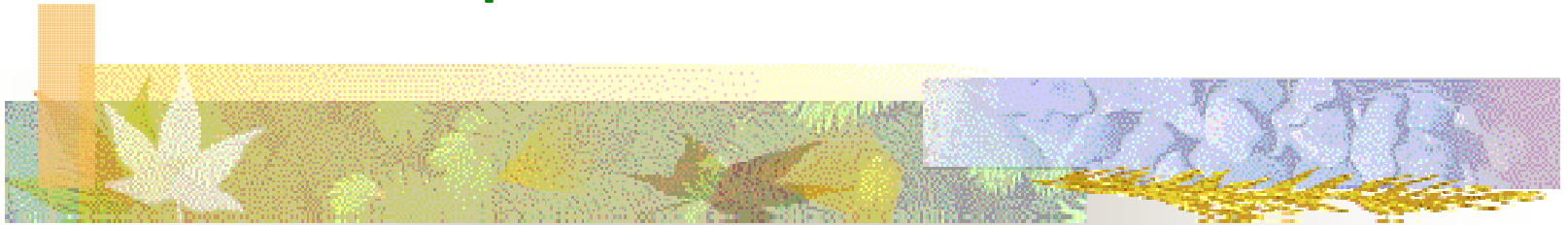


The Role of Collateral and Personal Guarantees in Relationship Lending: Evidence from Japan's Small Business Loan Market

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1. Motivation

- ✦ Investigating the determinants of collateral and personal guarantees in Japan's small business lending
- ✦ Examining three conventional theories
 - Riskier borrowing firms pledge collateral and personal guarantees more often in order to mitigate debtor moral hazard
 - Banks perform less screening and monitoring of borrowers if their loans are secured by collateral and personal guarantees ("lazy bank" hypothesis)
 - Collateral and personal guarantees are less likely to be pledged if the borrower establishes solid "relationship" with its main bank (they are substitutes)
- ✦ Data: SME Agency "Survey of Financial Environment" (2002, 2001) , Tokyo Shoko Research (TSR) Database

2. Data

- ◆ Firms with collateral or personal guarantees are “typical” SMEs
- ◆ Firms without collateral and personal guarantees are relatively larger and lower-risk (higher TSR credit scores)
- ◆ Firms receiving credit guarantees are relatively smaller and riskier (lower TSR credit scores)

	No. of samples (share, %)	Capital (thousands of yen)	No. of employees	Gross sales (thousands of yen)	TSR Credit Scores	Interest rate (0.1 basis point)	profit margin	Capital/ asset ratio
With Collateral	4,834 (73.9)	197,509	38	1,299,848	55	2000	0.0139	0.2009
With Personal Guarantee	4,984 (76.2)	161,017	32	1,079,825	55	2100	0.0133	0.1991
With Credit Guarantee	3,381 (51.7)	96,277	26	873,705	53	2375	0.0120	0.1588
With Collateral and Personal Guarantee								
And With Credit Guarantee	2,819 (43.1)	104,015	28	931,178	53	2400	0.0122	0.1537
And Without Credit Guarantee	1,413 (21.6)	417,121	52	1,939,796	59	1750	0.0160	0.2966
Without Collateral, Personal Guarantee, or Credit Guarantee	889 (13.6)	464,040	45	2,098,614	60	1375	0.0182	0.3860
All Samples	6,540 (100.0)	207,012	36	1,290,303	56	2000	0.0143	0.2201
(standard deviation)		(1,797,737)	(155)	(5,837,277)	(7)	(1204)	(0.2506)	(0.3028)

Note: As of 2002 hereinafter, unless otherwise stated. The figures are median.

2. Data

Composition of Collateral

- ✦ Mostly real estate + financial assets for high-risk firms, machinery for low-risk firms
- ✦ Account receivables and inventories are rarely used

	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Composition of Collateral (multiple answers allowed, %)							
real estate	95.9	95.8	96.0	95.5	95.9	96.8	95.5
machinery	5.4	6.3	4.6	5.0	5.8	4.8	10.5
deposits	22.8	29.2	28.4	24.4	16.5	12.2	12.0
equity securities	9.2	11.4	10.9	9.2	7.0	7.0	6.0
commercial bills	6.9	8.4	8.1	7.1	5.2	5.4	2.3
other securities	2.4	3.6	3.4	2.2	1.2	1.4	0.8
proceeds of guarantee	1.2	2.6	1.1	0.8	0.9	0.8	0.8
accounts receivable	0.8	0.8	0.8	0.4	0.9	1.3	0.8
intellectual property	0.1	0.3	0.0	0.1	0.0	0.0	0.0
others	1.9	1.4	2.1	1.5	2.6	1.3	3.8

Note: As of 2001.

2. Data

Composition of Personal Guarantees

- Mostly by the representative + other directors, relatives for high-risk firms

	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Composition of Personal Guarantee (multiple answers allowed, %)							
Representative	94.8	95.3	94.5	94.6	95.1	94.4	95.0
Executives other than representative	34.1	45.9	38.2	34.1	25.5	23.5	21.0
Relatives of representative	18.3	30.0	20.5	17.0	14.6	8.0	8.0
Third party (individuals)	2.4	6.4	2.5	2.0	0.7	0.2	0.0
Enterprises with capital relationship	6.3	7.4	6.9	5.9	5.9	5.0	4.0
Enterprises without capital relationship	0.6	1.3	0.5	0.7	0.0	0.2	0.0
Others	1.1	1.0	1.1	1.4	1.4	0.7	0.0

Note: As of 2001.

3. Riskiness of the Borrower

Collateral, Guarantees, and the Riskiness of the Borrower

- ✦ The use rate of collateral and personal guarantees negatively correlate with the firm's credit risk (credit scores)
 - Consistent with the moral hazard hypothesis
 - Inconsistent with the adverse selection (signaling) hypothesis

	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
No. Of Samples (Share, %)	5,380 (100.0)	868 (16.1)	1,521 (28.3)	1,366 (25.4)	850 (15.8)	663 (12.3)	112 (2.1)
Collateral							
Percentage of Borrowers with Collateral	79.7	85.1	82.0	80.7	76.5	71.5	69.6
Average Interest Rate (with Collateral, 0.1 b.p.)	2283	3073	2557	2069	1800	1636	1386
Average Interest Rate (without Collateral, 0.1f b.p.)	1842	2653	2224	1767	1552	1269	1157
Personal Guarantees							
Percentage of Borrowers with Personal Guarantees	81.8	90.6	87.2	83.7	73.6	67.1	64.3
Average Interest Rate (with Personal Guarantees, 0.1 b.p.)	2326	3080	2581	2088	1867	1648	1341
Average Interest Rate (without Personal Guarantees, 0.1 b.p.)	1600	2347	1919	1614	1392	1294	1272

3. Riskiness of the Borrower

Comparison with the United States

- ✦ The use rate of collateral is the highest among “Low-Risk” firms
- ✦ Firms with collateral pay lower interest rates than those without

	Total	D&B Credit Score (as of May, 1999)				
		High Risk	Significant Risk	Average Risk	Moderate Risk	Low Risk
Share Of Samples (%)	100.0	10.9	21.8	32.3	28.1	6.9
Collateral						
Percentage of Borrowers with Collateral	57.3	66.9	55.7	58.8	50.4	68.8
Average Interest Rate (with Collateral, %)	9.1	9.9	9.1	8.9	8.9	8.6
Average Interest Rate (without Collateral, %)	9.8	9.7	9.7	10.0	9.6	10.1
Guarantee						
Percentage of Borrowers with Guarantee	53.4	53.4	59.9	50.9	53.9	45.9
Average Interest Rate (with Guarantee, %)	9.3	9.8	9.8	9.1	9.1	8.8
Average Interest Rate (without Guarantee, %)	9.4	9.9	8.9	9.6	9.5	9.3

Source: FRB, “1998 Survey of Small Business Finances”

4. Monitoring by the Main Bank

Collateral, Guarantees, and Monitoring by the Main Bank

- ✦ Proxies for the monitoring activity: the frequency of contact, document submission
- ✦ Within the same risk category, the frequency of monitoring has a positive correlation with the use rate of collateral and guarantees
 - Inconsistent with the lazy bank hypothesis

Frequency of Document Submission	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Percentage of Borrowers with Collateral							
once every 1-2 months	91.5	92.3	94.8	88.9	89.9	78.1	93.8
quarterly	87.6	88.1	88.6	89.3	83.5	83.6	75.0
semi-annually	75.9	78.8	77.7	77.2	73.7	70.9	72.4
annually	67.2	69.3	69.5	70.1	66.0	63.8	53.3
Percentage of Borrowers with Personal Guarantees							
once every 1-2 months	89.7	92.3	91.4	91.4	85.8	71.2	68.8
quarterly	88.4	91.1	93.6	91.9	77.6	69.1	50.0
semi-annually	70.9	82.7	80.4	73.8	59.2	56.3	62.1
annually	75.7	88.0	82.9	78.2	72.0	65.4	55.1



4. Monitoring by the Main Bank



Why Monitoring and Collateral are Complements?

- ✦ Collateral is effective only if its value is monitored (Rajan and Winton, 1995)
 - Monitoring incentive is more extensive when the value of collateral varies depending upon business conditions (e.g. accounts receivables, inventories) than when the value of collateral is relatively stable (e.g. real estate)
 - Fragility of the real estate market since the 1990s might have enhanced the banks' monitoring incentives
- ✦ Collateral serves as an incentive device for investing in costly information production activities (Longhofer and Santos, 2000)
 - Taking collateral effectively raises the lender's priority
 - By making its loan senior to other creditor's claims, the bank can reap the benefits of the relationship-building investments
 - Main bank usually takes the first lien on collateral

5. Relationship between the Borrower and the Main Bank

Collateral, Guarantees, and the Relationship

- ✦ Proxies for “relationship”: duration, scope (number of financial products purchased), the number of banks in transactions
- ✦ Within the same risk category, the duration (scope) of relationship positively correlates with the use rate of collateral and guarantees
 - Inconsistent with the conventional theory (substitution)

Duration of relationship with the main bank	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Percentage of Borrowers with Collateral							
less than 15 years	54.9	53.9	58.3	54.9	54.5	44.4	52.4
15-28 years	73.9	84.1	80.5	73.2	65.2	59.0	49.8
28-40 years	79.8	92.4	87.0	81.2	70.1	68.0	52.2
40 years or more	82.8	92.7	89.2	86.2	80.1	72.2	57.5
Percentage of Borrowers with Personal Guarantees							
less than 15 years	71.2	76.8	78.8	71.8	60.4	45.5	42.9
15-28 years	78.0	91.7	85.1	79.7	67.4	56.5	50.0
28-40 years	78.2	92.0	88.8	79.3	67.1	61.5	50.0
40 years or more	78.1	90.0	83.9	82.8	71.1	68.9	56.3

5. Relationship between the Borrower and the Main Bank

Collateral, Guarantees, and the Relationship

- ✦ Firms establishing sole-relationships with their main banks pledge collateral and guarantees less often
- *Inside* collateral (collateral owned by the borrower) defines the order of seniority among creditors. In the case of sole-banking, the need to define seniority among creditors would be less

# of banks in transactions	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Percentage of Borrowers with Collateral							
1	52.0	67.1	56.9	52.9	43.7	42.9	29.2
2	73.6	79.7	71.9	69.4	74.7	73.9	84.6
3-4	79.7	82.7	83.9	81.2	76.4	71.8	63.8
5 or more	82.5	88.2	88.1	84.7	79.4	69.3	58.8
Percentage of Borrowers with Personal Guarantees							
1	59.4	78.7	67.9	58.5	50.0	47.5	22.9
2	81.7	89.6	86.1	81.3	78.3	66.7	65.4
3-4	81.5	91.0	86.9	84.7	71.2	68.0	65.5
5 or more	79.2	87.5	88.8	82.2	70.6	60.3	56.9



5. Relationship between the Borrower and the Main Bank

Why Relationship and Collateral are Complements?

- ◆ “Hold-up” problem (Sharpe, 1990)
 - The bank exerts information monopoly by charging higher interest rates and/or requiring more collateral
- ◆ Mitigating the “soft-budget constraint” (Boot, 2000)
 - The possibility of renegotiation in relationship lending, when the borrowing firm faces difficulty, increases the firm’s incentive to misbehave ex ante (soft-budget constraint problem)
 - Collateral will make the value of lender’s claim less sensitive to the borrower’s total net worth. Then, the bank can credibly threaten to call in the loan

5. Relationship between the Borrower and the Main Bank

Why Relationship and Collateral are Complements?

- ✦ Interest rates are somewhat lower for borrowers with longer main bank relationships
 - Inconsistent with the hold-up hypothesis

Duration of relationship with the main bank	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Average Interest Rate, 0.1 b.p.							
less than 15 years	2375	2987	2556	2047	1970	1769	1382
15-28 years	2351	3118	2622	2112	1828	1636	1568
28-40 years	2193	3079	2499	2050	1702	1530	1254
40 years or more	1963	2857	2319	1870	1628	1410	1286

6. Robustness Check: Credit Guarantee Users and Non-users

- ✦ The use of government supported credit guarantees may distort the inferences above
 - Guaranteed percentage is 100% in most cases
 - The share of borrowers using credit guarantees is inversely related to the credit score
 - The share of borrowers pledging collateral is high among the credit guarantee users, irrespective of the credit score

	Total	TSR Credit Scores					
		-49	50 - 54	55 - 59	60 - 64	65 - 69	70 -
Percentage of borrowers using Credit Guarantees	51.7	79.1	68.8	52.0	31.9	18.1	6.5
Users of Credit Guarantees							
Percentage of Borrowers with Collateral	86.9	86.2	86.0	87.1	89.3	90.4	100.0
Percentage of Borrowers with Personal Guarantees	94.6	94.4	95.2	94.2	94.2	93.6	91.7
Average Interest Rate, 0.1 b.p.	2592	3145	2692	2268	2061	1971	1788
Non-users of Credit Guarantees							
Percentage of Borrowers with Collateral	60.0	58.8	61.7	62.0	59.5	59.1	52.9
Percentage of Borrowers with Personal Guarantees	56.6	59.3	59.0	61.1	54.3	53.1	48.8
Average Interest Rate, 0.1 b.p.	1673	2356	1984	1680	1561	1417	1260

6. Robustness Check: Credit Guarantee Users and Non-users

- ✦ However, the correlation between the use rate of collateral (guarantees) and the frequency of document submission, duration of the main-bank relationship are qualitatively the same even among the credit guarantee users

(%, bp)

	With Credit Guarantee		Without Credit Guarantee	
	Percentage of Borrowers with Collateral	Percentage of Borrowers with Guarantee	Percentage of Borrowers with Collateral	Percentage of Borrowers with Guarantee
Frequency of Document Submission				
once every 1-2 months	94.3	96.7	83.2	69.3
quarterly	92.8	95.9	76.7	72.8
semi-annually	88.3	94.1	64.7	50.2
annually	77.8	92.7	59.4	63.3
Duration of relationship with the main bank				
less than 15 years	69.0	92.8	38.0	45.1
15-28 years	88.7	96.1	54.0	53.6
28-40 years	91.2	94.9	67.1	59.8
40 years or more	95.4	94.6	72.6	64.8
# of banks in transactions				
1	77.6	91.7	37.4	40.9
2	83.3	94.5	61.7	66.3
3-4	88.2	95.3	69.1	64.3
5 or more	91.2	95.1	71.3	58.7



7. Conclusions

- ✦ Collateral and personal guarantees are useful in mitigating debtor moral hazard
- ✦ Even with collateral and personal guarantees, main banks closely monitor SMEs and establish solid relationships with borrowers
- ✦ Further issues to be addressed:
 - The sample SMEs are relatively large; “small” firms without tangible assets may face strict borrowing constraints
 - Need to examine ex-post performances of the borrowing firms in order to evaluate the magnitude of “bright” side of collateral and personal guarantees