

Lending and Shareholding

Falko Fecht ¹ Jose-Luis Peydro ² Günseli Tümer-Alkan ³
Yuejuan Yu ⁴

¹Frankfurt School of Finance and Management

²Universitat Pompeu Fabra

³Vrije Universiteit Amsterdam

⁴Shandong University

May 16, 2017

Bank as financier in crises

- Many paper studies the bank lending behavior during the 2008 global crises. i.e., firms suffered from crises mainly through banks cut back lending.
- Heterogeneity of credit contraction exists across banks or firms. (eg., Albertazzi and Marchetti (2010))
 - Larger and less-capitalized banks reallocated loans away from riskier firms, that is “flight to quality”.
 - This has not occurred for smaller and less-capitalized banks.

However, if the bank is also an equity holder . . .

- Bank as shareholder and creditor can
 - Internalize the conflicts between the two roles they assume.
 - Process better information due to involvement on both equity and debt.
- Both two channels should improve the firms' access to bank funding.
- But this might not be the most relevant channel in crises . . .

Residual cash flow

- In crises period, the residual cash flow might be a more important concern.
- When bank hold a stable number of shares for long-term investment purposes rather than short-term speculation, bank should care about the firm's stock price and upward potential of the firm.
- So they may even roll over loans to a risky firm in which they hold shares.
- Crises would exacerbate this.

In crises . . .

- For bank: they face a larger constraint in supplying credit during crises, i.e., lower loanable funds/ capital adequacy requirement.
- For firm: possibility of raising funds from alternative sources is limited in crises, due to i.e., credit rationing, especially for risky firms.

Zombie bank lending to zombie firms?

- So will a distressed bank stay away from a risky borrower in crises?
 - Not necessarily. The bank may want to delay the recognition of losses by **rolling over loans to borrowers of high risk.** (Caballero et al. (2008); Albertazzi and Marchetti (2010))
 - If the distressed bank also holds shares in the risky borrowing firm, a higher chance this is the case! when **not rolling over the loan will impair both their loan assets and residual cash flow rights if they hold shares for long-term investment.**

Main results

- We find that bank equity holdings are associated with a larger volume of credit exposures.
- During the crisis riskier firms—measured by their Z-Score—obtain relatively larger loans from banks that also hold a stable equity position in the respective firm.
- Having a closer look at the characteristics of banks, we find that holding a large equity stake only increased riskier banks' (i.e., banks with a low Z-Score) lending to distressed companies during the crisis (Zombie lending).

Contribution

Our results contribute to two strands of literature.

- 1 Dual holding or institutional holding of banks on firms. (C.Ferreira and Matos (2012); Santos and Wilson (2016) and Jiang et al. (2010))
 - Previous studies are either in theory or empirically from lowering borrowing costs, and do not distinguish between banks or firms of different qualities.
 - With bank-firm level security and credit exposure data, we focus on shareholding for long-term investments purpose.
- 2 Credit supply during period of crises or liquidity crunch. (Presbitero et al. (2014); Puri et al. (2011) ; Iyer et al. (2014) and Albertazzi and Marchetti (2010))
 - We find that holding equity in a firm **mitigate debt over-hang**, but divert distressed banks further from "flight to quality" and induce them to take on more risks during crises.

Data

- Quarterly data of German banks holding shares and extending credit to listed non-financial firms between 2006 to 2011.
 - Credit register (Mimik)
 - Securities Holdings Statistics
 - Bank/Firm balance sheet data
- The first two datasets are from Deutsch Bundesbank.
- Except the credit variable(dependent variable), all other variables are lagged one quarter.
- We control for credit demand and supply by exploiting firm borrowing from multiple banks and bank lending to multiple firms, which allows us to use fixed effects at bank-time level and firm-time level.

Identification strategy I

- 1 Whether share holdings by bank foster more credit supply during crises:

$$\log Credit_{ijt} = \beta_1 Shareholdings_{ijt-1} + \beta_2 Shareholdings_{ijt-1} \times Crisis_t + \alpha_{it} + \alpha_{jt} + \epsilon_{ijt} \quad (1)$$

$$\log Credit_{ijt} = \beta_1 StableShareholdings_{ijt-1} + \beta_2 StableShareholdings_{ijt-1} \times Crisis_t + \alpha_{it} + \alpha_{jt} + \epsilon_{ijt} \quad (2)$$

Both $Shareholdings_{ijt-1}$ and $StableShareholdings_{ijt-1}$ (hold stable number of shares for 4 quarters) are binary variables

Identification strategy II

- ② Whether shareholdings can mitigate debt overhang problem?

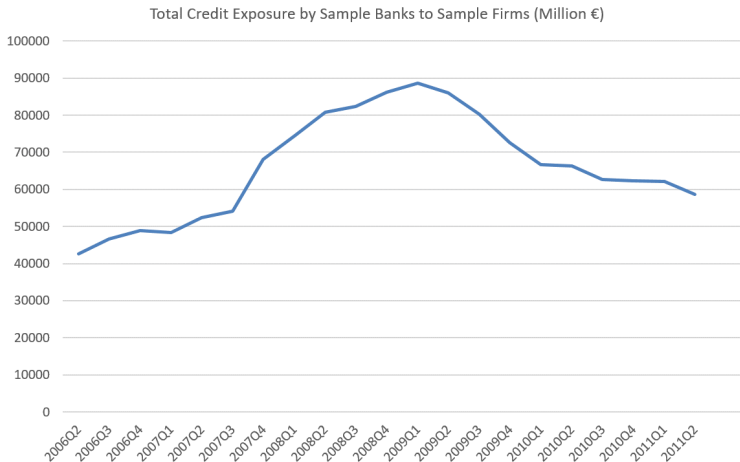
$$\begin{aligned} \log \text{Credit}_{ijt} = & \beta_1 \text{StableShareholdings}_{ijt-1} + \\ & \beta_2 \text{StableShareholdings}_{ijt-1} \times \text{Crisis}_t + \\ & \beta_3 \text{StableShareholdings}_{ijt-1} \times \text{FirmDistressed}_{jt-1} + \\ & \beta_4 \text{StableShareholdings}_{ijt-1} \times \text{Crisis}_t \times \text{FirmDistressed}_{jt-1} + \\ & \alpha_{it} + \alpha_{jt} + \epsilon_{ijt} \end{aligned} \quad (3)$$

Where $\text{FirmDistressed}_{jt-1}$ is a dummy equal to 1 if firm Z-Score is below 1.81 or 2.99.

- ③ Subsample regression of high versus low Z-Score banks.

Defining Crises dummy

$Crisis_t=1$ for all the quarters after 2009Q1



Bank holding equity in firm foster lending in crises?

VARIABLES	(1)	(2)	(3)	(4)	(5)	Top 100 banks (6)	Top 100 banks (7)
Shareholdings	0.278*** [0.055]	0.461*** [0.098]	0.579*** [0.151]				
Shareholdings * Crisis	-0.593*** [0.068]	-0.279** [0.119]	-0.099 [0.186]				
Stable Shareholdings				-0.914*** [0.133]	-0.002 [0.261]	-0.185 [0.375]	0.559 [0.430]
Stable Shareholdings * Crisis				-0.12 [0.181]	-0.037 [0.310]	1.752*** [0.541]	-0.018 [0.532]
Observations	469,534	234,643	153,962	234,643	153,962	85,496	76,513
R-squared	0.251	0.136	0.316	0.136	0.316	0.14	0.291
Firm FE	Yes						
Bank FE	Yes						
Time FE	Yes						
Firm*Time FE		Yes	Yes	Yes	Yes	Yes	Yes
Bank*Time FE			Yes		Yes		Yes
Restriction 1		Yes	Yes	Yes	Yes	Yes	Yes
Restriction 2			Yes		Yes		Yes

Can bank holding equity in a firm mitigate debt overhang problem?

VARIABLES	(1)	(2)
Stable Shareholdings	-0.168 [0.308]	1.446*** [0.524]
Stable Shareholdings * Crisis	-0.523 [0.378]	-1.332** [0.642]
Stable Shareholdings * Firm distressed 1 (Z<2.99)	-0.858** [0.337]	-1.779*** [0.552]
Stable Shareholdings * Crisis * Firm distressed 1	0.407 [0.432]	1.599** [0.690]
Observations	216,351	141,249
R-squared	0.136	0.32
Firm*Time FE	Yes	Yes
Bank*TimeFE		Yes
Restriction 1	Yes	Yes
Restriction 2		Yes

According to Altman(1968),
firm Z-score >2.99
: Safe Zone
1.81 < firm
Z-score < 2.99: Gray
zone
Firm Z-score < 1.81
: Bankruptcy zone

Continued...

VARIABLES	(1)	(2)
Stable Shareholdings	1.459*** [0.523]	0.864** [0.382]
Stable Shareholdings * Crisis	-1.319** [0.642]	-0.665* [0.401]
Stable Shareholdings * Firm distressed 2 ($Z < 1.81$)	-2.275*** [0.588]	-1.272*** [0.426]
Stable Shareholdings * Crisis * Firm distressed 2	1.569** [0.732]	1.050** [0.488]
Stable Shareholdings * Firm gray zone ($2.99 > z > 1.81$)	-1.185* [0.633]	
Stable Shareholdings * Crisis * Firm gray zone	1.794** [0.784]	
Observations	141,249	87,008
R-squared	0.32	0.775
Firm*Time FE	Yes	Yes
Bank*Time FE	Yes	Yes
Firm*Bank FE		Yes
Restriction 1	Yes	Yes
Restriction 2	Yes	Yes

Zombie bank lending to zombie firms?

VARIABLES	Bank Z-score above 50%		Bank Z-score below 50%	
	(1)	(2)	(1)	(2)
Stable Shareholdings	-0.647 [0.452]	1.610** [0.683]	0.766 [0.560]	2.199** [0.995]
Stable Shareholdings * Crisis	-0.498 [0.716]	-2.857** [1.220]	-2.098*** [0.684]	-3.293*** [1.256]
Stable Shareholdings * Firm distressed 1 (Z<2.99)	-0.353 [0.515]	-1.299* [0.748]	-1.786*** [0.594]	-2.790*** [1.066]
Stable Shareholdings * Crisis * Firm distressed 1	0.62 [0.815]	1.965 [1.291]	2.183*** [0.769]	4.321*** [1.355]
Observations	51,950	35,348	67,069	47,132
R-squared	0.206	0.389	0.146	0.318
Firm*Time FE	Yes	Yes	Yes	Yes
Bank*Time FE		Yes		Yes
Restriction 1	Yes	Yes	Yes	Yes
Restriction 2		Yes		Yes

$$\text{Bank Z-Score} = (\text{mean}(\text{ROA}) + \text{Equity Ratio}) / \text{Std.Dev}(\text{ROA})$$

Continued...

VARIABLES	Bank Z-score above 50%		BankZ-score below 50%	
	(1)	(2)	(1)	(2)
Stable Shareholdings	1.636**	0.932	2.188**	0.253
	[0.682]	[0.705]	[0.995]	[0.481]
Stable Shareholdings * Crisis	-2.838**	-1.024	-3.276***	-0.339
	[1.218]	[0.987]	[1.255]	[0.550]
Stable Shareholdings * Firm distressed 2 ($Z < 1.81$)	-1.885**	-1.207	-3.391***	-0.729
	[0.832]	[0.847]	[1.150]	[0.568]
Stable Shareholdings * Crisis * Firm distressed 2	1.707	1.551	4.687***	0.419
	[1.365]	[1.097]	[1.438]	[0.673]
Stable Shareholdings * Firm gray zone ($2.99 > z > 1.81$)	-0.695		-2.177*	
	[0.868]		[1.198]	
Stable Shareholdings * Crisis * Firm gray zone	2.638*		4.078***	
	[1.438]		[1.504]	
Observations	35,348	21,541	47,132	28,946
R-squared	0.389	0.856	0.318	0.861
Firm*Time FE	Yes	Yes	Yes	Yes
Bank*Time FE	Yes	Yes	Yes	Yes
Firm*Bank FE		Yes		Yes
Restriction 1	Yes	Yes	Yes	Yes
Restriction 2	Yes	Yes	Yes	Yes

Robustness

- Some may fear that our Stable shareholding dummy capture the effect of relationship lending.
- We use a variable of “Relationship” .
 - Equal to the ratio of credit exposure of bank i to firm j in quarter $t-1$ to total credit exposure of firm j in quarter $t-1$.
 - Interact this variable to both crises dummy and firm Z-Score dummy to correct for relationship effect.

VARIABLES	All Banks		Bank Z-score above 50%		Bank Z-score below 50%	
	(1)	(2)	(1)	(2)	(1)	(2)
Stable Shareholdings	-0.362 [0.244]	0.583 [0.448]	-0.953*** [0.363]	0.208 [0.623]	0.553 [0.455]	1.533* [0.823]
Stable Shareholdings * Crisis	-0.757** [0.325]	-1.132* [0.592]	-0.64 [0.627]	-1.795 [1.133]	-2.001*** [0.553]	-3.053*** [1.058]
Stable Shareholdings * Firm distressed 2 (Z<1.81)	-0.756*** [0.291]	-1.603*** [0.512]	0.014 [0.452]	-0.799 [0.752]	-1.717*** [0.513]	-2.765*** [0.988]
Stable Shareholdings * Crisis * Firm distressed 2	0.308 [0.398]	1.375** [0.672]	0.39 [0.763]	1.111 [1.263]	1.673** [0.677]	3.889*** [1.239]
Relationship	33.194*** [1.512]	27.210*** [1.345]	33.268*** [2.346]	28.043*** [2.236]	31.841*** [2.196]	25.717*** [1.951]
Relationship * Crisis	3.409* [2.025]	2.745 [1.861]	6.438 [5.908]	5.036 [5.244]	5.019* [3.029]	4.264 [2.734]
Relationship * Firm distressed 2 (Z<1.81)	16.436*** [3.157]	11.964*** [2.648]	18.909*** [4.703]	14.504*** [4.077]	16.119*** [4.413]	13.536*** [3.769]
Relationship * Crisis * Firm distressed 2	-4.908 [3.825]	-2.887 [3.268]	-1.622 [8.289]	2.583 [7.800]	-10.236* [5.487]	-9.236** [4.614]
Observations	132,675	84,414	33,236	22,003	42,225	28,945
R-squared	0.271	0.431	0.309	0.477	0.297	0.436
Firm*Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank*Time FE		Yes		Yes		Yes
Restriction 1	Yes	Yes	Yes	Yes	Yes	Yes
Restriction 2		Yes		Yes		Yes

Conclusion

- We find that bank holding stable equity in firm increase the provision of credit to firm by the bank, especially in crises period to distressed firms.
- This effect is more pronounced for less healthy banks, supporting bank evergreen loans or zombie lending behaviors.
- This results has important implications for the current ongoing debate about re-regulation of the banking sector, in particular whether universal banks should stop proprietary trading in stocks.