

The Interbank Market Puzzle

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Xian Gu

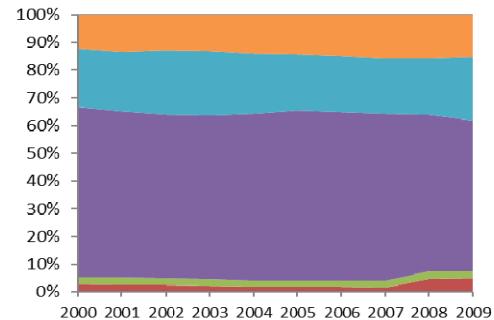
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IESEG School of Management

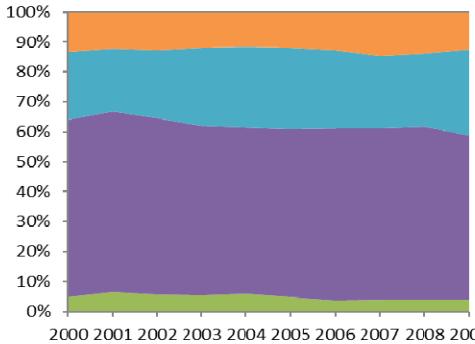
Bank of Finland and CEPR Conference “Money in the Digital Age”
Helsinki, 12-13 June 2018

Structure of bank assets



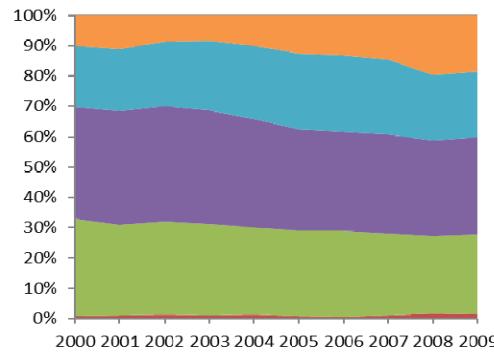
US

- Other assets
- Securities
- Loans
- Interbank loans
- Cash and balance with Central bank



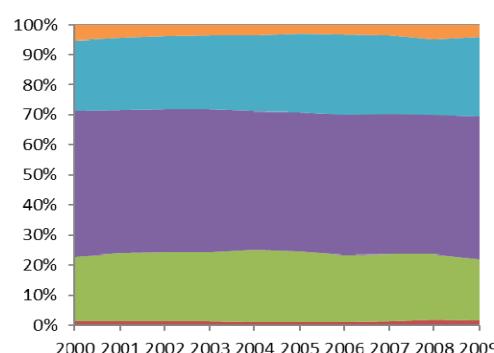
Japan

- Other assets
- Securities
- Loans
- Interbank loans
- Cash and balance with Central bank



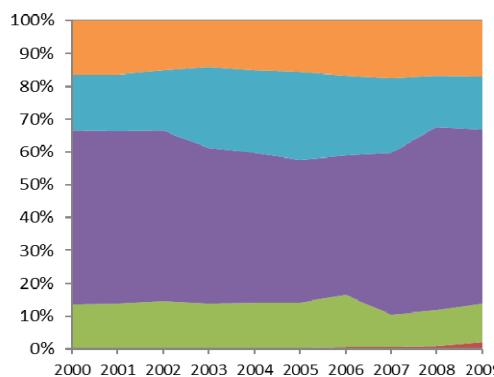
France

- Other assets
- Securities
- Loans
- Interbank loans
- Cash and balance with Central bank



Germany

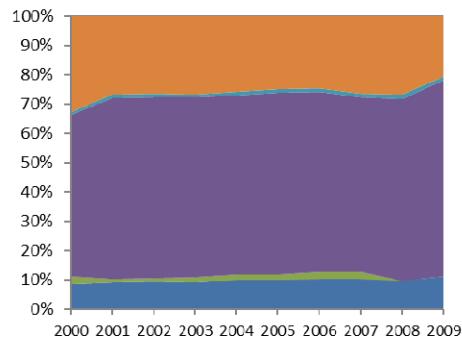
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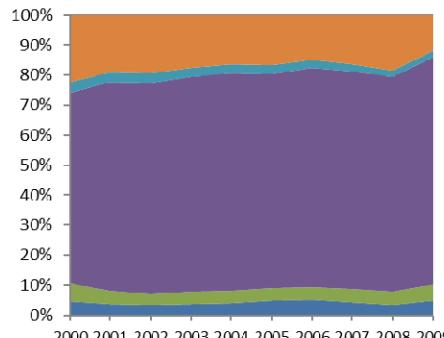
UK

- Other assets
- Securities
- Loans
- Interbank loans
- Cash and balance with Central bank

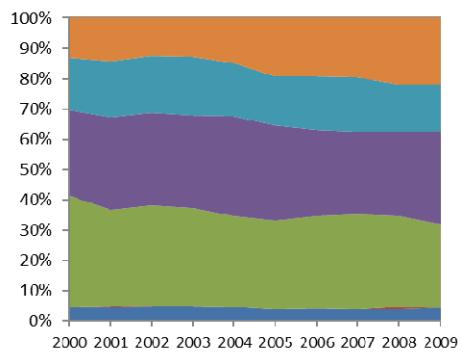
Structure of bank liabilities


US

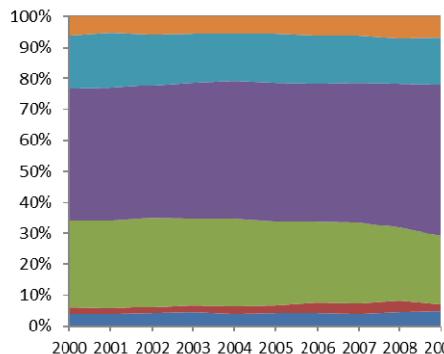
- Other liabilities
- Bonds
- Customer deposits
- Interbank deposits
- Borrowing from Central bank
- Capital and reserves


Japan

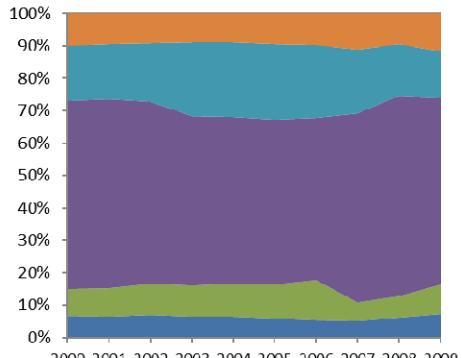
- Other liabilities
- Bonds
- Deposits
- Negotiable Certificates of Deposits
- Borrowing from Central bank
- Capital and reserves


France

- Other liabilities
- Bonds
- Customer deposits
- Interbank deposits
- Borrowing from Central bank
- Capital and reserves


Germany

- Other liabilities
- Bonds
- Customer deposits
- Interbank deposits
- Borrowing from Central bank
- Capital and reserves


UK

- Other liabilities
- Bonds
- Customer deposits
- Interbank deposits
- Borrowing from Central bank
- Capital and reserves

Motivation

- Interbank markets allow
 - efficient liquidity transfer between surplus and needy banks (risk-sharing) (Bhattacharya and Gale, 1987; Acharya et al., 2008)
 - central bank's intervention to guide policy interest rates (Furfine, 2001)
- Recent studies suggest that efficient risk sharing through interbank market may not occur during crises
 - Moral hazard and market frictions in this market
 - During the crisis of 2007-08, the interbank market froze up due to rising counterparty credit risk and precautionary liquidity hoarding (Afonso et al., 2011)

The interbank market puzzle

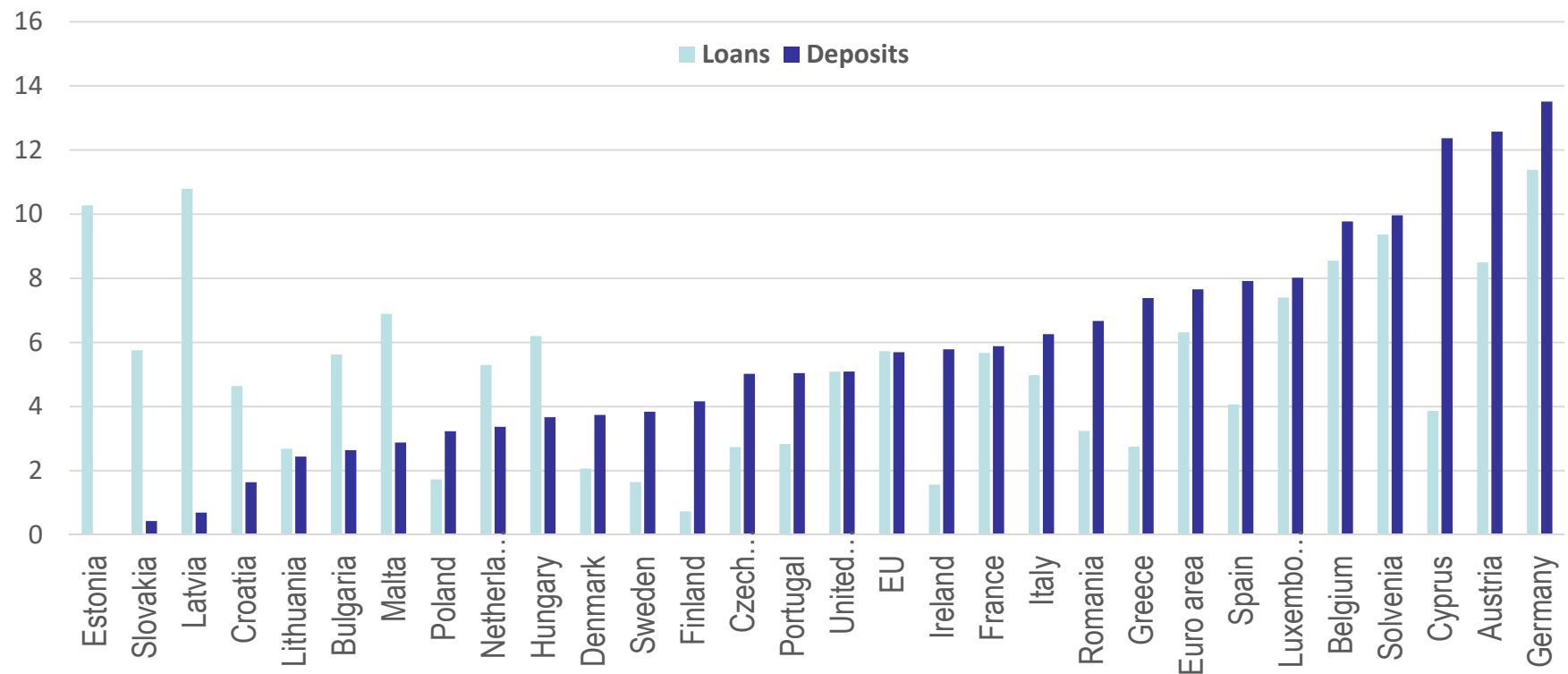
- The average ratio of interbank activities to total bank position has been quite stable over time from a long-run perspective (BIS, 1983)
 - There could be great variations between banks in their use of the interbank market
 - E.g. for the US, the average ratio of loans to depository institutions to total assets of insured commercial banks from 1934 to 2015 is 1.81%; while for Germany, the average ratio of interbank loans from 1950 to 2015 is 20.61%.
- The data raises several important questions:
 - Why is there such difference in the size of interbank market?
 - What determines the interbank participation of banks?
 - Is risk sharing better in those countries with larger interbank market size?

Comparative statistics: country-level

	Germany		France		UK		Japan		US	
	Interbank deposits	Interbank loans								
2000	29.17%	25.52%	36.09%	32.00%	8.02%	13.22%	3.00%	3.94%	6.88%	4.43%
2001	28.94%	26.42%	34.84%	32.27%	8.52%	13.74%	2.56%	3.75%	7.05%	4.87%
2002	28.87%	27.80%	35.49%	32.62%	9.73%	14.38%	2.38%	5.21%	6.71%	5.01%
2003	28.29%	27.89%	34.08%	30.55%	9.54%	13.74%	1.97%	4.48%	5.91%	4.21%
2004	28.31%	28.48%	34.75%	30.70%	10.30%	13.94%	1.91%	4.25%	5.48%	4.13%
2005	28.45%	29.29%	34.85%	30.50%	10.44%	13.95%	1.81%	4.62%	4.66%	3.46%
2006	28.48%	29.94%	34.83%	29.37%	12.44%	16.06%	1.76%	3.86%	4.60%	3.81%
2007	29.21%	31.57%	36.01%	30.38%	5.68%	10.12%	2.78%	2.68%	4.84%	4.25%
2008	28.96%	32.14%	35.49%	29.53%	6.50%	10.97%	2.57%	3.04%	3.37%	2.63%
2009	26.56%	29.65%	33.32%	28.72%	9.05%	11.92%	3.97%	2.98%	2.46%	1.86%
2010	23.44%	26.12%	31.28%	28.18%	7.93%	8.04%	3.31%	2.96%	2.15%	1.57%
2011	21.83%	26.59%	32.07%	30.97%	8.87%	8.93%	4.90%	4.34%	1.17%	0.93%
2012	21.84%	26.46%	31.70%	30.45%	9.67%	9.76%	4.43%	3.76%	1.29%	0.98%
2013	21.64%	26.84%	30.84%	30.31%	11.27%	11.03%	3.38%	4.81%	1.06%	0.78%
2014	21.76%	26.21%	30.62%	30.03%	8.08%	7.86%	3.76%	10.45%	0.83%	0.55%
Average 2000-14	26.38%	28.06%	33.75%	30.44%	9.07%	11.84%	2.97%	4.34%	3.90%	2.90%

EU Interbank market

The figure shows the interbank loans and deposits as % of total assets of all domestic banking groups and stand-alone banks in 2016

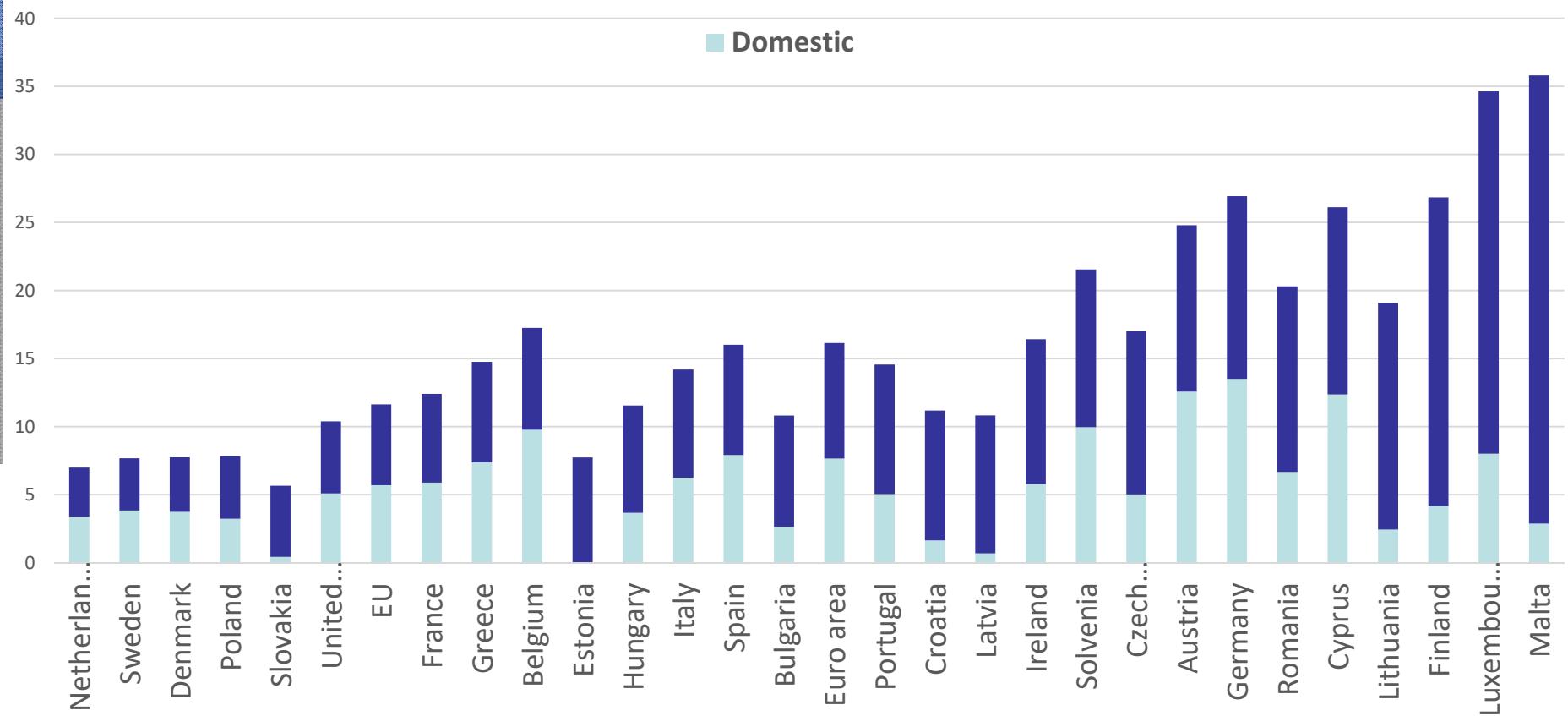


Bank-level evidence

- Our sample
 - 11,412 domestic banks over 96 countries (1995-2015)
 - Exclude the banks operated in the form of subsidiaries/branches
 - Exclude the countries with no more than 5 banks in the dataset
- Data sources
 - Bank-level data: Bankscope
 - Regulation: Worldwide Governance Indicator (WGI), Kaufmann et al. (1999, 2010, 2017)
 - Legal origins: Djankov et al.(2007)
 - Systemic banking crises: Laeven and Valencia (2013)

Interbank deposits in domestic and foreign banks

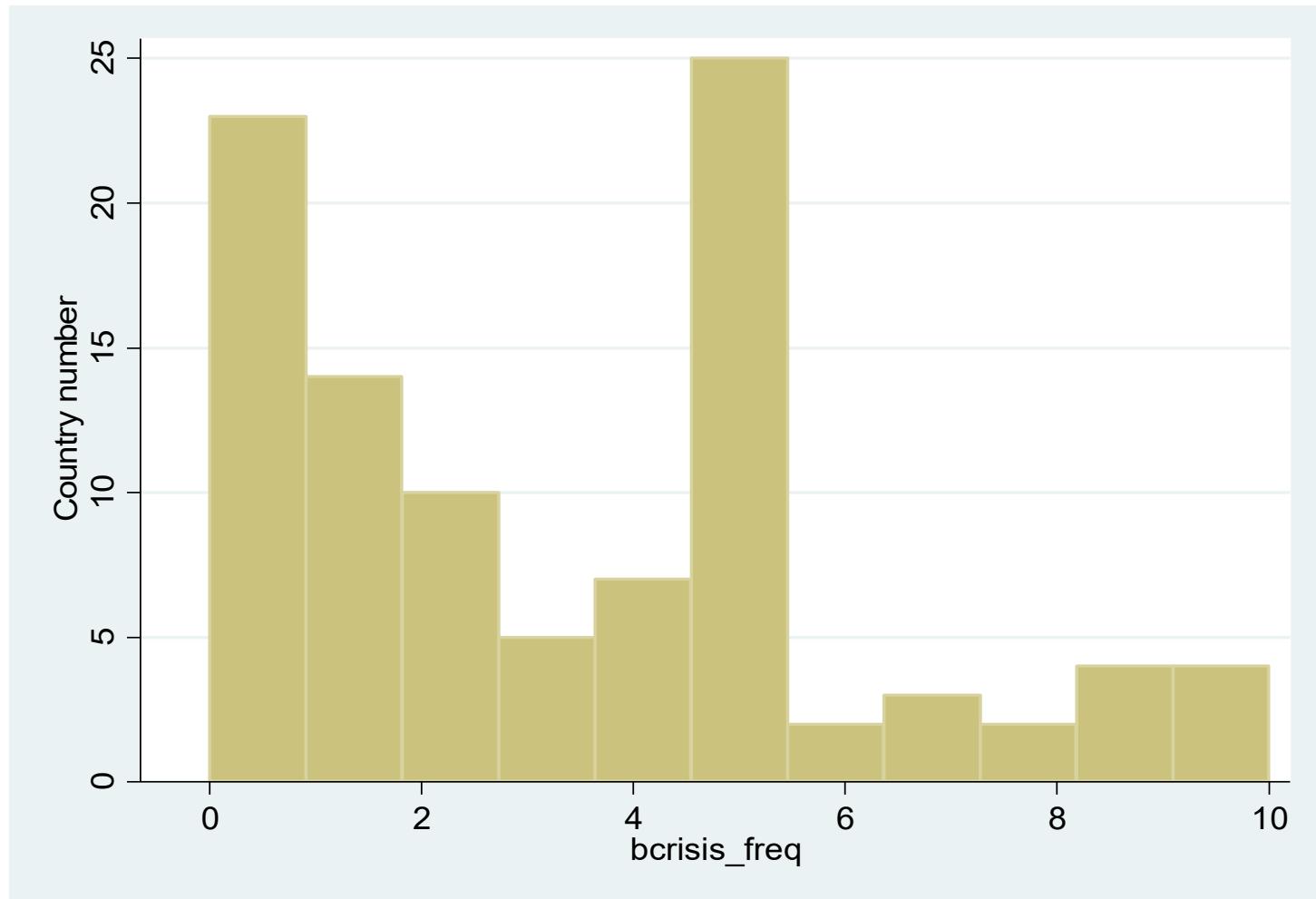
The figure shows the interbank deposits as % of total assets
of all banking groups in 2016



Variable definition

Variable	Definitions	Source
<i>Measures of trust in the banking system</i>		
Bank z-score	Ratio of return on assets plus capital-asset-ratio to the standard deviation of return on assets	BankScope
Crisis length.	The number of banking crises occurred in the country from 1970-2015.	Laeven and Valencia (2012) and own computation
Bank failure	Logarithm of the sum of bank failures in the country in which the bank is licensed	BankScope
<i>Bank level variables</i>		
Interbank borrowing	Borrowing and deposits from banks divided by total assets	
LtD	Bank's gross nonfinancial loans divided by nonfinancial deposits	
Securities	Securities to total assets	BankScope
Equity	Equity to total assets	
ROA	Return on assets	
Size	Bank's total assets divided to gross domestic product of the country in which the bank is licensed	

The length of banking crisis



Variable definition

Variable	Definitions	Source
<i>Country level variables</i>		
Common law	Equals to 1 if the legal origin of the country is common law.	Djankov et al. (2007)
Rule of law	The index of rule of law	
Reg. quality	The index of regulation quality	Worldwide
Gov. effect	The index of government effectiveness	Governance Indicator
Accountability	The index of accountability	Database (2016)
Pol. stability	The index of political stability	
Private credit	Private credit by deposit money banks divided by GDP	
Market cap.	Stock market capitalization divided by GDP	World Bank, Global
Concentration	Assets of three largest commercial banks as a share of total commercial banking assets.	Finance Database (2016)
Central Bank	Central bank total assets divided by GDP	

Summary statistics

Panel A: Summary statistics: Bank-level full sample

	Obs	Mean	Std. Dev.	Min	Max
Interbank_borrowing	74,578	0.0775	0.1107	0.0000	1.0000
LtD	74,578	0.9271	0.5621	0.0657	5.4421
Securities	74,578	0.2135	0.1494	0.0000	0.9903
Equity	74,578	0.0947	0.0534	0.0147	0.3309
ROA	74,578	0.0054	0.0103	-0.0606	0.0727
Size	74,578	0.0026	0.0176	0.0000	0.8561
Crisis length	74,572	4.8989	1.4827	0.0000	10.0000
Bank Z-score	74,195	2.9905	2.7138	-0.3123	11.4330
Private credit	73,535	0.7884	0.3481	0.0115	2.6246
Market Cap.	72,803	0.7471	0.4832	0.0001	8.5733
Central Bank	73,556	0.0643	0.0737	0.0000	1.1358
Concentration	69,682	0.5515	0.2084	0.2228	1.0000

Summary statistics

Panel B: Comparison of bank characteristics: longer vs shorter periods of banking crisis country

	Long	Obs.	Short	Obs.	Diff
Interbank_borrowing	0.020 (0.000)	33,966	0.123 (0.001)	33,966	0.103*** (0.001)
LtD	0.862 (0.003)	33,966	0.993 (0.003)	33,966	0.131*** (0.004)
Securities_ratio	0.216 (0.000)	33,966	0.214 (0.001)	33,966	-0.002 (0.001)
Equity_ratio	0.114 (0.000)	33,966	0.083 (0.000)	33,966	-0.031*** (0.000)
ROA	0.006 (0.000)	33,966	0.004 (0.000)	33,966	-0.002* (0.000)
Banksize	0.001 (0.000)	33,966	0.004 (0.000)	33,966	0.003*** (0.000)

Determinants of interbank borrowing

- Banks with higher liquidity mismatch tend to borrow more from interbank market.
- Larger banks are more likely to be borrowers in the interbank market, consistent with Cocco et al. (2009)

Dep. Var	Interbank borrowing									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Bank characteristics</i>										
LtD	0.0715*** (0.00179)	0.0695*** (0.00178)	0.0716*** (0.00180)	0.0690*** (0.00176)	0.0683*** (0.00178)	0.0760*** (0.00196)	0.0728*** (0.00195)	0.0755*** (0.00195)	0.0733*** (0.00195)	0.0710*** (0.00193)
Securities	0.0919*** (0.00339)	0.0917*** (0.00341)	0.0922*** (0.00339)	0.0938*** (0.00340)	0.0965*** (0.00341)	0.0872*** (0.00362)	0.0872*** (0.00363)	0.0865*** (0.00363)	0.0884*** (0.00361)	0.0896*** (0.00364)
Equity	-0.257*** (0.0100)	-0.274*** (0.0100)	-0.249*** (0.0101)	-0.282*** (0.0100)	-0.292*** (0.0100)	-0.249*** (0.0104)	-0.276*** (0.0104)	-0.236*** (0.0104)	-0.282*** (0.0105)	-0.288*** (0.0103)
ROA	0.0240 (0.0401)	0.00443 (0.0401)	0.0114 (0.0401)	-0.00719 (0.0396)	-0.0617 (0.0395)	0.0157 (0.0397)	-0.00317 (0.0396)	0.00904 (0.0399)	-0.0107 (0.0393)	-0.0356 (0.0394)
Size	0.447*** (0.0575)	0.396*** (0.0549)	0.467*** (0.0586)	0.373*** (0.0532)	0.335*** (0.0505)	0.585*** (0.110)	0.457*** (0.0953)	0.613*** (0.113)	0.453*** (0.0950)	0.433*** (0.0939)

Determinants of interbank borrowing

- The history of banking crisis/number of bank failures tend to be negative associated with interbank borrowing.
- One more year experience of banking crisis would reduce interbank borrowing by **8.7%** ($0.00677/0.0775$).
- Legal and regulatory institutions matter for the interbank market size

Dep. Var	Interbank borrowing									
Crisis length	-0.00677*** (0.000351)	-0.00656*** (0.000351)	-0.00683*** (0.000352)	-0.00677*** (0.000356)	-0.00520*** (0.000338)					
Bank failure						-0.0101*** (0.000639)	-0.0101*** (0.000662)	-0.00921*** (0.000627)	0.00959*** (0.000657)	0.00959*** (0.000674)
Common law	0.0224*** (0.00254)	0.0329*** (0.00247)	0.0246*** (0.00249)	0.0394*** (0.00241)	0.0476*** (0.00239)	0.0507*** (0.00348)	0.0673*** (0.00348)	0.0525*** (0.00342)	0.0723*** (0.00339)	0.0872*** (0.00344)
Rule of law	0.0240*** (0.000954)					0.0330*** (0.00131)				
Reg. quality		0.0227*** (0.00118)					0.0293*** (0.00174)			
Gov. effect			0.0292*** (0.00108)					0.0389*** (0.00137)		
Accountability				0.0168*** (0.000998)					0.0286*** (0.00184)	
Pol. stability					0.0107*** (0.00100)					0.0166*** (0.00142)
Other controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	67119	67119	67119	67119	67119	63867	63867	63867	63867	63867
Adj. R²	0.431	0.426	0.433	0.424	0.421	0.463	0.455	0.466	0.454	0.451

Interbank borrowing and bankruptcy risk

- Banks that have higher bankruptcy risk can borrow less from interbank market.
- US banks account for 40.5% (4,621/11,412) in our bank-level sample- ex cl. US banks does not change our main results, that trust is an important determinant of interbank borrowing.

Dep. Var	Interbank borrowing									
	Full sample					Sample excl. US banks				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bank Characteristics										
LtD	0.0710*** (0.00183)	0.0691*** (0.00181)	0.0712*** (0.00183)	0.0685*** (0.00180)	0.0681*** (0.00181)	0.0714*** (0.00189)	0.0694*** (0.00188)	0.0715*** (0.00190)	0.0691*** (0.00188)	0.0688*** (0.00188)
Securities	0.0970*** (0.00352)	0.0971*** (0.00354)	0.0971*** (0.00352)	0.0992*** (0.00353)	0.100*** (0.00353)	0.0962*** (0.00594)	0.0977*** (0.00601)	0.0966*** (0.00594)	0.104*** (0.00594)	0.106*** (0.00591)
Equity	-0.296*** (0.00992)	-0.311*** (0.00993)	-0.288*** (0.00996)	-0.319*** (0.00993)	-0.320*** (0.00993)	-0.361*** (0.0140)	-0.384*** (0.0140)	-0.348*** (0.0141)	-0.398*** (0.0140)	-0.398*** (0.0140)
ROA	0.114*** (0.0417)	0.0865** (0.0417)	0.103** (0.0416)	0.0623 (0.0412)	0.0328 (0.0412)	0.0930 (0.0827)	0.0503 (0.0828)	0.0588 (0.0824)	0.0160 (0.0825)	-0.0386 (0.0819)
Size	0.465*** (0.0562)	0.410*** (0.0531)	0.484*** (0.0573)	0.381*** (0.0508)	0.362*** (0.0502)	0.441*** (0.0553)	0.392*** (0.0524)	0.461*** (0.0566)	0.367*** (0.0500)	0.349*** (0.0494)
Bank Zscore	-0.00117*** (0.000147)	-0.00114*** (0.000147)	-0.00115*** (0.000147)	-0.00111*** (0.000147)	-0.00109*** (0.000147)	-0.00181*** (0.000199)	-0.00182*** (0.000199)	-0.00175*** (0.000200)	-0.00183*** (0.000199)	-0.00182*** (0.000199)

Interbank borrowing and bankruptcy risk

- The economic impact of legal and regulatory institutions is even stronger when we excl. US banks in our sample

Dep. Var	Interbank borrowing									
	Full sample					Sample excl. US banks				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Country characteristics										
Com law	0.0306*** (0.00251)	0.0406*** (0.00246)	0.0323*** (0.00247)	0.0469*** (0.00242)	0.0514*** (0.00241)	0.0606*** (0.00411)	0.0618*** (0.00423)	0.0658*** (0.00414)	0.0553*** (0.00413)	0.0603*** (0.00439)
Rule of law	0.0208*** (0.000921)					0.0251*** (0.00110)				
Reg. quality		0.0183*** (0.00113)					0.0216*** (0.00143)			
Gov. effect			0.0257*** (0.00105)					0.0311*** (0.00123)		
Account.				0.0116*** (0.000950)					0.0116*** (0.00105)	
Pol. stability					0.00976** * (0.000996)					0.00989** * (0.00116)
Other controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	66854	66854	66854	66854	66854	42543	42543	42543	42543	42543
Adj. R ²	0.426	0.422	0.428	0.420	0.419	0.280	0.274	0.284	0.271	0.269

Determinants of interbank market size

- In order to measure the interbank market size, we use total interbank activities (borrowing plus lending), over GDP as dep var.
- Banks located in countries with shorter periods of crises tend to have more interbank activities.

Dep var	T_interbank activities/GDP				
	Full sample				
	(1)	(2)	(3)	(4)	(5)
Crisis length	-0.0000292*** (0.0000107)	-0.0000290*** (0.0000113)	-0.0000287*** (0.0000108)	-0.0000286** (0.0000119)	-0.0000168* (0.00000926)
Rule_law	0.000226*** (0.0000639)				
Regulation_quality		0.000268*** (0.0000881)			
Gov_effect			0.000240*** (0.0000738)		
Accountability				0.000169** (0.0000670)	
Political_stability					0.000360*** (0.0000822)
Cons.	YES	YES	YES	YES	YES
Bank variables	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES
Country FE	NO	NO	NO	NO	NO
N	66778	66778	66778	66778	66778
adj. R-sq	0.669	0.669	0.669	0.668	0.670

Determinants of interbank market size

- Sample excl. US banks

Dep var	T_interbank activities/GDP				
	Sample excl. US banks				
	(1)	(2)	(3)	(4)	(5)
Crisis length	-0.0000332** (0.0000133)	-0.0000329** (0.0000134)	-0.0000331** (0.0000133)	-0.0000368** (0.0000146)	-0.0000170* (0.0000089)
Rule_law	0.000198*** (0.0000756)				
Regulation_quality		0.000232** (0.000108)			
Gov_effect			0.000206** (0.0000882)		
Accountability				0.000134* (0.0000683)	
Political_stability					0.000357*** (0.000101)
Cons.	YES	YES	YES	YES	YES
Bank variables	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES
Country FE	NO	NO	NO	NO	NO
N	66778	66778	66778	66778	66778
adj. R-sq	0.669	0.669	0.669	0.668	0.670

Matched sample

- Endogeneity issue: our results might be affected by omitted variables (e.g. financial structure characteristics)
- Treated=1 if the bank is allocated in a country with a history of banking crisis longer than 5 years in total.
- The control sample is defined by a one-to-one matching based on the financial structure (Private credit & market cap.)
- Banks can reduce interbank borrowing by **up to 35%** ($0.0272/0.0775$) if they are located in a treated country (having longer periods of crisis in the past) but has similar financial structure.

Dep. var	Interbank borrowing				
	(1)	(2)	(3)	(4)	(5)
Treated	-0.0272*** (0.00148)	-0.0265*** (0.00147)	-0.0292*** (0.00151)	-0.0268*** (0.00147)	-0.0275*** (0.00148)
Common law	0.0312*** (0.00390)	0.0280*** (0.00406)	0.0326*** (0.00391)	0.0246*** (0.00394)	0.0226*** (0.00428)
Rule of law	0.0161*** (0.000953)				
Reg. quality		0.0104*** (0.00127)			
Gov. effect			0.0175*** (0.00105)		
Accountability				0.00666*** (0.000970)	
Pol. stability					0.00171 (0.00107)
Other controls	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES
N	44296	44296	44296	44296	44296
Adj. R²	0.247	0.242	0.248	0.241	0.240

The role of banking crisis

- During crises, efficient liquidity transfer may not occur between surplus and needy banks.

Dep. Var	Interbank borrowing				
	(1)	(2)	(3)	(4)	(5)
Crisis length	-0.00315*** (0.000380)	-0.00283*** (0.000380)	-0.00337*** (0.000385)	-0.00312*** (0.000384)	-0.00198*** (0.000398)
Crisis	-0.0595*** (0.00364)	-0.0781*** (0.00432)	-0.0531*** (0.00371)	-0.0670*** (0.00379)	-0.0458*** (0.00312)
Rule of law	0.0196*** (0.00129)				
Rule of law*Crisis	0.0384*** (0.00212)				
Reg. quality		0.0119*** (0.00173)			
Reg. quality*Crisis		0.0541*** (0.00310)			
Gov. effect			0.0199*** (0.00140)		
Gov. effect*Crisis			0.0367*** (0.00226)		
Accountability				0.00599*** (0.00130)	
Accountability*Crisis				0.0467*** (0.00271)	
Pol. stability					0.000151 (0.00139)
Pol. stability*Crisis					0.0397*** (0.00267)
Other controls	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES
N	35250	35250	35250	35250	35250
Adi. R ²	0.281	0.272	0.275	0.269	0.262

The mitigating role of institutions

- In countries with better legal enforcement, regulatory quality or stronger govt effectiveness and political stability, the marginal effect of the occurred banking crisis would be mitigated.

Dep. Var	Interbank borrowing				
	(1)	(2)	(3)	(4)	(5)
Crisis length	-0.00315*** (0.000380)	-0.00283*** (0.000380)	-0.00337*** (0.000385)	-0.00312*** (0.000384)	-0.00198*** (0.000398)
Crisis	-0.0595*** (0.00364)	-0.0781*** (0.00432)	-0.0531*** (0.00371)	-0.0670*** (0.00379)	-0.0458*** (0.00312)
Rule of law	0.0196*** (0.00129)				
Rule of law*Crisis	0.0384*** (0.00212)				
Reg. quality		0.0119*** (0.00173)			
Reg. quality*Crisis		0.0541*** (0.00310)			
Gov. effect			0.0199*** (0.00140)		
Gov. effect*Crisis			0.0367*** (0.00226)		
Accountability				0.00599*** (0.00130)	
Accountability*Crisis				0.0467*** (0.00271)	
Pol. stability					0.000151 (0.00139)
Pol. stability*Crisis					0.0397*** (0.00267)
Other controls	YES	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES	YES
N	35250	35250	35250	35250	35250
Adi. R²	0.281	0.272	0.275	0.269	0.262

The role of institutional improvement

- Usually, banks that have higher liquidity mismatch, lower equity ratio are more likely to resort to interbank market for temporary liquidity; during crises, these banks get less financed.
- If legal enforcement is strengthened, such effect during crises would be mitigated.

Dep. Var	Interbank borrowing			
	Δ Rule law		Δ Reg quality	
	>0	\leq 0	>0	\leq 0
LtD	0.0976*** (0.0240)	0.0978*** (0.00260)	0.109*** (0.0240)	0.0981*** (0.00260)
LtD*Crisis	0.0705* (0.0406)	-0.0547*** (0.00287)	-0.0289 (0.0446)	-0.0550*** (0.00287)
Equity	0.162** (0.0638)	0.0933*** (0.00699)	0.212*** (0.0616)	0.0929*** (0.00698)
Equity*Crisis	-0.660*** (0.134)	-0.366*** (0.0190)	-0.268** (0.111)	-0.372*** (0.0191)
ROA	-0.174 (0.225)	0.0593** (0.0289)	0.296 (0.324)	0.0581** (0.0289)
ROA*Crisis	-0.787* (0.431)	-0.168 (0.105)	-0.145 (0.638)	-0.191* (0.103)
Crisis length	0.000537 (0.00262)	-0.00341*** (0.000386)	0.000506 (0.00301)	-0.00346*** (0.000384)
Other controls	YES	YES	YES	YES
Year Fe	YES	YES	YES	YES
N	283	34278	289	34272
Adj. R ²	0.292	0.318	0.293	0.318

Robustness:

Euro banks and large vs small banks

- Our results are not affected by the central bank policy (Using only Euro banks as a sample)
- Large banks' interbank borrowing tends to be more impacted by the trust (e.g. Cocco et al. (2009)-large banks tend to be net borrowers in the market)

Dep. Var	Interbank borrowing			
	Eurozone		Bank size	
	11 countries	19 countries	Q1	Q3
LtD	0.156*** (0.00264)	0.155*** (0.00267)	0.120*** (0.00345)	0.0320*** (0.00235)
Securities	0.174*** (0.00634)	0.166*** (0.00642)	0.156*** (0.00812)	0.0299*** (0.00438)
Equity	-0.398*** (0.0228)	-0.394*** (0.0229)	-0.375*** (0.0354)	-0.108*** (0.0123)
ROA	-0.473*** (0.145)	-0.527*** (0.146)	0.521*** (0.120)	0.00465 (0.0549)
Size	0.174 (0.129)	0.301** (0.147)	0.198*** (0.0505)	4.136*** (1.034)
Crisis length	-0.0183*** (0.000958)	-0.0173*** (0.000999)	-0.00905*** (0.000544)	-0.00580*** (0.000810)
Chi-sq				11.16***
(P-value)				(0.0008)
Year Fe	YES	YES	YES	YES
N	27855	27949	16221	17281
Adj. R ²	0.490	0.482	0.488	0.370

Robustness: IV

- Instrument: whether the country has introduced the deposit insurance scheme/ the power of insurance scheme
- Both variables from Barth, Caprio and Levine (2013)

	IV model			
	Crisis length	Interbank borrowing	Crisis length	Interbank borrowing
	(1)	(2)	(3)	(4)
Crisis length		-0.0450*** (0.00358)		-0.00172* (0.000956)
Explicit_DI	2.931*** (0.0797)			
DI_power			0.578*** (0.0196)	
LtD	-0.289*** (0.0244)	0.112*** (0.00221)	-0.447*** (0.0337)	0.0931*** (0.00281)
Securities	-0.685*** (0.0435)	0.133*** (0.00362)	-0.964*** (0.0767)	0.107*** (0.00556)
Equity	5.061*** (0.177)	-0.331*** (0.0103)	4.485*** (0.252)	-0.314*** (0.0132)
ROA	3.080*** (0.720)	0.0502 (0.0398)	6.929*** (0.950)	0.00594 (0.0502)
Size	2.710*** (0.764)	0.382*** (0.0559)	3.687*** (1.132)	0.702*** (0.0797)
Rule of law	0.104*** (0.0235)	0.0291*** (0.00111)	-0.183*** (0.0278)	0.0175*** (0.00140)
Other controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	64722	64722	30968	30968

To conclude

- **Trust** is crucial in determining the interbank market size.
 - Higher trust helps to obtain liquidity in the unsecured interbank market through mitigating info asymmetries
 - If a bank is located in a country with longer periods of banking crisis or more bank failures in the past, trust can be weaker and support less interbank activities.

- **Institutional factors** such as legal enforcement/regulation quality matter, and can further mitigate the impact of banking crises or failures.
 - Law and institutions may play as a substitute for market discipline in the interbank market.



Thank you!

