Financial Globalisation, Monetary Policy Spillovers and Macro-Modelling: Tales from One Hundred and One Shocks

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Motivation

- Dramatic rise of financial globalisation since 1990s
  - Growing potential for (monetary policy) spillovers
    Kim (2001); Canova (2005); Dedola et al. (2015); Feldkircher and Huber (2015); Georgiadis (forthcoming)
  - Global financial cycle hypothesis
    Bekaert et al. (2013); Bruno and Shin (2015b); Passari and Rey (2015); Rey (2015)
- Parallel evolution of structural macro-modelling
  - New Keynesian DSGE models
    Smets and Wouters (2003); Christiano et al. (2005)
  - Global financial crisis spurred work on financial frictions
    Gertler and Karadi (2011); Christiano et al. (2014)
  - Less focus yet on the role of financial spillovers
    Dedola and Lombardo (2012); Kollmann (2013); Banerjee et al. (2015)
- Do standard New Keynesian DSGE models adequately account for the importance of financial spillovers in the data?

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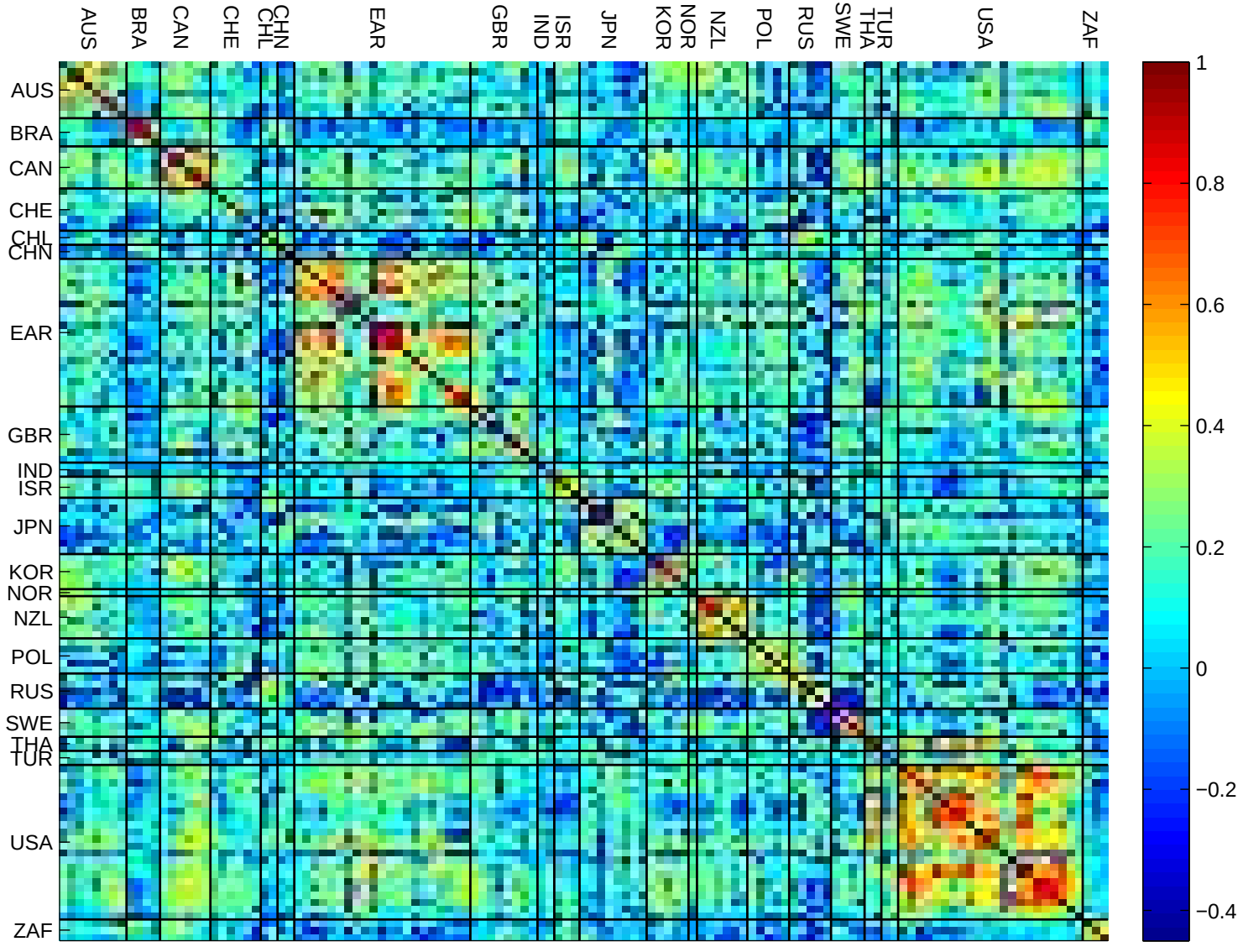
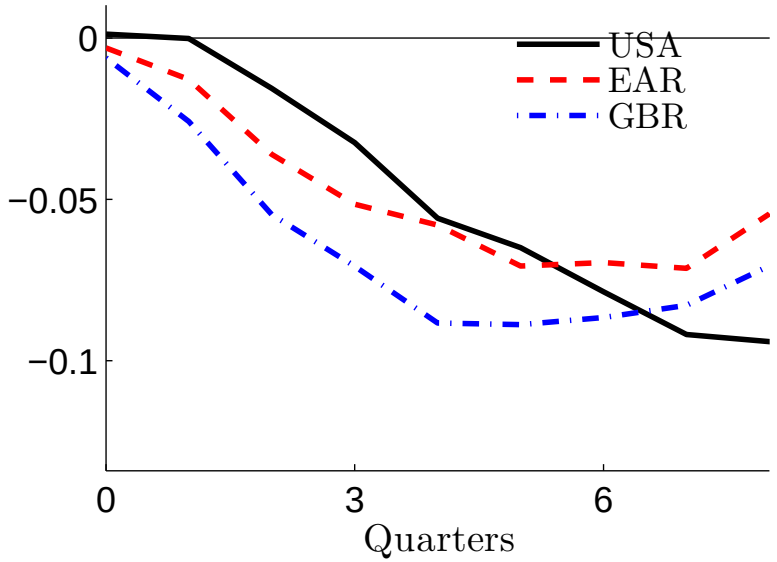
Correlations between MP shock estimates from NK DSGE models



Why this is important: An example

- Estimate global output spillovers from MP in $j \in \{us, ea, uk\}$
- Use local projections (or ARDL-model) with MP shock estimate $\widetilde{s}_{jt}$

$$y_{i,t+h} = \alpha^{(h)} + \gamma_k^{(h)} \widetilde{s}_{jt} + u_{i,t}^{(h)}$$



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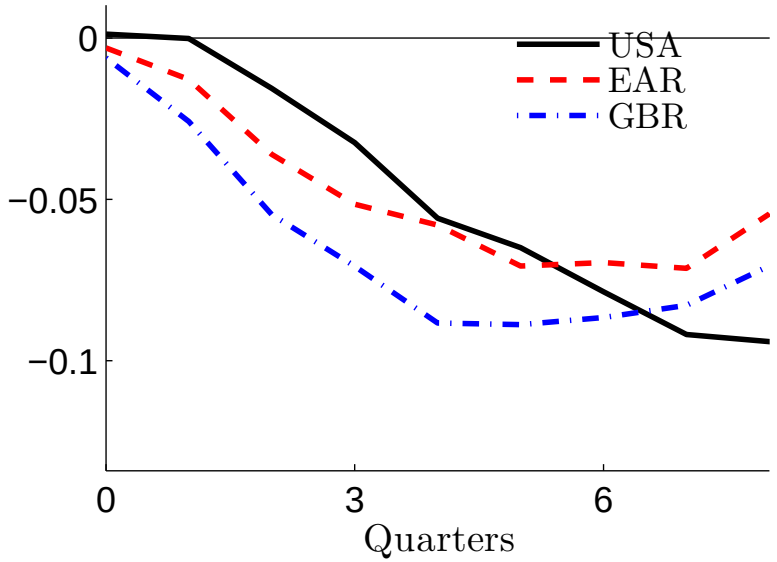

- Estimates appear to be responses to a common global component in the MP shock estimates $\widetilde{s}_{jt}$

The hypothesis

NK DSGE models fail to adequately account for financial spillover channels in the data

$$\Longrightarrow$$

MP shock estimates contaminated by common global component

Mechanism

- In the data, foreign MP shocks transmit to the domestic economy through financial spillover channels
- A model that lacks financial spillover channels labels foreign MP shocks as domestic when confronted with data

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This paper

- Test hypothesis that lack of financial spillovers in NK DSGE models implies MP shock estimates with global component
- Set up a cross-country database with MP shock estimates from more than 180 macro-models
- Evidence consistent with our hypothesis
  - Larger cross-country correlations between MP shock estimates for financially integrated economies
  - Particularly important role for cross-border banking linkages
    Goldberg (2009); Cetorelli and Goldberg (2012); Bruno and Shin (2015b,a); Morais et al. (2015)
  - US component in MP shock estimates: “Global financial cycle”
    Bekaert et al. (2013); Bruno and Shin (2015b); Passari and Rey (2015); Rey (2015)
  - Global component not present in non-NK DSGE model shocks

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Related literature

- Powerful financial spillover channels in NK DSGE models crucial to replicate cross-country business cycle correlations in the data
  Iacoviello and Minetti (2006); Ueda (2012); Yao (2012); Chin et al. (2015)
- Standard open-economy NK DSGE models
  Justiniano and Preston (2010, *JIE*); Alpanda and Aysun (2014, *JIMF*)
  - fail to replicate business cycle co-movements in the data
  - imply only minor role of foreign shocks for domestic variables
  - match cross-country output correlations and spillovers much better if structural shocks are assumed to be cross-country correlated
- Our paper provides indications for the importance of financial spillovers in this class of models from a different perspective

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Testable predictions

Under our hypothesis

- In the data, foreign MP shocks transmit to the domestic economy through financial spillover channels
- A model that lacks financial spillover channels labels global MP shocks as domestic when confronted with the data
- Global component dominated by systemically most important economy

Then, the cross-country correlation in MP shock estimates should rise with economies'

- overall financial integration with the RoW
- bilateral financial integration with the US

▸ Monte Carlo experiment

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MP shocks database

- We test our hypothesis in a sample of MP shock estimates
- Database draws on existing/ongoing academic/institutional work
- Multitude of macro-models
  - Structural macro-models (NK DSGEs)
  - VAR models (SVARs, SVECMs, SFAVARs, SDFMs)
  - Other statistical approaches (shadow rates, term-structure models)
  - Narrative approaches
  - Shocks based on financial market expectations

Contributors

Country coverage

	Number of shocks	Percent
AUS	11	5.9
BRA	4	2.1
CAN	9	4.8
CHE	7	3.7
CHL	2	1.1
CHN	3	1.6
EAR	31	16.6
GBR	16	8.6
IND	2	1.1
ISR	3	1.6
JPN	8	4.3
KOR	5	2.7
NOR	3	1.6
NZL	6	3.2
POL	7	3.7
ROU	1	0.5
RUS	5	2.7
SWE	7	3.7
THA	2	1.1
TUR	2	1.1
USA	46	24.6
ZAF	7	3.7
Total	187	100.0
N	187	

Model type coverage

	Number of shocks	Percent
Financial market expectations	7	3.7
Narrative approach	2	1.1
New Keynesian DSGE models	124	66.3
Other statistical models	7	3.7
VAR models	47	25.1
Total	187	100.0
N	187	

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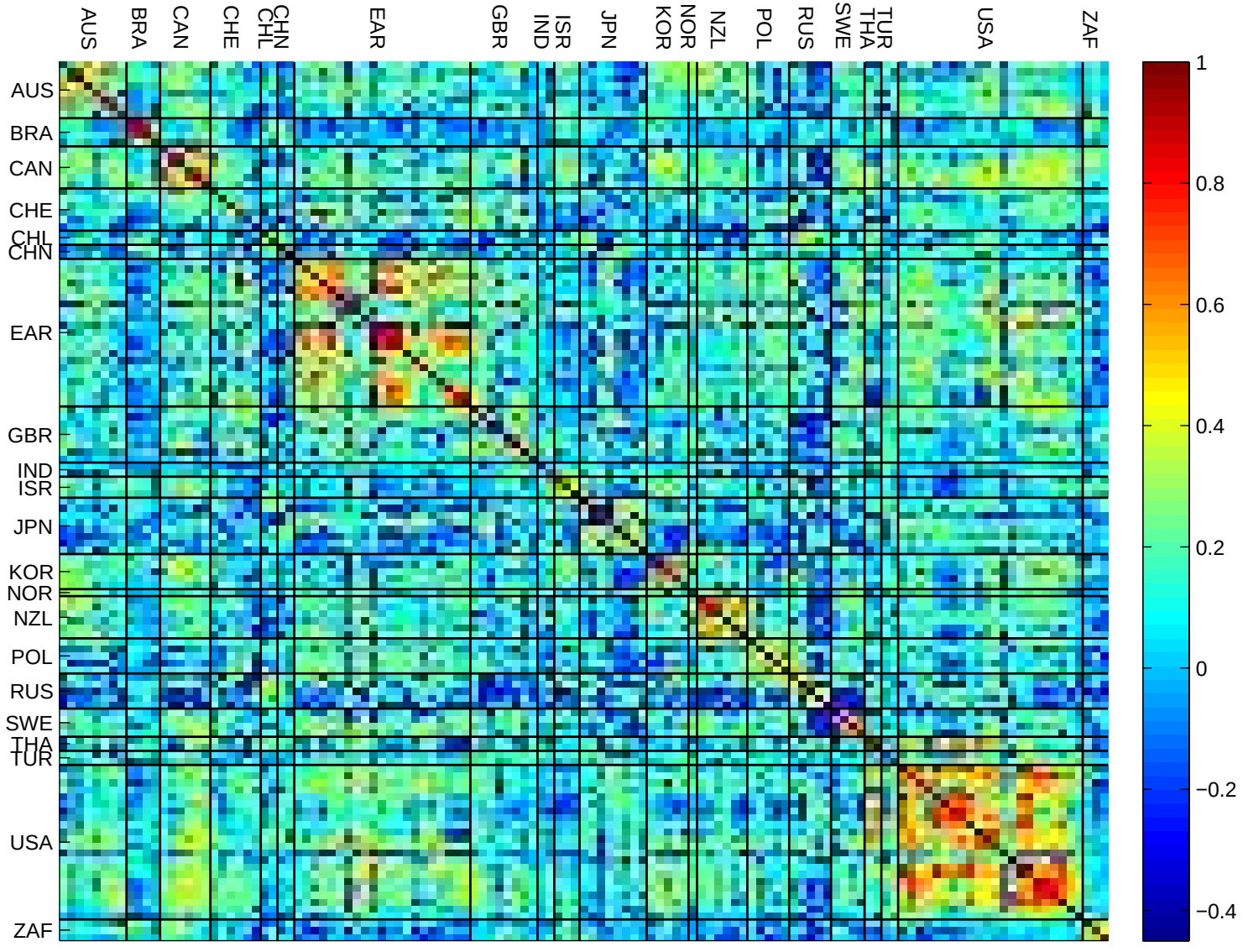
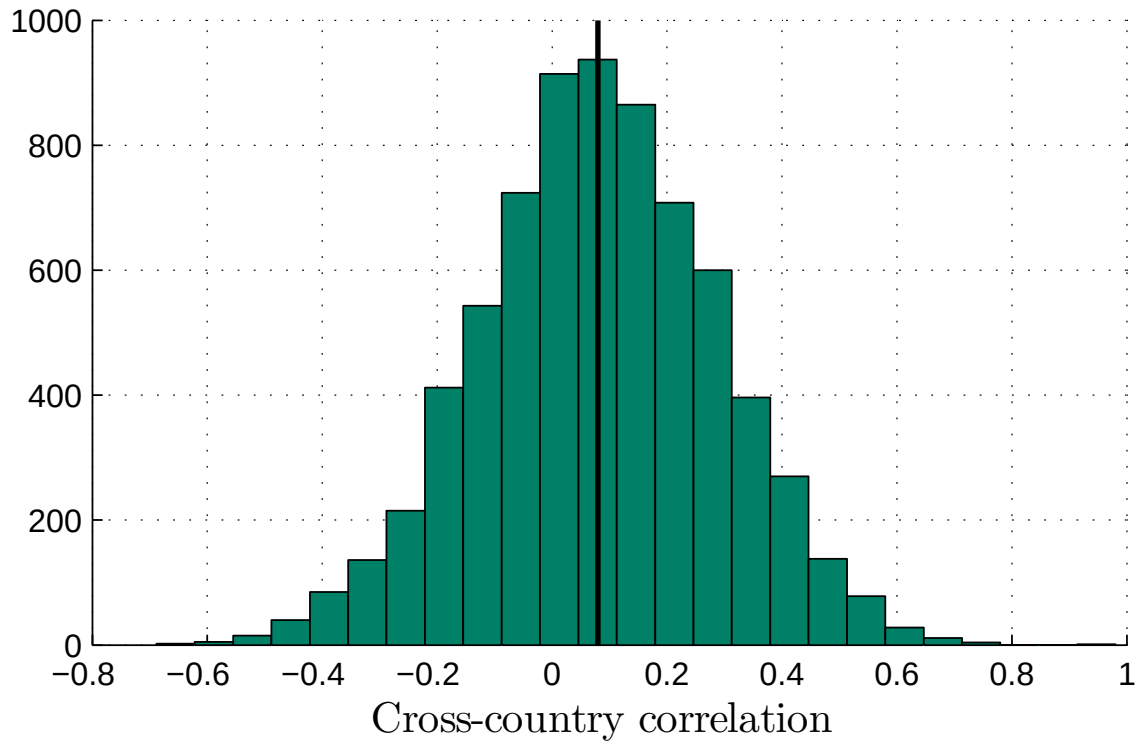


Distribution of cross-country correlations



▸ AEs vs. EMEs

Testing for the role of financial integration

Consider the regression

$$\rho_{\ell_i,m_j} = \alpha_i + \gamma_j + \boldsymbol{x}_{ij} \cdot \boldsymbol{\beta} + u_{\ell_i,m_j}, \tag{1}$$

$$i,j = 1,2,\ldots,N, \quad i \neq j, \quad i,j \neq us, \quad \ell_i = 1,2,\ldots,L_i, \quad m_j = 1,2,\ldots,M_j,$$

where

- ρ_{ℓ_i,m_j}: Correlation between shock time series ℓ_i and m_j
- $\boldsymbol{x}_{ij}$: Vector of bilateral country characteristics
  - Economy $i \times$ economy j overall financial integration
  - Economy $i \times$ economy j bilateral financial integration with US
- Only NK DSGE model MP shock estimates over 1993q1-2007q2

▸ Data

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▸ Data

Cross-country correlation between MP shock estimates higher for financially integrated economies

	(1)	(2)	(3)	(4)
Overall financial integration	0.09***	0.08**	0.08***	0.06*
	(0.00)	(0.01)	(0.01)	(0.06)
Share of US in overall financial integration	0.12***	0.11***	0.11***	0.11***
	(0.00)	(0.00)	(0.00)	(0.00)
Share of portfolio assets in GFAL		-0.09	0.11	
		(0.49)	(0.65)	
Share of FDI in GFAL		0.04	0.01	
		(0.40)	(0.84)	
Share of other investment in GFAL		0.06**		
		(0.03)		
Share of other investment assets in GFAL			-0.03	
			(0.61)	
Share of other investment liab. in GFAL			0.07**	
			(0.02)	
Non-resident bank loans/GDP				0.02*
				(0.09)
Country 1 dummies	Yes	Yes	Yes	Yes
Country 2 dummies	Yes	Yes	Yes	Yes
Adj. R-squared	0.18	0.18	0.18	0.18
Observations	3693	3693	3693	3693

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Cross-country correlation between MP shock estimates higher for economies integrated with the US

	(1)	(2)	(3)	(4)
Overall financial integration	0.09***	0.08**	0.08***	0.06*
	(0.00)	(0.01)	(0.01)	(0.06)
Share of US in overall financial integration	0.12***	0.11***	0.11***	0.11***
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Non-resident bank loans/GDP				0.02*
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Country 1 dummies	Yes	Yes	Yes	Yes
Country 2 dummies	Yes	Yes	Yes	Yes
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Particular role for cross-border banking linkages

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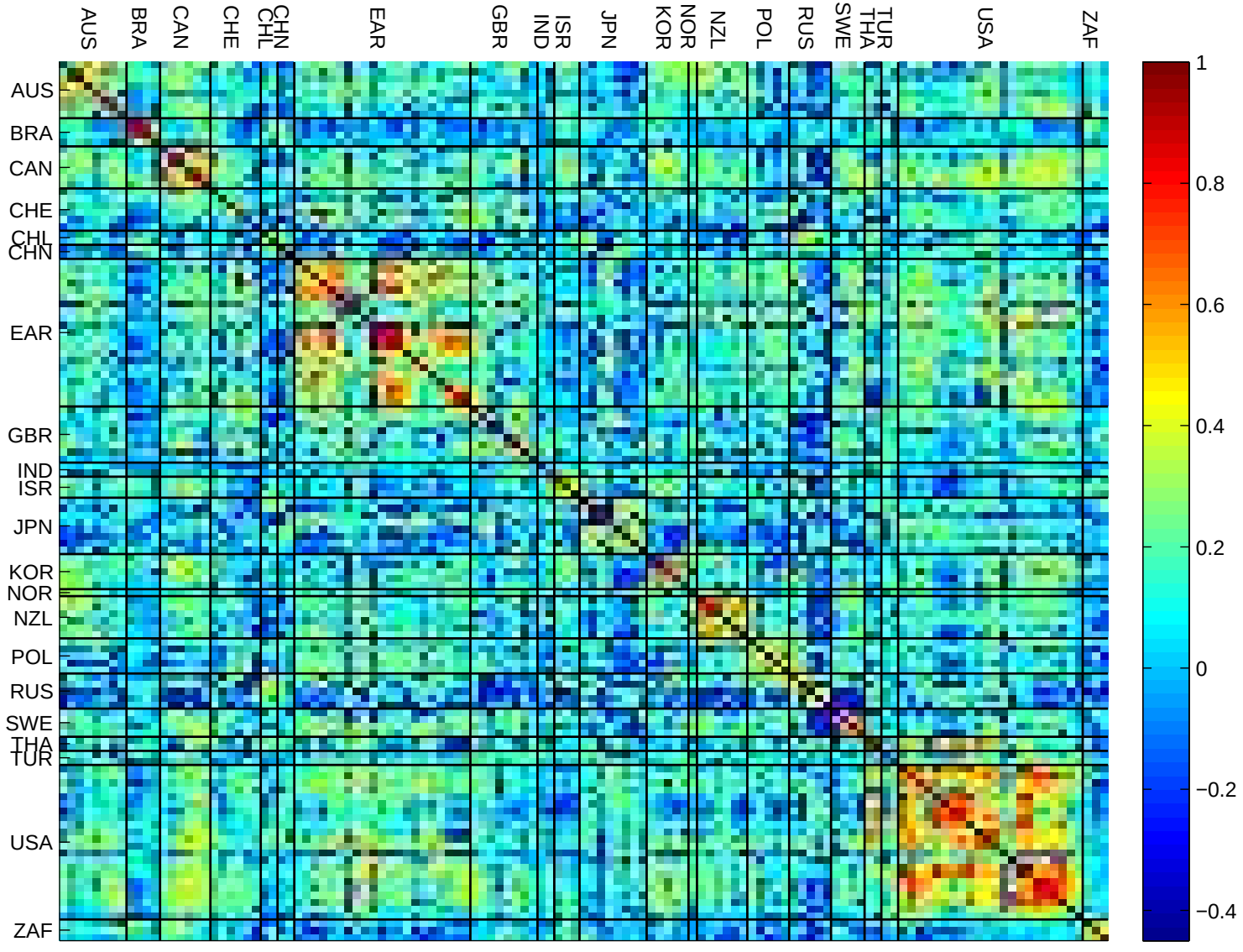
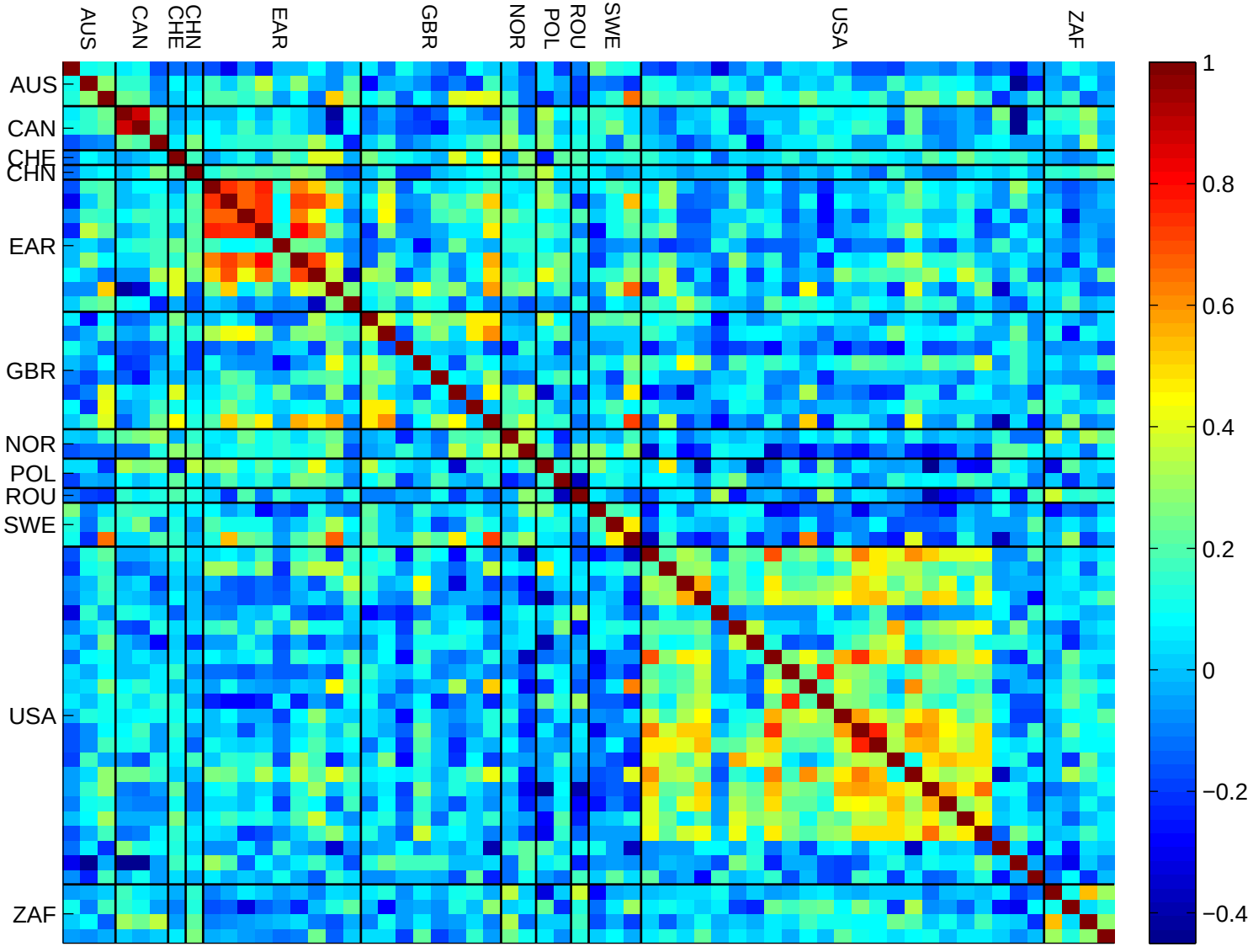
Correlation heat-map of MP shock estimates from NK DSGE models



Correlation heat-map of MP shock estimates from *non*-NK DSGE models



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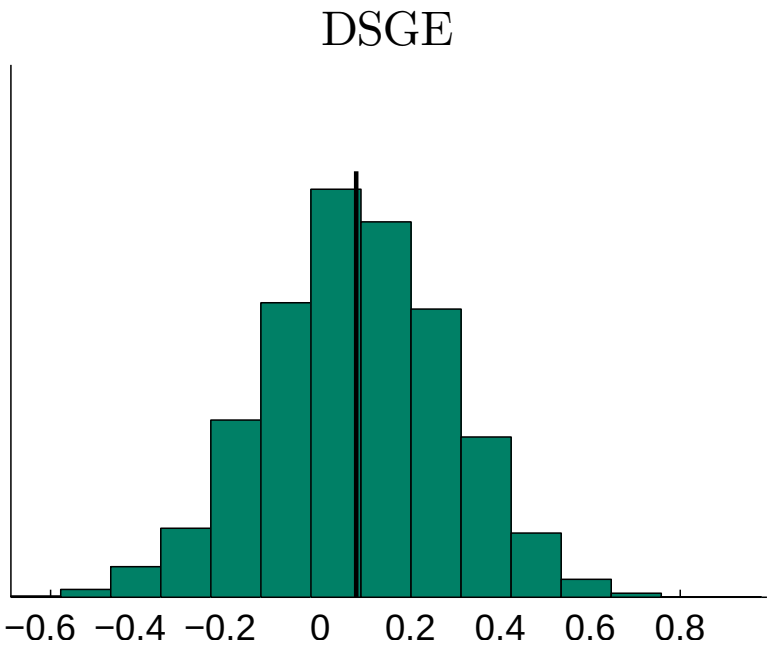
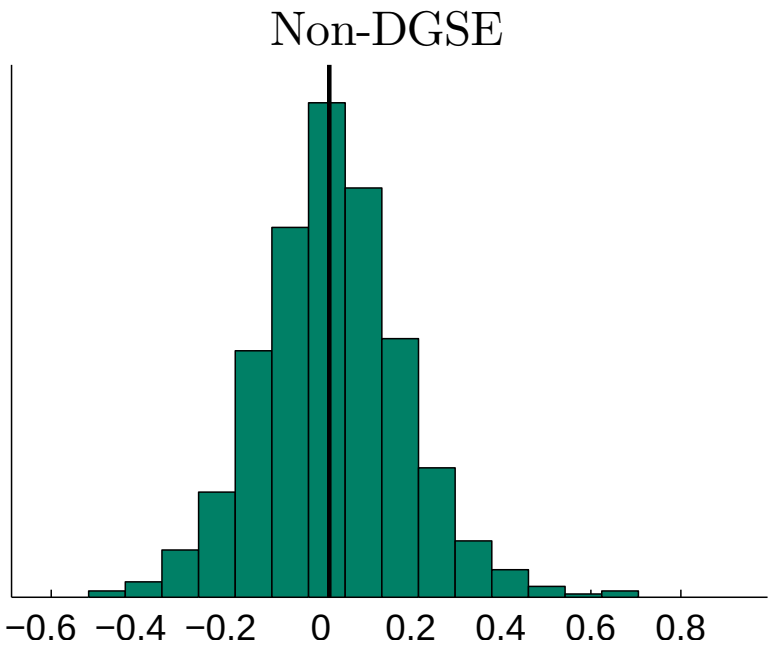




Placebo test

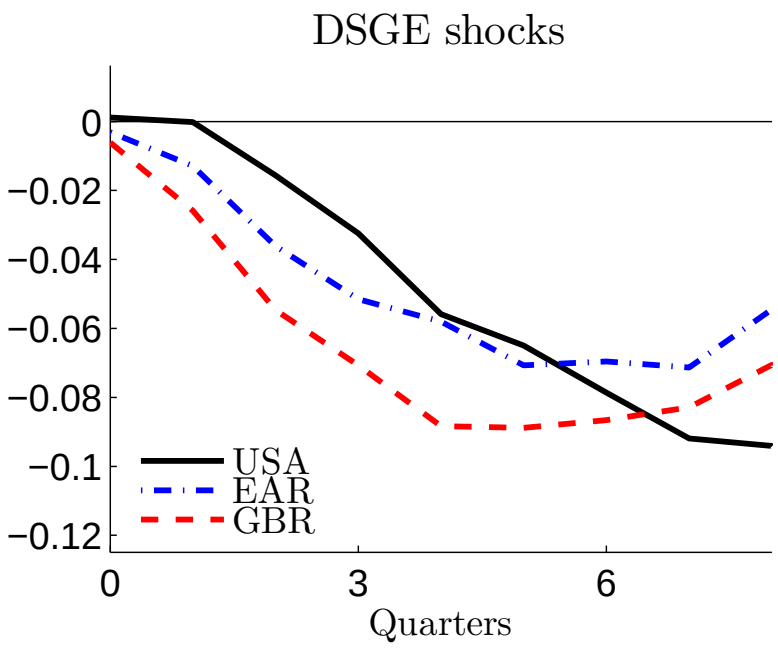
	(1) DSGE	(2) Non-DSGE
Overall financial integration	0.09***	0.02
	(0.00)	(0.53)
Share of US in overall financial integration	0.12***	0.01
	(0.00)	(0.89)
Country 1 dummies	Yes	Yes
Country 2 dummies	Yes	Yes
Adj. R-squared	0.18	0.05
Observations	3693	659

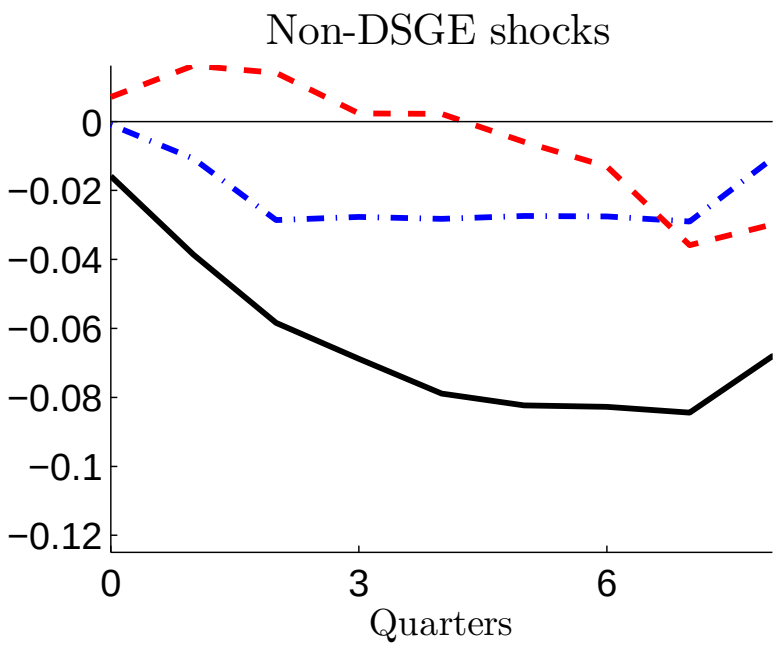
p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

▸ Dummy regressions

Global output spillover estimates based on non-NK DSGE MP shock estimates





Additional predictions: Multi-country models with international financial frictions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Overall financial integration	0.09***	0.09***	0.11***	0.09***	0.10***	0.09***	0.11***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Share of US in overall financial integration	0.15***	0.15***	0.15***	0.15***	0.15***	0.15***	0.15***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
At least one multi-country model		-0.00	-0.00			-0.00	-0.00
		(0.73)	(0.78)			(0.80)	(0.82)
Over. fin. integr. x at least one multi-country model			-0.02*				-0.02
			(0.07)				(0.10)
At least one model with intern. fin. frictions				-0.01	-0.00	-0.01	-0.00
				(0.63)	(0.88)	(0.73)	(0.95)
Over. fin. integr. x at least one model with intern. fin. frictions					-0.02		-0.01
					(0.19)		(0.47)
Country 1 dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country 2 dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Observations	2601	2601	2601	2601	2601	2601	2601

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Additional predictions: Capital controls and FX flexibility

	(1)	(2)	(3)
Overall financial integration	0.09***	0.08***	0.08***
	(0.00)	(0.00)	(0.00)
Share of US in overall financial integration	0.12***	0.12***	0.12***
	(0.00)	(0.00)	(0.00)
Capital controls (PC)		0.01	0.06*
		(0.75)	(0.08)
FX flexibility		-0.00	-0.00
		(0.65)	(0.86)
Capital controls x At least one economy is EME			-0.08*
			(0.09)
Exchange rate flexibility x At least one economy is EME			-0.00
			(0.14)
At least one economy is EME			0.22
			(0.18)
Country 1 dummies	Yes	Yes	Yes
Country 2 dummies	Yes	Yes	Yes
Adj. R-squared	0.18	0.17	0.18
Observations	3693	3693	3693

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Alternative explanations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Overall financial integration	0.09***	0.08***	0.10***	0.08***	0.08***	0.09***	0.07*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.08)
Share of US in overall financial integration	0.12***	0.13***	0.12***	0.12***	0.11***	0.15***	0.19***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Trade integration		0.08***					0.07**
		(0.01)					(0.04)
Share of US in trade integration		-0.01					-0.02
		(0.75)					(0.45)
Net short in foreign currency			-0.01				0.01
			(0.62)				(0.79)
Bilateral overall financial integration				0.00			-0.03
				(0.44)			(0.30)
Bilateral overall trade integration					0.01		0.04
					(0.21)		(0.21)
Heterogeneity in sectoral composition						0.01	0.00
						(0.50)	(0.80)
Country 1 dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country 2 dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Observations	3693	3693	3693	3693	3693	3099	3099

p-values in parentheses

$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Alternative samples

	(1) Baseline	(2) CBs/IOs	(3) w/o Vitek	(4) Max. sample	(5) Collapsed
Overall financial integration	0.09***	0.09*	0.09***	0.07***	0.03***
	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)
Share of US in overall financial integration	0.12***	0.10***	0.15***	0.11***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Country 1 dummies	Yes	Yes	Yes	Yes	No
Country 2 dummies	Yes	Yes	Yes	Yes	No
Adj. R-squared	0.18	0.19	0.18	0.16	0.11
Observations	3693	440	2601	4453	91

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Alternative specifications

	(1) Baseline	(2) Insign.=0	(3) Logit	(4) FE	(5) Min.
Overall financial integration	0.09***	0.05***	0.19***	0.09***	0.09***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Share of US in overall financial integration	0.12***	0.09***	0.25***	0.12***	0.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Country 1 dummies	Yes	Yes	Yes	No	Yes
Country 2 dummies	Yes	Yes	Yes	No	Yes
Country-shock 1 dummies	No	No	No	Yes	No
Country-shock 2 dummies	No	No	No	Yes	No
Adj. R-squared	0.18	0.11	0.17	0.30	0.18
Observations	3693	3693	3693	3693	3693

p-values in parentheses

$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Conclusion

- Standard NK DSGE models imply cross-country correlated MP shock estimates
- This can be rationalised by a lack of accounting for financial spillover channels in this class of models
- Possible/likely consequences
  - Inconsistent likelihood-based estimation of NK DSGE models
  - Mis-leading historical decompositions
  - Estimates of monetary policy effects inconsistent
- Financial spillovers are an important gap in standard structural macro-modelling

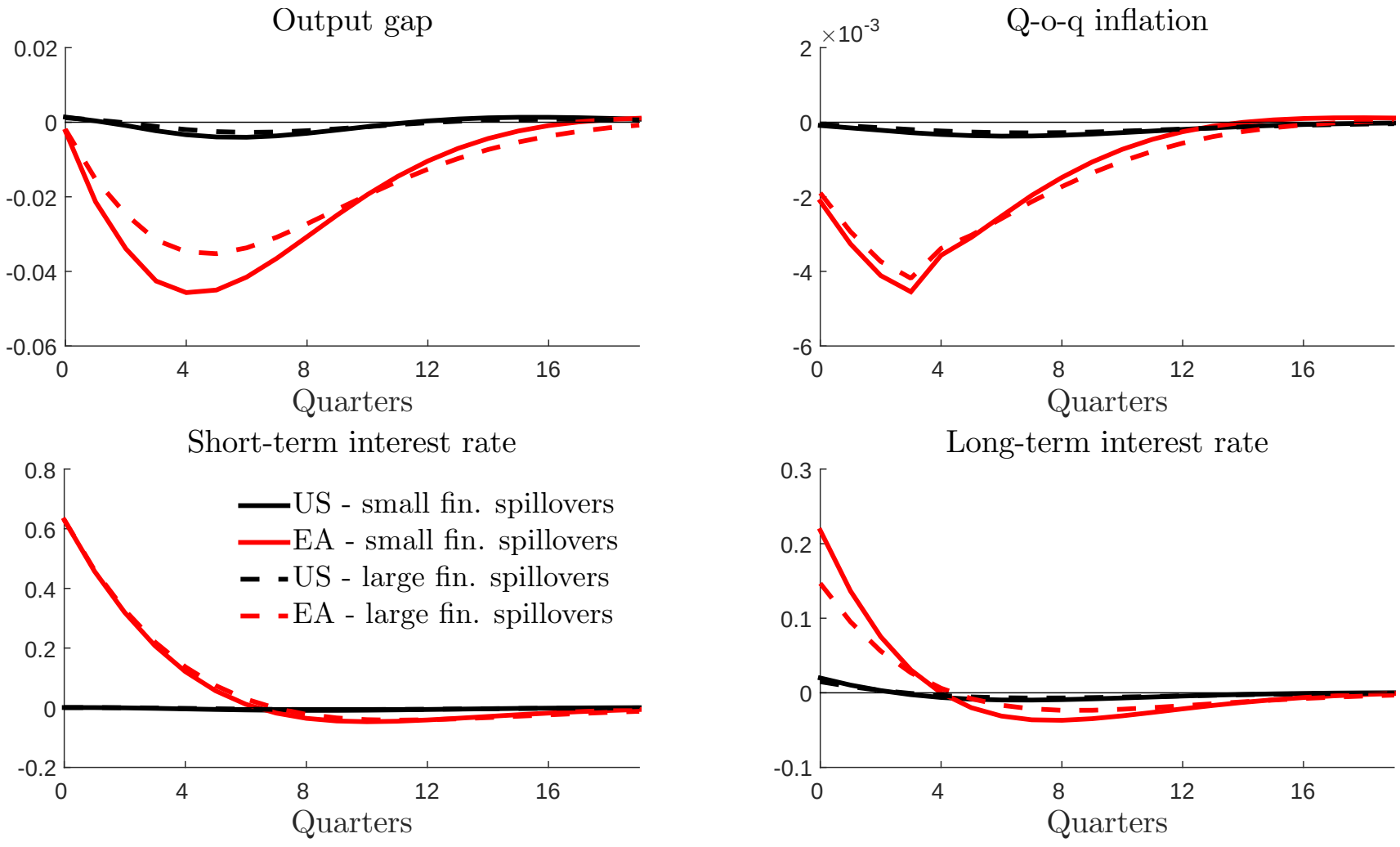
Does lack of financial spillovers in a NK DSGE model cause cross-country correlated MP shock estimates?

- Consider the 3-country model of Coenen and Wieland (2002)
- Small, semi-structural model: IS/Phillips curves, Taylor rules
- Cross-country uncorrelated MP shocks
- Introducing financial spillovers

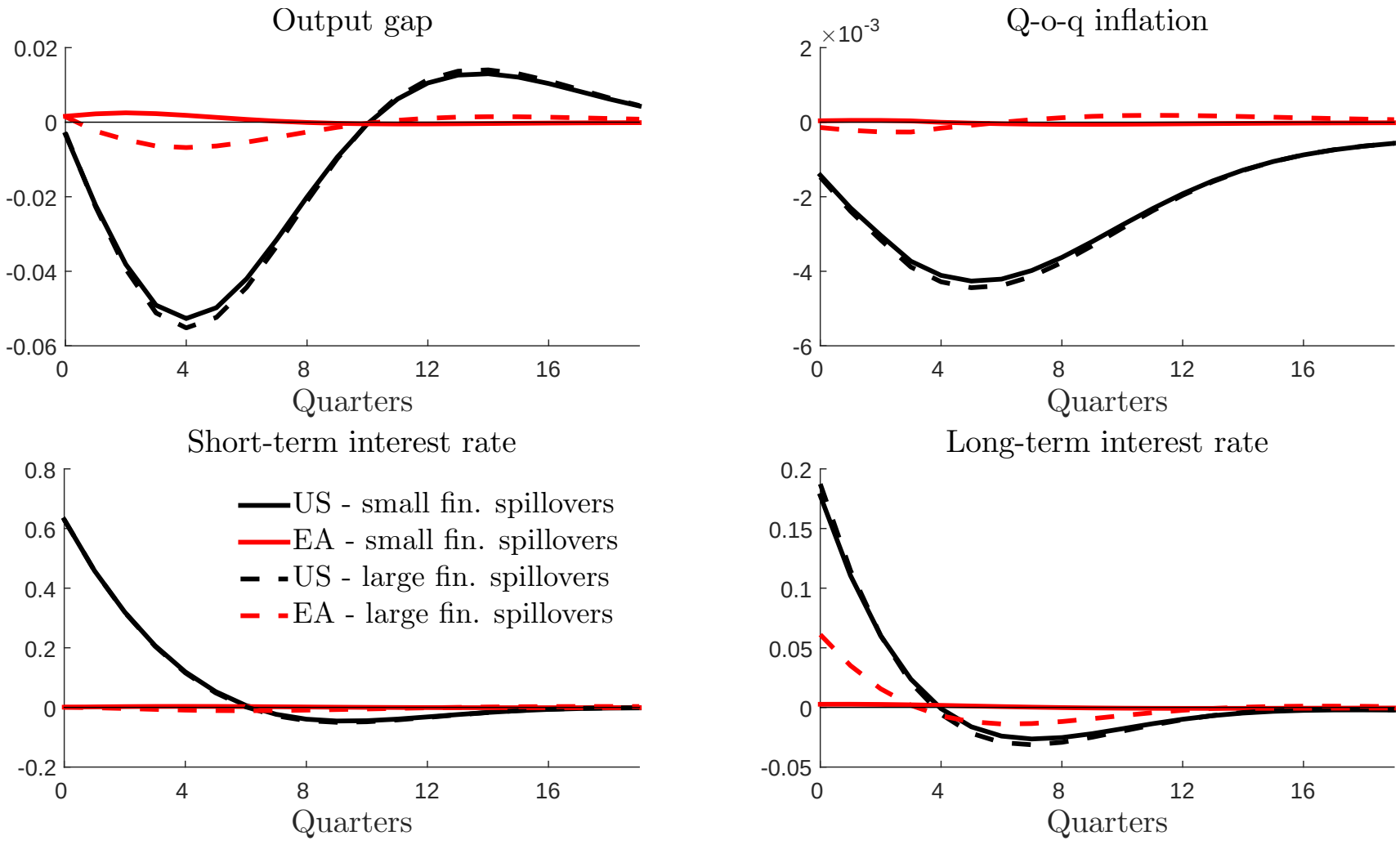
$$i_{it}^{(l)} = (1-\vartheta_i)\cdot\left(\frac{1}{8}\sum_{j=0}^{8} E_t i_{i,t+j}^{(s)}\right) + \vartheta_i \cdot \left(\sum_{j=1, j\neq i}^{N} \omega_{ij}\, i_{jt}^{(l)}\right) \qquad (2)$$

  - $i_{it}^{(l)}$: Long-term interest rate (appearing in IS curve)
  - ϑ_i: Degree of international financial integration
  - ω_{ij}: Rel. importance of economy j in economy i's overall integration

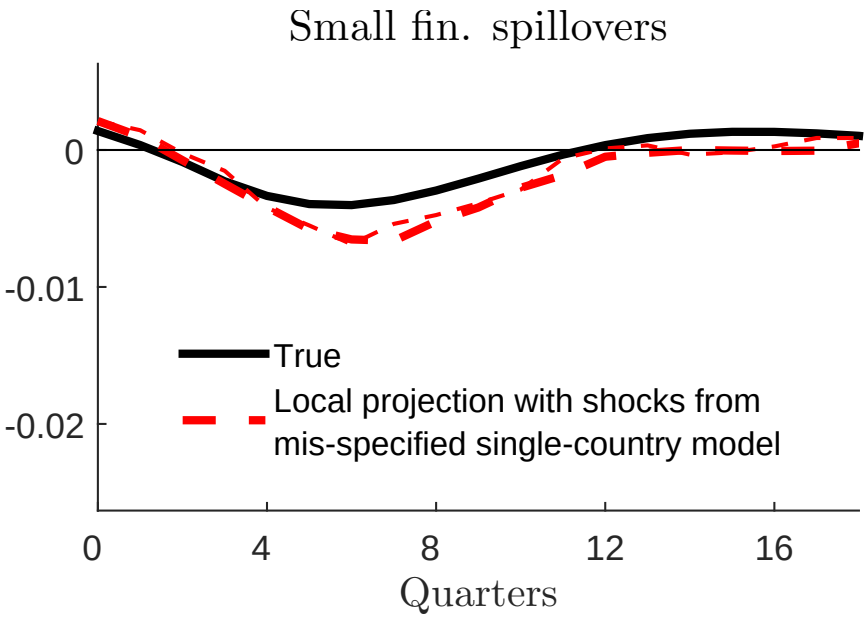
True EA MP shock spillovers

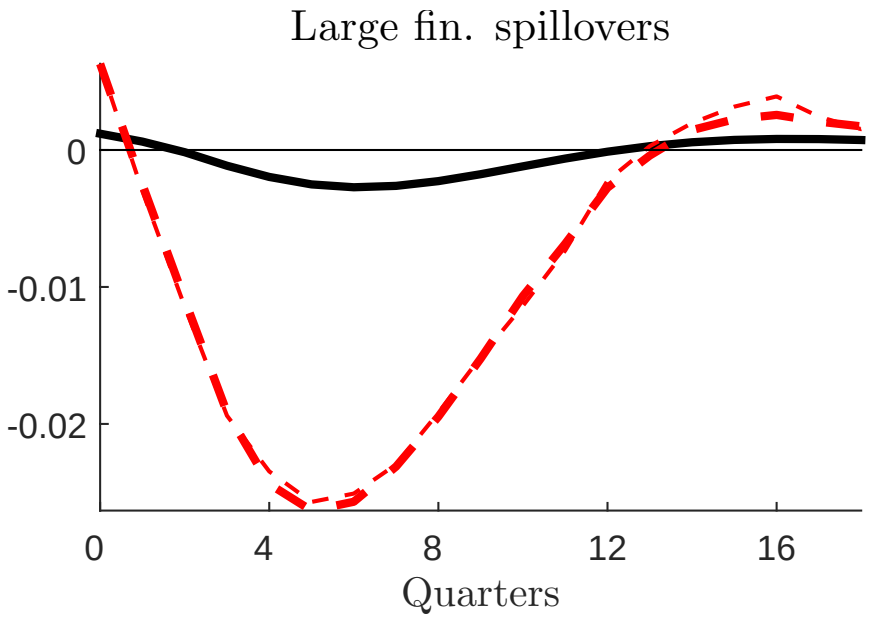


True US MP shock spillovers



Spillovers from euro area monetary policy to US output gap

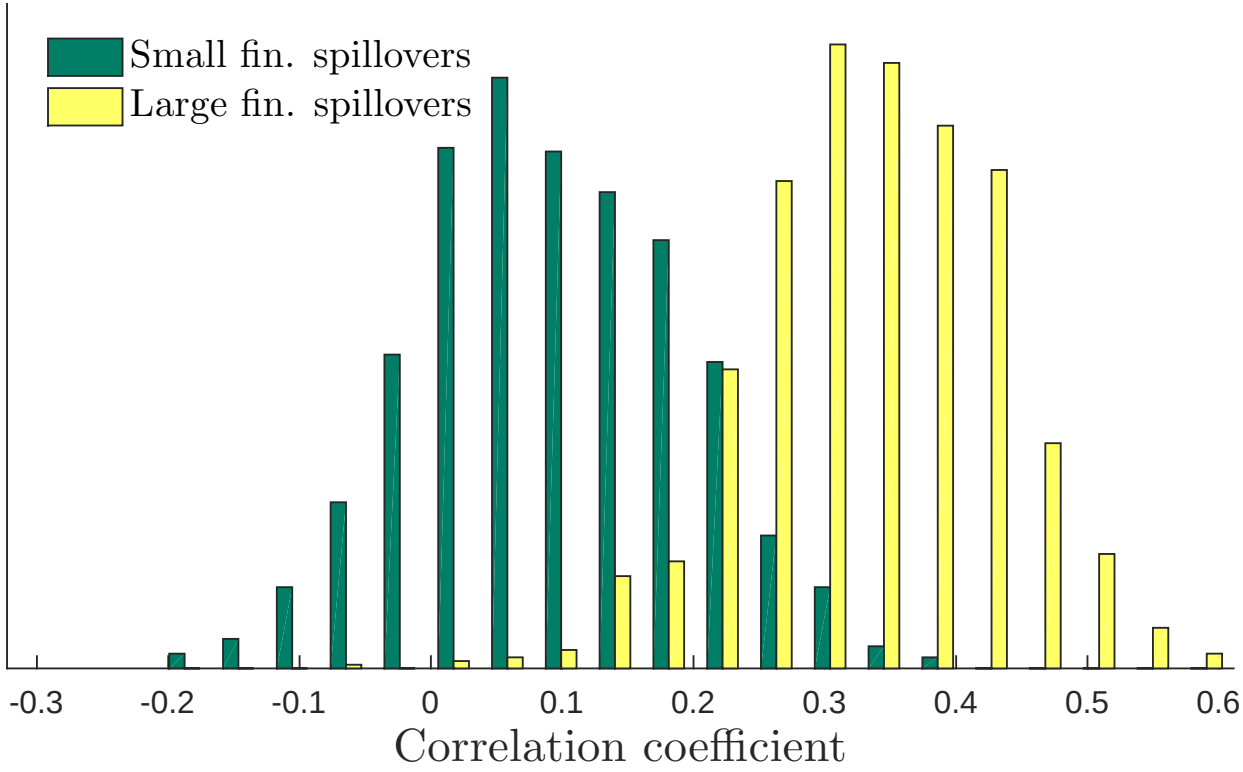




The Monte Carlo experiment

1. Simulate data in multi-country model **with** financial spillovers
2. Estimate MP shocks in single-country models **which lack** financial spillovers
3. Compute cross-country correlations of MP shock estimates
4. Repeat steps 1- 3 a large number of times

Estimated MP shocks cross-country correlated in case true DGP features strong financial spillovers



Return

US MP shock time series

Reference	Acronym	Type	Sample period	Multi-country	Fin. spillovers
Alpanda and Aysun (2014)	aya	DSGE	1996q1-2009q2	y	y
Bacchiocchi and Fanelli (2015)	bf	VAR	1956q2-2008q3		
Bacchiocchi et al. (2014)	bfc	VAR	1961q1-2008q2		
Barakchian and Crowe (2013)	bc	FME	1988m12-2008m6		
Bernanke and Kuttner (2005)	bk	FME	1988m12-2008m6		
Bernanke and Mihov (1998)	bm	VAR	1990m1-2007m11		
Bernanke et al. (2005)	bbe	VAR	1960q1-2007q2		
Brayton et al. (2014)	frb	DSGE	1970q1-2010q4	y	y
Breuss and Fornero (2009)	forn	DSGE	1984q1-2015q3	y	n
Carabenciov et al. (2008)	gpm	DSGE	1994q1-2008q1	y	y
Ca'Zorzi et al. (2015)	jp	DSGE	1975q1-2013q3	n	n
Chin et al. (2015)	cft	DSGE	1976q1-2013q2	y	n
Christiano et al. (1999)	cee	VAR	1989q4-2007q3		
Christiano et al. (2014)	cmr	DSGE	1981q1-2010q2	n	n
Chung et al. (2010)	edo	DSGE	1984q4-2016q2	n	n
Claus and Dungey (2012)	cld	SM (term-structure model)	1994m1-2008m10		
Claus et al. (2016)	cck	SM (shadow rate)	1996m1-2015m11		
Consensus Forecast	cpf	FME	1990q1-2013q1		
Dungey and Osborn (2014)	duo	VAR	1983q1-2007q4		
Dungey et al. (2014)	dor	VAR	1984q3-2008q1		
Feldkircher and Huber (2016)	fel	VAR	1995q1-2012q4		
Forni and Gambetti (2010)	fg	VAR	1990m1-2007m11		
Fragetta and Melina (2013)	frm	VAR	1965q4-2007q4		
Furlanetto et al. (2014)	fgs	DSGE	1964q2-2009q4	n	n
Galí and Gambetti (2015)	gag	VAR	1960q1-2011q4		
Gertler and Karadi (2015)	kg	FME	1991q1-2012q2		
Gertler et al. (2008)	gst	DSGE	1960q1-2005q1	n	n
Iacoviello and Neri (2010)	in	DSGE	1965q1-2006q4	n	n
Kaihatsu and Kurozumi (2014)	kak	DSGE	1985q1-2008q4	n	n
Kamber et al. (2015b)	kst	DSGE	1954q3-2011q4	n	n
Kollmann et al. (2011)	quest	DSGE	1999q1-2015q1	y	y
Luciani (2015)	luc	VAR	1983q1-2010q4		
Merola (2015)	swrm	DSGE	1965Q1-2012Q4	n	n
Merola (2015)	swrmff	DSGE	1965q1-2012q4	n	n
Nguyen (2015)	ngu	DSGE	1960q1-2007q1	n	n
Poutineau and Vermandel (2015b)	pov1	DSGE	1993q1-2012q3	n	n
Pragidis et al. (2013)	pgt	SM (LSTAR)	1980m1-2011m10		
Razafindrabe (2016)	raz	DSGE	1999q1-2011q2	y	n
Romer and Romer (2004)	rr	NARR	1988m1-2008m6		
Rossi and Zubairy (2011)	roz	VAR	1955q3-2006q4		
Rychalovska (2013)	ryc1	DSGE	1954q1-2008q3	n	n
Sims and Zha (2006)	sz	VAR	1989q4-2008q2		
Villa (2014)	vbgg	DSGE	1983q1-2008q3	n	n
Villa (2014)	vgk	DSGE	1983q1-2008q3	n	n
Vitek (2015)	vit	DSGE	1999q3-2008q4	y	y
Voss and Willard (2009)	vow	VAR	1985q2-2007q4		

EA MP shock time series

Reference	Acronym	Type	Sample period	Multi-country	Fin. spillovers
Albonico et al. (2014)	alb1	DSGE	1993q2-2012q4	n	n
Albonico et al. (2016)	alb2	DSGE	1985q1-2012q4	n	n
Alpanda and Aysun (2014)	aya	DSGE	1996q1-2009q2	y	y
Kucharcukova et al. (2014)	bab	VAR	2001m4-2015m7		
Bank of Finland	ver	DSGE	1996q1-2014q3	n	n
Barigozzi et al. (2014)	bcl	VAR	1984q1-2007q4		
Benchimol and Fourcans (forthcoming)	benf	DSGE	1995q2-2013q1	n	n
Benkovskis et al. (2011)	bbfw	VAR	1999q3-2010q3		
Boivin et al. (2009)	bgm	VAR	1988q1-2007q3		
Breuss and Fornero (2009)	forn	DSGE	1984q1-2015q3	y	n
Carabenciov et al. (2008)	gpm	DSGE	1994q1-2008q1	y	y
Ca'Zorzi et al. (2015)	jp	DSGE	1975q1-2013q3	n	n
Christoffel et al. (2008)	nawm	DSGE	1985q1-2011q4	n	n
ConsensusForecast	cpf	FME	1990q1-2013q1		
Dungey and Osborn (2014)	duo	VAR	1983q1-2007q4		
Dungey et al. (2014)	dor	VAR	1984q3-2008q1		
Gelain (2010)	gel	DSGE	1980q1-2008q3	n	n
Gerali et al. (2010)	ger	DSGE	1998q1-2009q4	n	n
Jannsen and Klein (2011)	jk	VAR	1990q1-2008q4		
Kollmann et al. (2011)	quest	DSGE	1999q1-2015q1	y	n
Kühl (2016)	kue	DSGE	1997q4-2013q3	*	*
Peersman and Smets (2001)	ovar	VAR	1990q2-2011q2		
Poutineau and Vermandel (2015a)	pov2	DSGE	1999q1-2013q3	n	n
Poutineau and Vermandel (2016)	pov3	DSGE	1999q1-2013q4	n	n
Quint and Rabanal (2014)	qir	DSGE	1996q1-2011q4	n	n
Razafindrabe (2016)	raz	DSGE	1999q1-2011q2	y	n
Smets et al. (2013)	sww	DSGE	1970q2-2010q2	n	n
Toroj and Konopczak (2012)	tor	DSGE	1995q2-2011q2	y	n
Villa (2014)	vbgg	DSGE	1983q1-2008q3	n	n
Villa (2014)	vgk	DSGE	1983q1-2008q3	n	n
Vitek (2015)	vit	DSGE	1999q3-2008q4	y	y

UK MP shock time series

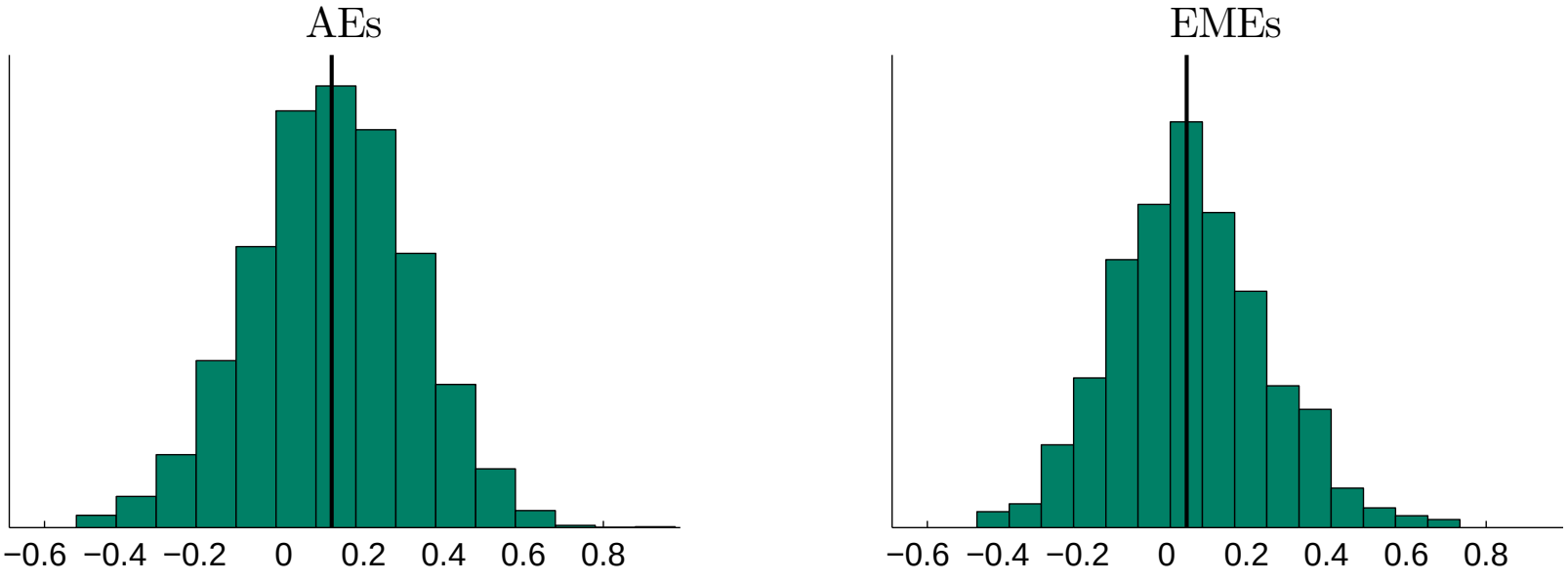
Reference	Acronym	Type	Sample period	Multi-country	Fin. spillovers
Andreasen (2011)	and	DSGE	1990q1-2008q3	n	n
Kucharcukova et al. (2014)	bab	VAR	2001m4-2015m7		
Bjørnland and Jacobsen (2010)	bjo	VAR	1983q1-2006q4		
Burgess et al. (2013)	boe	DSGE	1987q3-2007q4	n	n
Ca'Zorzi et al. (2015)	jp	DSGE	1975q1-2013q3	n	n
Cesa-Bianchi et al. (2016)	ctv	FME	1997m7-2015m6		
Chin et al. (2015)	cft	DSGE	1976q1-2013q2	y	y
Cloyne and Hürtgen (forthcoming)	clh	NARR	1975m1-2007m12		
Consensus forecast	cpf	FME	1990q1-2013q1		
Ellis et al. (2014)	mum	VAR	1976q1-2005q4		
Faccini et al. (2013)	fmz	DSGE	1971q1-2009q4	n	n
Harrison and Oomen (2010)	harr	DSGE	1958q1-2007q1	n	n
Kamber and Millard (2012)	km	VAR	1979q4-2007q4		
Mumtaz and Theophilopoulou (2016)	mut	VAR	1976q2-2009q1		
Razafindrabe (2016)	raz	DSGE	1999q1-2011q2	y	n
Vitek (2015)	vit	DSGE	1999q3-2008q4	y	y

Other economies

Reference	Acronym	Country	Type	Sample period	Multi-country	Fin. spillovers
Adolfson et al. (2011)	ado	SWE	DSGE	1980q2-2007q3	n	n
Adolfson et al. (2013)	rams	SWE	DSGE	1995q2-2015q2	n	n
Alp and Elekdag (2013)	has	TUR	DSGE	2002q1-2010q4	n	n
Alp et al. (2012)	ael	KOR	DSGE	2000q1-2012q4	n	n
Argov et al. (2012)	moi	ISR	DSGE	1992q1-2011q4	y	n
Assenmacher-Wesche (2008)	asw	CHE	VAR	1975q1-2006q4		
Kucharcukova et al. (2014)	bab	SWE, POL	VAR	2001m4-2015m7		
Bank of Japan	mjem	JPN	DSGE	1978q1-2016q1	n	n
Bank of Korea	bok	KOR	DSGE	2001q1-2015q2	*	*
Bank of Thailand	bot	THA	DSGE	2002q1-2015q3	n	n
Baranowski et al. (2013)	bgms	POL	DSGE	1997q1-2012q4	n	n
Barnett et al. (2015)	gho	IND	VAR	1996m1-2013m12		
Beltran and Draper (2008)	bel	CHE	DSGE	1970q2-2005q2	y	n
Benchimol (2016)	ben	ISR	DSGE	1995q2-2013q1	n	n
Bjørnland and Jacobsen (2010)	bjo	NOR, SWE	VAR	1983q1-2006q4		
Bong et al. (2016)	dpb	AUS, NZL, CAN	DSGE	1989q2-2006q4	n	n
Brzoza-Brzezina and Makarski (2011)	bbm	POL	DSGE	1997q1-2009q2	n	n
Melecky and Buncic (2008)	bud	AUS	DSGE	1984q1-2005q4	y	n
Melecky and Buncic (2008)	buv	AUS	VAR	1984q1-2005q4		
Caputo et al. (2008)	mas	CHL	DSGE	2001q2-2016q1	*	*
Carabenciov et al. (2008)	gpm	JPN	DSGE	1994q1-2008q1	y	y
Ca'Zorzi et al. (2015)	jp	AUS, CAN	DSGE	1975q1-2013q3	n	n
Chen and Columba (2016)	cco	SWE	DSGE	1996q1-2014q4	y	n
Claus and Dungey (2016)	cd	JPN	SM (term-structure model)	1996m1-2015m11		
Claus and Dungey (2016)	cd	AUS, CAN	SM (term-structure model)	1996m1-2015m11		
Claus et al. (2016)	cck	JPN	SM (shadow rate)	1998m1-2015m6		
Cuche-Curti et al. (2009)	cdn	CHE	DSGE	1995q2-2015q4	n	n
de Carvalho and Castro (2015)	dc	BRA	DSGE	1999q3-2013q4	n	n
de Carvalho and Valli (2011)	dv	BRA	DSGE	1999q1-2010q2	y	n
de Carvalho et al. (2014)	dcc	BRA	DSGE	1999q3-2012q4	n	n
Dorich et al. (2013)	tot	CAN	DSGE	1990q1-2014q4	y	n
Drygalla (2015)	dry	POL	VAR	1994q1-2013q4		
Fueki et al. (2016)	fue	JPN	DSGE	1990q1-2008q4	n	n
Gallic and Vermandel (2016)	gav	NZL	DSGE	1989q1-2014q2	y	n
Gervais and Gosselin (2014)	lens	CAN	DSGE	1993q1-2014q4	n	n
Grabek and Klos (2013)	grk	POL	DSGE	1999q1-2011q3	n	n
Gupta and Steinbach (2013)	gs	ZAF	VAR	1981q2-2010q4		
Hirose (2014)	hir	JPN	DSGE	1983q2-2013q1	n	n
Jacob and Munro (2016)	jam	NZL	DSGE	1998q4-2014q3	n	n
Jiang and Kim (2013)	jkc	CHN	VAR	1993q1-2009q3		
Kamber et al. (2015a)	nzsim	NZL	DSGE	1993q2-2013q1	n	n
Kim (2014)	tbk	KOR	DSGE	2000q2-2012q4	n	n
Takeshi and Jouchi (2016)	nik	JPN	VAR	1990q1-2015q3		
Kreptsev and Seleznev (2016), only in Russian	krs	RUS	DSGE	2003q1-2013q1	*	*
Leist (2013)	lei	CHE	DSGE	1989q1-2010q2	n	n
Li and Spencer (2015)	lsp	AUS	DSGE	1993q1-2013q4	n	n
Malakhovskaya and Minabutdinov (2014)	mmi	RUS	DSGE	1999q3-2011q3	n	n
Milani (2011)	mil2	AUS, CAN, NZL	DSGE	1982q3-2007q2	y	n
Milani and Park (2015)	mil	KOR	DSGE	1991q2-2012q4	n	n
Naraidoo and Paya (2012)	run	ZAF	SM (non-linear Taylor rules)	1986m1-2008m11		
Ncube and Ndou (2011)	nd1	ZAF	VAR	1976q1-2009q4		
Ncube and Ndou (2013)	nd2	ZAF	VAR	1983q3-2010q1		
Paetz and Gupta (2014)	pag	ZAF	DSGE	1971q1-2013q1	n	n
Pop (2016)	pre	ROM	VAR	2001q1-2008q4		
Raghavan et al. (2016)	ras1	CAN	VAR	1974m3-2007m12		
Raghavan et al. (2016)	ras2	CAN	VAR	1975m1-2007m12		
Razafindrabe (2016)	raz	JPN, CHE, CHN	DSGE	1999q1-2011q2	y	n
Rees et al. (2015)	rsh	AUS	DSGE	1992q1-2013q4	y	n
Robstad (2014)	rob	NOR	VAR	1994q3-2013q4		
Rudolf and Zurlinden (2014)	ruz	CHE	DSGE	1983q2-2015q4	y	n
Roman (2013)	sem	RUS	DSGE	2003q1-2012q1	n	n
Sheena and Wang (2016)	shw	AUS	DSGE	1993q2-2013q1	n	n
Shulgin (2014)	shu	RUS	DSGE	2001q1-2014q2	*	*
Steinbach et al. (2009)	sms	ZAF	DSGE	1990q1-2007q4	y	n
Sveriges Riksbank	bvar	SWE	VAR	1995q4-2014q4		
Toroj and Konopczak (2012)	tor	POL	DSGE	1995q2-2011q2	y	n
Vitek (2015)	vit	NZL, AUS, SWE, CAN, ZAF, KOR, CHN, JPN, CHE, ISR, CHL, IND, TUR	DSGE	1999q3-2008q4	y	y
Voss and Willard (2009)	vow	AUS	VAR	1985q2-2007q4		

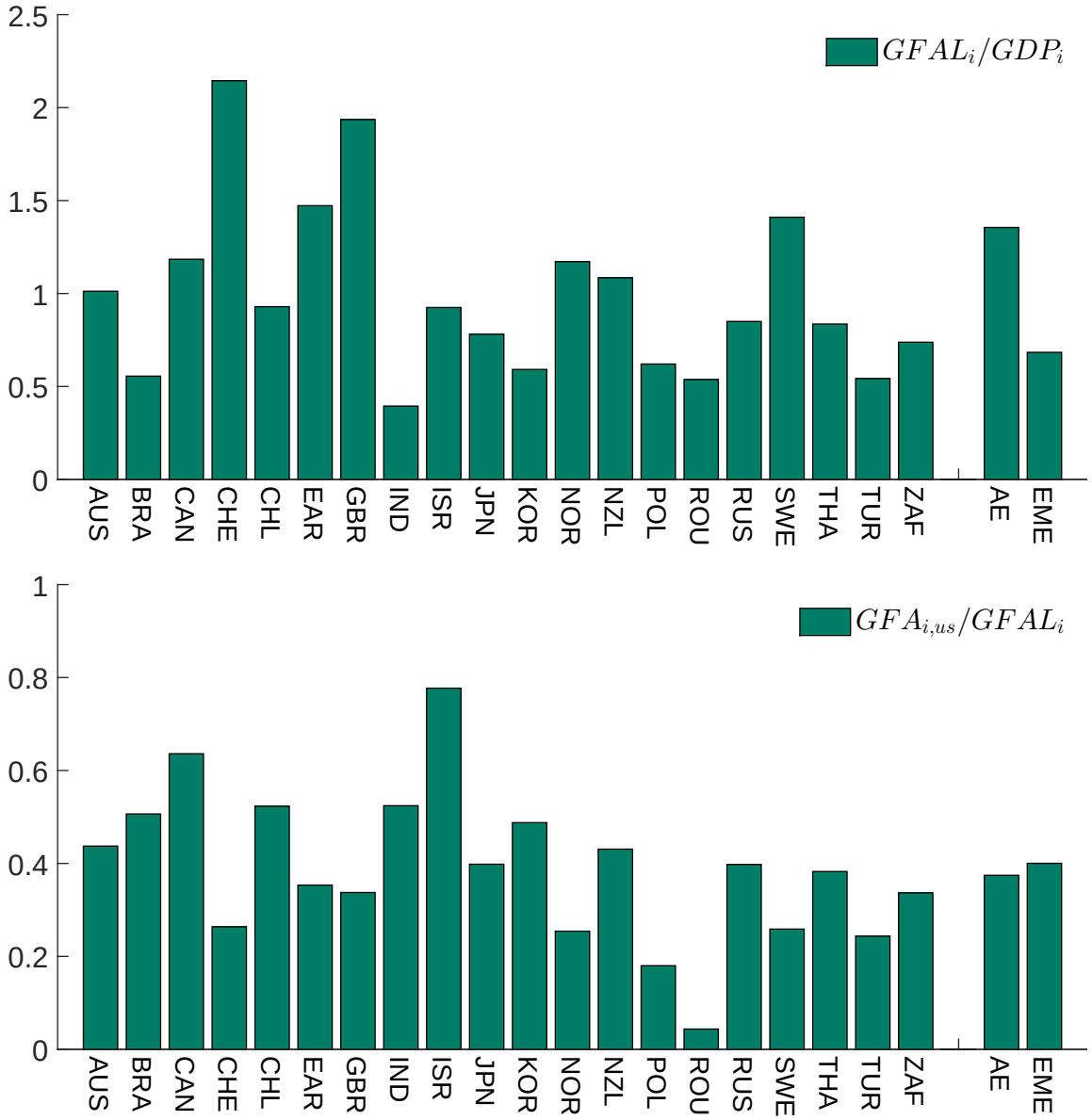
Return

Distribution of cross-country correlations



Return

Financial integration: Data



Return

Are these correlations patterns specific to MP shock estimates from NK DSGE models?

We consider regressions of the form

$$\rho_{\ell_i,m_j} = \alpha_i + \gamma_j + \boldsymbol{\mathcal{I}}_{\ell_i,m_j} \cdot \boldsymbol{\beta} + u_{\ell_i,m_j}, \tag{3}$$
$$i,j = 1,2,\ldots,N, \quad \ell_i = 1,2,\ldots,L_i, \quad m_j = 1,2,\ldots,M_j,$$

where

- ρ_{ℓ_i,m_j}: Correlation between MP shock time series ℓ_i of economy i and m_j of economy j
- $\mathcal{I}_{\ell_i,m_j}$: Indicator variables equalling unity if shocks ℓ_i and m_j, e.g.
  - pertain to same economy
  - stem from same model type

Are these correlations patterns specific to MP shock estimates from NK DSGE models?

We consider regressions of the form

$$\rho_{\ell_i,m_j} = \alpha_i + \gamma_j + \mathcal{I}_{\ell_i,m_j} \cdot \boldsymbol{\beta} + u_{\ell_i,m_j}, \tag{3}$$
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- $\mathcal{I}_{\ell_i,m_j}$: Indicator variables equalling unity if shocks ℓ_i and m_j, e.g.
  - pertain to same economy
  - stem from same model type

MP shock time series for same economy correlated

	(1) All	(2) All	(3) All
Same frequency	0.01***	0.01	0.00
	(0.00)	(0.35)	(0.85)
Same economy	0.20***	0.16***	0.16***
	(0.00)	(0.00)	(0.00)
Same model type	0.03***	0.03***	
	(0.00)	(0.00)	
Same economy x same model type		0.08***	
		(0.00)	
Both DSGE			0.04***
			(0.00)
Same economy x Both DSGE			0.10***
			(0.00)
Both financial market expectation			-0.02
			(0.11)
Same economy x Both financial market expectations			0.23***
			(0.00)
Both VARs			-0.02***
			(0.01)
Same economy x Both VARs			0.01
			(0.51)
Both other statistical models			-0.02
			(0.64)
Same economy x Both other statistical models			0.02
			(0.63)
Both narrative			-0.04***
			(0.00)
Constant	0.03***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.10	0.11	0.12
Observations	17391	17391	17391

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Shock time series from same model type correlated

	(1) All	(2) All	(3) All
Same frequency	0.01***	0.01	0.00
	(0.00)	(0.35)	(0.85)
Same economy	0.20***	0.16***	0.16***
	(0.00)	(0.00)	(0.00)
Same model type	0.03***	0.03***	
	(0.00)	(0.00)	
Same economy x same model type		0.08***	
		(0.00)	
Both DSGE			0.04***
			(0.00)
Same economy x Both DSGE			0.10***
			(0.00)
Both financial market expectation			-0.02
			(0.11)
Same economy x Both financial market expectations			0.23***
			(0.00)
Both VARs			-0.02***
			(0.01)
Same economy x Both VARs			0.01
			(0.51)
Both other statistical models			-0.02
			(0.64)
Same economy x Both other statistical models			0.02
			(0.63)
Both narrative			-0.04***
			(0.00)
Constant	0.03***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.10	0.11	0.12
Observations	17391	17391	17391

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

...also if they pertain to different countries

	(1) All	(2) All	(3) All
Same frequency	0.01***	0.01	0.00
	(0.00)	(0.35)	(0.85)
Same economy	0.20***	0.16***	0.16***
	(0.00)	(0.00)	(0.00)
Same model type	0.03***	0.03***	
	(0.00)	(0.00)	
Same economy x same model type		0.08***	
		(0.00)	
Both DSGE			0.04***
			(0.00)
Same economy x Both DSGE			0.10***
			(0.00)
Both financial market expectation			-0.02
			(0.11)
Same economy x Both financial market expectations			0.23***
			(0.00)
Both VARs			-0.02***
			(0.01)
Same economy x Both VARs			0.01
			(0.51)
Both other statistical models			-0.02
			(0.64)
Same economy x Both other statistical models			0.02
			(0.63)
Both narrative			-0.04***
			(0.00)
Constant	0.03***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.10	0.11	0.12
Observations	17391	17391	17391

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Cross-country correlation for same model type driven by NK DSGE models

	(1) All	(2) All	(3) All
Same frequency	0.01***	0.01	0.00
	(0.00)	(0.35)	(0.85)
Same economy	0.20***	0.16***	0.16***
	(0.00)	(0.00)	(0.00)
Same model type	0.03***	0.03***	
	(0.00)	(0.00)	
Same economy x same model type		0.08***	
		(0.00)	
Both DSGE			0.04***
			(0.00)
Same economy x Both DSGE			0.10***
			(0.00)
Both financial market expectation			-0.02
			(0.11)
Same economy x Both financial market expectations			0.23***
			(0.00)
Both VARs			-0.02***
			(0.01)
Same economy x Both VARs			0.01
			(0.51)
Both other statistical models			-0.02
			(0.64)
Same economy x Both other statistical models			0.02
			(0.63)
Both narrative			-0.04***
			(0.00)
Constant	0.03***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.10	0.11	0.12
Observations	17391	17391	17391

p-values in parentheses

$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

...and not by non-NK DSGE models

	(1) All	(2) All	(3) All
Same frequency	0.01***	0.01	0.00
	(0.00)	(0.35)	(0.85)
Same economy	0.20***	0.16***	0.16***
	(0.00)	(0.00)	(0.00)
Same model type	0.03***	0.03***	
	(0.00)	(0.00)	
Same economy x same model type		0.08***	
		(0.00)	
Both DSGE			0.04***
			(0.00)
Same economy x Both DSGE			0.10***
			(0.00)
Both financial market expectation			-0.02
			(0.11)
Same economy x Both financial market expectations			0.23***
			(0.00)
Both VARs			-0.02***
			(0.01)
Same economy x Both VARs			0.01
			(0.51)
Both other statistical models			-0.02
			(0.64)
Same economy x Both other statistical models			0.02
			(0.63)
Both narrative			-0.04***
			(0.00)
Constant	0.03***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.10	0.11	0.12
Observations	17391	17391	17391

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The US is special

	(1)	(2)	(3)
USA-EA	0.24***	0.24***	0.24***
	(0.00)	(0.00)	(0.00)
One shock is for USA	0.06***		
	(0.01)		
One shock is for EA	0.04		
	(0.13)		
One is USA, the other EME		0.02	
		(0.42)	
One is USA, the other AE		0.09***	
		(0.00)	
One is EA, the other EME		-0.03	
		(0.44)	
One is EA, the other AE		0.10***	
		(0.00)	
One is USA, the other American			0.08
			(0.38)
One is EA, the other American			0.01
			(0.95)
One is USA, the other European			0.09***
			(0.00)
One is EA, the other European			0.12***
			(0.00)
One is USA, the other Asian			0.09***
			(0.01)
One is EA, the other Asia			0.06
			(0.12)
Constant	0.05***	0.05***	0.04***
	(0.00)	(0.00)	(0.00)
Adj. R-squared	0.07	0.10	0.09
Observations	6974	6974	6974

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Return

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