Global Financial Conditions and Monetary Policy Autonomy

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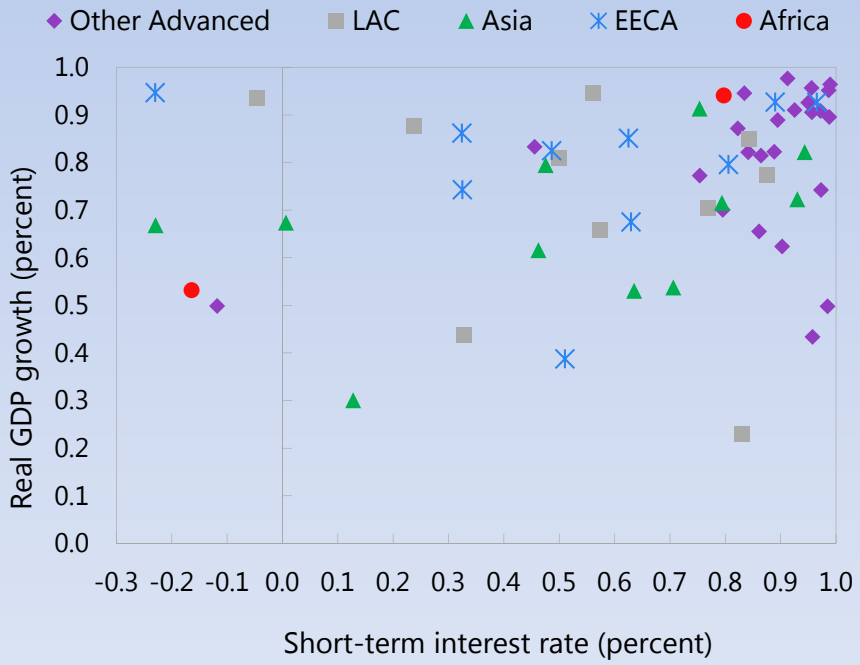
Motivation

Correlation of short-term interest rates often taken as evidence of limited monetary policy autonomy.

But, is this co-movement excessive?

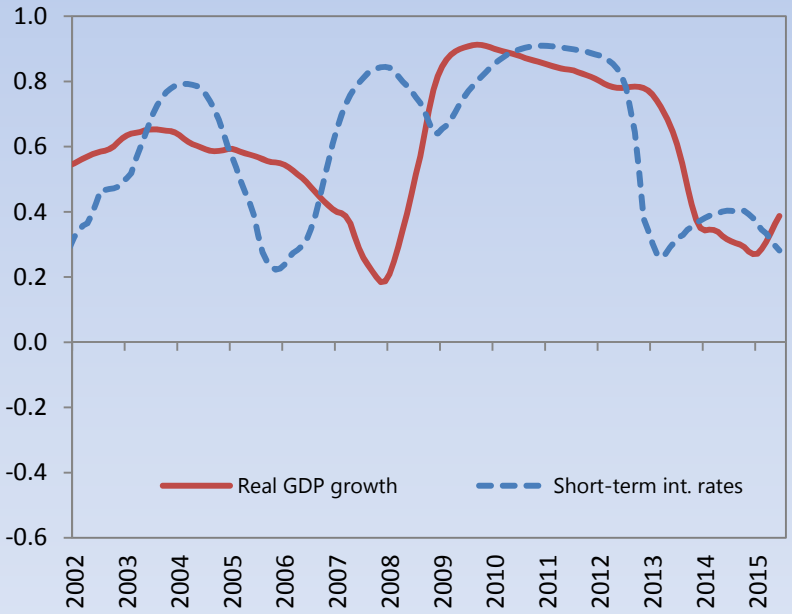
Synchronicity with global output and interest rate cycles

(Correlations of real GDP growth (vertical axis) and short-term interest rates (horizontal axis))



Evolution of Correlation with Global Factor

(Average correlations across advanced economies with corresponding "global component"; 4-year moving average)



Note: For each variable, the "global component" is computed as the first principal component, derived from principal component analysis, for all the countries in our sample, estimated over the period 2000m1 to 2014m12.

Motivation

Questions:

Do central banks in SOEs follow monetary conditions in the 'center'?

Even if they let their currencies float?

What does it mean in terms of the trilemma's predictions?

This paper:

What does evidence of monetary *spillovers* tell us about monetary *autonomy* (ability to tailor monetary policy to domestic conditions)?

→ Measuring monetary *spillovers* to infer limits to monetary *autonomy* may lead to biased conclusions:

'false positives' / understate degree of monetary autonomy

What we do

- Use a Monte Carlo exercise to show how common empirical approaches may understate degree of monetary autonomy in SOEs
- Propose an empirical strategy to identify *autonomy-impairing spillovers*, shifting the focus to the domestic policy problem.

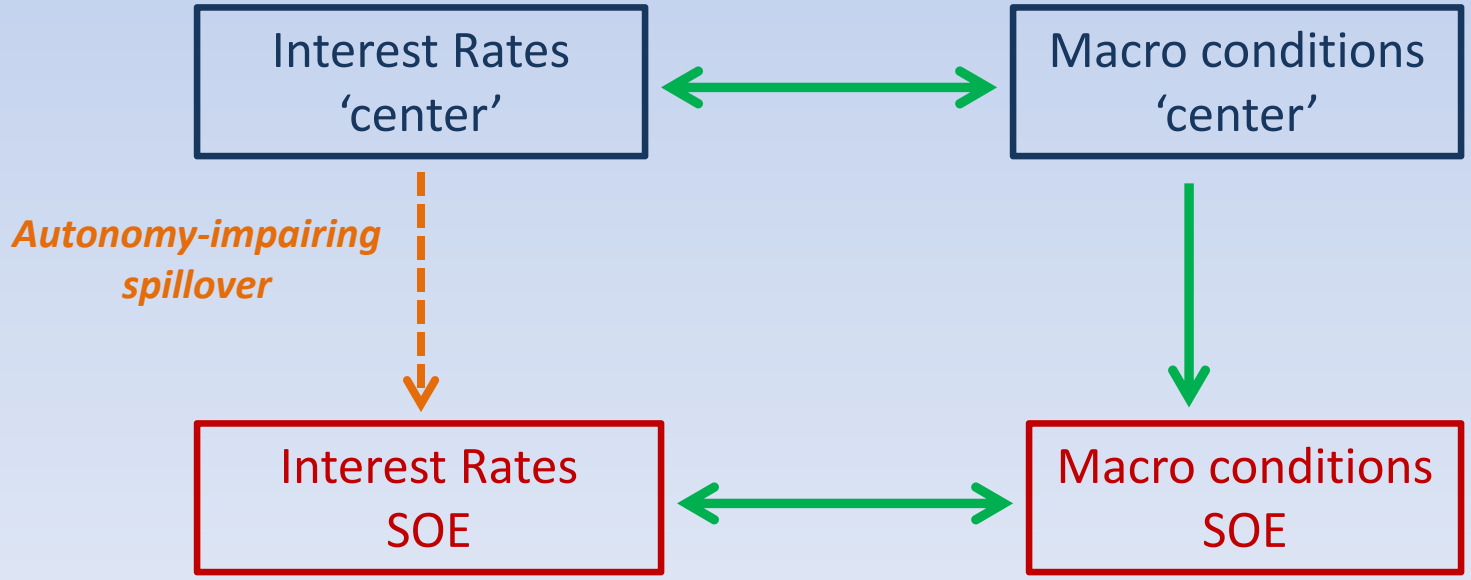
  Using same artificial data, we show it avoids 'false positives' of lack of autonomy
- Using an application of this strategy:
  - We find broad evidence of monetary autonomy in a group of advanced SOEs with flexible exchange rates
  - Is there are dilemma with the trilemma? We find no evidence of autonomy-impairing spillovers in countries with flexible exchange rates in a panel of 40 ADV and EME economies
- Note: Globalization may also impair *effectiveness* of monetary transmission mechanism (e.g. corporate issuance of debt in international markets). This is not explored in this paper.

Conceptual framework

Concepts of monetary autonomy and monetary spillovers intimately related, but spillovers do not necessarily signal lack of autonomy

Autonomy-impairing spillovers: subset of responses of domestic interest rates to foreign shocks

→ Movements in domestic rates (i) not associated with domestic objectives, and (ii) attributable to changes in global financial conditions



Inferring autonomy from spillover estimates

- Common strategy in literature: estimate pass-through of foreign to domestic interest rates

$$\Delta i_t^s = \alpha + \beta . \Delta i_t^b + e_t .$$

  and infer limits to monetary autonomy if coefficient significantly different from 0

- Yet, pass-through could reflect high sync of economic cycles
- Benchmark? Interest rate co-movement that would prevail if CB acted with full autonomy in sense of trilemma

$$\Delta i_t^s = \alpha + \beta . \Delta i_t^b + \gamma' X_t + e_t .$$

- Does policy rule reacts to foreign policy?

$$i_t = \alpha + h[\pi_t(i_t^*; \dots), y_t(i_t^*; \dots)] + g(i_t^*) + e_t$$

Reaction (or *spillover*):

$$s_t = \frac{\partial\{i_t | \pi_t, y_t\}}{\partial i_t^*} = \frac{\partial i_t}{\partial g} \cdot \frac{\partial g}{\partial i_t^*}$$

Quantifying "autonomy-impairing spillovers": Measurement problems

1. Simultaneity of international asset prices that are affected by common drivers complicates identification of foreign interest rate shocks
2. The endogenous response of domestic macro outlook to changes in foreign monetary conditions

→ Reverse the problem: start by the domestic monetary policy reaction function

One way of implementing this strategy: a multi-stage VAR procedure:

1) "remove" effects of business cycle *lags:*

$$\begin{bmatrix} \Delta i^s \\ \Delta mc^s \end{bmatrix}_t = \boldsymbol{A}_0 + \sum_{j=1}^{2} \boldsymbol{A}_j \begin{bmatrix} \Delta i^s \\ \Delta mc^s \end{bmatrix}_{t-j} + \begin{bmatrix} e^{i^s} \\ e^{mc^s} \end{bmatrix}_t$$

"remove" *contemporaneous* effects:

$$\hat{e}_t^{i^s} = \alpha + \beta' \, \hat{e}^{mc^s} + u_t^{i^s}$$

2) Use residuals in VAR with global rates:

$$\begin{bmatrix} \hat{u}^{i^s} \\ \Delta i^b \end{bmatrix}_t = \boldsymbol{B}_0 + \sum_{j=1}^{2} \boldsymbol{B}_j \begin{bmatrix} \hat{u}^{i^s} \\ \Delta i^b \end{bmatrix}_{t-j} + \begin{bmatrix} v \\ e^{i^b} \end{bmatrix}_t$$

→ Autonomy-impairing spillovers :

Cholesky-orthogonalized impulse response of *residual* interest rate to a shock to i^b

Monte Carlo simulations

Artificial stochastic series for policy rates in *base* and *small* economy:

- Macro conditions:

$$X_t^* = \alpha^* + \rho^* X_{t-1}^* + e_t^*$$
$$X_t = \alpha + \rho X_{t-1} + \gamma e_t^* + e_t$$

- Taylor rules:

$$i_t^* = \bar{i}^* + \tau^* i_{t-1}^* + \delta^*(X_t^* - \bar{X}^*) + u_t^*$$
$$i_t = \bar{i} + \tau i_{t-1} + \delta(X_t - \bar{X}) + \beta i_t^* + u_t$$

Monte Carlo exercise
(Baseline parameterization)

	Base	SOE
ρ	0.5	0.5
τ	0.5	0.5
σ	1	1
θ	0	0
γ	-	1
β	-	0

Average correlations
(Baseline parameterization)

	i_t	i_t^*	X_t^s	X_t^*
i_t	1.00			
i_t^*	0.46	1.00		
X_t	0.98	0.50	1.00	
X_t^*	0.47	0.97	0.51	1.00

Monte Carlo simulations (2)

Artificial stochastic series for policy rates in *base* and *small* economy:

- Macro conditions:

$$X_t^* = \alpha^* + \rho^* X_{t-1}^* + e_t^*$$

$$X_t = \alpha + \rho X_{t-1} + \gamma e_t^* + e_t$$

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$$i_t^* = \bar{i}^* + \tau^* i_{t-1}^* + \delta^*(X_t^* - \bar{X}^*) + u_t^*$$

$$i_t = \bar{i} + \tau i_{t-1} + \delta(X_t - \bar{X}) + \beta i_t^* + u_t$$

Spillover estimates, alternative VAR methods

(Simulated data, baseline parameterization)

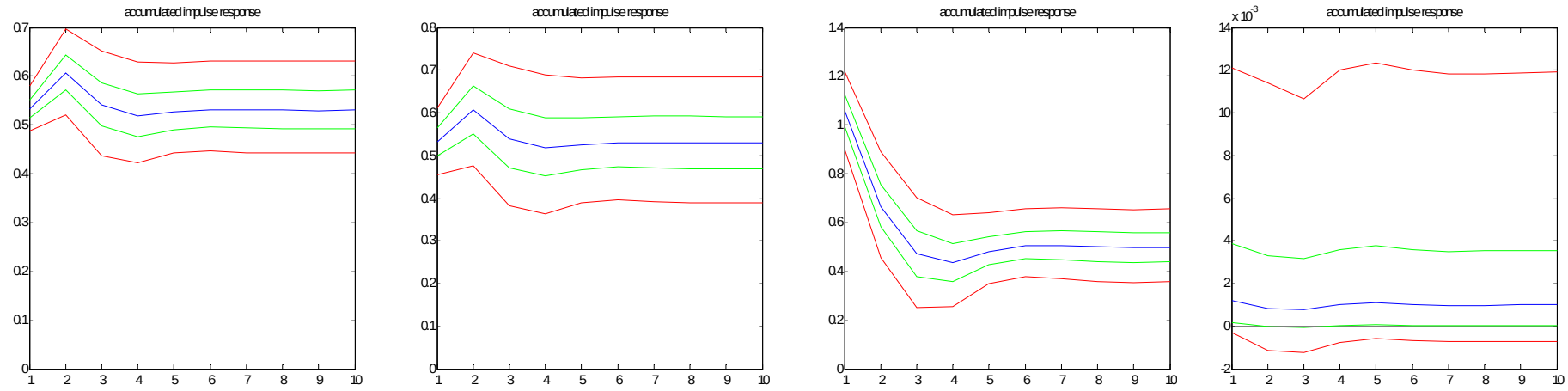
Response of i^b

No macro conditions

Response of i^s

Single-stage

Multi-stage



Note: Median response estimate across simulated samples (blue line), 75 percent (green lines) and 95 percent confidence bands (red lines).

Monte Carlo: Comparison with common approaches

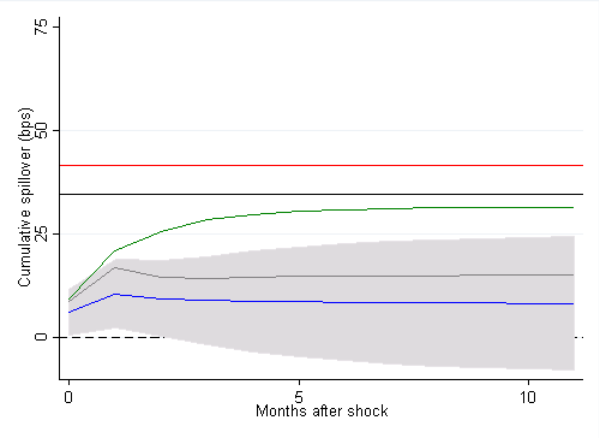
Scenario	Parameter values							Spillover estimate by method					
								Single equation			Structural VAR		
	ρ	γ	σ	τ^*	α^*	θ^*	τ	I	II	III	IV	V	VI
Baseline	0.5	1	1	0.5	0.5	0	0.5	100.0*	36.6*	22.4*	100.1*	93.8*	0.2
1	0.5	1	1	0.5	0.5	1	0.5	18.1*	4.3*	4.0*	25.7*	23.2*	0.0
2	0.5	1	1	0	0.5	0	0.5	83.4*	1.4	0.7	156.7*	155.5*	0.1
3	0.5	1	1	0.5	0.5	0	0	93.5*	0.5	0.3	56.2*	56.6*	0.2
4	0.5	1	0.1	0.5	0.5	0	0.5	100.0*	76.2*	22.3*	100.3*	98.8*	0.2
5	0.5	1	0.1	0.5	0.5	1	0.5	18.1*	4.7*	4.1*	26.1*	23.7*	0.0
6	0.5	1	0.1	0	0.5	0	0.5	83.3*	6.1	0.6	179.6*	189.2*	0.1
7	0.5	1	0.1	0.5	0.5	0	0	93.6*	1.2	0.3	52.5*	52.6*	0.2
8	0.5	0.5	1	0.5	0.5	0	0.5	50.2*	13.4*	11.3*	50.6*	44.9*	0.1
9	0.5	0.5	1	0.5	0.5	1	0.5	9.2*	2.2	2.1	12.3	11.5	0.0
10	0.5	0.5	1	0	0.5	0	0.5	41.5*	0.4	0.3	76.7*	66.9*	0.0
11	0.5	0.5	1	0.5	0.5	0	0	46.8*	0.1	0.1	28.4*	28.9*	0.1
12	0.9	1	1	0.5	0.5	0	0.5	87.2*	2.0	1.1	182.9*	199.0*	0.0
13	0.5	1	1	0.5	0.5	0	0.5	80.5*	36.3*	29.5*	37.3*	37.6*	0.2

Autonomy-impairing spillovers in selected SOEs?

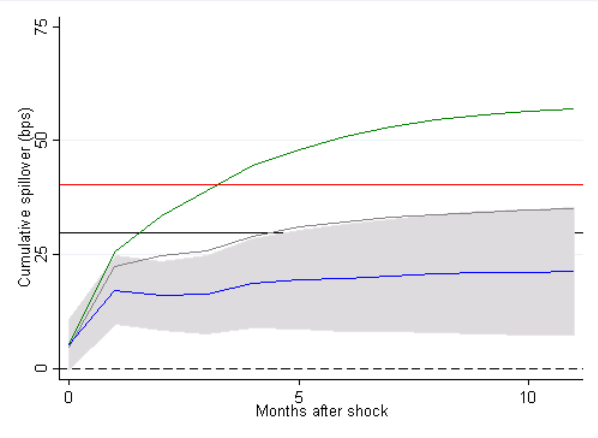
- Sample: Advanced inflation targeters with flexible exchange rates
  - Australia, Canada, New Zealand, South Korea, Sweden, U.K.
  - Monthly data, January 1998 to June 2009
- 'Center': changes in U.S. federal funds rate
- SOE: domestic short term-rates; treasury bills, 3-6 months maturity
- Changes in domestic macro outlook (X): changes in expectations about output growth and CPI inflation from Consensus (fixed 1Y horizon)
- Alternative exercises:
  - Euro area as 'base country' for Sweden and U.K.
  - Monetary surprises (Gertler and Karadi, 2015) instead of realized movements in federal funds rate

Autonomy-impairing spillovers, alternative methods

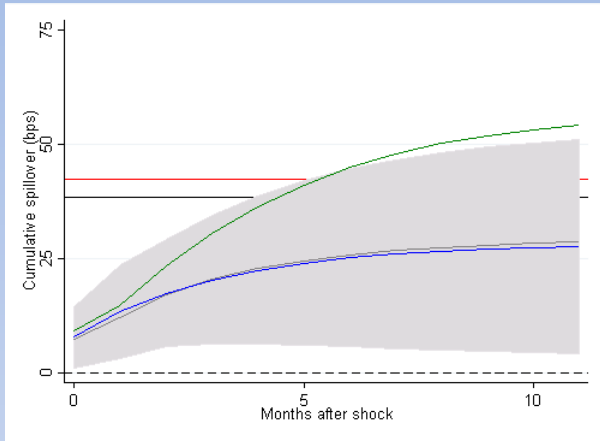
Australia



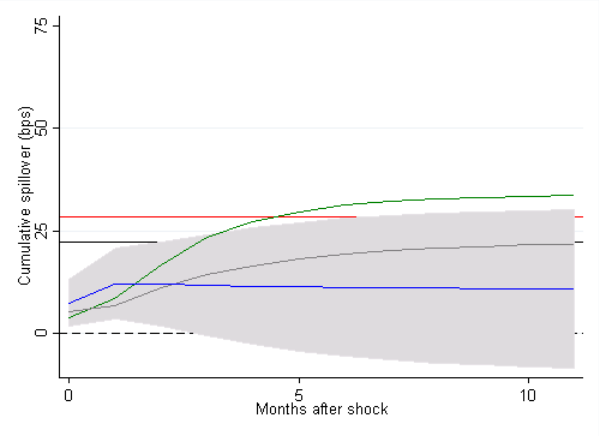
Canada



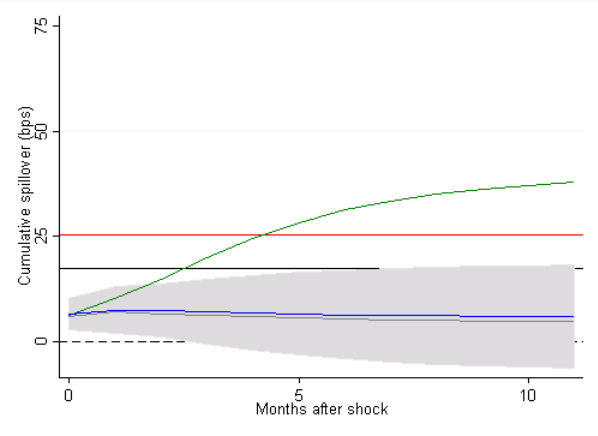
New Zealand



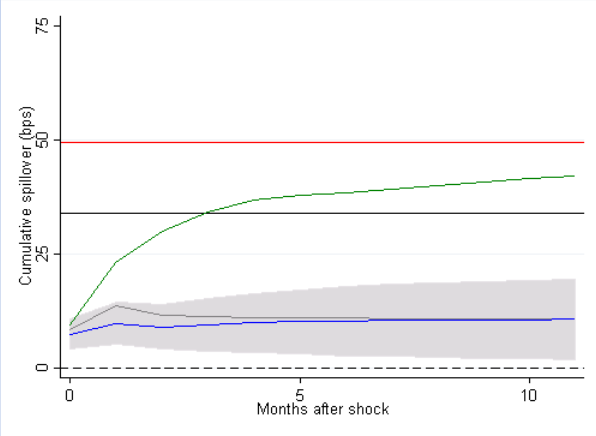
Korea

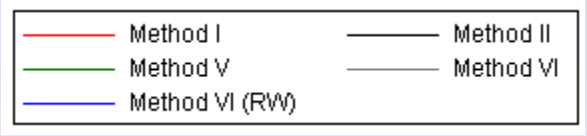


Sweden



United Kingdom

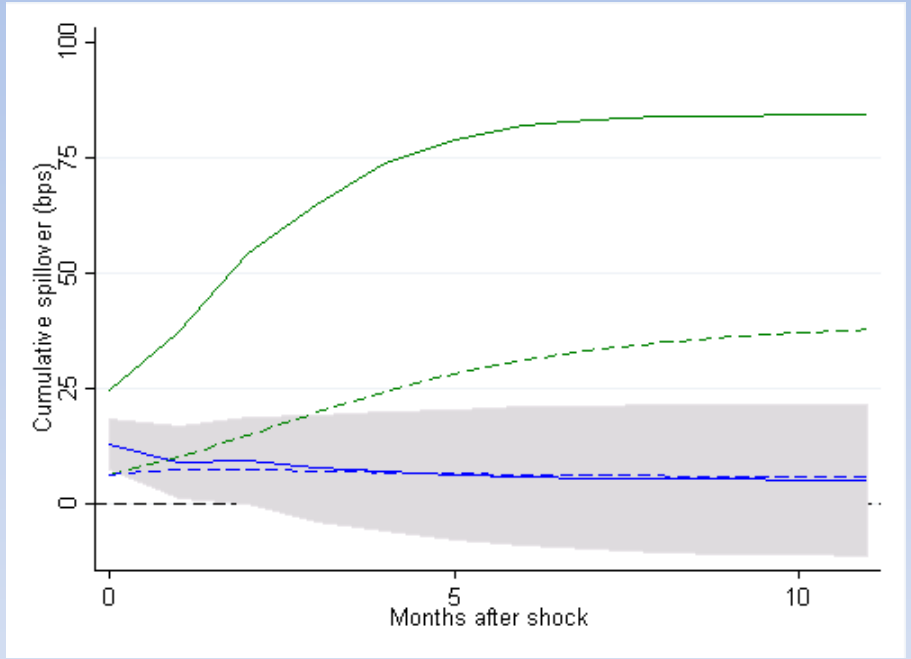




Note: Bands correspond to 95 percent confidence intervals.

Autonomy-impairing spillovers
Base country: euro area vs. U.S. rates

Sweden



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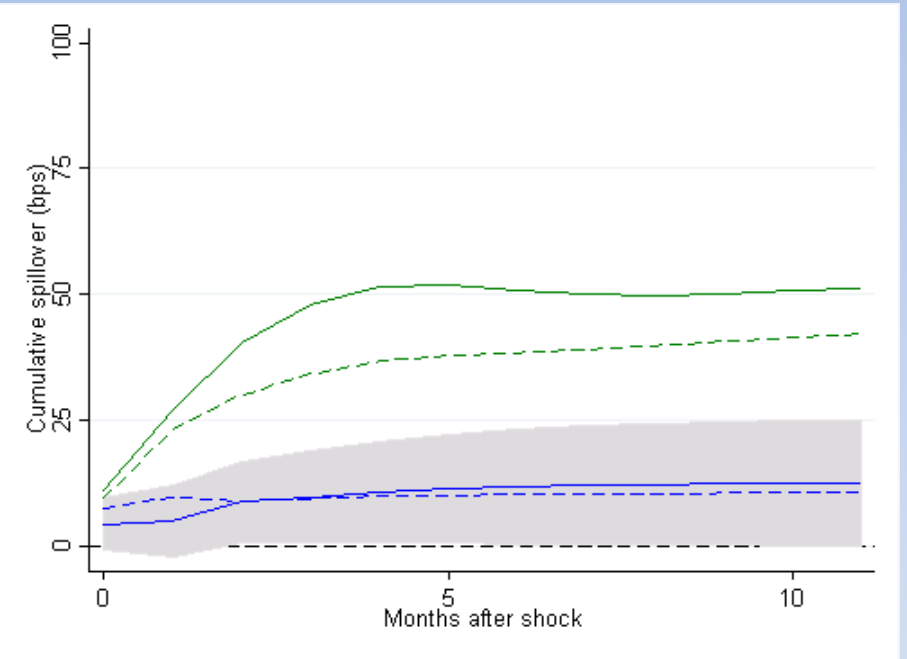
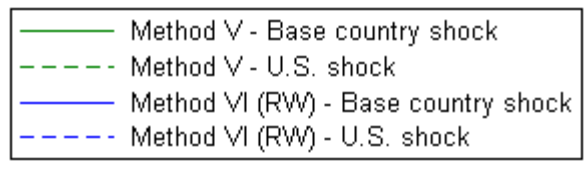
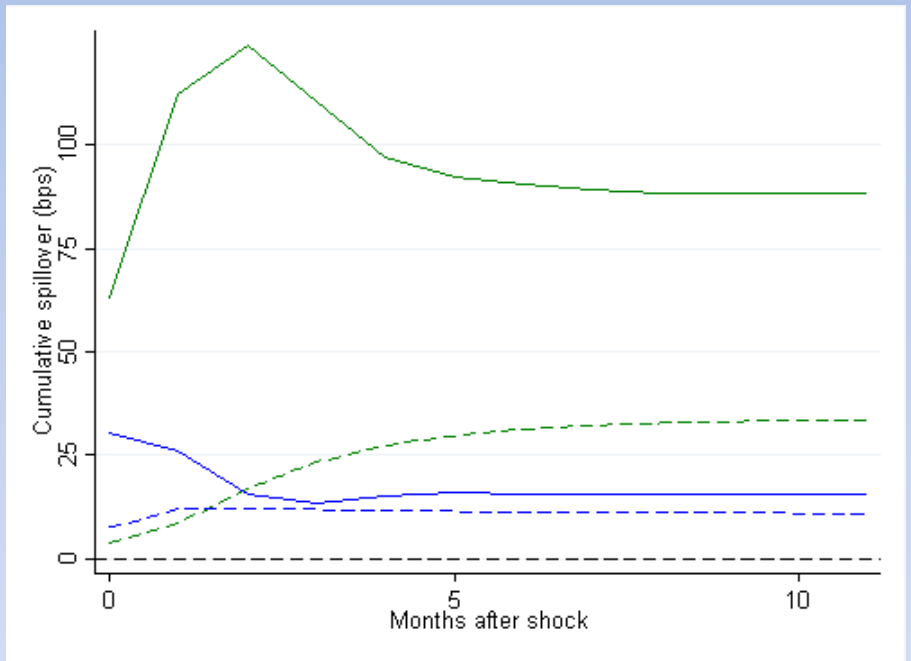




Note: Bands correspond to 95 percent confidence intervals.

Autonomy-impairing spillovers
Monetary policy surprises (Gertler and Karadi 2015)

Korea



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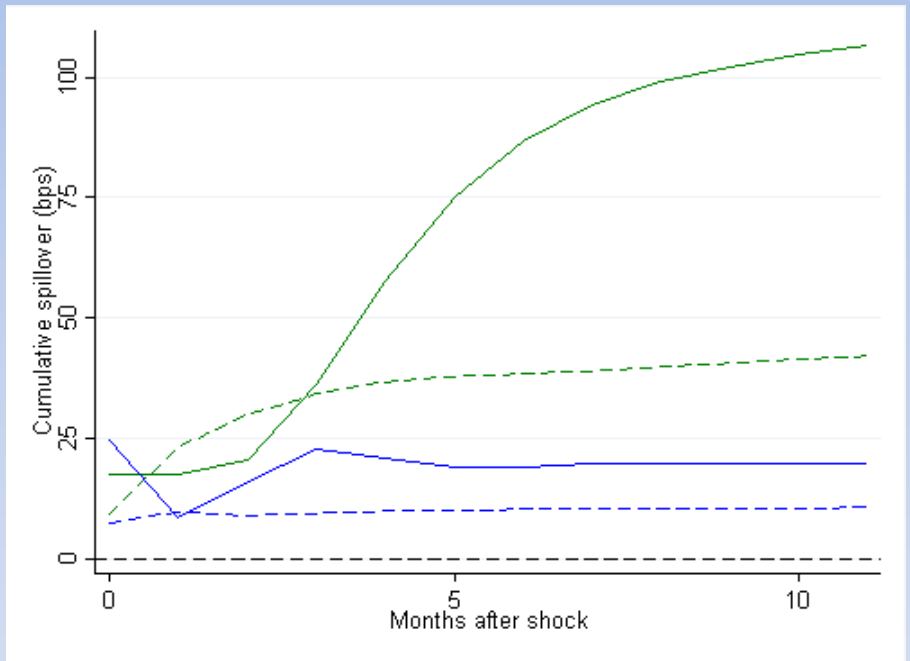
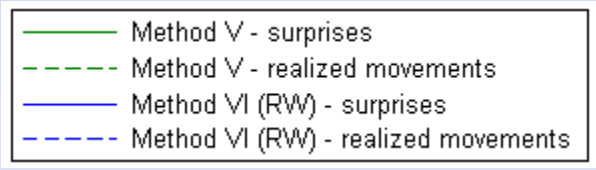




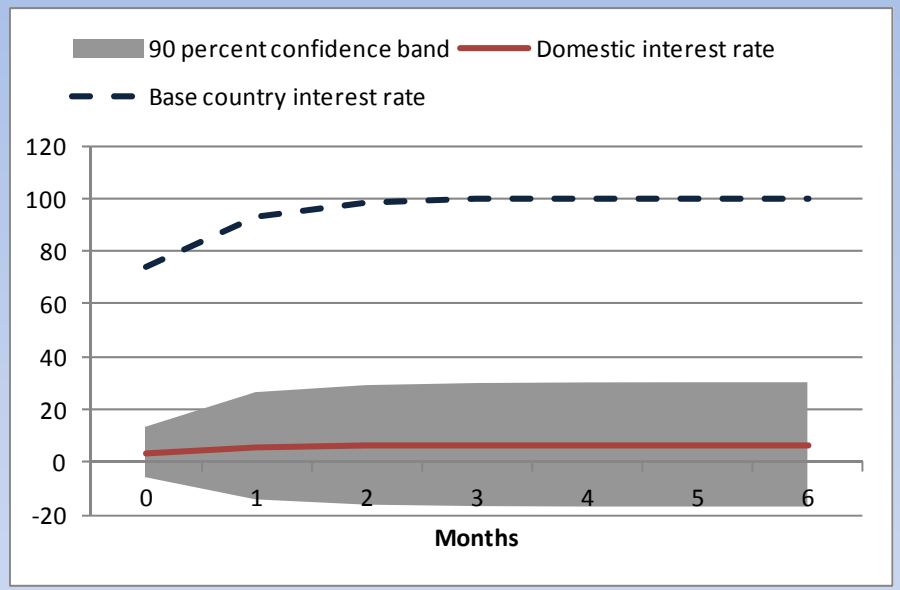
Is there a dilemma with the trilemma?

- Sample: 40 EME and ADV economies; monthly data 1/2000-10/2015
- Base country, exchange rate regime (float, soft peg, hard-peg), degree of financial openness (open, mid-open, closed) follows Klein and Shambaugh (2015).

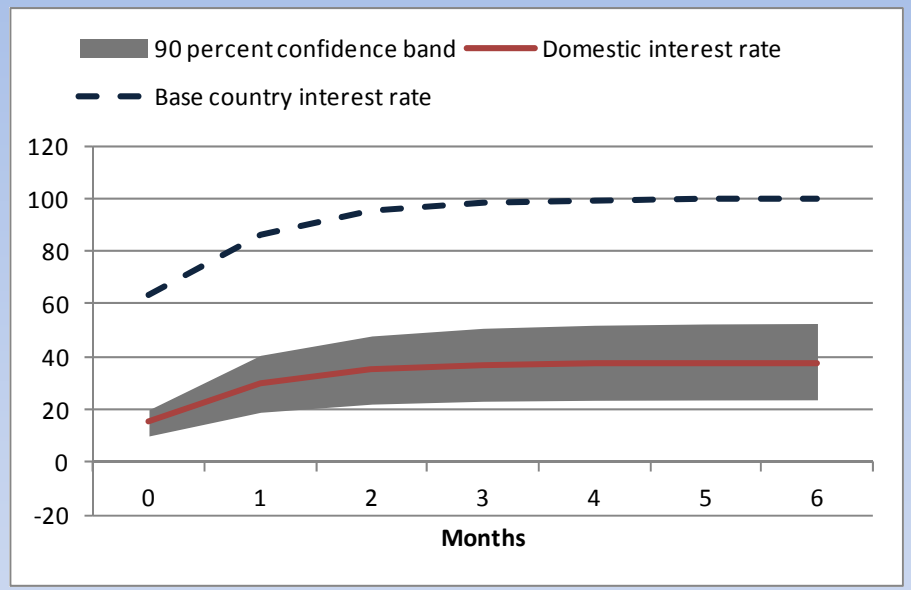
  Keep observations with open and mid-open financial markets
- Sample split in (i) floating exchange rate; (ii) soft and hard peg
- First stage: estimate country-specific Taylor-type rules
- Second stage: PVAR model separately for (i) floating exchange rate; (ii) soft and hard peg

Is there a dilemma with the trilemma?

Floating exchange rate



Hard and soft pegs



Consistent with trilemma:

→ autonomy-impairing spillovers significantly larger for pegs

→ Cannot reject null hypothesis of monetary autonomy for floaters

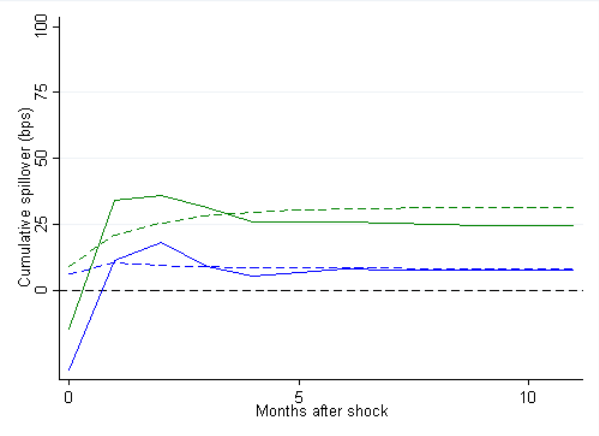
Conclusions

- We show that identifying subset of spillovers that reflect limits to monetary autonomy is challenging; autonomy often understated
- We propose a more conservative identification approach, reversing the problem, that is shown to avoid 'false positives' of lack of autonomy
  1. Model monetary policy in SOE. Identify rate movements that are orthogonal to the outlook for domestic outlook or inflation. (Refinements to Taylor-type approach in this paper naturally possible)
  2. Autonomy-impairing spillovers: movements in first-stage residuals attributable to foreign financial variables in separate model
- Spillovers from U.S. or base-country policy rates to six SOEs much smaller with our approach; can't reject null of autonomy in many
- Panel of 40 ADV and EME: Spillovers much larger in countries with fixed ER regimes; no evidence of autonomy-impairing spillovers among floaters

  Overall: Strong evidence in favor of trilemma's predictions

Autonomy-impairing spillovers, alternative methods

Australia



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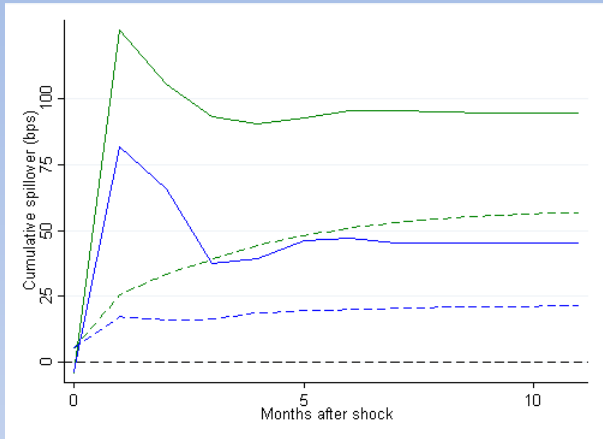

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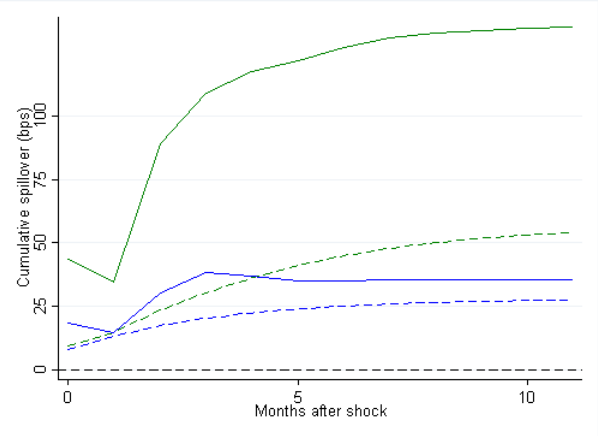

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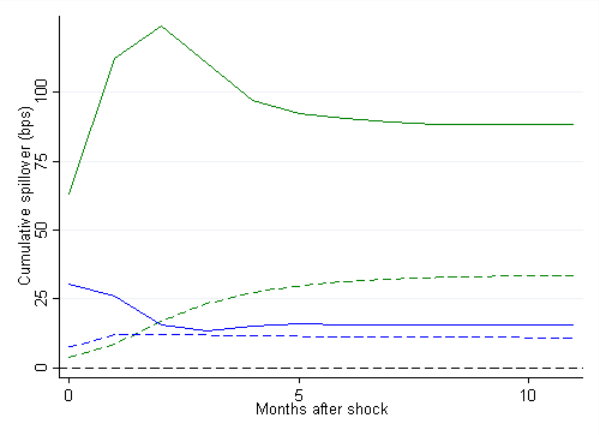
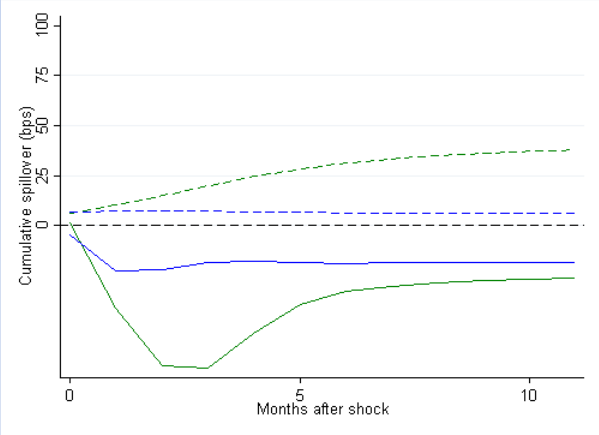


Sweden



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