Transmission Of Bank Liquidity Shocks in Loan and Deposit Markets: The Role of Interbank Borrowing and Market Monitoring

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What we know about foreign bank?

- Stabilizing role in developing countries

  Demirgüc-Kunt and Detragiache (1997)

- Associated with credit growth and reduced likelihood of crises

  Clarke et al. (2003)

- Higher competition and better efficiency of the domestic banking sector

  Claessens et al. (2001)

- Unaffected during local crises

  Martinez Peria et al. (2002) and de Haas and van Lelyveld (2006 and 2010)

Home country effects and parent bank distress

Mixed evidence on home economic cycles and foreign bank lending

Adverse effects of home country problems

Peek and Rosengren (1997, 2000)

Mixed results for Asia and Latin America

Goldberg (2001)

Substitution effects

Martinez Peria et al. (2002) and De Haas and van Lelyveld (2010)

Financial distress of the parent

Strengh of the parent bank has a positive effect

De Haas and van Lelyveld (2010)

Foreign banks reduced lending during the crisis, as compared to domestic banks

Popov and Udell (2010)

What we do

Analyze international **transmission** of bank liquidity shocks from multinational bank-holding companies to their subsidiaries

Investigate the impact on subsidiary **lending**

Focus on interbank market dependence

Examine the existence of **market discipline** in host countries

- Does it explain the shortage of funding and the reduction in lending during the crisis?
- First to investigate the market discipline in an international transmission context .

What we find

Parent bank fragility **reduces** subsidiary **lending**.

- stronger for those subsidiaries ***dependent on the interbank market***

Foreign bank lending is determined by different factors in *emerging markets* and in *developed countries*

- "lending-channel" more relevant for developing economies

Depositors react to a deterioration of bank performance

- Market discipline less important during the crisis

- Liquidity needs determine the change in deposits in **developing** economies,

Especially for banks that rely on interbank borrowing.

Data and methodology

Data source: BankScope

Sample of multinational banks and their foreign subsidiaries from 1990 to 2008

We also exclude the offshore centers

- ✓ **51 largest banks from twenty developed countries and**
- ✓ **all of their subsidiaries from 99 countries**

Lending Channel

$$\Delta L_{it} = f(B_{it}, C \; o_{it}, P_{t} \; a_{i}, R \; a \; o_{t} \; a \; n_{i})$$

Dependent Variables

ΔLoans	Log (Total Loans)t - Log (Total Loans)t-1

Bank Characteristics

Total Assets	in million USD
Loan Loss	Loan Loss Provisions to Net Interest Revenues
Equity	Equity to Total Assets
ROE	Return on Equity
Liquidity	Liquid Assets to Total Assets
Interbank	Interbank Lending to Interbank Borrowing

Country Variables

GDP growth	Yearly change
Exchange rate	Exchange Rate from local currency to USD
Concentration	Assets of three largest banks as a share of assets of all commercial banks
Cost to Income	Total costs as a share of total income of all commercial banks

Results: Determinants of loan growth

				developing			developed		
	1	2	3	1	2	3	1	2	3
subsidiary characteristics									
Loan Loss	0.021	0.094	0.091	0.049	0.159	0.146	-0.083	-0.043	-0.039
	[0.061]	[0.097]	[0.118]	[0.055]	[0.114]	[0.141]	[0.072]	[0.085]	[0.081]
ROE	0.027	0.076	0.055	0.077	0.093	0.067	-0.028	-0.122	-0.278
	[0.099]	[0.077]	[0.083]	[0.079]	[0.073]	[0.075]	[0.208]	[0.535]	[0.624]
Equity	**-1.797****	**-2.431****	**-2.631****	-0.358	-0.794	-1.023	**-3.597*****	**-4.014*****	**-3.994*****
	[0.784]	[0.941]	[1.017]	[0.856]	[1.122]	[1.178]	[1.017]	[1.336]	[1.456]
Liquidity	0.163	-0.073	-0.045	0.297	0.008	0.092	0.118	0.009	-0.012
	[0.265]	[0.167]	[0.181]	[0.388]	[0.304]	[0.321]	[0.148]	[0.158]	[0.155]
Size	-0.002	-0.080	-0.123	**0.080***	0.013	-0.083	**-0.157***	**-0.269***	-0.241
	[0.041]	[0.077]	[0.091]	[0.047]	[0.088]	[0.113]	[0.094]	[0.158]	[0.173]
host country									
GDP growth	**2.329****	**2.507****	**3.123****	**1.821***	1.711	2.128	1.062	4.743	7.991
	[1.066]	[1.234]	[1.437]	[1.065]	[1.169]	[1.346]	[4.627]	[6.826]	[6.725]
Exchange rate	**0.088*****	0.047	0.152	**0.107*****	0.48	**0.690***	0.024	-0.013	0.336
	[0.021]	[0.301]	[0.342]	[0.028]	[0.346]	[0.369]	[0.232]	[0.413]	[0.421]
Concentration	0.122	0.676	0.828	0.227	**1.062***	**1.347***	0.050	-0.296	-0.247
	[0.300]	[0.486]	[0.540]	[0.386]	[0.623]	[0.690]	[0.417]	[0.687]	[0.853]
Cost to Income	0.107	0.151	0.159	0.1	0.239	0.226	-0.035	-0.120	-0.878
	[0.214]	[0.308]	[0.379]	[0.262]	[0.425]	[0.427]	[0.365]	[0.469]	[0.828]

Results: Loan Growth and parent bank's health

				developing			developed		
	1	2	3	1	2	3	1	2	3
parent characteristics									
Loan Loss		**-0.398****	**-0.634****		**-0.525****	**-0.630***		-0.156	**-0.564***
		[0.179]	[0.289]		[0.258]	[0.372]		[0.187]	[0.311]
ROE		-0.310	0.107		-0.597	-0.172		0.042	0.234
		[0.234]	[0.634]		[0.452]	[0.836]		[0.229]	[0.925]
Equity		0.436	0.532		0.383	0.506		0.799	-0.133
		[1.448]	[1.514]		[2.153]	[2.175]		[1.216]	[1.487]
Liquidity		0.555	0.426		0.519	-0.019		1.138	1.634
		[0.468]	[0.603]		[0.623]	[0.814]		[0.964]	[1.038]
home country									
GDP growth		-3.268	**-9.049****		-4.549	-7.134		-4.591	**-17.422****
		[2.485]	[4.188]		[3.478]	[5.033]		[4.076]	[7.713]
Crisis			**0.604***			0.335			**1.242***
			[0.361]			[0.358]			[0.640]
interactions									
*crisis*P_Loan Loss*			-0.428			-0.285			-1.031
			[0.590]			[0.668]			[0.857]
*crisis*P_ROE*			-0.614			0.236			-1.974
			[1.022]			[1.231]			[1.359]
*crisis*P_Equity*			-5.662			-4.434			**-9.955***
			[4.661]			[6.452]			[5.787]
*crisis*P_Liquidity*			-0.482			1.070			**-2.843****
			[1.465]			[1.937]			[1.357]
Observations	1674	978	881	1059	605	566	622	374	316
R-squared	0.015	0.025	0.034	184	111	105	0.044	0.062	0.083

Summary of the results on foreign bank lending

Parent fragility ↓ lending

In developing countries

– higher economic growth and a stronger currency in *host country* ↑ lending

Substitution effect in developed countries

– Subsidiaries of highly capitalized and liquid parents ↓ lending during the ***recent crisis***.
– Total effect of crisis negative.

Results: Role of interbank market

	Interbank<1			Interbank>1		
	2	3	4	2	3	4
parent characteristics						
Loan Loss	**-0.858****	-0.632	**-0.539***	-0.677	-0.704	-0.613
	[0.349]	[0.449]	[0.277]	[0.437]	[0.627]	[0.464]
ROE	-0.165	-0.567	-0.264	**-1.353***	0.800	0.245
	[0.636]	[1.034]	[0.732]	[0.783]	[1.442]	[0.780]
Equity	-7.066	-8.713	-3.138	0.849	0.080	0.711
	[4.825]	[6.603]	[6.281]	[2.310]	[2.439]	[2.130]
Liquidity	-1.117	-1.792		0.502	-0.193	
	[1.495]	[1.536]		[0.805]	[0.962]	
Interbank			-0.082			-0.017
			[0.101]			[0.088]
interactions						
*Crisis*P_Loan Loss*		-2.480	**-2.517****		-0.510	**1.941***
		[1.551]	[0.994]		[0.719]	[1.006]
*Crisis*P_ROE*		-0.758	**-2.568****		-2.793	-1.141
		[1.911]	[1.182]		[1.969]	[1.561]
*Crisis*P_Equity*		0.304	-7.046		0.895	-0.630
		[14.757]	[12.461]		[3.853]	[3.646]
*Crisis*P_Liquidity*		0.703			1.981	
		[4.175]			[1.674]	
*Crisis*P_Interbank*			0.540			0.337
			[0.965]			[0.338]

Market Discipline

Do subsidiary and parent bank characteristics explain the behaviour in deposit markets?

$$MarketDiscipline_{it} = f(Bank_{it-1}, Country_{it}, ParentBank_{it-1}, ParentCountry_{it})$$

Measure Market Discipline by:

- *ΔTime Deposits*
- *ΔBank Deposits*
- *Interest Rates* (Interest Rate Expenses to Interest-Bearing Deposits)

Results: Market discipline in *developing countries*

	ΔTime Deposits		ΔBank Deposits		Interest Rate	
subsidiary characteristics						
Loan Loss	-0.098	**-0.154***	0.342	0.331	**0.023****	**0.030*****
	[0.081]	[0.090]	[0.280]	[0.342]	[0.010]	[0.011]
ROE	-0.266	**-0.429****	**-0.292*****	**-0.299*****	-0.019	-0.021
	[0.172]	[0.165]	[0.090]	[0.085]	[0.018]	[0.021]
parent characteristics						
Loan Loss	-0.288	**-1.300***	0.295	0.387	**0.037***	**0.054***
	[0.411]	[0.725]	[0.585]	[0.542]	[0.021]	[0.031]
home country						
GDP growth	**13.669*****	**12.692****	**-13.376***	-8.797	-0.146	-0.402
	[3.969]	[5.270]	[7.621]	[7.949]	[0.534]	[0.537]
Crisis		**-1.143****		**1.878****		0.005
		[0.484]		[0.904]		[0.046]
interactions						
*Crisis*P_Loan Loss*		**2.009***		-1.674		0.128
		[1.111]		[1.121]		[0.084]
*Crisis*P_ROE*		**3.582****		3.084		-0.132
		[1.771]		[2.457]		[0.113]
*Crisis*P_Liquidity*		0.177		**-11.284*****		-0.066
		[1.351]		[3.847]		[0.160]

Market discipline

Liquidity needs

Results: Market discipline in *developed countries*

	ΔTime Deposits			ΔBank Deposits			Interest Rate		
	1	2	3	1	2	3	1	2	3
subsidiary characteristics									
Loan Loss	0.158	0.125	0.095	-0.034	-0.146	-0.152	**0.013*****	**0.015*****	**0.013*****
	[0.160]	[0.232]	[0.251]	[0.086]	[0.091]	[0.098]	[0.005]	[0.004]	[0.005]
ROE	**0.993***	0.16	-0.071	-0.565	-0.931	-1.201	0.039	**0.078***	0.055
	[0.579]	[0.560]	[0.607]	[0.565]	[0.565]	[0.806]	[0.039]	[0.039]	[0.040]
Equity	1.175	**3.689*****	**2.957***	-1.311	-0.468	-0.316	0.025	-0.078	-0.02
	[1.886]	[1.299]	[1.691]	[1.084]	[0.984]	[1.166]	[0.089]	[0.064]	[0.034]
Liquidity	0.173	**-1.341*****	**-1.100***	0.105	-0.598	-0.435	**-0.156*****	0.001	0.000
	[0.273]	[0.440]	[0.568]	[0.194]	[0.471]	[0.419]	[0.044]	[0.013]	[0.012]
Size	-0.054	0.041	0.007	0.033	0.062	0.221	-0.009	-0.012	-0.003
	[0.105]	[0.106]	[0.127]	[0.151]	[0.239]	[0.272]	[0.006]	[0.009]	[0.005]

Conclusions

Multinational banks are sources of shock transmission between the countries through their foreign subsidiaries.

The lending-channel more relevant for developing countries

Bank fundamentals determine the lending activity in more advanced economies.

Market monitoring seem to exist

- related to subsidiary characteristics in *developed countries*

-liquidity needs determine the change in deposits in *developing* countries during the crisis