

The international transmission of monetary policy – evidence from banks in Austria and Germany

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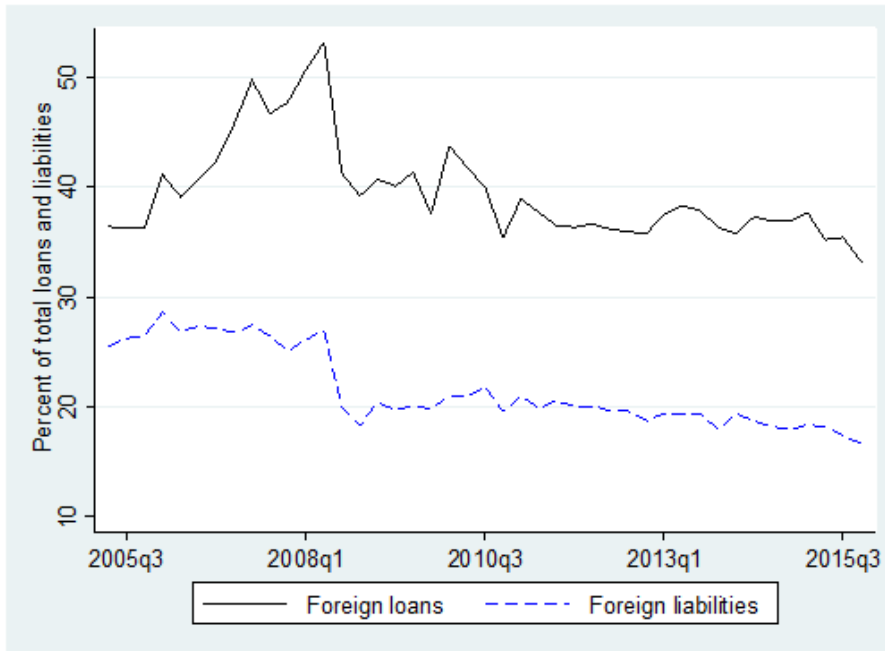
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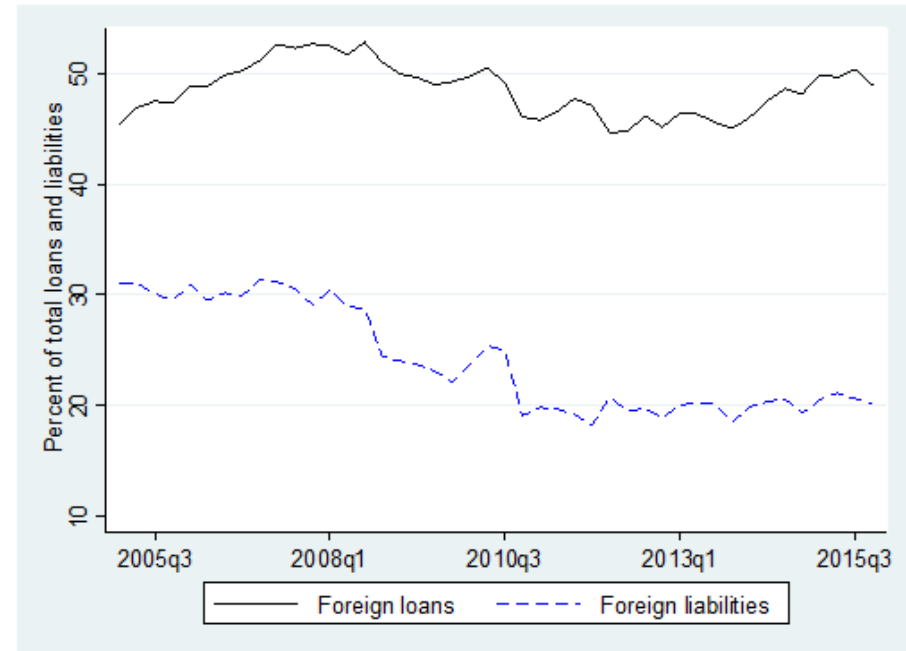
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Banking systems of AT and DE are integrated internationally



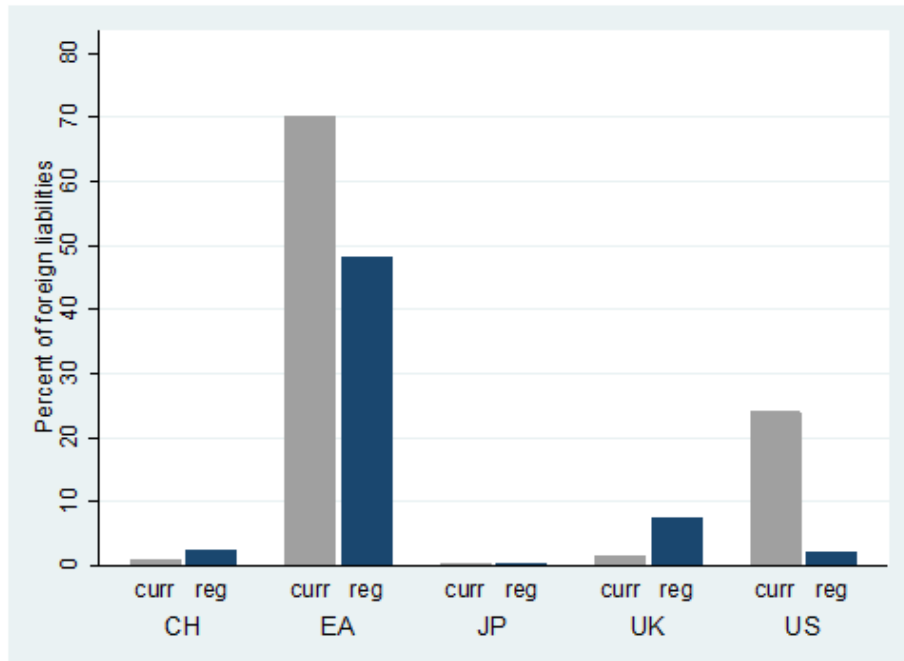
AT



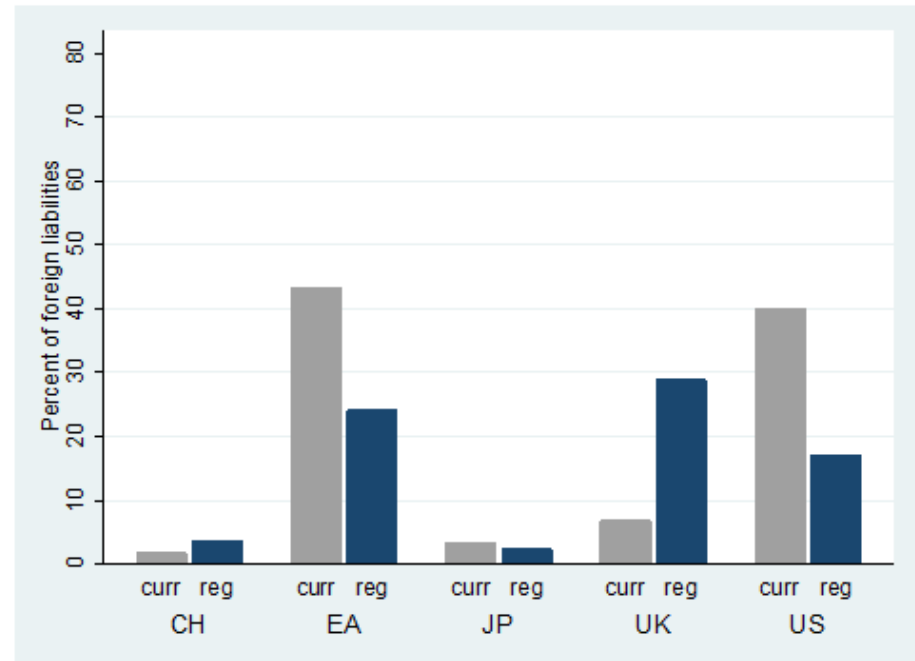
DE

- substantial shares of loans and liabilities are extended/received cross-border
- sample of internationally active banks

The liabilities of major banks can be split across regions and currencies



AT (2015 Q4)



DE (2015 Q4)

Baseline inward transmission

$$\Delta Y_{b,t} = \alpha_0 + \sum_c \left(\sum_{k=0}^K (\alpha_{1,k}^c \cdot \Delta MP_{t-k}^c \cdot trans_{b,t-K-1}^c) + \alpha_{2,k}^c \cdot trans_{b,t-K-1}^c \right) + \alpha_3 X_{b,t-1} + f_b + f_t + \varepsilon_{b,t}$$

$\Delta Y_{b,t}$ - change in log domestic lending to nfps of bank b in quarter t [first diff of ln loans]

ΔMP_{t-k}^c - change in money market rate of c , i.e. {US, UK, CH, JP} or {usd, gbp, chf, yen}

$trans_{b,t-K-1}^c$ - bank specific transmission channel (up to $K=3$ lags) related to c

$X_{b,t-1}$ - bank specific controls

f_b and f_t - bank and time fixed effects

$\varepsilon_{b,t}$ - standard errors clustered at the bank level

Our transmission channel variables distinguish between *region* and *currency*

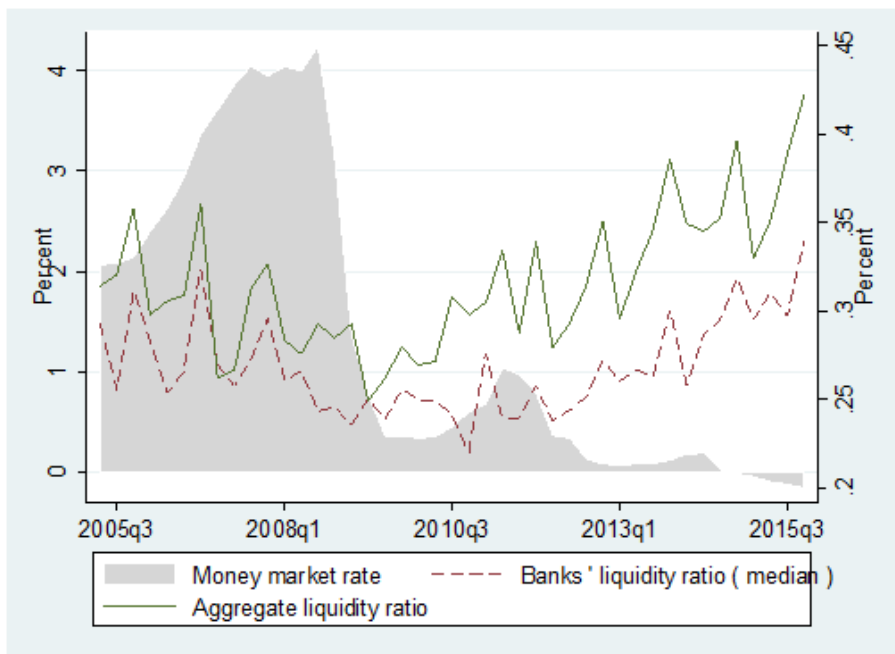
- **Transmission channel variables** ($trans_{b,t-K-1}^c$)
 - (1) ext. liabilities from a certain **region** {US, UK, JP, CH} to total assets,
 - (2) ext. liabilities to banks from a certain **region** {US, UK, JP, CH} to total assets
 - (3) ext. liabilities in a certain **currency** {usd, gbp, yen, chf} to total assets
 - (4) ext. liabilities to banks in certain **currency** {usd, gbp, yen, chf} to total assets
- **Control variables** ($X_{b,t-1}$)
 - capital ratio
 - total assets (ln)
 - net intragroup funding ratio
 - core deposits ratio
 - liquid assets ratio

Little evidence for significant inward transmission found

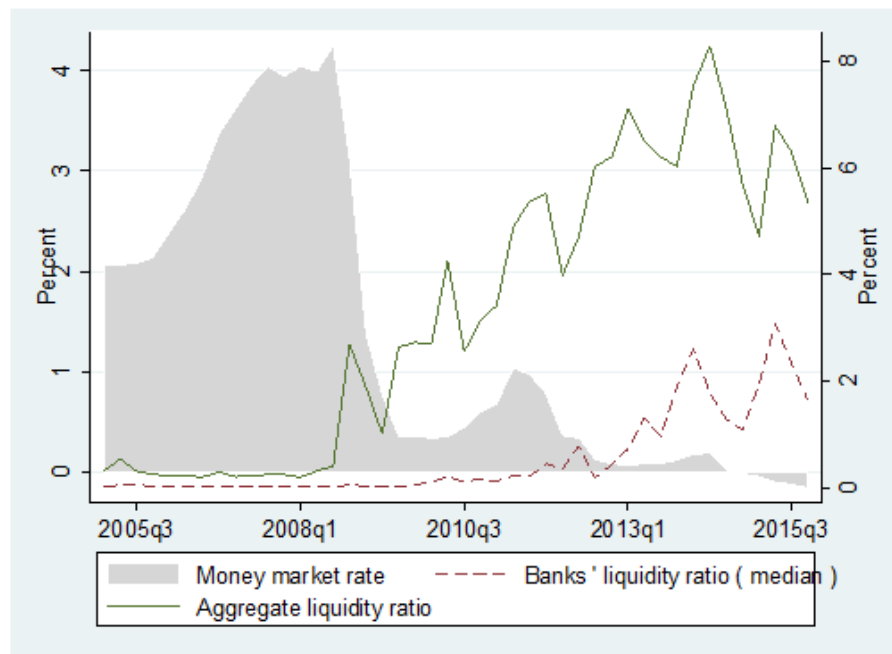
Transmission channel:	AT				DE			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Ext. liabilities	Ext. liabilities to banks	Ext. liabilities	Ext. liabilities to banks	Ext. liabilities	Ext. liabilities to banks	Ext. liabilities	Ext. liabilities to banks
Dimension:	region		currency		region		currency	
US: $\Sigma\alpha_{1,k}$	0.185 [0.664]	-0.264 [0.847]	0.039 [0.537]	0.021 [0.882]	0.284 [0.837]	1.101 [0.322]	-0.585* [0.579]	-1.03** [0.542]
UK: $\Sigma\alpha_{1,k}$	-0.031 [0.952]	0.698 [0.134]	-1.29 [0.140]	-2.09 [0.357]	-0.051* [0.097]	-0.004 [0.908]	-1.52 [0.210]	-0.03 [0.986]
JP: $\Sigma\alpha_{1,k}$	7.136 [0.770]	21.74 [0.185]	7.325 [0.183]	5.023 [0.474]	6.602*** [0.000]	4.805 [0.331]	34.34* [0.070]	55.32** [0.029]
CH: $\Sigma\alpha_{1,k}$	0.028 [0.869]	-0.199 [0.561]	-0.09 [0.136]	-0.139 [0.137]	.6682*** [0.000]	.5515*** [0.000]	7.914*** [0.000]	8.372*** [0.004]

- no evidence for inward spillovers in AT
- in DE
 - for US currency seems to be more relevant, while
 - for UK one regional channel is significant
- estimates for CH and JP remarkable

Unconventional monetary policy needs to be accounted for



AT



DE

Extension of the baseline estimation by interaction with liquidity ratio

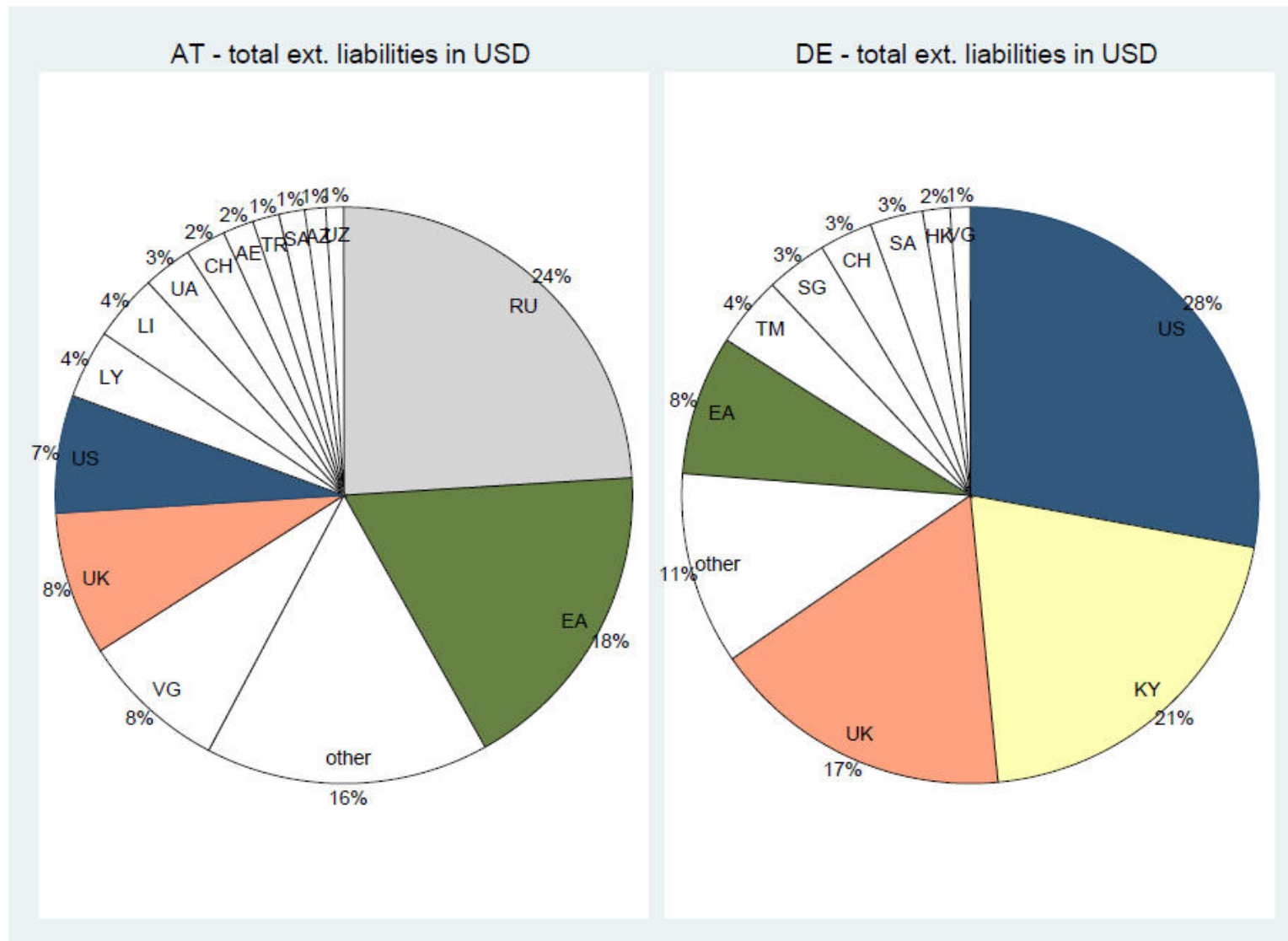
$$\Delta Y_{b,t} = \alpha_0 + \sum_c \left(\sum_{k=0}^K \left(\alpha_{1,k}^c \cdot \Delta MP_{t-k}^c \cdot trans_{b,t-K-1}^c + \alpha_{2,k}^c \cdot \Delta MP_{t-k}^c \cdot trans_{b,t-K-1}^c \cdot LR_{b,t-k} + \alpha_{3,k}^c \cdot trans_{b,t-K-1}^c \cdot LR_{b,t-k} \right) + \alpha_{4,k}^c \cdot trans_{b,t-K-1}^c \right) + \alpha_3 X_{b,t-1} + f_b + f_t + \varepsilon_{b,t}$$

Extension of interaction by:

$LR_{b,t-k}$ - liquidity ratio [i.e. (cash + central bank deposits)/total assets] of bank b to account for the **bank specific dependence on short term funding** (and hence heterogeneity in the importance of the bank lending channel).

→ of our special interest are α_2 and $(\alpha_1 + \alpha_2)$

Only a relative small share of funding in USD roots in the US



Baseline outward transmission and extension by LR

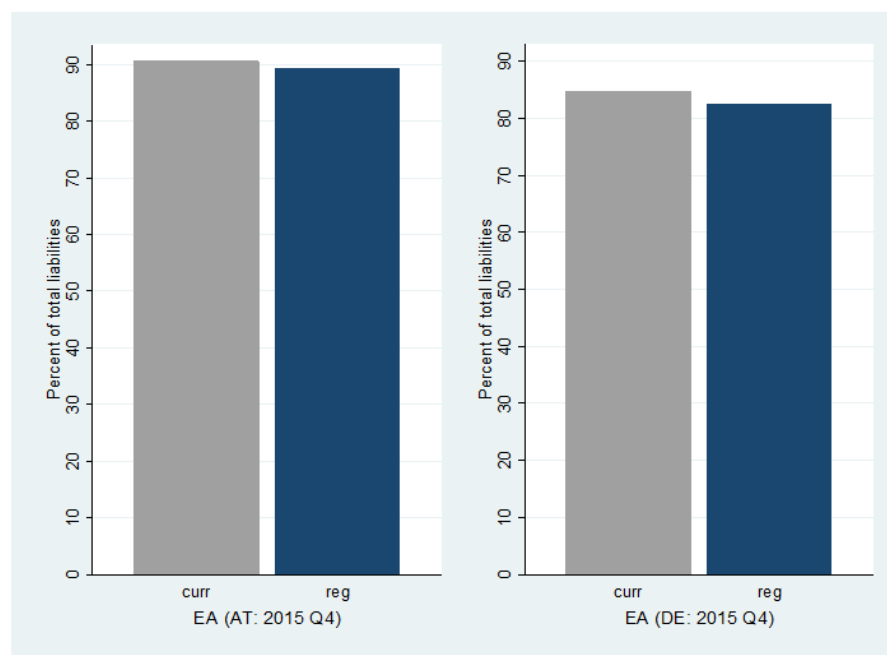
$$\Delta Y_{b,j,t} = \alpha_0 + \sum_{k=0}^K (\alpha_{1,k} \cdot \Delta MP_{t-k}^{EA} \cdot trans_{b,j,t-K-1}^c + \alpha_{2,k} \cdot \Delta MP_{t-k}^{EA} \cdot trans_{b,j,t-K-1}^c \cdot LR_{b,t-k} + \alpha_{3,k} \cdot trans_{b,j,t-K-1}^c \cdot LR_{b,t-k} + \alpha_{4,k} \cdot trans_{b,t-K-1}^c) + \alpha_5 X_{b,t-1} + f_b + f_{j,t} + \varepsilon_{b,j,t}$$

$\Delta Y_{b,j,t}$ - change in the log cross-border lending of bank b to recipient country j at time t

ΔMP_{t-k}^{EA} - change in euro area monetary policy

f_b and $f_{j,t}$ - bank and country-time fixed effects

$\varepsilon_{b,j,t}$ - standard errors are clustered at the bank-time level



Evidence for outward spillovers of EA monetary policy in baseline estimation

		AT				DE			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Transmission channel:	Liabilities to euro area	Liabilities to euro area banks	Liabilities in EUR	Liabilities to banks in EUR	Liabilities to euro area	Liabilities to euro area banks	Liabilities in EUR	Liabilities to banks in EUR	
	Dimension: by region		by currency		by region		by currency		
$\Sigma\alpha_{1,k}$	-0.191*	0.1325	-0.103	0.097	0.035	-0.235	-0.057	-0.221**	
	[0.080]	[0.487]	[0.136]	[0.348]	[0.694]	[0.145]	[0.623]	[0.005]	

- results indicate outward spillovers of EA monetary policy for AT and for DE, albeit through different channels
- does bank specific liquidity endowment impact the outward transmission?

Liquidity endowment seems to mitigate outward transmission of EA MP from DE

Transmission channel:	AT				DE			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Liabilities to euro area	Liabilities to euro area banks	Liabilities in EUR	Liabilities to banks in EUR	Liabilities to euro area	Liabilities to euro area banks	Liabilities in EUR	Liabilities to banks in EUR
Dimension:	by region		by currency		by region		by currency	
$\Sigma\alpha_{2,k}$	0.007 [0.961]	0.125 [0.179]	0.006 [0.944]	0.056 [0.234]	0.106** [0.048]	0.277* [0.052]	0.104* [0.097]	0.131*** [0.000]
$\Sigma\alpha_{1,k} + \Sigma\alpha_{2,k}$	-0.054 [0.725]	-0.17 [0.544]	-0.026 [0.747]	-0.085 [0.539]	-0.01 [0.916]	-0.041** [0.046]	-0.119 [0.321]	-0.164* [0.084]

- no outward spillovers through AT banking system through cross-border lending
- for DE banking system we find that
 - banks with more liquid assets extend more stable credit abroad in case of a EA monetary tightening (pos. and sig. α_2)
 - overall a EA monetary tightening is associated with curbed cross-border lending growth for those banks being more dependent on funding from banks (in EA as well as in EUR) (neg. and sig. $\alpha_1 + \alpha_2$ for liabilities to banks in EA and in Euro)

Robustness checks

- use MP policy rate instead of money market rate
- exclude EA from inward regressions
- exclude JP/CH resp. yen/chf
- ZLB dummy instead of LR
- extension of sample period (DE only)
- focus on euro-lending in outward specification
- ...

Summary of results

- limited evidence for **inward transmission** of foreign monetary policies as
 - lending in **AT** seems unaffected from major foreign monetary policies
 - for **DE** the currency channel appears to be a more relevant for US
- stronger evidence for **outward transmission** of EA monetary policy
 - the more a bank is funded in EA/Euro, the more its cross-border lending is impacted by EA monetary policy
 - mitigated transmission by less funding constrained banks (DE only)