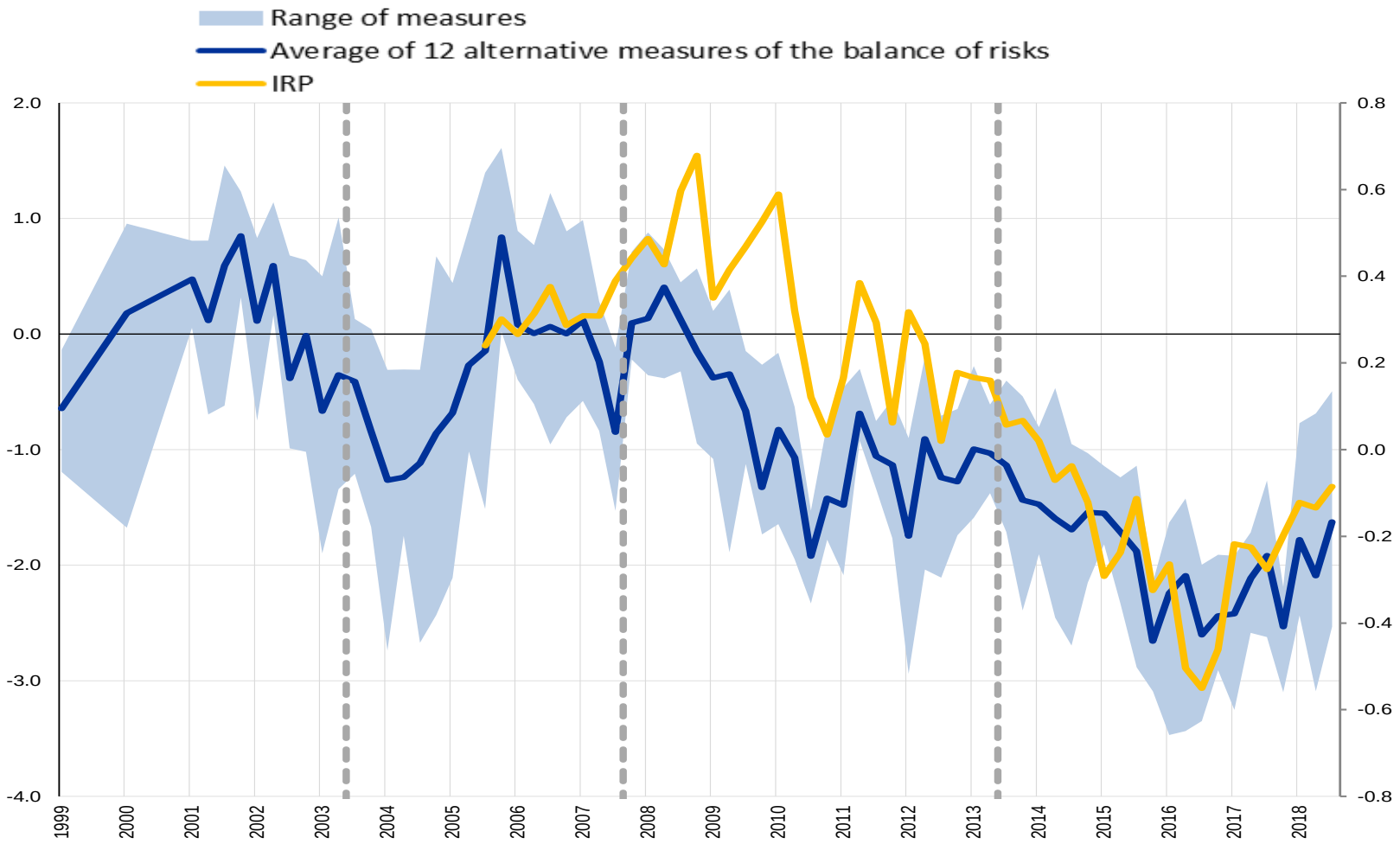
Sources: Figure 2 in Hartmann and Smets (2019), 20 Jahre EZB-Geldpolitik, *Zeitschrift für das gesamte Kreditwesen*, vol. 72, 1 January, pp. 28-32.

Figure 19: Euro area longer-term inflation uncertainty (SPF; standard deviations)



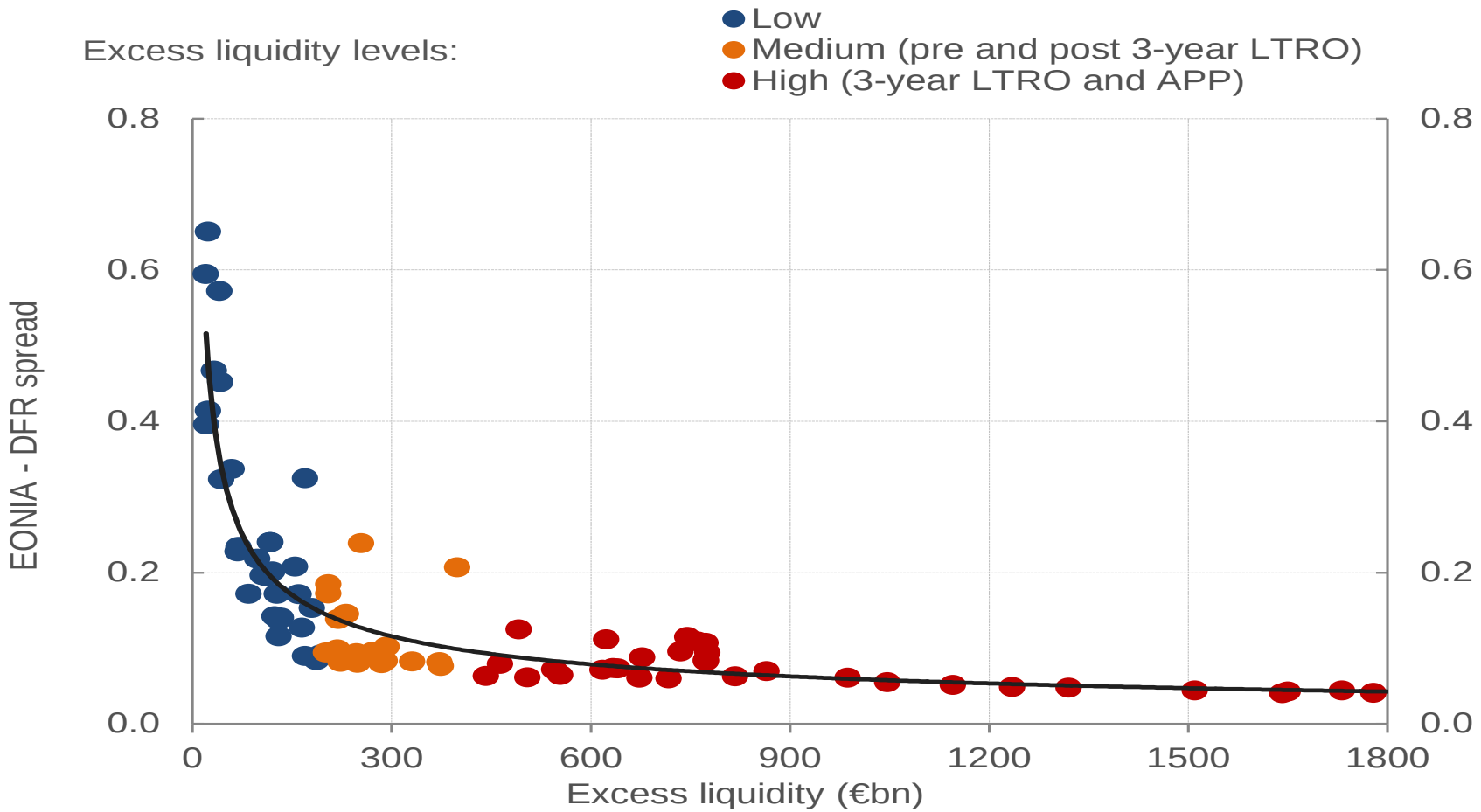
Sources: ECB.

Figure 20: Euro area balance of longer-term inflation risks (SPF) and inflation risk premium (RHS: number of standard deviations from zero, LHS: percentage points)



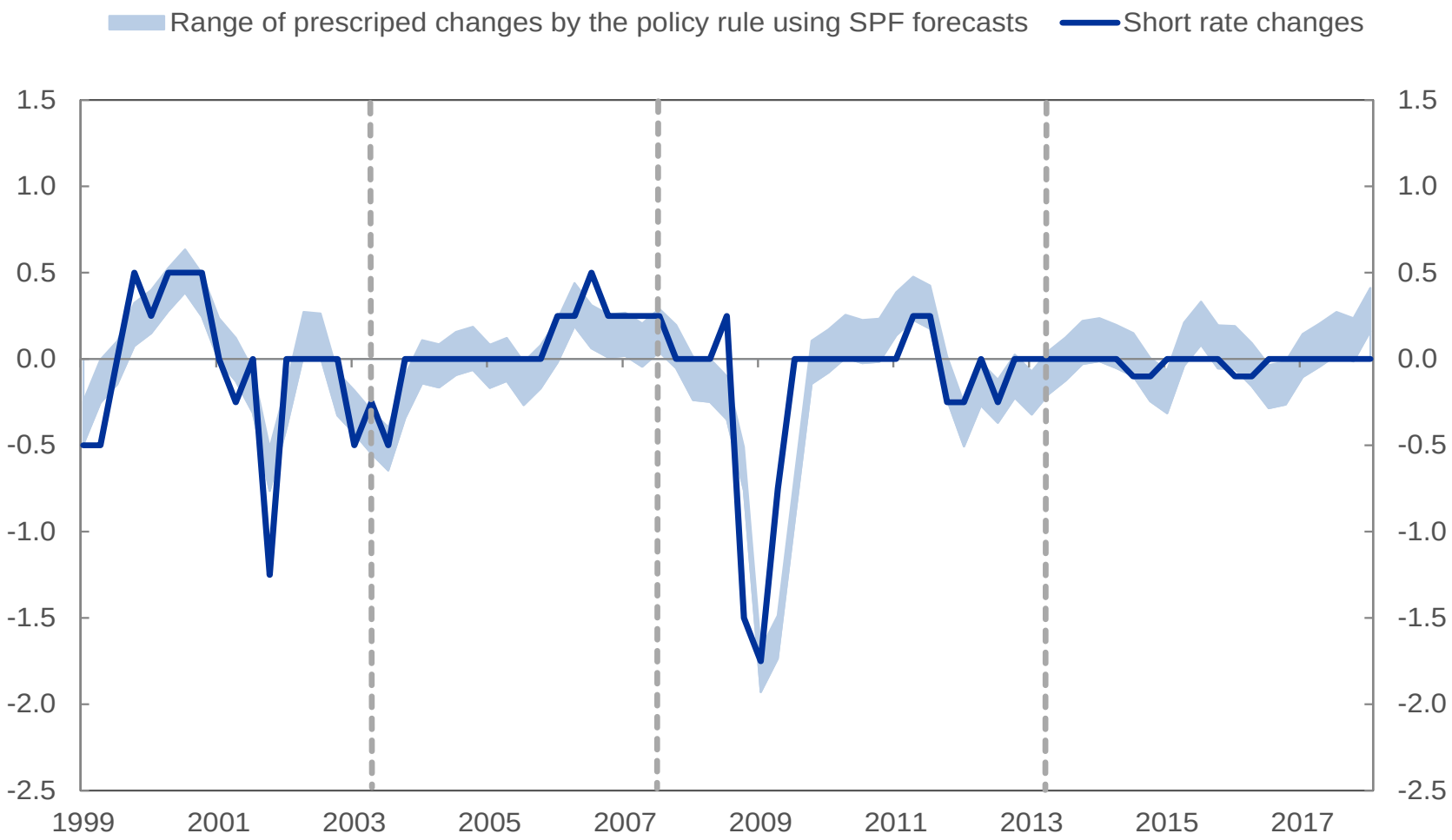
Sources: ECB.

Figure 21: Euro area excess liquidity and EONIA-DFR differential (percentage points)



Sources: ECB.

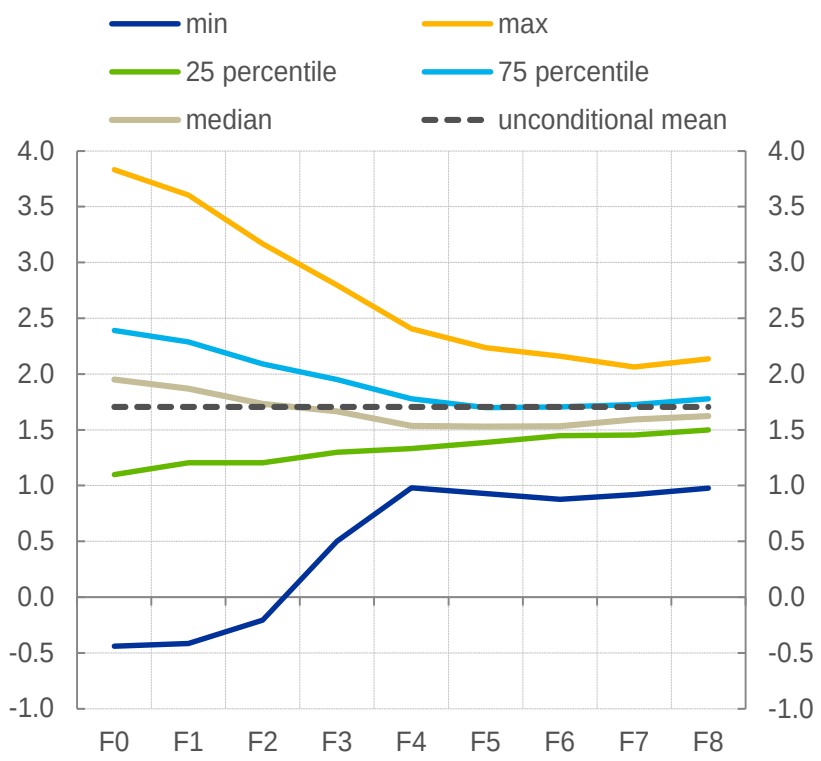
Figure 22: Orphanides rule for the euro area (with SPF as in Orphanides and Wieland, 2013) (percent)



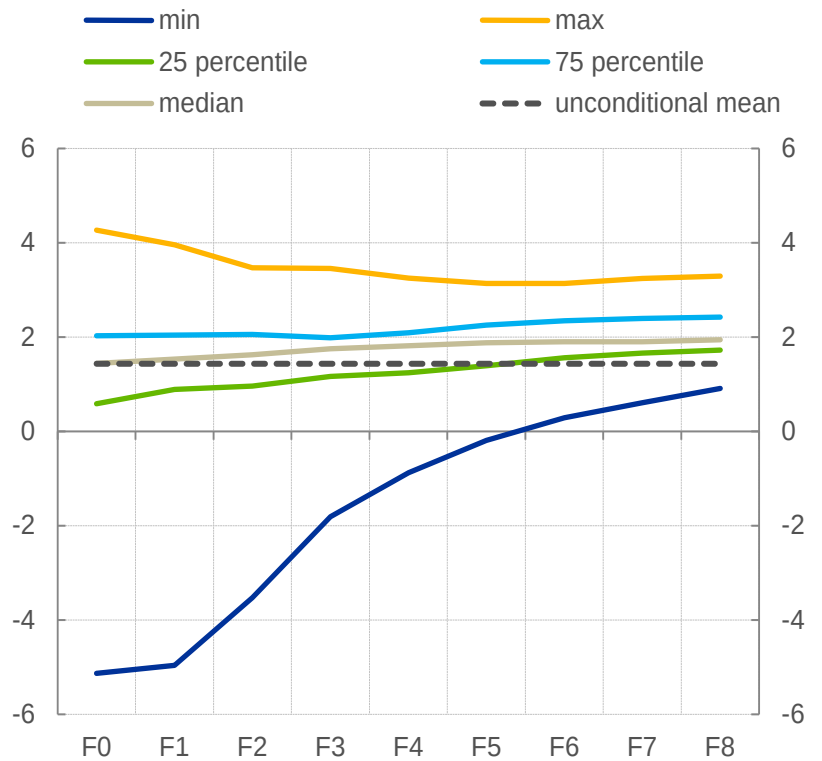
Sources: ECB, ECB Survey of Professional Forecasters and European Commission.

Figure 23: ECB/Eurosystem staff projections for year-on-year HICP inflation and real GDP growth - horizons 0 to 8 quarters (percent)

HICP inflation

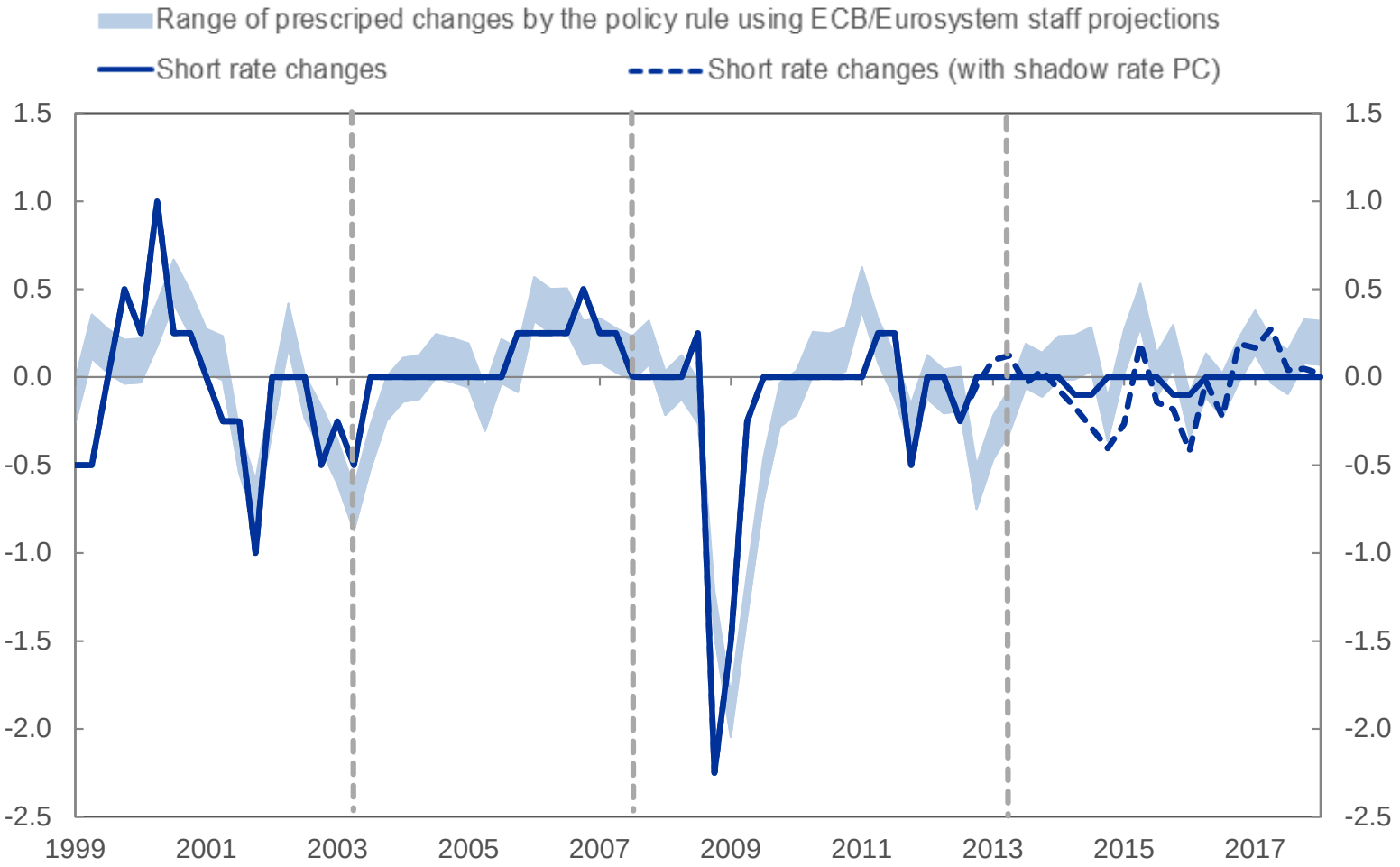


Real GDP growth



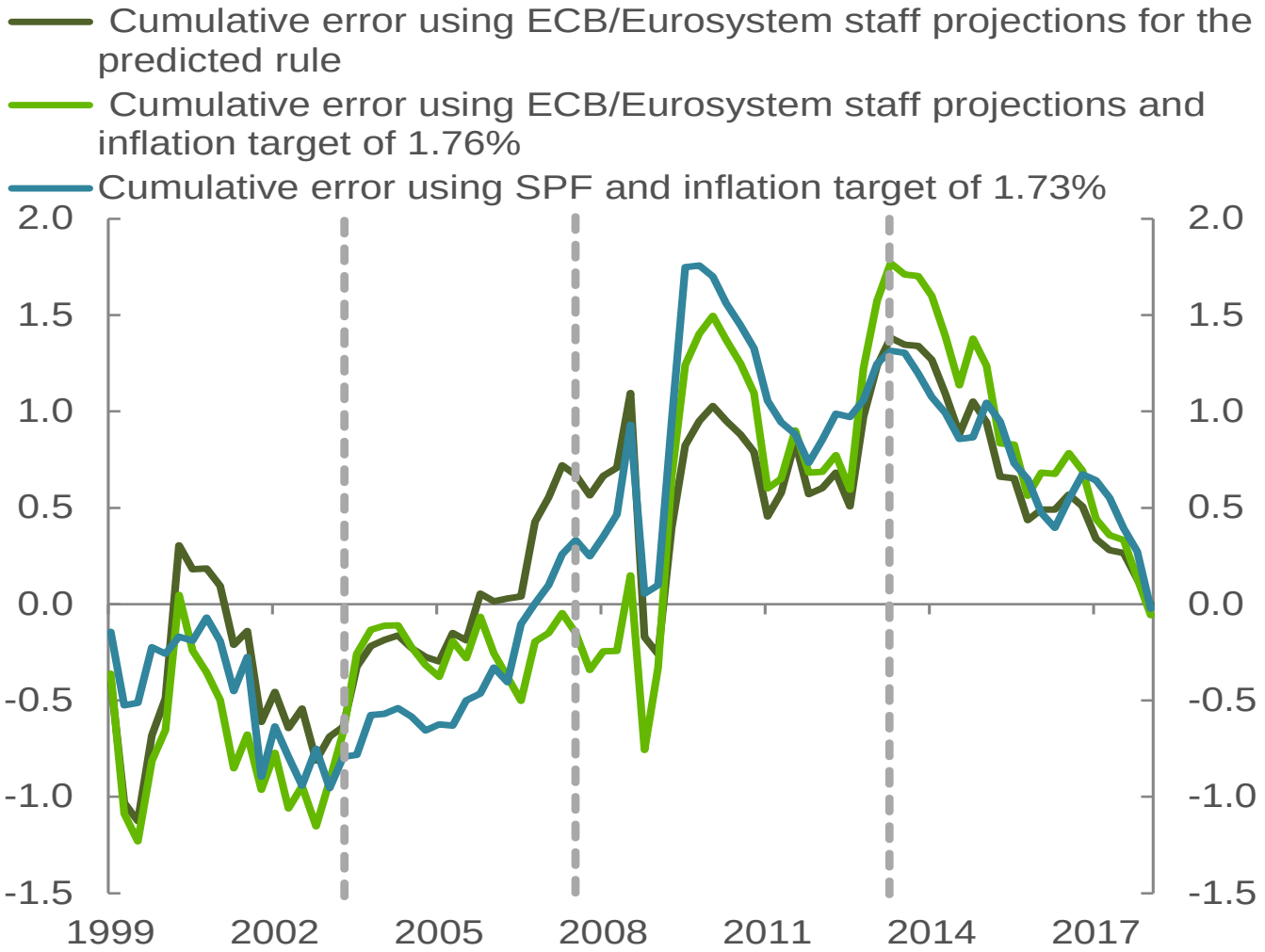
Sources: ECB, ECB staff projections.

Figure 24: Orphanides rule for the euro area with forecasts based on ECB/Eurosystem staff projections (percent)



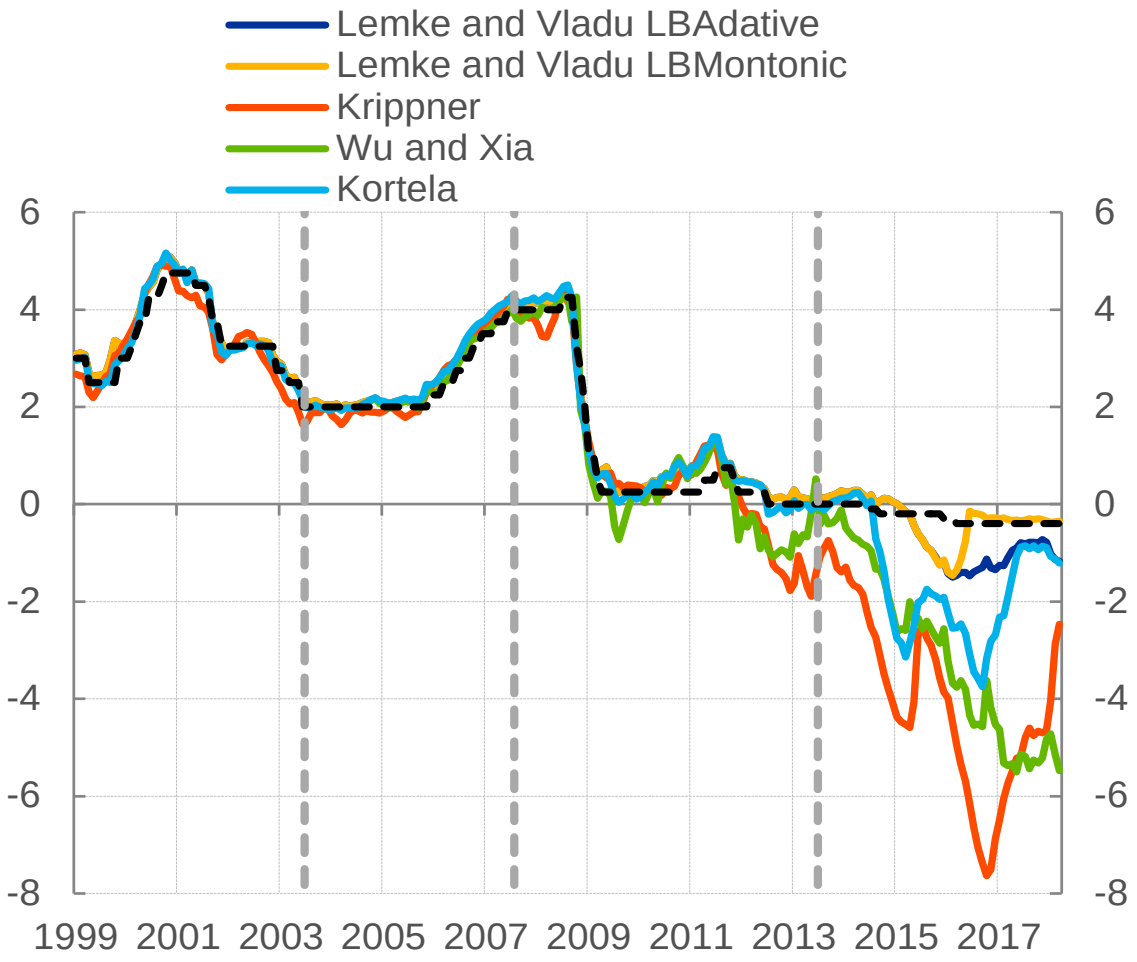
Sources: ECB, ECB staff projections and European Commission. The shadow rates come from Krippner (2015), Kortela (2016), Lemke and Vladu (2017) and Wu and Xia (2017).

Figure 25: Cumulative errors from the Orphanides rule for the euro area (percent)



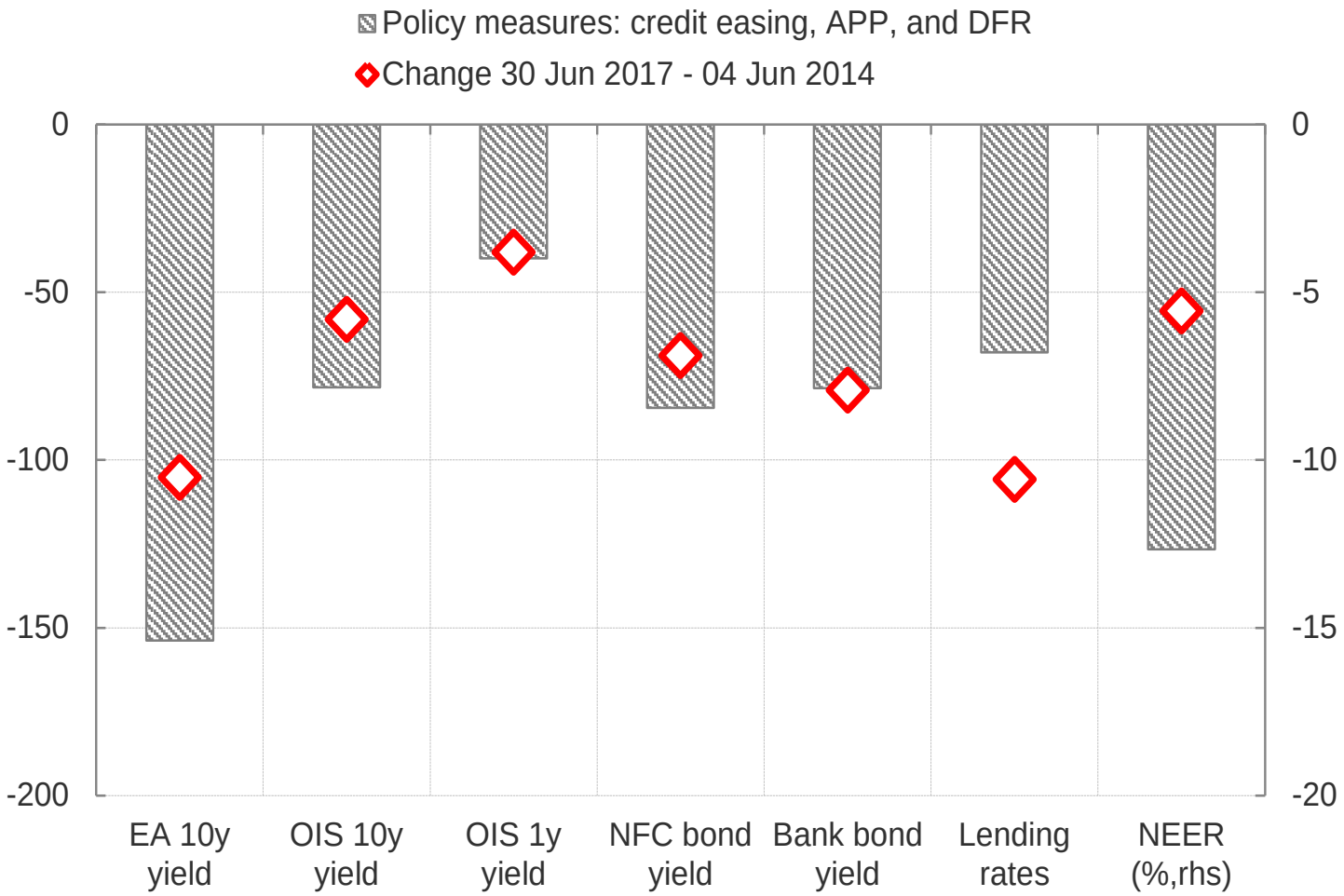
Sources: ECB, ECB staff projections, ECB Survey of Professional Forecasters and European Commission.

Figure 26: Estimated shadow rates for the euro area (percent)



Sources: ECB; Kortela (2016); Krippner (2015); Lemke and Vladu (2017); Wu and Xia (2017).

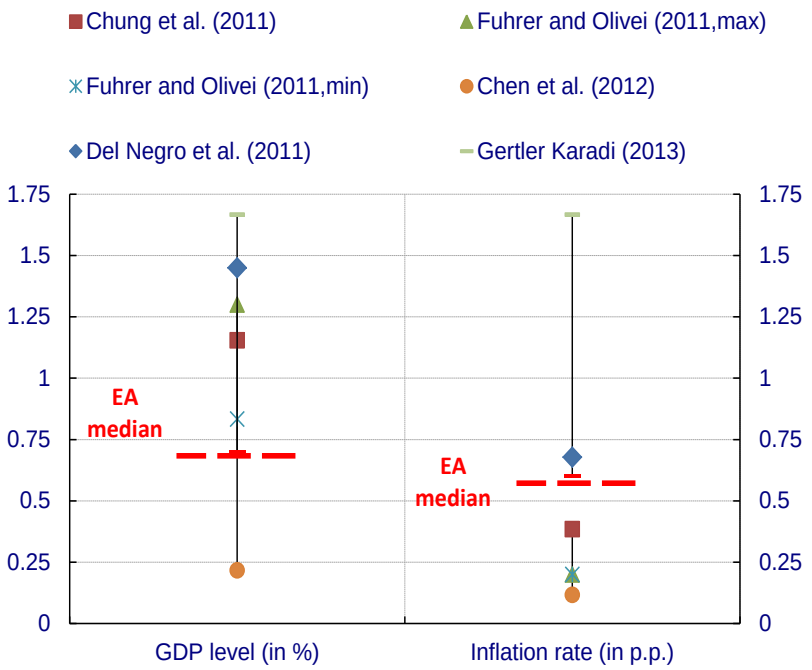
Figure 27: Changes in key euro area financial indicators since June 2014 and the impact of ECB policy measures (basis points unless indicated)



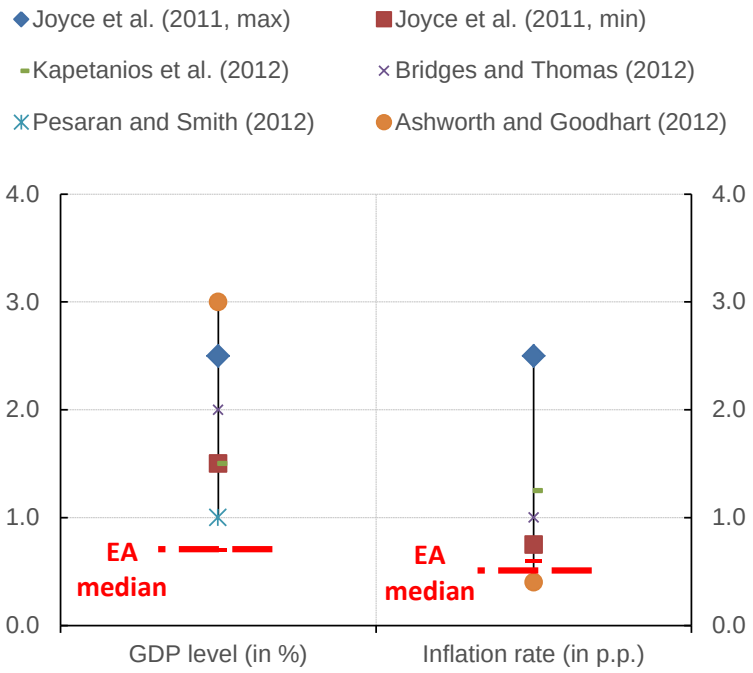
Sources: Bloomberg, ECB and ECB calculations.

Figure 28: Comparison of the effectiveness of asset purchases in the euro area, the US and the UK

US: re-scaled to USD 1.0 tr. Purchases (peak effects)



UK: re-scaled to GBP 200 bn purchases (peak effects)



Sources: ECB calculations, Ashworth and Goodhart (2012), Bridges and Thomas (2012), Chen et al. (2012), Chung et al. (2011), Del Negro et al. (2011), Fuhrer and Olivier (2011), Gertler and Karadi (2013), Joyce et al. (2012), Kapetanio et al. (2012) and Pesaran and Smith (2012).

Table 1: Selected regression results for Orphanides Rule

$$\Delta i = \alpha + \beta\,(E\pi_{t+1} - \bar{\pi}) + \gamma\,(E\Delta y_{t+1} - \Delta\bar{y}) + \varepsilon$$

Δi	(1)	(4)	(5)	(6)	(7)
Inf_BMPE	0.34*** (0.09)	0.37*** (0.14)	0.33** (0.14)	0.17 (0.13)	0.36*** (0.09)
GDP_BMPE	0.37*** (0.08)	0.36*** (0.08)	0.37*** (0.08)	0.52*** (0.14)	0.40*** (0.09)
Core_Inf_BMPE		-0.073 (0.16)			
Pos_Inf_Dev			0.27 (0.17)	0.50*** (0.18)	
Pos_GDP_Dev				-0.46*** (0.17)	
Change_in_credit_to_HH&NFC					-0.07 (0.07)
Constant	-0.62*** (0.164)	-0.56*** (0.16)	-0.60** (0.22)	-0.22 (0.20)	-0.65*** (0.16)
Inf_target	1.81	1.85			1.82
Observations	77	77	77	77	77
Adjusted R-squared	0.52	0.52	0.53	0.57	0.53

Sources: Authors and ECB.

Table 2: Timeline of ECB monetary policy measures since the breakout of the financial crisis (August 2007 to June 2018)

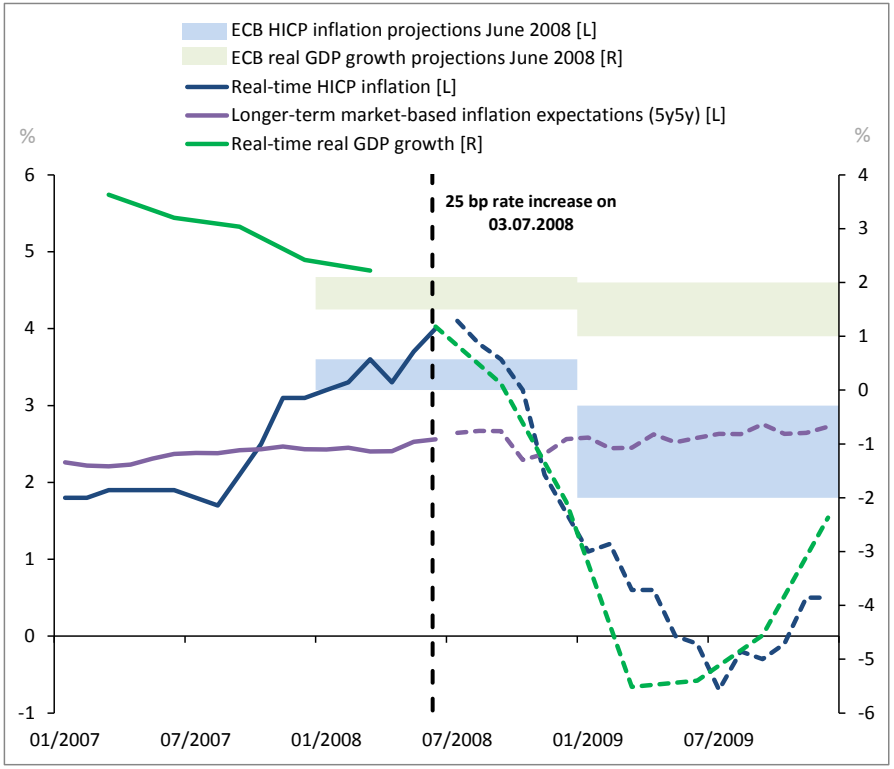
	Financial crisis		Sovereign debt crisis		Low-inflation recovery (with lower bound constraint)		
Interest rate policy	+25bps MRO:4.25%	-325bps DFR:0.25%	+50bps DFR:0.75%	-75bps DFR:0%	-20bps DFR:-0.20%	-20bps DFR:-0.40%	
Credit operations	Overnight FTOs "Front-loading" Maturity extension Dec07 $ swaps	Oct08 **FRFA** Expand. collateral LTROs (6m) $ swaps May09 **LTROs** (1y)		Oct11 **LTROs** Dec11 **VLTRO I** (3y) Feb12 **VLTRO II** (3y)	Jun14 **TLTRO I**	Mar16 **TLTRO II**	
Asset purchases		May09 **CBPP I**	May10 **SMP I**	Aug11 **SMP II** Oct11 **CBPP II** Sep12 **OMT**	Jun14 **ABSPP** **CBPP III** Jan15 **PSPP**	Dec15 **APP I** Mar 16 **CSPP** **APP II** (80bn)	Dec16 **APP III** (60bn) Oct17 **APP IV** (30bn) Jun18 **APP V** (15bn)
Forward guidance					Jul13 **FG I:** Policy rate extended period Jan15 **FG II:** APP date and SAPI	Mar16 **FG III:** Policy rate well past APP	Jun18 **FG IV:** Exp. APP end date and SAPI

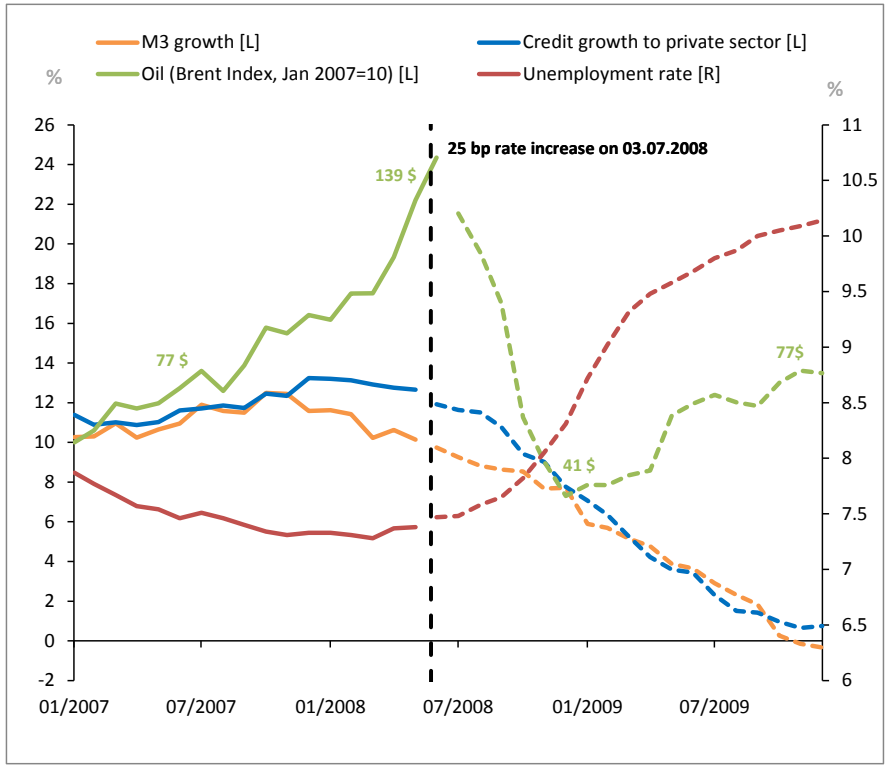
08/2007 09/2008 05/2010 08/2011 06/2013 08/2015 12/2016

- Standard interest rate policies
- Negative Deposit Facility Rate
- Non-standard policies to address lower bound of rates
- Impaired interbank and bank funding markets and later also bank lending channel
- Sovereign-bank nexus and re-denomination risk
- Heterogeneous pass-trough in bank lending markets

Sources: Authors and ECB.

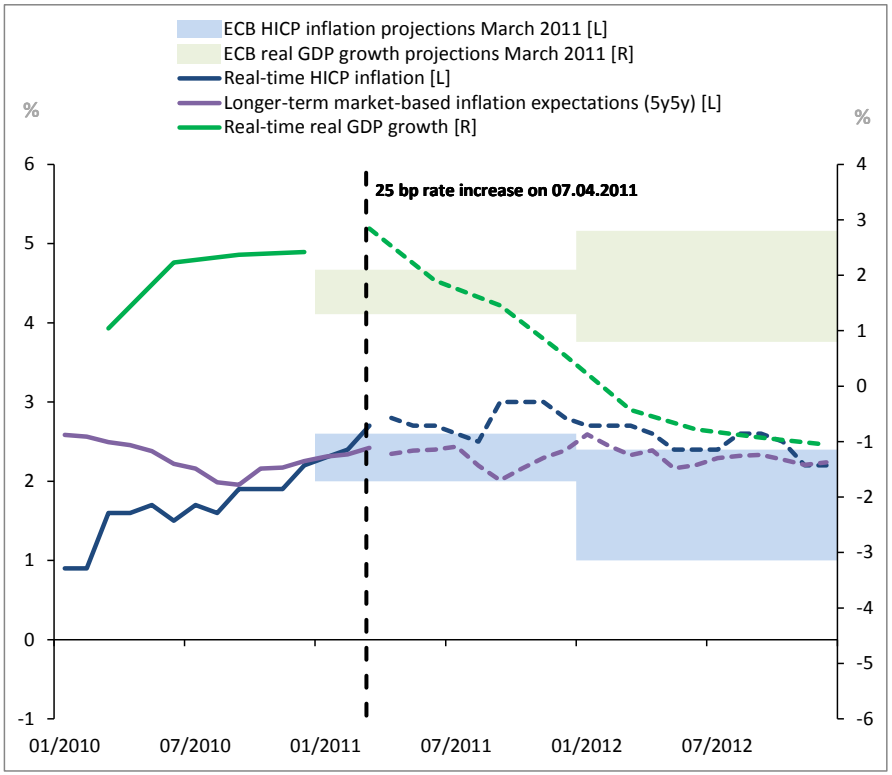
The interest rate increase in July 2008

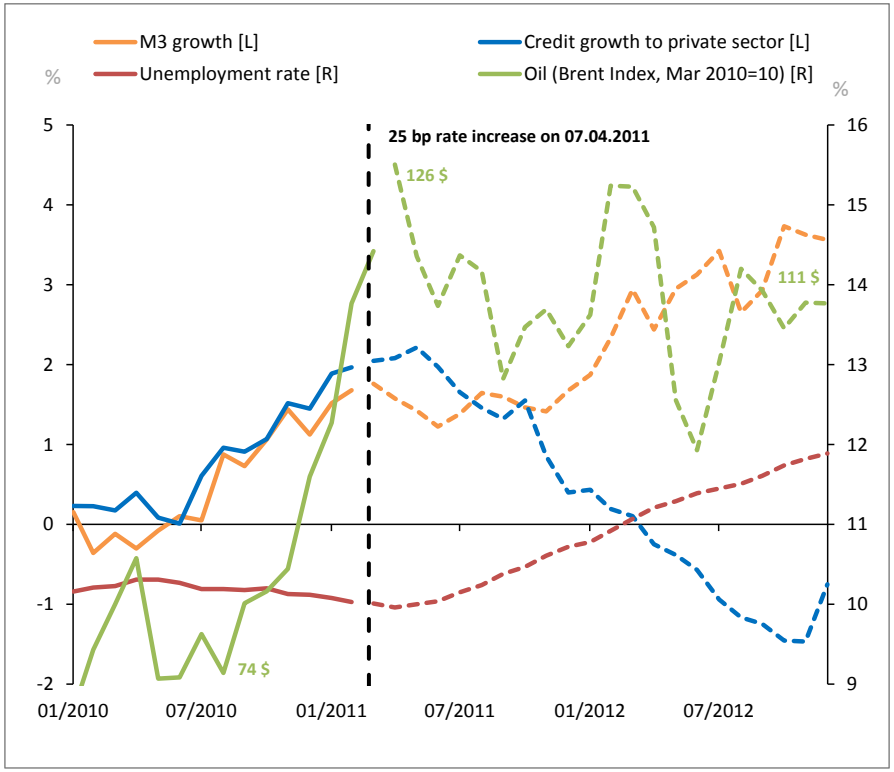




Sources: Authors and ECB.

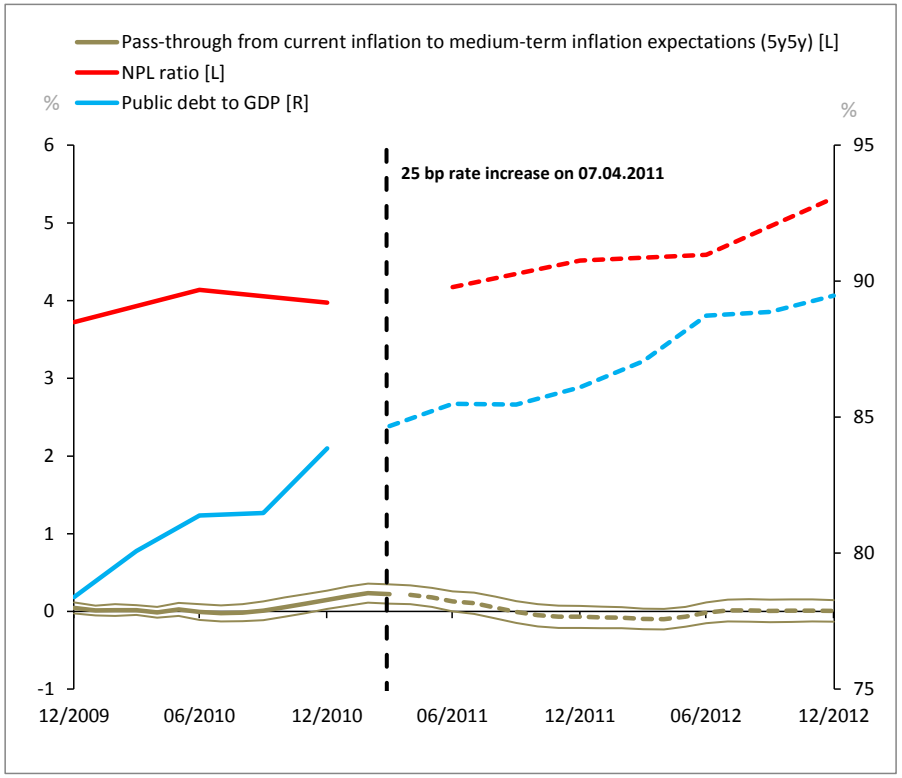
The interest rate increase in April 2011





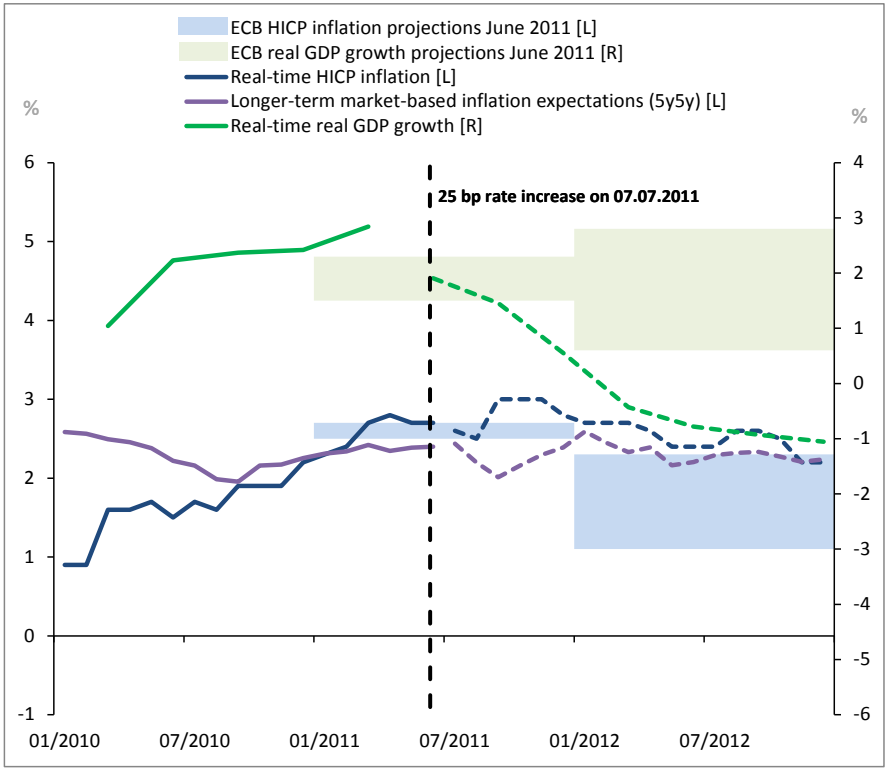
Sources: Authors and ECB.

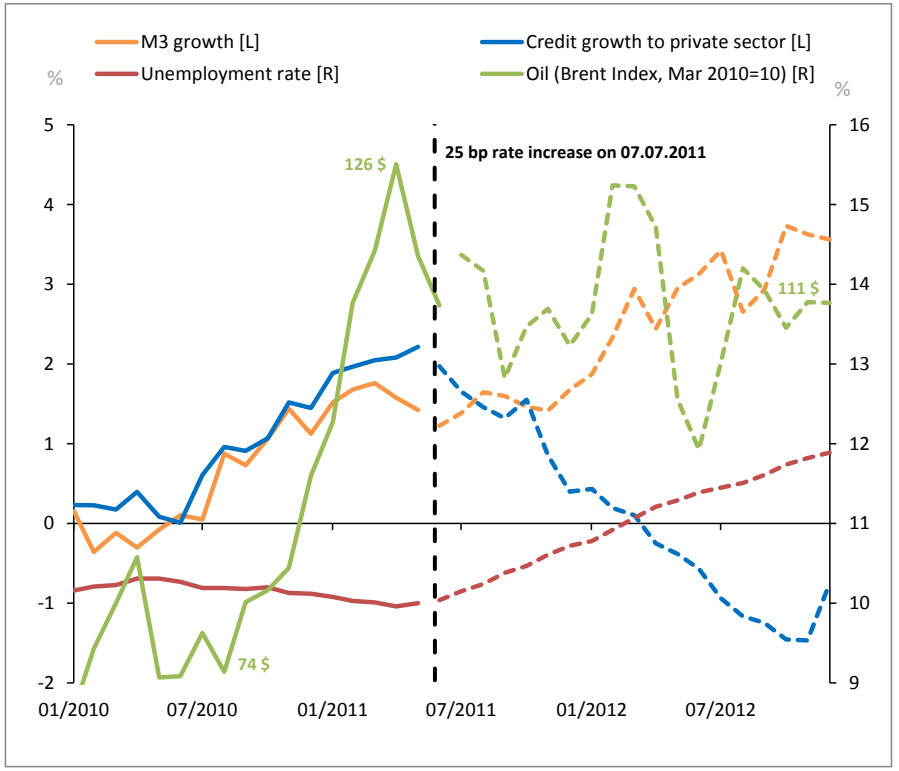
The interest rate increase in April 2011



Sources: Authors and ECB.

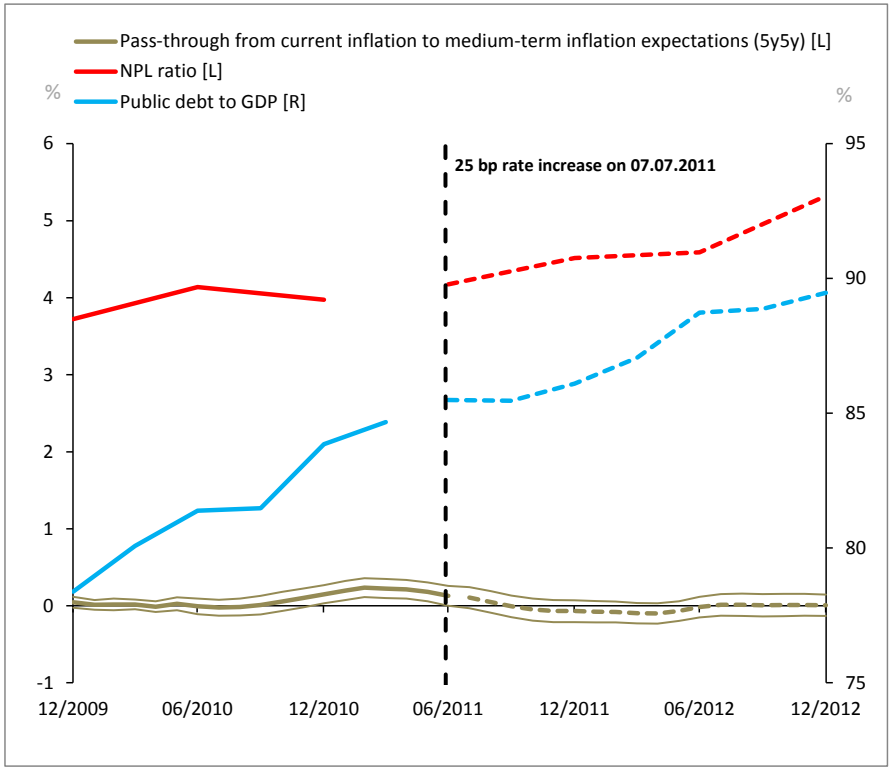
The interest rate increase in July 2011





Sources: Authors and ECB.

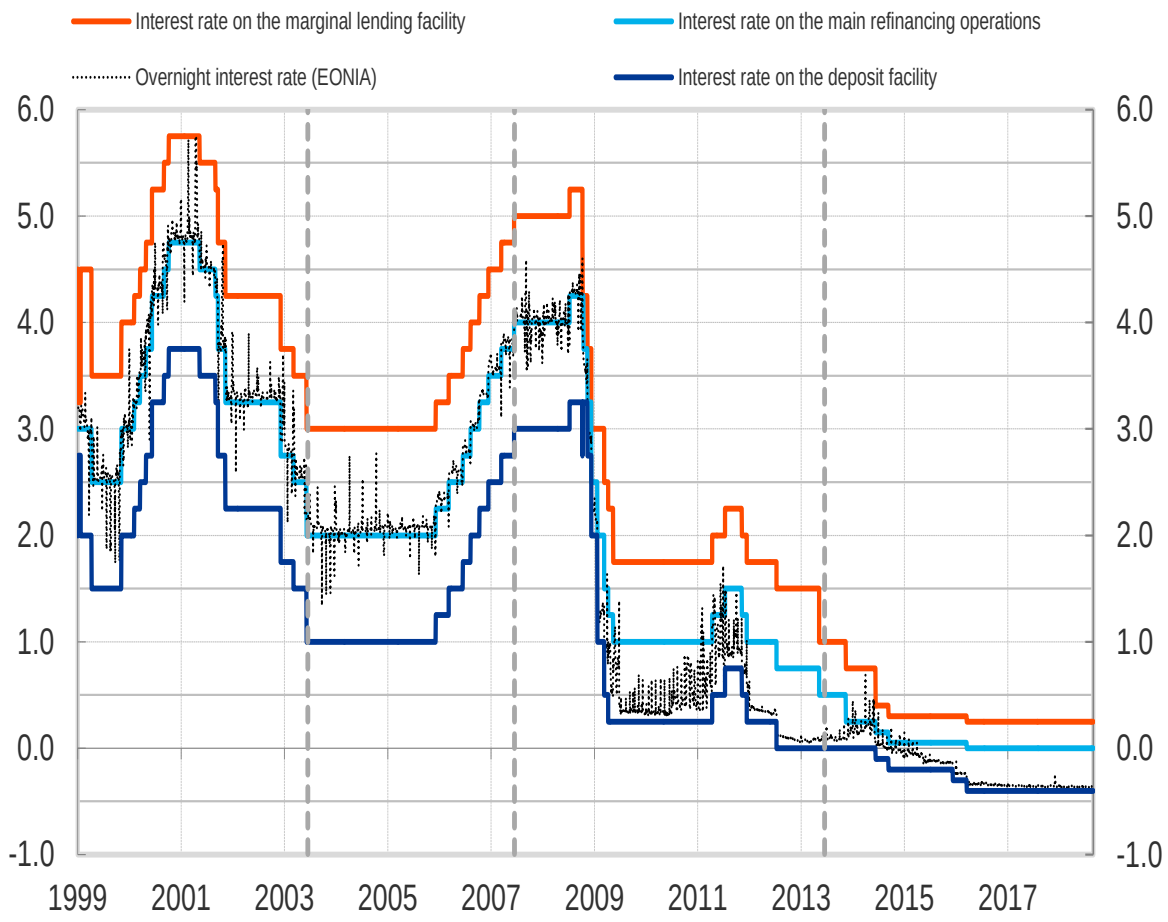
The interest rate increase in July 2011



Sources: Authors and ECB.

ECB interest rates “low” since the second quarter of 2009 or the third quarter of 2012

Main ECB policy rates and EONIA (per cent)

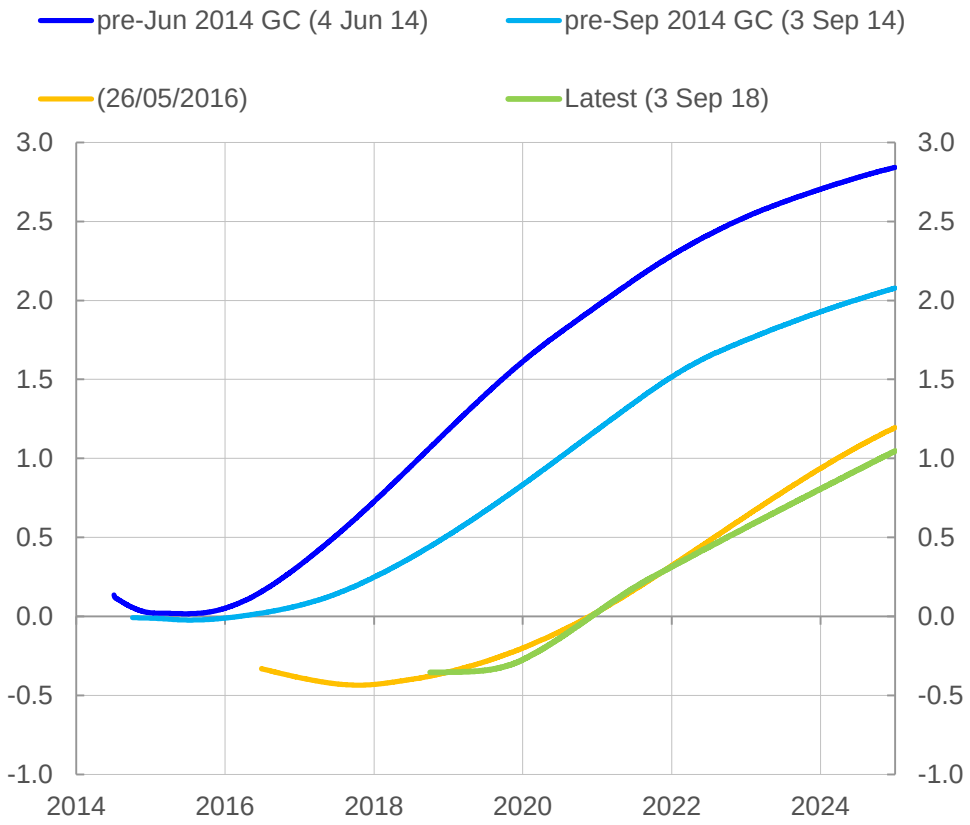


Sources: ECB.

- Overall 6 to 9 years, depending on what is regarded as “low”
- Consequence of financial and sovereign debt crises
- Negative component since June 2014: deposit facility rate (DFR) moved from 0 to -40 basis points
- Due to ample liquidity policy, overnight rate close to DFR
- NB: other measures!

Deposit facility rate reductions below zero flattened the risk-free yield curve and shifted it down

EONIA forward curves before and after ECB rate reductions below zero (percentage points)

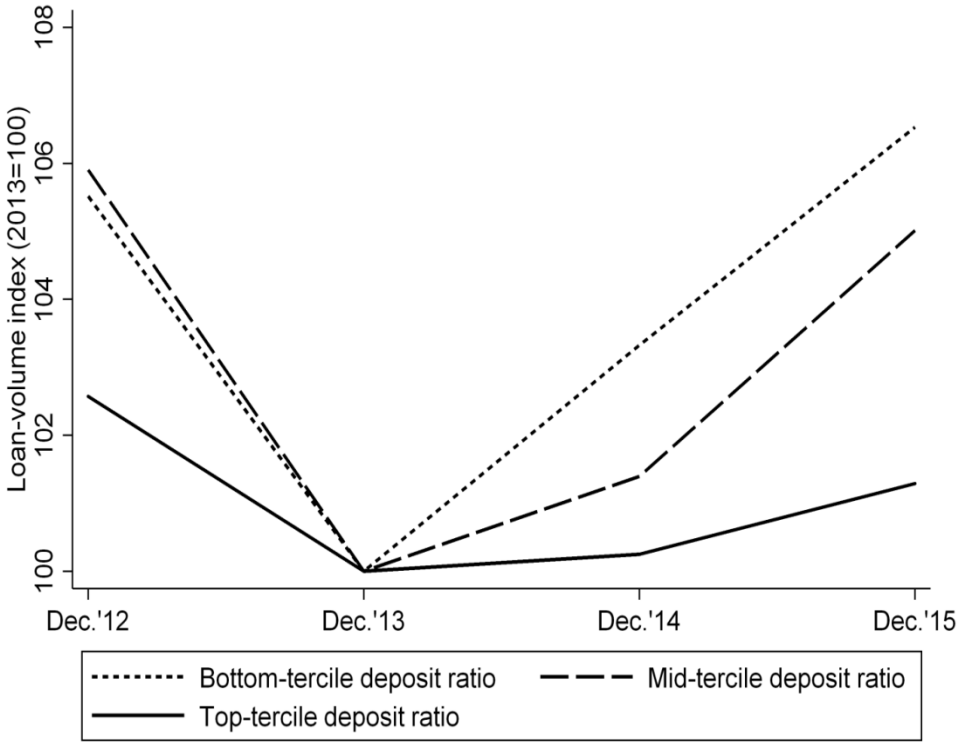


Notes: Forward curve is estimated using spot Overnight Index Swap (EONIA) rates.
Sources: Thomson Reuters and ECB calculations.

- Disinflationary forces after sov. debt crisis (mid-2013 and on)
- Three-pronged easing strategy:
  - Negative interest rate policy (NIRP)
  - Targeted longer-term ref. operations
  - Various asset purchase programs
- NIRP removes non-negativity constraint on future expected short rates
- Charge on cash hoarding triggers portfolio shifts towards long-term bonds compressing term premium
- Movements as broadly predicted in novel yield curve models (Lemke and Vladu 2017)
- Imply stimulating effects on investment and consumption

The policy also contributed to higher lending of banks relying less on deposit funding

Total bank lending before and after ECB rate reductions below zero (by deposit ratios)

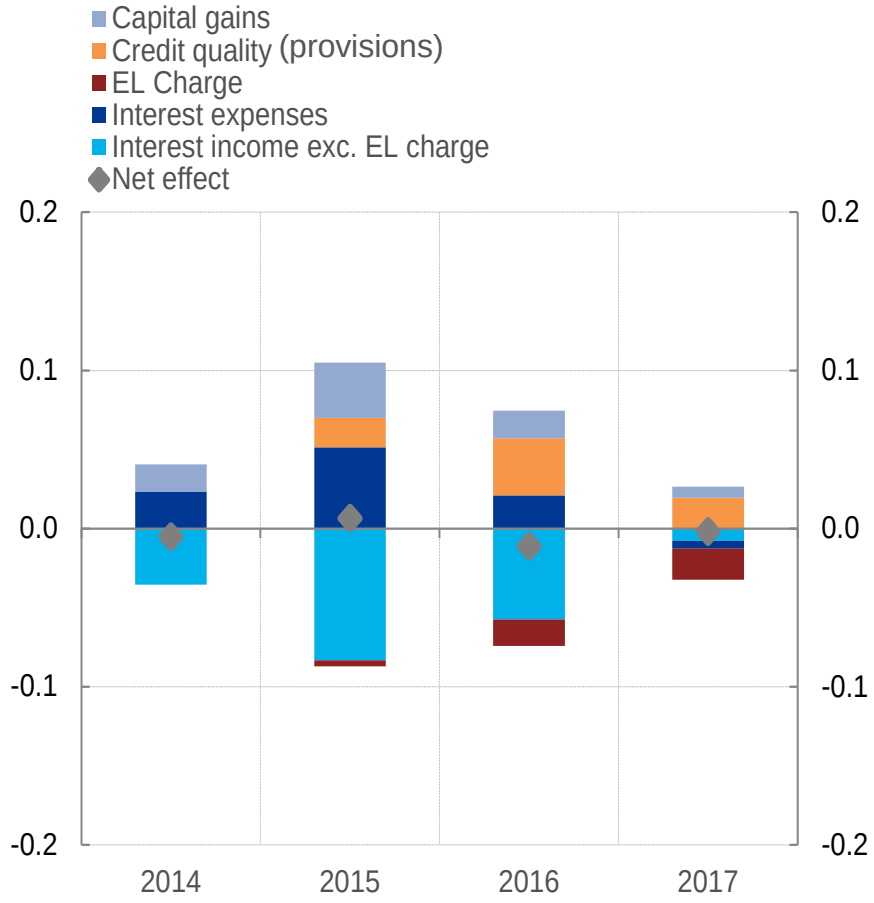


Notes: Annual total loan volumes (end of year) indexed to 2013 levels for 70 large euro area banks. Bank sample is split in terciles of deposit ratios, which are defined as total deposits divided by total assets in 2013.
Sources: Heider et al. (2018), Figure 6, using SNL Financial data.

- Banks with low deposit-to-asset ratios benefited from funding advantages
- Extended lending relative to high deposit-ratio banks (Heider et al. 2018)
- Led to net lending increase in the aggregate (Demiralp et al. in progress)
- Potential “reversal rate” (Brunner-meier and Koby 2018) not reached
- NB: Accompanying TLTRO-2 pricing
- But initial capital gains on securities portfolios offset over time by reductions in net interest margins

Bank profitability implications of negative policy rates: positive effects offset negative ones so far

Simulated deviations of banks' return on assets from a no policy scenario (all monetary policy measures, p.p.)

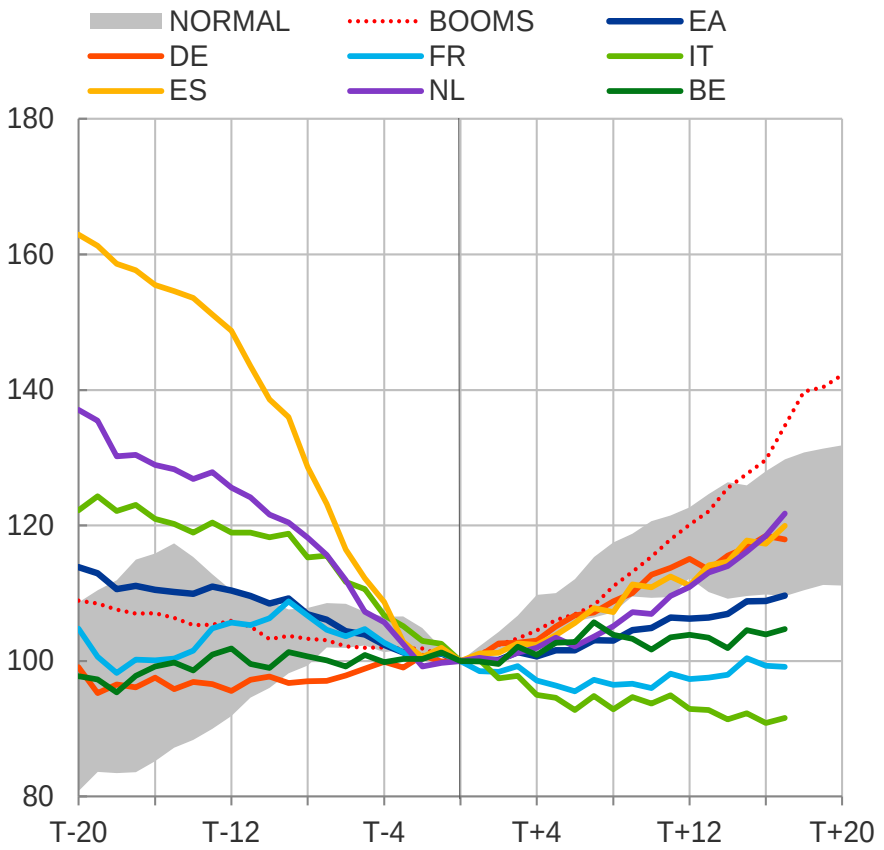


- NB: Sizeable differences across countries and individual banks
- ECB Banking Supervision's SREP stress tests found that most European banks could weather a 200 bp interest rate shock (ECB 2017)
- Many other dimensions than banks (ESRB 2016, CGFS 2018):
  - Profitability and solvency of life insurers and pensions funds
  - Search for yield (real estate, fixed income)
  - Accelerated transition to market-based financial structure

Notes: Capital gains based on data on a consolidated basis for 68 euro area banking groups included in the list of significant institutions under direct ECB supervision and in the 2014 EU-wide stress test. Other estimates based on aggregate banking statistics. Euro area aggregate calculated as average of the countries included in the sample, using the ECB's consolidated banking data for weighting. NII stands for net interest income and EL for excess liquidity.
Sources: Altavilla et al. (forthcoming).

Property price developments are within (or below) regular ranges and below historical boom dynamics

Post-crisis real house prices compared to boom periods and normal ranges (Q4 2013 and historical troughs normalised to 100)



- No general property bubble in the euro area
- A few countries and/or large cities have nevertheless high property price growth now
- In some countries risks may be particularly pronounced in commercial real estate
- A number of prudential policy actions have been taken in those cases

Notes: Real house price indexes based on residential property price and consumer price indexes of euro area countries between 1975Q1 and 2018Q1. Identification of troughs and peaks following Harding and Pagan (2002). Red dotted line refers to the median for all upswings covered in the fourth quartile (historical "booms"). Grey area refers to the range of all upswings covered in the second and third quartile (historically "normal" upswings).
Sources: BIS, ECB, Fed Dallas, OECD and ECB calculations.