

Fiscal policy, Output and Financial Stress in the case of Developing and Emerging European Economies: a threshold VAR approach

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#### Motivation...(1)



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- Fiscal policy (FP) is an important determinant of economic developments and often government decisions on spending and taxes are assigned a crucial role in speeding up or slowing down economic growth.
- In the recent years the Emerging European countries in the CESEE have been confronted to the effects and post-effects of financial crisis and economic turmoil via financial and trade linkages, accomplished with:
  - Capital equity and debt funds saw significant withdrawals;
  - Lending by advanced economies' banks dropped precipitously reflecting both a weakened outlook and the need for banks to de-leverage;
  - Increasing spreads on sovereign debt;
  - Lower or/and negative growth rate and foreign capital inflows;

#### Motivation...(2)



- Exchange markets came under pressure with most of the countries experiencing sharp and huge currency depreciation;
- Deteriorating financial conditions due to banking system balance sheet constrains;
- Higher fiscal deficits (debt burden) due to lower or/and negative growth rate;
- Fiscal stimulus could smooth the negative effects, given that monetary policy could not do it all by itself, **BUT**:
  - Most of these economies faced hard budget constraints;
  - Placed more stress to financial markets via higher risky scenarios and sovereign debt defaults;

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#### Motivation...(3)



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- These patterns reveal the strong interrelations between financial markets and macroeconomics dynamics and have awaked new interest in assessing the effects of FP, given the inability of monetary policy (MP) alone to restore growth [*Ferraresi, Roventini and Fagiolo, (2013)*].
- Policymakers have a very limited understanding of the impact of crises on economic activity and on the transmission mechanism of FP and vice versa, while the debate about quantitative effects of such interrelations:
  - Is still at the top of research agenda in economics [Ramey, (2011); Blanch and Leigh (2013)];
  - Has not been yet discussed and evaluated in the case of Developing and Emerging European countries in the CESEE;
  - Might be different from what is usually observed in good or normal times compared to a bad or non-stable time;

#### Motivation...(4)



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- **BUT**, the link between the financial stress and FP can be two-sided.
  - Despite the drives of financial instability, policy makers may try to soften its effect on the economy.
  - The so-called "bad" policies can also contribute to financial instability.
- European Banking Authority's new regulations have provided costly and more restricted rules for lending to both the public and private sector in CESEE countries.
- This paper aims to examine whether and how fiscal developments in the Emerging European countries in the CESEE, effect:
  - Financial market conditions, measured through a Financial Stress Indicator;
  - Economic activity in differ times of financial instability;

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## Methodology & data issues...(1)



• Afonso, Baxa and Slavik, (2011) build upon a threshold VAR model as:

$$X_{t} = A^{1}X_{t} + B^{1}(L)X_{t-1} + (A^{2}X_{t} + B^{2}(L)X_{t-1}) I[FSI_{t-d} > \lambda] + U_{t}$$

where,

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- X is a vector of endogenous variables such as GDP (Y), inflation (P), fiscal variable (f), short term interest rate (i) and a financial condition indicator (FSI);
- $A^{1}Y_{t}$  and  $A^{2}Y_{t}$  represent the contemporaneous terms;
- A<sup>1</sup> and A<sup>2</sup> have a recursive structure;
- $B^{1}(L)$  and  $B^{2}(L)$  are lag polynomial matrices;
- *I* is an indicator function that takes the value of 1 if *FSI* is higher than the threshold value  $\lambda$ , and 0 otherwise, while the time lag will be set at 1;
- *U<sub>t</sub>* is structural disturbance;

## Methodology & data issues...(2)



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- The *TVAR* model is build upon variables such as:
  - $\circ$  (Y) real GDP annual growth rate;
  - $\circ$  (*P*) inflation rate proxy as first difference of the logarithm of CPI;
  - $\circ$  (f) annual growth rate of debt to GDP ratio;
  - $\circ$  (*i*) 3 months treasury bill rate (3TBill);
  - (s) a dummy taking the value of 1 if financial stress is higher than a threshold value calculated as in Balakrishnan, Danninger, Elekdag, Tytell, (2009) and 0 otherwise, where the proxy on FSI will include a set of information such as those used by *Holló, Kremer and Lo Duca, (2012)* and *Kota and Saqe (2013)*;
  - DUMMY\_EU an exogenous dummy variable taking the value of 1 for the period when a country has been part of EU, and 0 otherwise.



### Methodology & data issues...(4)



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- Panel approach priory [*Barnerjee, (1999)*; *Gali and Perotti (2003)*; *Wyplosz (2006)*; *Staehr (2008)*; *Afonso and Hauptmeier (2009)*; *Afonso and Jalles (2011)*], is threefold:
  - Provides more information contained in the cross-section dimension, while the unit root tests are more powerful than the conventional ones;
  - Reducing the probability of a spurious regression, while the variances are both cross-sectional and time series related.
  - Cross-country dependence can mirror common changes in fiscal behavior authorities due to increasing economic synchronization across all countries;
- The adoption of a TVAR model is very suitable because:
  - it imposes very little theoretical structure on the data and can be used to establish some relevant stylized facts;
  - o allows to analysis through regime switches and the impulse response functions analysis;

#### Methodology & data issues...(5)



The FSI construction scheme identification.   1. Banking System Balance Sheet a. (loan – HP trend) b. (deposit – HP trend) c. (net interest margin – HP trend) PC <sub>BSH</sub> 2. Money Market a. (3-TBill – German 3-TBill) PC	
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b. (overnight – EONIA)	°C <sub>j</sub> )
c. volatility of (3-TBill – German 3-TBill) - EGARCH	, be
d. volatility of (overnight – EONIA) - EGARCH	nch
3. Exchange Rate a. ratio of CMAX to Euro/Domestic Currency	mai
b. volatility of Euro/Domestic Currency – EGARCH	ネー
c. ratio of CMAX to Dollar/Domestic Currency	2*0
d. volatility of Dollar/Domestic Currency – EGARCH	FSI
4. House Market a. (HPI – HP Filter) PC <sub>HPI</sub>	

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## Methodology & data issues...(6)



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- TVAR analysis includes a panel dataset, for 10 Emerging Market and Developing economies in the Central Eastern and South Eastern European Countries [*Albania*, *Bulgaria*, *Croatia*, *Hungary*, *Latvia*, *Lithuania*, *FYR Macedonia*, *Poland*, *Serbia* and *Turkey*] based on IMF classification.
- The data are collected from Eurostat, IMF and the respective National Central Banks and Ministry of Finance. They cover the period 2001Q 01-2013Q 03.
- Variables are ordered as X = [Y, P, f, i, s]. Based on Afonso, et. al. (2011) it will reflect some assumption about the links in the economy.
  - s ordered in the end revealing that it reacts contemporaneously to all variables in the system. It is assumed that all new changes in both macroeconomic aggregates and economic policy that occur during one quarter are transmitted to financial markets within this quarter.



# Methodology & data issues...(7)



- (f) is ordered after (Y) due to the need to identify the effects of automatic stabilizers in the economy. It is assumed that all reactions of fiscal policy within each quarter are purely automatic because of implementation lags of fiscal policy measures.
- (*i*) shows up after (*f*) since it can react to fiscal policy, but not vice versa;
- The TVAR reflects some short run restricted type assumptions [Ae=Bu where E[uu']=I] emplaced, with a [(n<sup>2</sup> + n) / 2] total number of restrictions allowed, as follows:
  - (Y) is effected by (f) and vice versa [Hakkio and Rush (1991); Cuddington (1997); Cecchetti, Mohanty and Zampolli, (2011)].
  - (Y) is effected by (P) and vice versa [Calza and Sousa, (2005); Mancellari, (2011)];
  - (*i*) is effected by shocks of (*P*) and (*f*) [*Afonso, et. al., (2011)*].
  - (s) assumed to respond very quickly to all types of shocks in the system identified [Li and Amant (2010); *Afonso, et. al. (2011)*], apart from (*P*).

# Methodology & data issues...(8)



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• The restrictions emplaced follow an parsimonious approach and the Blanchard and Perrotti, (2002)'s and Mancellari (2012) technique, as follows:





#### Results - FSI Analysis...(1)



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#### Results - FSI Analysis...(2)





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## Results – Diagnostic Checks



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- Panel Unit Root Test [LLCH, ADF Fisher Chi-Square; PP Fisher Chi-square and Im, Pesaran and Shin] reject the null unit root hypothesis at significance level.
- TVAR model estimated with 11 lag levels and diagnostics test suggest:

VAR Residual Se	rial Correlation LM Tests	
Null: no SC at lo	ıg order h;	
Sample: 2001Q	1 2013Q3; Included obser	vations: 441
Lags	LM-Stat	Prob
1	22.74003	0.5927
2	19.16561	0.7891
3	20.75113	0.7064
4	39.50923	0.3027
5	32.62577	0.1407
6	22.34835	0.6156
7	24.53671	0.4886
8	30.10505	0.2204
9	23.29983	0.5601
10	21.80035	0.6472
11	27.42968	0.3348
12	24.87888	0.4692
Probs from chi-s	auare with 25 df	





#### Results – Unrestricted VAR



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#### Results – STVAR Analysis...(1.1)



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(Y) to (f) (Y) to (f) (P) to (f) (P) to (f) (P) to (f) (P) to (f) (F) to (f) (f) to (f) (f) to (f) (i) to



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### Results – STVAR Analysis...(1.2)



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#### Fiscal policy effect during high and low regime stress



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#### Results – STVAR Analysis...(2.1)



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The effect of economic growth during high and low regime stress



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#### Results – STVAR Analysis...(2.2)



The effect of economic growth during high and low regime stress





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#### Results – STVAR Analysis...(3.1)



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Market condition effect during high and low regime stress



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### Results – STVAR Analysis...(3.2)



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Market condition effect during high and low regime stress



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#### Conclusions...(1)



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- This paper analyzed the interactions between fiscal, economic activity and financial developments during good and bad times through TSVAR approach.
- The results with regards to the financial stress episodes show that:
  - FSI captures relatively well stress episodes experienced by countries in the sample.
  - Stress episodes were more evident and persistent in more financial integrated countries;
- The main empirical results show:
  - The interaction between FP, output and financial stress does not differ in good or bad time.
  - Macroeconomic and financial conditions improve through lower debt burden;
  - Effect of FP would be greater during high stress periods;
- Other results show that:
  - Positive shocks on GDP are FP and FSI. Stronger during low stress regime;
  - FSI is more effected by FP than vice versa;



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# Thank you for your attention!!!



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