Spillover effects from Euro Area Monetary Policy across the EU

A Factor-Augmented VAR approach

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Section 1

Introduction

Motivation

Euro area monetary policy is likely to have spillover effects on EU
countries outside the monetary union (10 CEE countries, Sweden,
Denmark, UK)

- Strong trade and financial integration within the EU

- Exchange rate pegs against the Euro (Bulgaria, Denmark and
  before euro adoption Estonia, Latvia, Lithuania)

- Fear of floating due to high foreign currency lending exposures
  (Poland, Hungary, Czech Republic, Romania)

Theoretical background

Spillovers from a foreign monetary policy expansion can arise via

- the trade channel (Mundell-Flemming-Dornbusch model)
    - Increased foreign demand for domestic goods
    - Asymmetric spillovers via exchange rate adjustments

- the financial channel
    - Foreign interest rate affects world interest rates (Svensson and van Wijnbergen, 1989)
    - Banking channel: reduced funding costs of international banks, increased cross-border leverage and lower risk perceptions (Bruno and Shin, 2015; Rey, 2015)

Previous empirical literature

Previous studies that consider spillover effects from Euro area monetary policy to non-Euro area countries

- use country-specific models: Mumtaz and Surico (2009), Benkovskis et al. (2011), Jiménez-Rodríguez et al. (2010)

- use multi-country models, but only consider spillovers to real activity and prices: Eickmeier and Breitung (2005), Feldkircher (2014)

- focus on the trade channel

Contribution

- I analyze spillover effects from a shock in the Euro area short-term interest rate to thirteen non-EA economies

- FAVAR model with two blocks, based on a large set of monthly Euro area and non-Euro area data (1999-2013)

- Impulse responses to real activity, prices and financial variables (exchange rates, interest rates, uncertainty/risk aversion)

Main findings

- Strong symmetric spillover effects on production and on financial variables, independently of the exchange rate regime

- Prices are more independent from Euro area monetary policy

- Results are qualitively robust for sub-samples and when accounting for unconventional monetary policy measures

Introduction
Empirical Methodology
Results
Conclusions

FAVAR Model
Data
Estimation
Shock Identification

Section 2

Empirical Methodology

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Introduction
Empirical Methodology
Results
Conclusions

FAVAR Model
Data
Estimation
Shock Identification

FAVAR model with two blocks of factors

VAR model (order one)

$$\begin{bmatrix} Z_t^{EA} \\ F_t^{nonEA} \end{bmatrix} = \begin{bmatrix} \Phi_{1,1} & 0 \\ \Phi_{2,1} & \Phi_{2,2} \end{bmatrix} \begin{bmatrix} Z_{t-1}^{EA} \\ F_{t-1}^{nonEA} \end{bmatrix} + \nu_t \tag{1}$$

with $Z_t^{EA} = [F_t^{EA} \ R_t^{EA}]'$ summarizing EA factors

Observation equation

$$\begin{bmatrix} X_t^{EA} \\ X_t^{nonEA} \end{bmatrix} = \begin{bmatrix} \Lambda_{1,1} & 0 \\ \Lambda_{2,1} & \Lambda_{2,2} \end{bmatrix} \begin{bmatrix} Z_t^{EA} \\ F_t^{nonEA} \end{bmatrix} + e_t \tag{2}$$

$\Phi_{1,2}$ **and** $\Lambda_{1,2}$ **set to zero by block-exogeneity assumption**

Introduction
Empirical Methodology
Results
Conclusions

FAVAR Model
Data
Estimation
Shock Identification

Data

- Monthly data for 1999-2013

- 210 aggregate time series from Euro area and non-Euro area countries
    - Industrial production, unemployment, consumer and producer prices, real effective exchange rates, short-term interest rates, share prices, stock market volatility
    - International variables (oil and commodity prices, US and JP)

- First differences taken of all time series except interest rates

- All time series standardized prior to factor analysis

Introduction
Empirical Methodology
Results
Conclusions

FAVAR Model
Data
Estimation
Shock Identification

2-step Estimation Procedure

1 Factors estimated with principal component analysis (Stock and Watson 2002) :

- Bai and Ng (2002) criteria: 6 EA factors, 3 non-EA factors
- Non-EA factors are rotated to become orthogonal to EA factors (Charnavoki and Dolado, 2014)

2 VAR including factors and policy rate is estimated with OLS

- Impulse responses to a monetary policy shock of any time series in the data set can be calculated through equation (2)

Introduction
Empirical Methodology
Results
Conclusions

FAVAR Model
Data
Estimation
Shock Identification

Identification of shocks

Cholesky decomposition

- Joint dynamics underlying EA variables (factors) do not react contemporaneously to EA short-term interest rate
- Individual EA time series separated into slow-moving and fast-moving variables (Bernanke et al., 2005)
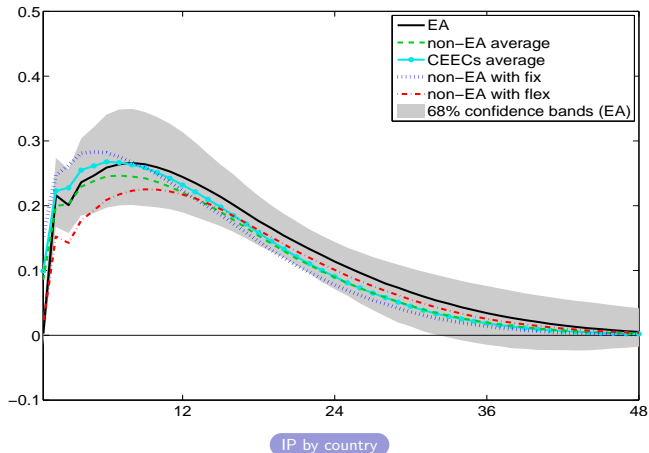- Fast-moving EA variables and non-EA variables can react on impact (factor rotation)

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis

Section 3

Results

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis

Results

- Impulse responses to a negative 100bp shock in the Euro area short-term interest rate and 68 percent confidence bands presented

- Average effects of country groups compared: Euro area, non-EA, CEECs, non-EA with fix, non-EA with flex

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis

Industrial production growth

Figure 1: Impulse responses of industrial production (IP) growth, averaged over country groups

IP by country

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis

Consumer price inflation

Figure 2: Impulse responses of consumer price inflation (CPI), averaged over country groups

CPI by country

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis
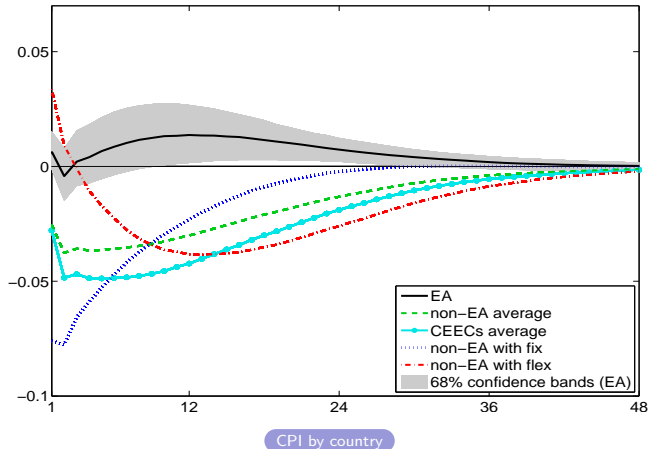
Real effective exchange rates

Figure 3: Impulse responses of the change in real effective exchange rates, averaged over country groups

REER by country

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis
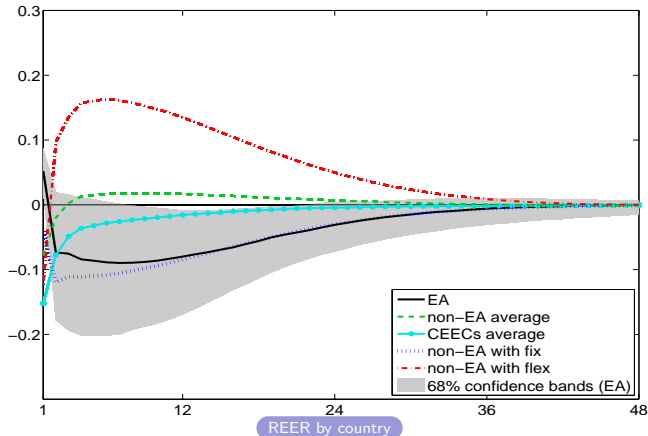
Short-term interest rates

Figure 4: Impulse responses of short-term interest rates, averaged over country groups

INT by country

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis
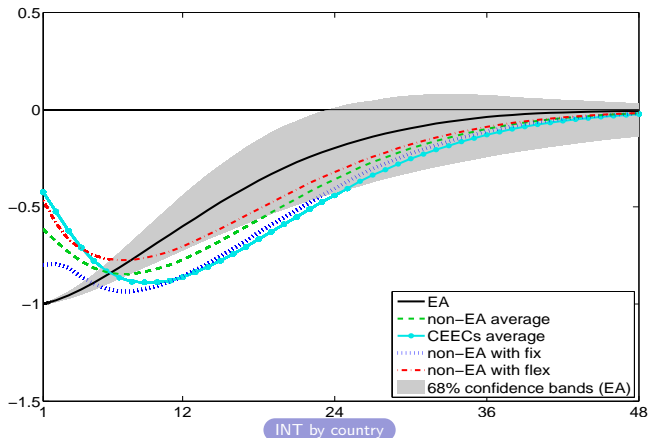
Uncertainty on financial markets

Figure 5: Impulse responses of stock price volatility, averaged over country groups

Introduction
Empirical Methodology
Results
Conclusions

Baseline Results
Robustness analysis
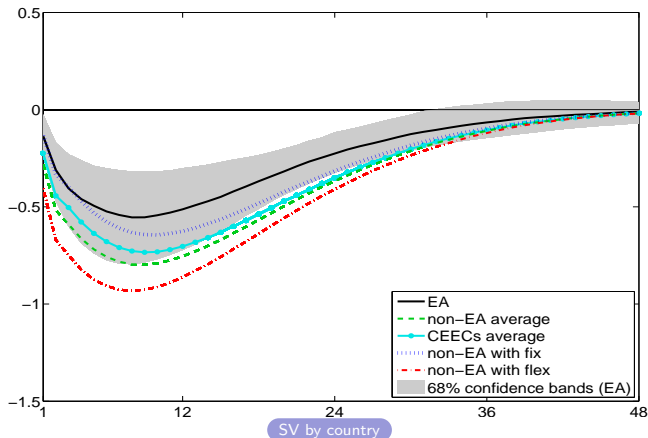
Robustness checks

Results robust to a number of alternative specifications

- Use of shadow interest rate by Wu and Xia (2014) to account for unconventional monetary policy and the zero lower bound ⟨Shadow rate⟩

- Sub-sample analysis: 1999-2007 vs. 2008-2013 ⟨Sub-samples⟩

- Alternative number of factors ⟨Factors⟩

- Alternative model specifications: one group of factors, no block-exogeneity, structural factors ⟨Models⟩

Section 4

Conclusions

Concluding remarks

- Monetary policy actions of the ECB substantially affect real activity and financial markets outside the monetary union

- Small European economies outside the Euro area have limited possibilities to conduct an independent monetary policy

- Policy makers need to closely monitor economic developments and monetary policy in the Euro area

- Macroprudential policies might me needed to prevent boom and bust cycles fueled by foreign monetary policy

Thank you very much for your attention.

Section 5

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Impulse responses of industrial production growth

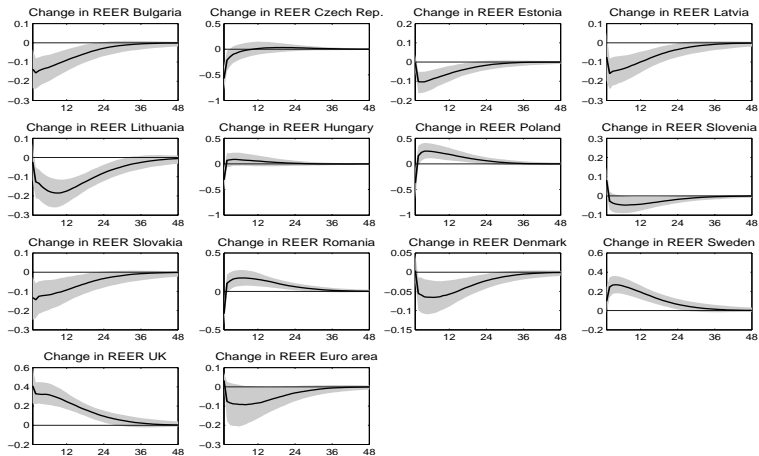Galina Potjagailo   Spillover effects from EA Monetary Policy across the EU

Impulse responses of consumer price inflation (CPI)
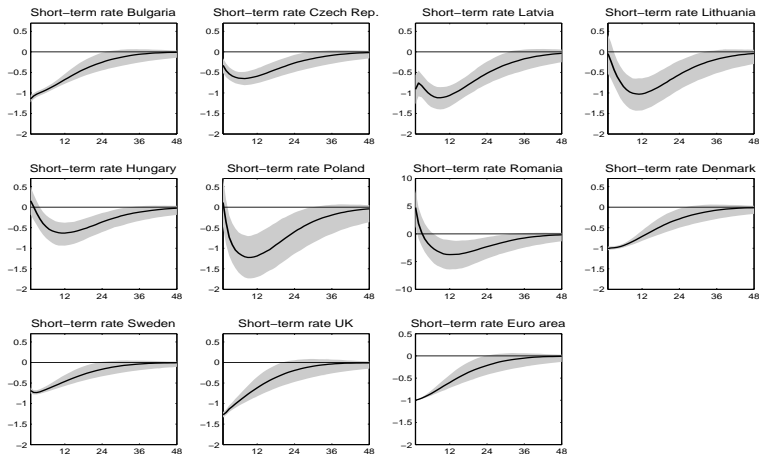
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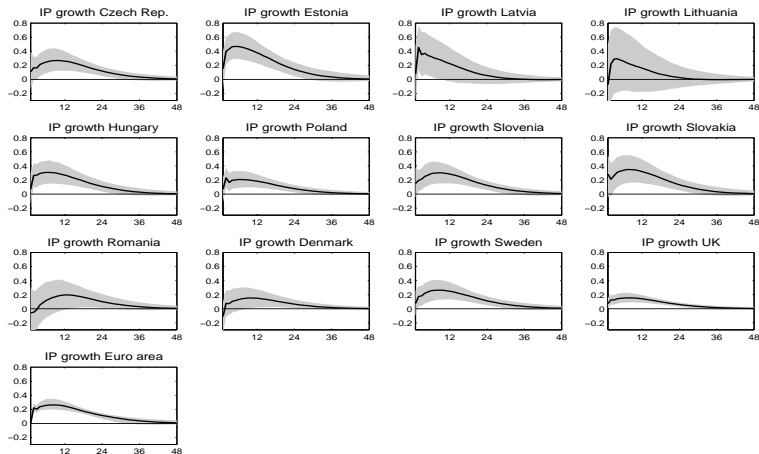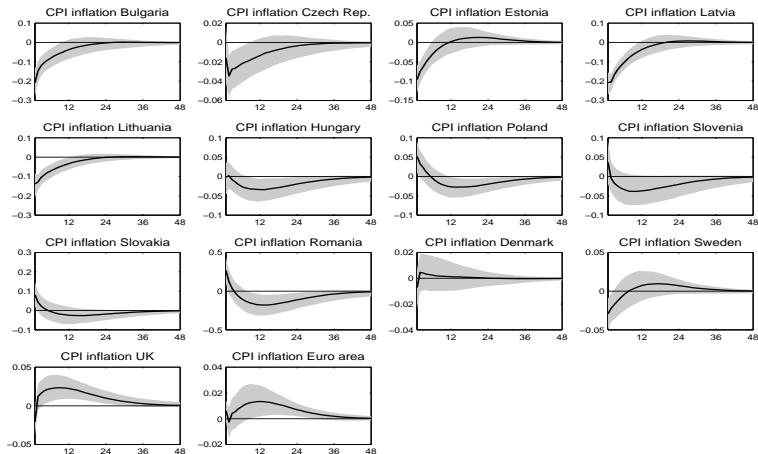
Impulse responses of producer price inflation (PPI)
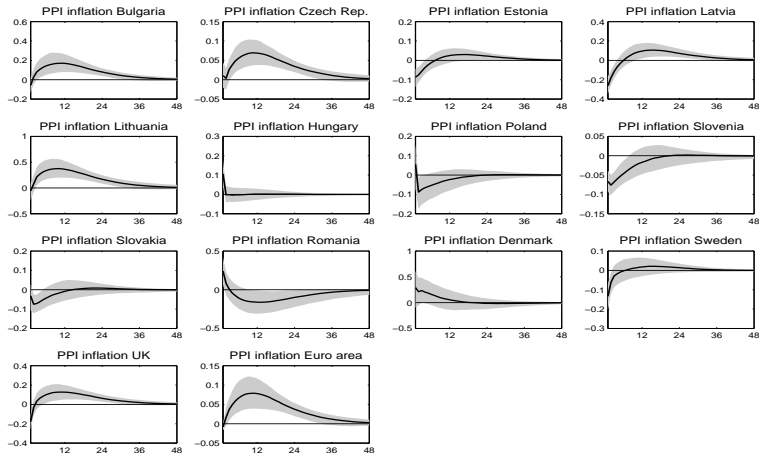
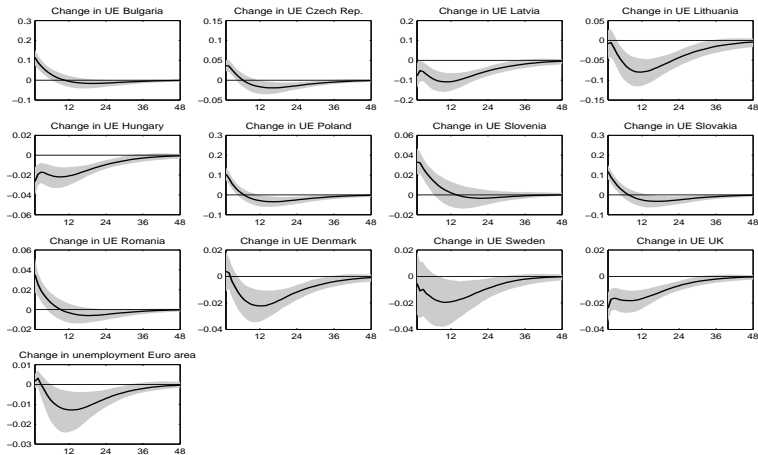# Impulse responses of change in real effective exchange rate

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Impulse responses of short-term interest rates

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Impulse responses of uncertainty
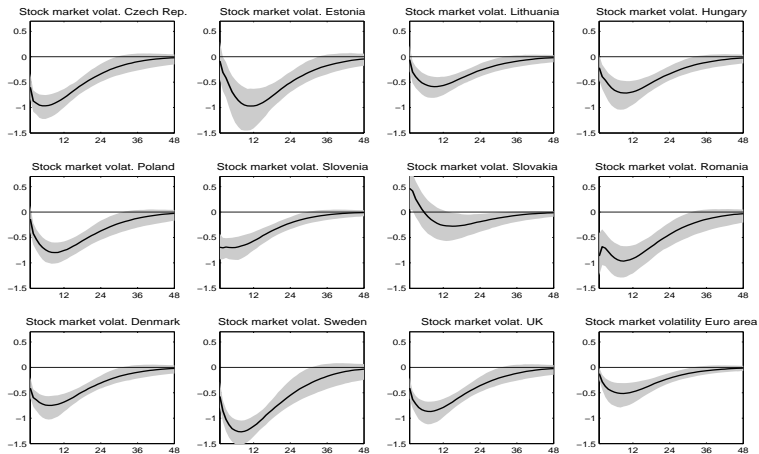
Impulse responses of change in unemployment rates
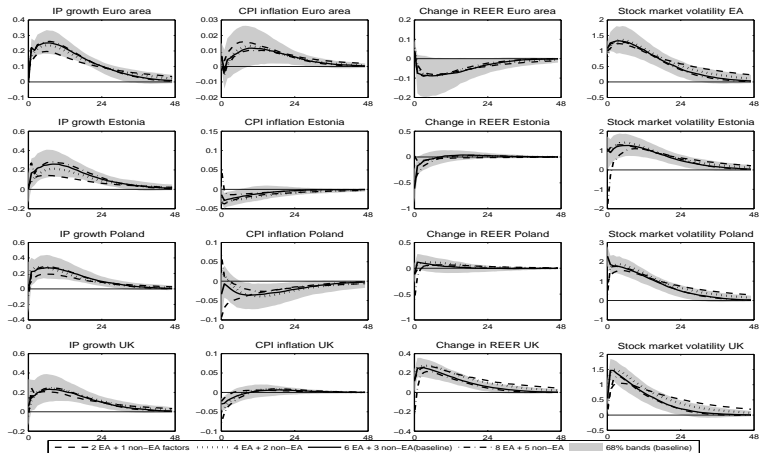

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Robustness I: FAVAR model with shadow rates
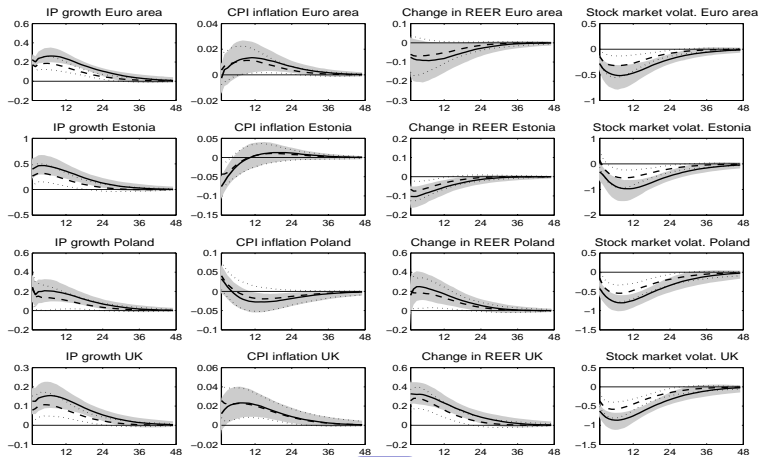
Robustness II: Sub-samples
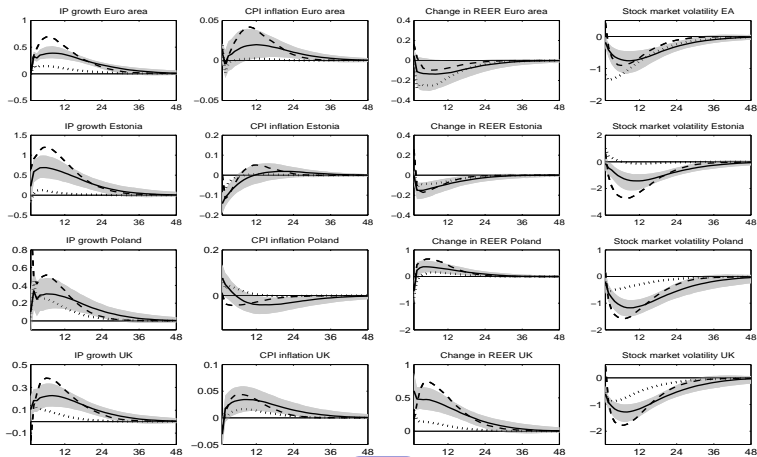
Robustness III: Number of factors

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Robustness IV: Alternative models
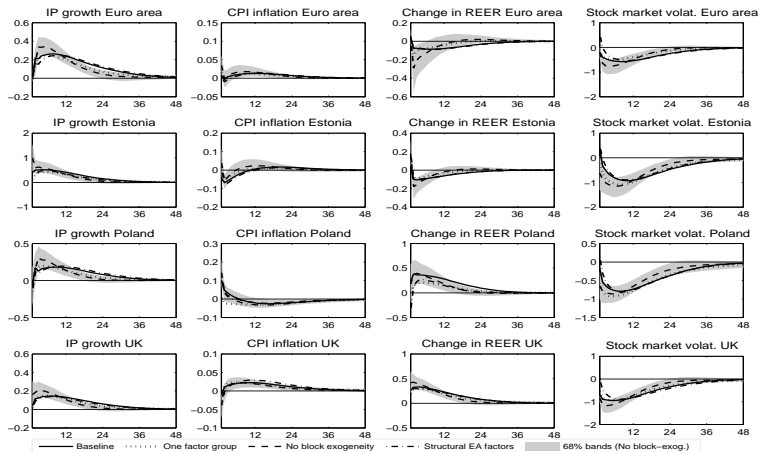
EA factor rotation

1. An initial set of EA factors, $\hat{F}_t^{EA}(0)$, is extracted from EA data X_t^{EA}

2. Another set of slow-moving EA factors, $\hat{F}_t^{EAslow}$, is extraced from slow-moving EA variables

3. Estimate $\hat{F}_t^{EA}(0) = b_1 \hat{F}_t^{EAslow} + b_2 R_t + e_t$

4. Obtain new factors by $\hat{F}_t^{EA} = \hat{F}_t^{EA}(0) - \hat{b}_2 R_t$

5. Order R_t after $\hat{F}_t^{EA}$ in the VAR

◂ back