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

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Abstract

Economic historians have long accepted the view that in prewar Japan, many of the banks were closely connected with certain industrial companies, and those banks loosely gave loans to the connected companies. However, there has been no attempt to test this view quantitatively. In this paper, we measured the extent and implications of the director interlocking in the prewar banking industry, through compiling a comprehensive database of company directors and auditors in 1926. We found that interlocking of directors and auditors between banks and non-banking companies was very pervasive. Nearly 90% of ordinary banks had more than one directors or auditors who were at the same time directors or auditors of non-banking companies. Also, through regression analyses, we found that those banks with interlocking were less profitable and had riskier financial structures, and that interlocking increased the probability of bank closure and bank runs.

1. Introduction

As a result of the Asian financial crisis in 1997, corporate governance has recently attracted the attention of researchers as well as the policy authorities. Much of the literature on the Asian crisis focuses specifically on the exploitation of minority shareholders by core members of family-based companies (Claessens et al. (1998); Lang (2001)). We argue that family-based companies do not always exploit minority shareholders, because the companies affiliated to major zaibatsu in pre-war Japan basically outperformed other companies in terms of ROE (Okazaki (1999); Okazaki (2001)). However, the existence of major zaibatsu such as Mitsui and Mitsubishi was only one aspect of the pre-war Japanese corporate system. Besides the major zaibatsu, many small and medium-sized corporate groups based on families existed.

In relation to corporate groups other than the major zaibatsu, it is widely accepted by economic historians that banks were personally connected with industrial companies. According to the accepted view these "organ banks" (kikan ginko) freely loaned funds to the connected companies, which turned out to be bad loans *ex post*. This problem of the organ bank is considered to be the major cause of the Showa Financial Crisis in 1927, (Kato (1957); Yamazaki (2000); Teranishi (2000)).

If this accepted view, hereafter referred to as the organ bank hypothesis, is the case, the minority shareholders and depositors of the organ bank were exploited by the core members of

the corporate group, composed of the bank and industrial companies. In this sense the Showa Financial Crisis of 1927 was a precursor of the Asian Financial Crisis in 1997. Investigating this organ bank hypothesis, which is the basic motivation of this paper, is important not only because it is relevant to the contemporary governance issue in Asian economies, but also because it concerns the most fundamental hypothesis on pre-war Japanese financial history.

The concept of the "organ bank" was first emphasised by Kato (1957), who suggested that the organ bank was established in order to raise funds for the industrial businesses of the bank founders. Therefore the organ bank was not managed for the profit of the bank itself, but for the corporate group in which it was included. Consequently, the organ bank tended to give large numbers of long-term loans to the small number of industrial companies that were connected with the bank founders (Sugiyama (1976); Murakami (1983)).

As mentioned above, the organ bank relationship has been regarded as a major cause of the Showa Financial Crisis. For example, just after the crisis, the Bank of Japan (BOJ) wrote in its research report that the fundamental cause of the bankruptcy of the banks was the weakness of industrial organization and the banking system. The BOJ pointed out the unsound practices of the banks. The bank directors participated in other businesses, using the bank as an instrument for financing these other businesses. In addition, because loan policy was based on personal connections, the banks gave large numbers of loans to certain persons or companies without

reliable collateral (Bank of Japan (1933), p.984). Takahashi and Morigaki (1968), one of the

most well known books on the Showa Financial Crisis, identified the organ bank relationship as

a major cause of the crisis.

After Kato's seminal work, research has progressed in two directions. The first direction

involves case studies of the organ bank relationship. In the 1960s and 1970s the focus of this

research was the function of the banks affiliated to major zaibatsu. Kato (1957) argued that most

banks in pre-war Japan, including those affiliated to major zaibatsu, had the characteristics of

the organ bank. On the other hand, Shibagaki (1965) stressed that the zaibatsu-affiliated banks

did not give substantial loans to the core companies in the same zaibatsu groups. Following the

contributions of Imuta (1966) and Sugiyama (1976), it has come to be the consensus that, apart

from exceptional periods, the zaibatsu-affiliated banks were not the organ banks of zaibatsu in

Kato's sense (Murakami (1983)). Concerning non-zaibatsu banks, Imuta (1976), Ishii (1999)

and Yamazaki (2000) investigated the cases of several typical organ banks, based on the

research by the BOJ and the original documents.

The second research direction involves statistical analysis of bank performance. Imuta

(1976b) classified banks into several groups by scale and location, and compared the basic

financial indices across those groups. He found that the financial conditions of the medium-

sized banks in the city areas were relatively bad. They were characterized by high loan-deposit

ratios, high borrowing-deposit ratios and so on. Teranishi (1982) reported similar results, using a more comprehensive data set. Yabushita and Inoue (1993) analysed the influence of bank performance on bank closure in 1927. Through probit analysis of bank closures, they found that low equity-deposit ratios, high loan-deposit ratios and low ROE increased the probability of bank closure.

Based on the above brief survey, in this paper we try to integrate the two clusters of research following Kato (1957). We first objectively measure the extent of the connection between banks and non-banking companies. As explained in detail later, we compile a comprehensive database of the directors and auditors in 1926, just before the Showa Financial Crisis. From this, we identify the extent of interlocking of directors and auditors, that is, when one individual holds multiple director or auditor positions in banks and non-banking companies. This is the first attempt to quantitatively measure the extent of the bank-firm connection in pre-war Japan. Next, using the data on interlocking, we examine the influence of the interlocking on bank performance to test the organ bank hypothesis.

The paper is organized as follows. Section 2 briefly addresses the pre-war history of the Japanese banking industry. In section 3, we explain our database of directors and auditors as well as the findings derived from it. Section 4 econometrically analyses the influence of the interlocking of directors and auditors on bank performance. Section 5 concludes the paper.

2. A brief history of the pre-war banking industry

The modern history of the banking industry in Japan began in 1873 with the National Bank Act. National banks were the private banks that were privileged to issue bank notes. After the revision of the Act in 1876 to suspend convertibility of national bank notes, the number of national banks rapidly increased to 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 transform 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 to provide a legal framework for ordinary banks, which brought about a rapid increase in the number of such banks (Figure 1). In 1901 the number of ordinary banks approached the peak of the pre-war period, which was in 1890. While deposits of ordinary banks increased rapidly, the ratio of deposits to banks' equity remained low until the early twentieth century (Figure 2). In fact, equity accounted for 36% of the total liabilities of ordinary banks in 1901. In other words, lending their own funds was still a substantial part of the ordinary banks' activities in those days, and in this sense the nature of the banks was substantially different from that of the modern banks based on deposits.

The ratio of deposits increased remarkably in the 1900s due to a change in the BOJ's policy. Until 1897 the BOJ freely gave loans to the private banks. As a result, many ordinary banks depended heavily on borrowings from the BOJ, and earned profits from the interest rate spread between borrowings from the BOJ and loans to private companies. In 1897 the BOJ started lending to non-banking companies and individuals, in order to prevent the banks from earning profits from the interest rate spread (Bank of Japan (1983a) p.16). This policy change pushed ordinary banks to decrease borrowings from the BOJ and to seriously seek deposits. At the same time, the number of ordinary banks began to decrease, many closing due to bankruptcy in the bank panics in 1901 and 1907.

In the 1910s, the First World War had a substantial influence on the banking industry as well as on the Japanese economy as a whole. In this period deposits increased rapidly, due to the expansion of the economy and expansionary monetary policy. Consequently, the equity-liabilities ratios of the ordinary banks decreased to be less than 20% (Figure 2). In other words, the nature of the ordinary bank came close to the modern bank based on deposits, at least in terms of the liabilities composition.

On the other hand, many ordinary banks loaned large amounts to companies that rapidly expanded, especially heavy industries and the chemical industry, in the boom during the War. In many cases those companies were faced with difficulties when the War ended and international

competition renewed, which, in turn, meant that the bank loans became bad credit. Because, as mentioned above, the equity-liabilities ratio had decreased in the 1910s, the deterioration of their assets seriously damaged the banks' financial conditions, which came to be the basic cause of the instability of the financial market in the 1920s.

During the bank panic in 1920 many banks, especially small-sized banks, were closed. To secure stability of the financial market, the government initiated reform of the industrial organization of the banking industry in the early 1920s by regulating entry and promoting mergers (Goto (1991) p.19; Okazaki (2001)). However, the huge earthquake in Tokyo in 1923 made the financial market still more unstable. The earthquake destroyed or burnt down large numbers of assets that were the collateral of the bank loans, or were expected to produce cash flow to repay the loans.

In 1926 the government intended 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 discussion at the diet, a notorious slip of the tongue by the Minister of Finance concerning the closure of certain banks caused the financial crisis in 1927.

The Showa Financial Crisis was the largest crisis in the financial history of Japan. Forty-five banks were closed due to bank runs. The closed banks made up 2.91% of the total number

of ordinary and savings banks, and accounted for 9.02% of total deposits. Among the closed

banks was Jugo Bank, which was one of the top ten banks and had transactions with the

Imperial Family. In addition, Taiwan Bank, the special bank for developing Taiwan as well as

the central bank of Taiwan, closed. 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).

In 1928, after the Crisis, the Bank Law was enacted, compelling ordinary banks to have

the form of a joint-stock company and hold more than one million yen in capital.[1] The existing

banks whose capital was under the lower limit—unqualified banks—were obliged to clear it

within seven years. At the same time, the ordinary bank was prohibited from businesses other

than those relating to banking. In addition, the executive directors and managers of ordinary

banks were prohibited from other businesses. The restriction of the subsidiary businesses of the

bank itself and its executive directors and managers reflected the government's recognition that

the organ bank relationship was the basic cause of the unsound financial system.

3. Interlocking between the banks and the non-banking companies

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[1] Bank capital was required to be two million yen in Tokyo and Osaka, and 500,000 yen in towns
and villages with a population smaller than ten thousand.

According to the Ministry of Finance (1928), there were 1,420 ordinary banks at the end of 1926. Financial data for 1,402 of these are available in the Ministry of Finance (1928). Figure 3 indicates the distribution of these banks in terms of [deposit + equity]. The vertical axis denotes the logarithm of the [deposit + equity], and the horizontal axis denotes the rank of banks in terms of [deposit + equity]. The Herfindahl index of deposit was 0.019, which means the market structure of the banking industry was highly competitive in pre-war Japan.[2]

We measure the extent of bank-firm connections concerning those ordinary banks. We approach this task by compiling a comprehensive database of the directors and auditors of banks and non-banking companies. The source of the data on the directors and auditors is Shogyo Koshinjo (1926) (*Zenkoku Shogaisha Yakuinroku*, 1926 issue). Shogyo Koshinjo, the first private credit bureau in Japan, published *Zenkoku Shogaisha Yakuinroku* every year from 1893 to 1944. *Zenkoku Shogaisha Yakuinroku* is remarkable, not only because it continued to be published for a long time, but also because it contains rich information on wide-ranging companies (Yui and Asano (1989)). It covers a large number of banks, non-banking joint-stock companies, and non-banking partnership companies. In addition, it provided information on the company name, establishment year, capital, and names and addresses of the directors, auditors and major employees.

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[2] Okazaki (2001) confirms the competitive market structure of the banking industry, using data on entry and exit.

Several previous studies have extensively utilized *Zenkoku Shogaisha Yakuinroku*.

Wada, Kobayakawa and Shiomi (1992a), (1992b), (1993), and Kobayakawa, Suzuki and Wada

(1999a), (1999b), compiled databases of directors based on the 1898, 1907 and 1918 issues of

the *Zenkoku Shogaisha Yakuinroku* to identify the networks of directors and investors. Using

the database of Kobayakawa, Suzuki and Wada (1999a), Miwa and Ramseyer (2000) analysed

the monitoring function of the "prominent directors", namely those who had the post of director

in multiple companies, focusing on the case of the cotton spinning industry in the late

nineteenth century.

However, in this paper we focus on the interlocking connections of the directors and

auditors between banks and non-banking companies. In addition to identifying the interlocking

connections, we examine the influence of this interlocking on bank performance. Since our

primary motivation is to test the organ bank hypothesis, we select 1926 as the object year, just

before the Showa Financial Crisis, which has been supposed to be caused by the organ bank

relationship. For this purpose, we newly compiled a database of the directors and the auditors,

based on the 1926 issue of *Zenkoku Shogaisha Yakuinroku*.

There are data for 16,558 companies, including banks, in Shogyo Koshinjo (1926). Of

these companies 15,060 were located in the present territory of Japan and the other 1,498 were

located in Karafuto, Taiwan, Korea, Manchuria and other foreign countries. Out of the 15,060

companies in the present territory, 1,427 were banks, 11,578 were non-banking joint-stock companies, and 2,055 were non-banking partnership companies. We can check the coverage of Shogyo Kishinjo (1926) by comparing the above number of observations with the number of companies in the Ministry of Industry and Commerce (1928) (*Kaisha Tokeihyo*, 1926 issue). *Kaisha Tokeihyo* consists of corporate statistics edited by the Ministry of Industry and Commerce, based on the census survey.

According to the Ministry of Industry and Commerce (1928), there were 36,068 companies, including banks, in Japan at the end of 1926 (Table 1). 1,506 of these companies were banks, 16,251 were non-banking joint-stock companies, and 18,311 were non-banking partnership companies. Therefore, the coverage ratio of Shogyo Koshinjo (1926) is 41.8 % (15,060/36,068) in terms of the total number of companies. The coverage ratio of banks and the non-banking joint-stock companies are as high as 94.8% and 71.2% respectively. On the other hand, the coverage ratio of non-banking partnership companies is 11.2 %. The low coverage ratio of non-banking partnership companies is a weakness of Shogyo Koshinjo (1926), especially for research on the family-based companies. However, according to the Ministry of Industry and Commerce (1928), in terms of capital, the share of non-banking partnership companies was only 10.4% of the total, which might mitigate the weakness.

From the common set of ordinary banks in Shogyo Koshinjo (1926) and the above 1,402

banks in the Ministry of Finance data (1928), we have 1,199 samples. Table 2 shows the basic

statistics of these samples. CAPDEP (=equity/deposit) and LOANDEP (=loan/deposit) indicate

solvency. RESDEP (=reserve/deposit) is an index of liquidity as well as solvency. The

maximum values of CAPDEP (188.56) and the excess kurtosis (433.6) suggest that there are

outliers in the observations. We then excluded 9 of the 1,199 observations for which CAPDEP

is over 9.4 (the average plus one S.E.) as outliers. The basic statistics of the remaining 1,190

samples are in Table 2.

To identify the interlocking positions between banks and non-banking companies, we

arranged the data of the directors and auditors by person. 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. Meanwhile, if a person who was a director of a certain

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

two interlocks. In addition, to deal with the problem of the same family and personal name, we

utilize the information of the address by prefecture.

Table 3-a summarizes the results. There were as many as 1,030 banks, or 86.6% of the

total observations, with directors or auditors who held the post of directors or auditors in the

non-banking companies.[3]. Further, the average number of interlocking positions in each bank was 7.80. Table 3-a shows the data broken down by the position in the non-banking companies. We classified the positions of directors and auditors into four categories, namely 1) top executive (president, chairman, etc), 2) executive director, 3) ordinary director, and 4) auditor.[4] For example, those banks in which at least one director or auditor had the post of top executive of a non-banking company, numbered 549, or 46.1% of the total observations.

Tables 3-b, 3-c, 3-d, and 3-e show the data broken down by the position in the bank. In 43.3% of the observations, the top executives of the banks had the position of director or auditor of the non-banking companies, and the average number of interlocks of the banks' top executives was 2.11. Meanwhile, the percentage of banks in which at least one ordinary director had the position of director or auditor of the non-banking companies, was 71.7%, and the average number of interlocks of the banks' top executives was 3.78. From these results, we can safely say that most of the ordinary banks were connected with non-banking companies through the interlocking of the directors and auditors.

Table 4 is a break down of Table 3 by the scale of banks. We split our 1,190 observations into three groups in terms of paid in capital following Teranishi (1982). The first point to be stressed is that interlocking of directors and auditors with non-banking companies

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[3] If we use the data of Shibuya et al. (1983), the ratio is 58.8%. See Appendix.
[4] Some companies did not have a president or a chairman. In this case, we identified the executive

was pervasive across the three groups. At the same time, relatively speaking, interlocking with

non-banking companies was more pervasive in the large-sized banks. The percentage of the

banks with interlocking positions, as well as the average number of interlocks, was largest in the

large-sized banking group. The situation is the same when we break down the data by the

position in the non-banking companies. In any sub-category of the data, both the percentage of

banks with interlocking positions and the average number of interlocks were largest in the large-

sized group (Table 4-a). In addition, when we break down the data by the position in the bank,

the situation is almost the same (Table 4-b, 4-c, 4-d, 4-e).

Results derived from our database are really striking. Nearly 90% of the ordinary banks

were connected to the non-banking companies through the interlocking of directors and

auditors. Moreover, the interlocking was more pervasive in the large-sized banks. These facts

are consistent with the conjecture of Kato (1957) concerning the pervasiveness of the organ

bank relationship. However, the interlocking itself does not mean the 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 indicated in Tables 3 and 4.

For this purpose, we focus on the cases of the ten banks with the largest number of

interlocks: Yokohama Koshin Bank (81), Bushu Bank (71), Mitsui Bank (70), Shimotsuke Chuo

director as the top executive.

Bank (65), Joshu Bank (64), Mitsubishi Bank (64), Meiji Bank (64), Yasuda Bank (63), Yokkaichi Bank (54), and Enshu Bank (52).[5] Since it is difficult to check all the cases of the interlocking positions, we concentrate on the interlocking of these banks' top executives.

The interlocking of these ten banks' top executives is listed in Table 5. As the fourth and fifth columns indicate, it is remarkable that eight of the ten bank presidents were large shareholders of the 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 the non-banking companies, they were large shareholders of those companies. Like their counterparts in the banking industry, management of those non-banking companies was not separated from ownership. In other words, many cases of the interlocking of the directors and auditors were based on the condition that there were common large shareholders on both sides of banks and non-banking companies, which is consistent with the organ bank hypothesis.

At the same time, it implies that the nature of the director interlocking between banks and non-banking companies in pre-war Japan was essentially different from that in the main bank relationship in post-war Japan.[6] In post-war Japan a main bank, not its shareholders, dispatches directors to the companies to monitor them. In addition, "contingent governance" is

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[5] The numbers in parentheses denote the number of interlocks.
[6] Since the dispatched directors usually resign from the bank, the interlocking of the pre-war Japan type does not occur in the post-war main banking system.

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characteristic of the corporate governance in the Japanese system incorporating the main bank relationship. Contingent governance means that the governance of a company is contingent on its financial condition. When a company falls into financial distress, its main bank intervenes with the management to restructure it by dispatching directors (Aoki, Sheard and Patrick (1994); Aoki (2001)). In this sense, under the post-war main bank system, the causality between the financial condition and personal connection is from the former to the latter. On the other hand, Table 5 suggests that such causality was not universal in pre-war Japan, because the interlocking positions basically reflected the common ownership structure between the banks and non-banking companies.

We can support this view by a couple of cases in Table 5 on which biographical information of the bank presidents is available. The president of Yokohama Koshin Bank, Tomitaro Hara, was a president of Hara Partnership, a major silk export company (Yokohama City ed. (1965) p.383). Hara held five positions as an ordinary director and three positions as an auditor in the non-banking companies, other than Hara Partnership. He not only owned Hara Partnership, but was also a large shareholder of the companies he directed or audited. He was the second largest shareholder of Yokohama Koshin Bank (Table 5). Yokohama Koshin Bank was established in 1920 to liquidate Nanajushi Bank, which was closed during the financial crisis of that year. Nanajushi Bank was a typical organ bank whose president was Sobei Mogi,

the president of Mogi Partnership, another major silk export company. In the 1910s Mogi

Partnership raised funds, mainly from Nanajushi Bank, to expand its business, which resulted in

the bankruptcies of both (Yokohama City ed. (1971) p.679). The capital of Yokohama Koshin

Bank was financed by the major business people in Yokohama, including Tomitaro Hara, who

became the first president of the bank.

The president of Bushu Bank, Heizaburo Okawa, had relationships with a great many

companies (Table 5), but his central business was the paper and pulp industry. He established a

paper company Karafuto Kogyo in 1914, and then in 1919 took over Fuji Seishi, the second

largest paper company. When the president of Bushu Bank, a cousin of Okawa, fell ill, he took

over this position in 1920 (Takegoshi (1936) p.303, p.323-327, p.369-370). At the same time,

Okawa was the top shareholder of Bushu Bank (Table 5).

4. The influence of the governance structure on bank performance

In this section we examine the influence of interlocking on the bank's performance

quantitatively. First, the relationship between the interlocking and the bank's financial condition

in 1926 is checked by equation (1).

$$X = \beta_1 * INTERLOCK + \beta_2 * FORM + \beta_3 * URBAN + const. + \varepsilon \qquad (1)$$

X denotes the variables indicating the bank's financial condition, namely CAPDEP, LOANDEP,

RESDEP or ROA. The notations of the variables are the same as those in Section 3. INTERLOCK denotes the number of interlocks, namely, the number of director and auditor posts of non-banking companies which the directors and auditors of each bank occupied. In addition, we use two control variables. FORM is a dummy variable, which equals 1 if the bank was a joint-stock company, otherwise it equals 0. URBAN is a dummy variable, which equals 1 if the headquarters of the bank were located in an urban area, namely in Tokyo, Kanagawa, Aichi, Osaka, Kyoto or Hyogo prefectures. Otherwise it equals 0.

Equation (1) is estimated by OLS except in the case of ROA. Since the profit data available from the Ministry of Finance (1928) are censored, the equation with ROA as a dependent variable is estimated using a tobit model. As reported in Table 6, the coefficients of INTERLOCK are negative and statistically significant in the equations with CAPDEP and ROA as dependent variables, which implies that those banks with interlocking were less profitable and had riskier financial structures.

Poor financial condition itself might lower the valuation of the bank in the financial market. In fact, Yabushita and Inoue (1993) examined the relationship between each bank's financial condition and the probability of its closure under the financial crisis in 1927 and found that a poor financial condition increased the probability of closure. Based on Yabushita and Inoue (1993), we estimated the following equations (equations (2)　(5)).

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$$CLS = \Pi (\gamma_1 * INTERLOCK + \gamma_2 * FORM + \gamma_3 * URBAN + const. + \varepsilon) \qquad (2)$$

$$RUN = \Pi (\gamma_4 * INTERLOCK + \gamma_5 * FORM + \gamma_6 * URBAN + const. + \varepsilon) \qquad (3)$$

$$BCON = \Pi (\gamma_7 * INTERLOCK + \gamma_8 * FORM + \gamma_9 * URBAN + const. + \varepsilon) \qquad (4)$$

$$BCON = \Pi (\gamma_{10} * INTERLOCK + \gamma_{11} * FORM + \gamma_{12} * URBAN + \gamma_{13} * CAPDEP$$

$$+ \gamma_{14} * LOANDEP + \gamma_{15} * RESDEP + \gamma_{16} * ROA + const. + \varepsilon) \qquad (5)$$

$\Pi(\cdot)$ is a logistic cumulative distribution function. CLS is a dummy variable, which equals 1 if

the bank was closed in the period from 1927 to 1929, otherwise it equals 0. RUN is a dummy

variable which equals 1 if a run on the bank occurred in the period from 1927 to 1929, while

BCON is a dummy variable which equals 1 if CLS or RUN is 1, otherwise it equals 0.

The information on bank closure and bank 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). Unlike Yabushita and Inoue (1993), we focus not only on bank closures under the

financial crisis, but also on bank closures and runs in the ordinary period.

The results of the Logit estimation are reported in Table 7. In equations (2), (3) and (4)

the coefficients of INTERLOCK are positive and statistically significant at the 1% level. These

results indicate that the interlocking lowered the valuation of the bank in the financial market.

Also, in equation (5), we find that low CAPDEP, high LOANDEP, low RESDEP, and low ROA

increased the probability of bank closure or of a bank run, which confirms Yabushita and Inoue

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(1993). At the same time, in equation (5) the coefficient of INTERLOCK is positive and statistically significant at the 5% level, which means that the interlocking was evaluated as additional negative information adding to the poor financial indices in the financial market.

Finally, we examine the valuation of the banks in the financial market by different data, namely the interest rate data by bank. In Toyo Keizai Shinposha (1928), the profit and loss accounts of 115 banks are available, of which 114 are common to our samples. Although there might be a sample selection bias, it is the second best solution under the constraint of data availability.

We regress the interest rates of deposit and loan to INTERLOCK. As reported in Table 8, in the equation with the deposit interest rate as a dependent variable, the coefficient of INTERLOCK is positive and statistically significant, which implies that the market evaluated the deposits of the banks with interlocking as relatively risky. On the other hand, in the equation with the interest rates of loan as a dependent variable, the coefficient of INTERLOCK is not statistically significant. While the banks with interlocking had to pay risk premiums to the depositors to gather deposits, they could not earn higher interest rates from their loans. In other words, the profit margins of those banks were relatively small, which is consistent with the results in Table 6.

5. Concluding remarks

More than forty years ago, Kato (1957) posed the organ bank hypothesis, which has been one of the most basic hypotheses on the financial history of pre-war Japan. In this paper, we tested the organ bank hypothesis using quantitative data and econometric methodology.

First, we compiled a comprehensive database of company directors and auditors, based on the 1926 issue of *Zenkoku Shogaisha Yakuinroku* (Shogyo Koshinjo (1926)). Using the database we identified the interlocking of directors and auditors between banks and non-banking companies, and found that it was pervasive. In nearly 90% of ordinary banks, at least one director or auditor had the position of director or auditor of non-banking companies, and the average number of interlocking connections per bank was as large as 7.80. In addition, observing banks by scale, we found that the interlocking with non-banking companies was universal across the bank scale.

Second, using the interlocking variables, we examined the influence of the interlocking of the directors and auditors on bank performance. Through regression analyses we found that those banks with interlocking were less profitable and had riskier financial structures, and that interlocking increased the probability of bank closure and bank runs. Further, the interest rates of the deposits of those banks with interlocking were relatively high, which implies that the financial market negatively evaluated the interlocking.

Our findings support the organ bank hypothesis. In pre-war Japan the business practices of the bank, based on the connection of the directors and auditors, made the banking system unsound, and eventually caused the Showa Financial Crisis in 1927. In this sense, as we mentioned in Section 1, the Showa Financial Crisis was a precursor of the Asian Crisis in 1997.

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Appendix: Analysis of the list of large asset holders

In section 3, we made it clear that as many as 86.6 % of the total number of observed

banks had at least one director or auditor who held the post of director or auditor of a non-

banking company. We can compare this with the data of Shibuya et al. (1983), which contains

the data of large asset holders whose assets were over 500 thousand yen. Since the data include

names, addresses, occupations and positions in the companies of the large asset holders in 1917,

we can calculate how many bank directors and auditors with large assets had the post of

directors or auditors in non-banking companies. The result is shown in Table A. 58.8% of bank

directors and auditors held at least one position as director or auditor of a non-banking

company, which indicates that the results in Table 7 are plausible.

Figure1 Number of banks

Legend:
- Savings bank
- Ordinary bank
- Agricultural and industrial bank
- Special bank
- National bank
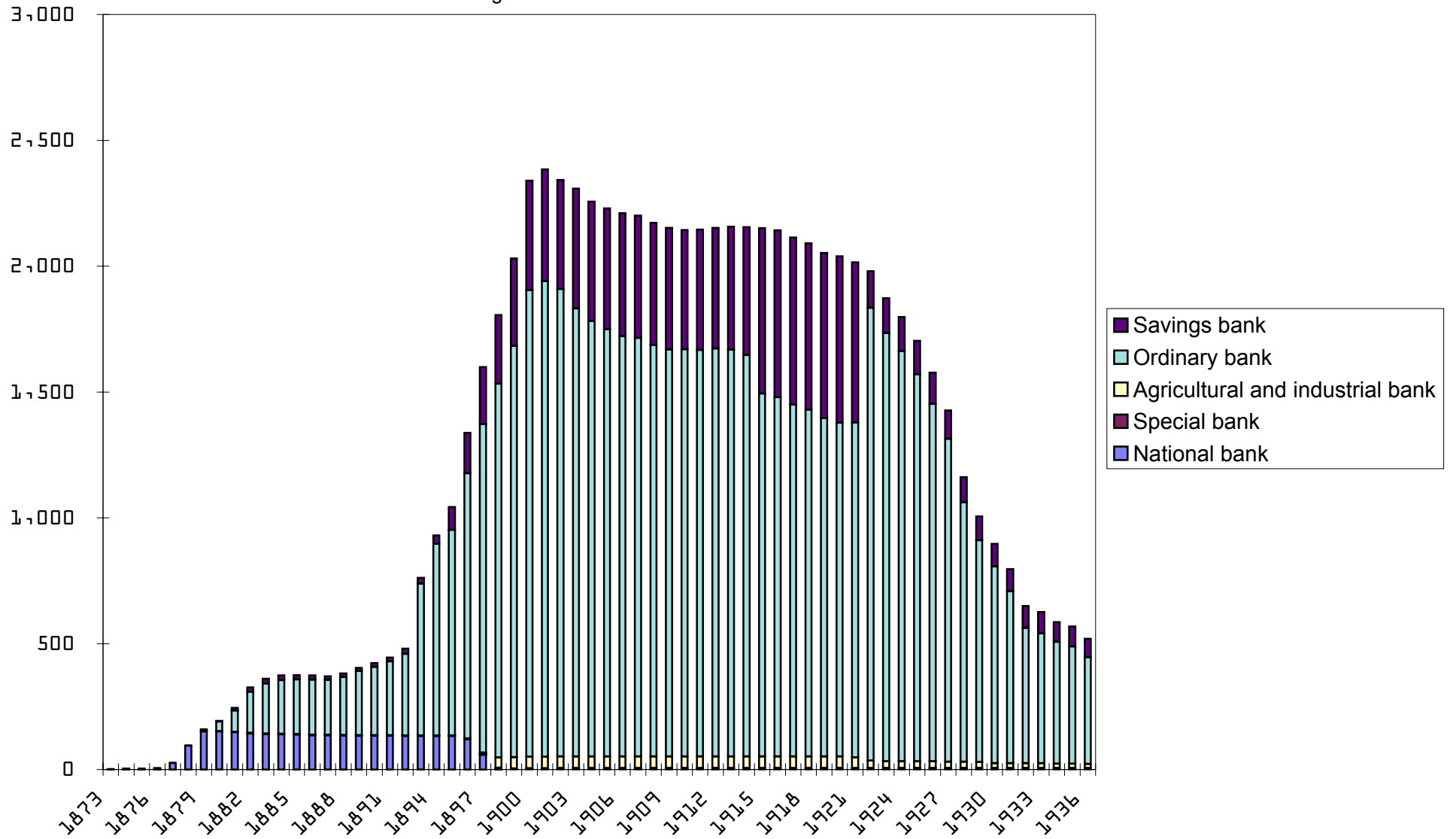
Figure2 Composition of bank

Figure 3   Scale distribution of the ordinary banks
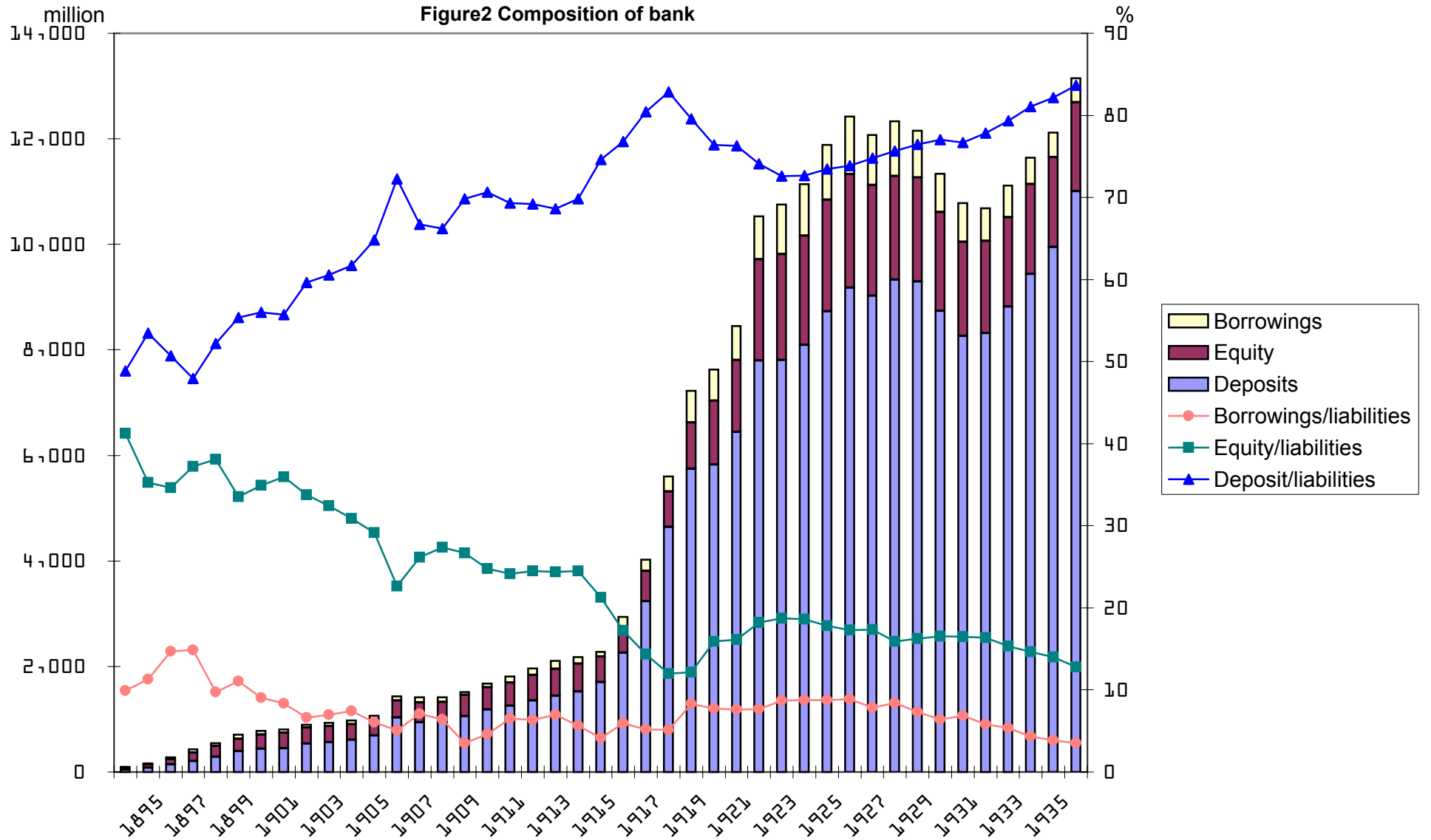
Logarithm values of
(Capital + Deposit)

Rank of the scale
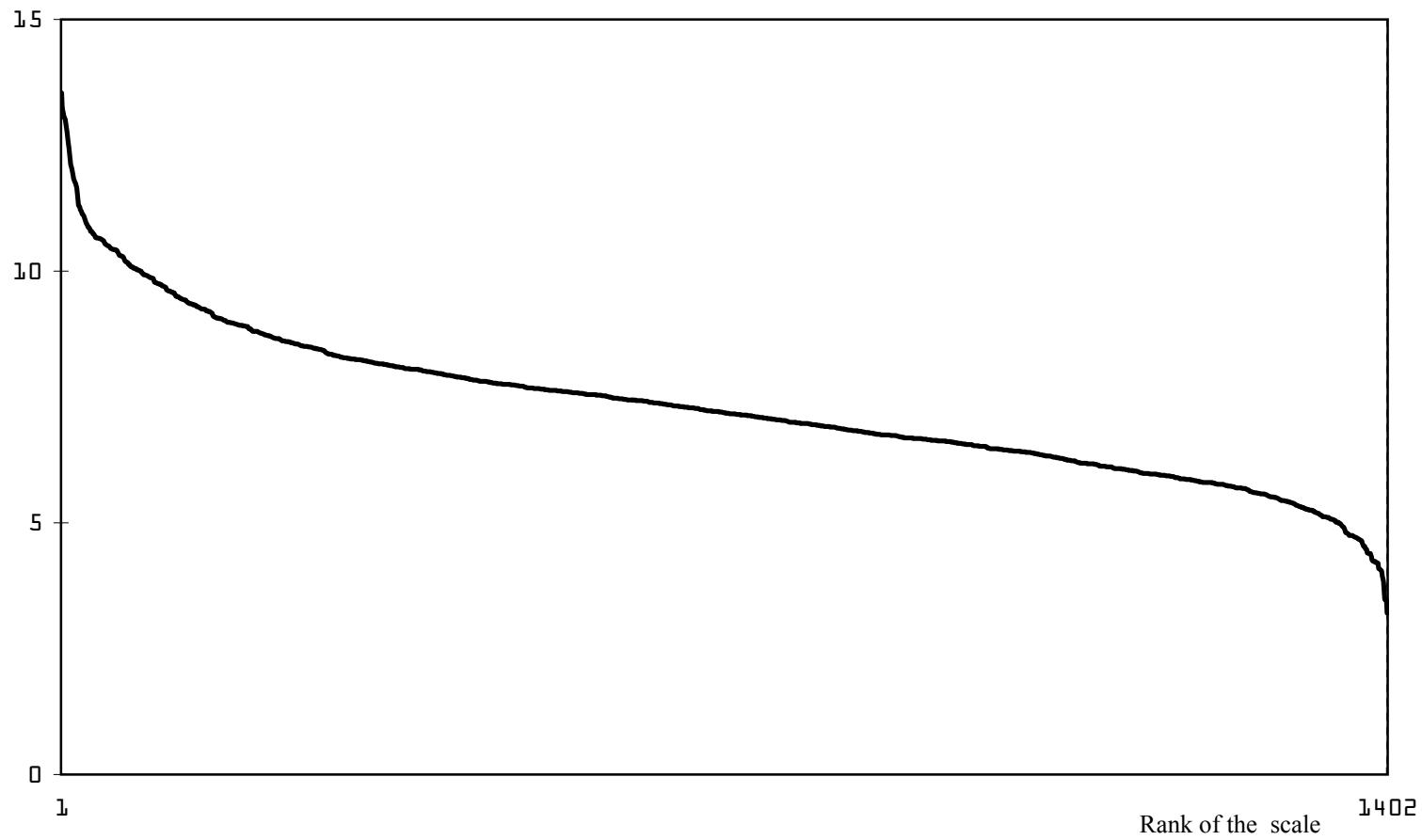
Table 1 Coverage of Zenkoku Shogaisha Yakuinroku

	Categories of the companies	Number of obsevations
A. Zenkoku Shogaisha Yakuinroku, 1926 issue	Total	15,060
	Banks	1,427
	Non-banking joint-stock companies	11,578
	Non-banking companise of the other form	2,055
B. Kaisha Tokei Hyo, 1926 issue	Total	36,068
	Banks	1,506
	Non-banking joint-stock companies	16,251
	Non-banking companise of the other form	18,311
C. Coverage (A/B*100, %)	Total	41.8
	Banks	94.8
	Non-banking joint-stock companies	71.2
	Non-banking companise of the other form	11.2

Note: All the data are concerning the companies in the present territory of Japan.

Table 2 Basic statistics of the bank performance

a. 1,402 samples

	CAPDEP	LOANDEP	RESDEP
N	1,402	1,402	1,402
Average	1.27	2.09	0.25
St.dev	9.13	10.13	4.08
Median	0.40	1.21	0.03
Max	188.56	310.45	141.07
Min	0.01	0.10	0.00
Skewness	18.1	23.5	31.0
Excess kurtois	346.5	651.8	1035.3

b. 1,199 samples

	CAPDEP	LOANDEP	RESDEP
N	1,199	1,199	1,199
Average	1.12	2.04	0.14
St.dev	8.22	10.25	1.65
Median	0.41	1.21	0.03
Max	188.56	310.45	51.99
Min	0.02	0.10	0.00
Skewness	20.2	24.9	28.2
Excess kurtois	433.6	706.1	844.5

c. 1,190 samples (excluding 9 outliers)

	CAPDEP	LOANDEP	RESDEP
N	1,190	1,190	1,190
Average	0.64	1.57	0.07
St.dev	0.84	3.03	0.12
Median	0.41	1.20	0.03
Max	8.49	83.80	1.86
Min	0.02	0.10	0.00
Skewness	4.9	21.0	5.4
Excess kurtois	31.8	517.1	53.2

CAPDEP	[paid-in capital + fund]/deposits
LOANDEP	loan/deposits
RESDEP	reserve/deposits

Table 3 Interlocking of directors and auditors between banks and non-banking companies

a. All directors and auditors of 1,190 banks

Positions in the non-banking companies	Number of banks with interlocking	Ratio to all observations	Number of cases of interlocking	Average per bank
Total	1,030	86.6	9,280	7.80
Top executives	549	46.1	1,322	1.11
Executive directors	185	15.5	249	0.21
Ordinary directors	930	78.2	5,150	4.33
Auditors	785	66.0	2,424	2.04

b. Top executives of 1,190 banks

Positions in the non-banking companies	Number of banks with interlocking	Ratio to all observations	Number of cases of interlocking	Average per bank
Total	515	43.3	2,496	2.10
Top executives	202	17.0	318	0.27
Executive directors	28	2.4	33	0.03
Ordinary directors	377	31.7	862	0.72
Auditors	220	18.5	341	0.29

c. Executive directors of 1,190 banks

Positions in the non-banking companies	Number of banks with interlocking	Ratio to all observations	Number of cases of interlocking	Average per bank
Total	253	21.3	722	0.61
Top executives	50	4.2	65	0.05
Executive directors	29	2.4	33	0.03
Ordinary directors	178	15.0	372	0.31
Auditors	136	11.4	224	0.19

d. Ordinary directors of 1,190 banks

Positions in the non-banking companies	Number of banks with interlocking	Ratio to all observations	Number of cases of interlocking	Average per bank
Total	853	71.7	4,499	3.78
Top executives	346	29.1	636	0.53
Executive directors	89	7.5	109	0.09
Ordinary directors	730	61.4	2,601	2.19
Auditors	518	43.6	1,090	0.92

e. Auditors of 1,190 banks

Positions in the non-banking companies	Number of banks with interlocking	Ratio to all observations	Number of cases of interlocking	Average per bank
Total	673	56.6	1,562	1.31
Top executives	184	15.5	302	0.25
Executive directors	64	5.4	73	0.06
Ordinary directors	526	44.2	1,304	1.10
Auditors	406	34.1	759	0.64

Table 4

Table 4 Interlocking of directors and auditors between banks and non-banking companies by scale of banks

a. All directors and auditors of 1,190 banks

Positions in the non-banking companies	Classes by paid-in capital	Number of observations	Number of banks with interlocking	Ratio to all observations (%)	Average per bank
Total	Total	1,190	1,030	86.6	7.7
	-1,000 thousand yen	983	831	84.5	5.5
	1,000-10,000	190	182	95.8	16.5
	10,000-	17	17	100.0	34.6
Top executives	Total	1,190	549	46.1	1.1
	-1,000 thousand yen	983	382	38.9	0.8
	1,000-10,000	190	150	78.9	2.5
	10,000-	17	17	100.0	5.8
Executive directors	Total	1,190	185	15.5	0.2
	-1,000 thousand yen	983	117	11.9	0.1
	1,000-10,000	190	60	31.6	0.5
	10,000-	17	8	47.1	0.9
Ordinary directors	Total	1,190	930	78.2	4.3
	-1,000 thousand yen	983	732	74.5	3.2
	1,000-10,000	190	181	95.3	9.2
	10,000-	17	17	100.0	17.9
Auditors	Total	1,190	785	66.0	2.0
	-1,000 thousand yen	983	599	60.9	1.4
	1,000-10,000	190	169	88.9	4.4
	10,000-	17	17	100.0	10.0

b. Top executives of 1,190 banks

Positions in the non-banking companies	Classes by paid-in capital	Number of observations	Number of banks with interlocking	Ratio to all observations (%)	Average per bank
Total	Total	1,190	515	43.3	1.3
	-1,000 thousand yen	983	380	38.7	1.0
	1,000-10,000	190	120	63.2	2.7
	10,000-	17	15	88.2	5.1
Top executives	Total	1,190	202	17.0	0.3
	-1,000 thousand yen	983	132	13.4	0.2
	1,000-10,000	190	59	31.1	0.6
	10,000-	17	11	64.7	1.2
Executive directors	Total	1,190	28	2.4	0.0
	-1,000 thousand yen	983	20	2.0	0.0
	1,000-10,000	190	6	3.2	0.0
	10,000-	17	2	11.8	0.1
Ordinary directors	Total	1,190	377	31.7	0.7
	-1,000 thousand yen	983	271	27.6	0.5
	1,000-10,000	190	94	49.5	1.5
	10,000-	17	12	70.6	2.4
Auditors	Total	1,190	407	34.2	0.3
	-1,000 thousand yen	983	335	34.1	0.2
	1,000-10,000	190	63	33.2	0.6
	10,000-	17	9	52.9	1.4

Table 4

c. Executive directors of 1,190 banks

Positions in the non-banking companies	Classes by paid-in capital	Number of observations	Number of banks with interlocking	Ratio to all observations (%)	Average per bank
Total	Total	1,190	253	21.3	0.6
	-1,000 thousand yen	983	157	16.0	0.4
	1,000-10,000	190	84	44.2	1.5
	10,000-	17	12	70.6	2.5
Top executives	Total	1,190	50	4.2	0.1
	-1,000 thousand yen	983	35	3.6	0.0
	1,000-10,000	190	14	7.4	0.1
	10,000-	17	1	5.9	0.1
Executive directors	Total	1,190	50	4.2	0.0
	-1,000 thousand yen	983	35	3.6	0.0
	1,000-10,000	190	14	7.4	0.1
	10,000-	17	1	5.9	0.0
Ordinary directors	Total	1,190	178	15.0	0.3
	-1,000 thousand yen	983	107	10.9	0.2
	1,000-10,000	190	62	32.6	0.8
	10,000-	17	9	52.9	1.4
Auditors	Total	1,190	136	11.4	0.2
	-1,000 thousand yen	983	73	7.4	0.1
	1,000-10,000	190	54	28.4	0.5
	10,000-	17	9	52.9	1.1

d. Ordinary directors of 1,190 banks

Positions in the non-banking companies	Classes by paid-in capital	Number of observations	Number of banks with interlocking	Ratio to all observations (%)	Average per bank
Total	Total	1,190	853	71.7	3.7
	-1,000 thousand yen	983	671	68.3	2.7
	1,000-10,000	190	165	86.8	7.8
	10,000-	17	17	100.0	15.6
Top executives	Total	1,190	347	29.2	0.5
	-1,000 thousand yen	983	228	23.2	0.4
	1,000-10,000	190	105	55.3	1.2
	10,000-	17	14	82.4	2.9
Executive directors	Total	1,190	89	7.5	0.1
	-1,000 thousand yen	983	52	5.3	0.1
	1,000-10,000	190	33	17.4	0.2
	10,000-	17	4	23.5	0.4
Ordinary directors	Total	1,190	730	61.3	2.2
	-1,000 thousand yen	983	554	56.4	1.6
	1,000-10,000	190	159	83.7	4.5
	10,000-	17	17	100.0	8.5
Auditors	Total	1,190	518	43.5	0.9
	-1,000 thousand yen	983	376	38.3	0.7
	1,000-10,000	190	125	65.8	1.9
	10,000-	17	17	100.0	3.9

Table 4

Positions in the non-banking companies	Classes by paid-in capital	Number of observations	Number of banks with interlocking	Ratio to all observations (%)	Average per bank
Total	Total	1,190	674	56.6	2.0
	-1,000 thousand yen	983	504	51.3	1.4
	1,000-10,000	190	153	80.5	4.3
	10,000-	17	17	100.0	11.4
Top executives	Total	1,190	184	15.5	0.3
	-1,000 thousand yen	983	100	10.2	0.2
	1,000-10,000	190	73	38.4	0.6
	10,000-	17	11	64.7	1.6
Executive directors	Total	1,190	64	5.4	0.1
	-1,000 thousand yen	983	39	4.0	0.0
	1,000-10,000	190	21	11.1	0.1
	10,000-	17	4	23.5	0.5
Ordinary directors	Total	1,190	526	44.2	1.1
	-1,000 thousand yen	983	378	38.5	0.8
	1,000-10,000	190	133	70.0	2.3
	10,000-	17	15	88.2	5.6
Auditors	Total	1,190	406	34.1	0.6
	-1,000 thousand yen	983	282	28.7	0.5
	1,000-10,000	190	113	59.5	1.3
	10,000-	17	11	64.7	3.7

Table 5

Table 5 Interlocking and investment 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	
	Nihon Yusen	Ordinary director	-		
	Toyo Seitetsu	Auditor	-		
	Taisho Kaijo Kasai	Ordinary director	1.0	4	
	Yokohama Kasai Kaijo Hoken	Ordinary director	4.6	5	
	Yokohama Seimei Hoken	Auditor	-		
	Taisei	Ordinary director	n.a.		
	Hara Partnership	President	…		
	Minami Manshu Tetsudo	Auditor	0.5	4	
	Nikka Sanshi	Ordinary director	1.2	4	
Heizaburo Okawa	Bushu Bank	President	2.8	1	Okawa Partnership
	Nihon Feruto	Ordinary director	30.8	1	Fuji Seishi, Karafuto Kogyo
	Nihon Konkurito Kogyo	Ordinary director	1.0	9	
	Nihon Sakusan Seizo	Ordinary director	n.a.		
	Nichiei Sekken	Ordinary director	n.a.		
	Hojo Tanko	Ordinary director	n.a.		
	Hokkaido Dento	Ordinary director	36.0	1	Fuji Seishi, personal
	Tokai Kogyo	President	3.8	6	Okawa Partnership
	Toyo Kisen	Ordinary director	1.1	3	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
	Okawa Tanaka Jimusho	President	n.a.		
	Otaki Kozan	Ordinary director	n.a.		
	Oshima Seikojo	President	4.2	4	Okawa Partnership
	Dainihon Jidosha	Ordinary director	n.a.		
	Tsurumi Rinko Tetsudo	Ordinary director	5.0	7	
	Keihin Unga	Ordinary director	0.8	8	Okawa Partnership
	Fuji Seishi	President	5.9	2	Okawa Partnership
	Fujigawa Denryoku	Ordinary director	n.a.		
	Enkaishu Mokuzai	Ordinary director	n.a.		
	Asano Semento	Ordinary director	4.5	3	Okawa Partnership
	Kyodo Parupu	Ordinary director	n.a.		
	Kyodo Yoshi	Ordinary director	n.a.		
	Joto Denki Kido	President	3.4	4	Okawa Partnership
	Ninju Seimei	Ordinary director	-		
	Seibu Tetsudo	Ordinary director	2.2	3	Okawa Partnership
	Ishiwata Sureto	Auditor	1.0	8	
	Okawa Partnership	Representative partner	…		
	Osaka Hoteru	Ordinary director	2.5	4	Okawa Partnership
	Nakanoshima Seishi	Ordinary director	3.7	5	Okawa Partnership
	Teikoku Jinzo Hiryo	Ordinary director	-		
	Nihon Kokan	President	4.6	3	Okawa Partnership
	Shizuoka Denryoku	President	38.5	1	Personal, Okawa Partnership
	Shizuoka Denki Tetsudo	President	1.2	10	Okawa Partnership
	Kumamoto Denki	Ordinary director	6.1	3	Karafuto Kogyo, Okawa Partnership
	Kumamoto Denki Kido	President	23.0	1	Karafuto Kogyo, Okawa Partnership
	Kizan Tetsudo	President	n.a.		
	Kyushu Seishi	President	12.1	1	Okawa Partnership
	Toho Tanko	Ordinary director	n.a.		
	Karafuto Kogyo	President	7.2	1	Okawa Partnership
	Karafuto Tetsudo	Ordinary director	53.8	1	Fuji Seishi, personal
	Karafuto Kisen	President	32.5	1	Karafuto Kogyo, Okawa Partnership
	Karafuto Seishigenryo	Chairman	n.a.		
	Chosen Tetsudo	Auditor	1.6	7	Okawa Partnership
	Chosen Denki Kogyo	Auditor	1.0	1	Okawa Partnership
	Oryokuko Seishi	Vice Chairman	28.8	2	Karafuto Kogyo, Okawa Partnership
Genemon Mitsui	Mitsui Bank	President	0.3	10	
	Mitsui Bussan	Representative director	-		
	Mitsui Partnership	Executive partner	…		
Matsujito Ueno	Shimotsuke Chuo Bank	President	-		
	Higashino Tetsudo	Auditor	-		
	Utsunomiya Gas	President	2.9	9	

Table 5

	Shimotsuke Seishi	Ordinary director	n.a.		
Sohei Ozawa	Joshu Bank	President	6.3	1	
	Daini Azumagawa Denryoku	Ordinary director	n.a.		
	Daiwa Insatsu	President	n.a.		
	Azumagawa Denryoku	Ordinary director	n.a.		
	Ozawa Shoten	Ordinary director	n.a.		
	Takasaki Soko	Ordinary director	n.a.		
	Marugami Ueno Unsoten	Representative director	n.a.		
	Joshu Kenshi Boseki	Ordinary director	1.9	8	
	Joshin Denki	Vice president	2.5	4	
	Shinei Un'yu	Ordinary director	n.a.		
Manzo Kushida	Mitsubishi Bank	Chairman	-		
	Nihon Musen Denshin	Ordinary director	-		
	Hodogaya Gorufu	Auditor	-		
	Tokyo Kaijo Kasai	Ordinary director	n.a.		
	Kokusai Tsushin	Ordinary director	7.5	1	
	Meiji Seimei	Ordinary director	-		
	Mitsubishi Kaijo Kasai Hoken	Ordinary director	n.a.		
	Mitsubishi Soko	Ordinary director	88.5	1	Mitsubishi Ginko
	Mitsubishi Zosen	Auditor	0.2	3	Mitsubishi Ginko, personal
	Mitsubishi Kogyo	Auditor	3.1	2	Mitsubishi Ginko
	Mitsubishi Shoji	Auditor	0.5	3	Mitsubishi Ginko, personal
	Mitsubishi Seitetsu	Auditor	0.2	3	Mitsubishi Ginko, personal
	TokyoKoshinjo	Chairman	…		
Shigehiko Ikoma	Meiji Bank	President	1.5	3	
	Bengi Unso	Ordinary director	n.a.		
	Toyo Soko	Ordinary director	8.7	1	Meiji Ginko
	Nagoya Hoteru	Ordinary director	n.a.		
Zenjiro Yasuda	Yasuda Bank	President	30.6	1	Yasuda Hozensha, personal
	Toyo Kasai Hoken	Advisor	22.8	2	Yasuda Hozensha
	Toykowan Umetate	Ordinary director	21.4	2	Yasuda Hozensha
	Asano Semento	Ordinary director	5.4	2	Yasuda Ginko
	Yasuda Hozensha	Representative partner	…		
	Yasuda Shintaku	President	16.7	1	
	Seiryu Ginko	Advisor	n.a.		
Kazue Kumazawa	Yokkaichi Bank	President	11.2	1	
	Hattori Seisakujo	Auditor	8.0	5	
	Nihon Iou	Ordinary director	n.a.		
	Nihon Feruto	Auditor	-		
	Hojo Tanko	Auditor	n.a.		
	Hokkaido Dento	Auditor	-		
	Tokai Kogyo	Auditor	3.2	7	
	Dainihon Jidosha	Ordinary director	n.a.		
	Daido Unso	Auditor	n.a.		
	Fuji Seishi	Ordinary director	1.2	9	
	Fujigawa Denryoku	Ordinary director	n.a.		
	Minamitaiheiyou Kogyo	Auditor	n.a.		
	Sumatakyo Suiryoku Denki	Ordinary director	n.a.		
	Daido Yoshiten	Auditor	-		
	Nihon Kokan	Auditor	2.3	6	
	Daitai Ringyo	President	28.3	1	
	Yokkaichi Tetsudo	Ordinary director	n.a.		
	Oigawa Tetsudo	Ordinary director	11.7	2	
	Shizuoka Debryoku	Executive director	7.8	3	
	Shizuoka Denkitetsudo	Executive director	25.4	1	
	Kumamoto Denki Kido	Ordinary director	3.3	5	
	Kyushu Seishi	Auditor	3.5	6	
	Karafuto Kogyo	Auditor	1.7	8	
	Karafuto Kisen	Ordinary director	2.8	6	
Yasutora Takabayashi	Enshu Bank	Executive director	2.6	3	
	Enshu Hoken Daiben	Ordinary director	n.a.		
	Enshu Denki Tetsudo	Auditor	-		
	Tenryu Mokuzai	Auditor	-		

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

Table 6 Estimation results of equation (1)

a. Dependent Variable : CAPDEP(OLS)

INTERLOCK	-4.64E-03	(-1.84)	*
FORM	0.330	(2.11)	**
URBAN	-8.75E-02	(-1.56)	
constant	0.377	(2.44)	**
adj-R squares		0.01	

b. Dependent Variable : LOANDEP(OLS)

INTERLOCK	-2.99E-03	(-0.33)	
FORM	0.352	(0.63)	
URBAN	0.390	(1.94)	*
constant	1.1487	(2.06)	**
adj-R squares		0.00	

c. Dependent Variable : RESDEP(OLS)

INTERLOCK	2.03E-04	(0.56)	
FORM	-5.71E-03	(-0.25)	
URBAN	2.83E-02	(3.51)	***
constant	6.92E-02	(3.11)	***
adj-R squares		0.01	

d. Dependent Variable : ROA(Tobit)

INTERLOCK	-3.89E-04	(-4.03)	***
FORM	3.67E-03	(0.62)	
URBAN	-1.22E-02	(-5.68)	***
constant	4.47E-02	(7.49)	***
Log-likelihood Function		2227.2	
Limit		0	
Limit observations		57	
All observations		1190	

INTERLOCK	: The number of interlocking the Bank had in 1926.
FORM	= 1 if the bank was the stock company, otherwise 0.
URBAN	= 1 if the bank wasin the urban area(Tokyo, Kanagawa, Aichi, Osaka, Kyoto, Hyogo), otherwise 0.
CAPDEP	=[paid-in capital + fund]/deposits
LOANDEP	=loan/deposits
RESDEP	=reserve/deposits
ROA	=profit/[deposits+paid-in capital+fund]
t-values in parentheses	
***	: significant at 1% level.
**	: significant at 5% level.
*	: significant at 10% level.

Table7 Estimation results of equation (2)-(5)

Equation	(2)		(3)		(4)		(5)	
INTERLOCK	0.021	(2.05) **	0.050	(3.77) ***	0.031	(3.51) ***	0.022	(2.28) **
FORM	25.926	(0.00)	24.173	(0.00)	25.847	(0.00)	25.164	(0.00)
URBAN	0.652	(2.30) **	0.212	(0.37)	0.616	(2.39) **	0.336	(1.24)
CAPDEP							-1.636	(-2.94) ***
LOANDEP							0.107	(2.03) **
RESDEP							-4.718	(-2.27) **
ROA							-27.716	(-3.47) ***
constant	-29.304	(0.00)	-29.304	(0.00)	-29.078	(0.00)	-26.501	(0.00)
Log-likelihood Function		-219.9		-74.8		-256.1		-219.9
Maddala R-squares		0.01		0.01		0.02		0.01
dependent variable	CLS		RUN		BCON		BCON	
observations at one		56		15		70		56
observations at zero		1134		1175		1120		1134
total observations		1190		1190		1190		1190

INTERLOCK:	The number of interlocking the Bank had in 1926.
FORM:	equals 1 if the bank was the stock company, otherwise 0.
URBAN:	equals 1 if the bank wasin the urban area(Tokyo, Kanagawa, Aichi, Osaka, Kyoto, Hyogo), otherwise 0.
CAPDEP:	[paid-in capital + fund]/deposits
LOANDEP:	loan/deposits
RESDEP:	reserve/deposits
ROA:	profit/[deposits+paid-in capital+fund]
CLS:	equals 1 if the bank closed within 3 years after the Showa Financial Crisis in 1927, otherwise 0.
RUN:	equals 1 if the bankrun occured within 3 years after the Showa Financial Crisis in 1927, otherwise 0.
BCON:	equals 1 if CLS or RUN is 1, otherwise 0.
t-values in parentheses	
***:	significant at 1% level.
**:	significant at 5% level.
*:	significant at 10% level.

Table 8 Estimation of the risk premium

a. Dependent variable: interest rate of deposit

Estimation-2	depevdent variable : deposit rate		
INTERLOCK	1.78E-04	(2.62)	***
DEPOSIT	-4.67E-05	(-4.69)	***
constant	4.53E-02	(26.33)	***
adj-R squares		0.16	

b. Dependent Variable: interest rate of loan

INTERLOCK	1.25E-04	(1.32)	
LOAN	-6.14E-11	(-3.87)	***
constant	6.20E-02	(25.97)	***
adj-R squares		0.10	

t-values in parentheses

***:	significant at 1% level.
**:	significant at 5% level.
*:	significant at 10% level.

Appendix Table

	Number
Large asset holder	2,130
Bank director and auditor **1**	648
Bank director and auditor who had a position of director or auditor of a non-banking company **2**	381
2 /**1**(%)	58.8%

Source: Shibusya et al.[1983].