Changing Banking Relationships and Client Firm Performance: Evidence for Japan from the 1990s

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Abstract

The banking literature concludes that the performance of client firms deteriorates if their distressed main bank reduces the supply of credit. However, these results rely on the assumption that main banks have an information advantage over other banks, such that if a client firm changes its main bank, its access to credit worsens. Using Japanese data from a period including financial shocks, we show that firms change the main banking relationship when their main bank becomes distressed. In addition, the performance of client firms improves after a change in the main bank relationship. This implies that the availability of credit improves for these firms, despite the change in main bank.

JEL classification : G20; G21; G32
Keywords : Bank–firm relationships; Bank distress; Private information

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1 Introduction

The banking literature concludes that deterioration in bank health has a negative impact on the performance of client firms (For example Gibson, 1995; Yamori and Murakami, 1999; Kang and Stultz, 2000; Sohn, 2010). For the most part, these studies assume that main banks have an information advantage over other banks gained through their lending relationships. If informed main banks are then obliged to decrease lending for whatever reason, other banks cannot offer sufficient credit to these same client firms because of the information problem. During financial shocks, as Udell (2009) pointed out, distressed banks decrease loans to maintain an adequate capital ratio and reduce nonperforming loans, so client firms face financial shortages and experience poorer performance. In Japan, as Hoshi et al. (1991) and Wu and Yao (2012) argue, the relationship between main banks and their client firms is very close and helps mitigate this information problem. On this basis, the banking literature suggests that poor bank performance and the changing of main banks account for the low level of activity and poor performance of Japanese client firms.

Contrary to the findings of the banking literature, if the information problems between client firms and non-main banks are not severe, client firms have an incentive to shift their main banking relationship from a distressed bank to another bank. Because distressed banks cannot offer sufficient money to maintain an adequate capital ratio, client firms benefit by changing their relationships with distressed banks. In addition, the performance of client firms improves after the change in main bank because credit availability for the client firm improves. Importantly, if client firms can switch main bank easily, we observe that firms will switch their main bank relationship away from a distressed bank. Further, while some studies (For example, Gibson, 1995; Kang and Stultz, 2000) show that the performance of Japanese client firms deteriorates if they have a main bank relationship with a distressed bank using data from the financial shock of the 1990s, they do not provide evidence about whether the change in the main bank relationship improves the

performance of the client firms.

This paper uses Japanese firm-level data from the 1990s to investigate whether client firms shift their main banking relationship away from distressed banks, and whether the ex post firm performance of client firms improves after making this change. As many banks suffered problems with nonperforming loans and commensurately reduced loans for firms following the post-bubble financial shock, Japanese firm-level data from the 1990s are appropriate for our study. Moreover, in addition to the relationship between bank health and firm performance, we investigate whether client firms lock in main banking relationships with distressed banks, a question not adequately addressed in previous work.

2 Empirical Analysis

2.1 Hypothesis

If, as the banking literature argues, incumbent main banks have an information advantage over other banks, client firms face severe financial constraints when they change their main banking relationship. If this is the case, these firms are unlikely to change their relationship with the main bank, even if the main bank becomes distressed. This is because if a client firm changes its main banking relationship, its access to credit worsens. As a result, client firm performance deteriorates after shifting the main banking relationship from the distressed bank to another bank. Conversely, if the incumbent main bank does not specialize in accumulating credit information on its client firms, the client firms benefit from a change in the main banking relationship when their main bank becomes distressed. In this case, we can observe that client firms change the main banking relationship if their main bank is distressed.[1] In addition, the performance of client firms improves after changing the main banking relationship because of the concomitant improvement in credit

[1]Some listed firms can choose to issue bonds or stocks to finance credit demand. To focus on the banking relationship, we only investigate bank loans.

availability.

2.2 Data

Many Japanese financial institutions faced severe difficulties with large amounts of nonperforming loans as their assets deteriorated following the bursting of the bubble economy in the late 1980s. During the 1990s, many financial institutions went bankrupt because of the burden of nonperforming loans. We therefore use Japanese listed-firm data from 1993 to 1997. We sample 1,810 listed nonfinancial Japanese firms, the data for which we obtained from the Nikkei Financial Quest database. We identified a firm's main bank as the private bank that lent it the most each year.[2] We omit from our database firms that have more than one main bank. A proxy of the health of a main bank is the bank's ratio of nonperforming loans to total loans, which is obtained from the *Financial Statements of All Banks* issued by the Japanese Bankers Association. A bank's nonperforming loans ratio is defined as the ratio of "Loans to borrowers in legal bankruptcy" (*hatansaki saiken*) plus "Past due loans" (*entai saiken*) plus "Restructured loans" (*kinri genmen saiken*) to total loans (hereafter NPL3). As some data for regional banks before 1995 are unavailable, we also use several alternative definitions of the nonperforming loans ratio. These are the ratio of "Loans to borrowers in legal bankruptcy" plus "Past due loans" to total loans (hereafter NPL2) and the ratio of "Loans to borrowers in legal bankruptcy" to total loans (hereafter NPL1).

2.3 Empirical Strategy

To investigate the hypotheses described in Section 2.1, we estimate the following regression:

[2]This definition of the main bank is also used by Kang and Stultz (2000).

$$
\begin{aligned}
Ex\ Post\ Firm\ Performance_{i,t+1} &= \alpha_1 Nonperforming\ Loans_{i,t} + \alpha_2 Failed\ Bank\ Dummy_{i,t} \\
&+ \mathbf{x}_{i,t}\beta + \delta C_{i,t} + u_{i,t} \qquad (1)
\end{aligned}
$$

$$
\begin{aligned}
C^*_{i,t} &= \gamma_1 Nonperforming\ Loans_{i,t} + \gamma_2 Failed\ Bank\ Dummy_{i,t} \\
&+ \mathbf{y}_{i,t}\eta + v_{i,t} \qquad (2) \\
& C_{i,t} = 1\ if\ C^*_{i,t} > 0 \\
& C_{i,t} = 0\ otherwise,
\end{aligned}
$$

where $u_{i,t} \sim N(0, \sigma^2), v_{i,t} \sim N(0, \sigma^2)$, and $Cov(u_{i,t}, v_{i,t}) = \rho \neq 0$.

Following Morck et al. (2000), we use Tobin's q in year t+1 as a proxy for $Ex\ Post\ Firm\ Performance_{i,t+1}$. The proxies for main bank health are $Nonperforming\ Loans_{i,t}$ and $Failed\ Bank\ Dummy_{i,t}$. $Nonperforming\ Loans_{i,t}$ is the ratio of nonperforming loans to total loans of a main bank for firm i in year t (defined as NPL1, NPL2 or NPL3). We also use a dummy variable that equals one if the main bank for firm i in year t is an ex post failed bank ($Failed\ Bank\ Dummy_{i,t}$).[3] The dummy variable $C_{i,t}$ takes a value of one if the name of the main bank for firm i in year t differed from that in year t+1 (Changing the Main Bank Dummy), and zero otherwise. $C^*_{i,t}$ is a latent variable for the change in the main bank, which is the net benefit from changing the main banking relationship. If $C^*_{i,t}$ is greater than zero, firms change the main banking relationship. If client firms that have a main banking relationship with a distressed bank have an incentive to change the relationship, the estimated coefficients for $Nonperforming\ Loans_{i,t}$ (NPL1, NPL2 and NPL3) and $Failed\ Bank\ Dummy_{i,t}$ (γ_1, γ_2) will be positive in equation (2).

[3]Ex post failed banks in our sample are Hokkaido Takushoku Bank, Long-Term Credit Bank of Japan, Nippon Credit Bank, Hanwa Bank, Tokuyo City Bank, Midori Bank, Fukutoku Bank, Naniwa Bank, Kokumin Bank, Koufuku Bank, Tokyo Sowa Bank, Namihaya Bank, and Niigata Chuo Bank, all of which went bankrupt between 1996 and 1999.

If the performance of the client firms improves after they change their main banking relationship, the estimated coefficient of $C_{i,t}$ (δ) in equation (1) will be positive and statistically significant.

We use a treatment effects model to mitigate endogeneity bias. If the dummy variable for changing the main bank ($C_{i,t}$) is a random variable, the coefficient (δ) exhibits the effects of changing the main bank on client firm performance. However, if our hypotheses are correct, client firms that have a main banking relationship with a distressed bank are likely to change their main bank. Therefore, the dummy for changing a main bank is a nonrandom variable.[4] We estimate the parameter vectors using the maximum likelihood method.

We also specify several control variables ($\mathbf{x}_{i,t}$) in the estimation of firm performance in equation (1), including assets, leverage, profitability, liquidity, main bank dependence, and the number of lending relationships, along with year and industry dummies[5] for each year t. To start with, we employ the natural log of each firm's total assets as a proxy of firm scale (size). We include leverage to control for the effects of capital structure, defined as the ratio of a firm's total debts to total assets. From a theoretical point of view, firm performance and capital structure are irrelevant. However, some studies suggest that capital structure could have either positive or negative effects on firm performance, so we include leverage in our estimation of firm performance. We measure profitability using the ratio of a firm's operating incomes to total assets. As a rule, profitable firms are better performing firms and so each firm's Tobin's q will be higher. We predict that a firm's profitability has a positive effect on firm performance. Firms with higher liquidity also have better performance because they do not face liquidity constraints. We predict that liquidity has a positive effect on firm performance and specify the ratio of cash to total assets as a proxy of liquidity.

[4]We obtain similar results if we estimate equation (1) using the simple fixed effects model and equation (2) using the logit model.

[5]We generate 28 industry dummies using the "Shoken code" for each firm.

The number of lending relationships with banks is the number of banks that offer loans for firm i in year t. According to Detragiache et al. (2000), as firms with a large number of relationships are less likely to face liquidity problems, the number of lending relationships has a positive effect on firm performance. Main bank dependence is the ratio of loans obtained from the main bank to total loans. According to Rajan (1992), a close main bank relationship causes the holdup problem. As a result, the performance of client firms that depend more on their main bank is lower. Conversely, a close main bank relationship can enhance credit availability for these client firms. Overall, the bank dependence should then have some effect on firm performance, but the predicted sign is ambiguous. We also include proxies for nonperforming loans and a failed bank dummy in equation (1). As Gibson (1995) finds that the deterioration of main bank health has a negative effect on client firm performance, we predict that the performance effects of nonperforming loans and the failed bank dummy will be negative.

Following Ongena and Smith (2001), we specify firm scale, leverage, profitability and the number of lending relationships with banks in year t as control variables ($\mathbf{y}_{i,t}$) in equation (2). In addition, we use liquidity, main bank dependence in year t, and year and industry dummies as control variables. Our justification is as follows. Larger-sized firms are more informationally transparent firms, so they may find it easier to change their main bank relationship. We predict that the effect of firm scale is positive for a change in main bank. Highly leveraged firms are dependent on banks, so they are more likely to lock in their main bank. The estimated coefficient for leverage should be negative given the change in main bank dummy. Conversely, highly leveraged firms are risky for banks, so main banks decrease credit supply for these firms. If this effect is greater, leveraged firms are more likely obliged to change their main bank, so the coefficient for leverage should be negative for the change in main bank dummy. We predict that leverage has either positive or negative effects on the dummy variable for the change in main bank.[6]

[6]Ongena and Smith (2001) provide evidence that highly leveraged firms are more likely to change their primary bank.

Profitable firms can also change their main bank relationship more easily, so profitability has a positive effect on the dummy variable for the change in main bank. Firms with higher liquidity are less likely to default, so they may also find it easier to change the relationship with a main bank. Firms with a larger number of lending relationships do not face a lock-in problem with their main bank. As they can easily change their main bank relationship, we predict that the number of relationships has a positive effect on the change in main bank. Alternatively, if the information problem is not severe for banks lacking strong relationships with firms, the effects of the number of lending relationships can be negative or statistically insignificant. Firms that depend more on their main bank are also less likely to switch main bank, so the effects of bank dependence should be negative.

We use the natural log of total loans from the main bank as an instrumental variable. Firms that borrow large sums from their main bank cannot change the main banking relationship easily, because only a few (especially large) banks can offer large loans to substitute for the role of the main bank. Therefore, the size of loans from the main bank negatively correlates with the dummy for changing the main banking relationship. This variable is mainly determined by firm size, so it is not considered to be correlated with firm performance and $u_{i,t}$.

2.4 Results

We provide summary statistics for our variables in Table 1. The average for "Changing the Main Bank" shows that 7.1% of the sample firms changed their main banking relationship. The column headed "Change" is limited to the subsample of firms that changed their main banking relationship, while the column headed "No Change" is limited to client firms that did not change their main banking relationship. As shown, the means of NPL1, NPL2 and NPL3 in the "Change" group are large, suggesting that the main banks of firms that changed their main banking relationship had large amounts of nonperforming loans.

The firm scale, leverage, main bank dependence and number of lending relationships are smaller and statistically significant for firms that changed their main banking relationship than for those that did not. In contrast, the profitability and liquidity of firms that changed their main banking relationship are larger and statistically significant.

[Table 1 About Here]

Table 2 provides the estimation results for equations (1) and (2). We simultaneously estimate columns (1) and (4), columns (2) and (5) and columns (3) and (6) using the treatment effects model. Columns (1)–(3) detail the results of equation (2). As shown, the estimated coefficients for NPL1, NPL2 and NPL3 in columns (1)–(3) are all positive and statistically significant at the 1% level. These suggest that client firms are likely to change their main banking relationship if their main bank has a large amount of nonperforming loans. In addition, the estimated coefficients for the failed bank dummy are positive and statistically significant at the 1% level. In sum, our results suggest that client firms are more likely to change their main banking relationship if their main bank is distressed. We provide the estimation results for equation (1) in columns (4)–(6). As shown, the coefficients for changing the main bank are all positive and statistically significant at the 1% level. These results suggest that a client firm's performance (in terms of Tobin's q) improves after it changes its main banking relationship. Apart from profitability, the signs on the estimated coefficients for the control variables are consistent with our predictions.

[Table 2 About Here]

2.5 Causes of Improving Firm Performance

We find that firms that have a main bank relationship with a distressed bank are more likely to switch to a new main bank. This means that firms prefer not to have relationships with distressed main banks. Interestingly, after switching their main bank relationship,

the performance of client firms improves. This suggests that the new main bank can offer sufficient credit for client firms because any information problems are not severe for the new main bank. To check the availability of credit improves for client firms after the change in main bank relationship, we regress the change in main bank dummy on the annual change in total borrowings and interest payments. We then estimate equations (1) and (2) using the firm's total growth in borrowings [(total borrowings in year t+1 – total borrowings in year t)/total borrowings in year t] and the annual change in interest payments normalized by the amount of total borrowings [(interest payments in year t+1 – interest payments in year t)/total borrowings in year t][7] as a dependent variable in equation (1).

The results are shown in Table 3. As shown, the estimated coefficient for the change in main bank dummy given the change in interest payments is negative and statistically significant at the 1% level, implying that a client firm's cost of borrowing decreases after it changes its main banking relationship. In contrast, the coefficient for the change in main bank dummy given growth in total borrowings is positive, but not statistically significant. These results imply that credit availability for client firms improves after the change in their main bank relationship because they can retain the existing level of borrowing but also reduce the cost of borrowing. These results are inconsistent with our prediction that the new main bank cannot offer sufficient credit because the incumbent main bank has an information advantage. These results correspond with the results when we employ Tobin's q as a proxy for firm performance. [8] Our results then show that client firms change their relationship with a distressed bank to improve credit availability. Subsequently, the performance of client firms improves because of the enhancement in credit availability.

[Table 3 About Here]

[7]These variables include outliers, so we truncate the data at the 1st and the 99th percentiles of the sample.

[8]However, as the estimated ρ is statistically insignificant when using total borrowings growth as the dependent variable, the results in column (1) are not robust.

The results for the control variables show that highly leveraged and profitable firms, firms with greater liquidity, and firms with a larger number of lending relationships display decreased levels of borrowing. The cost of borrowing (interest) also increases in less creditworthy firms (that is, in highly leveraged firms and firms with low levels of profitability). In addition, the effects of nonperforming loans and the failed bank dummy for interest payments are positive. This suggests that distressed banks impose higher rates on their loans because these banks (generally those with higher credit risk) are only able to raise funds at correspondingly higher rates. Overall, the estimates for the control variables are reasonable and consistent with common intuition.

3 Conclusion

We investigate the empirical relationship between the change in the main banking relationship and client firm performance (in terms of Tobin's q) using Japanese firm-level data from the 1990s. Our findings are as follows. First, we find that client firms were likely to change their main banking relationship if their main bank suffered from the burden of nonperforming loans and went bankrupt during the 1990s. Second, we find that client firm performance improved after changing the main banking relationship. The banking literature suggests that credit availability for client firms worsens when their main bank becomes distressed because they are locked into the main banking relationship; as a result, the performance of these firms decreases. In contrast, our results show that client firms can change their relationship with a distressed main bank to improve their performance because of decrease in the borrowing cost. In addition, our findings suggest that client firms are not actually locked into a main banking relationship with distressed banks.

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Table 1: Summary Statistics

	Full Sample			Change (A)			No Change (B)			Difference	
Variable	N	mean	sd	N	mean	sd	N	mean	sd	(A–B)	
Tobin's q	7,320	1.264	0.445	523	1.275	0.502	6,797	1.263	0.440	0.012	
Changing the Main Bank	7,320	0.071	0.258	523	1.000	0.000	6,797	0.000	0.000		
NPL1	7,320	0.007	0.004	523	0.009	0.008	6,797	0.007	0.004	0.002	***
NPL2	6,798	0.033	0.016	472	0.038	0.024	6,326	0.032	0.015	0.006	***
NPL3	3,273	0.043	0.029	249	0.057	0.049	3,024	0.042	0.027	0.015	***
Failed Bank Dummy	7,320	0.045	0.207	523	0.111	0.314	6,797	0.040	0.196	0.071	***
Firm Scale	7,320	10.780	1.300	523	10.482	1.220	6,797	10.803	1.303	–0.321	***
Leverage	7,320	0.634	0.191	523	0.604	0.197	6,797	0.637	0.191	–0.033	***
Profitability	7,320	0.029	0.039	523	0.033	0.042	6,797	0.029	0.039	0.005	**
Liquidity	7,320	0.107	0.082	523	0.121	0.091	6,797	0.106	0.081	0.015	***
Main Bank Dependence	7,320	0.356	0.165	523	0.320	0.168	6,797	0.359	0.165	–0.039	***
Number of Lending Relationships	7,320	11.525	8.959	523	9.388	6.027	6,797	11.690	9.125	–2.301	***
Ln (Amount of Loans from Main Bank)	7,320	7.698	1.414	523	7.045	1.419	6,797	7.748	1.401	–0.703	***
Total Borrowings Growth	7,247	0.035	0.341	505	0.030	0.470	6,742	0.035	0.330	–0.005	
Change in Interest Payments	7,170	–0.014	0.022	497	–0.016	0.026	6,673	–0.014	0.021	–0.002	**

Note: ** indicates significance at the 5% level, *** at the 1% level.

Table 2: Estimation Results of Treatment Effects Model

	(1)	(2)	(3)	(4)	(5)	(6)
	Changing the Main Bank			Firm Performance (Tobin's q)		
Changing the Main Bank				0.5949***	0.5957***	0.5924***
				(0.0209)	(0.0212)	(0.0294)
NPL1	25.3136***			–4.5621***		
	(4.5829)			(1.3284)		
NPL2		7.1017***			–1.0973***	
		(1.2424)			(0.3425)	
NPL3			4.6923***			–1.0422***
			(0.9749)			(0.2738)
Failed Bank Dummy	0.4077***	0.3878***	0.5079***	–0.0824***	–0.0770***	–0.0478
	(0.0890)	(0.0922)	(0.1347)	(0.0249)	(0.0259)	(0.0396)
Firm Scale	0.0769***	0.0830***	0.0791**	–0.0148***	–0.0141***	0.0067
	(0.0270)	(0.0276)	(0.0385)	(0.0051)	(0.0052)	(0.0075)
Leverage	0.3386**	0.3135**	0.1282	0.4120***	0.4122***	0.5619***
	(0.1496)	(0.1552)	(0.2174)	(0.0311)	(0.0320)	(0.0432)
Profitability	–0.0810	–0.1057	–1.4700	1.8443***	1.8996***	2.7867***
	(0.6329)	(0.6661)	(0.9189)	(0.1401)	(0.1463)	(0.2070)
Liquidity	0.6790***	0.8133***	1.0460***	0.0951	0.0362	0.1153
	(0.2613)	(0.2787)	(0.3995)	(0.0662)	(0.0699)	(0.1000)
Number of	–0.0268***	–0.0264***	–0.0273***	0.0002	0.0001	0.0007
Lending Relationships	(0.0054)	(0.0055)	(0.0083)	(0.0008)	(0.0008)	(0.0012)
Main Bank Dependence	–1.4468***	–1.3279***	–1.7537***	0.3193***	0.3192***	0.2916***
	(0.1687)	(0.1731)	(0.2677)	(0.0355)	(0.0370)	(0.0520)
Ln (Amount of Loans	–0.1610***	–0.1504***	–0.1474***			
from Main Bank)	(0.0241)	(0.0248)	(0.0348)			
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,320	6,798	3,273	7,320	6,798	3,273
Log Likelihood				–5310.4	–4864.3	–2325.2
Estimated ρ				–0.722***	–0.732***	–0724***

Note: This Table provides estimates of treatment effects model with the changing the main bank dummy and firm performance (Tobin's q) as dependent variables. We describe the definitions of all variables in Section 2.3. * represents significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 3: Estimation Results of Treatment Effects Model Using Total Borrowings and Interest Payments

	(1)	(2)
	Total Borrowings Growth	Change in Interest Payments
Changing the Main Bank	0.0556	–0.0251***
	(0.049)	(0.002)
NPL1	1.2167	0.1241*
	(1.084)	(0.068)
Failed Bank Dummy	–0.0315	0.0031**
	(0.020)	(0.001)
Firm Scale	–0.0024	–0.0029***
	(0.004)	(0.000)
Leverage	–0.0523**	0.0086***
	(0.025)	(0.002)
Profitability	–0.6131***	–0.0414***
	(0.112)	(0.007)
Liquidity	–0.0014**	0.0002***
	(0.001)	(0.000)
Number of Lending Relationships	–0.2807***	–0.0104***
	(0.053)	(0.003)
Main Bank Dependence	0.0356	–0.0175***
	(0.030)	(0.002)
Year Dummy	Yes	Yes
Industry Dummy	Yes	Yes
Observations	7,247	7,170
Log Likelihood	–4051.5	16065.8
Estimated ρ	–0.093	0.538***

Note: This Table provides estimates of treatment effects model with the firm's total growth in borrowings (column (1)) and the annual change in interest payments normalized by the amount of total borrowings (column (2)) as dependent variables. We estimate the changing the main bank dummy as an endogenous variable. We describe the definitions of all variables in Section 2.3. * represents significance at the 10% level, ** at the 5% level and *** at the 1% level. The total growth in borrowings and the annual change in interest payments include outliers, so we truncate the data at the 1st and the 99th percentiles of the sample.