Building a Financial Conditions Index for the Euro Area and Selected Euro Area Countries: What does it tell us about the crisis?

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A Brief History of Financial Conditions Indices

- **Research on FCIs** dates back to the early 2000s, motivated by:

  a. A growing realisation of the key ***role played by*** **financial variables** in monetary policy transmission

  b. The dot-com bubble: Should central banks ***account for*** **financial variables** (e.g. asset prices) in their policy stance?

A Brief History of Financial Conditions Indices

a. A growing realisation of the key ***role played by*** **financial variables** in monetary policy transmission

- The **bank lending channel literature** highlights the role of financial market imperfections in propagating the effects of monetary policy on the economy, by leading to excessive responses of liquidity constrained banks and firms (e.g. Bernanke and Gertler, 1995)
- The **consumption literature** also indicates that liquidity constraints lead to larger fluctuations in consumption (e.g. Zeldes 1989)

A Brief History of Financial Conditions Indices

b. The dot-com bubble: Should central banks ***account for*** **financial variables** (e.g. asset prices) in their policy stance?

- Financial asset prices should be used to improve on central banks’ **inflation forecasts** (Bernanke and Gertler, 1999, 2001)
- They should form **part of a broader price index targeted** by central banks (Goodhart and Hofmann, 2000, 2001 and 2003)
- Monetary policy should actively pursue a **stabilization** of asset prices around fundamentals (Cecchetti et al., 2000)

A Brief History of Financial Conditions Indices

- First FCIs included:
  - asset prices (stocks and housing)
  - money market rates and spreads (shape of the yield curve)
- Recently (for the US):
  - Credit terms and conditions (Swiston, 2008)
  - Survey data (Hatzius et al. 2010)
- FCIs constructed:
  - for a number of countries
  - with different aims (most commonly as forecasting tools or leading indicators)

What we do

- We construct:
  - FCIs for the euroarea, with and without monetary policy variables (2003-2011)
  - Analogous FCIs for Germany and countries of the periphery in crisis (Greece, Ireland, Portugal and Spain)
- We examine:

  - The evolution of each of these FCIs over time, against the timeline of the crisis

  - How financial conditions differed between euroarea countries at different points in time

  - The contribution of monetary policy to financial conditions

Methodology

- **Principal Components Analysis (PCA)** is a way of:
  - identifying patterns in the data
  - obtaining factors which explain most of the variance
  - compressing datasets with minimal (controlled) loss of info
- **Disadvantage:** no structure, atheoretical
- **Advantage:** no structure, the results do not reflect *a priori* beliefs, they merely reflect the data
- However, our approach is ***not atheoretical***. Theory is used in:
  – **Identifying** variables which capture all aspects of financial conditions (thus the inclusion of up to 24 variables)
  – Including them in the **direction** indicated by economic theory

Data selection: the economic underpinnings of the FCI

- **Prices**: Healthier balance sheets which facilitate borrowing
- **Quantities**: In the presence of incomplete markets and/or extreme financial conditions, quantities also contain valuable information
- **Interest Rate Spreads**: Credit, Interbank, Sovereign
- **Volatilities**: A sign of heightened tension in financial markets
- **ECB Bank Lending Surveys**: Credit terms / availability
- **Monetary policy variables** impact on financial conditions

Data selection: the economic underpinnings of the FCI

1. Loans to non-financial corporations (NFCs, flows)
2. Loans to households (Hhlds, flows)
3. Spread: loans and deposits to NFCs
4. Spread: overdrafts and deposits to NFCs
5. Spread: consumer loans and deposits to Hhlds
6. Spread: mortgage loans and deposits to Hhlds
7. Net liquidity provision by Eurosystem
8. Growth rate of net liquidity provision by Eurosystem
9. Debt securities issued by NFCs
10. Debt securities issued by monetary financial institutions

Data selection: the economic underpinnings of the FCI

11. Rate of change of residential property prices
12. Rate of change of Harmonised Index of Consumer Prices
13. Spread: 3-month – overnight
14. Spread: 2-year – 3-month EURIBOR
15. Spread: 10-year – 3-month EURIBOR
16. Average spreads of long-term government debt vs Germany
17. Rate of change of stock prices
18. Volatility of stock prices
19. Volatility of bond prices

Data selection: the economic underpinnings of the FCI

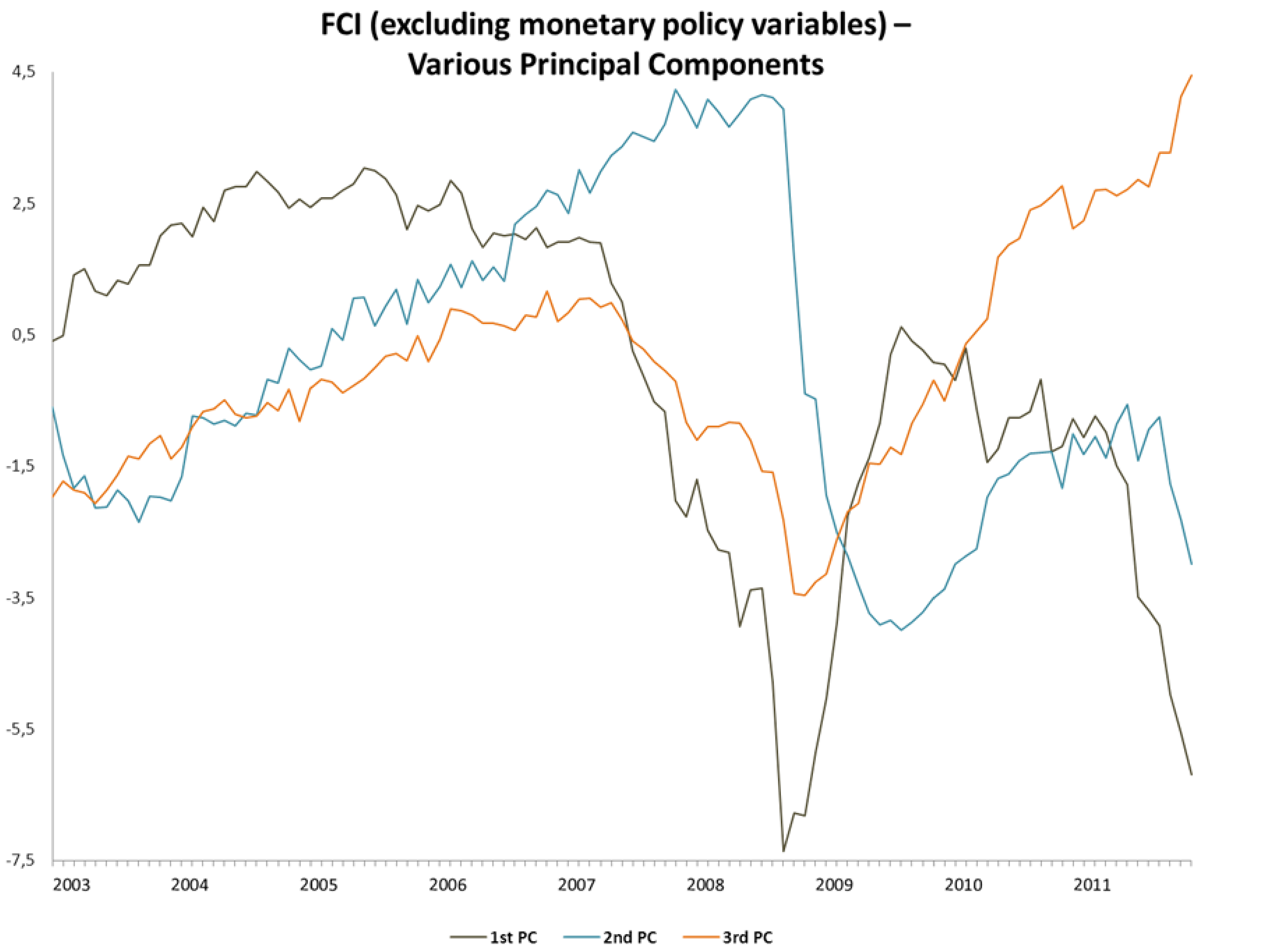
20. Bank lending survey - banks’ access to market financing
21. Bank lending survey - banks’ liquidity position
22. Bank lending survey - housing market prospects
23. Bank lending survey - consumer creditworthiness
24. ECB refinancing rate

What we find

- Our FCIs:
  - intuitively track financial and credit-related developments, for the euroarea as well as for individual countries
  - can be used to gauge and assess the impact of monetary policy on financial conditions at different points in time
  - strongly indicate that financial conditions across the euroarea have varied greatly between the core and the periphery, especially during the recent crisis
  - suggest that monetary policy in the euroarea has not been equally effective over the sample period, nor equally suitable for different countries

Results: Euro area principal components

- Cut-off threshold: 70% of the dataset’s overall variability
- For the euro area dataset this is explained by:
  - 1st principal component: the Bank Lending Survey, residential property prices, interbank spread
  - 2nd principal component: bank credit variables (prices and quantities), securities
  - 3rd principal component : Loan-to-deposit spreads
- To construct the FCI, the selected principal components are weighted by the share of variance they explain and their sum is divided by the total share of variance explained, to ensure comparability between FCIs


FCI (excluding monetary policy variables) –
Various Principal Components
4,5
2,5
0,5
-1,5
-3,5
-5,5
-7,5
2003
2004
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2006
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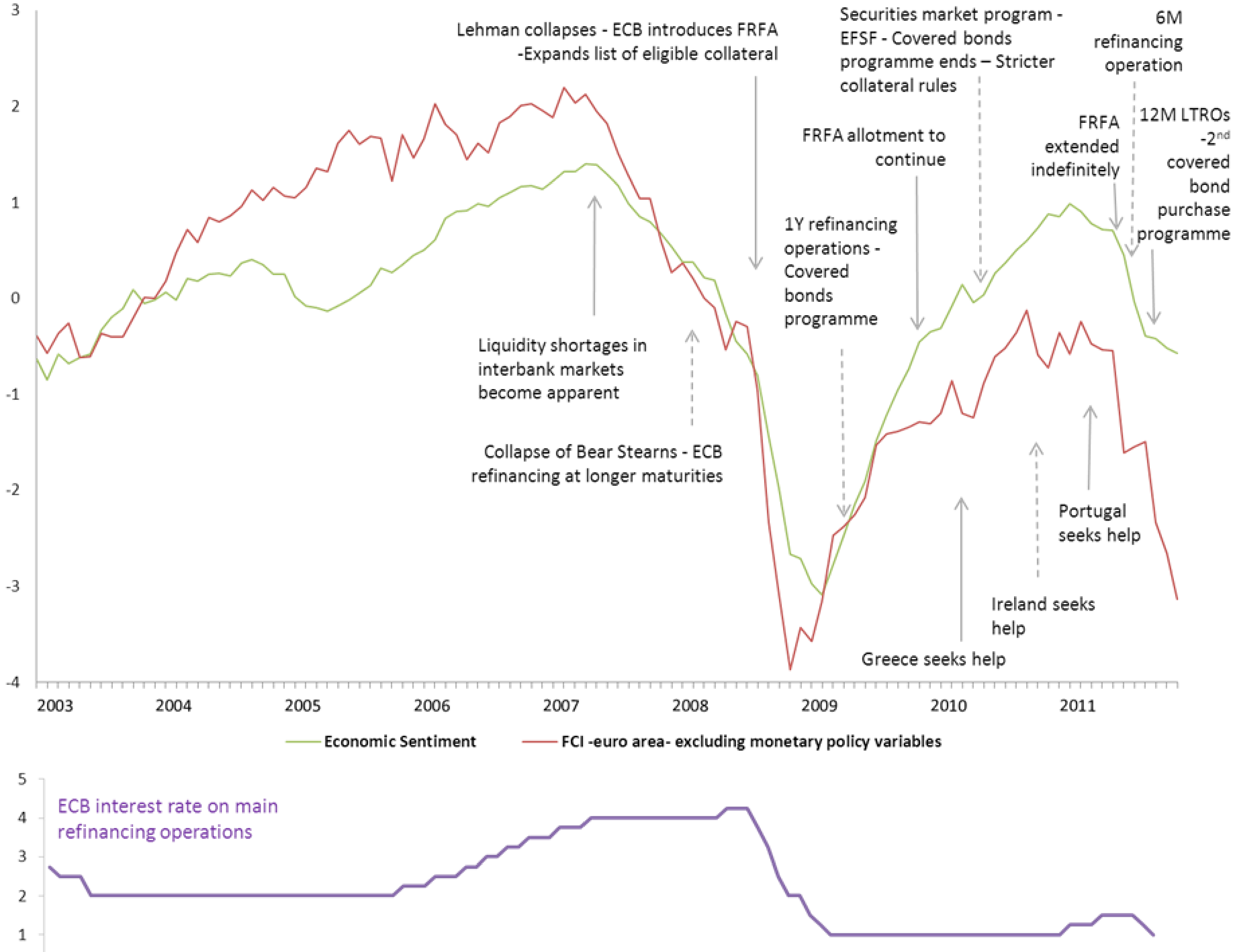
2008
2009
2010
2011
1st PC
2nd PC
3rd PC



3
2
1
0
-1
-2
-3
-4
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Securities market program -
EFSF - Covered bonds
programme ends – Stricter
collateral rules
6M
refinancing
operation
FRFA allotment to
continue
FRFA
extended
indefinitely
12M LTROs
-2nd
covered
bond
purchase
programme
1Y refinancing
operations -
Covered
bonds
programme
Liquidity shortages in
interbank markets
become apparent
Collapse of Bear Stearns - ECB
refinancing at longer maturities
Portugal
seeks help
Ireland seeks
help
Greece seeks help
2003
2004
2005
2006
2007
2008
2009
2010
2011
Economic Sentiment
FCI -euro area- excluding monetary policy variables
5
4
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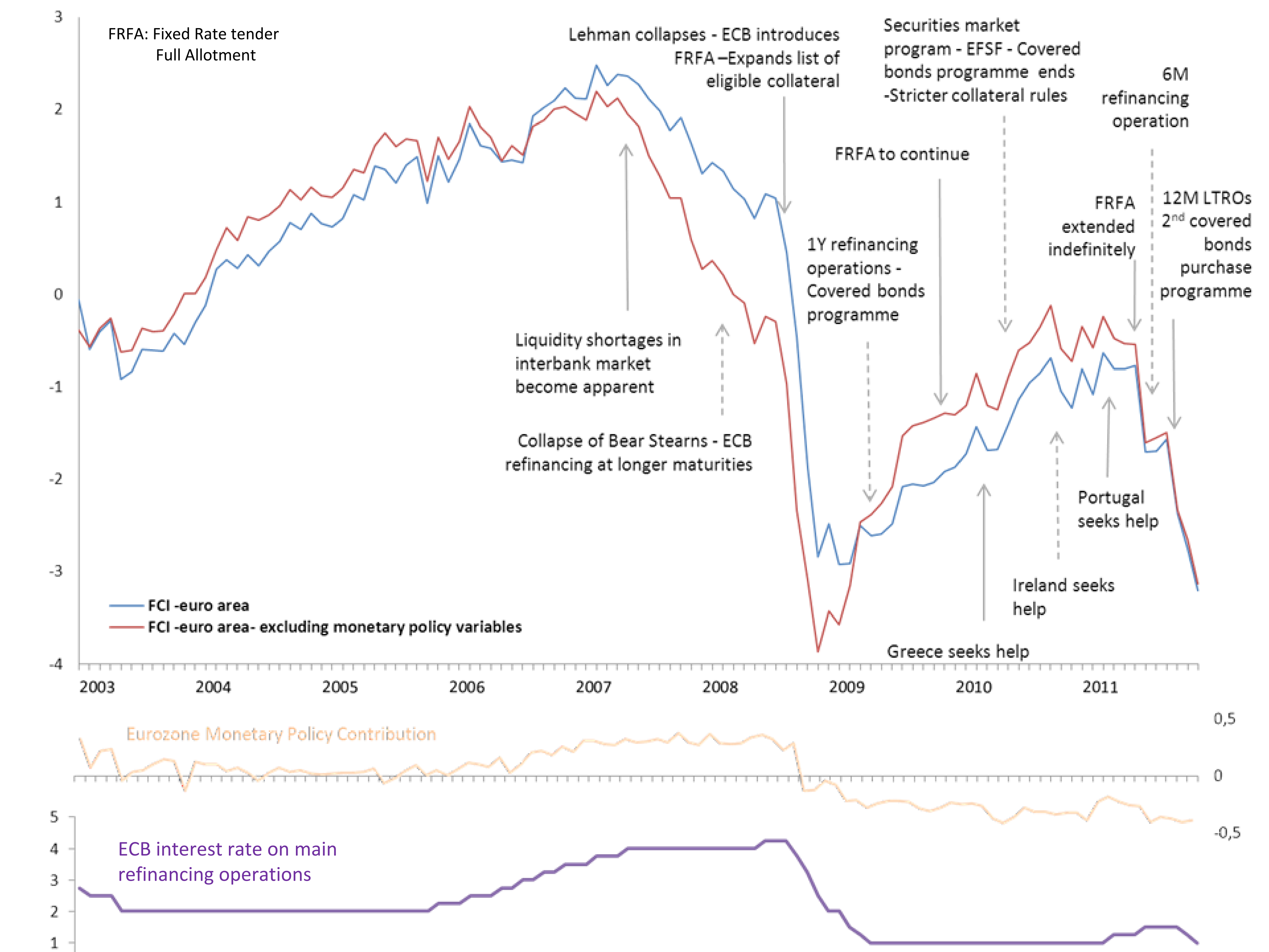
ECB interest rate on main
refinancing operations



FRFA: Fixed Rate tender Full Allotment
Lehman collapses - ECB introduces FRFA –Expands list of eligible collateral
Securities market program - EFSF - Covered bonds programme ends -Stricter collateral rules
6M refinancing operation
FRFA to continue
FRFA extended indefinitely
12M LTROs 2nd covered bonds purchase programme
1Y refinancing operations - Covered bonds programme
Liquidity shortages in interbank market become apparent
Collapse of Bear Stearns - ECB refinancing at longer maturities
Portugal seeks help
Ireland seeks help
Greece seeks help
FCI -euro area
FCI -euro area- excluding monetary policy variables
3
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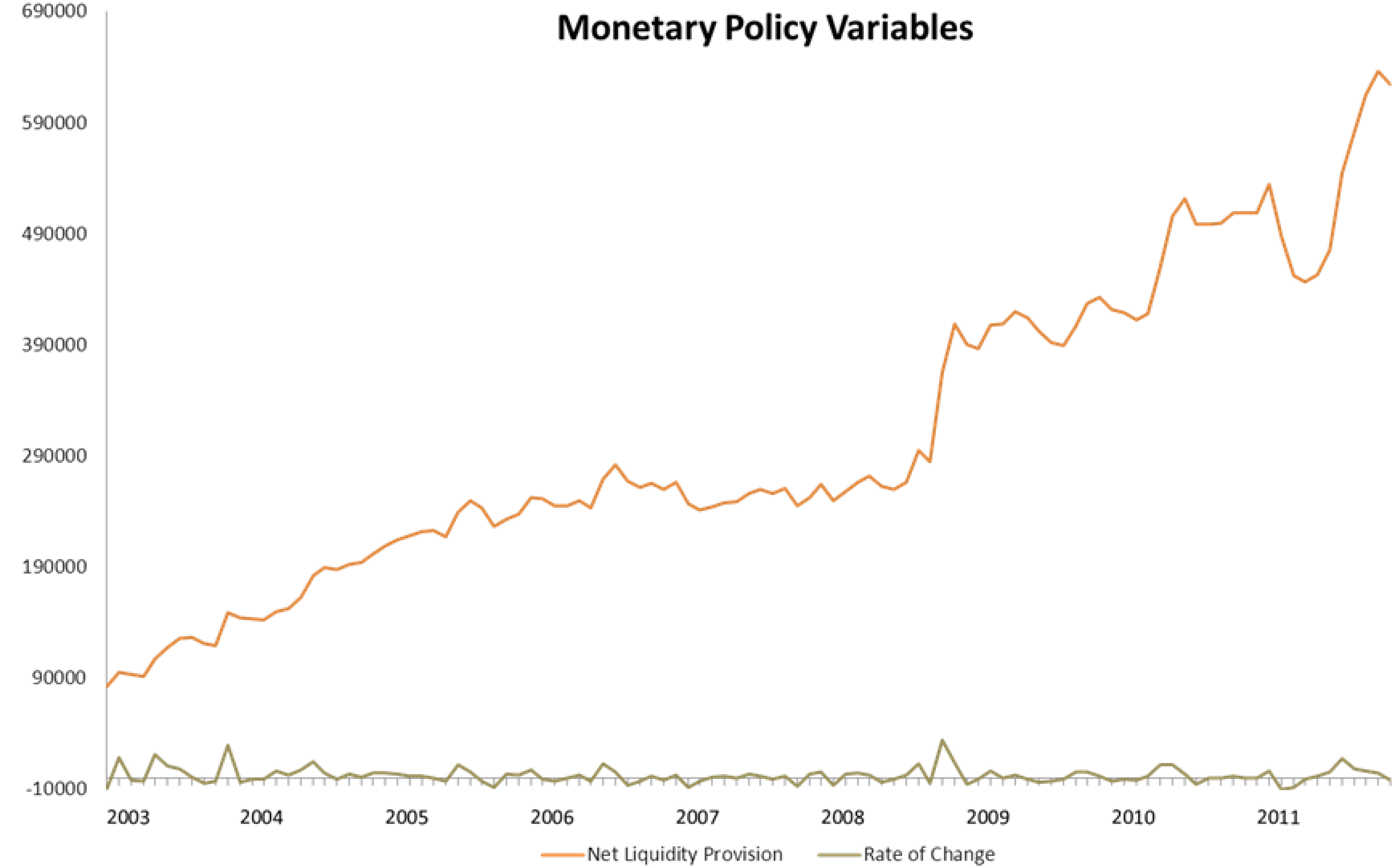
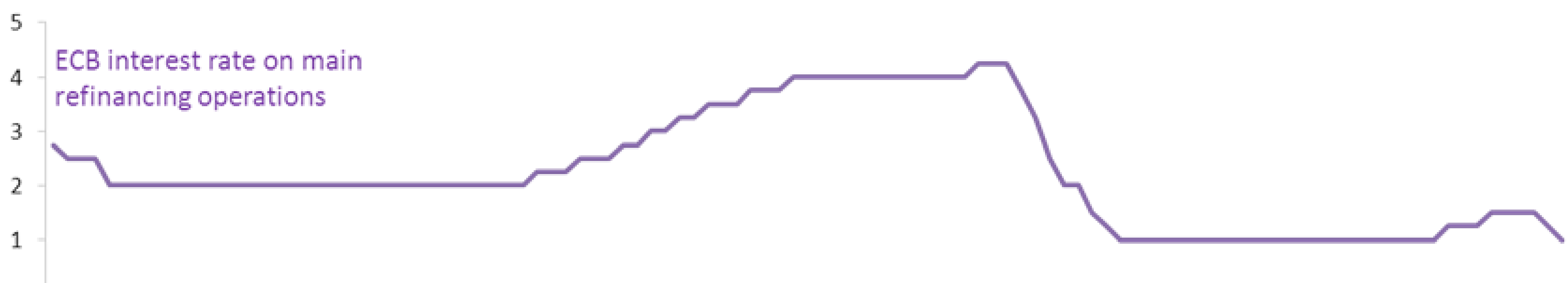
-2
-3
-4
2003
2004
2005
2006
2007
2008
2009
2010
2011
Eurozone Monetary Policy Contribution
0,5
0
-0,5
ECB interest rate on main refinancing operations
5
4
3
2
1


Monetary Policy Variables
690000
590000
490000
390000
290000
190000
90000
-10000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Net Liquidity Provision
Rate of Change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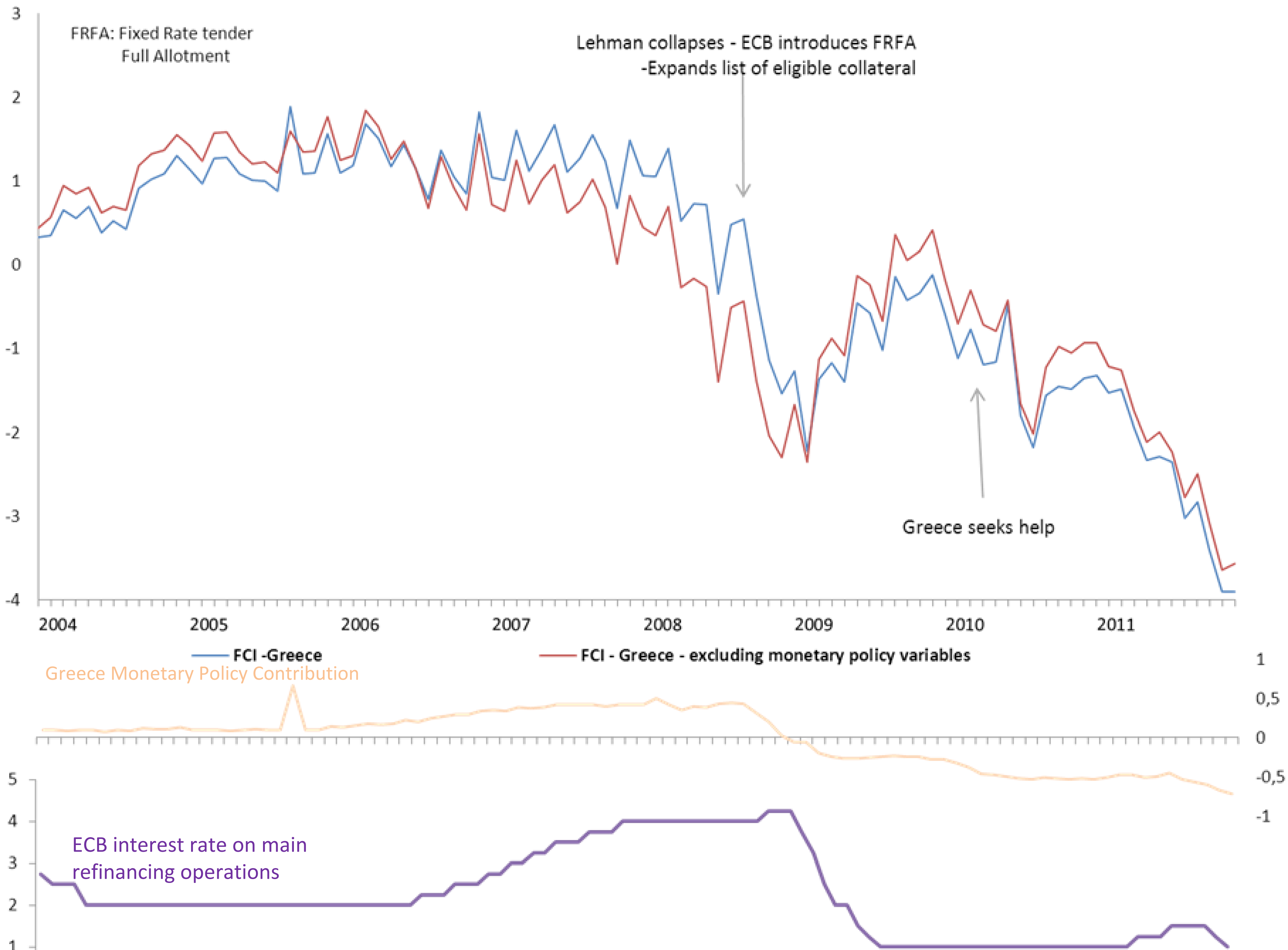
ECB interest rate on main refinancing operations

GREECE



FRFA: Fixed Rate tender
Full Allotment
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Greece seeks help
3
2
1
0
-1
-2
-3
-4
2004
2005
2006
2007
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2010
2011
FCI -Greece
FCI - Greece - excluding monetary policy variables
Greece Monetary Policy Contribution
1
0,5
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-0,5
-1
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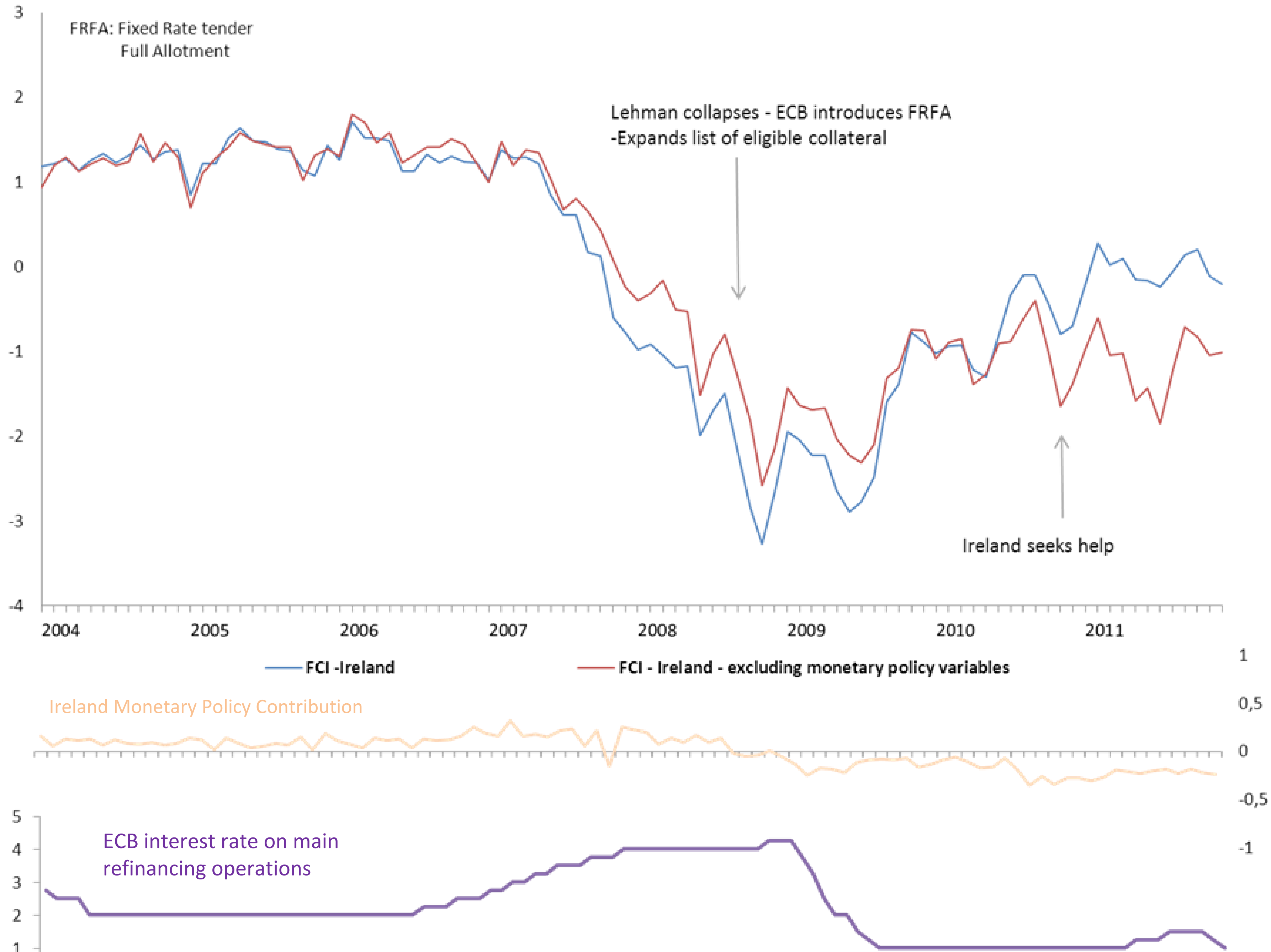
1
ECB interest rate on main
refinancing operations

IRELAND



FRFA: Fixed Rate tender
Full Allotment
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Ireland seeks help
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2004
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2011
FCI -Ireland
FCI - Ireland - excluding monetary policy variables
Ireland Monetary Policy Contribution
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-0,5
-1
ECB interest rate on main
refinancing operations
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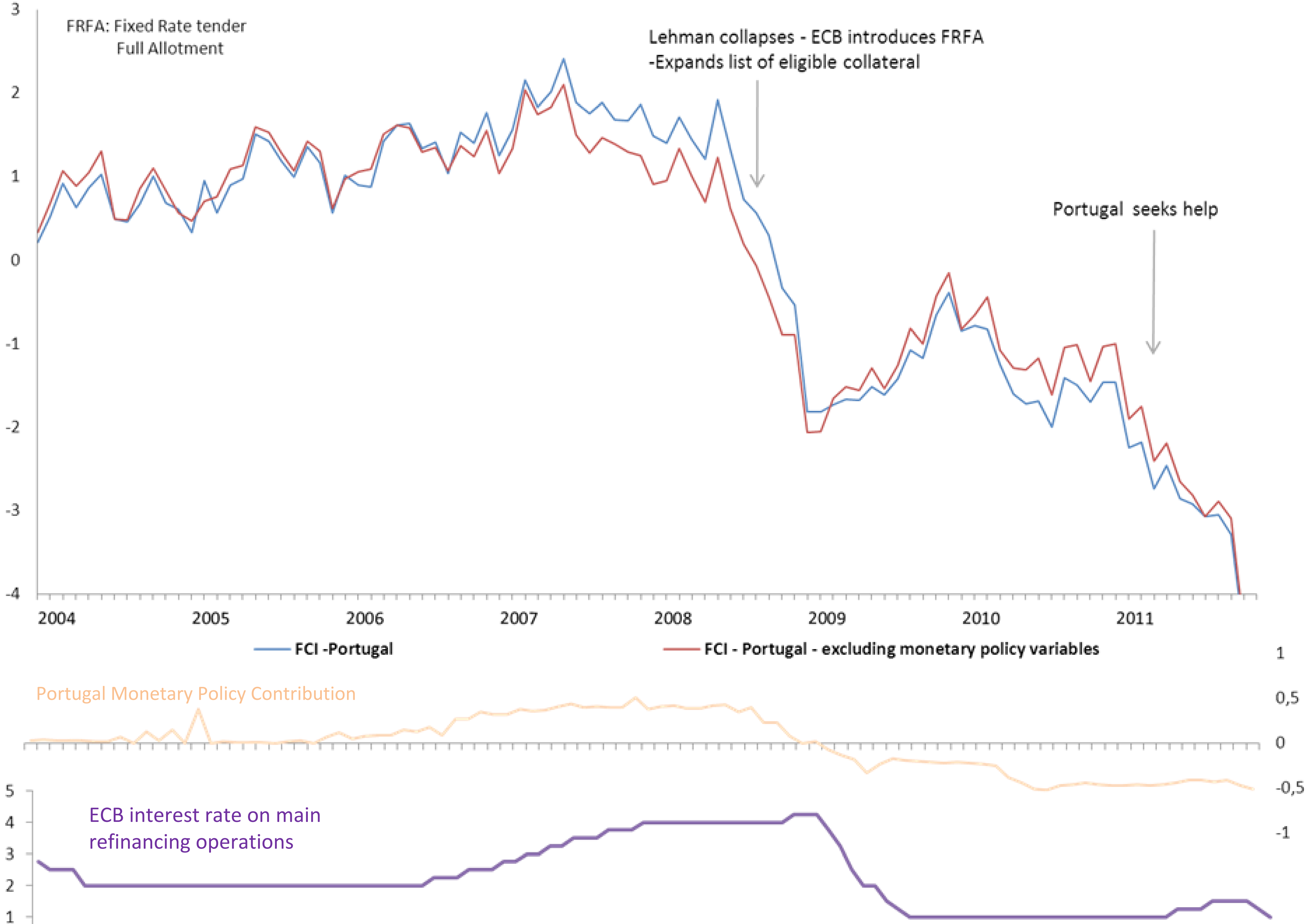
1

PORTUGAL



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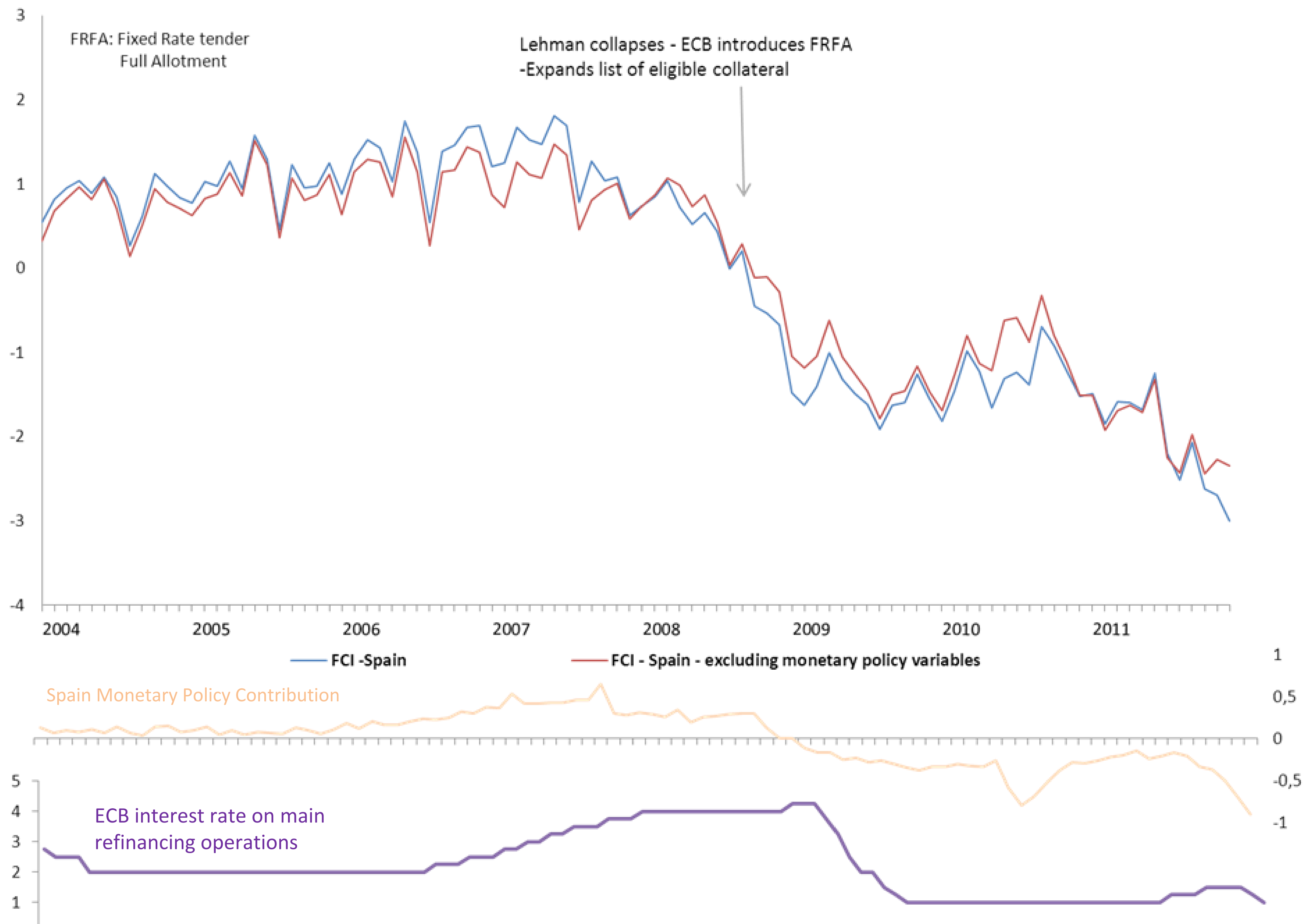
-4
FRFA: Fixed Rate tender
Full Allotment
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Portugal seeks help
2004
2005
2006
2007
2008
2009
2010
2011
FCI -Portugal
FCI - Portugal - excluding monetary policy variables
Portugal Monetary Policy Contribution
1
0,5
0
-0,5
-1
5
4
3
2
1
ECB interest rate on main
refinancing operations

SPAIN


FRFA: Fixed Rate tender Full Allotment
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
3
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0
-1
-2
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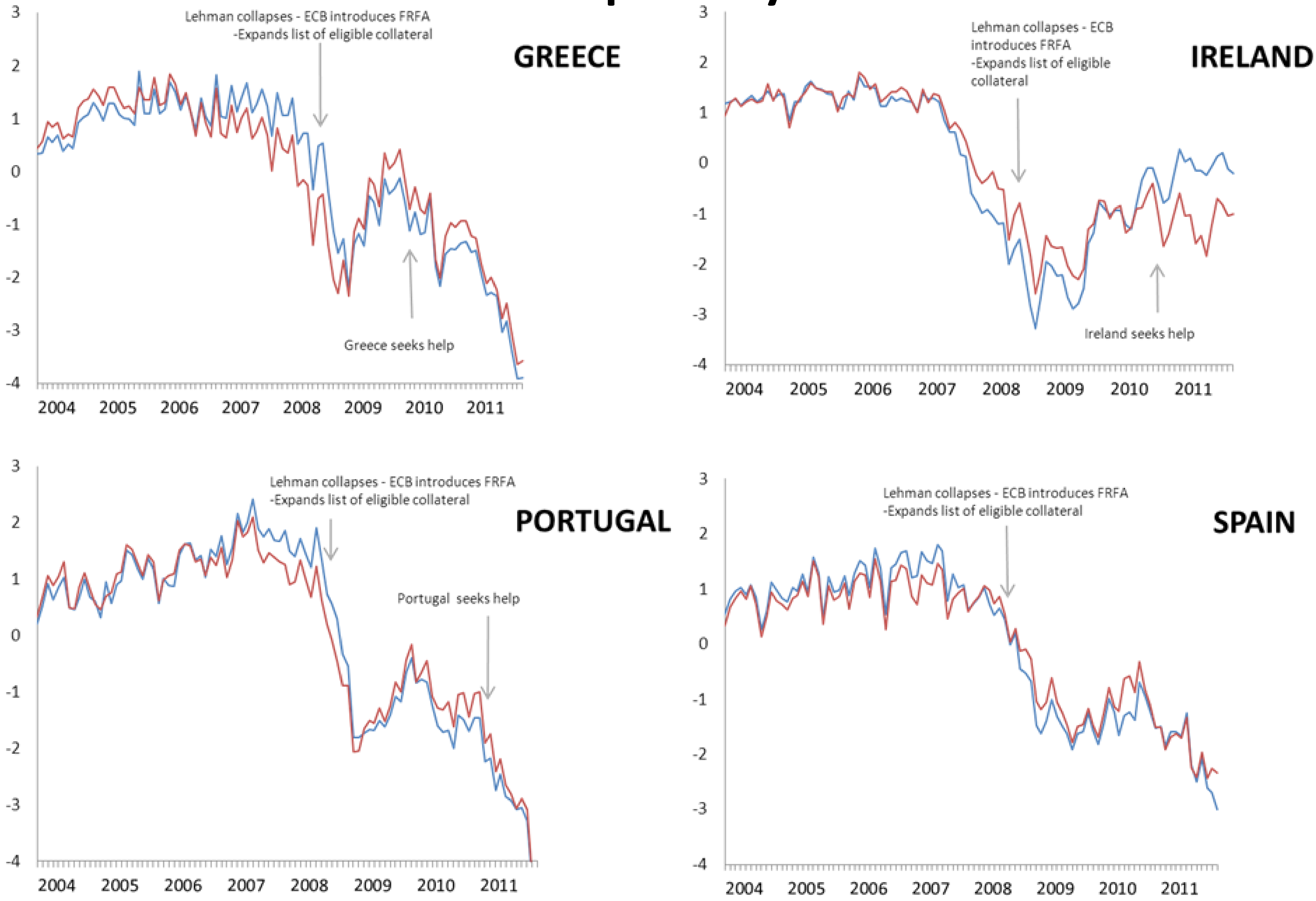
-4
2004
2005
2006
2007
2008
2009
2010
2011
FCI -Spain
FCI - Spain - excluding monetary policy variables
Spain Monetary Policy Contribution
1
0,5
0
-0,5
-1
ECB interest rate on main refinancing operations
5
4
3
2
1

Periphery



GREECE
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Greece seeks help
3
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-2
-3
-4
2004
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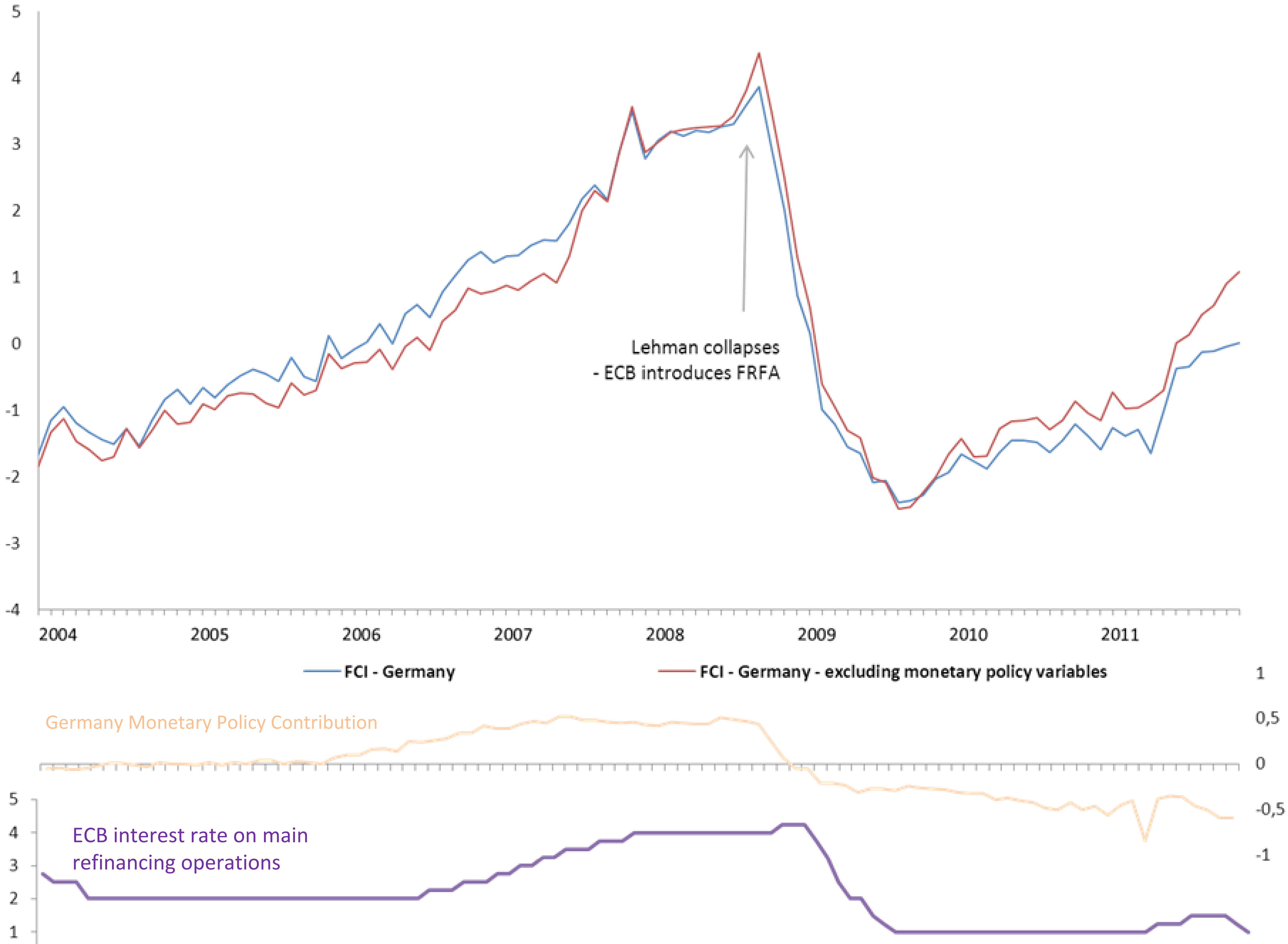
2006
2007
2008
2009
2010
2011
IRELAND
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Ireland seeks help
PORTUGAL
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral
Portugal seeks help
SPAIN
Lehman collapses - ECB introduces FRFA
-Expands list of eligible collateral

GERMANY



Lehman collapses
- ECB introduces FRFA
2004
2005
2006
2007
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2010
2011
FCI - Germany
FCI - Germany - excluding monetary policy variables
Germany Monetary Policy Contribution
ECB interest rate on main
refinancing operations

Weighted loadings of monetary policy variables in FCIs

	Euro area	Germany	Greece	Ireland	Portugal	Spain
Net liquidity provision by the Eurosystem	-0.071	0.076	-0.094	-0.086	-0.142	-0.106
Growth of net liquidity provision	-0.038	0.006	0.075	-0.015	-0.020	0.019
ECB refinancing rate	-0.115	-0.176	-0.131	-0.037	-0.108	-0.148

Cross-correlations between FCIs

Without monetary policy

	Euro area	Greece	Ireland	Portugal	Spain	Germany
Euro area	1					
Greece	0.828	1				
Ireland	0.895	0.808	1			
Portugal	0.830	0.897	0.764	1		
Spain	0.801	0.821	0.786	0.931	1	
Germany	-0.000	-0.125	-0.106	0.193	0.292	1

With monetary policy

	Euro area	Greece	Ireland	Portugal	Spain	Germany
Euro area	1					
Greece	0.851	1				
Ireland	0.662	0.501	1			
Portugal	0.879	0.946	0.434	1		
Spain	0.919	0.924	0.616	0.940	1	
Germany	0.517	0.356	-0.131	0.516	0.441	1

Main findings

- Financial conditions **fluctuate** substantially over time
- Strong evidence of **heterogeneous** financial conditions within EMU both before and during the global financial crisis, in spite of the single monetary policy
- **Asymmetric responses** to financial shocks: Lehman fall has different impact on different countries
- **Divergent experiences of the crisis:**
  - **Periphery**: financial conditions did not loosen as much up to 2008, then tightened earlier on than in Germany
  - **Germany**: No evidence of the deterioration seen in euro-area financial conditions in the second half of 2011

Main findings

- Monetary policy appears to have '**leaned against the wind**' in the run-up to the crisis, containing the credit easing.
- The same appears to have been the case in the periphery, in the aftermath of Lehman Brothers, setting a break on the unprecedented tightening of credit conditions.

- However, during the **sovereign debt crisis** and once the interest rate tool became available, monetary policy seems to have led to tighter financial conditions across the EMU.

- Overall, the single monetary policy does seem to help **convergence in conditions** across the euro area.

In conclusion

1. Our FCIs appear to be **potentially valuable tools,** both for **monitoring** financial conditions and for **assessing** the impact and appropriateness of monetary policy with regards to financial conditions.

2. Making monetary policy which will adequately **account for the heterogeneity** and asymmetries detected in financial conditions across the euro area represents a **considerable challenge**.