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Corporate Governance and Investment in the 20th Century Japan:
A Comparison between prewar zaibatsu and postwar keiretsu

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Deviation

1 Introduction

Family owned business groups known as *zaibatsu* were important features of the pre-war (World War Two) the Japanese firms from the corporate governance perspective. Business and economic historians have focused on the role of these groups in the prewar industrialization. Conventional understanding insisted that *zaibatsu* system enjoyed high profitability through preferential governmental support and monopolizing capital. Recently new theory suggests that zaibatsu system with family based ownership could contribute to subsidiary firms raise internal funds for investment projects, and effectively monitoring kept their high performance though strict under holding company system (Okazaki 1999 and 2001). This understanding is, however, contradicted to the other conventional theory raised by Hirschmeier and Yui (1975) and Morikawa (1992). They rather emphasized that *zaibatsu* system made subsidiary firms' investment conservative, because the contradiction between family with high share ownerhip and the professional (salaried) managers was so serious that they were often prevented from taking the investment projects that they initiated.

Corporate governance structure of the post war firms drastically changed from those of the prewar frims.   Board of directors mainly composed of corporate insider who promoted within firms.   The cross-shareholding among firms prevented shareholders from exerting both the voice and the exit.   Possible moral hazard problem was mitigated by monitoring of main bank which has the long-term relationship with firms.   Corporate groups known as *keiretsu* are the representatives of such postwar governance structures.   Concerning on the role of postwar *keiretsu*, conventional wisdom has argued that corporate groups have encouraged investment through reducing asymmetric information, and keeping top managers free from the pressures of external markets (Abegglen and Stalk, 1985, Porter 1992, Hoshi, Kashyap, and Scharfstein 1991).   However, an increasingly popular view suggests that there is no clear evidence for corporate groups to contribute their members' corporate growth and profitability even during the high growth era (1955-1970).   It further stresses that corporate groups have rather generated an over-investment problem through cross subsidization among internal capital markets, and managerial discretion by keeping top managers from appropriate outside monitors (Weinstein and Yafeh 1999, Hall and Weinstein 1996).

The purpose of this paper is to coherently understand the costs and benefits of *zaibatsu*

and *keiretsu* in relation to corporate investment, and to highlight the relationship (similarity and difference or continuity and discontinuity) between both types of business groups. In order to approach this topic, we focus on the effect of governance structure on corporate behavior rather than the effect on the ex post corporate performance in which previous literature are interested.

The remainder of this paper is organized as follows. In section two, we attempt to stylize the characteristics of the prewar *zaibatsu* and the postwar *keiretsu* groups from the corporate governance perspective, using our original data base and previous empirical researches. Then, in section three, we elaborate a theoretical framework for understanding the impact of governance structure on investment, stressing the constraints of cash flow and default risks. The fourth and fifth sections represent the substantial part of this paper. They discuss the results of investment function, which explicitly includes governance structure variables. Section four treats the role of *zaibatsu* in the prewar period (1920-1937). We emphasize the conservative investment behavior with relatively stable performance of the three big *zaibatsu* (*Mitsui, Mitsubishi, Sumitomo*) and risk taking investment behavior and possible asset substitution problems among other owner-manager types of *zaibatsu*. Section five examines the role of *keiretsu* in the postwar period (1955-1970). We highlight the benefits of corporate groups in terms of mitigating asymmetric information, default risks and market myopia.

The conclusion discusses the continuities and discontinuities between the prewar *zaibatsu* and the postwar *keiretsu*. we also give some perspectives on functional changes of the *keiretsu* system from the mid-1980s.

2. Two periods that Corporate Governance Structure Crucially Matters

2-1   The Interwar period : The Age of zaibatsu

Corporate governance structure in Japanese firms experienced drastic change in the 20th century. In the prewar period, as is already pointed out (Nakamura 1988, Okazaki1999, Teranishi 2000), the control right of shareholder was much stronger than the postwar period. Given the prewar legal framework that is less regulated, and less protective for shareholder and debt holder, the role of individual investor (family) was relatively large and the role of

institutional investors was still limited.   The average share held by the largest shareholder

( ) that is a proxy of shareholder monitoring incentive was over 31.3 % with 32.8 % standard

deviation in 1928 (**Table 1**).   In addition to these characteristics, the ownership structure was

noticeably diversified among large firms.   We can divide the prewar firms into following three

types by considering on who initiated firms investment projects and who owned firms (Fama

and Jensen 1983).

<center>----**Table 1** about here----</center>

First type was the subsidiary firms of three big *zaibatsu*, Mitsui, Mitsubishi, and

Sumitomo.   They located in the capital-intensive industries such as metal, shipbuilding,

electric machine, and mining industries.   Holding company exclusively held its subsidiary

firms, i.e. the share held by the holding companies on average,   , is quite high, 76.5% in 1928,

although some of them began to be public in the 1930s.   Under the high concentration of

ownership, family delegated the holding companies' professional manager to monitor their

subsidiary firms.

This organizational structure was arranged by spinning off former division to independent

joint stock firms.   *Mitusi Gomei* (holding company) was established in 1909, followed by

Mitsubishi Goshi in 1918 and *Sumitomo Goshi* in 1927.   After this organizational

arrangement, the salaried manager of subsidiary firms began to initiate their investment plan,

which was in turn ratified by the holding companies.   After top manager of subsidiary firms

implemented its plan, holding companies strictly monitored their performance.   Through this

procedure, effective monitoring of holding companies mitigated their possible agency problems.

Second type of firms in the prewar Japan was the owner-manager type well known as new

zaibatsu.   This type of firms was characterized in the regard that the owner manager still took

an initiative of corporate decision.   They located in shipbuilding, mining, and other new

industries in the interwar period such as chemicals, air plain and automobiles.   Their

ownership structure ranged from family firms with the high ownership of the founder to public

firms with the relatively dispersed ownership.   Firms with the high ownership of founder

often depended external funds on bank borrowing, as is typical in Furukawa and Asano

zaibatsu which established their own bank.   On the other hand, the owner manager who

raised investment funds from the external market had to accept their low share ownership.

However, since the share held by external shareholders was low and highly dispersed, they could be entrenched from the external intervention.

Third type was the firm that already highly separated the management from ownership. This type of firms located in the traditional middle-tech industries such as cotton spinning, sugar, paper and pulp, and cement. They were established by the joint stock company at the beginning of the early industrialization. The share of large shareholder ( ) on average was 16.1% with high standard deviation. The of some large firms such as Kanegafuchi Cotton Spinning Ltd and Oji Paper Ltd was less than five percent.

Although the corporate ownership was dispersed, the large shareholder took a position on the boards of directors for monitoring corporate performance (Morikawa 1989). It is worth noticing that these outside directors imposed the top managers of firms to keep the high dividend. This pressure was intensified by the unique institutional setting of prewar period[1]. According to Yui (1995), firms with the board of directors composed of the salaried managers (who promoted within firms) could perform much better than firms with the board of directors composed of outside shareholders.

Then our concern is whether the corporate governance structure could affect on the corporate behavior or not. In our perspective, the period 1905-1910, after the Russia-Japan war boom, and the period of 1915-1919 known as the World War first boom, are possible candidates to be investigated. However, mainly due to the data availability, we pick up the interwar period from 1920 to 1937. In the 1920s, Japanese firms faced the deflational pressure and the serious international competition under the high exchange rate. In the 1930s, under the expansive physical policy and the low exchange rate Japanese economy experienced the last investment boom before the wartime planned economy.

2-2   Postwar period: The Age of *Keiretsu*

Diversified corporate governance structure in the prewar period has changed during the

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[1] Individual investors often borrowed their investment fund from bank putting their stock as collateral. As the result, individual investor had strong preference of income gain rather than capital gain. It is reported that the dividend yields always exceed the corporate bond yields in prewar periods. This preference was further encouraged by the prewar tax system that the tax of income gain was highly deductive and income tax was less progressive.

wartime and the postwar economic reform. The control right of shareholder was restricted under wartime planned economy through the regulation on the dividend policy and the managerial reward since 1939 and the revision of the commercial law in 1943 (Okazaki 1994). However, the ownership structure was relatively stable under the strict regulation of capital market that made ownership transfer inactive. It was the postwar reform that completely changed the ownership structure of prewar Japanese firms. The 'Americanization' of the economic system initiated by General Headquarters Supreme Commander for the Allied Nations (GHQ) created a discontinuous transformation of the economic system[2]. In addition of the change of legal environment such as the enactment of the Securities Transaction Act and the introduction of the small shareholder protection (La Porta et al 1998), there are three points to be noted for understanding the drastic changes of the governance structures.

First, the cancellation of the wartime compensation during the postwar reform gave large shock to the corporate structure. In order to prevent any possible profit from wartime activities, GHQ ordered the Japanese government to suspend the payment of huge amounts of indemnities promised to munitions companies.[3] Large scale of balance sheet adjustment became inevitable, and the high debt-asset ratio was fixed because the special loss in asset side was off set by mainly decreasing capital in the liability side[4]. The debt asset ratio

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[2] Although stricter comparative studies would be further research agenda, we understand that the impact of American reform on economic institutions in Japan was far more drastic than that on both Germany and Italy. In the case of Germany, introduction of an antitrust framework was quite important in the sense of dissolving prewar cartel activities (Berghan 1986: 282). However, the economic purge implemented in Germany was not so drastic, despite the thorough elimination of Nazi influence from political areas (Entnizifizierung). Similarly, close bank-firm ties were not severely affected. More importantly, the universal-banking tradition was not touched upon at all. According to Corlin (1993), "American influence did not extend to corporate governance". In the case of Italy, the impact of the American occupation on the economic system was much more limited. There, dissolution of economic power was not tried, and antitrust policy was not imposed by the Americans (Federico 1999: 311) .

[3] Notably, this treatment was quite different from case of Germany, in which financial reform resolved postwar insolvency problems through a one-tenth devaluation of Reiches Marks to Deutche Marks.   The losses growing out of the repudiation of government wartime debt were estimated to amount to nearly 20 per cent of GNE in 1946 (MOF, 1978).

[4] The process began by allowing companies rendered insolvent as a result of the suspension of wartime indemnities to declared themselves 'special account companies.' The balance sheet of a special account company was divided into an 'old' and a 'new' account. Business operations were

in the early 1950s was over 60 %, comparing to 40% in the prewar period as is shown in **Table 2**. In addition to that, the voice of banks in client firms increased in the process of the restructuring.   Large city banks, which exclusively supplied money to munitions companies as the Designated Financial Institution at the last phase of the war, was now appointed to be a special manager (*Tokubetu-kannzainin*) of almost insolvent firms.   They took part in planning the reconstruction of client firms, and by doing so they accumulated much their private information (Miyajima 1994).

--- Table 2 about here ----

Second, the holding companies are completely dissolved through postwar reform as is known as *zaibatsu* dissolution[5].   Designated holding companies were altogether 83 firms which included not only the pure holding companies, but also the manufacturing firms with the holding companies function such as *Toshiba* and *Hitachi*.   The share held by those holding companies and *zaibatsu* family were compulsory transferred to HCLC (Holding Companies Liquidation Committee), and, in turn, sold to individuals and employees.   Thus, concentrated ownership structure was completely dissolved.   The prewar owner-managers were also eliminated by the economic purge in which GHQ ordered the incumbent president and the board of directors to be resigned.   As a result, managerial ownership dramatically decreased. Estimated percentage of top share holder ( )   decreased to 6.4 % in 1949 compared to 23.9 % in 1937, whereas the average managerial ownership is almost zero in 1950.   Consequently, the ownership structure of Japanese firms became dispersed as well as homogenous comparing to the prewar period.   The share held by individuals was over 50% in 1955, while the institutional shareholder was not influential yet at that time as is shown in **Table 3**.   Notice that this ownership structure was different from the 1970s when so-called J-type firms were established as a result of shareholder stabilization scheme.

----**Table 3** about here----

Third, along with increasing number of labor unions that were newly established as a

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allowed to continue using the new account.   The old account became the object of reorganization procedures. Once reorganization was completed, the old account was merged with the new account and the firm could then recapitalize.   This process was guided by the Corporation Reconstruction and Reorganization Act of October, 1946. In detail see MOF(1983), and briefly Hoshi(1995).

[5] See in detail. GHQ 1951, Hadley 1970, Miyajima 1994, MOF(1981).

result of labor reform, the voice of employee in the corporate governance increased.   There were several cases that labor union took part in the appointment of new managers in the postwar reform period.   Labor union was also asked to commit the reconstruction plan after the cancellation of the wartime compensation.   It was this process that the board of directors composed of the corporate insiders who promoted within firms.

Edo Hideo, the former employee of Mitsui Head Quarter, told that the postwar firm's growth was realized by the aggressive investment initiated by the young top management, who were standing at the same start line[6].   It was this drastic change of the corporate governance that was behind the postwar behaviors.

However, the top managers of Japanese firms have faced the myopic pressure of small investors.   Small investors did not have any incentives to monitor the firms in which they invested, nor any ability to monitor them (Yafeh 1994).   So that they exclusively disciplined the top management through the exit (selling stocks), when stock price declined.   Furthermore, the individual shareholders still had the strong preference on the dividend at least by the early 1960s when the "dividend yield revolution" was emphasized.   The dividend yield was still high comparing to the late 1960s, although it did not exceed the bond yield as the prewar period.

Japanese firms still faced the threat of takeover, given dispersed ownership structure created by the postwar reform and the low stock price comparing to their actual asset value. The estimated Tobin's q was far below one in the early 1950s.   There is anecdotal evidence that firms often faced takeover bid (Miyajima 1995).

On the other hand, Japanese firms in the postwar period faced serious financial difficulties to raise long-terms funds .   The securities based financial system designed by GHQ was not realized because the household sector lost its financial assets due to the postwar hyperinflation, and had strong preference on the low risk deposits (Teranishi 1995).

It was in these circumstances that the so called Japanese type of corporate governance structure was emerged.   The city bank that established the long-term relationship with client firms supplied the investment funds.   Former *zaibatsu* bank supplied new money to the same line firms through organizing the de fact syndicate and being trustee of issuing corporate bond.

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[6] Ando, Yoshio ed. *Showa Seiji-keizaishi no Shogen*, Mainichi Shinbunsha, 1975,p.159.

City banks also played an important role for supply money to the newly established firms such as Honda and Sony.

Second, the top manager of firms tried to stabilize their shareholder by various ways after the postwar recovery period (Miyajima 1995). It is interesting to note that the stabilized shareholder implies that shareholder did not chose an appropriate top management, but top management rather chose their friendly shareholders. Ex-*zaibatsu* firms, which had organized their president clubs after the Peace Treaty became effective, increased their stabilized shareholder through cross-shareholding among members. *Sumitomo* and *Mitsubishi* presidents club members reached a cross-shareholding ratio of 12% by 1953. Main banks also played a significant role in the client firms' shareholder-stabilizing schemes. It is reported that the share held by city bank were significantly correlated to the dependence of a firm on loans from their city bank[7]. An amendment of the Commercial Law in 1955 allowing top management to issue new shares to existing shareholder and third parties without approval by a general shareholder's meeting was also an important step in the process of shareholder stabilization.

Thus, our concern is whether these emerging new governance structure really affected on investment behavior or not. In other words, we will test whether governance characteristics of firms really influence on investment behavior through mitigating cash flow constraint on investment.

3. Research Design: Four Empirical Conjectures

3-1 Cash flow Sensitivity

Corporate governance structure could influence on investment behavior though various path. In this paper we focus on the constraint of the cash flow and the default risk on investment.

Efficiency of internal capital market It was the path of reducing asymmetric information on which previous literature focused. If the financial market were imperfect, and therefore the asymmetric information problem between the corporate insider and the investors were serious, the investment project exceeding internal funds would face high capital cost, and as a result,

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[7] Miyajima 1994: 318, Table9

the investment of firms would be constrained by internal funds Myer and Majulf 1984, Fazzari, Hubbard and Peterson 1988 .   However, if firms could mitigate the asymmetric information problem, they could be relatively free from such under investment problem.   In the line of this thought, the network of prewar *zaibatsu*, and the postwar corporate groups could make it easy for member firms to raise their investment funds comparing to independent firms when they had the same business chances.   Main bank relationship could have played such a role that is often tested by previous researches (Hoshi, Kashyap, and Scharfstein 1991).   Thus following hypothesis would be set.

HO.   The investment of firms which belongs to the prewar *zaibatsu*, or postwar corporate groups, or have a strong relationship with its main bank would be less sensitive to the cash flow than independent firms or firms without such strong main bank ties.

The trap of myopic shareholder   The investment will be sensitive to the cash flow due to the other factors than the asymmetric information problem.   One of its possibilities is the case that top manager was trapped by the myopic pressure of the stock market.   Assuming that there are the asymmetric information problem between the top manager and the capital market (small shareholder), and the current dividend pay-out ratio were low.   Since small shareholders could not verify whether it was caused by the low effort level and the low ability of the top management or the result of reasonable long-term investment plan.   Thus they would use dividend payout as a signal of the future profitability.   Considering on such investors' behavior, the top manager tends to pay the high current dividend at the expense of the future profit.[8]

Since the investment funds is substitutive for the dividend, other things being equal, increasing divided is a factor to intensify the sensitivity of investment to internal funds.   The high sensitivity of investment on the cash flow would be the evidence that the firms faced the myopic pressure.   Further, this myopic behavior will be plausible in the situation where the ownership structure was diversified, because small investor did not have any ability and

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[8] Stein(1988) that firstly focused on this myopic behavior did not introduce the signaling using this devidend payout policy.   The explanation in test is based on Hall and Weinstein(1996), which tried

incentives to monitor firms in which they invested (Stiglitz 1985).   Thus, second hypothesis is as follows:

HO.   Investment of firms with less dispersed ownership structure could be less sensitive to the cash flow because they were mitigated the myopic pressure of capital market.

Both HO.1 and   HO2 are intuitively summarized as **Figure 1**.   The I^* is the optimal investment level given business chances.   If the economy is free from any asymmetric information problem and market myopia, the investment will be determined at I^* and do not have any correlation with the cash flow, CF .   However, in the real world, the actual investment, I, is always sensitive to cash flow due to various reasons including the asymmetric information and the managerial myopia.   Then, we estimate whether the governance variable could mitigate or intensify the sensitivity of investment on cash flow.

<div align="center">---Figure   1   about here ---</div>

3-2   The constraint of debt on investment

Default Risk and Risk Sharing   Another possible path that governance structure could influence on the corporate investment is to reduce the constraint of the default risk on its investment.   Different from a frictionless world where the investment was determined regardless of the initial debt asset ratio, the real investment level was usually influenced by the initial debt-asset ratio.   Although this negative correlation will be occurred by the asymmetric information and others, we focus on the possibility that the top manager, or the corporate insider was negatively influenced by the debt level[9].   High default risk associated with the high debt-asset ratio would make the marginal cost of investment higher.   Given a certain level of sunk cost of corporate insiders such as firm specific skills, the high default risk could constrain the corporate investment through increasing the discount present value of its marginal cost (Otaki 1997).   It is in this context that the risk-sharing device could play a

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empirical work on investment behavior of Japanese firms in the 1980s and 1990s.
[9] Lange   Ofek, and Stulz (1997) raised another possibility that high debt asset ratio could mitigate a free cash flow problem through the decipline of debt..

promotional role on corporate investment.   *Zaibatsu* and corporate groups may work for reducing such constraints of the debt on investment as a risk-sharing device.   For instance, top manager of member firms could expect the rescue operation from other member firms when they faced financial distress.[10]   Thus we can get third hypothesis

HO.3   The investment of prewar *zaibatsu* and postwar corporate groups could be less constrained by their debt asset ratio than independent firms

Risk taking by owner-manager and risk averse by family owner.   The constraint of debt on investment could be influenced by the extent of separation between ownership and control, or the risk attitude of shareholders.   In other word, it is possible that the investment level of two firms even with the same business chance and the same debt-asset ratio could be different, if they have the different governance structure.

On the one hand, owner manager could be risk-taker because they had strong stake in their firms, and expect high returns when the investment projects were succeeded.   Thus, the investment decision was less sensitive at debt asset level comparing to the managerial firms given limited liabilities of joint stock companies.   On the other hand, *zaibatsu* family who held the holding companies as unlimited partners would be risk averse as is already pointed out by Hirschmeier and Yui (1975) and Morikawa (1992).   If so, the investment of *zaibatsu* subsidiary firms with the high debt-asset ratio may be constrained by the effective control of the holding companies.   Thus last hypothesis is as follows:

HO4-1.   The investment of subsidiary firms of the old *zaibatsu* was much more constrained by the debt asset ratio compared to the independent managerial firms.

HO4-2.   The investment of the new *zaibatsu* or firm with the high managerial ownership was much less constrained by their debt-asset level compared to the independent managerial firms.

What HO.3 and HO.4 imply is summarized in Figure 2.   Suppose that the economy wholly composed of the joint stock company with the limited liabilities and have no default cost

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[10] This point was emphasized by Nakatani 1984 from different perspectives.

in the sense that salaried managers and employee could find new jobs without any cost.   Then, the investment level will be determined by I^*, and the debt-asset ratio could not affect on the corporate investment at all.   However, the actual investment, I, is sometimes negatively correlated to the debt-asset level.   Then, our concern is whether debt asset ratio, DA, really affected on the investment behavior of prewar and postwar firms or not?   If so, whether was the constraint intensified by corporate governance factors?

<center>---Figure   2   about here ---</center>

3-3 Estimation Strategy

The regressions of investment function include as regressors, a measure of the internal fund, the default risk, and the business chance.   We estimate the following regression formula developed in the previous literatures.

$$I_t/K_{t-1} = f\,(dy_{t-1},\ CF_t,\ DA_{t-1}\ GOV,\ DA^*Gov,\ CF^*GOV,\ Year\ Dummy) \qquad (1)$$

$$I_t/K_{t-1} = F\,(\,ORR,\ c,\ CF_t,\ DA_{t-1}\ GOV,\ DA^*GOV,\ CF^*GOV,\ Year\ Dummy) \qquad (2)$$

Here, I_t/K_{t-1} is a firm's physical investment standardized by fixed asset K_{t-1}. For estimating investment function in the 1950s, we use, as a physical investment, the difference between tangible fixed assets at period t and that of period $t-1$ plus depreciation.   However, for calculating a physical investment in the 1920 and 1930s, we do not include firms' depreciation without any expense of losing sample firms, because depreciation of prewar firm is under high discretion of top management.   Therefore, we adopt as a dependent variable the net investment for the prewar estimation, supplementing gross investment in the limited samples.

dy_{t-1} which is used in the prewar investment function is a growth rate of the real sales from period $t-2$ to period $t-1$. ORR and c, both of which are used in the postwar estimation, is the operational profit and the capital cost respectively.   These variables are considered to be a proxy for a firm's business chance, since we cannot apply the required data for calculating the Tobin's q, which is frequently employed in the previous literatures.   As a measure of the internal fund, we use the cash flow calculated as the income after tax plus the depreciation less the dividend payments, CF_t, divided by fixed asset K_{t-1}.   Here we again, for calculating CF_t in

the prewar period, do not include the depreciation because of its high discretion. To eliminate the effects of scale, we normalize the investment and the internal fund measured by the firm's capital stock at the beginning of the firm year.

Further, to remove firm-specific effects and macro economic shocks, we include a firm dummy and a yearly dummy for the postwar estimation. However, the Tobit model is used in the prewar estimation, because the net investment is truncated at the zero. Regrettably, we could not introduce the firm effect in the prewar estimation, but we supplementary estimate the fired effect model for limited sample.

4　The function of the prewar *zaibatsu*.

4-1　Data Construction

Sample firms for the prewar period are roughly 70 firms in the manufacturing and mining sectors. Sample firms are selected by the following procedure. For the 1920s, we firstly pick up the top 70 firms in 1918 using the appendix of Fruin (1992), and add subsidiary firms of three old *zaibatsu*, which were spun off by 1920. Then, considering the data availability from 1921-28, we can finally get 67 firms panel data. The financial data is mainly constructed by the *Year Book of Joint Stock Company* published by Toyo-keizai.

For the 1930s, we construct another data set, which is slightly different from the 1920s, because several firms in the 1920s' list were bankrupt, whereas new firms were established in the late 1920s and the early 1930s. Picking up the large one hundreds firms in 1937 according the asset size, and considering on the data availability from 1932-1937, we can get 74 firms panel data. Here the financial statement was obtained from the *Honpo-Jigyo bunseki* of Mitsubishi Economic Research Institute, and partly supplemented by other sources (company history and the annual report). As sample firms did not always disclose their depreciation in the prewar period, we use net investment for estimation in the subsequent section.

The descriptive statistics are summarized in **Table** 4. It seems puzzling that the I_t in the 1930s is lower than that in the 1920s. It is the reflection of changing corporate behavior in their depreciation. Some of firms tended to avoid their depreciation for making up their low profitability in the 1920s. However, after financial crisis in 1927 and the Great depression firms began to depreciate regularly. In fact, although sample firms are limited, gross

investment I_t in the 1930s is larger than that of the 1920s. [11]

--**Table 4**   about here---

We set following variables as corporate governance variables, considering organizational features described in the section two.   Dummy variable, ***OLD***, is given to firms which belongs to three old *zaibatsu, Mitusi, Mitsubishi,* and *Sumitomo.*   These firms are characterized as the initiatives of the salaried manager, the effective and strict monitor of holding companies, and the possible existence of the internal capital market.   Firms that is given dummy variable ***OLD*** is nine in the 1920s and ten in the 1930s.

Dummy variables, ***OWN***, is given to either firms in which the owner themselves initiated their investment plan and implemented them, or firms which were the subsidiary firms of the owner-manager firms.   Number of firms that is given dummy variable, ***OWN***, is nineteen in the 1920s, and twenty-four in the 1930s.   *Suzuki* line firms and *Kawasaki* Shipbuilding Co. were the representatives of the 1920s, *Nihon* Soda and *Showa Fertilizer* as is known as new z*aibatsu* was those of the 1930s.

Thirdly, we add the ownership structure to our estimation: the   means the managerial ownership, the percentage share held by the top management (president).   The is the share held by the external large shareholder that have strong incentives to monitoring firms.   The   is the proxy of the extent of the ownership dispersion.   Estimating   , we add the share held by the presidents' asset management firms to the managerial ownership.   Estimating   , we use the percentage share held by the largest shareholder unless the largest shareholder was the owner-manager.[12]   Thus, the   is calculated as   -   - .   The   of *zaibatsu* firms is quite low, almost zero, before they were in public in the 1930s.   Needless to say, the low   implies that firms potentially face the myopic pressure of shareholder.   When constructing these ownership variables, we mainly use the ten large shareholder list from the *Yearly book of Joint Stock Companies* issued by Toyo-keizai and others sources.

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[11] As Fazzari Hubbard and Perterson(1988) suggested that this estimation includes a defect that *CF* might be closely related to business chance.   However, since correlation between *dY* and *Cf* is no high, 0.05 in the 1920s and 0.10 in the 1930s, this defect will not be so serious.

[12] We used as   the aggregated share held by ten largest shareholder.   Estimation result is almost same as I report followings.

4-2　The basic regression for the interwar period

The estimation result without governance variables are summarized in **Table** 5. According to the both estimation of the net investment by the Tobit model and the gross investment function by the OLS model, the corporate investment in both the 1920s and the 1930s were sensitive to the *CF,* even after controlling the business chance measured by *dy*

---**Table 5** base regressions for prewar period, about here---

Although it should be careful to compare the magnitude of the *CF* sensitivity between two periods since the sample firms of both periods is not completely identical, the *CF* sensitivity of investment in the 1930s is larger than that of 1920s.　In the net investment, the coefficient, 0.4 , in the 1920s could be compared to 1.1 in the 1930s.　In the gross investment, the coefficient of *CF* in the 1930s is three times larger than that of the 1920s.　This result implies that one standard deviation increase of the *CF* from the sample average raises the investment level 8.8　1.12× 0.075　.　As I_t on average in the 1930s was approximately 18% among firms with the positive net investment, the cash flow sensitivity is fairly high.

On the other hand, the corporate investment is less sensitive to the debt-asset ratio in the 1920s.　However, it does not imply that every firm has decided its investment indifference to their debt-asset ratio, as we will explain later.　In the 1930s, the investment decision was negatively sensitive to the debt-asset ratio with enough significance.　Even firms have the same business chances and the same level of the cash flow, their investment level could be different according to their debt asset ratio.　This result is held if we changed *dYt* instead of *dYt-1*, or exclude industry dummies (not shown), or limited the sample firms into the capital intensive industries (Iron and steel, machine, chemicals and mining.(column 5 of **Table 5**).

Then the question is whether the cash flow and the debt-asset sensitivity of investment is influenced by corporate governance variables or not.

4-3　The effect of corporate governance structure

The constraint of default risks　　The estimation results introducing the corporate governance variables are summarized in **Table 6**.　At first, let us focus on the interaction term between *DA* and governance variables.　Following points are clear: (1) The sign of *DA* is negative which is different from the basic estimation. (2) The sign of the interaction term between *OLD* and *DA* is

unstable and insignificant in both the 1920s and the 1930.   (3) Conversely, the sign of the interaction term between *OWN* and *DA* is positive and significant with at least 5% level in both 1920s and the 1930s (Panel1 of **Table** 6).

<center>---**Table 6 Effect of Governance factor** about here---</center>

First and second results imply that the investment decisions of three *zaibatsu* affiliated firms were influenced by the initial debt-asset level similar to the managerial firms in the 1920s.   As we mentioned in the 1920s, it is expected that *zaibatsu* system could mitigate the constraint of debt on investment through the risk-sharing device (**HO.3**).   However, this hypothesis is not held.   Rather, z*aibatsu* affiliated firms were strongly constrained by their initial debt-asset level.

This result is consistent to the anecdotal facts that *zaibatsu* affiliated firms did not have any rights to raise their investment funds from external market through the debt, and holding companies was always careful for raising investment funds from debt, when they ratified the investment plan of their subsidiary firms.   The function of *zaibatsu* in the prewar period is not consistent to **HO3**, but to **HO4**.

One the other hand, contrasting with three old *zaibatsu*, third result indicates that the investment decision of owner-manager firms or the new *zaibatsu* was less influenced by the initial debt-asset level.   This result is supported from the panel analysis using I_{it} (not shown) [13].   Since the coefficient of $DA \times OWN$ (0.58) is the almost same as that of *DA* (-0.59), the owner-manager firms or the new *zaibatsu* decided its investment being unconstrained by the initial debt-asset level.   Firms with less constraint of the default risk was not three old *zaibatsu*, but the owner-manager type of firms or new *zaibatsu*.   However, it is still unclear which factor could explain the result, the risk sharing function of new *zaibatsu* (**HO3**), or the effects of owners' shareholding (**HO4**).

Then, we introduced the interaction term between the share held by owner,   , and *DA.* According to the estimation result of panel 2 of **Table** 6, consistent to **HO4**, the interaction term $\times$ *DA*   is positive and significant in the 1930s, while it is not enough significant in the 1920s. When *OWN* $\times$ *DA* and $\times$ *DA* is simultaneously introduced for the 1930s estimation, $\times$ *DA*

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[13] The sign of *OWN* $\times$ *DA* is positive in both the 1920s and 1930s estimation.

is significantly positive while $OWN \times DA$ is insignificant. Thus we could conclude that less constraint of DA in OWN firms of the 1930s is not the result of risk sharing, but the result of owner's shareholding. Previous literatures pointed out that the owner manager of new *zaibatsu* lunched at vigorous investment in the 1930s. For instance, Molony (1990) clarified that Noguchi, president of Nihon Chisso, took an aggressive investment projects introducing the new technology during the interwar period. We can interpret that such risk taking investment behavior was supported by the high shareholding of the owner.

The constraint of internal funds Next, let us change our focus on whether the governance structure could affect on the cash flow sensitivity of the investment. According to the Tobit model using the net investment, I_t, the interaction term of CF and OLD is significantly positive, while it is insignificant in the 1930s Panel 1 of **Table 6** . This result indicates that the new investment of three old *zaibatsu* is much more sensitive to their cash flow than the independent firms and the owner manager firms (new *zaibatsu*). According to **HO1**, *zaibatsu* affiliated firms would be less sensitive to cash flow through the quasi-internal capital market. However, as long as the new investment concerns, I_t of subsidiary firms belong to three old *zaibatsu* were rather sensitive to their cash flow.

Then, why was it occurred as opposed to our prediction? One of its possible interpretations could be that the holding companies imposed them to the hard budget constraint. According to Kaplan and Zingales (1997), the cash flow sensitivity could be occurred by various reasons except the asymmetric information problem. They pointed the case that shareholders who could have an effective control was 'overly risk-averse' or the case that they had the 'precautionary saving motivation'. It could be possible to understand the high sensitivity of investment on the cash flow in the subsidiary firm of three old *zaibatsu* in this line of conjectures.[14]

There were several anecdotal evidences supporting this understanding. For instance, Mitsui Mining Ltd imposed a strict budget constraint on divisions in the mid of 1920s, requiring to prohibit their investment exceeding their (each divisions) internal funds (Mitsui Bunko 1994). Sumitomo holding companies overruled an investment plan initiated by

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[14] Fohlin (1998) reports the same unpredicted result between German universal bank system and

Sumitomo Fertilizers Ltd during the great depression, saying that this plan includes huge financing plan exceeding to holding firms internal fund (Sumitomo Chemical 1981).   In short, the high sensitivity of investment on the cash flow in the 1920s was the result of the hard budgeting process of their holding companies.[15]

However, contrasting to the result of old *zaibatsu*, the interaction term between *CF* and *OWN* is basically negative in the 1920s, while it became significantly positive in the 1930s. The latter result of the 1930s is contradicted to **HO1**, which predicts that the internal capital market organized by new *zaibatsu* could mitigate the asymmetric information.   It was often pointed out that new *zaibatsu* raised their investment funds in the capital market in the 1930s. However, we could not interpret that this pattern was the result of organizational advantages of new *zaibatsu*.

On the other hand, it seems to be consistent to **HO1** that the estimation result of the interaction term between *OWN* and *CF* was significantly negative in the 1920s.   However, this result was occurred in the case that no effective monitor made the capital budgeting softer.   In order to test this possibility, we make dummy variables, *DF*, that is one, if ROE of a firm was negative at least one firm year from 1921 to 1929.   This dummy variable that indicates ex post low performance is given to 24 firms, which includes 12 *OWN* firms.   The estimation result is shown in **panel 3 of Table 6.**   The interaction term between *DF* and *CF* is significantly negative (5%) in the estimation of net investment by the Tobit model, although the significance level is slightly low in the gross investment estimation by the OLS   (Column 2).   What the cash flow sensitivity of investment in firms facing financial distress ex post is significantly low could be interpreted as the reflection of the soft budget constraint among owner-managers firms in the 1920s.   This empirical result is consistent to anecdotal stories that owner manager were free from external pressure due to their high ownership, and several financial institutions,

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corporate investment.

[15] This understanding is also consistent to the cost of excess monitoring associated with high shareholding that is advocated by Agihon and Tirole   1997   , Burkart, Gromb, and Panunzi (1997). They emphasized that too high shareholding ( ) may reduce incentives of top management, and thus decrease firm value.   If shareholder often overruled the investment plan initiated by top management, they tends to self-constrain to initiate promising investment plan that exceed their firm's or *zaibatsu* internal funds.

often called organ banks, lent money to these firms without strict monitoring.[16] In short, what the sensitivity of owner manager firms or new *zaibatsu* in the 1920s is low is not the result of internal capital market mitigating asymmetric information, but the result of less governance of external shareholders.   This moral hazard problem was supported by the characteristics of bank-firm relationship in that period.

　　Lastly, the interaction term　　and *CF* is significantly positive in the 1930s, which is consistent to **HO.2**.   However, it is surprisingly negative with the high significance in the 1920, which result is contradicted to **HO2**.   This result is also the reflection of the moral hazard problems associated with the dispersion of ownership.   Top management of the firms with the high　　tended to pay the high dividend even when their profitability was low in the 1920s, because less dividends induced the criticism of outside shareholder.   In fact, the sensitivity of dividend to the profit in the high　　firms in the 1920s were much lower than those of the low

　　firms.   Myopic behavior of the top manager associated with the ownership dispersion could work differently between the business downturns (the 1920s) and the business upturns (the 1930s)

5　Corporate groups in the High Growth Era

5-1　Data Construction

　　In the section, we report the estimation result of the high growth era from 1955 to 1970. This period was characterized as the high growth era.   The investment ratio of firms increased dramatically.   The average gross investment over initial capital stock in the 1930s is 17.6% while it was over 30% in the late 1950s.   High growth era was characterized by the vigorous investment of Japanese firms

　　As for this period, sample firms are 126 firms that are ranked in top 100 firms list in either 1937 or 1955.   Notice that sample does not include the IPO firms after 1956[17].   We obtained the accounting data from *Japan Development Bank's Corporate Finance Data Bank*.

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[16] This result indicate that the coefficient of *CF* is not always proxy of asymmetric information.   In some cases, it would be proxy of the constraint imposed by shareholder or debt holder on top management.

[17] Therefore Sony and Honda are not included in our samples.

Since yearly depreciation is completely available in the postwar period, we use the gross investment as an independent variable and the cash flow with depreciation as a dependent variable in the postwar estimation.

As we mentioned in section two, the top manager of postwar firms struggled from reducing the effect of dispersed ownership and the high debt asset ratio that was a result of postwar reform. Corporate groups and the J-type governance structure were gradually emerged in this process. Cross shareholding advanced under the highly dispersed ownership structure, and the relationship banking as known as main bank system was established in this period.

Considering on these points, we made following governance variables. First one is shareholder-stabilized ratio (*STAB*).   Here stabilized shareholder is shareholder who implicitly promised the issued firms not to use both option of shareholding, the exit and the voice.   We construct the variable, *STAB* , through aggregating percentage share held by financial institutions and non-financial firms excluding investment trust (in detail see **Table 2**)[18].

Second is the main bank dummy (*MB*), that may express the long-term relationship between bank and client firms (Aoki and Patrick 1994).   *MB* is dummy variable that is one if a bank identified by a firm as main bank is the same at the two timing, a few years interval, and this bank is the largest lender and the largest shareholder among banks.   Number of firms to which *MB* dummy is given increased from 56 in 1955 to 73 in 1967.

Third is corporate group affiliation (*KEIRETSU*).   *KEIRETSU* is also dummy variable, which is one if a firm belongs to one of ex-*zaibatsu* president group (*Mitsubishi, Mitsui, and Sumitomo*), otherwise zero.   Number of firms that belongs to ex-*zaibatsu* president club is 21 out of 126 sample firms.   Although governance variables should be idealistically identified every year prior to the corporate investment decision, given high cost of research design, they are identified in 1955, 1958, 1962, and 1967.   It implies that for instance same governance variables for 1955 are applied to the investment decision of firm years from 1956 to 1958.

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[18] For estimating the share of stabilized shareholder, we identify shares held by trust banks and Daiwa Banks which was only a city bank that can be a trustee of investment trust by using the ten large shareholder list. As trust banks may hold shares by their own account, while trust banks below top ten shareholder could not be included in this estimation, our estimation may have a certail level of noise.

Information concerning the governance structure of our sample firms is summarized in **Table 2**.

As our sample is panel data composed of 126 firms times firm years, fixed effect model is applied.   We estimate the investment function from 1956 to 1965.   The early phase of the high growth era includes three business cycles; 1956-1958 so called "*Jinmu* boom", 1959-1962 so called "*Iwato* Boom", and 1963-1965.   As is often pointed out that the structural change occurred around in the third phase, we also estimate the investment function for the time period from 1956-1962 excluding third phase.   In addition, we estimate same function on the later phase of the HGE from 1963-1970 for reference.   Descriptive statistics are summarized in **Table 7**.

---Table 7 about here---

5-2　The basic result of the postwar Period

According to **Table 8** that estimates the investment function without governance variables, the sign of cash flow (*CF*) is significantly positive, while the sign of debt asset is significantly negative.   In the estimation of the same regression for the wartime from 1937-1942, the coefficient of *CF* was far less than those of the prewar period and *DA* was insignificant. Thus, what Japanese economy recovered to the market economy in the postwar period indicates that firms faced the constraint of the internal funds and the default risk, again.

Comparing to the coefficient of the early phase of the high growth era (1955-1964) with later phase (1965-1970), the coefficient in the early phase is quite high comparing to the later phase.   Measuring one standard deviation decrease, it would reduce 0.131 the of investment level, *It* /*Kt-1*,in the early phase, which is almost 35% of *It* /*Kt-1* on average.   It is safe to say that firms in the early phase faced liquidity constraint much seriously than in the later phase.

On the other hand, the sign of *DA* is negative, which is also statistically highly significant.   The magnitude of the effect of *DA* on investment is, less than half of *CF* though, estimated as -0.058.   This results implies that if a firm's *DA* is one standard deviation (0.123) lower than average, its investment level would decrease 15%.

---**Table 8 : Base regression for HGE** about here---

5-3 The role of governance structure on investment

Then, our concern is the interaction term between the governance variables and *CF* or *DA*.   Interesting results to be noted in **Table 9** are as follows.

<div align="center">---**Table 9 : Effect of Governance factor** about here---</div>

First, the interaction term of *MB* with *CF* is negative as is shown in panel 1 of **Table 9**. It suggests that *MB* relationship would mitigate the cash flow constraint on investment as expected.   This effect seems to be large enough.   The sensitivity of investment on cash flow in firms with strong *MB* ties could be almost half (-0.534 out of 1.033) comparing to firms without strong *MB* ties according to the estimation results for 1956-1962.   Notice that this effect seems to be unique in the early phase of the high growth era (HGE), since there are no such relation in the estimation result for 1963-1970.   Although *MB* dummy needs further elaboration, we can tentatively conclude that, consistent to HO.1, *MB* played a more significant role in the early phase of HGE comparing to the latter phase in mitigating asymmetric information.   On the other hand, opposite to our prediction, the sign of interaction term of *MB* with *DA* is rather negative, although significant level is low.   It implies that main bank relationship may intensify the constraint of *DA* on investment, or at least, could not mitigate this constraint.

Second, and most importantly from this regression results, the sign of interaction term of *DA* with the share of stabilized shareholder (*STAB*) is positive, and statistically highly significant.   This result is fully robust if we divided our estimation period into two sub periods; 1956-1958, and 1959-1962 (not shown).   The magnitude of this term is, using one standard deviation change of *STAB* (0.14), to reduce 0.276 out of –0.625 of *DA*.   If we compare two firms with same *DA,* and one of them has average *STAB* and the other has one standard deviation higher *STAB*, the sensitivity of later firm's investment on *DA* is 44% less than that of the former firm.   Thus, we could conclude that, consistent to HO3, shareholder stabilization scheme played a promotional role for investment through functioning as a risk sharing device. This effect is also supported in later phase of the HGE, although the magnitude was reduced than before, approximately 14%.   Different from MB relationship that seems to be less functioned in mitigating the cash flow constraint on investment in the later phase of HGE, shareholder stabilization may continually encourage the corporate investment through functioning as a risk-sharing device.

Third, estimation results with *KEIRETSU* dummy is shown in panel 2 of **Table 9**. Notice that institutional characteristics of corporate groups such as cross shareholding among members and the strong bank-firm relationships could be attributable to *MB* dummy and *STAB*. Consequently, the result shown in panel 2 tests whether the affiliation of ex-*zaibatsu* president club has an unique effect on investment or not, that is not attributable to *MB* dummy and *STAB*. The result is slightly different between two-time period, 1956-1965 and 1956-1962. The interaction term of *KEIRETSU* with *CF* is negative, but insignificant in the estimation for 1956-1962. If we estimate for 1956-1965, the unique effect is much clear. For testing which is strong to mitigate cash flow constraint, *MB* or *KERETSU*, we adjust overlaps of *MB* dummy with *KEIRETSU* dummy. According to the result shown in panel 3, the coefficient of interaction term of *KERETSU* with *CF* is higher than that of *MB*. Thus, it is safe to say that corporate groups played a slightly stronger role for reducing cash flow constraints on investment comparing to MB relationship in non ex-*zaibatsu* firms.

However, there is no unique role that corporate groups play in mitigating the constraint of default risk on investment. The sign of the interaction term of *KEIRETSU* with *DA* is negative and insignificant in panel 3 of both period. This result is also seen in panel 3 where overlaps of *KEIRETSU* with *MB* is adjusted.

6 Conclusion and Perspectives

The prewar old *zaibatsu* have an effective governance mechanism through their high ownership and the monitoring of the holding company over subsidiary firms as is pointed out. The performance of *Mitsui Mining* and *Mitsubishi Mining* were better than the *Kuhara Mining* and *Furukawa Mining* in the 1920s. Mitsubishi Ship building performed well, whereas *Kawasaki Shipbuilding* was bankrupt in the 1920s. However, contradicted our expectation, this system did not play any role to mitigate the constraint of cash flow as well as the default risks. Effective control of the holding companies on subsidiary firms often reduced the initiative of salaried manager of subsidiary firms when they have high business chances. Due to the unlimited responsibility of *zaibatsu* family for holding companies, the risk taking investment project initiated by salaried manager were often overruled. In this sense, the prewar old *zaibatsu* system had the cost that associated with

its effective control.   This understanding is the new interpretation of the conservative behavior of the old *zaibatsu* suggested by Morikawa (1992), and consistent to the empirical result shown by Frankl (1999), which stressed the performance of firms belonging to old *zaibatsu* line were not high, but stable.

 The risk taking investment plan was rather implemented by firms that owner-manager firms or new *zaibatsu*.   The less constraint of the debt on the corporate investment among these firms were supported by their managerial ownership.   However, they did not have any effective monitors and banking sectors in the prewar period tended to lend their money to these firms without strict screening, there were several cases that these firms tended to take an excess investment, and thus faced financial distress. Owner-manager firms also had a cost which associated with their managerial ownership.

Thus, both type of *zaibatsu* complimentarily played a significant role in the prewar industrialization in the sense that new *zaibatsu* aggressively invested in new businesses in business upturns, and old *zaibatsu* contributed to maintain capital stock and its efficiency level through their strict monitoring in the business downturns.

Postwar reform was the epoch making that dissolved the prewar corporate governance structure.   It raised an initiative of top management through resolving the holding companies, redistributing the managerial ownership, and eliminating shareholder from corporate boards.   However, the postwar reform gave birth to another set of problems such as myopic pressure imposed by small shareholder, asymmetric information problem under the confused financial system and the high default risk associated with the high debt-asset ratio.   Postwar governance structure and corporate groups emerged in the process that firms coped with these difficulties.

Postwar corporate groups played a significant role of reducing asymmetric information and mitigating the constraint of the debt on investment.   In these regards, the function of the postwar war corporate governance structure was quite different from that of prewar.   The investment funds that used to be limited within firms internal money were now supplied by the main bank system.   The risk that used to be mitigated by the managerial ownership was now reduced by the cross shareholding.   Thus we can conclude that, contradicted to the current popular understanding (Hall and Weinstein 1996, Weinstein and Yafeh 1998), corporate groups

and the postwar governance structure have mitigated the under-investment problems that Japanese firms faced in the catch up phases of the 1950s and the early 1960s, .

However, it is worth noticing that corporate groups played different function in the postwar economic development.   Lastly, let us put few words on the role of corporate groups after the high growth era.   Entering into 1980s, when Japanese economy ended up its catch up phases, and reached at the matured phase, postwar governance structure of *keiretsu* has changed its function from the growth oriented one to induce the excess investment.   In another occasion we have estimated the same regression as this paper, dividing whole sample firm into two typesusing their growth opportunities: young growing firms (*YG* firms) and old matured firms (*OM* firms).   We get a result that the cash flow sensitivity of *OM* firms are higher than *YG* firms, and main bank relationship surprisingly intensified this sensitivity.   This would be clear evidence that Japanese firms firstly faced the free cash flow problem suggested by Jensen (1986).   In this regard, Hall and Weinstein (1996), and Weinstein and Yafeh (1998) is right, whereas the conventional understanding (Abegglen and Stalk 1985, and Porter 1992) is no longer the case for this phase of Japanese firms.

Further, in the 1990s the ownership structure of Japanese firms began to change.   The share held by foreign investors has drastically increased, while the cross shareholding has gradually been dissolved.   Under this situation, the risk sharing among firms under *keiretsu* groups seems to be disappeared.   According to our recent estimation of investment function in the 1990s, the interaction term between *DA* and *STAB* become less significant.   In the regard of the constraint of *DA* on investment, there would be no difference between firms belongs to *keiretsu* and independent firms.   Thus, Japanese firms now began to lunch various types of corporate reforms.

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Figure 1　Investment and Internal Fund
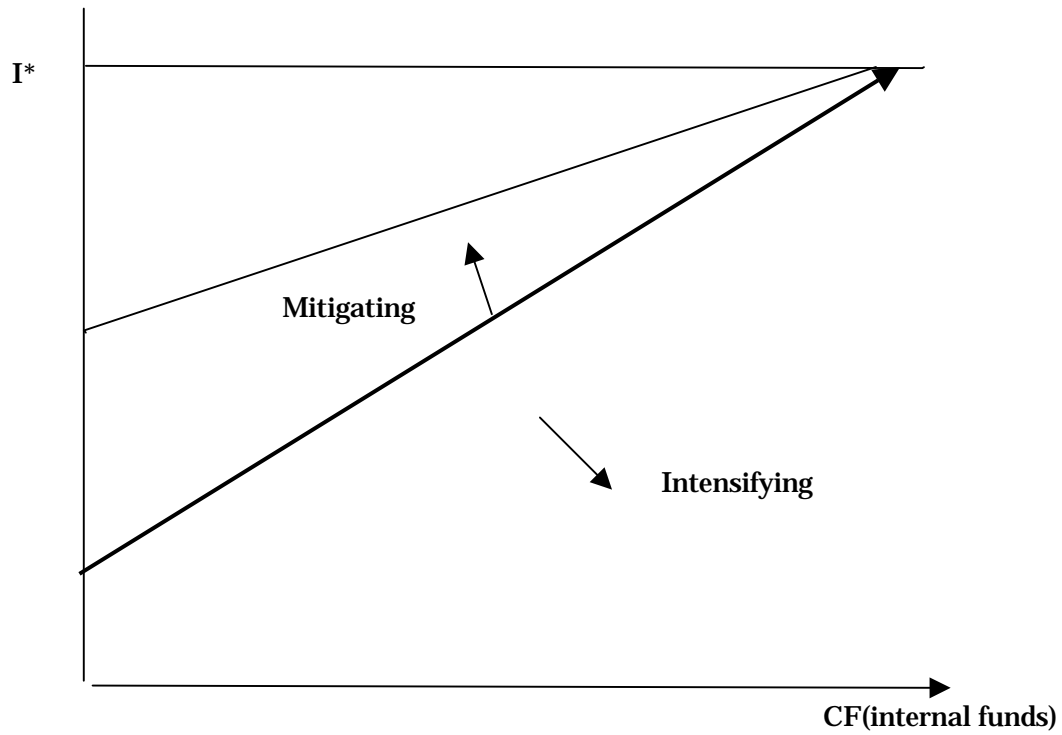
I* is optimal investment level, given business chance.

Figure 2   Investment and Debt-asset ratio

Soft budget constraint   excess investment

I*

Mitigating

Intensifying

DA(Debt-asset ratio)
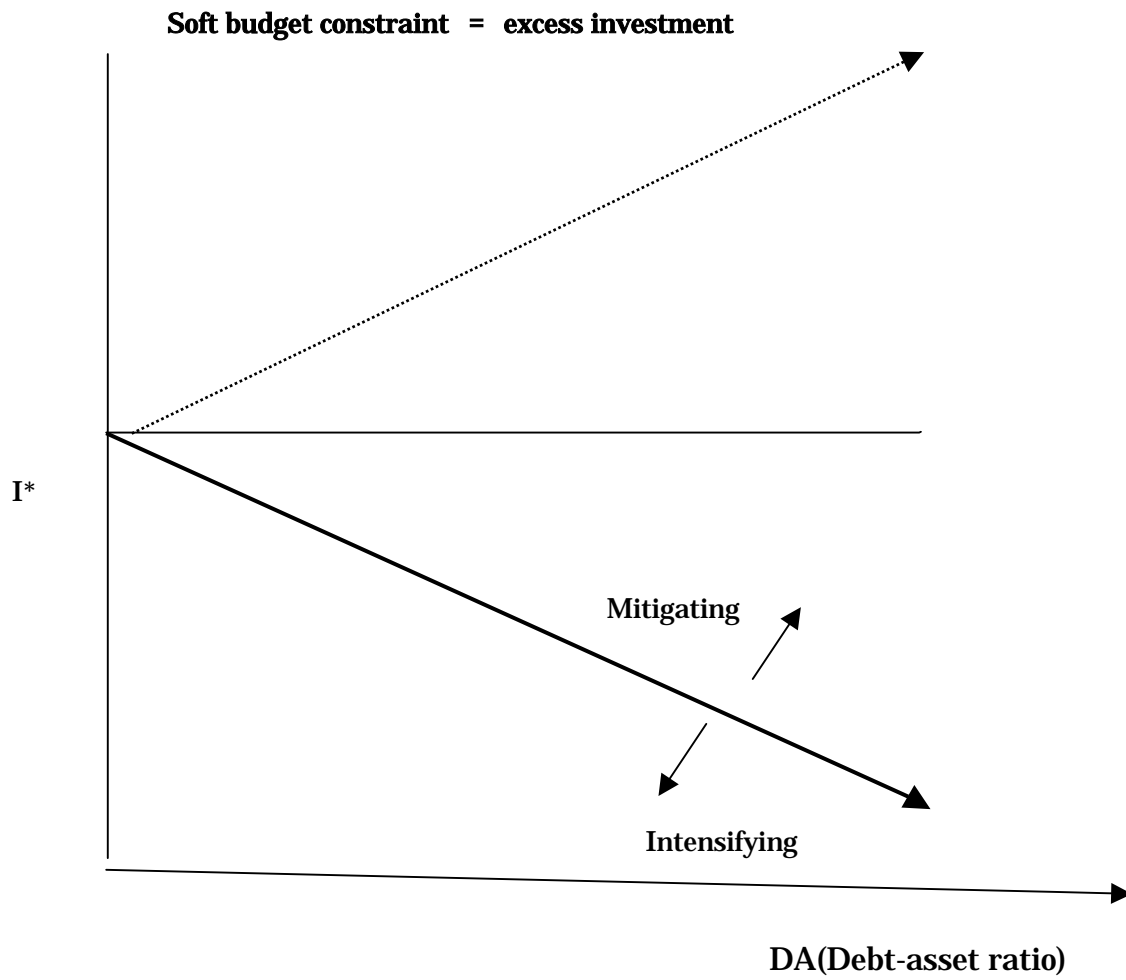
I*   is optimal investment level, given business chance.

Table 1 Summary of Governance Structure of Prewar Large Firms in 1928

		%share held by president	%share held by largest shareholder except top managers	%share held by ten largest shareholder	No of stocks,	No. shareholders	Debt-asset ratio
				C10	1000 units		DA
N= 84 firms	average	0.065	0.313	0.522	568	4,620	0.392
	standard deviation	0.169	0.328	0.322	497	4,890	0.199
Old Zaibatsu	average	0.019	0.765	0.915	216	449	0.334
	standard deviation	0.082	0.245	0.152	152	947	0.167
Own, New Zaibatsu	average	0.167	0.314	0.576	624	4,884	0.414
	standard deviation	0.299	0.316	0.332	579	5,142	0.206
Managerial Firms	average	0.056	0.161	0.372	606	5,124	0.402
	standard deviation	0.148	0.201	0.236	453	4,602	0.195

Source: Toyokeizai, Kabusiki-kaisha Nenkan (Year Book of Joint Stock Companies), Companies History , Annual Reports.

Note: Old zaibatsu is subsidiary firms that belongs to three big zaibatsu, Mitusi, Mitsubishi, Sumitomo.

Own, Old Zaibatsu: Firms which top manager was large shareholders, or subsidiary firms of the owner firms

Managerial Firms: Firms which top management is salalied managers.

Table 2 Capital Composition : Prewar, Wartime and Postwar Period

(million yen, and billion yen after 1950)

	1935	1943	1946.8.11 1)	1950	1953	1955	1960
N	295	289	266	545	597	599	571
Total Asset	11,185	35,092	79,071	10,388	33,400	46,309	101,793
Current asset	4,523	24,439	34,426	6,661	17,686	21,280	47,177
Fixed asset	6,662	10,653	23,045	3,727	15,713	25,029	54,250
Special loss account	-	-	21,600				
Debt	4,377	19,383	57,854	7,222	21,807	28,164	71,959
Equity	6,808	15,710	19,138	3,166	11,593	18,145	29,834
paid in capital	5,232	10,672	15,775	936	2,954	5,086	14,486
Debt-asset ratio	39.1%	55.2%	73.2%	69.5%	65.3%	60.8%	70.7%
Paid in capital /Total asse	46.8%	30.4%	20.0%	9.0%	8.8%	11.0%	14.2%

Source, MOF 1983, 904-05, Mitsubishi Research Institute, Honpo-Jigyo Bunseki and Kigyou-keieino Buseki.
note 1.   1946.8.11 Just before old and new accout were devided

Table 3 Corporate Governance in the High Growth Era

Panel-a: Main Bank Relationship

		1953.9	1955	1958	1962	1967
	No of firms	126	126	126	124	121
a	Top Bank in Kaisha Shikiho in t+1 as that in	86	121	121	117	114
b	Top lender in total loan	N.A	78	85	85	62
c	Top lender in short term loan	N.A	84	89	90	79
d	Top shareholder among banks	63	69	93	98	104
	Satisfied condition a,b and c	N.A	56	68	73	65

Panel-b: Owership Strcture

		1953.9 Average	Stdev.	1955 Average	Stdev.	1958 Average	Stdev.	1962 Average	Stdev.	1967 Average	Stdev.
	Stabilized shareholder	0.207	0.138	0.300	0.142	0.350	0.144	0.384	0.151	0.462	0.120
	Stabilized shareholder2	0.160	0.131	0.253	0.134	0.303	0.142	0.345	0.146	0.392	0.129
	Share held by Main bank	0.011	0.017	0.016	0.017	0.026	0.020	0.037	0.030	0.040	0.022
	Portfolio investor	0.728	0.157	0.606	0.141	0.601	0.148	0.599	0.141	0.457	0.123
	share of top shareholder	N.A	N.A	0.083	0.092	0.083	0.089	0.082	0.070	0.094	0.084
a	financial institution	0.229	0.106	0.286	0.109	0.326	0.112	0.357	0.119	0.330	0.106
b	Securiteis Firms	0.077	0.056	0.082	0.051	0.041	0.042	0.023	0.029	0.072	0.043
c	Non finnancial Firms	0.074	0.080	0.074	0.068	0.115	0.124	0.117	0.099	0.123	0.102
d	Individual shareholder	0.620	0.158	0.532	0.140	0.516	0.141	0.498	0.131	0.445	0.121
e	Investment Trust	0.095	0.056	0.084	0.051	0.092	0.049	0.106	0.078	0.022	0.026
f	Insurance Comp	0.047	0.038	0.049	0.041	0.048	0.041	0.038	0.036	0.070	0.056
g	owner	0.011	0.028	0.010	0.025	0.007	0.019	0.005	0.016	0.008	0.031
h	Foreign Corporation	0.027	0.103	0.025	0.107	0.017	0.077	0.020	0.085	0.025	0.097

Source, TSE, *Jojokaisha Soran* , Daiamond, *Kaisha Yoran* , Nikkei, *Kaishanenkan* .

Note: 1. Column e-h based on top ten shareholder list

2. Stabilzed Shareholde = a + c + h - e

3 Stabilzed Shareholder2 = a + c + h - (e + f)

4. Portfolio Investor = d - g + c

5. Column c in 1958 and 1962 includes sharehold by Foreing corporatio

Table 4 Sisctiptive Statistics
Panel 1: Net Investment

		The 1920s (1921-1927)		The 1930s 1933-1937	
N	No of firm years	354		258	
		Means	Std.ev	Means	Std.ev
I/Kt-1	net investment	0.138	0.246	0.094	0.164
DY(-1)	real sales growth rate	0.063	0.400	0.148	0.221
DA(-1)	debt-asset ratio	0.385	0.170	0.357	0.191
CF	cash flow	0.027	0.106	0.075	0.075
CFD	cash stock (cash + deposit)	.	.	0.125	0.099
	the extent of owenrship dispersion	0.669	0.297	0.676	0.301
	%share held by largest shareholder except owner manager	0.268	0.317	0.269	0.286
	%share held by owner-manager	0.063	0.092	0.030	0.102

Panel 2 Gross Investment

		297		201	
I /Kt-1	gross investment	0.171	0.178	0.176	0.177
Dep/Kt-1	depreciation/intangible capital stock at the biginning of the firm year	0.025	0.039	0.082	0.050
DY(-1)	real sales growth rate	0.074	0.422	0.137	0.225
DA(-1)	debt-asset ratio	0.394	0.173	0.363	0.193
CF2	cash flow	0.048	0.117	0.154	0.142

Table 5 Basic Statistics

I/Kt-1   net investment
CF   cash flow/fixed asset at the beginning of firm year, CF= after tax profit - devidend
DY(-1)   real sales growth rate
DA   debt /asset

	the 1920 (1921-1927)				the 1930s 1933-1937					
Column			(2)		(3)		(4)		(5) Heavy Industries	
Model	Tobit		Random Effect		Tobit		Fixed effect			
Independent variables	I_1 Net		I_2 Gross		I_1 Net		I_2 Gross		I_1 Net	
logliklihood, or adj, R^2	-84.910		0.122		-68.004		0.635		-60.613	
N	360		308		271		203		172	
No of the case that investment is positive	281		296		144		203		96	
	coeffcient	p-value	coeffcient	p-value	coeffcient	p-value	coeffcient	p-value	coeffcient	p-value
C	0.083	[.164]	0.103	0.127	0.700	[.011]	-		0.375	[.249]
DY	0.118	[.058]	0.137	0.016	0.143	[.046]	0.045	0.277	0.283	[.017]
CF	0.337	[.029]	0.204	0.107	0.789	[.001]	0.664	0.000	0.821	[.007]
DA(-1)	0.039	[.710]	-0.058	0.498	-0.372	[.000]	-0.216	0.101	-0.508	[.001]
Y21(Y33)	0.254	[.000]	0.279	0.000	-0.216	[.000]	-1.996	0.048	-0.500	[.000]
Y22(Y34)	0.134	[.016]	0.118	0.022	-0.161	[.001]	-0.089	0.374	-0.406	[.000]
Y23(Y35)	0.046	[.407]	0.046	0.356	-0.136	[.005]	-0.012	0.906	-0.450	[.000]
Y24(Y36)	0.018	[.748]	0.007	0.882	-0.172	[.000]	-0.026	0.303	-0.433	[.000]
Y25	0.012	[.820]	0.065	0.896	-		-		-	
Y26	0.069	[.206]	0.227	0.326	-		-		-	
SIGMA	0.190	[.000]	-		0.217	[.000]	-		0.286	[.000]
Inddummy	Yes		NO		Yes		NO		YES	
dP/dX(marginal effect										
DY	0.147		-		0.211		-		0.331	
CF	0.421		-		1.162		-		0.961	
DA(-1)	0.049		-		-0.547		-		-0.595	
1std.ev× marginal effect(coefficient)										
DY	0.059		0.055		0.047		0.010		0.105	
CF	0.031		0.022		0.088		0.050		0.080	
DA(-1)	0.008		0.010		-0.104		0.041		-0.099	

The choice between Random effect and fixed effect is based on the Hausman test.

Table 6 The Estimationf of Investment function in the Prewar Period

I_1 =   net investment, $K_t - K_{t-1}$

I_2 =   Gross investment, $K_t - K_{t-1} + \text{Depreciation}_t$

DY   real sales growth rate

CF   cash flow/fixed asset at the beginning of firm year, CF= after tax profit - devidend

DA   debt /asset

Old is subsidiary firms that belongs to three big zaibatsu, Mtusi, Mtsubishi, Sumitomo.

Own is a firm which top manager was large shareholders, or subsidiary firms of the owner

       %share held by president

   =1-   here   is %share held by largest shareholder except top managers

Panel 1 The Effect of Groups

Dependent Variable= I1= net investment	1920s			1930s	
	1		2		3
Model	Tobit		Tobit		Tobit
N	360				276
	281				147
	coeffcient	p-value	coeffcient	p-value	coeffcient	p-value
DY	0.15	[.016]	0.17	[.005]	0.12	[.139]
CF	0.42	[.021]	0.45	[.014]	0.19	[.044]
DA(-1)	-0.22	[.055]	-0.10	[.260]	-0.59	[.000]
OLD× CF	1.11	[.034]	0.90	[.078]	0.53	[.315]
OWN× CF	-0.30	[.405]	-0.59	[.082]	0.99	[.035]
OLD× DA	-0.26	[.443]	-		0.17	[.971]
OWN× DA	0.40	[.029]	-		0.58	[.004]
OLD	-0.11	[.368]	-0.18	[.001]	-0.02	[.811]
OWN	-0.13	[.124]	0.04	[.221]	-0.16	[.081]
industry dummy	YES		YES		YES	
logliklihood, or adj, R^2	-86.38		-92.1		-61.79	

All estimation includes constants and yearly dummy, but they are not reported.

Pnael 2 The effect of Ownership Structure

Dependent Variables	1920s			1930s		
	I_1	I_2	I_2	I_1	I_2	I_2
	1	2	3	4	5	6
Model	Tobit	Random Effect	Random Effect	TOBIT	Random Effect	Random Effect
N	360	305	305	276	203	203
No of the case that investment is positive	281	295	295	147	203	203
DY	0.16 [.009]	0.12 [.042]	0.10 [.075]	0.02 [.619]	0.07 [.037]	0.06 [.067]
CF2	1.35 [.003]	1.75 [.009]	2.05 [.003]	0.36 [.499]	-0.08 [.745]	-0.42 [.133]
DA(-1)	-0.08 [.376]	-0.13 [.182]	-0.25 [.021]	-0.51 [.000]	-0.14 [.067]	-0.20 [.010]
× DA	1.43 [.225]	1.98 [.094]	0.76 [.551]	6.78 [.000]	2.43 [.030]	2.39 [.050]
OWN× DA	-	-	0.47 [.016]	-	-	0.14 [.451]
× CF	-1.24 [.026]	-1.84 [.018]	-2.06 [.009]	1.27 [.086]	0.76 [.045]	1.08 [.006]
OWN× CASH	-	-	-0.21 [.481]	-	-	0.51 [.006]
OWN	-	-	-0.17 [.058]	-	-	-0.11 [.188]
	-0.31 [.507]	-0.69 [.158]	-0.19 [.716]	-1.47 [.000]	-0.55 [.044]	-0.56 [.056]
	0.16 [.004]	0.08 [.326]	0.10 [.212]	-0.06 [.508]	-0.16 [.042]	-0.20 [.016]
Industry dummy	YES	NO	NO	YES	NO	NO
logliklihood, or adj, R^2	-92.65	0.13	0.14	-28.69	0.28	0.32

Panel: Ex post Financial Distress

Dependent Variables	1		2	
	I_1		I_2	
Model	Tobit		Random Effect	
N	360		305	
DY	0.17	[.004]	0.14	[.013]
CF	0.57	[.006]	0.37	[.028]
DA(-1)	-0.02	[.865]	-0.04	[.654]
DF× CH	-0.50	[.103]	-0.53	[.040]
DF	-0.01	[.663]	-0.03	[.342]
industry dummy	YES		NO	
logliklihood, or adj, R^2	-99.43		0.14	

Table 7 The Estimation of Investment Function (1956-1970)

	1956-1965		1956-1962		1963-1970	
No. of Obs.	1014		692		824	
	Mean	SDtd.Dev	Std	Dev	Std	Dev
It / Kt-1	0.342	0.188	0.378	0.203	0.287	0.134
capital cost C1t-1	0.070	0.007	0.072	0.007	0.066	0.004
operational profit ORRt-1	0.085	0.042	0.093	0.043	0.069	0.034
cash flow=CFt	0.126	0.067	0.134	0.069	0.117	0.062
Debt-Asset (book value)=DAt-1	0.312	0.122	0.291	0.123	0.370	0.125
MB Dummy	501	-	355	-	412	-
STAB	0.340	0.144	0.324	0.139	0.424	0.137
	187	-	131	-	151	-

Table 8 The Estimation of Investment Function (1956-1970)

Dependent Variable *It / Kt-1*

	1956-1965		1956-1962		(fixed model) 1963-1970	
	coeffcient	p-value	coeffcient	p-value	coeffcient	p-value
capital cost C1t-1	3.460	[.193]	0.734	[.826]	3.573	[.319]
operational profit ORRt-1	0.420	[.018]	0.372	[.102]	0.593	[.011]
cash flow=CFt	1.615	[.000]	1.912	[.000]	0.660	[.000]
Debt-Asset (book value)=DAt-1	-0.309	[.000]	-0.473	[.000]	-0.343	[.000]
adj.R2	0.406		0.440		0.312	
"Elasticity"						
CFt	0.108		0.131		0.041	
DAt-1	-0.038		-0.058		-0.043	

Table 9 Estimation of Investment Function in the High Growth Era

Panel 1: With Governace Variables

	1956-1965		1956-1962		1963-1970	
	coefficient	p-value	coefficient	p-value	coefficient	p-value
capital cost C1t-1	2.343	[.129]	1.011	[.769]	4.141	[.251]
operational profit ORRt-1	0.402	[.024]	0.384	[.090]	0.614	[.009]
cash flow=CFt	1.146	[.000]	1.033	[.006]	0.858	[.008]
Debt-Asset (book value)=DAt-1	-0.468	[.000]	-0.625	[.000]	-0.539	[.000]
MB Dummy	0.104	[.035]	0.135	[.057]	-0.001	[.983]
MB*DA	-0.161	[.115]	-0.226	[.139]	-0.050	[.613]
MB*CF	-0.365	[.045]	-0.534	[.041]	0.052	[.790]
STAB	-0.523	[.004]	-0.886	[.001]	-0.152	[.393]
STAB*DA	1.247	[.000]	1.983	[.000]	0.677	[.015]
STAB*CF	2.301	[.001]	3.967	[.000]	-0.264	[.696]
adj.R2	0.480		0.464		0.392	
"Elasticity"						
DA*STAB	0.180		0.276		0.092	
CF*STAB	0.332		0.553		-0.036	

Panel 2 Adding *KEIRETSU*

	1956-1965		1956-1962		1963-1970	
capital cost C1t-1	2.435	[.369]	1.094	[.753]	5.165	[.158]
operational profit ORRt-1	0.387	[.029]	0.389	[.086]	0.651	[.006]
cash flow=CFt	1.389	[.000]	1.184	[.003]	0.771	[.020]
Debt-Asset (book value)=DAt-1	-0.485	[.000]	-0.631	[.000]	-0.548	[.000]
MB Dummy	0.087	[.080]	0.130	[.068]	0.003	[.957]
MB*DA	-0.127	[.217]	-0.210	[.172]	-0.056	[.572]
MB*CF	-0.314	[.087]	-0.533	[.042]	0.021	[.914]
STAB	-0.524	[.004]	-0.869	[.001]	-0.096	[.595]
STAB*DA	1.301	[.000]	1.994	[.000]	0.547	[.056]
STAB*CF	2.132	[.003]	3.779	[.000]	-0.261	[.700]
KEIRETSU*DA	-0.217	[.240]	-0.064	[.813]	0.373	[.115]
KEIRETSU*CF	-0.827	[.005]	-0.438	[.298]	0.395	[.193]
adj.R2	0.482		0.463		0.393	

Panel 3 Adjusting Overlaps

	1956-1965		1956-1962		1963-1970	
capital cost C1t-1	2.712	[.312]	1.307	[.703]	4.988	[.067]
operational profit ORRt-1	0.405	[.022]	0.399	[.078]	0.432	[.019]
cash flow=CFt	1.354	[.000]	1.192	[.004]	0.634	[.012]
Debt-Asset (book value)=DAt-1	-0.488	[.000]	-0.637	[.000]	-0.376	[.000]
MB Dummy adjusted	0.068	[.218]	0.122	[.123]	-0.019	[.652]
MB*DA	-0.111	[.324]	-0.206	[.232]	0.007	[.928]
MB*CF	-0.205	[.320]	-0.521	[.082]	0.037	[.820]
STAB	-0.507	[.006]	-0.857	[.002]	-0.202	[.106]
STAB*DA	1.280	[.000]	1.989	[.000]	0.602	[.004]
STAB*CF	2.060	[.005]	3.738	[.000]	0.218	[.699]
KEIRETSU	-	-	-	-	-0.051	[.415]
KEIRETSU*DA	-0.273	[.145]	-0.168	[.544]	0.122	[.306]
KEIRETSU*CF	-0.971	[.002]	-0.706	[.110]	0.271	[.288]
adj.R2	0.554		0.462		0.391	

Note; 1. For definition of MB dummy and STAB, see Table 8.
2. Fixed effects model. However, random effects model is applied for the estimation of 1963-1970.