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Links Between the Financial and Real Sectors in SOE: The case of the Czech Republic

Discussion by:
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NBP   Narodowy Bank Polski
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The location of the article in the literature

- Financial development facilitates long-term economic growth by reducing the costs of external finance to firms (Rajan and Zingales, 1998 and the literature that follows)
- Debt enhances growth only till a certain threshold level at which it becomes a drag on growth. For instance, Cecchetti, Mohanty, and Zampolli (2011) finds the thresholds to be 90% of GDP for corporate debt and 85% for household debt.
- Excessive level of credit (combined with credit booms) might lead to instability within the financial system and macroeconomic imbalances. The reason of recent changes: Basel III, ESRB, MIP. Also the start of working groups, e.g. MaRs (ECB) and RTF-TC group (BIS).
- Interaction of financial and real sector variables in the business cycle:
  - DSGE models (Lombardo and McAdam, 2012; Brzoza-Brzezina and Kolasa, 2013; Kolasa and Rubaszek, 2014)
  - VAR models (Jacobson, Linde, and Roszbach, 2005; Aspachs et al., 2007)
  - VAR threshold models (Balke, 2000; Christina, 2003; Alessandro and Joao, 2006; Konecny and Kucharcukova, 2014)

About the article

1. Research question:
   - To evaluate the impact of the financial sector on the real economy in the Czech Republic
2. Research method:
   - Threshold BVAR
   - Financial sector variables: aggregate credit or NPL, threshold variable: credit spread
   - Sample span: monthly data from 2004:1-2012:3 (about one business cycle)
3. Main findings
   - The relationship between the financial and real sector is non-linear (regime dependent)
   - The effect of financial shocks on output does not differ substantially across the regimes
   - The transmission mechanism from output to financial variables is regime dependent
   - The impact of foreign factors on financial sector is small

Question 1: Is the specification of the BTVARs justified?

Specification of the BTVAR model:

- Domestic vars: IP volume, prices, interest rates
- Foreign vars: ER, foreign IP volume, foreign interest rate
- Financial vars: volume of credit or NPL (two specifications)
- Threshold var: credit spread
- Recursive structuralization

Questions:

1. Why the credit spread is not among endogenous variables in the VAR model?

   - "*The advantage of TVAR is that it allows for endogenous switching between different regimes as a result of shocks to the modeled variables*"
   - In Balke (2000) the spread is both the endogenous and threshold variable (in three specifications)
   - The spread is a very important variable for credit dynamics (see. Rubaszek and Serwa, 2012)

2. Is recursive structuralization with financial variable reacting to all shocks justified? For instance: exchange rate vs. credit demand shocks (see. Kim and Roubini, 2000).

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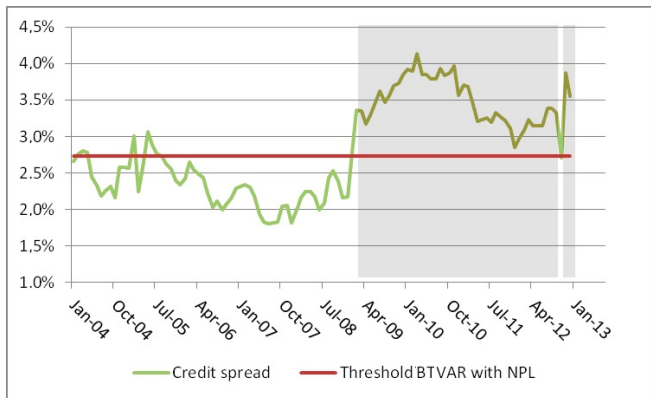
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Question 2: Threshold effect or structural break?

Figure : Credit Spread and Estimated Threshold From BTVAR With NPLs

Question 2: Threshold effect or structural break?

- The sample span (monthly data from 2004:1-2012:3) covers only one business cycle
- The identified regimes generally overlap with pre-crisis and crisis periods
- Is it possible to differentiate between the threshold effect and structural break? How confident can we be that the relationship will return to regime 1 after normalization of the credit spread?
- BIS (2012, p. 38): "*a key gap that the literature review has highlighted is the limited attention paid to nonlinearities and structural instabilities [...] some research on VAR models - specifically, the TVAR models - does allow for nonlinearities but it is not clear that this modelling strategy, which entails a single threshold at which model parameters switch values - is necessarily the closest representation of nonlinearities present in the economy.*"
- Alternative specifications:
    - Smooth transition vector autoregression (STVAR)
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The article presents only IRFs for shocks to output / credit / NPL.

The unanswered questions are as follows:

1. What is the contribution of financial shocks to the variance of output?
2. Does this contribution changes across the regimes?
3. What was the contribution of financial shocks to output dynamics in the sample?
4. Does accounting for financial variables helps in forecasting the real sector?
5. Are the findings in line with the earlier literature for developed countries?

Question 3: Are financial variables really important for the real sector?

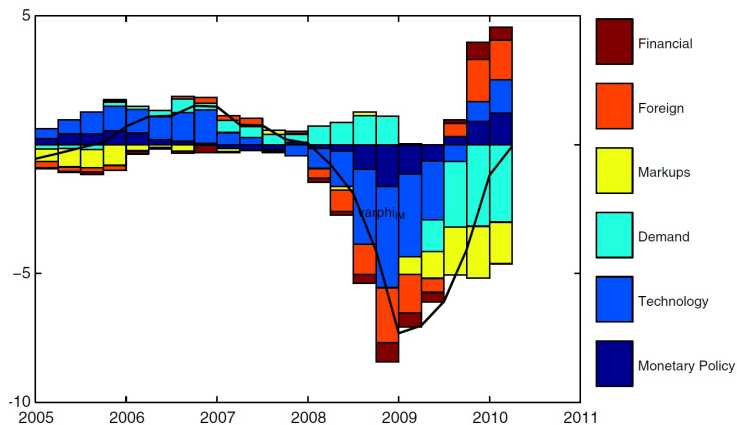Decomposition of GDP growth by Lombardo and McAdam (2012)

Fig. 26. Historical decomposition of annualized real GDP growth.

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Variance decomposition by Lombardo and McAdam (2012)

Table 5
Conditional variance decomposition.

	Financial	Foreign	Markups	Demand	Technology	Mon. policy
	$t = 1$					
Real output growth	17.53	13.96	7.09	21.66	25.38	14.38
GDP deflator	0.33	4.37	64.93	1.65	26.94	1.76
Real consumption growth	29.47	2.94	4.75	38.12	11.49	13.22
Real investment growth	3.04	7.65	12.77	11.47	59.68	5.4
Premium	85.06	0.42	2.26	0.27	9.55	2.46
Real residential investment growth	69.97	5.03	9.72	6.22	6.08	2.96
House prices	86.3	0.42	2.88	0.88	5.92	3.59
	$t = 20$					
Real output growth	13.92	12.33	22.54	15.74	27.33	8.15
GDP deflator	0.45	15.06	48.96	4.07	27.71	3.77
Real consumption growth	27.48	3.42	13.67	31.88	14.82	8.72
Real investment growth	2.24	21.03	24.37	11.94	37.27	3.17
Premium	33.42	14.07	16.58	4.51	30.06	1.34
Real residential investment growth	64.08	5.62	15.97	4.95	7.31	2.05
House prices	74.84	8.1	3.68	3.03	6.43	3.92

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RMSFE of forecasts in normal times by Kolasa and Rubaszek (2014)

	$H=1$	$H=2$	$H=4$	$H=6$	$H=8$	$H=12$	$H=16$
				Output			
DSSW	0.63	0.95	1.55	1.98	2.28	2.91	3.52
DSSW+FF	0.95	0.90	0.83[*]	0.80[*]	0.81	0.84[*]	0.85[**]
DSSW+HF	1.04	1.17	1.37	1.54[*]	1.70[**]	1.85[***]	1.94[***]
				Consumption			
DSSW	0.57	1.04	2.09	3.16	4.21	6.08	7.61
DSSW+FF	1.19[***]	1.30[***]	1.31[***]	1.27[***]	1.21[***]	1.13[***]	1.10[***]
DSSW+HF	1.20[***]	1.32[***]	1.40[***]	1.38[***]	1.34[***]	1.27[**]	1.23[**]
				Investment			
DSSW	1.49	2.73	5.38	7.55	8.60	8.85	7.52
DSSW+FF	1.09	1.13	1.02	0.89	0.80	0.72	0.77
DSSW+HF	0.90[**]	0.84[**]	0.80[*]	0.85	0.95	1.35	2.11[***]
				Hours			
DSSW	0.58	0.95	1.60	2.00	2.26	2.77	3.19
DSSW+FF	0.92	0.84	0.76[**]	0.68[**]	0.64[**]	0.64[**]	0.68[**]
DSSW+HF	1.01	1.03	1.05	1.14	1.21	1.23	1.22
				Prices			
DSSW	0.21	0.40	0.78	1.36	2.09	3.86	5.95
DSSW+FF	1.04	1.10	1.18	1.12	1.05	0.95	0.90
DSSW+HF	1.24[***]	1.46[***]	1.71[***]	1.61[***]	1.45[**]	1.24	1.11
				Wages			
DSSW	0.79	1.31	2.18	2.95	3.44	4.05	4.22
DSSW+FF	0.95[***]	0.90[***]	0.82[***]	0.78[***]	0.77[***]	0.80[***]	0.84[***]
DSSW+HF	0.92[**]	0.89[***]	0.83[***]	0.80[***]	0.79[***]	0.78[***]	0.76[***]
				Interest rate			
DSSW	0.57	1.04	1.73	2.16	2.47	2.83	2.96
DSSW+FF	1.20	1.18	1.20	1.25[**]	1.28[***]	1.30[***]	1.33[***]
DSSW+HF	0.83[**]	0.79[***]	0.78[***]	0.79	0.83	0.93	0.99

Notes: For DSSW+FF and DSSW+HF the RMSFEs are reported as ratios to DSSW.

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RMSFE of forecasts in crisis periods by Kolasa and Rubaszek (2014)

	$H = 1$	$H = 2$	$H = 4$	$H = 6$	$H = 8$	$H = 12$	$H = 16$
				Output			
DSSW	1.03	2.30	4.41	6.02	7.32	9.08	10.13
DSSW+FF	1.16	1.10	0.97	0.88[**]	0.84[***]	0.83[***]	0.86[***]
DSSW+HF	0.75	0.68	0.67	0.66[**]	0.65[***]	0.68[***]	0.67[***]
				Consumption			
DSSW	1.08	2.15	3.54	4.24	4.61	5.29	5.73
DSSW+FF	0.93[*]	0.92[*]	0.92[**]	0.94[*]	0.93[**]	0.95[*]	0.95[**]
DSSW+HF	0.81	0.82	0.86	0.84	0.79[*]	0.57[**]	0.50[**]
				Investment			
DSSW	3.19	7.19	15.15	23.01	29.91	36.22	38.37
DSSW+FF	1.55[**]	1.39[**]	1.13	0.94	0.84[***]	0.79[***]	0.81[***]
DSSW+HF	0.85	0.75[*]	0.72[**]	0.73[**]	0.75[**]	0.75[***]	0.70[***]
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DSSW+HF	0.89[**]	0.87	0.80	0.79[**]	0.74[***]	0.78[***]	0.74[***]
				Interest rate			
DSSW	0.72	1.23	2.34	3.27	4.00	4.68	5.03
DSSW+FF	2.01[**]	1.47[*]	1.01	1.01	1.03	1.03	0.98
DSSW+HF	0.91	0.88	0.93	0.94	0.86	0.99	0.95

Notes: For DSSW+FF and DSSW+HF the RMSFEs are reported as ratios to DSSW.

Final remarks

- The (non-linear) relationship between the financial and real sectors - very important topic in economics
- The article analyzes this relationship for the Czech economy
- It uses a relatively sophisticated tool: Threshold Bayesian VAR
- The specification of the VAR needs some additional justification
- The results could be extended for variance decomposition (what is the role of financial shocks?)

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