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Working Paper

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Discussion papers // WZB, Wissenschaftszentrum Berlin für Sozialforschung, Forschungsschwerpunkt Marktprozeß und Unternehmensentwicklung, No. FS IV 97-40

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Suggested citation: Miarka, Tobias; Yang, Jianping (1997) : New directions in Japanese bank-firm-relationships: does a relationship matter for corporate performance?, Discussion papers // WZB, Wissenschaftszentrum Berlin für Sozialforschung, Forschungsschwerpunkt Marktprozeß und Unternehmensentwicklung, No. FS IV 97-40, http://hdl.handle.net/10419/51183

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discussion papers

FS IV 97 - 40

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December 1997

ISSN Nr. 0722 - 6748

Forschungsschwerpunkt Marktprozeß und Unternehmensentwicklung

Research Area Market Processes and Corporate Development

Zitierweise/Citation:

Tobias Miarka, Jianping Yang, **New Directions in Japanese Bank-Firm-Relationships: Does a Relationship Matter for Corporate Performance?** Discussion Paper FS IV 97 - 40, Wissenschaftszentrum Berlin, 1997.

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Reichpietschufer 50, 10785 Berlin, Tel. (030) 2 54 91 - 0

ABSTRACT

New Directions in Japanese Bank-Firm-Relationships:
Does a Relationship Matter for Corporate Performance?

by Tobias Miarka, Jianping Yang

The paper is a first step to tests the impact of bank-firm-relationships on corporate performance under changing economic conditions. Using a data set of standardized annual financial statements of 100 Japanese corporations all listed at the First Section of the Tokyo stock exchange, at the current stage of analysis we find empirical evidence that: (1) investment is determined by output expectations. (2) *Q* is a significant variable for investment behavior. (3) Investment is restricted by debt-equity ratio, (4) therefore the much claimed signaling effect of a high debt-equity ratio does not hold. (5) In contrast to Germany though, banks allow firms with bank-relationships higher short term debt to total finance and long term loans to total finance ratios, whereas firms with no relationships have a higher equity ratio. (6) Banks influence firms with bank-relationships to decide on low risk investment decisions. Therefore they are able to allow a higher debt-equity ratio (in contrast to Germany). (7) Non-bank-related firms are much more profitable than bank-related firms. The difference is even stronger than in Germany. Yet they also have to bear a higher amount of risk. (8) Apparently the policy of banks in Japan is much different to German banks: Banks force bank-affiliated firms to follow an investment policy, which is much more cautious and therefore leads to less profitability. This again leads to a bank-policy that allows to supply these firms with higher amounts of borrowings.

ZUSAMMENFASSUNG

Änderungen bei japanischen Bank-Firmen-Beziehungen: Sind Bankbeziehungen wichtig für die Leistungsfähigkeit der Firma?

Gegenstand dieses Beitrages ist die Untersuchung des Einflusses von Bank-Firmen-Beziehungen auf die Unternehmensleistung bei sich ändernden wirtschaftlichen Rahmenbedingungen. Unter Verwendung eines Datensatzes von standardisierten Geschäftsberichten 100 japanischer Unternehmen, welche an der ersten Sektion der Börse in Tokio notiert sind, kommt die empirische Untersuchung zu folgenden Ergebnissen: (1) Investitionen werden von Output-Erwartungen bestimmt, (2) *Q* ist eine signifikante Variable in Bezug auf Investitionsverhalten (3) Investitionen werden durch den Verschuldungsgrad beschränkt, (4) daher gilt der so oft herangezogene signaling effect eines hohen Verschuldungsgrades nicht. (5) Im Gegensatz zu Deutschland gewähren die Banken den Unternehmen mit Bankbeziehungen jedoch höhere Quoten kurzfristiger und langfristiger Verschuldung. Die Unternehmen ohne Bankbeziehungen haben hingegen einen höheren Eigenkapitalanteil. (6) Bei Investitionsentscheidungen beeinflussen japanische Banken die Unternehmen mit Bankbeziehungen dahingehend, Investitionen mit geringem Risiko zu tätigen. Daher sind sie bereit, einen höheren Verschuldungsgrad zu gewähren als dies in Deutschland der Fall ist. (7) Unternehmen ohne Bankbeziehungen sind erheblich profitabler als Unternehmen mit Bankbeziehungen. Die unterschiedliche Höhe der Rentabilität beider Gruppen ist noch ausgeprägter als in Deutschland, die japanischen Unternehmen ohne Bankbeziehungen haben jedoch auch ein höheres Risiko zu tragen. (8) Offenbar ist die Politik japanischer Banken sehr unterschiedlich im Vergleich zu der Politik deutscher Banken: Banken zwingen Unternehmen mit Bankbeziehungen eine Investitionspolitik zu betreiben, die viel vorsichtiger ist und daher zu einer geringeren Rentabilität führt. Dies wiederum gestattet den Banken eine Politik zu verfolgen, die es erlaubt den Unternehmen in höherem Maße Kredite zu gewähren.

A. Introduction

The impact of bank-firm-relationships on corporate performance has become a much discussed field of research in recent years. Analyzing the effect of close bank-firm-relations on corporate performance in Germany, Elston and Albach (1995), could not identify any negative effects. Though finding higher bankruptcy risk and higher corporate risk for bank-related firms, Albach/Brandt/Brandt/Yang (1996), showed that these firms do not perform better than non-bank-related firms. Research of Perlitz and Seger (1994), and Seger (1997) point out that corporate performance in Germany is reduced by bank equity ownership and representation on the board of directors of client-firms.

In Japan, bank-firm-relationships are generally seen as an important pillar of the competitiveness of Japanese firms. Japanese bank-firm-relations are usually characterized by crossholding of stock, the exchange of personnel, a strong commitment of banks as lender of last resort, a high amount of bank-loans, and the provision of information between firms and banks (Nakatani 1983, 1984; Aoki 1984; Aoki/Patrick 1994), therefore going much beyond the capital access function.

Since the end of the exceptional speculative boom during the late 1980s as well as the launch of financial market reform, the much discussed advantages of bank-firm-relationships in Japan have become arguable. Recent bankruptcies in the financial as well as manufacturing sectors seem to support this view. The bad loan crisis underlines that monitoring abilities of Japan's banks are very much over-estimated. Some academics even believe that the form of bank-firm-relationships characterized above has never existed (Miwa, 1985, 1991, 1996). Consequently, it can be questioned whether a strong relationship to one or more banks has a positive effect on corporate performance of the Japanese firm. It has to be asked also whether in the case of Japan, monitoring advantages that a bank-dominated financial system can provide (Diamond 1984), will be subject to change.

This development is due to three major changes banks have to face in present Japan. First, after the burst of the late 1980`s speculative boom in real estate and stocks, the former stronghold of the Japanese financial system—banks—have become weak itself, loaded with an amount of potentially risky loans as large as Y76.710bn ($583bn). Due to the recent economic crisis in Asia, Japanese banks have to expect additional bad loans, being one of the biggest lenders of the distressed region, holding $25bn of Korea's debt alone. Second, the deregulation of the financial sector confronts Japanese banks with severe competition from inside and outside the country[1]. Third, constraints on the

[1] Of particular importance for reforming Japanese financial markets is the Financial System Reform Act, which went into effect at the beginning of April 1993. Several years in the making, this law

owned subsidiaries. Up to this key-date, Article 65 of the Securities and Exchange Law put up an

growth of bank lending, caused by the need to satisfy BIS (Bank of International Settlement) requirements of an eight per cent capital adequacy ratio have caused additional changes in the financial market of the 1990s.

The purpose of this paper is to test whether bank-firm-relationships have an impact on corporate performance with respect to recent changes in the economic environment of present Japan. To answer this question, we are using a data base comprising annual statements of 100 Japanese firms and look at the impact of bank-relations on investment and the financial structure, as well as profitability and firm-risk. Following this agenda, we try to find first evidence whether one of the fundamental pillars of "Japan Inc."—the strong relationship between large firms and banks—is subject to change and has an extensive impact on the corporate policy of Japanese firms.

B. The Influence of Bank-Firm-Relationships on Corporate Performance

There are many ways to define bank-firm-relationships. For Germany, Albach/Brandt/Brandt/Yang (1996), assume a bank-firm-relationships if one of the following holds: (1) the bank holds more than 10% of the firm's equity; (2) an insurance company holds more than 10 per cent of the firm's equity; (3) the chairman of the firm's board is a member of a bank; (4) the chairman of the firm's board is a member of an insurance company; (5) a member of a bank executive committee is a member of the board and no other bank is represented on the firm's board. As has been pointed out above, for Japanese bank-firm-relationships borrowing, crossholding of stocks, exchange of personnel, the bank's position as lender of last resort or the provision of information are generally seen characteristics. Though these characteristics might all be of some influence for distinguishing whether the firm has a bank affiliations or not, following other work of research on Japanese bank-firm-relationships (Bank of Japan 1992; Campbell/Hamao 1994), we focus on the amount of borrowings for characterizing relationships in the current state of our analysis. Our aim is to observe the influence of debt in general and bank loans in particular on corporate performance of large Japanese firms. Considering that in Japan the financial market did not offer enough alternatives to companies up to the early 1980s, one can argue that the widely seen relationships between banks and firms up to that period were relationships not by agreement but by coercion. But even after the impact of financial market deregulation became considerably evident, the 1992 Economic White Paper noted that „the existence of main banks is an important factor to consider in understanding why bank borrowing continues to

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impenetrable barrier between commercial banking and securities brokering, very similar to the Glass-Steagall Act in the United States. Though the Financial Reform Act weakens Article 65, it does not diminish it to a liberal regime found in major European countries, where "universal" banks can offer all financial services under one roof.

represent a larger share of business financing in Japan than in other countries.“ Nevertheless, it closed its comment by stating that „the relationship between companies and banks in the future will undergo further change and diversity more rapidly, based on the autonomous decisions of each entity as (....) reforms are carried out in the Japanese financial system.“ Keeping this perspective in mind, we will proceed with our analysis.

I. Definitions

1. Bank-Firm-Relationship

There is no commonly shared definition of Japanese bank-firm-relationships, neither in academic literature nor around bankers or representatives of client-firms. Due to our focus on borrowings, we divide our sample into the following two groups:

Having an amount of bank loans equal to or larger than five percent of total capital over the nine-year period (mean) of 1986 to 1994, the firm belongs to the group of firms with bank-firm-relations (BFR group), following the above mentioned characteristic of a large amount of borrowings for firms with strong bank-relationships.

The second group comprises all firms of which the amount of bank loans is less than five percent of total capital over the nine year period observed (mean). This is the group of firms without bank-relations (NON-BFR group).

Bernanke and Campbell (1988), have shown that calculating the market value of debt is indirect and cumbersome and has a relatively minor effect in US data in the 1980s. Assuming that Bernanke and Campbells findings also hold for Japan, we use the book value to estimate the ratio of borrowings to total capital, rather than trying to calculate market value. Out of the 100 firms used in our empirical analysis, 39 firms represent the „NON-BFR group“ and 61 firms belong to the „BFR group“.

2. Investment

There has already been research to explain the impact of bank-firm-relationships on corporate performance by examining investment. Albach (1997), analyzed the effect of relationships on firm-investment in Germany. The analysis notes that banks have a strong influence on investment activities of client-firms through their allocation of credit. They use credit rationing as an instrument to control client-firms and exercise, if necessary, their possibilities of controlling the firm in order to enlarge the amount of the client-firms’ equity in order to lessen credit risk.

In our analysis we want to observe the impact of the debt-equity ratio on investment of the two groups mentioned above. Elston and Albach (1995), have already used *q* to estimate the influence of bank affiliations on investment of German firms. In their model they used cash flow as a proxy for liquidity constrains of the firm, the firms' net sales level to control size effects and the variation of *q*, which is defined as the measure of the firm's marginal incentive to invest. Albach and Yang (1998) have mathematically addressed the influence of average *Q* and output on marginal *q* and introduced financial variables such as the user cost of capital, which is depending on the debt to total capital ratio. They adopt the modified *q*-theory for their empirical analysis of German bank-firm-relationships and find empirical evidence for marginal *q* being a variable for investment behavior. However, their analysis also shows that the degree of bank-firm-relationship influences the company's financial decisions, and therefore the firms' investment strategy.

We follow Albach and Yang (1998), and use their model which helps us analyze the interdependence of investment and capital structure for the two firm groups. To develop an investment function for the purpose of our analysis, we start with the assumption that the firm wants to maximize its market value. The market value is given by:

(1) $$V_{t=0} = \int_0^{\infty} \exp\left(-\int_0^t \Gamma(\xi)d\xi\right) CF dt$$ [2]

with the cash flow defined as:

(2) $$CF = (1-u)\left\{p\left[F(K,L) - c(I,K)\right] - wL\right\} - p_I I$$

where:

p:	*Output price*
$F(K,L)$:	*Output*
u:	*Tax*
$c(I,K)$:	*Cost of adaptation of the stock of capital (measured in losses in output)*
p_I:	*Price of investment goods*
I:	*Investment*
L:	*Labor*
w:	*Wage rate*
K:	*Capital*
G:	*User cost of capital.*

[2] For a derivation of the objective function see: Albach and Yang (1998).

The adaptation cost function $c(I,K)$ is linear homogenous. Adaptation costs are deducted from taxable income since the increase in the rate of investment requires resources which are not available for production.

The user cost of capital G are defined as

$$G = q + [-uq + a(VG)]\frac{VG}{1+VG} \tag{3}$$

where *VG:* *Debt to total capital*
q : *Cost of equity*
$a(VG)$: *Agency cost of indebtedness.*

Albach and Yang (1998), assume that the agency costs of indebtedness do not reduce output because the agency costs do not use up resources for production. They assume that the agency costs are contractual constraints with the objective to control the conflict of interest between creditors and shareholders. Following Jensen and Meckling (1976), they presume that the firm is treated as a contracting arena in which creditors, shareholders and management negotiate about their conflicting interests. It is assumed that the relations with creditors as well as other constraints force shareholders to maximize the market value of the shares plus debt. In conformity with the costly contracting hypothesis by Smith and Warner (1979), it is postulated that there exists a certain contractual combination which causes costs to be incurred, resulting in a maximization of the firms' total value.

The problem of the firm is to decide on *K, L and VG* such that under the constraints

$$\dot{K} = I - d\,K \tag{4}$$

with d as a depreciation rate and

$$F(K,L) \geq F^*(K,L) \tag{5}$$

with $F^*(K,L)$ as expected output, the market value of the firm (1) is maximized.

Cash flow is a function of the real variables *K* and *L*. G is a function of financial variables represented by the debt equity ratio *VG*. In the following sequence, the corporation optimizes and chooses *K* and *L first*, in order to maximize cash flow and then chooses *VG* in order to minimize the cost of capital.

The Hamilton-function used for optimizing the objective function subject to the constraints is:

$$H = exp\left(-\int_0^t G(x)dx\right)\left\{(1-u)\left[pF(K,L) - pc(I,K) - wL\right] - p_I I\right\} + l\,(I - d\,K) + m\left[Y(K,L) - Y^*(K,L)\right] \tag{6}$$

where l and m are the Hamiltonian-multipliers attached to *K* and *F(K,L)* deriving for *I*, *K* and *L*. We get (6), (7) and (8):

$$l = p_I + p(1-u)c_I(I,K) \tag{7}$$

$$\dot{l} = l\,(G+d) - \left[p(1-u)\right]\left[F_K(K,L) - c_K(I,K)\right] + m\,F_K(K,L) \tag{8}$$

$$\left[p(1-u) - m\right]F_L(K,L) - (1-u)w = 0 \tag{9}$$

as necessary conditions. (7) can be transformed into

$$q = \frac{l}{p_I} = 1 + \frac{p(1-u)c_I(I,K)}{p_I} \tag{7'}$$

Following Schiantatelli and Georgoustos (1990), it is assumed that the adaptation costs are quadratic and of the following form:

$$c(I,K) = \frac{f}{2}\left[\frac{I}{K} - a - e\right]^2 K \tag{10}$$

with a and e as parameters. From this we get the following investment function:

$$\frac{I}{K} = a + b\,(Q_m) + e \tag{11}$$

with $ß = 1/f$ and $Q_m = (q-1)\dfrac{p_I}{p(1-u)}$.

(11) seems to be similar to published *q*-investment functions. However, (11) differs from previous investment functions due to the objective function (1) and the constraints introduced above.

Trying to develop an investment function that can be tested empirically, we have to ask which factors influence marginal *q* since marginal *q* cannot be measured. There have been derived various restrictive assumptions between average *Q* and marginal *q* (Hayashi, 1982; Precious, 1985). In this paper we continue to follow Albach and Yang

(1998), who show that marginal q can be represented by average Q, output and the user cost of capital by deriving:

$$(12) \qquad q_{marginal} = Q_{average} + \frac{\exp\left(\int_0^t \Gamma(x)dx\right)\int_0^t \left\{m(z)F(z)\exp\left(-\int_z^t \Gamma(x)dx\right)\right\}dz}{p_I K} - \frac{\exp\left(\int_0^t \Gamma(x)dx\right)}{p_I K}$$

(12) shows that marginal q (or: investment I) is influenced by average Q, by the user cost of capital G (by the debt equity ratio VG respectively) and by output $F(K,L)$.

(11) and (12) are the basic equations for the analysis of investment behavior in this paper.

Using (11) and (12) we can now derive the following investment function for our empirical analysis:

$$(13) \qquad \ln I = a_0 + a_1 \ln Q + a_2 \ln F + a_3 \ln VG$$

with: *I:* *Investment*

Q : *Market to book*

F : *Sales*

VG: *Debt-equity ratio*

a_0, a_1, a_2, a_3 : *Parameter*

and as an alternative:

$$(14) \qquad \ln I = a_0 + a_1 \ln Q + a_2 \ln F - a_3 (1 - VG)$$

with: *I:* *Investment*

Q: *Market to book*

F: *Sales*

VG: *Debt-equity ratio*

a_0, a_1, a_2, a_3 : *Parameter*

These functions are of central importance because they allow us to answer the question whether the amount of debt has an impact on the investment activities of the firm. This again answers the fundamental question whether a high amount of debt, or in other words bank-relationships of the type discussed above, have an impact on investment and therefore on the competitiveness of the Japanese firm.

II. Data Description

For our empirical analysis, we use data from standardized unconsolidated financial statements (yûka shôken hôkokushô) of Japanese firms of the Manufacturing Industry (hereafter MI) listed at the First Section of the Tokyo Stock Exchange (TSE). The data are drawn from the KAISHA data base[3]. This data base contains balance sheet information of 104 MI companies, all listed at the TSE for the period between 1970-1996. A sub-set of 100 firms is used in the following analysis, since some of the variables used were not available for the full set of firms (see appendix for the list of firms used). For additional data not included in the balance sheets, the data base is supplemented by selected Japan Company Handbook (JCH) data[4] for the period between 1974 and 1996. The data base includes corporations of the following industrial sectors:

Chemical Industry (31); Communications Equipment (5); Consumer Electronics and Parts (15); Heavy Electric Machinery (12); Industrial Machinery (13); Machine Tools (15); Pharmaceuticals (11); Shipbuilding + Aircraft Industry (3).

Due to the fact that the paper focuses on the analysis of recent changes caused by drastic developments resulting of the burst of the bubble economy and the deregulation of Japanese financial markets, the focus of our analysis is on the period between 1986 and 1994. These nine years have been picked to sketch the development of corporate finance, starting with a date just before the bubble period, continuing with the period that represents the changes during and right after the burst of the bubble, and concluding with data that comprises recent developments.

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[3] The KAISHA data base which is sponsored by the German Research Foundation, can be accessed at the Social Science Research Center Berlin (WZB). See also: Albach/Görtzen/Miarka/Moerke/Westphal/Zobel (1997).

[4] The Japan Company Handbook is a compendium of basic data on all listed companies in Japan published by Toyo Keizai Inc. Separate volumes are published for TSE first-section and second-section stocks. The JCH is a standard reference work that is widely used in the securities industry.

III. Empirical Analysis

In order to analyze the impact of bank-firm-relationships on corporate performance, our empirical analysis looks at the influence of debt on:

1. investment
2. actual capital structure
3. return rates
4. firm risk

1. Investment

Tables 1 to 3 present the results of our investment function (13) for all firms as well as for each of the two groups, respectively. Tables 4 to 6 show the results of our alternative investment function (14). Observing the parameter for sales (Tables 1 to 6), we can notice that for both groups, investment is determined by output expectations. Table 1 and 4 gives empirical evidence that for all firms, investment is restricted by the debt-equity ratio. But Tables 2 and 5 as well as Tables 3 and 6 show a more detailed picture. The parameter shows contrary results for firms with bank-relationships (Tables 2 and 5) and firms without bank-relationships (Tables 3 and 6). For firms with relationships, the parameter is significant but small. As will be shown later, starting in 1992, firm-risk is much smaller for this group of firms (Table 12). This underlines that banks influence firms with bank-relationships to decide on low risk investment decisions. For firms without banks, the parameter of the debt-equity ratio, though not significant, shows a contrary sign in comparison to firms with relationships. We believe that this result is due to the small amount of bank loans of this group. For these firms, banks are not as restrictive as for firms with a high amount of borrowings.

Table 1: **Investment: All firms, 1986-1994, (equation 13)**

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1340 * (-2.4350)
a_2 (sales)	0.7813 * (26.5100)
a_3 (debt / equity)	-0.0568 (-1.3610)
Constant	2.3408 * (3.9870)
R^2	0.8040
Durbin-Watson	2.2199

Source: KAISHA data base, own calculation
* significant at level $\leq$ 5 %

Table 2: **Investment: With bank relations, 1986-1994, (equation 13)**

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1178 ** (-1.7970)
a_2 (sales)	0.6054 * (12.440)
a_3 (debt / equity)	-0.1034 ** (-1.7830)
Constant	5.7302 * (6.0270)
R^2	0.7729
Durbin-Watson	2.3202

Source: KAISHA data base, own calculation
** significant at the level $\leq$5%; * significant at the level $\leq$ 1%

Table 3: **Investment: Without bank relations, 1986-1994, (equation 13)**

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1613 ** (-1.9040)
a_2 (sales)	0.7889 * (20.7900)
a_3 (debt / equity)	0.0895 (1.1270)
Constant	2.2190 * (2.8520)
R^2	0.8515
Durbin-Watson	1.9613

Source: KAISHA data base, own calculation
** significant at the level $\leq$5%; * significant at the level $\leq$ 1%

Table 4: Investment: All firms, 1986-1994, (equation 14)

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1432 * (-2.7010)
a_2 (sales)	0.7980 * (26.2400)
a_3 (debt / equity)	0.0177 * (3.3330)
Constant	2.6344 * (4.4620)
R^2	0.8063
Durbin-Watson	2.2158

Source: KAISHA data base, own calculation
* significant at the level $\leq$ 1%

Table 5: Investment: With bank relations, 1986-1994, (equation 14)

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1097 ** (-1.7080)
a_2 (sales)	0.5981 * (12.350)
a_3 (debt / equity)	0.0094 ** (1.8760)
Constant	5.7883 * (6.086)
R^2	0.7729
Durbin-Watson	2.3166

Source: KAISHA data base, own calculation
** significant at the level $\leq$5%; * significant at the level $\leq$ 1%

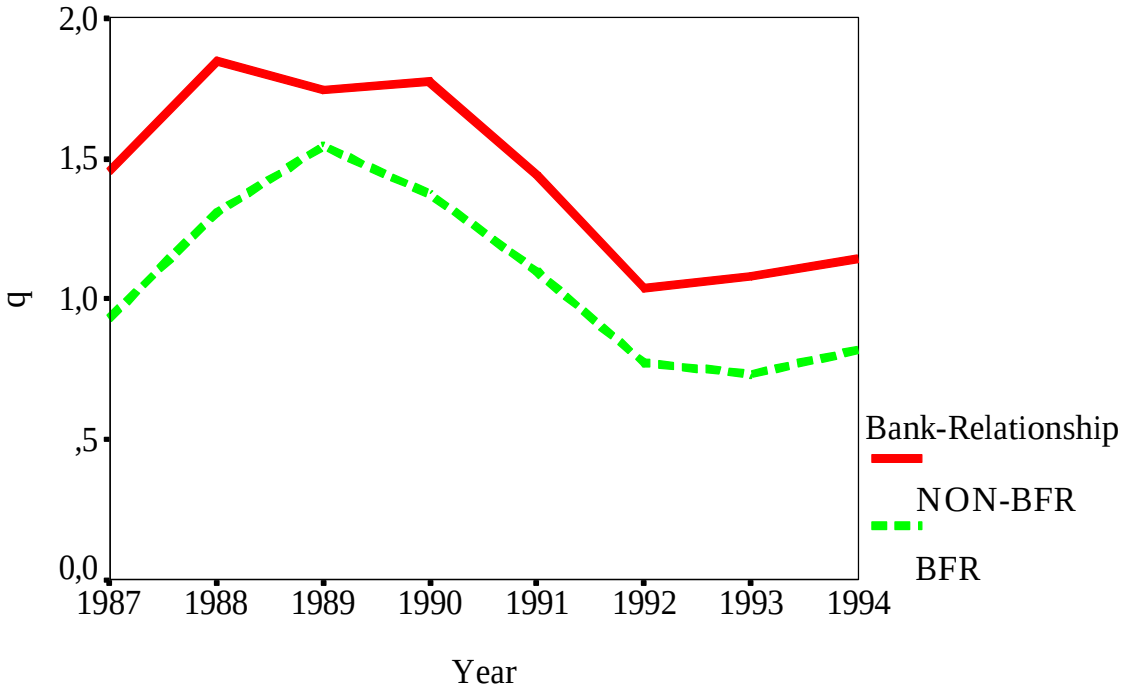
Table 6: Investment: Without bank relations, 1986-1994, (equation 14)

PARAMETER	COEFFICIENT (T-TEST)
a_1 (average Q)	-0.1577 ** (-1.8290)
a_2 (sales)	0.7912 * (20.6400)
a_3 (debt / equity)	-0.0765 (-0.9998)
Constant	2.0698 * (2.7950)
R^2	0.8514
Durbin-Watson	1.9616

Source: KAISHA data base, own calculation
** significant at the level $\leq$5%; * significant at the level $\leq$ 1%

In addition, Figure 1 shows the development of average *Q* for the period between 1987 and 1994. We can notice that for firms without bank-relationships, *Q* is bigger than one over the total period. For the group of firms with bank-relationships, starting in 1991 *Q* is smaller than one. The parameter for average *Q* is a significant variable of the investment function and is, as expected, negative.

Figure 1: Development of average *Q*, 1987-1994



Source: KAISHA data base, own calculation

2. Actual Capital Structure

Table 7 to 9 present the actual capital structure. Firms without bank-relationships have a much higher equity ratio. Though between 1986 and 1994 long term debt increased to a small degree, the amount of short term debt declined. Because the amount of short term debt is larger than that of long term debt, we suggest that the bank relations might have changed after the bubble era. The short term debt to total finance ratio declined for both groups over the years observed.

Table 7: Actual Capital Structure: All firms, 1986-1994

Year	KD/F(%)	LL/F(%)	EK/F(%)
1986.	44.76	17.14	38.10
1987.	42.16	19.03	38.81
1988.	41.78	18.14	40.08
1989.	41.05	18.21	40.74
1990.	39.07	19.87	41.06
1991.	39.01	19.45	41.54
1992.	36.85	20.66	42.49
1993.	36.38	20.37	43.25
1994.	34.76	21.08	44.17
Mean	**39.54**	**19.33**	**41.14**

Source: KAISHA data base, own calculation.
KD= short term debt; LL= long term loans; EK= equity; F=KD+LL*EK

Table 8: Actual capital structure: With bank relations, 1986-1994

Year	KD/F(%)	LL/F(%)	EK/F(%)
1986.	50.05	18.05	31.90
1987.	49.21	20.81	29.98
1988.	48.24	20.09	31.67
1989.	46.97	19.83	33.20
1990.	44.64	21.91	33.44
1991.	44.51	21.64	33.85
1992.	42.45	22.89	34.66
1993.	42.19	22.62	35.18
1994.	40.50	23.73	35.77
Mean	**45.42**	**21.29**	**33.30**

Source: KAISHA data base, own calculation
KD= short term debt; LL= long term loans; EK= equity; F=KD+LL*EK

Table 9: Actual Capital Structure: Without bank relations, 1986-1994

Year	KD/F(%)	LL/F(%)	EK/F(%)
1986.	36.49	15.72	47.79
1987.	31.13	16.26	52.62
1988.	31.69	15.07	53.23
1989.	31.79	15.68	52.53
1990.	30.35	16.67	52.98
1991.	30.41	16.02	53.56
1992.	28.10	17.16	54.74
1993.	27.28	16.84	55.87
1994.	25.78	16.92	57.30
Mean	**30.34**	**16.26**	**53.40**

Source: KAISHA data base, own calculation
KD= short term debt; LL= long term loans; EK= equity; F=KD+LL*EK

3. Return Ratios

In order to observe the profitability of both groups, we look at the return on sales ratio as well as the return on equity ratio. Table 10 and 11 underline that over the period observed, firms without bank-relationships are much more profitable than bank-related firms.

Table 10: Percentage of return on sales for all groups, 1986-1994

Year	ALL	NON-BFR	BFR
1986.	5.587	9.505	3.134
1987.	5.213	8.532	3.143
1988.	6.282	9.458	4.323
1989.	7.418	10.200	5.734
1990.	7.832	10.799	6.034
1991.	7.160	10.454	5.138
1992.	5.182	8.165	3.330
1993.	2.678	4.981	1.225
1994.	2.043	3.825	.967

Source: KAISHA data base, own calculation

Table 11: Percentage of return on equity for all groups, 1986-1994

Year	ALL	NON-BFR	BFR
1986.	14.169	20.288	11.836
1987.	10.431	12.656	9.314
1988.	12.540	14.512	11.662
1989.	13.509	14.835	12.872
1990.	15.127	15.261	15.292
1991.	13.949	15.027	13.481
1992.	9.424	10.920	8.608
1993.	4.268	6.405	2.950
1994.	2.723	5.753	.841

Source: KAISHA data base, own calculation

4. Firm-Risk

As has been pointed out, the short term debt to total finance ratio declined continuously. On the other hand, the equity ratio rises over the period observed. To find out the reason for this development, we estimate firm-risk. Following Geisen (1979), we use the following risk-variable:

$$(15) \qquad VAR_{i,t} = \sqrt{\sum_{m=0}^{3} \frac{\left(x_{i,t-m} - \overline{x_{i,t}}\right)^2}{4}}$$

with:

$$(16) \qquad \overline{x_{i,t}} = \frac{1}{4}\sum_{m=0}^{3} x_{i,t-m}$$

with: *x: return on sales*

This risk-variable is a measure of firm risk by using the variance of the return on sales over four years at a time.

The result presented in Table 12, shows that risk of the two groups is similar over the first three years, with the group of firms without relationships having a slightly smaller risk-variable. Starting in 1992, for firms with bank relations the firm-risk is much smaller than for firms with no bank affiliation.

Using the results of our estimation, the decline of short term debt ratio and an increase of the equity ratio can be explained by the strong increase of firm risk after the end of the bubble economy (see Table 12).

Table 12: Firm risk (variance of return on sales), 1989-1994

Year	ALL	NON-BFR	BFR
1989.	1.802	1.627	1.915
1990.	1.606	1.398	1.739
1991.	1.405	1.241	1.510
1992.	1.700	1.711	1.692
1993.	2.430	2.830	2.173
1994	2.758	3.256	2.439

Source: KAISHA data base, own calculation

Albach/Mori (1988), have already compared the financial structure of Japanese and German firms for the period from 1968 to 1984. They showed, among other characteristics, that there is no significant difference between equity ratios of firms in both countries. Comparing the capital structure of Japanese firms with German firms in the 1990s, we observe the following: Results of Stehle (1994), showed that the frequently stated assertion about small equity ratios of German firms does not hold true. Albach (1997), gives evidence that in Germany the equity ratio of firms with bank affiliations is higher than the equity ratio of firms without a bank affiliation. As has been pointed out above, we can find the opposite to be true for Japan. Here firms without relationships have a higher equity ratio. Banks in Japan allow firms with bank-relationships higher long term loans to total finance and short term debt to total finance ratios than in Germany. Taking the results of our investment function and the development of the risk variable into account, we believe that banks influence firms with bank-relationships to decide on low risk investment decisions. Therefore they are able to allow a high debt-equity ratio. The difference between the two results might be due to our criteria, the amount of borrowings, for destinguishing bank-relationship. Though the comparison shows different result in respect to equity ratios of the two groups, in both countries the equity ratio rises continuously over the period between 1986 and 1994. This development can be explained by the increase of total risk due to globalization and further liberalization of the capital market, resulting in an increase of the equity ratio to cope with the increase of risk.

C. Conclusion and Further Research Agenda

On the basis of the present state of our analysis, it is hard to derive a conclusive judgment on the impact of bank-firm-relationships on corporate performance of Japanese firms. However, for the period observed our results lead us to the tentative conclusion that:

1. Investment is determined by output expectations.
2. Similar to Germany, *Q* is a significant variable for investment behavior.
3. Investment is restricted by the debt-equity ratio.
4. Therefore the much claimed signaling effect of a high debt-equity ratio does not hold.
5. In contrast to Germany though, banks allow firms with bank-relatioships higher short term debt to total finance and long term loans to total finance ratios, whereas firms with no relationships have a higher equity ratio.

6. Banks influence firms with bank-relationships to decide on low risk investment decisions. Therefore they are able to allow a higher debt-equity ratio (in contrast to Germany). We like to ask why firms with no affiliation which by our definition have a bank-debt to total capital ratio of less than five per cent, still have a debt to total finance ratio of more than 40 per cent.
7. Non-bank-related firms are much more profitable than bank-related firms. The difference is even stronger than in Germany. Yet they also have to bear a higher amount of risk.
8. Apparently the policy of banks in Japan is much different compared to German banks: Banks force bank-affiliated firms to follow an investment policy, which is much more cautious and therefore leads to less profitability. This again leads to a bank-policy that allows to supply these firms with higher amounts of borrowings.

Our research conducted so far is a first step to analyze the impact of Japanese bank-firm-relationships on corporate performance under the influence of economic crisis and the liberalization of the Japanese financial market. The difference between our findings and results of research on German bank-firm-relationships might be due to the different definitions under which bank-firm-relationship is assumed. In comparison to the criteria of bank-firm-relationship used by Albach/Brandt/Brandt/Yang (1996), our current criteria needs to be scrutinized. Further study must explicitly introduce different potentials of bank influence on the Japanese firm. Besides the amount of bank loans, the flow of directors dispatched from banks and the amount of stocks held by banks have to be studied under the light of the corporate governance structure of Japanese firms and the changing structure of corporate control. Furthermore, the period of our observation has to be enlarged in order to look at different stages of Japans' financial liberalization process. It would also enable us to closely examine the impact of changing power positions of the diverse parties influencing the firm on corporate performance since the beginning of the liberalization process in 1983. Examining a variety of potentials of bank influence over the period of liberalization would shed further light on the problems of specifying the relationship between the interest of banks for monitoring and the interest of other shareholder (general investor). In order to take the different corporate objectives which are subject to the position of power of each party concerned into account, the degree of corporate performance has to be detected for different degrees of bank-firm-relationships. Further study must therefore introduce ways to measure corporate performance which considers these different and changing objectives.

We see the current crisis of the Japanese financial sector as an unique opportunity to test characteristics of Japanese bank-firm-relationships and to look at their changing conditions. Like in any other relationship, only in times of crisis it is possible to test whether the proposed characteristics prove effective.

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E. Appendix

List of Companies

Security Code	Industry	Company
6118	Machine Tools	Aida Engineering
6761	Consumer Electronics and Parts	Aiwa
6113	Machine Tools	Amada
6107	Machine Tools	Amada Sonoike
6108	Machine Tools	Amada Wasino
6140	Machine Tools	Asahi Diamond Industrial
4044	Chemicals	Central Glass
4519	Pharmaceuticals	Chugai Pharmaceutical
6796	Consumer Electronics and Parts	Clarion
4202	Chemicals	Daicel Chemical Industries
6383	Industrial Machinery	Daifuku
4505	Pharmaceuticals	Daiichi Pharmaceutical
6367	Industrial Machinery	Daikin Industries
4116	Chemicals	Dainichiseika Colour & Chemicals Mfg.
4061	Chemicals	Denki Kagaku Kogyo
6361	Industrial Machinery	Ebara
4523	Pharmaceuticals	Eisai
6504	Heavy Electric Machinery	Fuji Electric
4511	Pharmaceuticals	Fujisawa Pharmaceutical
6702	Communications Equipment	Fujitsu
6755	Consumer Electronics and Parts	Fujitsu General
6501	Heavy Electric Machinery	Hitachi
4217	Chemicals	Hitachi Chemical
6305	Industrial Machinery	Hitachi Construction Machinery
6581	Heavy Electric Machinery	Hitachi Koki
6106	Machine Tools	Hitachi Seiki
6102	Machine Tools	Ikegai

Security Code	Industry	Company
6310	Industrial Machinery	Iseki &Co.
7013	Shipbuilding	Ishikawajima-Harima Heavy Industries
6751	Communications Equipment	Japan Radio
4185	Chemicals	Japan Synthetic Rubber
4118	Chemicals	Kaneka
4452	Chemicals	Kao
7012	Shipbuilding	Kawasaki Heavy Industries
6765	Consumer Electronics and Parts	Kenwood
6756	Consumer Electronics and Parts	Kokusai Electric
6301	Industrial Machinery	Komatsu
6326	Industrial Machinery	Kubota
4151	Chemicals	Kyowa Hakko Kogyo
6782	Consumer Electronics and Parts	Kyushu Matsushita Electric
6135	Machine Tools	Makino Milling Machine
6586	Heavy Electric Machinery	Makita
6781	Consumer Electronics and Parts	Matsushita Communication Industrial
6583	Heavy Electric Machinery	Matsushita Refrigeration
6783	Consumer Electronics and Parts	Matsushita-Kotobuki Electronics Ind.
6508	Heavy Electric Machinery	Meidensha
6503	Heavy Electric Machinery	Mitsubishi Electric
4182	Chemicals	Mitsubishi Gas Chemical
7011	Shipbuilding	Mitsubishi Heavy Industries
4010	Chemicals	Mitsubishi Kasei
4184	Chemicals	Mitsubishi Petrochemical
4213	Chemicals	Mitsubishi Plastics Industries
4183	Chemicals	Mitsui Petrochemical Industries
4001	Chemicals	Mitsui Toatsu Chemicals
6701	Communications Equipment	NEC

Security Code	Industry	Company
4272	Chemicals	Nippon Kayaku
4403	Chemicals	Nippon Oil & Fats
4091	Chemicals	Nippon Sanso
4114	Chemicals	Nippon Shokubai
4205	Chemicals	Nippon Zeon
6703	Communications Equipment	Oki Electric Industry
6103	Machine Tools	Okuma
6645	Heavy Electric Machinery	Omron
6644	Heavy Electric Machinery	Osaki Electric
6136	Machine Tools	OSG Mit freundlichen Grüßen.
6773	Consumer Electronics and Parts	Pioneer Electronic
6707	Communications Equipment	Sanken Electric
4501	Pharmaceuticals	Sankyo
6764	Consumer Electronics and Parts	Sanyo Electric
4204	Chemicals	Sekisui Chemical
6753	Consumer Electronics and Parts	Sharp
4063	Chemicals	Shin-Etsu Chemical
4507	Pharmaceuticals	Shionogi
4004	Chemicals	Showa Denko
6758	Consumer Electronics and Parts	Sony
4203	Chemicals	Sumitomo Bakelite
4005	Chemicals	Sumitomo Chemical
6302	Industrial Machinery	Sumitomo Heavy Industries
6395	Industrial Machinery	Tadano
4535	Pharmaceuticals	Taisho Pharmaceutical
4502	Pharmaceuticals	Takeda Chemical Industries
4508	Pharmaceuticals	Tanabe Seiyaku
6803	Consumer Electronics and Parts	Teac

Security Code	Industry	Company
4045	Chemicals	Toagosei Chemical Industry
4043	Chemicals	Tokuyama Soda
6588	Heavy Electric Machinery	Tokyo Electric
6502	Heavy Electric Machinery	Toshiba
6104	Machine Tools	Toshiba Machine
6139	Machine Tools	Toshiba Tungaloy
4042	Chemicals	Tosoh
6330	Industrial Machinery	Toyo Engineering
6201	Industrial Machinery	Toyoda Automatic Loom Works
6206	Industrial Machinery	Toyoda Machine Works
6101	Machine Tools	Tsugami
4540	Pharmaceuticals	Tsumura & Co
4225	Chemicals	Tsutsunaka Plastic Industry
4208	Chemicals	Ube Industries
6792	Consumer Electronics and Parts	Victor Co. of Japan
4503	Pharmaceuticals	Yamanouchi Pharmaceutical
6506	Heavy Electric Machinery	Yasukawa Electric