International sentiment spillovers

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Introduction

This paper:

- Question: do confidence fluctuations contribute to international business cycles comovement?
- Proposes a model of international spillovers of noise shocks:
  - 2-country extension of the framework by Blanchard et al. (2013);
  - Agents in both countries face signal extraction problem.
- Use the model to assess the importance of foreign (global) noise shock for SOE.

Main findings:

- US noise shock explains significant portion of US consumption:
  - in line with Blanchard et al. (2013);
  - around 30 % of the consumption in the US may be explained by the US noise shock.
- US noise shock explains significant portion of Canadian consumption:
  - around 15 % of the consumption in Canada may be explained by the US sentiment shock.
- US noise shocks generate strong international comovement in:
  - productivity, output, consumption and investment.
- Caveat: preliminary results.

Motivation:

- Agents' sentiment affects business cycles (noted already by Pigou, 1927 and Keynes, 1936).
- To a large extent ignored by structural business cycle models. Recently - more interest.
- Business cycles clearly spill over borders.
- But our models find it hard to explain comovements (BKK 1992; JP 2010).
- We check whether accounting for noise spillovers can help.

Literature:

- Theoretical models point to the importance of news shocks (Beaudry and Portier,2006; and Barsky and Sims, 2011), noise shocks (Blanchard et al., 2013) and limited communication between agents (Angeletos and La'O, 2013; Angeletos et al., 2014)
- Empirical findings:
  - DSGE models usually find a large portion of real variables explained by beliefs: Blanchard et al. (2013), Barsky and Sims (2011) and Milani (2017).
  - Kamber et al. (2017) use VAR models for four developed economies to find that technology news shocks explain between 6% (NZ) and 40% (UK) of output fluctuations.
- Empirical evidence for open economies:
  - Beaudry et al. (2011) show that technology news shocks can drive cross-country synchronization of cycles.
  - Levchenko and Pandalai-Nayar (2015) show that the Canadian business cycle is driven to a large extent by US sentiment shocks.

Model and data

Model overview:

- 2 countries: small (home, size ω) and large (foreign, size $1-\omega$).
- Capital adjustment costs, variable capital utilization.
- Sticky prices and wages, local currency pricing.
- Conventional monetary policy: Taylor-like rule.
- Exogenous public spending.

Agents' filtering problem:

- Aggregate productivity consists of 2 components: permanent (non-stationary) and temporary (stationary):

$$\triangle x_t = \rho \triangle x_{t-1} + \epsilon_t$$

$$z_t = \rho z_{t-1} + \eta_t$$

- Agents observe aggregated productivity and receive noisy signal about permanent component:

$$a_t = (1-\lambda^x)x_t + \lambda^x x_t^* + z_t$$

$$a_t^* = x_t^* + z_t^*$$

$$s_t = x_t + \varepsilon_{s,t}$$

$$s_t^* = x_t^* + \varepsilon_{s,t}^*$$

- Noise is a non-fundamental disturbance reflecting agents misbeliefs about the productivity.

Calibration and estimation:

- Parameters: calibrated (well-established) and estimated (Bayesian estimation).
- 19 shocks. Most important: 2 noise shocks, 2 temporary productivity, 2 permanent productivity.

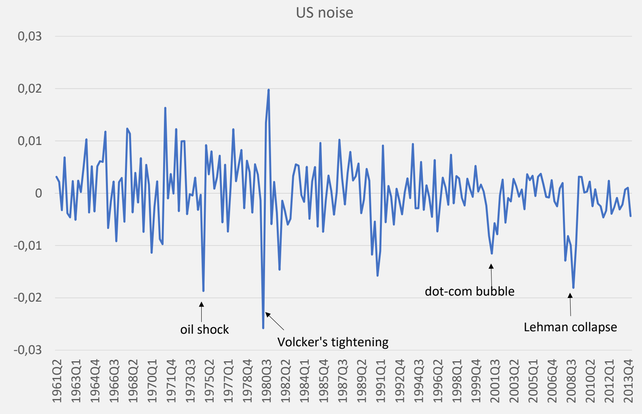
Data:

- US and Canada, 1Q1960 - 1Q2014
- 13 Time series used. For both economies: productivity, individual consumption, investments, wages, inflation, nominal interest rate. Plus exchange rate.

Some estimation output:

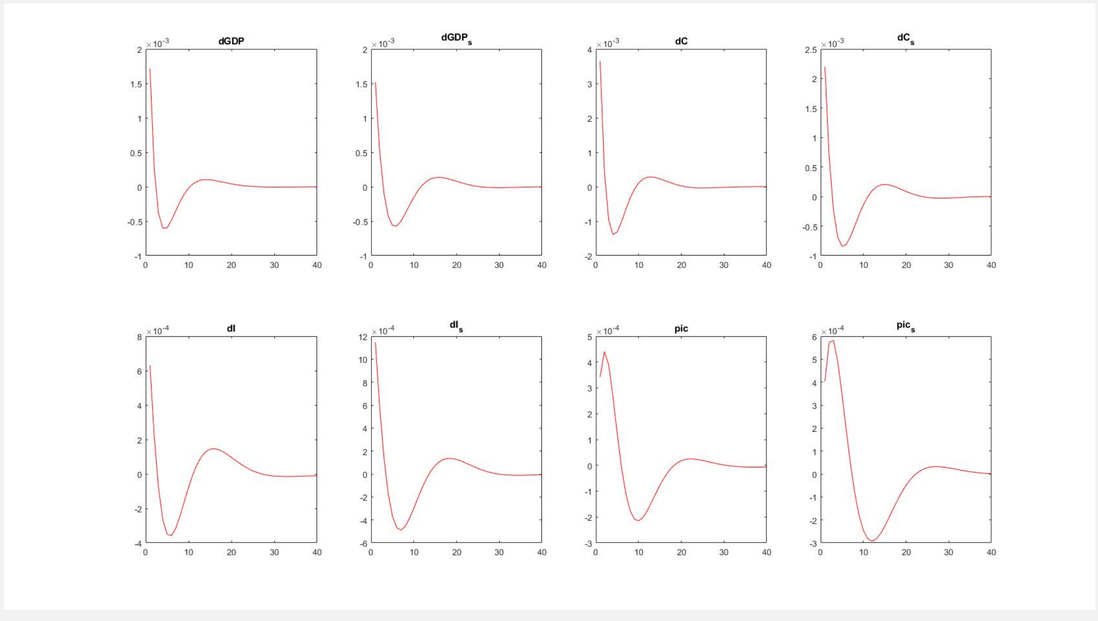
name	prior mean	post mean	90% HPD interval		prior type	prior std dev
λ^x (weight of US perm prod)	0.800	0.9556	0.9208	0.9916	beta	0.1000
autocorrel. prod. shock CAN	0.900	0.9448	0.9277	0.9599	beta	0.0500
autocorrel. prod. shock US	0.900	0.9678	0.9578	0.9774	beta	0.0500
std dev noise shock CAN	0.010	0.0063	0.0032	0.0095	invg	0.0010
std dev noise shock US	0.010	0.0094	0.0054	0.0141	invg	0.0010
std dev prod. shock CAN	0.005	0.0151	0.0141	0.0162	invg	0.0010
std dev prod. shock US	0.005	0.0235	0.0230	0.0239	invg	0.0010

- Noise shocks can be interpreted as sentiment fluctuations.



Main results

Noise in the US leads to comovement in main macro variables:



correlation (CAN,US)	without noise shock	with noise shock
Consumption	0.30	0.41
GDP	0.07	0.09

Noise in the US explains significant portion of consumption volatility in the US...

Quarter	CAN pp	CAN tp	US pp	US tp	CAN noise	US noise
1	0.0	2.6	0.5	26.1	0.0	37.6
4	0.0	1.9	8.2	27.4	0.0	25.9
12	0.0	1.6	20.1	19.1	0.0	23.4
40	0.0	1.5	20.9	17.7	0.0	21.9

... and in Canada:

Quarter	CAN pp	CAN tp	US pp	US tp	CAN noise	US noise
1	0.0	16.5	0.4	4.4	0.0	16.9
4	0.0	14.2	4.2	4.2	0.0	15.0
12	0.0	11.4	7.8	3.3	0.0	13.8
40	0.0	11.1	8.1	3.4	0.0	13.3

Spillovers to GDP in Canada are weaker:

Quarter	CAN pp	CAN tp	US pp	US tp	CAN noise	US noise
1	0.0	32.5	0.1	10.0	0.0	1.7
4	0.0	29.1	0.9	9.7	0.0	1.8
12	0.0	25.6	2.5	8.6	0.0	1.9
40	0.0	25.2	3.2	8.4	0.0	1.9