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Bank Centered Corporate Groups and Investment: Evidence from the First Phase of High Growth Era in Japan*

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I Introduction

Economic reforms initiated by the GHQ (Generalheadquarters of Allied Nations) had a great impact on the prewar structure of the large Japanese businesses. Focussing on the ownership and financial structures of those big businesses, the following three points should be noticed. First, the postwar reforms contributed to establishing a competitive market structure. This was not only because the prewar *zaibatsu* were dissolved through deconcentration measures initiated by GHQ, but also because new companies emerged to fill the void. Meanwhile, not only were ex-*zaibatsu* companies forced to dissolve, neither were they compensated for wartime loses. Second, the dissolution of the prewar *zaibatsu* ownership structure in which large individual in-

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vestors and holding companies owned a majority share of stocks gave birth to new managerial enterprises. As a result, the industrial development of postwar Japan was largely implemented by salaried professional managers under a dispersed ownership structure. Third, postwar reform changed prewar corporate finance patterns. Before the war, companies relied largely on internal funds and the equity market as sources of funds. During the war, that pattern shifted toward debt-financing. After the war, companies exhibited low savings rates and thus the pattern of debt-financing established during the war not only continued but, in fact, grew more prominent (Teranishi, Kosai, 1993).

Japanese companies with this new structure helped Japan to realize its high growth rate initiating investment while introducing foreign technology. Also through this process, bank-centered corporate groups in Japan gradually emerged. In the 1950s, *ex-zaibatsu* companies which became free from the control of holding companies, organized "presidents' clubs" and held each others' member stocks.⁽¹⁾ Meanwhile, the big city banks were developing close relations with large client companies. Such "*keiretsu*" formations can be seen not only in the case of Fuji, Sanwa, and Daichi banks, which organized presidents' clubs in the late 1960's, but also in *ex-zaibatsu* banks such as Mitsubishi, Sumitomo, and Mitsu Bank.

This paper focuses on the time period of the late 1950s and early 1960s, so called the first phase of the high growth era in Japan, when *ex-zaibatsu* companies organized corporate groups with president club and cross-shareholding, while the main bank relationships were formed among the other companies and big six banks. Hence, concrete questions to be investigated are: how and why did both corporate groups

(1) These president's clubs, sometimes referred to as a council of chief executives, involved the presidents or vice-presidents of member companies meeting, on average, once a month.

and the main bank relationships emerge in this period? What kind of role did these corporate groups and main bank relationships play in fostering Japan's high economic growth? In particular, how were such high levels of investment achieved which, in turn, led to Japan's increased productivity and subsequent international competitive edge?

Let us first address the question of how the corporate groups were able to encourage investment. We will focus on the following two points: first, the relation between the degree of cross-shareholding and managerial behavior, and second, the influence of corporate groups and main banks relationships to investment.

In the first case, cross-shareholding could allow the top management team of corporate groups to increase investment by shielding them from the pressures of the external stock market to maximize value. This path was originally suggested by Marris (1964) and applied by Odagiri (1994) to corporate group issues. It could account for the observed increased investment which in turn contributed to the rapid growth of Japanese companies.⁽²⁾ In the first half of the high growth era (hereafter referred to as HGE) in Japan, measures designed to break up the pre-war *zaibatus* led to increasingly dispersed ownership and thus exposed the large corporations to the pressures of the external market. Later as cross-shareholding emerged, the question arises as to whether such cross-shareholding in fact aided in easing those external pressures and thus contributed to high investment and high growth.

The second possible path is on the side of corporate finance; here it is supposed that close main bank ties to corporate groups could have aided in raising the level of investment among presidents' club members and their affiliated companies relative to that of independent companies by merely easing constraints on cash flow. This idea was originally developed by Myers and Majiluf (1984), and applied to corporate groups

(2) However, Odagiri (1994) did not get clear results from his empirical studies.

in 1970s and 80s by Hoshi, Kashyap, Scharfstein (1990, 1991) and Horiuchi and Okazaki (1993).

During the 1950s and early 60s, asymmetry of information was particularly pronounced, because on the one hand remnants of the large pre-war corporations were still in the process of recovering from the damage and disorganization caused by the war, while on the other hand, newly emerging companies had not yet had the time to establish a solid track record on which to base informed business decisions. These new companies included such present-day highly reputed firms as Sony and Honda. Therefore, the second point under investigation is to what degree the increasing ties between the main banks and client companies aided in mitigating the asymmetry of information, and thereby both reduce the agency costs and the moral hazard of management teams.

Previous research on corporate groups was based mainly on the definition of *Keiretsu no Kenkyū* (Keizai Chōsa Kyōkai). However, this definition needs to be more precise since it does not distinguish between corporate groups and main bank relationships, as Horiuchi and Okazaki (1993) have already pointed out. Here we will try to set up our own data base and classify sample companies by our own index. Our data set is based on pooled data composed of the largest 150 companies in each of the years 1955, 1964 and 1972. Due to the appearance and disappearance of some companies from those lists depending on the particular year, the total number of companies included in the three years is 202. For the purposes of clarifying the relationships among corporate groups, companies with main bank relationship and independent companies, the Bank Tie Index has been created, which is calculated by using principle component analysis on several main bank variables (For details, see Appendix 1).

Using the Bank Tie Index, we will classify the sample companies into three groups: 1) *Ex-zaibatsu* companies, (members of the *ex-zaibatsu* presidents' clubs), 2) Bank Groups companies (those com-

panies most affiliated with the three *ex-zaibatsu* banks, Mitsubishi, Sumitomo and Mitsui banks, as well as those affiliated with Fuji, Sanwa, Daiichi banks), and 3) independent companies.

Henceforth, this paper will be organized as follows: This next second section summarizes the initial ownership and capital structures of large corporations as well as the corporate governance structure resulting from postwar reforms. Section three traces the evolutionary process by which *ex-zaibatsu* corporate groups developed relationships with the main banks. The fourth section clarifies the difference between the behavior of the top managers of *ex-zaibatsu* corporate groups and those of other companies with main bank ties, using Marris's valuation ratio. The fifth section estimates investment functions including cash flow constraints and Tobin's q . The relation between the growth rate of firms and their group affiliation is also investigated in this section. The sixth and the last section is planned to give some perspectives on the latter phase of HGE.

II The Impact of Postwar Reform: Initial Conditions of the HGE (High Growth Era)

As I pointed out earlier, the postwar reforms had a great impact on the ownership and financial structures of big businesses in Japan. Therefore, it is necessary to summarize those initial structures in 1955, when the high growth era first began.

As a result of postwar reforms, ownership of large corporations became much more diversified relative to the concentrated prewar structure (Table 1). The share owned by individuals and securities companies together was still over 60%, although the share of individual owners decreased rapidly after the stock market crash of 1949 from 70% to 55% by 1951. The share of the largest shareholder as well as the largest ten shareholders in 1955 was much lower than that of 1937.

Table 1 Ownership and Capital Structure in Prewar and Postwar

	1937 Total (N=105)	Total (N=122)	1955 Ex-zaibatsu (N=63)	Independent (N=59)
Owner ship Largest				
Largest	23.9% (22.5)	8.7% (10.0)	8.9% (12.0)	8.7% (9.2)
Top10	47.1 (24.5)	25.6 (12.9)	26.1 (14.1)	25.4 (10.7)
Financial Institution	6.0 (7.5)	28.5 (11.0)	26.9	30.0
Individual	N.A.	52.5 (14.0)	53.9	53.6
Capital composition				
debt-equity	0.396 (0.403)	1.702 (0.909)		
Borrow-Asset	0.040 (0.07)	0.238 (0.122)		
Bond-Asset	0.055 (0.082)	0.046 (0.037)		

Source; Tôyô-keizai, 1938; Yamaichi-Shôken, 1956.

Note: 1. Standard deviation in parenthesis.

2. Column 1937 shows the largest 100 companies as measured by total assets in 1937. However, column 1955 is large 100 companies in either 1937 or 1955.

3. Ex-zaibatsu means companies whose issued stock was held by designated holding companies in the zaibatsu dissolution. For details, see Miyajima, 1994.-a

Another point to note is that the share of financial institutions was much greater than prewar levels.

Furthermore, after the war, the ownership structure of big businesses became quite homogeneous. Before the war, the ownership structure of big businesses covered the following broad range: 1) *zaibatsu*-type companies centered on holding companies (around 30% of the 100 largest businesses), 2) owner-manager type companies (40%), 3) managerial-enterprise type companies (the remaining 30%). The focus of efforts to dissolve the *zaibatsu* was mainly on groups 1 and 2. The stocks of those families and holding companies were liquidated and

sold to the general public. As a result of these measures, most big businesses in 1955 exhibited almost the same ownership structure. In this regard, GHQ reforms had a pronounced effect, though often not as were originally intended (for details, see Miyajima, 1994-b).

Looking at the capital composition of big businesses, the high debt-equity ratio in 1955 is quite impressive. The debt-equity ratio is 4 times high than prewar, and the borrowing-asset ratio in 1955 was also much higher than its prewar level. The fact that the standard deviation of all indices was very small among big businesses in 1955 shows that the capital structure of big businesses had also become homogeneous, in comparison with prewar wide diversified structure. The reason for this is that the companies could help decreasing their capital in the process of reorganization, and during time when their stock price was declined, they had to rely on raising fund from banks. So called *keiretsu* financing patterns – a big city bank supplied large part of monetary demands of the same line companies, with the rest being supplied by the cooperative loans of other banks and financial institutions – accompanied this debt financing. This pattern, which originated from the “Designated Financial Institutions System” (hereafter DFIS) in wartime, emerged during the postwar period, because former designated financial institutions had an informational advantage for former clients by being “special manager (Tokubetsu Kanrinin)” of companies in the process of designing their reorganization plans. Utilizing this informational advantage, the former designated financial institutions could evaluate whether the financial distress the companies faced was, in fact, just a “liquidity crisis” or a “bankruptcy crisis”. In this process, the prototype of main bank relationships was basically established (Teranishi 1994; Hoshi 1994; Miyajima 1994-a).

The corporate governance structure was also influenced by postwar economic reforms. Although career managers fairly prevailed in prewar Japan (approximately 70% of big businesses in my estimation),

they were strictly monitored by executive boards in which either holding companies or large shareholders took part. Such a structure was completely changed by the “managerial revolution from above” including the purging of top management and the dissolution of *zaibatsu*. As a result, the big businesses of postwar Japan had their own unique characteristics in that the executive board completely excluded large shareholders, and the top management team, most of whom were promoted within companies, was in fact the same as the executive board members (Miyajima 1993).

The net result of these changes in postwar Japan was that the top management team tended to put too much stress on insiders’ interest. The postwar reform gave birth to “insider control problems” such as the fact that top management did not have any incentive to reduce cost, especially to adjust employment levels as demanded by the postwar situation (Aoki 1995; Yafeh 1994). The mechanism for disciplining the new top managers was a kind of “market for corporate control”.⁽³⁾ This mechanism was introduced after 1949, when stock market crashed. After that, the new top management team, who faced difficulties in corporate financing as well as threats of a hostile takeover, began to consider the shareholders’ interests again.

In this context, it is also important to note that the shareholding of financial institutions was encouraged from 1950, and investment trusts were newly introduced in 1951. Introducing this system meant that new mechanisms were institutionalized as a part of the market for corporate control. As Grossman and Hart (1980) predicted, the small investors, which GHQ assumed would be the pillar of economic democratization, had neither any intention nor ability to monitor companies which they had invested in. Furthermore, their volatile behavior dis-

(3) This word is not used as a strict meaning of Jensen and Ruback (1983), which put stress on the takeover bid as well as the managerial market.

torted the equity market. The shareholding of financial institutions could not only mitigate such a volatile effect, but also discipline the top management team.

However, financial institution such as trust banks and insurance companies did not play a role of “block shareholder” as defined by Shleifer and Vishny (1986). The most important player for disciplining the top management team during the postwar period was the main bank as the largest debt-holder, which also played a significant role in corporate financing. The main bank has dispatched their executives to large client companies before and after the peace treaty came into effect. They also tended to hold the client companies stock, being independent of their yield level. Under such a system, main banks intervened into personnel matter, if client companies showed bad performance in regard to profitability or dividend (Miyajima, 1994-b).

However, it is noteworthy that the main bank relationship, which played an important role in reducing asymmetry of information problem as well as incentive problems at that time, was not yet been established. The changes in the largest debt-holder between 1948 to 1955 were more frequent than that of 1943 and 1948 (Miyajima, 1994-b; FTC 1948). Especially, independent companies, which had not had close relations with any particular bank during the prewar years, tended to change their largest debtholder more frequently. By 1955, main bank relationships had not yet spread to cover the whole economy.

III Corporate Groups and Financial *keiretsu* in the first phase of HGE: Evolutionary Processes

1) *Ex-zaiibatsu* corporate groups: Forerunners of Group Formation

The *ex-zaiibatsu* companies such as Mitsui, Mitsubishi, and Sumitomo line companies, reorganized their networks again after US-Japan Peace Treaty came into effect. Unofficial presidents clubs secretly

organized during occupation period thereafter became official. It was in the early 1950s that the Friday club of Mitsubishi and Hakusui-kai of Sumitomo were organized.

Cross-shareholding among three *ex-zaibatsu* which appeared in the early 1950s continued to increase through the late of 1950s and early 1960s. The cross-shareholding ratio of Mitsubishi and Sumitomo rose to around 20-25%, as shown in Table 2.

The impetus for cross-shareholding was to be free from the possible risk of hostile takeovers. Although the threat of such takeovers had been decreasing during the mid 1950s, *ex-zaibatsu* companies still tried to stabilize their shareholder by asking securities companies to hold their stock. In 1955, securities companies held, on average, 12% of *ex-zaibatsu* stock. Most of that was held in name only (Suzuki 1992). Cross-shareholding increased as *ex-zaibatsu* companies gradually repurchased these stocks from the securities companies.

Another incentive of the companies was to maintain the price of their stock and to improve their debt-equity ratio. For example, when Sumitomo Metal Inc. sought to borrow investment funds from the World Bank, as a precondition for obtaining the loan, the World Bank required that it lower its debt-equity ratio. Sumitomo Metal borrowed in 1958 for the first time, it responded to the World Bank request by offering stock to its existing shareholders in compensation for reducing its dividends from 12% to 6%. However, when the stock price of Sumitomo Metal declined, Sumitomo asked president club member to hold its stocks. A similar situation occurred when Sumitomo Metal borrowed from the World Bank in 1962. This fact accounts for the increase (12%) of the shareholding of member companies of Sumitomo Metal (Sumitomo Metal Inc. 1967).

What, in turn, was the incentive for member companies to hold the other member companies' stocks? Generally speaking, because eventually each company has to issue its own stock, it is in its own self-

Table 2 Cross-Shareholding Ratio in High Growth Era (%)

Year	50	54	58	62	66
〈Mitsubishi〉					
Cross-shareholding	2.18	12.61	13.92	17.39	17.50
Financial Institutions	2.01	10.29	11.96	11.72	11.45
Trust bank/Insurance company	N.A.	—	8.01	8.98	8.16
Non-financial company	0.17	2.32	1.96	5.67	6.05
Trading company	—	—	—	0.59	0.75
Manufacturing company	0.17	2.32	1.96	5.08	5.30
〈Sumitomo〉					
Cross-shareholding	0.00	15.00	18.19	27.62	23.60
Financial Institutions	0.00	10.35	10.54	15.82	14.89
Trust bank/Insurance company	N.A.	—	6.82	10.35	9.48
Non-financial company	0.00	4.65	7.65	11.80	8.71
Trading company	N.A.	—	—	1.86	1.02
Manufacturing company	N.A.	-4.65	—	9.94	7.69
〈Mitsui〉					
Cross-shareholding	0.44	6.87	7.42	11.70	10.66
Financial Institutions	0.13	3.22	5.40	7.23	5.97
Trust bank/Insurance company	0.00	—	3.25	4.19	3.71
Non-financial company	0.31	3.65	2.02	4.47	4.69
Trading company	—	—	—	1.03	1.05
Manufacturing company	0.31	3.65	—	3.44	3.64

Source: TSE; Keizai Chōsa Kyōkai.

Note: 1. Sample based on the president club member in 1961.

2. The ratio based on the ten largest shareholders up to 1958. However, it is based on all the shareholders from 1962. Therefore, the ratio is not comparable in strict sense.

interest to hold other member's stocks. However, the more important incentive was to maintain actual transaction relationship. In fact, cross-shareholding among manufacturing companies first developed from the actual business transactions, such as those between Tōyō Rayon (a synthetic fiber company) and Mitsui Petrochemical; Nihon Electric Company (NEC, Electronic and telecommunications company) and Sumitomo Electric Works (a copper wire producer). The cross-shareholding

among manufacturing companies was based on the intention of inhibiting opportunistic behaviors and to maintain stable transactions.

However, the main contributor to the rising percentage of cross-shareholding ratio was financial institutions (see Table 2). It is true that the trend during this period was for financial institutions to increase their relative share of the issued stock (Table 6), as I will explain in more detail later. The point to be noted is that the shareholding of financial institutions in *ex-zaibatsu* was not based on the portfolio profitability in the normal sense, in other words, simple profit maximization, but rather than based on the transactional priority.⁽⁴⁾ In during the stock market boom of 1959 to 1961, transactional factors were the main incentive for shareholding.

In parallel with the increases in cross-shareholding, the president clubs became increasingly active. First, the president clubs played coordinating role in the repurchasing of stocks, when the companies faced the threat of hostile takeover or a sudden stock price decline. Second, more importantly, as the cross-shareholding increased, president clubs became equivalent to "large shareholders meeting". While a member company was sheltered from the external pressures of the equity market, it was monitored by other member companies.⁽⁵⁾

(4) The percentage change in share held by *ex-zaibatsu* financial institutions from 1957 to 1964 regressed on the portfolio factor, the rate of return on the stocks (RRS) and other transactional factor (the ratio of loans to a company divided by total loan). While RRS did not show the significant correlation, the transactional factor showed the significance positive correlation to the percentage change.

(5) President club often ruled to coordinate the contradiction of interest among members. The examples are to encourage merger of member companies dissolved in the postwar deconcentration measures (Mitsui Trading Inc. and Mitsubishi Heavy Inc.); to coordinate investment such as petro chemical industry; and to support declining industries such as coal industry (Gerlach 1992).

2) *Keiretsu* Financing

Among *ex-zaibatsu* companies, “*keiretsu* financing” was kept high in the first phase of HGE (Table 3). The dependence of member companies on same line financial institution was over 40% in the case of Sumitomo and Mitsubishi Groups. This dependence would be even more impressive, if we consider *keiretsu* 2 based on the borrowing from private financial institutions in Table 3. While the dependence on banks tended to decrease, the dependence on other financial institutions tended to increase. One can assume that the information concerning the financial situation of member companies spilled over from banks to other financial institutions. The monitoring of client companies was delegated to member banks and mutual monitoring among president club members.

Loans from member financial institutions played a crucial role as “a first lender” for such big projects as the diversification and enlargement of their facilities. Financial institutions would normally tend to avoid concentrating their loans on only a few clients in favor of risk diversification. However, at these crucial times when member companies plan large investments, financial institutions of *ex-zaibatsu* were willing to lend large sum of money to them, correctly evaluating this investment project by utilizing information based on long term transactions.

The financial institutions of corporate groups played the “first lender” role primarily in such high growth industries as petro-chemical, iron and steel, and electric appliances. In order to clarify this “first lender” role systematically, we will perform the following simple regression for member companies in heavy and chemical industries.

$$\Delta M_t = a_1 + a_2 M_{t-1} + a_3 \Delta L_t + a_4 \Delta GM_t \quad (1)$$

Where ΔM_t is the percentage change of *keiretsu* financing ratio, ΔL_t , ΔGM_t are the rate of increase in borrowing and the percentage change in borrowing from government financial institutions respectively. It is

Table 3 Main Bank Ratio and Loan Concentration of Three Ex-zaibatsu President Club Members (billion yen; %)

Year	1951	54	58	62	66
Mitsubishi (N=24)					
Total Borrowings	39	100	188	424	866
<i>Keiretsu</i> (1)	32.6	22.1	30.5	32.9	25.7
Bank (2)	29.9	18.6	23.6	21.6	13.7
Other Fin.Inst. (3)	2.8	3.6	6.8	11.3	11.9
<i>Keiretsu</i> 2 (4)	44.0	31.2	46.0	39.9	31.9
Concentration ratio					
Bank (5)	17.0	10.6	11.1	12.6	9.2
Other Fin. Inst. (6)	2.8	3.6	6.8	11.3	11.9
Sumitomo (N=10)					
Total Borrowings	11	30	63	203	400
(1)	31.3	34.9	36.7	47.8	43.2
(2)	28.3	29.5	24.0	23.1	20.1
(3)	3.0	5.5	12.8	24.7	23.0
(4)	55.3	44.8	39.0	49.7	45.2
(5)	3.5	5.3	4.0	6.8	6.4
(6)	2.0	3.8	7.1	17.1	15.7
Mitsui (N=15)					
Total Borrowings	38	74	163	333	718
(1)	16.5	28.8	27.2	24.8	23.1
(2)	15.0	21.7	20.3	16.3	12.9
(3)	1.4	7.1	6.9	8.5	10.2
(4)	30.2	39.9	30.1	30.0	28.5
(5)	8.3	12.3	12.8	10.8	10.2
(6)	3.9	14.0	10.3	10.7	13.2

Source: Same as Table 2.

Note: 1. Only manufacturing and trading companies are selected from the president club members.

2. Notations and numbers in parentheses in the first column indicate as follows:

(1) *Keiretsu*: Borrowing from same line financial institutions / Total borrowing.

(2) Bank: Borrowing from same line banks / Total borrowing.

(3) Other Fin. Inst.: Borrowing from same line trust banks and insurance companies / Total borrowing.

(4) *Keiretsu* 2: Borrowing from same line financial institutions / (Total borrowing - Borrowing from government financial institutions). Here government financial institutions mean Japan Developmental Bank and Japan Export and Import Bank.

(5) Concentration of Bank: Loan from a bank to member companies / total loan of this bank

(6) Concentration of Other Fin. Inst.: Loan from trust banks and insurance companies to member companies / total loan of trust banks and insurance companies.

Table 4 Analysis of Keiretsu Financing among President Club MembersModel: $\Delta M_t = a_0 + a_1 M_{t-1} + a_2 \Delta L_t + a_3 \Delta GM_t$

year	M_{t-1}	ΔL_t	ΔGM_t	Mitsui-Dum	R ²	N
58	-0.713 (-3.10) ^a	-0.045 (-0.47)	-0.144 (-0.84)	—	0.33	26
	-0.452 (-2.49) ^b	0.023 (0.27)	-0.233 (-1.66)	-19.581 (-2.30) ^b	0.43	26
62	-0.041 (-0.23)	0.043 (5.23) ^a	-0.219 (-1.16)	—	0.64	26
	-0.036 (-0.23)	0.044 (4.80) ^a	-0.224 (-1.09)	0.385 (0.07)	0.62	26
66	-0.230 (-2.62) ^a	-0.294 (-2.12) ^b	-0.182 (-1.01)	—	0.48	23
70	-0.430 (-5.85) ^a	0.011 (0.22)	-0.593 (-2.78) ^a	—	0.77	22

Source: Same as Table 2.

Note: 1. Notations are as Follows.:

ΔM : Percentage change in *keiretsu* financing, which is calculated by borrowing from same line financial institutions / total borrowing.

M_{t-1} : Percentage of *keiretsu* financing at the previous period.

ΔL : Increasing in borrowing calculated $L_t/L_{t-1} - 1$, where L_t denotes borrowing at the current period Percentage expression.

ΔGM : Percentage change in borrowing from government financial institutions.

2. Metal, machine, chemical, and synthetic fiber companies are selected from president club members.

3. *t*-value in parenthesis.

a. Significant at 1% level.

b. Significant at 5% level.

c. Significant at 10% level.

clear from Table 4 that the more rapid the ΔL increased, the higher ΔM went up. Comparing with the result for 1966 and 1970, the role of the “first leader” was especially obvious in the first phase of HGE. In this phase, even president member companies did not establish their reputation in the capital market. Therefore, the *keiretsu* financing had significant role as the “first lender” for investment of member companies.

3) Strategy of Developing large Client in the case of Ex-zaibatsu Banks

This *keiretsu* financing was not limited to president club member companies. Ex-*zaibatsu* banks such as Mitsubishi, Sumitomo, and Mitsui Banks looked for promising large clients which they could maintain a stable, long-term business relationships (Kondo 1988). The reasons for taking this strategy of "developing large client" were as follows: first, there were obvious economies of scales in offering loans as well as the cost reduction of obtaining deposits through compensation balance; second, concentrating their loan on president club member tended to limit their ability to expand their businesses; and third, aggressive strategies taken by other non-*zaibatsu* city banks, which will be mentioned later, had a large stimulus to ex-*zaibatsu* companies.

This strategy was applied to two types of companies; first were those companies with which they had long-term dealings since DFIS, and the other were those companies which had just been established and to which ex-*zaibatsu* banks had not yet set up any relations. The latter, such as the relationship between Mitsubishi bank and Honda Automobile, Mitsui Bank and Sony Inc., and Sumitomo bank, Mazda and Bridgeston, tended to be more important.

The case of Honda and Sony can be reviewed in more detail (Table 5). Honda Automobile Inc. which had tangible assets of only 1.4 billion yen in 1958, had plans to establish mass production facilities for making motor cycles. The company required 10 billion yen for ensuing two years, in effect eight times its tangible assets. It is quite impressive that Honda borrowed more than 5 billion yen in both 1960 and 61, approximately 60% of which was supplied by Mitsubishi Bank (Honda 1975).

The same situation can be seen in the case of Sony Inc. in its initial stages. It was quite crucial for Sony to succeed in exporting their radio to the US market in 1957 and to establish a mass production plant for radio in 1959. The fund planned was three billion yen which was

Table 5 Corporate Finance and Main Bank Dependence in Honda and Sony
(million yen; %)

Year (t)	Honda Auto Inc.			Sony Inc.		
	I_t	ΔL_t	M_t	I_t	ΔL_t	M_t
57	—	—	—			
58	1,030	—	49.0	926	250	51.7
59	2,744	611	47.4	1,796	157	51.6
60	6,493	1,044	60.9	4,462	1,629	65.0
61	15,187	4,078	56.0	4,685	557	57.0
62	12,599	-622	66.2	3,328	1,374	51.8
63	8,941	-140	51.3	5,083	4,524	49.1
64	10,783	8,460	54.0	5,655	1,657	47.2
65	23,624	5,061	50.0	3,882	1,981	44.8
66	22,001	3,204	40.4	4,599	-1,376	42.6
67	30,438	16,200	35.3	10,221	-3,651	46.0
68	37,416	12,750	34.4	10,556	1,675	46.6

Source: Same as Table 2.

Note: 1. The main bank of Honda Automobile Inc. is Mitsubishi Bank; that of Sony Inc. is Mitsui Bank.

2. I_t : Investment

ΔL_t : Increase in borrowings

M_t : The ratio of Main Bank Loan. See Appendix 1.

15 times its tangible assets at that time. Here, Mitsui Bank supplied 70% of the whole loan, basing their decision on information accumulated since 1950, when the former executives of Mitsui Bank took part in the board of this company (Sony Inc. 1986):

In these cases summarized above, *ex-zaibatsu* bank in effect supplied a kind of venture capital to promising newly emerging companies, correctly evaluating (*ex-ante* monitoring) such high risk projects.

4) Non *ex-zaibatsu* City Bank; Latecomer to Group Formation

Fuji, Sanwa, and Daiich also had long-term business relationships with certain companies since DFIS in wartime. However, their network

was far weaker than that of *ex-zaibatsu* companies in the sense of the size of their clients as well as the degree of business relationships. For example, Fuji bank had few dealings with large client companies. The large clients of Sanwa tended to be concentrated in the textile industries (Tōyō-keizai 1953; 1955).

Non-*zaibatsu* banks tried to develop large clients beginning in the early 1950s. The main reason for taking this strategy was to compete with the *ex-zaibatsu* banks, in addition to trying to obtain economies of scale in their loan structure. The former chief of the general division of Sanwa Bank recalled that main task of this division at that time (around the early 1950s) was “how Sanwa could compete against *ex-zaibatsu* banks”, and “with which companies Sanwa should establish business relations?” (Sanwa 1974, p. 242).

Interestingly, Fuji and Sanwa put priority on issuing loans to large clients, while they decided on a policy of seeking deposits from general public. For example, the president of Fuji Bank clarified this priority strategy at the meeting of branch managers in 1954. “As the economy has largely turned to normal, the accumulation of capital has made it possible for well-performing companies to improve their position and strengthen their *keiretsu* relationship (vertical *keiretsu*). If a bank could establish business with these high-performance, group affiliated companies, this bank would strengthen its position and, at the same time, lay the foundation for growth in the future” (Fuji Bank 1982, p. 797). After having decided on this strategy, Fuji enlarged its screening and research divisions, dividing the former screening division into first and second divisions, wherein the first division focused on screening large clients.

Sanwa Bank was even more aggressive than Fuji Bank in placing priority on catering to large clients, because their existing client companies at that time were limited to those in the textile industry. Sanwa

focused on a "strategy of concentrating loans on the heavy and chemical industries" in 1952. According to this strategy, Sanwa established its branch offices in east part of Japan.⁽⁶⁾

In so doing, the *keiretsu* financing between non *ex-zaibatsu* banks and companies was developed in the 1950s and early 1960s. This financing pattern grew to play the significant "first lender role" to the related companies, on a par with that of the *ex-zaibatsu* banks.

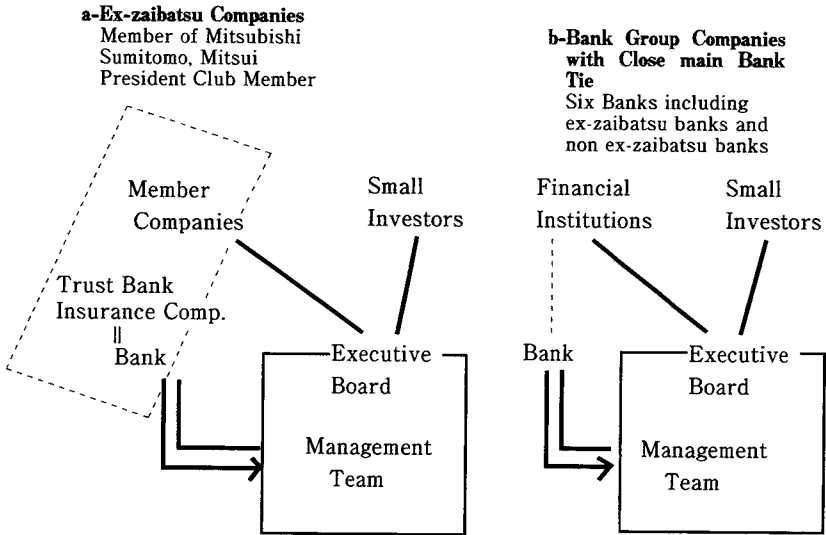
However, companies having close ties with non *ex-zaibatsu* banks tended not to engage in cross-shareholding, not to be involved in transactional relationships in 1955. The first phase of HGE was still the period in which these transactional relationships has been gradually established. Even in 1964, there were no cross-shareholding relations among them such as those established among *ex-zaibatsu* president club members. The cross shareholding ratio of Fuji Bank Group was 6.3% and that of Sanwa was 10.8% in 1964 (Keizai Chōsa Kyōkai). The percentage of share held by of banks out of the cross shareholding was 4.3% and 3.6% respectively.

IV Ownership Structure and the MVR (Marginal Valuation Ratio)

As just described above, there were two type of relationships by the mid 1960s. The first one is a president club organized by *ex-zaibatsu* companies, which already had cross shareholding and *keiretsu* financing as shown in Figure 1-a. Second one is main bank relationships or bank groups composed not only of companies having close tie with non-*zaibatsu* banks but also the companies having close tie with *ex-zaibatsu* banks. Among them, there were not cross-shareholding, but

(6) Until that time, the branch offices of Sanwa Bank were primarily concentrated in the western part of Japan (Sanwa, 1974).

Figure 1 Two Types of Bank centered Corporate Groups in 1964



had main bank relationships including *keiretsu* financing. Figure 1-b gives an intuitive image about bank group.

However, these main bank relationships were very diverse depending on the degree of dependence on loans, borrow-asset ratio of a company, the degree of shareholding of the bank in the client company, dispatching executives from the bank and so on. Therefore, it is necessary to develop an index which can measure degree and nature of the bank tie. The bank tie index (hereafter referred to as BTI) used here is calculated from the following six main bank variables; 1) the ratio of main bank loan, 2) the amount of borrowing from main bank, 3) the borrowing-asset ratio, 4) the shareholding of the main bank, 5) the index expressing the personnel relation between the bank and client companies, and 6) whether the main bank is the manager bank responsible for issuing the corporate bond or not, using the principle factor analysis. (The procedure and notation for calculating index is summarized in

Table 6 Shareholding Ratio of Financial Institution and Borrow-Asset Ratio (%)

	Ex-Zaibatsu	Bank1	Bank2	Independent
N	21	22	32	28
FIN ₆₄	35.6 (10.7)	37.3 (11.4)	43.7 (14.0)	35.6 (12.3)
Δ FIN ₅₇₋₆₄	8.4 (8.1)	11.7 (9.9)	11.1 (9.5)	10.1 (9.7)
TRUST ₆₄	15.9 (9.3)	17.2 (9.9)	19.1 (12.0)	15.6 (7.3)
Δ TRUST ₅₇₋₆₄	0.4 (6.2)	4.6 (8.6)	3.3 (7.8)	4.8 (6.5)
BOR ₆₄	0.32 (0.15)	0.25 (0.09)	0.35 (0.09)	0.29 (0.13)
Δ BOR ₅₇₋₆₄	0.10 (0.12)	0.06 (0.08)	0.13 (0.11)	0.09 (0.13)

Source: TSE; Diamond, 1964.

Note; 1. Standard deviation in parentheses.

2. Grouping is as follows.

Ex-Zaibatsu: Mitsui, Mitsubishi, and Sumitomo presidents club among top 200 companies.

Bank1: Companies whose main bank is Mitsui, Mitsubishi, or Sumitomo Bank and also have positive Bank Tie Index (BTI), as for it, see Appendix 1.

Bank2: Companies whose main bank is Fuji, Sanwa, or Daichi Bank and also have positive BTI.

Independent: Lower 30 companies according to BTI

3. Notations are as follows:

FIN₆₄: The share held by financial institutions in 1964.

Δ FIN₅₇₋₆₄: The percentage change in share held by financial institutions from 1964.

TRUST₆₄: The share held by trust banks and insurance companies in 1964.

Δ TRUST₅₇₋₆₄: The percentage change in share held by trust banks and insurance companies from 1957 to 1964

BOR₆₄: Borrowing asset ratio in 1964.

Δ BOR₅₇₋₆₄: The percentage change in borrowing-asset ratio from 1957 to 1964.

Appendix 1). Hereafter we will use the factor 1 in the principle component analyses as bank tie index (BTI), and focus on these companies which have a positive BTI value as "Bank Group" companies.

Looking at ownership structure in Table 6, it is interesting to note that the percentage increase in share held by financial institutions in Bank Group companies was much higher than president member com-

panies (*Ex-zaibatsu*). This share increase was valid for both the companies having close tie with *ex-zaibatsu* bank (hereafter Bank Group 1) and the companies having close tie with non-*zaibatsu* bank (hereafter Bank Group 2). Because this change was mainly caused by the percentage increase in share held by trust banks and insurance companies, it is supposed that these companies were the main target of institutional investors. The facts mentioned above indicate that the top management team of Bank Group companies was more strongly exposed to the pressure of external capital market than that of *ex-zaibatsu* companies. As I remarked before, the system established immediately after postwar reform institutionalized the market for corporate control as well as the monitoring by main bank. This type of market for corporate control effected to all big businesses except *ex-zaibatsu* companies in the first phase of HGE.

In order to test the validity of this observation, it is necessary to investigate: 1) the incentive of financial institutions to engage in shareholding and 2) the behavior of companies issuing stocks.

As for the first point, let us perform the simple equation that the percentage change in share held by financial institutions ($\Delta SH-Fin_t$) from 1957 to 64 was regressed on the rate of returns on stocks (RRS_t) from 1957 to 63 and other control variables (As for more detail definition, see Table 7).

$$\Delta SH-Fin_t = a_1 + a_2 SH-Fin_{t-1} + a_3 RRS_t + a_4 Bor_{t-1} + a_4 \Delta Bor_t \quad (2)$$

Because of a lack of data, both the percentage change in share held by institutions including banks in the whole shareholder list ($\Delta SH-Fin_t$) and the percentage change in share held by trust banks and insurance companies in the large ten shareholder list ($\Delta SH-Trust_t$) were designated as dependent variables. The result was shown in Table 7. The $\Delta SH-Fin_t$ and $\Delta SH-Trust_t$ of *ex-zaibatsu* companies is not correlated to RRS_t , as would be expected. On the other hand, $\Delta SH-Fin_t$ and

Table 7 The Percentage Change in Share Held by Financial Institutions and the Rate of Return on Stocks (RRS): 1957-64

$$\text{Model: } \Delta SH-Fin = a_0 + a_1 SH-Fin_{57} + a_2 RRS + a_3 B_{57} + a_4 \Delta B$$

$$\Delta SH-Trust = a_0 + a_1 SH-Trust_{57} + a_2 RRS + a_3 B_{57} + a_4 \Delta B$$

	All Financial Institutions			Trust Banks and Insurance companies	
	<i>N</i>	<i>RRS</i>	<i>R</i> ²	<i>RRS</i>	<i>R</i> ²
All samples	94	0.348 (4.343) ^a	0.29		
(1) Ex-zaibatsu	20	0.162 (0.785)	0.05	0.206 (1.208)	-0.03
(2) Bank Group-1	19	0.446 (1.309)	0.31	0.324 (1.276)	0.20
(2')	19	0.641 (1.878) ^c	0.40	0.474 (1.583)	0.19
(3) Bank Group-2	30	0.398 (3.354) ^a	0.29	0.373 (4.179) ^a	0.32
(4) Independent	25	0.436 (2.702) ^b	0.33	0.189 (2.023) ^c	0.42

Source: The JDB (Japan Development Bank) corporate Finance Date Bank (here after JDB database); Keizai Chōsa Kyōkai; TSE.

Note: 1. Notations are as follows:

$\Delta SH-Fin$: The percentage change in share held by financial institutions.

$\Delta SH-Trust$: The percentage change in share held by trust banks and insurance companies.

Note that the figures based on the ten largest holders.

RRS: Average of the rate of returns on stocks from 1958 to 1963.

$SH-Fin_{57}$: Percentage in share held by financial institutions in 1957.

$SH-Trust_{57}$: Percentage in share held by trust banks and insurance companies in 1957

ΔB : The percentage change in borrowing-asset ratio.

B_{57} : Borrowing-asset ratio in 1957.

Equation (2') includes the share of owner as additional independent variable.

2. Grouping is same as Table 6.

$\delta SH-Trust_i$ of Bank Group 2 shows positive significant correlation with *RRS*. This result was also valid for the Bank Group 1 and the Independent, although the level of significance decreased slightly.

As for second point, we estimate following Marris's marginal valuation ratio (*MVR*) of ex-zaibatsu, Bank Group and Independent.

$$MVR = \frac{\Delta v}{\Delta g} \quad (3)$$

Where Δv is the increase in the value of firm from 1957-63 and Δg is that of asset. Table 8 supports a hypothesis. that the companies having close bank ties with either an *ex-zaibatsu* bank or non *ex-zaibatsu* bank were exposed to the pressure of external equity market. The *MVR* of the Bank Group is relatively higher than other 121 companies. It is possible to reject a hypothesis. that both average is the same in a 10% level of significance. It should be apparent that the Bank Group companies had a preference to select investment projects which were highly evaluated by the equity market, when comparing the *MVR* of Bank Group with *MVR* of *ex-zaibatsu* companies. On the other hand, as there is little difference between *MVR* of Bank Group 1 and 2, both would appear to have been under the same pressure of equity market.

In the first phase of HGE, institutional investors such as trust bank (securities companies) and insurance companies behaved on the basis of portfolio profitability, and the top management team of big businesses had a tendency to prefer these projects which these institutional investors evaluated highly. The market for corporate control functioned alongside monitoring by banks. The situation wherein president club members were sheltered from pressures of the external market through cross-shareholding was still the exception rather than the rule. The behavior of top management team relatively free from shareholders' pressure, which has often been seen typical of Japanese type of firm, did not yet prevail in this phase.

V Main Bank Relationship and Agency Cost.

Changing our focus to the corporate finance side, the following questions ave to be raised: could the formation of corporate groups and main bank system have contributed to higher for corporate investment

Table 8 The Estimation of Marginal "Valuation Ratio" (MVR): 1958-63

a) Marginal Valuation Ratio

	Ex-zaibatsu	Others			
N	21	142			
MVR	1.53	1.76			
Std. dev.	0.26	1.05			
	Bank Group	Group-1	Group-2	Others-2	Independent
N	42	22	21	121	25
MVR	1.98	1.81	2.11	1.67	1.58
Std. dev.	2.36	0.20	2.58	0.40	0.30

b) Test of Average MVR

	t-value	degree of freedom
Ex-zaibatsu - Other	1.719 ^a	43
Ex-zaibatsu - Bank	1.740 ^a	54
Group-1 - Group-2	0.769	20
Bank - Others-2	1.312 ^b	45
Bank - Independ	1.419 ^b	74

Source: JDB database, Yamaichi

Note: 1. Marginal valuation ratio (MVR) is given by $\Delta V/\Delta g$, where

$$\delta V = V_{63} - V_{58},$$

$$\delta g = g_{63} - g_{58},$$

V : Value of firm equals average stock price multiplied by number of issued stock plus debt,

g : Total asset.

However, V_{63} is standardized by the change of PER (1958-63).

2. Grouping is same as Table 6. However, the "independent" means lower thirty companies according to BTL.

3. a: significant at 10% level, b: significant at 20% level.

in the high growth era? Is the extent of investment a function of whether or not a company belongs to a president club? By same token, is it dependent on the degree of the main bank relationships?

In order to clarify this point, we will perform following Eq (4-7), which were developed by Myers and Majluf (1984), and later applied to main bank relation by Hoshi, et. al (1990-b) and Horiuchi and Okazaki (1994).

$$\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log L_{t-1} + a_3 \log F_t + a_4 r_t + a_5 c_t \quad (4)$$

$$\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log L_t + (a_3 + a_4 BA) \log F_t + a_5 r_t + a_6 c_t \quad (5)$$

$$\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log L_{t-1} + a_3 \log F_t + a_4 q_{t-1} \quad (6)$$

$$\frac{I_t}{K_{t-1}} = a_0 + a_1 \frac{L_{t-1}}{K_{t-1}} + a_2 \frac{F_t}{K_{t-1}} + a_3 q_{t-1} \quad (7)$$

Here I_t denotes the investment, and K_{t-1} denotes tangible fixed assets at the end of previous year. F_t denotes cash flow. Eq. 4, and 5 is almost same model as Horiuchi and Okazaki (1994). Where r_t and c_t are proxies for marginal efficiency of capital and the cost of capital, respectively. Eq. 7, which is almost the same model as Hoshi et. al (1990-a) and Elston (1994), based on q theory. All regressions included Y_t , a set of yearly dummy (For more detailed notation, see Appendix 2).

The assumption behind this model is that there are differences in the cost of capital for various methods of fund raising. Using internal funds are the cheapest for firms because the funds are immune from agency costs that accrue from external fund-raising such as borrowing. The firm tends to finance its investment expenditure first of all by the use of internal funds. Therefore, the availability of internal funds is one of the most important determinants of investment by the firm. In other words, the availability of internal funds reduces the cost of capital and, other things being equal, induces the firm to increase investment expenditures (Fazzari, et. al. 1988).

Then the first step is to test whether I_t was influenced by F_t or not in the high growth era. According to Table 9, the expenditure of investment was positively influenced by cash flow in all Eqs. Agency costs certainly accompanied with debt issuing in the HGE. However, coefficient of F_t has been decreasing from the first phase of HGE to later

phase of HGE. This finding was made robust by the fact that the coefficient of intersection of F_t and B_t of Eq. 5 was significantly positive in the first phase of HGE, whereas it showed no significance in the later phase. The coefficient a_3 of Eq. 5 indicates that the greater the dependence on borrowing, the more the investment is influenced by internal funds. Therefore, one can see that the agency costs associated with external financing in first phase of HGE were much higher than those during the latter phase of HGE. This result was consistent with common knowledge that at that time even big businesses were still suffering from the effect of war, while those businesses such as Sony and Honda which have gone on to become large corporations, had not yet established their reputations in the capital market.

The other outstanding fact to be derived from Table 9 is that I_t was influenced by Tobin's q in the first phase of HGE, while the coefficient of q_t in the latter phase of HGE is not statistically significant. The fact that I_t was sensitive to q_t in the first phase indicates that the investment behavior of big businesses in the first phase of HGE was different from later phase of HGE.

The second step of our estimation is to test whether cash flow constraint for I_t was influenced by corporate groups with cross-shareholding and main bank ties. In order to clarify this point, we will classify our pooled companies data from 1958 to 64, using 1) bank tie index (BTI) which has already been explained, and 2) the net dependence ratio of a companies to main bank loan (hereafter NRM), which could be calculated by the main bank loan over total asset. As we are focusing on borrowing from main banks, NRM could be a helpful proxy of expressing main bank ties. Thus the grouping is as follows:

- 1) Ex-*zaibatsu* president club companies: 27 companies.
- 2) Net Dependence Ratio of Main Bank loan (NRM);
 - a High-50; high rank 50 companies of NRM out of 174 companies, which remained after removing ex-*zaibatsu* companies

Table 9 The Estimation of Investment Functions: 1957-72

Models: $\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log Tloan_{t-1} + a_3 \log F_t + a_4 r_t + a_5 c_t$ $\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log Tloan_{t-1} + a_3 \log F_t + a_4 B_t \cdot \log F_t + a_5 r_t + a_6 c_t$

preiods	N	$\log K_{t-1}$	$\log Tloan_{t-1}$	$\log F_t$	$\log r_t$	$\log c_t$	$B_t \cdot \log F_t$	R^2
1957-64	1189	0.843 (28.16) ^a	0.020 (0.867)	0.201 (11.95) ^a	-0.009 (-1.749) ^c	-0.066 (-1.713) ^c	—	0.748
	1189	0.864 (26.67) ^a	-0.029 (-0.914)	0.196 (11.17) ^a	-0.009 (-1.746) ^c	-0.068 (-1.761) ^c	0.096 (2.351) ^b	0.749
1965-72	1472	0.940 (40.37) ^a	-0.003 (-0.189)	0.158 (12.48) ^a	-0.004 (-3.086) ^a	7.836 (3.403) ^a	—	0.811
	1466	0.938 (32.72) ^a	-0.007 (-0.235)	0.158 (12.45) ^a	-0.004 (-3.110) ^a	7.619 (3.284) ^a	0.020 (0.820)	0.811

Model: $\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log Tloan_{t-1} + a_3 \log F_t + a_4 q_{t-1} + a_5 Y_t$

	N	$\log K_{t-1}$	$\log Tloan_{t-1}$	$\log F_t$	$\log q_{t-1}$	R^2
1957-64	1084	0.859 (26.74) ^a	0.021 (0.861)	0.172 (8.924) ^a	0.034 (4.390) ^a	0.722
1965-72	1521	1.008 (39.45) ^a	-0.024 (-1.216)	0.101 (10.24) ^a	-0.000 (-0.286)	0.782

Model: $I_t/K_{t-1} = a_0 + a_1 F_t/K_{t-1} + a_2 Tloan_{t-1}/K_{t-1} + a_3 q_{t-1} + a_4 Y_t$

	N	$Tloan_{t-1}/K_{t-1}$	F_t/K_{t-1}	q_{t-1}	R^2
1957-64	1084	0.005 (0.188)	0.155 (8.652) ^a	0.101 (4.50) ^a	0.193

Source: JDB database.

Note: 1. As for the notation, see Appendix 2.

2. t -value in parenthesis.

a: Significant at 1% level.

b: Significant at 5% level

c: Significant at 10% level.

from the whole of our sample.

b Low-50; low lank 50 companies of NRM out of 174.

3) Bank Tie Index (BTI);

a Bank Group: companies which have main bank tie with six large city banks and shows positive BTI.

Table 10 The Estimation of Investment Functions according to Bank Tie Index: 1957-64

	Ex-zaibatsu	Net Ratio of Main Bank Loan		Bank Tie Index	
		High-50	Low-50	BANK	Independent
N	172	297	295	388	516
K_{t-1}	0.935 (12.246) ^a	0.930 (13.910) ^a	0.785 (12.041) ^a	0.790 (15.208) ^a	0.873 (19.167) ^a
$Tloan_{t-1}$	0.074 (1.081)	-0.131 (-1.689) ^c	0.030 (0.825)	0.013 (0.275)	-0.009 (-0.262)
F_t	0.105 (3.242) ^a	0.103 (2.569) ^b	0.262 (6.325) ^a	0.249 (9.560) ^a	0.214 (7.123) ^a
r_t	-0.024 (-1.001)	-0.037 (-5.319) ^a	0.017 (1.208)	-0.010 (-1.284)	-0.030 (-3.151) ^a
c_t	-0.062 (-0.821)	-0.031 (-0.395)	-0.088 (-1.031)	-0.026 (-0.452)	0.070 (-1.077)
R^2	0.783	0.717	0.738	0.773	0.726
N	142	297	282	355	478
$Tloan_{t-1} / K_{t-1}$	-0.017 (-0.220)	-0.040 (-0.529)	0.028 (0.650)	0.028 (0.623)	-0.020 (-0.485)
F_{t-1} / K_{t-1}	0.080 (2.042) ^b	0.090 (2.053) ^b	0.210 (4.945) ^a	0.173 (6.262) ^a	0.139 (4.583) ^a
q_{t-1}	0.094 (2.116) ^b	0.142 (2.865) ^a	0.152 (3.321) ^a	0.174 (4.377) ^a	0.179 (4.030) ^a
R^2	0.176	0.134	0.213	0.300	0.199

Source: JDB database.

Note: 1. Concerning grouping, see the main text.

2. Net Ratio of Main Bank Loan is calculated by LM/A , where LM is borrowing from same Line financial institutions; A is total asset

3. Concerning Bank Tie Index, see Appendix 2.

4. t -value in parenthesis.

a: Significant at 1% level.

b: Significant at 5% level

c: Significant at 10% level.

b Independent: companies whose largest debtholder was six large city bank, but show negative BTI.

The estimation of investment function Eq. 4 and 7 according to these classification is summarized in Table 10. Although this estimation is not perfect enough in the sense that the NRM and BTI calculated in 1964 are applied to all the data of companies from 1957-64 and other

independent variables such as ct , rt and gt should be elaborated, we can tentatively take note of the following points;⁽⁷⁾

1) The cash flow constraints for investment in the case of president club companies is much lower than the average and other group-ing excluding the High-50. The member companies, which expected borrowing from the same line financial institutions and monitored by president club, were free from cash flow constraints. It is also worth noticing that the coefficient of q_t of *ex-zaibatsu* companies were much lower than other companies. This result would seem to be consistent with the fact that *ex-zaibatsu* companies were relatively free from the pressures of external equity market.

2) The High-50 companies, which depended largely on debt financing and also depended heavily on main bank loan, show lower F_t than Low-50. Their coefficient of F_t is the same level of *ex-zaibatsu* companies. While the increasing borrowing-asset ratio corresponds to high cash flow constraints in the first phase of HGE, as has already been pointed out, high dependence on main bank loan mitigated the constraints on using internal funds for investment. In other words, those firms with strong dependence on main bank loan could maintain higher levels of investment than those with low dependence on main bank loan.

3) The estimation according to the classification of the BTI seems not to be consistent with what one would expect from the theory. This discrepancy possibly occurred partly because this classification is too broad and partly because it neglects to take into account the difference in investment levels according to industries. Then, industries are divided into two types, high growth industries (such as syntectic fiber, metal, chemical, and machine) and low growth industries (the others), according to growth rate of value-added production from 1957-64.

(7) Statistically to say, the variance of each Eq. has to be tested by the method of GMM (Generalized Methods of Moments), which was already applied by Elston (1994). This estimation is now going.

Table 11 The Estimation of Investment Functions according to Industry: 1957—1964Model: $\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log Tloan_{t-1} + a_3 \log F_t + a_4 BTI \cdot \log F_t + a_5 r_t + a_6 c_t$

	N	K_{t-1}	F_t	$F_t \cdot BTI$	r_t	c_t	R^2
All industries	1012	0.824 (24.235) ^a	0.212 (11.108) ^a	-0.004 (-1.099)	-0.009 (-1.615)	-6.334 (-1.473)	0.728
Low Growth Industries	394	0.901 (14.846) ^a	0.194 (4.873) ^a	-0.003 (-0.455)	-0.20 (-2.960) ^a	-4.082 (-0.536)	0.625
High Growth Industries	637	0.842 (20.890) ^a	0.191 (9.439) ^a	-0.008 (-2.060) ^c	0.035 (3.909) ^a	-7.662 (-1.628)	0.809
Syntetic Fiber	36	3.230 (8.138) ^a	1.056 (8.909) ^a	-0.017 (-2.311) ^b	-0.015 (-0.410)	2.551 (0.348)	0.930
Metal	138	0.686 (5.306) ^a	0.137 (2.285) ^b	-0.025 (-2.066) ^b	0.033 (3.201) ^a	-24.009 (-2.107) ^b	0.859
Chemical	138	0.867 (11.320) ^a	0.142 (3.498) ^a	-0.007 (-1.075)	-0.013 (-0.277)	6.892 (0.792)	0.697
General Machine	181	0.759 (8.067) ^a	0.255 (4.153) ^a	0.008 (1.143)	0.169 (3.679) ^a	-19.001 (-2.442) ^b	0.841
Electric Machine	93	0.834 (6.360) ^a	0.244 (2.444) ^b	0.014 (1.278)	0.222 (2.076) ^b	-12.935 (-1.161)	0.863
Transportation Machine	100	0.870 (5.592) ^a	0.178 (2.187) ^b	-0.021 (-1.815) ^c	6.179 (2.442) ^b	15.584 (1.495)	0.822

Source, JDB database.

Note; 1. t -value in parenthesis

a: Significant at 1% level.

b: Significant at 5% level.

c: Significant at 10% level.

Furthermore, the intersection of F_t and the value of BTI ave introduced into Eq 4. The Eq. to be test is:

$$\log I_t = a_0 + a_1 \log K_{t-1} + a_2 \log L_{t-1} + (a_3 + a_4 BTI) \log F_t + a_5 r_t + a_6 c_t \quad (8)$$

The result is summarized in Table 11. While a_4 , the intersection of F_t and BTI is not significant in the all industries, nor low growth industries, the a_4 in high growth industries is significantly negative at the 5% level. This result is especially clear in syntectic fiber, metal and transport industries, which were most rapidly growing industries in this period. In these industries, there were a lot of companies, which

aggressively planned large investments, but had not had a high reputation in the capital markets. Close main bank relationship made it possible for them to mitigate the constraints on using for internal fund for investment, reducing asymmetry of information as well as moral hazard problems.

3) The Growth of Firm and Group Affiliation.

At this point, question becomes: could corporate groups and main bank relationships have accelerated the growth of companies? Table 12 estimated simple regression of firm growth as follows;

$$G_{57-64} = a_0 + a_1 \log A_{57} + a_2 D_g + a_3 D_i \quad (9)$$

Where growth rate of firm G is measured by assets, group-dummy (D_g) is the same grouping as Table 10. Industry dummy (D_i) is based on 2 digit code. Following points can be pointed out concerning the first phase of HGE.

1) The growth rate of presidents club member is not necessarily higher than the other companies. The member companies of president club, which were free from cash flow constraints as well as the pressure of external equity market, did not show high growth to relative to other companies, although they show high growth rate in the latter phase of HGE (1965-72).

2) In the classification of NRM, High-50 does not show high growth, while Low-50 rather shows significantly high growth. This indicates that close main bank tie contributed to promote investment level of low performance firms, which would have had to reduce their investment levels without the close bank tie.

3) According to Bank Tie Index, Bank Group (the firms with BTI positive) shows high growth rate. Main bank relationship correlated to the high growth of firm.

4) According to last row of Table 12, in which the growth rate of asset was regress on the percentage change in share held by financial

Table 11 Growth of Firm and Bank Group (N=205)

Model: $G = a_0 + a_1 \log A_0 + a_2 G D_i + a_3 \ln D_i - dum$ $G = a_0 + a_1 \log A_0 + a_2 \Delta SH.Fin + a_3 SH.Fin_0 + a_4 \Delta Bor_0 + a_5 Bor_0 + a_6 D_i$

	log A_0	Group Dummy				D_i	R^2
		Ex-zaibatsu	Bank Group	Group 1	Group 2		
57-64 (1)	-1.749 (-4.424) ^a	0.522 (1.097)	0.867 (2.887) ^b	—	—	NO	0.09
(2)	-1.726 (-4.590) ^a	0.184 (0.426)	0.589 (2.119) ^b	—	—	YES	0.30
(3)	-1.549 (-4.200) ^a	-0.169 (-0.407)	—	—	—	YES	0.30
(4)	-1.672 (-4.731) ^a	—	0.552 (2.086) ^b	—	—	YES	0.31
(5)	-1.606 (-4.617) ^a	—	—	1.039 (2.504) ^b	—	YES	0.31
(6)	-1.625 (-5.130) ^a	—	—	—	0.361 (1.345)	YES	0.30
64-72	0.024 (0.143)	0.601 (3.210) ^a	—	0.069 (0.640)	0.299 (1.594)	YES	0.20
	log A_0	High-50	Low-50		D_i		R^2
57-64 (7)	-1.774 (-4.710) ^a	0.414 (1.233)	0.864 (2.404) ^b		YES		0.31
	log A_0	$\Delta SH.Fin$	ΔBor		D_i		R^2
57-64	-0.752 (-1.905) ^c	0.030 (2.028) ^c	0.748 (0.532)		YES		0.23
64-72	0.130 (0.838)	0.025 (4.201) ^a	0.938 (1.975) ^c		YES		0.30

Source: JDB database

Note: 1. Notations of variables are as follows:

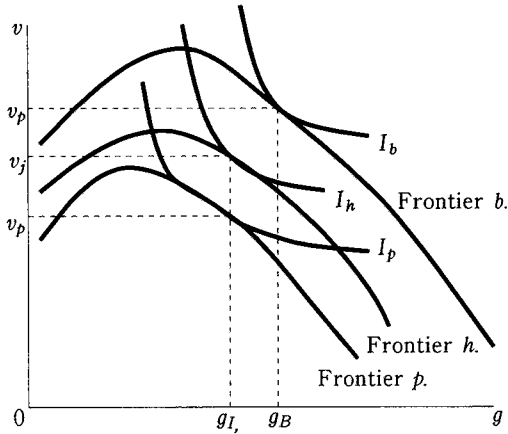
 G : Growth of asset, e.g., A_{64}/A_{57} . A_0 : Asset in the initial period D_i : Industry dummy according to two-digit code. $Group$: Group dummy based on the same grouping as Table 10. $\Delta SH.Fin$: The percentage change in share held by financial institutions from 1957 to 1964. $SH.Fin_0$: Percentage in share held by financial institutions in the initial period. ΔBor : The percentage change in borrowing-asset ratio from 1957 to 1964. Bor_0 : Borrowing-asset ratio in the initial period.2. t -value in parenthesis.

a: Significant at 1% level.

b: Significant at 5% level

c: Significant at 10% level.

Figure 2 Growth Rate of Firm and Group Affiliation ($v-g$ Frontier).



Frontier b : Frontier of the firm b with close BTI
 Frontier h : Frontier of the firm h with high NRM.
 Frontier p : Frontier of President club member (firm p).
 I_b, I_h, I_p : Indifference curve of each firm indicated by subscript.
 g : Growth rate
 i : Discount rate.
 v : Value of firm calculated by $v = (P - f(g)) / (i - g)$.
 $f(g)$: Growth cost function. Note that $f(g)$ is strictly increasing and convex, i.e., $f'(g) > 0$ and $f''(g) > 0$.

institutions ($\Delta SH-Fin_i$) as well as the percentage change in borrow-asset ratio (ΔB_i), there is a significant positive co-relation between $\Delta SH-Fin_i$ and asset growth. This result is as one would expect the fact that shareholding of financial institutions was based on the portfolio profitability.

The question raised from these facts is then; why is it that growth rate of president club members was not so high even though they were mitigated from cash flow constraints as well as sheltered from the pressure of external equity market; how is it possible that the companies, which depended on external equity market or faced the pressure of external equity market, showed the highest growth rate?

One possible explanation is that the value-growth frontier of president club member was lower than the Bank Group. Figure 2 displayed this possibilities, using the idea behind Marris's MVR. It is supposed that *Frontier_p* of president club member positioned south west from the *Frontier_b* of the Bank Group companies. Therefore, the growth rate of president member was lower than that of Bank Group, nonetheless the equilibrium of president club member was far left side from the point of value maximizing point, which made it possible for top management team to be free from the pressure of external market. As is well known, the v-g frontier is determined by growth cost function $f(g)$ and discount rate i . As it is unreasonable to assume that i of president club member is much higher than that of the Bank Group companies, this difference could be accounted for the shape of growth cost function of each group. That is, president club members were not the companies which engaged in innovative investments which in turn decreased the cost of growth. In other words, while the president club members were the forerunner of formation of groups, including cross-shareholding, they were not necessary the forerunner of innovative investment.

The companies which implemented innovative investments were the companies with positive BTI. The story, which I exemplified in the case of Sony and Honda, more or less happened in the all of the fields. The basic pass is as follows: the aggressive investment project with innovation by a company; ex ante evaluation of this project and interim, ex post monitoring by large six city banks, which looked for large clients; the spill over of this information to capital and equity markets; the increase of stock price; raising money by borrowing and issuing stocks; high investment and thus high growth; these stages summarized path which characterized the early phase of HGE in Japan.

Looking at a bank side, this fact indicates that large six city banks were able to select a winner in the first phase of HGE, although some

of their clients companies faced financial distress.⁽⁸⁾ They could attain economies of scale in issuing loans as well as reducing the cost of obtaining deposits, through selecting relatively high growth companies. The strategy of developing large client among large six banks was basically realized at that time.

VI Perspectives

The formation of corporate groups advanced after 1965 when stock prices crash happened again. Some perspectives on later phase of HGE should be given.

The big businesses were eager to stabilize their shareholders, partly because the chances of hostile takeover increased again, and partly because it was possible for foreign firms to enter into Japanese market by the liberalization of capital decided in 1965. This is especially the case for these companies (non ex-*zaibatsu* companies) which were under pressure of external equity market. They tried to stabilize their shareholders by asking related financial institutions to hold, after the investment trust had been canceled. In this process, the companies, which had close main bank tie with Fuji and Sanwa Bank, established their own president club, in 1966 and 1967 respectively. Their formation of president club could be understood to be the response of both financial and non-financial companies to the stock market collapse. Companies facing stock price decline tried to stabilize shareholder through taking part in president club. On the other hand, non-ex *zaibatsu* banks had a great incentives to coordinate the president club, possibly as a way to utilize this president club to rescue their client companies in financial distress.

The change of ownership structure after stock price depression affected the investment activities of big businesses.

First, non ex-*zaibatsu* companies seemed to be freer from the press-

ure of external equity market than they had been. It is clear that investment expenditure in the latter phase of HGE became less sensitive to q . (see Table 9). The stylized image for Japanese firm, that the top management team could behave freely from the pressure of external equity market, prevailed just in this phase.

Second, the "first lender role" of main bank decreased in this process. Some companies, which used to depend for their borrowing on city banks, changed their source of finance. Typical case was Sony Inc (see, Table 5). This company increasingly depended for their investment capital on internal funds as well as diversified banks from which it took out loan (Sony 1986). The function of supplying the venture capital by city bank, which was seen in the first phase of HGE, gradually disappeared among big businesses, as they established their own reputation. The ratio of main bank loan among the member companies of old and new president club has also decreased. The member companies tended to avoid concentrating their borrowing from the same line financial institutions (Table 3, 4).

Third, while the ratio of main bank loan gradually decreased, the investment of big businesses was less influenced by internal fund than the first phase of HGE (see Table 9). This could be due to the fact that the main bank relation prevailed in the first phase of HGE. The ex ante, interim and ex post monitoring by main bank, which prevailed over big businesses, could mitigated cash flow constraints through reducing the agency costs associated with debt issuing.

Forth, and last, the companies, which were free from the pressure of the external equity market and realized low agency cost through main bank relations, took the strategy of aggressive investment, depending on borrowing. Debt-equity ratio of big businesses increased rapidly in this later phase of HGE. The important point is that borrowing-asset ratio was positively correlated to the companies growth in the later phase of HGE as is shown in Table 12. It means that the more com-

panies depended on debt-financing, the more rapidly those companies grew. Furthermore, the borrowing-asset ratio of *ex-zaibatsu* companies increased much higher than the average of other big businesses. That is, the *ex-zaibatsu* president club members, which highly stabilized their shareholders through cross-shareholding, could realize relatively high growth, by financing their investment largely through borrowing. Such investment behavior, which is often described as the characteristics of corporate groups in Japan, was typically seen in this later phase of HGE and in the *ex-zaibatsu* companies. Thus, the bank centered corporate groups in Japan had its heyday in the later 1960s.

Appendix 1 The notations and the procedure for making Bank Tie Index (BTI) Private

At first, considering three stages of monitoring, that is, ex ante, interim, and ex post monitoring to client companies by the main bank (Aoki 1994; Aoki, Patrick and Sheard 1994; Sheard 1989), we select following six variables as proxies of main bank relationships; 1) the ratio of main bank loan including *keiretsu* financing (M_t), 2) the shareholding of the main bank (Hold), 3) the index expressing personnel relationship between bank and client companies (Dispatch), 4) the bond issuing service (Bond), 5) the amount of borrowing from banks (L_t) and 6) borrowing-asset ratio (B_t). The basic idea is shown in Figure A-1. Although it is difficult to figure out which bank was delegated to the agent of payment settlement, we assume the largest debtholder as the sole agent of settlement. First four variables indicate directly the main bank relationships. The fifth variables is introduced for expressing the significance of borrowing from the view point of borrowers. The sixth is introduced for expressing the significance of loans from the view point of banks. More detail notations are follows:

Mt: The ratio of the main bank loan = $(LB_t + LO_t) / (LT_t - G_t)$,

LB_t : borrowing from the main bank,

LO_t : borrowing from the same line financial institutions,

LT_t : total borrowing,

G_t : borrowing from government financial institutions.

L_t : Borrowing from the main bank in 1964. (Million yen)

B_t : Borrowing-asset ratio.

Dispatch: Index calculated as weighted sum of the number of executives who have been dispatched from the main bank in 1964. The weights are as follows:

Plain executives and auditors: one point.

Standard executives: three points.

Vice presidents and presidents: five points.

Maximum of this index is five points.

Hold: The percentage shares held by the main bank.

Bond: Dummy variable: taken to be one if the main bank managed the issuing of the bonds, zero otherwise.

The correlation matrix of the six variables is shown in Table A1.

Table A1. Correlation Matrix and Simple Statistics

	B_t	L_t	M_t	Hold	Dispatch	Bond
B_t	1.000					
L_t	0.194	1.000				
M_t	-0.070	-0.049	1.000			
Hold	0.077	0.027	0.331	1.000		
Dispatch	0.133	0.131	0.271	0.242	1.000	
Bond	-0.085	0.058	0.060	0.194	0.060	1.000
Mean	0.347	3786	30.29%	2.93%	1.75	0.33
Std. Dev.	0.115	5213	12.50	3.06	2.02	0.47
Minimum	0.001	30	8.00	0.00	0.00	0.00
Maximum	0.714	51157	78.90	16.98	5.00	1.00

Table A2. Principal Component Analysis on Main Bank Relationship

	Factor 1	Factor 2
Eigen value	1.70	1.24
Weight	0.283	0.207
Cumulative weight	0.283	0.497
B_t	-0.002	0.614
L_t	0.032	0.635
M_t	0.423	-0.113
Hold	0.434	0.047
Dispatch	0.398	-0.009
Bond	0.245	0.093

Then we performed the principal component analysis using the six variables listed above and extracted factor 1 and 2. The weight of factor 1 and 2 is shown in Table A2. We use the factor 1 score of each company as bank tie index (BTI) in the main text and tables.

Appendix 2 The Notations for Estimating the Investment Function

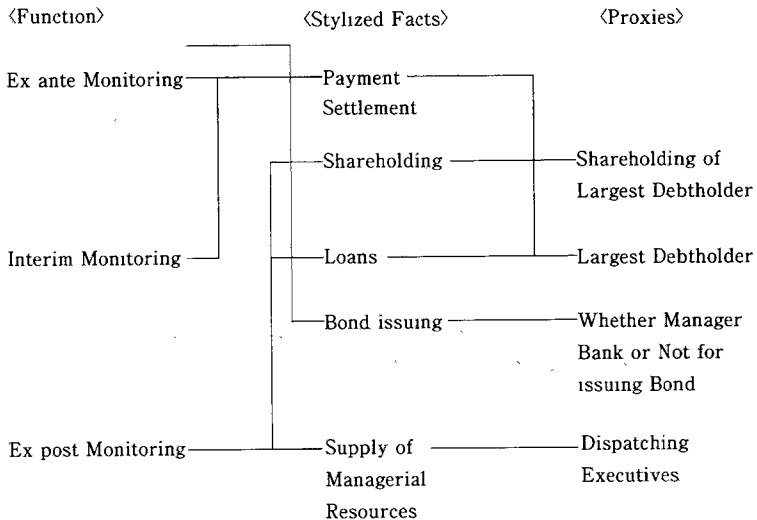
The notations we used for estimating the investment functions are as follows:

I_t : Capital investment: The increment of tangible fixed assets during the current fiscal year.

K_{t-1} : Stock of capital: The tangible fixed assets outstanding at the end of the previous fiscal year $t-1$.

$Tloan_{t-1}$: Borrowing: The total of borrowing outstanding at the end of

Figure A-1



the previous fiscal year $t-1$.

F_t : Cash flow calculated by $Dep_t + Prof_t - D_t$, where Dep_t , $Prof_t$, and D_t denote depreciation, net profit, and dividend, respectively.

q_{t-1} : Tobin's q calculated by $(V_{t-1} + Debt_{t-1}) / A_{t-1}$, where V_t , $Debt_t$, and A_t denote total value of firm, debt, and asset, respectively. Total value of firm is issued stock at the end of the previous fiscal year $t-1$ valued at stock market price. However, the simple average of highest and lowest price is taken as a market price instead of market price at the end of the previous year.

B_t : Borrowing-asset ratio.

τ_t : Marginal efficiency of capital: The growth rate of operating income from period to period.

C_t : Cost of capital: The weighted average of the call rate and the discount bill rate, based on BOJ (1985).

Some of the terms are defined in more detail in the appropriate section. All data except C_t are based on the JDB (Japan Development Bank) corporate and Finance Data Bank (Magnet Tape).

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