

Measuring the Extent and Implications of Director Interlocking in the Pre-war Japanese Banking Industry*

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Abstract

In prewar Japan, many banks were controlled by industrial companies through capital and personal relationships. Those banks are called “organ banks” (*kikan ginko*). Organ banks engaged in unsound lending to their related companies, which gave damage to the banks’ financial conditions, and consequently made the financial system unstable. This is an accepted view on the financial history in prewar Japan (organ bank hypothesis). However, this view has been based on case studies and casual observations. In this paper we examine the organ bank hypothesis using quantitative data and econometric methodology. To measure the extent of connections between banks and non-banking companies, we compile a comprehensive database of directors and auditors of banks and non-banking companies in 1926. It is found that interlocking of directors and auditors between banks and non-banking companies were very pervasive. More than 80% of ordinary banks had at least one director or auditor who was at the same time a director or auditor of at least one non-banking company. Also, regression analyses confirm that director interlocking had a negative effect on bank performance, especially for small-sized banks.

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1. Introduction

It is well known that the financial system in postwar Japan has been bank-based, and that it has been characterized by the main bank system (Aoki et al [1994]; Hoshi and

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Kashyap[2001]). On the other hand, in prewar Japan, most of the industrial investment was financed by equity, and correspondingly large shareholders played a major role in the corporate governance (Hoshi and Kashyap[2001]; Okazaki[1999, 2001]). In this sense, basically banks did not play the role of monitoring industrial companies in prewar Japan. On the contrary, many banks were controlled by the owners of industrial companies.

Those banks controlled by industrial companies are called “organ banks” (*kikan ginko*), and have been regarded as characterizing the prewar Japanese financial system, in the literature on the Japanese financial history. According to the literature, an organ bank was established to raise fund for the industrial businesses of the bank founder. Therefore, an organ bank was not managed for the profit of itself, but rather for the corporate group to which it was affiliated. Consequently, an organ bank tended to give large amount of loans to small number of industrial companies connected with the bank founder (Kato[1957]; Murakami [1983]). Also, the organ bank relationship has been regarded as a basic cause of the Showa Financial Crisis in 1927 (Teranishi[2000]; Takahashi and Morigaki [1968]; Yamazaki[2000]).

On the other hand, recent researches have made clear that this kind of bank-firm relationship (“related lending”) are widely observed in present developing countries (LaPorta et al[2003]; Beim and Calomiris[2001]). Furthermore, “insider lending” was prevalent also in US in the nineteenth century (Lamoreaux[1994]). These facts suggest that the organ bank relationship in prewar Japan is a part of the universal pattern of financial relationship in less developed financial market. In this sense, investigating the organ bank relationship can contribute not only to understanding the Japanese financial history, but also to more general

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research of the comparative financial systems and the comparative financial history (Allen and Gale[2000]; Calomiris[2000]; LaPorta et al.[1997]).

As organ bank relationship has been one of the focuses of the researches on the Japanese financial history, an extensive literature has been published since Kato's seminal work (Kato[1957]; Imuta[1966]; Sugiyama[1976]; Ishii[1999]). However, these researches are based on case studies on small number of banks, and there has been no literature which analyses the organ bank relationship quantitatively. In fact, we do not have such a basic data as how pervasive the close bank-firm relationship was in prewar Japan. There is a good reason, because it is difficult to have data indicating bank-firm relationship in prewar Japan. In this paper, we identify bank-firm relationship focusing on interlocking of directors and auditors, based on newly compiled database of directors and auditors of banks and non-banking companies in 1926. Then, using the interlocking variable, we examine the effect of director interlocking on bank performance.

The paper is organized as follows. In section 2, the historical background is summarized. In section 3, we describe the database of directors and auditors, and present basic findings derived from it. Section 4 presents econometric analyses of the influence of the interlocking of directors and auditors on bank performance. Section 5 concludes the paper.

2. A Brief Historical Background

The modern history of the banking industry in Japan started in 1872 with the National Bank Act. The national banks were private banks that were granted the privilege to issue bank notes. After the revision of the Act in 1876, suspending the convertibility of national bank

notes, the number of national banks rapidly increased to be 153, the upper limit prescribed by the National Bank Act in 1879 (Figure 1). In 1882 the Bank of Japan (BOJ) was established as the central bank, resulting in a further revision of the National Bank Act that obliged national banks to convert into ordinary banks within twenty years from their establishment (Asakura (1988) pp.36-37; Teranishi (1982) pp.35-37).

In 1893, the Bank Act was legislated as a legal framework for ordinary banks, which brought about a rapid increase of them (Figure 1). In 1901 the number of ordinary banks approached the peak. While deposits of ordinary banks grew rapidly, the ratio of deposits to banks' equity remained low until the early twentieth century (Figure 2). In 1901 equity accounted for 36% of the total liabilities of ordinary banks. Also, at the beginning of the twentieth century, ordinary banks heavily depended upon borrowings from the BOJ (Ishii[1999]). In this sense, the nature of ordinary banks was different from that of the typical modern bank based on deposits.

The ratio of deposits to the total bank liabilities increased in the 1900s. It was basically due to a change in the BOJ's policy. Until 1897, the BOJ generously gave loans to private banks, and they earned substantial profits from the interest rate spread between borrowings from the BOJ and loans to non-banking companies. In 1897 the BOJ began direct lending to non-banking companies, in order to prevent banks from earning profits from the interest rate spread (Bank of Japan [1983a], p.16). This policy change urged banks to decrease their borrowings from the BOJ and to collect deposits seriously. At the same time, the number of ordinary banks began to decrease due to failures and mergers.

In the 1910s, the First World War gave a substantial impact on the banking sector, as well as on the Japanese economy as a whole. In this period, deposits increased rapidly due to economic growth and an expansionary monetary policy. Consequently, the equity-liabilities ratios of ordinary banks fell to be less than 20% (Figure 2). In other words, the ordinary banks in Japan approached to the typical modern banks, at least in terms of the composition of liabilities .

Meanwhile, during the War boom, many ordinary banks loaned large amounts of fund to the companies expanding rapidly, especially those in the heavy and the chemical industries. In many cases, these companies were faced with difficulties when the War ended and international competition revived, which in turn, made large amount of bank loans non-performing. Because the equity-liabilities ratio of banks had substantially declined in the 1910s as mentioned above, the deterioration of the bank assets seriously damaged their financial conditions, which was the fundamental cause of the instability of the financial system in the 1920s.

Under the bank panic in 1920, many banks, especially small-sized ones, were closed down. In order to secure the stability of the financial market, the government initiated a reform of the industrial organization of the banking sector since the early 1920s, imposing regulations upon entry and promoting mergers (Goto (1991) p.19; Okazaki (2001)). However, the great earthquake in Tokyo in 1923 further destabilized the financial market. Due to the earthquake, large amount of the assets that had been collaterals for bank loans, or were expected to generate cash flows to repay the loans, were destroyed and burnt down.

In 1926, the government decided to take fundamental measures to restructure the financial system, proposing two draft laws to dispose of the bad loans. However, the Diet

opposed these drafts on the ground that they favoured capitalists connected to the government. In the Diet deliberations, the Minister of Finance made a notorious slip of the tongue concerning the closure of certain banks, which triggered the Showa Financial Crisis of 1927.

The Showa Financial Crisis was the largest crisis in the financial history of Japan. Forty five banks were closed due to bank runs. Their share in the total ordinary and savings bank was 2.91% in terms of number, and 9.02% of in terms of deposits. Among them were Jugo Bank and Taiwan Bank. Jugo Bank was one of the top ten largest banks, and Taiwan Bank was the central bank of Taiwan. The magnitude of the financial crisis can be measured by the shift of deposits from banks to the postal bureau. In 1927, while the total outstanding deposits of all banks decreased, postal deposits increased by 30.1% (Toyo Keizai Shinposha (1991) p.365, p.401).

One of the basic causes of the crisis has been said to be the organ bank relationship (Kato[1957]; Takahashi and Morigaki[1968]). There had been no effective regulation on director interlocking or the maximum loan exposure to a single customer until the Bank Law enacted in 1928. Hence, non-banking companies could control certain banks to raise fund.¹ Comprehensive data on the loans by bank and by borrower are not available, but with respect to the banks closed in the Showa Financial Crisis, the BOJ recorded the data.

Table1 reports the data of the loans which the closed banks supplied to their related groups. Panel A, reproducing the calculation of Teranishi [1982], shows that most of the closed banks engaged in the loans to the related groups connected thorough shareholding and/or director interlocking. Panel B and C compare the terms and ex post performances between the

¹ The Bank Act enacted in 1893, imposed a regulation that loans and discounts of a bank to a single customer should not be more than 10 % of the bank's capital. However, due to the objections of

related loans and the total loans.² As shown in column 5 and 6 of Panel B, the percentage of unsecured loans was larger in the related loans than in the total loans. Column 5 and 6 of Panel C show that the percentage of unrecovered loans was higher in the related loans than in the total loans. Thus, at least with respect to the banks closed under the Showa Financial Crisis, lending to related group was likely to be based on some corrupt relationship rather than on the appropriate financial judgement.³

The Bank Law of 1928 compelled ordinary banks to be joint-stock companies and have capital not smaller than one million yen.⁴ Existing banks whose capital was smaller than the minimum limit, “unqualified banks”, were obliged to clear the criterion within seven years. At the same time, ordinary banks were prohibited from business other than banking and incidental businesses. In addition, executive directors and managers of ordinary banks were prohibited from engaging in other businesses without the approval of the Minister of Finance. These regulations reflected the perception of the government that the organ bank relationship was a basic cause of instability of the financial system (Bank of Japan[1983b] pp.273-274).

3. Interlocking between Banks and Non-banking Companies

According to the Ministry of Finance [1928] (*Ginkokyoku Nenpo*, 1926 issue), the total population of ordinary banks at the end of 1926 was 1420. With respect to 1402 banks out of

bankers and industrialists, this regulation was removed in 1895 (Patrick[1967]).

² The total loans subtracted by related loans might not be equal to actual unrelated loan, since we cannot always get the data of loans to all the related groups (shareholders, bank directors, related companies). For example, the data of unsecured related loans of Imabari Shogyo Bank are available only with respect to the groups related to the bank directors.

³ Moreover, we can confirm 13 banks out of 15 banks in Table 1 had director interlocking with non-banking companies from the data of *Ginko Kaisha Yoroku*.

⁴ Bank capital was required to be not smaller than two million yen in Tokyo and Osaka, and not smaller than 500,000 yen in towns and villages with a population smaller than ten thousand.

the population, complete financial data are available in the Ministry of Finance [1928]. Figure 3 indicates the scale distribution of these banks in terms of [deposit + equity]. The vertical axis and the horizontal axis denote the logarithm of [deposit + equity] and the rank of banks in terms of [deposit + equity], respectively. The Herfindahl index of deposit was 0.019, which means that the market structure of the banking industry was highly competitive in prewar Japan.⁵

In this section, we will measure the extent of bank-firm connection with respect to ordinary banks. We approach this task by compiling a comprehensive database of the directors and auditors of banks and non-banking companies. The data source is Tokyo Koshinjo [1926] (*Ginko Kaisha Youroku*, 1926 issue). Tokyo Koshinjo, one of the largest private credit bureaus in Japan in prewar period, published *Ginko Kaisha Youroku*, every year from 1897 to 1942. We use the 1926 issue to see the bank-firm connection just before the Showa Financial Crisis in 1927. The data of 1079 banks are available in this source, 1,007 of which are common to the above 1402 banks in the Ministry of Finance [1928]. Hereafter, we use these 1007 banks as the basic samples.

From Tokyo Koshinjo[1926], we can have the names of the directors and auditors of each bank and non-banking firm whose paid-in capital was larger than twenty thousand yen. Conveniently, Tokyo Koshinjo[1926] includes the index by person. We identify interlocking between banks and non-banking companies by the following method. For example, if a person who was a director of a certain bank was at the same time a director of a certain non-banking company, we identify that there was one interlock. On the other hand, if a person who was a

⁵ Okazaki [2002] confirms the competitive market structure of the banking industry, using data of entry and exit.

director of a certain bank was at the same time directors of two non-banking companies, we identify that there were two interlocks.

Panel A of Table 2 summarizes the basic findings. As many as 836 banks, 83.0% of the total observations, had at least one director or auditor who held at least one position of director or auditor in a non-banking company. The average number of interlocking positions per bank was as large as 7.28. Panel A of Table 2 shows the data broken down by position in the non-banking companies. We classified the positions of directors and auditors into four categories, namely 1) top executives (president, chairman, etc), 2) executive directors, 3) ordinary directors, and 4) auditors.⁶ For example, those banks in which at least one director or auditor had the position of top executive of a non-banking company, numbered 407, or 40.42 % of the total observations.

Panel B through E of Table 2 show the data broken down by the position in the bank. In 48.1% of the total observations, the top executives of the banks held at least one position of director or auditor of non-banking companies, and the average number of interlocks of the banks' top executives was 1.48. Meanwhile, the percentage of banks in which at least one ordinary director had a position of director or auditor of a non-banking company was 68.6 %, and the average number of interlocks of the banks' ordinary directors was 3.49. From these results, we can safely say that most of the ordinary banks were connected with non-banking companies through the interlocking of directors and auditors.

Table 3 is a breakdown of Panel A of Table 2 by the scale of banks. We split the 1007 observations into three groups in terms of paid in capital following Teranishi (1982). The first

⁶ Some companies did not have a president or a chairman. In this case, we identified the executive director as the top executive.

point to be stressed is that the interlocking of directors and auditors with non-banking companies was pervasive across the three groups. At the same time, in relative sense, interlocking with non-banking companies was more pervasive among the large-sized banks. The percentage of banks with interlocking positions, as well as the average number of interlocks, was largest in the large-sized group. The situation is the same when we break down the data by the position in the non-banking companies. In any sub-categories of the data, both the percentage of banks with interlocking positions and the average number of interlocks were largest in the large-sized group⁷. The results derived from our database are striking. More than 80% of the ordinary banks were connected to non-banking companies through the interlocking of directors and auditors. Moreover, the interlocking was more pervasive in the large-sized banks. These facts support the conjecture of Kato [1957] concerning the pervasiveness of the organ bank relationship. However, the interlocking itself does not mean that there was an organ bank relationship in the sense discussed in section 1. It is necessary to examine in more detail the nature and influence of the interlocking shown in Tables 2 and 3.

For this purpose, we first look at the cases of the ten banks with the largest numbers of interlocks, namely Yokohama Koshin Bank (88), Bushu Bank (74), Meiji Bank (67), Yokkaichi Bank (67), Mitsui Bank (66), Mitsubishi Bank (63), Shimotsuke Chuo Bank (53), Jugo (51), Yasuda Bank (47) and Joshu Bank (43).⁸ Since it is difficult to check all the individual cases of interlocking positions, we focus on the interlocking of these banks' top executives.

⁷ When we break down the data by position in the bank, the situation is almost the same, while it is not reported.

⁸ The numbers in parentheses denote the number of interlocks.

The interlocking positions of these ten banks' top executives are listed in Table 4. As the fourth and fifth columns indicate, it is remarkable that seven of the ten banks' presidents were large shareholders of these banks. In this sense, the management of those banks was not separated from ownership. In addition, in many of the cases in which the bank presidents directed or audited non-banking companies, they were large shareholders of those companies. As in the banking industry, the management of those non-banking companies was not separated from ownership. In other words, in many cases the interlocking of directors and auditors was based on the fact that the banks and non-banking companies shared common large shareholders. This is consistent with the organ bank hypothesis.

At the same time, this implies that the nature of director interlocking between banks and non-banking companies in prewar Japan was essentially different from that in the main bank relationship in postwar Japan.⁹ In postwar Japan, the main bank, not its shareholders, dispatches its employees as directors to the borrowing companies to monitor them. In addition, "contingent governance" is a characteristic of the corporate governance with the main bank relationship. Contingent governance means that the governance of a company is contingent on its financial condition. When a company falls into a financial distress, the main bank intervenes with its management to restructure it, dispatching directors (Aoki, Sheard and Patrick (1994); Aoki (2001)). In this sense, under the postwar main bank system, the poor financial condition of a company causes the personal connection with its main bank. On the other hand, Table 4 suggests that this causality was not usual in prewar Japan, because the director interlocking

⁹ Since dispatched directors usually resign from the bank, the director interlocking we focus on in this paper is not observed in the postwar main bank system.

basically reflected the common ownership structure between the banks and non-banking companies.

4. The Influence of the Governance Structure on Bank Performance

4.1 Baseline Analysis

In this section we examine the influence of interlocking on bank performance quantitatively. The baseline analysis focuses on the bank profitability and the ability to collect deposits in 1926. The equation to be estimated is as follows.

$$X = \beta_0 + \beta_1 * \text{LN}(\text{INTERLOCK}) + \beta_2 * \text{URBAN} + \beta_3 * \text{LN}(\text{ASSET}) + \varepsilon \quad (1)$$

The dependent variable, X indicates return on assets (ROA), return on equity (ROE) or loan-deposit ratio (LOANDEPO). The loan-deposit ratio is total loans over total deposits. INTERLOCK in the right hand side denotes the number of interlocks, namely, the number of the positions of director and auditor of non-banking companies which the directors and auditors of each bank held. We use its natural log value, LN(INTERLOCK) in the estimation.¹⁰ If the organ bank hypothesis holds, the coefficient of LN(INTERLOCK) is negative, in the equation with ROA or ROE as an dependent variable, whereas it is positive in the equation with LOANDEPO as a dependent variable. In addition, two other control variables are included. URBAN is a dummy variable which equals 1 if the headquarters of the bank was located in an urban area, namely in Tokyo, Kanagawa, Aichi, Osaka, Kyoto or Hyogo prefecture, and it equals zero, otherwise. LN(ASSET) is the natural log of bank assets. We estimate equation (1)

¹⁰ The natural log value of INTERLOCK plus one is used in the estimation, since INTERLOCK sometimes takes the value zero.

by OLS, in case the dependent variable is LOANDEPO, and estimate it by Tobit, in case the dependent variable is ROA or ROE, since the profit data available from the Ministry of Finance (1928) are censored at zero.

On the other hand, it is known that largest banks such as Mitsui, Mitsubishi, Sumitomo, Yasuda and Daiichi were managed prudently (Kato[1957]). In addition, Shiratori [2002] pointed out that the connections between banks and non-banking companies through director interlocking were corrupt particularly in small local banks. Taking these points in account, we estimate the equations, separating the large and medium-sized banks from small-sized ones. We expect the negative effect of director interlocking was larger in small-sized banks than in large and medium-sized banks. In the following analysis, we define small-size banks as ones with assets of smaller than ten million yen.

Panel A of Table5 presents the estimation results of equation (1). Column 1 through 3 report the results of Tobit estimation with ROA as a dependent variable. Column 1 shows the result for the all banks. The coefficient of LN(INTERLOCK) is negative and statistically significant at 5% level, which implies that the banks with interlocking were less profitable. Column 2 reports the result for large and medium-sized banks. The coefficient of LN(INTERLOCK) is positive but statistically insignificant, which implies that director interlocking did not have a negative effect on profitability for large and medium-sized banks. Column 3 is the result for small-sized banks. The coefficient of LN(INTERLOCK) is negative and statistically significant at 5% level. Also, the magnitude of the coefficient is larger than that for all banks. These results indicate that the director interlocking had a negative effect on profitability especially for small-sized banks. Column 4 through 6 present the Tobit estimates

of equation(1) with ROE as a dependent variable. These results are qualitatively similar with those in case we use ROA as a dependent variable.¹¹

Column 7 to 9 show the OLS estimates of equation (1) with LOANDEPO as a dependent variable. Column 7 reports the result for all banks. The coefficient of LN(INTERLOCK) is positive, but it is not statistically significant. Also, if we split the samples into large and medium-sized banks and small-sized banks, the results are similar (column 8 and 9). The lack of statistical significance might be due to outliers, because, as shown in Appendix Table1, LOANDEPO has an extremely high kurtosis(605.9). Hence, we ran additional regressions eliminating 5 observations which value of loan-deposits ratio is more than 35.5(the mean plus 3*S.D.). The results are shown in Panel B of Table5. As column7 through 9 show, the coefficient of LN(INTERLOCK) is positive and statistically significant at 1% level. Furthermore, the effect of the director interlocking was large especially for the small-sized banks. Meanwhile, the results of ROA and ROE (column1-6) hardly changed from those of Panel A. Overall, the regression results support the hypothesis that director interlocking has negative effect on bank performance and it was larger for small-sized banks.

4.2 Robustness Check

There are some potential problems in the baseline analysis. In the following analyses, we address three potential problems in the baseline analysis and check the robustness of the results.

¹¹ The sign of the coefficient of the asset size is different. One possible interpretation of the difference is the shortage of profitable loan opportunities for large-sized banks, which had larger ability to collected deposits (column 7-9). Takahashi and Morigaki [1968] pointed out that many banks worried about the lack of profitable loan opportunities after the First World War.

A. Endogeneity of directors interlocking

First, it is possible that there was the inverse causality. In other words, non-banking companies might dispatch directors and auditors to the banks with poor performance to rescue and restructure them. However, there are evidences rejecting the possibility of this inverse causality. As stated in section 1, many case studies have been done on organ banks. But none of them report that non-banking companies dispatched directors and auditors to banks in order to rescue and restructure them.¹² Bank of Japan [1928] reports the histories of 20 banks closed under the Showa Financial Crisis, from establishment to bankruptcy. We can confirm that twelve banks out of the twenty failed due to more or less unsound lending related with their directors, and that there was no evidence that the non-banking companies despatched directors to those banks when performance of them became bad.

These evidences indicate that the inverse causality was not the case, but it might be useful to deal with the endogeneity problem econometrically. For this purpose, we estimate the equation (1) by IV, using the age of each bank and prefecture dummies as instrumental variables.¹³ Table 6 reports the result of IV estimation. The coefficients of LN(INTERLOCK) are basically similar to those of the baseline regressions (Table5, Panel A). It is notable that as shown in column 7 and 9, in the equations with LOANDEPO as a dependent variable, the coefficients of LN(INTERLOCK) become statistically significant when we use all banks and

¹² Shibuya[1975] investigated the causes of 213 bank failures in 1910-1915 using *Ginko Jiko Shirabe (Investigation into Bank Accident)* by the Ministry of Finance. According to Shibuya[1975], one fourth of the bank failures were related with unsound activities of bank directors.

¹³ In estimation, we ran two-stage regressions. In the first stage, INTERLOCK was regressed on bank age and prefecture dummies by OLS. In the second stage, we estimate equation (1), replacing INTERLOCK with its predicted value from the first stage. In addition, we also ran the first stage regression by Tobit and negative binominal estimation, instead of OLS, and confirmed that the results for second stage were qualitatively the same as the case we use OLS in the first stage.

small-sized banks as samples, and their magnitudes are larger than those in the baseline regressions.

B. Proxies of the strength of connection between banks and non-banking companies

In the previous analyses, we use the number of director interlocks (INTERLOCK) namely, the total number of positions of director and auditor in the non-banking companies held by the directors and auditors of each bank, as the proxy of the strength of connection between banks and companies. However, this variable might not always be the most appropriate proxy indicating the strength of connection of banks with non-banking-companies. Therefore, it is desirable to check robustness of the results using other proxies. We consider two other proxies. The first candidate is the number of non-banking companies related to each bank through the director interlocking (FIRM). The second candidate is the number of interlocks per director (INTDIRC). In other word, we normalize the number of interlocks by the total number of directors.¹⁴

Table 7 reports the estimation results of equation (1) using these two other proxies in place of LN(INTERLOCK). Panel A reports the result of estimation, when we replace LN(INTERLOCK) by the natural log of FIRM (LN(FIRM)).¹⁵ It shows that the results are qualitatively the same as those of the baseline regressions (Table 5, Panel A). Namely, the negative effect of director interlocking is observed for all banks and small-sized banks, especially in case the dependent variables are ROA and ROE, whereas it is positive but not statistically insignificant when the dependent variable is LOANDEPO. Moreover, the results in

¹⁴ We also ran regression using the number of interlocks normalized by bank assets and the natural log of bank assets, but the results were qualitatively the same as that of the baseline regression.

¹⁵ In estimation, we use LN(FIRM+1).

Panel A are slightly improved in the direction of supporting the organ bank hypothesis, in terms of the magnitude of coefficients and their statistical significance.

Panel B presents the results when we replace LN(INTERLOCK) by INTDIRC. The results in Panel B show that the coefficient of INTDIRC is negative but not statistically significant, in case the dependent variable is ROA (column 1-3). On the other hand, this coefficient is positive and statistically significant at 1% level in the equations for all banks and small-sized banks, in case the dependent variable is LOANDEPO (column 7-9). With respect to ROE (column 4-6), the results hardly change from the baseline regressions.

C. Measures of bank performance

Thus far, we focus on the financial ratios as measures of bank performance. To check robustness, we examine whether the director interlocking have negative effect on the evaluation of the bank in the financial market. As the stock price data are available for only twenty one ordinary banks, we use the data of bank runs and closures, which were analysed by Yabushita and Inoue [1993]. Yabushita and Inoue [1993] investigated the relationship between each bank's financial condition and probability of closure under the Showa Financial Crisis, and found that a poor financial condition increased the probability of closure¹⁶. Based on Yabushita and Inoue [1993], we estimate the following equation by logit model .

$$RC = \beta_0 + \beta_1 * LN(INTERLOCK) + \beta_2 * URBAN + \beta_3 * LN(ASSET) + \beta_4 * CAPDEPO + \beta_5 * LOANDEPO + \beta_6 * RESDEPO - \beta_7 * ROA + \varepsilon \quad (2)$$

¹⁶ Korenaga et al. [2001] split the series of bank closures and runs during the Showa Financial Crisis into the two waves, and confirmed that while the first wave was not a self-fulfilling withdrawal as

The dependent variables, RC, is a dummy variable, which equals 1 if the bank was closed or faced with a run in the period from 1927 to 1929, and it equals zero, otherwise.¹⁷ CAPDEPO (RESDEPO) is defined as the book value of capital (reserve) divided by total deposits. The rest of independent variables are defined in Section 4. The information on bank closures and runs was collected from various issues of *Ginko Jiko Geppo (Monthly Report on the Bank Issue)* by the Bank of Japan, reprinted in the Bank of Japan [1964].

Table 8 reports the results of logit estimation. Column 1 and 2 are the results for all banks. In column 1, the coefficient of LN(INTERLOCK) is positive but not significant.¹⁸ Column 2 shows that the coefficient is still statistically insignificant, even if we control for the financial conditions. On the other hand, the coefficient of the financial ratios are generally consistent with those of Yabushita and Inoue[1993]. Column 3 and 4 reports the results for large and medium-sized banks. They show that the director interlocking has no effect on the probability of bank closure or run for large and medium-sized banks. Finally, column 5 and 6 present the results for small-sized banks. In both cases, the coefficient of LN(INTERLOCK) are positive and statistically significant, indicating that the director interlocking increased the probability of closure and run with respect to small-sized banks, which is consistent with our hypothesis. According to the results of Table 8, director interlocking of the large and medium-sized banks was not perceived to be unfavourable by the financial market. However, for small-sized-banks,

Yabushita and Inoue[1993] argued, the second wave had an aspect of a self-fulfilling withdrawal.

¹⁷Unlike Yabushita and Inoue[1993], we focus not only on bank closures under the Showa Financial Crisis in 1927, but also on bank closures and runs in the ordinary years (1928 and 1929) in order to capture the evaluation of the financial market broadly.

¹⁸ We ran additional regressions eliminating LN(ASSET) from independent variables following Yabushita and Inoue[1993]. In this case, the coefficient of LN(INTERLOCK) is positive and statistically significant at 5% or 1% level.

director interlocking was evaluated as negative information, in addition to the poor financial condition.¹⁹

5. Concluding Remarks

More than forty years ago, Kato [1957] proposed the organ bank hypothesis, which has become one of the most basic hypotheses on the Japanese financial history, and it was consistent with looting view recently proposed (LaPorta et al.[2003]). In this paper, we examined the organ bank hypothesis, using quantitative data econometric methodology.

First, we compiled a comprehensive database of directors and auditors of banks and non-banking companies, based on the 1926 issue of *Ginko Kaisha Yoroku* (Tokyo Koshinjo [1926]). Using the database we identified the interlocking of directors and auditors between banks and non-banking companies, and found that interlocking was quite pervasive in the 1920s. In more than 80% of ordinary banks, at least one director or auditor had at least one position of director or auditor of a non-banking company, and the average number of interlocks per bank was as large as 7.28. In addition, interlocking with non-banking companies was universal in the banking industry across the scale.

Second, using the interlocking variables, we examined the influence of interlocking on bank performance. Through regression analyses, we confirm that the director interlocking had a negative effect on bank performance (profitability and ability to collect deposits), and this effect was serious especially for small-sized banks. Furthermore, it was confirmed that interlocking

¹⁹ The similar results were obtained, even if we replaced LN(INTERLOCK) with LN(FIRM) or INTDIRC

increased the probability of closures and runs for small-sized banks, which implies that the financial market negatively evaluated interlocking in small-sized banks.

In sum, business practices in the prewar Japanese banking industry, based on the connections of directors and auditors, made the banking system unsound and unstable. These findings support the organ bank hypothesis and the view that the prewar Japanese banking system suffered from looting.

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Appendix: Variable Definitions

INTERLOCK: The number of interlocks. That is, the total number of the positions of directors and auditors of non-banking companies, held by the directors and auditors of each bank.

FIRM: The number of the non-banking firms connected with the bank through director interlocking.

INTDIRC: The number of interlocks per director. That is, INTERLOCK divided by the number of directors.

ASSET: The book value of capital plus deposits. Capital is the sum of paid-in capital, reserved fund and profit

URBAN: Dummy variable which equals 1, if the bank's head office was located in Tokyo, Kanagawa, Aichi, Osaka, Kyoto, or Hyogo prefecture, and 0, otherwise.

ROA: Ratio of profit to ASSET. Profit is the profit of the second half of the fiscal year, multiplied by two.

ROE: Ratio of profit to the book value of capital. The profit is the profit of the second half of the fiscal year, multiplied by two.

LOANDEPO: Ratio of total loans to total deposits.

RESDEPO: Ratio of reserve for repaying deposits to total deposits.

CAPDEPO: Ratio of the book value of capital to total deposits.

RC: Dummy variable which equals to 1, if the bank was closed or faced with run in 1927-1929,
and 0 otherwise.

AGE: 1926 minus the year when the bank was established.

Table1 Composition of the loans of the banks closed under the Showa Financial Crisis (1927)

Panel A Size of the loans to related groups

Bank Name	Capital (million Yen)	ASSET (million Yen)	Percentage of loans to related group		
			□Shareholders	□Directors	□Related companies
Imabari Shogyo	2.50	17.5	-	28.7	-
Tokushima	0.70	8.6	9.7	-	30.9
Tokyo Watanabe	2.00	40.4	36.1	37.7	-
Nakai	5.00	53.0	2.8	-	-
Murai	5.13	68.6	25.8	-	-
Souda	2.50	24.2	9.2	-	31.1
Nakazawa	1.25	10.3	23.0	-	71.4
Hachijuyon	2.30	20.9	-	18.9	-
Toukatsu	0.40	2.4	-	30.2	-
Dai Rokujugo	6.25	36.3	22.5	5.9	-
Kurita	0.80	7.5	-	22.9	-
Oumi	9.38	147.2	-	7.7	-
Nishi Ehara	0.40	3.1	-	16.4	-
Jugo	49.75	450.6	35.8	4.5	34.0
Kasen	0.25	2.1	49.0	-	-

Panel B Comparison of the loan terms between related loans and total bank loans

	Related Loans(thousand yen)		Total bank loans(thousand yen)		Unsecured Ratio(%)	
	Unse□ured loans	All related loans	Unse□ured loans	Total bank loans	Related loans	Total bank loans
Imabari Shogyo	3,566	4,435	8,378	17,270	80.4	48.5
Tokushima	-	-	-	-	-	-
Tokyo Watanabe	-	-	-	-	-	-
Nakai	-	-	-	-	-	-
Murai	-	-	-	-	-	-
Souda	7,324	9,543	16,512	23,668	76.7	69.8
Nakazawa	10,158	11,509	10,378	12,176	88.3	85.2
Hachijuyon	-	-	-	-	-	-
Toukatsu	396	415	934	1,372	95.5	68.1
Dai Rokujugo	-	-	-	-	-	-
Kurita	751	1,209	1,718	5,920	62.1	29.0
Oumi	-	-	-	-	-	-
Nishi Ehara	400	440	1,021	2,679	90.9	38.1
Jugo	-	-	-	-	-	-
Kasen	-	-	-	-	-	-
Total	22,596	27,551	38,941	63,085	82.0	61.7

Panel C Comparison of the loan performances between relate loans and total bank loans

	Related Loans(thousand yen)		Total bank loans(thousand yen)		Unrecovered Ratio(%)	
	Uurecovered Loans	All related loans	Uurecovered Loans	Total bank loans	Related loans	Total bank loans
Imabari Shogyo	1,978	5,636	4,122	17,270	35.1%	23.9%
Tokushima	352	832	1,127	2,694	42.3%	41.8%
Tokyo Watanabe	-	-	-	-	-	-
Nakai	-	-	-	-	-	-
Murai	13,383	16,293	36,820	63,213	82.1%	58.2%
Souda	8,206	9,544	16,263	23,668	86.0%	68.7%
Nakazawa	10,896	11,509	11,032	12,176	94.7%	90.6%
Hachijuyon	3,096	3,296	8,957	17,441	93.9%	51.4%
Toukatsu	-	-	-	-	-	-
Dai Rokujugo	-	-	-	-	-	-
Kurita	-	-	-	-	-	-
Oumi	-	-	-	-	-	-
Nishi Ehara	-	-	-	-	-	-
Jugo	-	-	-	-	-	-
Kasen	445	804	489	1,642	55.3%	29.8%
Total	38,356	47,914	78,811	138,104	80.1%	57.1%

Source: Bank of Japan[1964] and Teranishi[1982].

Table 2 Interlocking of directors and auditors between banks and non-banking companies

Position in the non-banking companies	Number of banks with interlocking	Ratio to all banks	Number of cases of interlocking	Average per bank
Panel A: ALL directors and auditors of 1007 banks				
Total	836	83.0	7332	7.28
Top executive	407	40.4	967	0.96
Executive directors	158	15.7	208	0.21
Ordinary directors	753	74.8	4170	4.14
Auditors	637	63.3	1987	1.97
Panel B: Top executive of 1007 banks				
Total	484	48.1	1493	1.48
Top executive	176	17.5	285	0.28
Executive directors	27	2.7	31	0.03
Ordinary directors	365	36.2	844	0.84
Auditors	204	20.3	333	0.33
Panel C: Executive directors of 1007 banks				
Total	205	20.4	531	0.53
Top executive	30	3.0	45	0.04
Executive directors	17	1.7	20	0.02
Ordinary directors	149	14.8	284	0.28
Auditors	115	11.4	182	0.18
Panel D: Ordinary directors of 1007 banks				
Total	691	68.6	3513	3.49
Top executive	239	23.7	428	0.43
Executive directors	80	7.9	94	0.09
Ordinary directors	589	58.5	2080	2.07
Auditors	425	42.2	911	0.90
Panel E: Auditors of 1007 banks				
Total	526	52.2	1795	1.78
Top executive	132	13.1	209	0.21
Executive directors	57	5.7	63	0.06
Ordinary directors	420	41.7	962	0.96
Auditors	303	30.1	561	0.56

Source: See the text.

Table 3 Interlocking of directors and auditors between banks and non-banking company by scale of banks

Position in the non-banking companies	Classes by paid in capital	Number of observations	Number of banks with interlocking	Ratio to all banks	Average per bank
Total	Total	1,007	836	83.0	7.28
	0-1million yen	789	624	79.1	4.76
	1-10million yen	198	192	97.0	14.70
	10million yen-	20	20	100.0	33.25
Top executive	Total	1,007	407	40.4	0.96
	0-1million yen	789	247	31.3	0.58
	1-10million yen	198	140	70.7	2.03
	10million yen-	20	20	100.0	5.50
Executive directors	Total	1,007	158	15.7	0.21
	0-1million yen	789	85	10.8	0.14
	1-10million yen	198	62	31.3	0.43
	10million yen-	20	11	55.0	0.80
Ordinary directors	Total	1,007	753	74.8	4.14
	0-1million yen	789	545	69.1	2.78
	1-10million yen	198	188	94.9	8.23
	10million yen-	20	20	100.0	17.25
Auditors	Total	1,007	637	63.3	1.97
	0-1million yen	789	442	56.0	1.26
	1-10million yen	198	175	88.4	4.02
	10million yen-	20	20	100.0	9.70

Source: See the text.

Table 4 Interlocking and shareholding of the top executives of the selective banks

Name	Company Name	Position	Share of the stocks(%)	Ranking	Remarks
Tomitaro hara	Yokohama Koshin Bank	President	9.8	2	
	Hara Partnership	President	...		
	Ikeda Seishi	Ordinary director	n.a.		
	Nihon Yusen	Ordinary director	-		
	Nikka Sanshi	Ordinary director	1.2	4	
	Taisho Kaijo Kasai	Ordinary director	1.0	4	
	Toyo Seitetsu	Auditor	-		
	Yokohama Kasai Kaijo Hoken	Ordinary director	4.6	5	
Heizaburo Okawa	Yokohama Seimei Hoken	Auditor	-		
	Bushu Bank	President	2.8	1	Okawa Partnership
	Asano Semento	Ordinary director	4.5	3	Okawa Partnership
	Chosen Saitan	Ordinary director	n.a.		
	Chosen Denki Kogyo	Auditor	1.0	1	Okawa Partnership
	Chosen Tetsudo	Auditor	1.6	7	Okawa Partnership
	Chuoh Seishi	President	n.a.		
	Dainihon Jidosha	Ordinary director	n.a.		
	Enkaishu Mokuzai	Ordinary director	n.a.		
	Fuji Seishi	President	5.9	2	Okawa Partnership
	Hojo Tanko	Ordinary director	n.a.		
	Hokkaido Dento	Ordinary director	36.0	1	Fuji Seishi, personal
	Ishiwata Sureto	Auditor	1.0	8	
	Joto Denki Kido	President	3.4	4	Okawa Partnership
	Karafuto Kisen	President	32.5	1	Karafuto Kogyo, Okawa Partnership
	Karafuto Kogyo	President	7.2	1	Okawa Partnership
	Karafuto Seishigenryo	Chairman	n.a.		
	Karafuto Tetsudo	Ordinary director	53.8	1	Fuji Seishi, personal
	Keihin Unga	Ordinary director	0.8	8	Okawa Partnership
	Kumamoto Denki	Ordinary director	6.1	3	Karafuto Kogyo, Okawa Partnership
	Kumamoto Denki Kido	President	23.0	1	Karafuto Kogyo, Okawa Partnership
	Kyodo Parupu	Ordinary director	n.a.		
	Kyushu Seishi	President	12.1	1	Okawa Partnership
	Nakanoshima Seishi	Ordinary director	3.7	5	Okawa Partnership
	Nihon Feruto	Ordinary director	30.8	1	Fuji Seishi, Karafuto Kogyo
	Nihon Kakou Seishi	Ordinary director	n.a.		
	Nihon Kokan	President	4.6	3	Okawa Partnership
	Nihon Konkurito Kogyo	Ordinary director	1.0	9	
	Nihon Sakusan Seizo	Ordinary director	n.a.		
	Ninju Seimei	Ordinary director	-		
	Nisshi Tankou Kisen	Ordinary director	n.a.		
	Okawa Partnership	Representative partner	...		
	Okawa Tanaka Jimusho	President	n.a.		
	Oryokuko Seishi	Vice Chairman	28.8	2	Karafuto Kogyo, Okawa Partnership
Osaka Hoteru	Ordinary director	2.5	4	Okawa Partnership	
Oshima Seikojo	President	4.2	4	Okawa Partnership	
Otaki Kozan	Ordinary director	n.a.			
Seibu Tetsudo	Ordinary director	2.2	3	Okawa Partnership	
Shizuoka Denki Tetsudo	President	1.2	10	Okawa Partnership	
Shizuoka Denryoku	President	38.5	1	Personal, Okawa Partnership	
Teikoku Jinzo Hiryo	Ordinary director	-			
Toho Tanko	Ordinary director	n.a.			
Tokai Kogyo	President	3.8	6	Okawa Partnership	
Tokyo Chika Tetsudo	Ordinary director	1.5	5		
Tokyo Kanaami	Ordinary director	26.0	1	Fuji Seishi, Karafuto Kogyo	
Tokyowan Umetate	Executive director	5.4	4	Okawa Partnership	
Toyo Kisen	Ordinary director	1.1	3	Okawa Partnership	
Shigehiko Ikoma	Meiji Bank	President	1.5	3	
	Nagoya Hoteru	Ordinary director	n.a.		
Kazue Kumazawa	Yokkaichi Bank	President	11.2	1	
	Daido Unso	Auditor	n.a.		
	Daido Yoshiten	Auditor	-		
	Dainihon Jidosha	Ordinary director	n.a.		
	Daitai Ringyo	President	28.3	1	
	Fuji Seishi	Ordinary director	1.2	9	
	Hattori Seisakujo	Auditor	8.0	5	
	Hojo Tanko	Auditor	n.a.		
	Hokkaido Dento	Auditor	-		
	Karafuto Kisen	Ordinary director	2.8	6	
	Karafuto Kogyo	Auditor	1.7	8	
Kumamoto Denki Kido	Ordinary director	3.3	5		

	Kyushu Seishi	Auditor	3.5	6	
	Minamitaiheiyou Kogyo	Auditor	n.a.		
	Nihon Feruto	Auditor	-		
	Nihon Iou	Ordinary director	n.a.		
	Nihon Kokan	Auditor	2.3	6	
	Oigawa Tetsudo	Ordinary director	11.7	2	
	Shizuoka Denryoku	Executive director	7.8	3	
	Shizuoka Denkitetsudo	Executive director	25.4	1	
	Sumatakoyu Suiryoku Denki	Ordinary director	n.a.		
	Tokai Kogyo	Auditor	3.2	7	
	Yokkaichi Tetsudo	Ordinary director	n.a.		
Genemon Mitsui	Mitsui Bank	President	0.3	10	
	Mitsui Bussan	Representative director	-		
	Mitsui Partnership	Executive partner	...		
Manzo Kushida	Mitsubishi Bank	Chairman	-		
	Hodogaya Gorufu	Auditor	-		
	Kokusai Tsushin	Ordinary director	7.5	1	
	Meiji Seimei	Ordinary director	-		
	Mitsubishi Kaijo Kasai Hoken	Ordinary director	n.a.		
	Mitsubishi Kogyo	Auditor	3.1	2	Mitsubishi Ginko
	Mitsubishi Seitetsu	Auditor	0.2	3	Mitsubishi Ginko, personal
	Mitsubishi Shoji	Auditor	0.5	3	Mitsubishi Ginko, personal
	Mitsubishi Soko	Ordinary director	88.5	1	Mitsubishi Ginko
	Mitsubishi Zosen	Auditor	0.2	3	Mitsubishi Ginko, personal
	Tokyo Ginko Shukaijo	Chairman	...		
	Tokyo Tegata Kokanjo	Chairman	...		
	Tokyo Kaijo Kasai	Ordinary director	n.a.		
	TokyoKoshinjo	Chairman	...		
Matsujito Ueno	Shimotsuke Chuo Bank	President	-		
	Higashino Tetsudo	Auditor	-		
	Shimotsuke Seishi	Ordinary director	n.a.		
	Utsunomiya Gas	President	2.9	9	
Naruse Kyozeu	Jugo Ginko	President	-		
	Chiyoda Kasai Hoken	Ordinary director	-		
	Hodogaya Golf	Ordinary director	n.a.		
	Kawasaki Zosenjo	Auditor	-		
	Kokusai Tsushin	Ordinary director	n.a.		
	Tokkyo Ginko Shukaijo	Chairman	...		
	Tokkyo Tegata Kokanjo	Chairman	...		
Zenjiro Yasuda	Yasuda Bank	President	30.6	1	Yasuda Hozensha, personal
	Asano Semento	Ordinary director	5.4	2	Yasuda Ginko
	Toykowan Umetate	Ordinary director	21.4	2	Yasuda Hozensha
	Toyo Kasai Hoken	Advisor	22.8	2	Yasuda Hozensha
	Yasuda Hozensha	Representative partner	...		
Sohei Ozawa	Joshu Bank	President	6.3	1	
	Azumagawa Denryoku	Ordinary director	n.a.		
	Daini Azumagawa Denryoku	Ordinary director	n.a.		
	Joshin Denki	Vice president	2.5	4	
	Joshu Kenshi Boseki	Ordinary director	1.9	8	
	Joshu Unsou	Ordinary director	n.a.		
	Ozawa Shoten	Ordinary director	n.a.		
	Takasaki Soko	Ordinary director	n.a.		

Source: Our database (see the text); Toyo Keizai Shinposha[1926]; Shareholder list of each company.

Table 5 The effect of director interlocking on bank performance

Panel A: Baseline regression

Dependent Variable	ROA(Tobit)			ROE(Tobit)			Loan/Deposit(OLS)		
	ALL	Large and Medium	Small	ALL	Large and Medium	Small	ALL	Large and Medium	Small
Bank size	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
LN(INTERLOCK)	-0.246 b (-2.03)	0.139 (0.47)	-0.297 b (-2.24)	-1.258 a (-4.04)	0.047 (0.05)	-1.409 a (-4.24)	0.528 (1.28)	0.712 (0.96)	0.48 (1.03)
URBAN	-0.789 a (-3.30)	-0.002 (0)	-0.983 a (-3.65)	-1.744 a (-2.85)	-0.73 (-0.48)	-1.783 a (-2.64)	2.62 a (3.22)	2.728 b (2.13)	2.692 a (2.86)
LN(ASSET)	-0.457 a (-4.80)	-0.407 (-1.44)	-0.664 a (-4.54)	1.268 a (5.19)	-0.207 (-0.25)	2.036 a (5.54)	-0.851 a (-2.62)	-1.459 b (-2.05)	-1.19 b (-2.33)
INTERCEPT	11.351 a (8.77)	9.363 b (2.09)	14.385 a (7.10)	-3.226 (-0.97)	17.495 (1.31)	-13.889 a (-2.73)	13.16 a (2.99)	23.757 b (2.1)	17.944 b (2.54)
Log likelihood /Adj-R2	-2518.156	-355.03998	-2153.1201	-3408.093	-516.68	-2886.4695	0.011	0.020	0.011
Observations	1007	150	857	1007	150	857	1007	150	857
Censored	64	3	61	64	3	61			

Panel B: Eliminating 5 outlier observations

Dependent Variable	ROA(Tobit)			ROE(Tobit)			Loan/Deposit(OLS)		
	ALL	Large and Medium	Small	ALL	Large and Medium	Small	ALL	Large and Medium	Small
Bank size	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
LN(INTERLOCK)	-0.268 b (-2.31)	-0.043 (-0.24)	-0.296 b (-2.25)	-1.275 a (-4.11)	-0.156 (-0.18)	-1.404 a (-4.22)	0.195 a (3.79)	0.097 c (1.76)	0.200 a (3.46)
URBAN	-0.952 a (-4.13)	-0.81 a (-2.67)	-1.073 a (-3.99)	-1.846 a (-3.01)	-1.585 (-1.07)	-1.791 a (-2.64)	0.307 a (3.03)	0.156 (1.62)	0.306 b (2.60)
LN(ASSET)	-0.469 a (-5.13)	-0.011 (-0.06)	-0.688 a (-4.71)	1.232 a (5.05)	0.226 (0.28)	1.982 a (5.35)	-0.398 a (-9.88)	-0.147 a (-2.75)	-0.631 a (-9.86)
INTERCEPT	11.571 a (9.31)	3.162 (1.18)	14.738 a (7.29)	-2.661 (-0.80)	10.721 (0.82)	-13.096 b (-2.55)	6.988 a (12.75)	3.242 a (3.83)	10.258 a (11.58)
Log likelihood /Adj-R2	-2465.97	-276.22	-2137.37	-3387.74	-507.73	-2875.12	0.092	0.033	0.102
Observations	1002	149	853	1002	149	853	1002	149	853
Censored	63	3	60	63	3	60			

Notes: Significance at 1%, 5% and 10% level denoted by "a", "b" and "c".

The figures in parentheses are z-statistics (column 1-6) and t-statistics (column 7-9).

Significance levels reported for two-tail tests.

Variables: See Appendix

Table 6: The effect of director interlocking on bank performance (IV)

Dependent Variable	ROA(Tobit)			ROE(Tobit)			Loan/Deposit(OLS)		
	ALL	Large and Medium	Small	ALL	Large and Medium	Small	ALL	Large and Medium	Small
Bank size	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
LN(INTERLOCK)	-0.586 b (-2.56)	-0.394 (-0.75)	-0.691 a (-2.73)	-1.368 b (-2.31)	-0.878 (-0.56)	-1.379 b (-2.15)	1.552 b (1.98)	1.149 (0.87)	1.606 c (1.81)
URBAN	-0.641 a (-2.66)	0.098 (0.18)	-0.842 a (-3.12)	-1.271 b (-2.04)	-0.435 (-0.27)	-1.369 b (-2.00)	2.247 a (2.74)	2.138 (1.58)	2.392 b (2.53)
LN(ASSET)	-0.527 a (-6.72)	-0.314 (-1.23)	-0.758 a (-5.63)	0.786 a (3.88)	-0.113 (-0.15)	1.490 a (4.36)	-0.722 a (-2.70)	-1.25 c (-1.93)	-1.065 b (-2.26)
INTERCEPT	13.06 a (11.5)	8.922 b (2.09)	16.558 a (8.56)	4.337 (1.48)	17.73 (1.39)	-5.568 (-1.14)	9.271 b (2.39)	19.921 c (1.84)	13.923 b (2.06)
Log likelihood /Adj-R2	-2516.95	-354.87	-2151.90	-3413.54	-516.52	-2893.08	0.014	0.019	0.013
Observations	1,007	150	857	1,007	150	857	1,007	150	857
Censored	64	3	61	64	3	61			

Notes: Significance at 1%,5% and 10% level denoted by "a" "b" and "c".

The figures in parentheses are z-statistics (column1-6) and t-statistics (column7-9).

Significance levels reported for two-tail tests.

Variables: LN(INTERLOCK) is predicted value of first stage regression with instrument variables (bank age and prefecture dummy variables).

See appendix concerning the definitions of other variables.

Table 7: Effect of director interlocking on bank performance(Other proxies for bank's connection with firms)

Panel A Number of firms related through director interlocking

Dependent Variable	ROA(Tobit)			ROE(Tobit)			Loan/Deposits(OLS)		
	ALL	Large and Medium	Small	ALL	Large and Medium	Small	ALL	Large and Medium	Small
Bank size	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
LN(FIRM)	-0.297 b (-2.22)	0.162 (0.53)	-0.377 b (-2.57)	-1.640 a (-4.8)	-0.301 (-0.33)	-1.793 a (-4.87)	0.719 (1.58)	0.895 (1.16)	0.652 (1.26)
URBAN	-0.791 a (-3.31)	-0.002 (0.0)	-0.988 a (-3.67)	-1.773 a (-2.90)	-0.812 (-0.54)	-1.807 a (-2.69)	2.636 a (3.24)	2.744 b (2.15)	2.705 a (2.88)
LN(ASSET)	-0.444 a (-4.64)	-0.414 (-1.47)	-0.65 a (-4.47)	1.386 a (5.66)	-0.063 (-0.08)	2.101 a (5.76)	-0.914 a (-2.8)	-1.518 b (-2.14)	-1.228 b (-2.42)
INTERCEPT	11.196 a (8.61)	9.451 b (2.11)	14.246 a (7.07)	-4.617 (-1.39)	15.937 (1.19)	-14.546 a (-2.88)	13.89 a (3.14)	24.466 b (2.17)	18.335 a (2.61)
Log likelihood /Adj-R2	-2517.75	-355.01	-2152.35	-3404.80	-516.63	-2883.6787	0.012	0.023	0.011
Observations	1007	150	857	1007	150	857	1007	150	857
Censored	64	3	61	64	3	61			

Panel B Number of Interlocks per director

Dependent Variable	ROA(Tobit)			ROE(Tobit)			Loan/Deposit(OLS)		
	ALL	Large and Medium	Small	ALL	Large and Medium	Small	ALL	Large and Medium	Small
Bank size	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
INTDIC	-0.119 (-1.05)	-0.067 (-0.35)	-0.179 (-1.35)	-0.926 a (-3.19)	-0.31 (-0.54)	-1.037 a (-3.1)	1.393 a (3.64)	0.154 (0.31)	1.775 a (3.84)
URBAN	-0.722 a (-3.02)	-0.02 (-0.04)	-0.913 a (-3.39)	-1.35 b (-2.2)	-0.654 (-0.43)	-1.43 b (-2.11)	2.28 a (2.82)	2.496 c (1.95)	2.398 b (2.57)
LN(ASSET)	-0.526 a (-5.95)	-0.309 (-1.13)	-0.738 a (-5.25)	1.041 a (4.59)	-0.013 (-0.02)	1.741 a (4.91)	-1.144 a (-3.83)	-1.239 c (-1.79)	-1.533 a (-3.15)
INTERCEPT	12.059 a (9.59)	8.189 c (1.81)	15.149 a (7.62)	-1.184 (-0.37)	14.825 (1.1)	-10.979 b (-2.19)	17.22 a (4.05)	21.732 c (1.89)	22.398 a (3.26)
Log likelihood /Adj-R2	-2519.66	-355.09	-2154.72	-3411.14	-516.54	-2890.62	0.023	0.014	0.026
Observations	1007	150	857	1007	150	857	1007	150	857
Censored	64	3	61	64	3	61			

Notes: Significance at 1%,5% and 10% level denoted by "a" "b" and "c".

The figures in parentheses are z-statistics (column1-6) and t-statistics (column7-9).

Significance levels reported for two-tail tests.

Variables: See Appendix

Table 8 □ Logit estimation of bank closure and bank run

Bank size	ALL		Large and Medium		Small	
	[1]	[2]	[3]	[4]	[5]	[6]
LN(INTERLOCK)	0.211 (1.33)	0.248 (1.55)	-0.23 (-0.67)	-0.234 (-0.66)	0.329 c (1.82)	0.391 b (2.13)
URBAN	0.399 (1.43)	0.361 (1.26)	1.294 b (2.21)	1.158 c (1.88)	0.146 (0.43)	0.122 (0.35)
LN(ASSET)	0.329 a (3.06)	0.099 (0.81)	0.25 (0.88)	0.235 (0.81)	0.945 a (4.30)	0.576 b (2.35)
ROA		-0.213 a (-2.59)		-0.204 (-0.73)		-0.222 b (-2.48)
LOANDEPO		0.075 b (2.00)		0.078 (0.72)		0.061 (1.44)
CAPDEPO		-1.518 (-2.47) b		-1.034 (-0.55)		-1.235 c (-1.85)
RESDEPO		-1.097 (-0.8)		-0.62 (-0.13)		-1.529 (-1.06)
INTERCEPT	-8.112 a (-5.58)	-3.302 c (-1.84)	-6.3 (-1.43)	-5.244 (-1.15)	-17.214 a (-5.42)	-10.437 c (-2.85)
Log likelihood	-231.207	-218.65	-52.241	-51.36	-168.976	-160.085
Pseudo R2	0.071	0.122	0.084	0.099	0.100	0.148
Observations	1007	1007	150	150	857	857

Notes: Significance at 1%, 5% and 10% level denoted by "a" "b" and "c".

The figures in parentheses are z-statistics.

Significance levels reported for two-tail tests.

Variables: See Appendix

Appendix Table1

PanelA: Dependent variables

(1)All sample

	ROA	ROE	LOANDEPO
Mean	4.11	13.28	2.11
Std. Dev.	3.20	7.92	11.13
Min	0.00	0.00	0.00
Max	40.37	73.22	310.45
Skewness	2.94	1.92	23.08
Kurtosis	24.34	12.97	605.09
Obs	1007	1007	1007

(2)Excluding 5 outlier observations

	ROA	ROE	LOANDEPO
Mean	4.07	13.28	1.49
Std. Dev.	3.09	7.88	1.44
Min	0.00	0.00	0.00
Max	40.37	73.22	19.14
Skewness	2.80	1.93	7.86
Kurtosis	24.20	13.16	68.72
Obs	1002	1002	1002

PanelB: Independent Variables

	Observations	Mean	Std. Dev.	Min	Max
INTERLOCK	1007	7.28	10.06	0.00	88.00
FIRM	1007	5.60	7.76	0.00	66.00
INTDIRC	1007	0.85	1.06	0.00	7.44
URBAN	1007	0.26	0.44	0.00	1.00
CAPDEPO	1007	1.04	7.06	0.04	195.10
RESDEPO	1007	0.20	1.65	0.00	52.14
AGE	1007	26.72	11.56	0.00	53.00
ASSET	1007	11.00	47.50	0.06	770.00