

Spillover of the ECB's Monetary Policy Outside the Euro Area: How Different is Conventional From Unconventional Policy?

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AIECE Meeting - Economic Tools Workshop, Brussels

November 6 2015

- Introduction
- Related Literature
- Our Contribution
- A Monetary Conditions Index for the euro area
- Block-restricted FAVAR Approach
- Conclusions

- The recent financial crisis brought about number of **unconventional measures (UMP)** consisting in active use of CB balance sheet to affect market prices and conditions beyond short-term interest rate.
- Although the UMP target domestic objectives, given strong financial and trade linkages they might have **international spillover effects**. One needs to mainly distinguish between (i) immediate effects the UMP decisions can have on foreign financial variables from (ii) long-term effect on foreign macroeconomic variables.
- The goal of our paper is provide some evidence on the ECB's conventional and unconventional **monetary policy shock transmission on the EU countries outside the euro area**. Specifically we aim at three CE countries (CZE, HUN, POL) and three euro "opt-outs" (DNK, SWE, UK).
- These counties all share strong ties to the euro area albeit their degree of dependence on the euro area differs, which in turn determines the effective degree of their domestic monetary policy independence.

- Since the collapse of Lehman Brothers in September 2008, the ECB has adopted a number of balance sheet policies:
 - i) used its balance sheets to **intermediate trades** between commercial banks,
 - ii) **supplied liquidity** in full allotment tender at fixed rate both via main refinancing operations (MRO) and long-term financing operations (LTRO at 3, 6, 12 months and extended till 3 years), also in USD (via swap with FED), extended eligible collateral,
 - iii) implemented **asset purchase programmes**: a covered bond purchase program (CBPP) 2009-2010 to lower banks' financing cost and a Securities Markets Program (SMS) since 2010 to intervene in secondary sovereign bond market,
 - iv) outright monetary transaction (OMT) consisting in **discretionary purchases of ST sovereign bonds under defined conditions** (country requesting assistance via EFSM/ESM) introduced in 2012.
 - v) direct purchase of ABS, CBPP, TLTRO and since 2015 **standard QE**.

- **International transmission of monetary policy:** open-economy VAR (Cushman and Zha, 1997, Kim, 2001, Giordani, 2004, Canova, 2005), application to CE (Mackowiak, 2006, Horvath and Rusnak, 2009, Feldkircher, 2013).
- **Empirical studies on impact of unconventional measures:** domestic impact to EZ (Fahr et al., 2011, Lenza et al., 2010, Giannone et al., 2012), international impact for FED (Neely, 2010, Chen et al. 2012) and the ECB (Fratzscher et al., 2014).
- **Measures of monetary policy stance:** policy rate (Bernanke and Blinder, 1992), government and corporate bond spreads (Chen et al., 2012), balance sheet items of CB (Meaning and Zhu, 2012), shadow rate using term-structure (Bauer and Rudebusch, 2014, Wu and Xia, 2014) or factors of different measures (Lombardi and Zhu, 2014).

- **What we do:**

i) construct a synthetic index of overall euro area monetary conditions (MCI) using factor model,

ii) identify conventional and unconventional policy measures by means of MCI components,

iii) study the macroeconomic impact of ECB policy on the euro area and six non-EMU countries by means of block-restricted FAVAR.

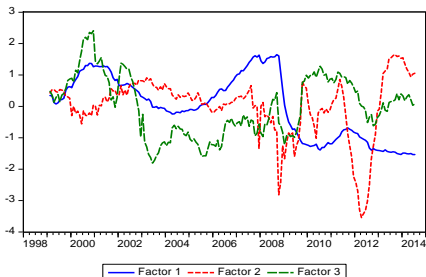
A Synthetic Measure of MC of the EA

- We follow the logic that Lombardi and Zhu (2014) and use factor analysis in order to construct a synthetic **measure of overall monetary conditions (MCI)** for the euro area.
- This index makes use of information based on **interest rates and spreads** and additionally of developments of **monetary aggregates, elected balance sheet items of the ECBs** and (given the relative openness of the euro area) **the exchange rate**.
- We have **set of 14 variables reflecting monetary conditions** in the euro area that can be divided into the following five blocks: I. Interest rates, II. Monetary aggregates, III. Selected asset items from the ECB balance sheet, IV. Selected liabilities from the ECB balance sheet, V. Exchange rate.
- We use monthly data from 1M/1999 till 7M/2014 (updated till 6/2015) from Thomson Datastream.

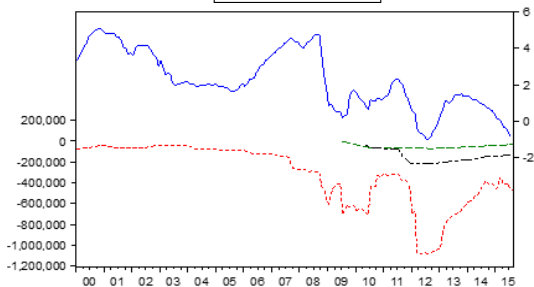
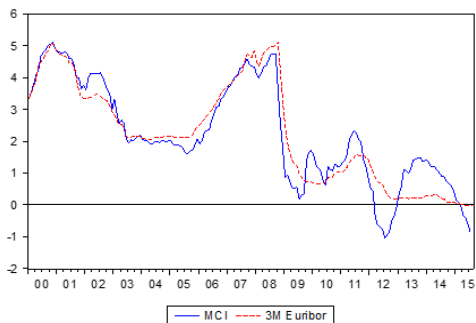
A Synthetic Measure of MC of the EA

	Factor 1	Factor 2	Factor 3	Communality	Uniqueness
EMPRATE	0.97	0.02	0.16	0.98	0.02
EMBOR3	0.99	-0.00	0.12	0.99	0.01
EMBOR1Y	0.97	-0.06	0.18	0.98	0.02
EMGBOND	0.70	0.02	0.42	0.66	0.34
OIS	0.98	0.09	0.12	0.98	0.02
EMM1NEG	-0.02	-0.28	0.36	0.21	0.79
EMM2NEG	-0.77	-0.04	0.53	0.89	0.11
EMM3NEG	-0.86	-0.03	0.43	0.92	0.08
EMASTOTNEG	-0.17	0.92	0.22	0.92	0.08
EMECASMNEG	0.23	0.09	-0.18	0.09	0.91
EMALTRONEG	-0.13	0.27	0.13	0.11	0.89
EMECLEBCNEG	0.07	0.04	0.66	0.44	0.56
EMECLEMMNEG	0.01	0.89	0.05	0.80	0.20
USDEUR	0.06	0.47	-0.35	0.35	0.65

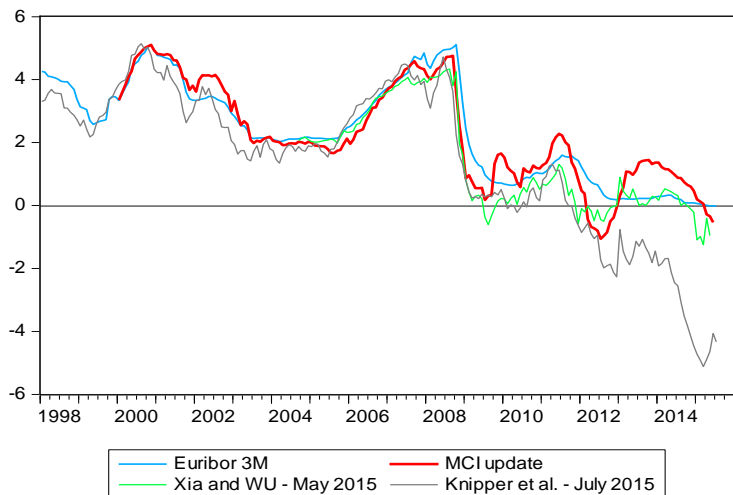
Factor	Variance	Cumulative	Difference	Proportion	Cumulative
Factor 1	5.76	5.76	3.72	0.62	0.62
Factor 2	2.04	7.80	0.52	0.22	0.84
Factor 3	1.52	9.32	---	0.16	1.00
Total	9.32	9.32		1.00	



A Synthetic Measure of MC of the EA



A Synthetic Measure of MC of the EA vs. shadow rates

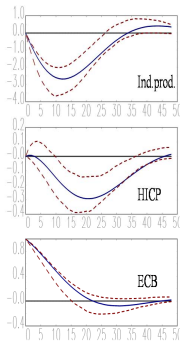


Block-restricted FAVAR approach

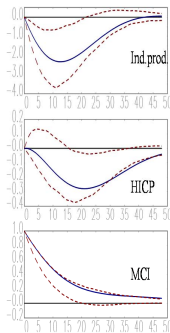
- We estimate a **block-restricted structural VAR model** in the spirit of Kim (2001), Canova (2005) or Mackowiak (2007).
- The VAR model is estimated separately for each of the six non-euro area countries. We use monthly data from 1M/2001 till 6/2014 from Thomson Datastream.
- **The endogenous block** of the VAR consists of four domestic financial variables with the standard VAR ordering: industrial production index, HICP, 3M interbank interest rate, and the exchange rate of the domestic currency to euro. **The exogenous block** includes the euro area's industrial production index, HICP and 3M EURIBOR (alt. MCI and the first two factors).
- All the variables are in year-on-year changes except for interest rate and the MCI (alike its two factors). To control for potential structural change following Lehman Brothers and the global financial crisis we use a shift dummy from September 2008. In line with SIC/HQ we use 1 lag.
- We aim at MP shock from (i) EURIBOR, (ii) MCI, (iii) F1 and F2.

Impulse responses of the EA to ECB MP shock

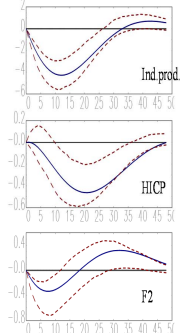
a) shock to 3-month Euribor



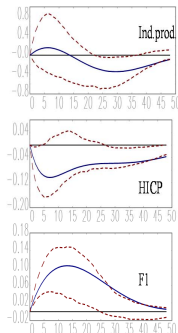
b) shock to MCI



c) shock to F1

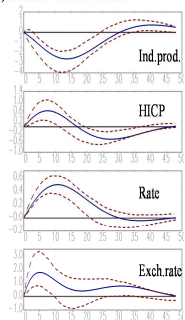


d) shock to F2

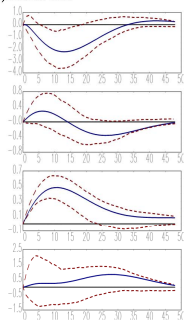


Impulse responses of CZE to ECB MP shock

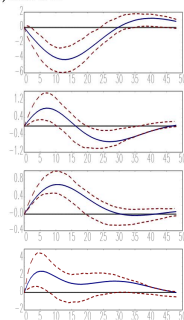
a) shock to 3-month Euribor



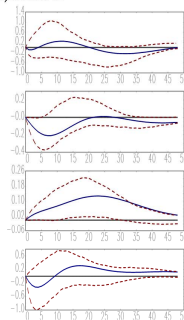
b) shock to MCI



c) shock to F1

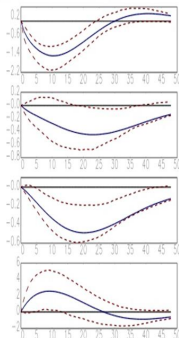


d) shock to F2

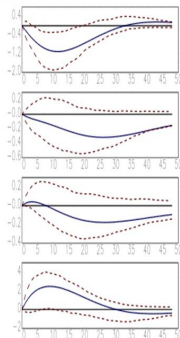


Impulse responses of UK to ECB MP shock

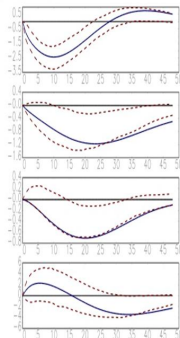
a) shock to 3-month Euribor



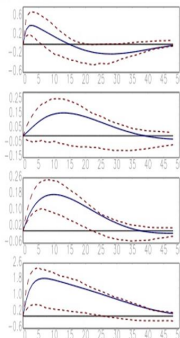
b) shock to MCI



c) shock to F1



d) shock to F2



Summary of spillover of the ECB's MP outside the EA

	Euro area	Czech Republic	Hungary	Poland	Denmark	Sweden	UK
a) Shock to Euribor							
Ind. prod.	12 -	12 -	12 -	15 -	12 -	9 -	10 -
HICP	20 -	7 + / 28 -	10 +	14 + / 40 -	26 -	9 +	24 -
Interest rate		12 +	8 +	6 +	5 +	26 -	20 -
Exch. rate	n.a.	5 +	5 +	8 +	4 -	7 +	7 +
b) Shock to MCI							
Ind. prod.	13 -	12 -	12 -	15 -	15 -	2 -	10 -
HICP	20 -	4 + / 24 -		12 + / 40 -		12 +	
MCI or int. rate		10 +	9 +	13 +	7 +	6 +	
Exch. rate	n.a.	0 +		7 +	7 -	6 +	7 +
c) Shock to F₁: conventional monetary policy							
Ind. prod.	10 -	12 -	10 -	15 -	12 -	9 -	10 -
HICP	20 -	6 + / 26 -	12 + / 35 -	12 +	25 -	10 +	24 -
Interest rate		10 +	10 + / 33 -		6 +	25 -	22 -
Exch. rate	n.a.	4 +	5 +	7 +	10 -	6 +	34 -
d) Shock to F₂: unconventional monetary policy							
Ind. prod.	30 -		26 -		22 -	2 -	3 + / 25 -
HICP	5 -	6 -	6 -			13 +	
Interest rate		20 +	22 +	4 +	12 +	15 +	10 +
Exch. rate	n.a.	0 +	4 - / 15 +	4 - / 24 +	10 -	5 +	4 +

- In this paper we assess the impact of the ECB monetary policy on six EU non-euro area countries.
- In order to account for as many ECB measures as possible we construct monetary conditions index (MCI) based on factor analysis.
- Unlike shadow rates based on term structure models, MCI additionally includes information on monetary aggregates, ECB balance sheet items and exchange rate.
- MCI, its first two factors (conventional, unconventional measures) are then used in a block exogenous VAR/FAVAR where the impact of the ECB policy is assessed via impulse response analysis.

- A standard monetary VAR including the MCI subcomponents shows that the transmission of unconventional monetary policy in the euro area is quite different than under conventional policy: prices react quickly, but the response of output (industrial production) is muted.
- A block-restricted VAR analysis confirms that euro area monetary policy spills over to macroeconomy of non-EMU countries.
- Conventional monetary policy has a generalized effect on economic activity, exchange rates and prices. Unconventional measures have generated a variety of responses. Exchange rates respond rather quickly, but an effect on the real economy is found only for some countries, and inflation remains largely unaffected.