Corporate Governance and Performance in Twentieth-Century Japan

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To understand the corporate performance of Japanese firms in the twentieth century, we have constructed a comprehensive database that includes asset, capital composition, profitability, and other variables relating to corporate governance structure. In this paper, we briefly introduce our project and report preliminary results of research on corporate performance and its determinants. We surveyed the long-term transition of ROA (defined as the ratio of profit after tax reduction to total assets) and its standard deviation using micro data of Japanese firms through the twentieth century, and investigate the effect of corporate governance structure (large shareholder and main bank) and the role of corporate groups (*zaibatsu* and *keiretsu*) on ROA and its volatility. Preliminary results show that high ROA with high volatility characterized the performance of large firms in the prewar period, while relatively low profitability with less volatility characterized the post-war era. In the 1990s, however, Japanese corporations showed extraordinarily low levels of performance with high volatility. The large shareholder enhanced firm performance in the prewar period. In contrast, *zaibatsu* did not enhance their affiliates' performance, nor did *keiretsu* and the main bank in the postwar period. *Keiretsu* group affiliation increased growth at the expense of profitability in the postwar period. Finally, *zaibatsu* in the prewar, and the main bank and *keiretsu* system in the postwar period both reduced the volatility of performance. This stabilizing effect was partly brought about by risk or profit sharing, and partly by strict monitoring (*zaibatsu*) and rent extraction (main bank). The main bank system and *keiretsu* systems lost the ability to reduce the volatility of performance in the 1990s.

The Japanese economy in the twentieth century experienced a variety of dramatic upheavals. Japan realized rapid heavy industrialization during World War I, and suffered from perpetual economic crises from the 1920s to the early 1930s, then wartime regulations began in 1937. Postwar reform especially influenced many aspects of the Japanese economy. Post-

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World War II, from 1955 to 1970, Japan enjoyed an unprecedented long-run economic boom (called the "high growth era"), when the average annual rate of economic growth was about 10 percent, and the country become an economic powerhouse. The collapse of the "bubble economy" at the end of the 1980s mired the Japanese economy in a serious slump during the 1990s.

To understand the corporate performance of Japanese firms during such macroeconomic upheavals, we have constructed a comprehensive database that includes asset, capital composition, profitability, and other variables relating to corporate governance structure. In this paper, we briefly introduce our project (see Appendix for further details), and report preliminary results of our research on corporate performance and its determinants.

Much has been written about Japan's economic performance in the twentieth century. However, previous scholars, particularly those dealing with the prewar Japanese economy, have used macro-level data, or if they have used micro-level data, they limited it to a certain number of firms in specific industries. In addition, there are few previous studies examining both the pre- and postwar Japanese economy from a historical perspective.

We chose average return on asset (ROA; defined as the ratio of profit after tax reduction to total assets) and the standard deviation of ROA as performance measures, supplemented by the annual growth rate of firms' total assets. As for determinants of corporate performance, we focus mainly on monitoring systems and corporate groups.

Family-owned business groups known as *zaibatsu* were important in the corporate governance of prewar Japanese firms. Business and economic historians have focused on the role of these groups in prewar industrialization. Conventional understanding was that the *zaibatsu* system enjoyed high profitability through preferential governmental support and capital monopolization. A new theory suggests that the effective monitoring by *zaibatsu* holding companies kept their subsidiary firms' performance high.[1] However, the strict monitoring by a family with high share ownership might diminish the incentives of professional (salaried) managers of subsidiary firms, thus leading to management inefficiency.[2] Furthermore, *zaibatsu* would possibly stabilize the

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[1] See Tetsuji Okazaki and Masahiro Okuno-Fujiwara, eds., *The Japanese Economic System and Its Historical Origins* (New York, 1999); Tetsuji Okazaki, "The Role of Holding Companies in Pre-war Japanese Economic Development: Rethinking *Zaibatsu* in Perspectives of Corporate Governance," *Social Science Japan Journal* 4 (Oct. 2001): 243-68.

[2] Hidemasa Morikawa, *Zaibatsu: The Rise and Fall of Family Enterprise Groups in Japan* (Tokyo, 1992).

performance of its subsidiary firms through a risk-sharing mechanism, which Iwao Nakatani suggested was a main function of postwar corporate groups known as *keiretsu*.[3]

The corporate governance structure of postwar firms changed drastically from that of prewar firms. After dissolution of holding companies and the complete elimination of outside directors, corporate boards in postwar Japanese firms were composed of corporate insiders promoted from within firms. This change raised initiatives for top management (salaried managers) higher than during the prewar period. Cross-shareholding among firms, which emerged in response to dramatic redistribution of property rights during postwar reform, made it possible for top management to take a long-term strategy now that they were free from external pressure of shareholders exercising voice and exit. Given less pressure from outside shareholders, main banks' long-term relationships with client firms played a significant role in corporate governance.

Keiretsu, which emerged as the reorganization of prewar-*zaibatsu*, represent one of the postwar governance structures. Conventional wisdom concerning the role of postwar *keiretsu* is that corporate groups have encouraged investment by reducing asymmetric information and keeping top managers free from the pressures of external markets.[4] This interpretation predicts high performance levels, or at least higher growth of *keiretsu* firms compared to non-*keiretsu* firms. However, an increasingly popular view suggests that there is no clear evidence of *keiretsu* contributing to their members' growth and profitability even during the high growth era.[5] Another perspective is that the main function of postwar *keiretsu* was to make the profitability of its member firms less volatile.[6] From this point of view, postwar *keiretsu* might provide a risk-sharing mechanism to member firms.

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[3] Iwao Nakatani, "The Economic Role of Financial Corporate Grouping," in *The Economic Analysis of the Japanese Firm*, ed. Masahiko Aoki (Amsterdam, 1984), 227-58.

[4] See Takeo Hoshi, Anil Kashyap, and David Scharfstein, "The Investment, Liquidity, and Ownership: the Evidence from the Japanese Industrial Groups," *Quarterly Journal of Economics* 106 (Feb. 1991): 33-60, and James C. Abegglen and George Stalk, Jr., *Kaisha: The Japanese Corporation* (New York, 1985).

[5] David E. Weinstein and Yishay Yafeh, "Japan's Corporate Groups: Collusive or Competitive? An Empirical Investigation of *Keiretsu* Behavior," *Journal of Industrial Economics* 43 (Dec. 1995): 359-76, and Yishay Yafeh, "Japan's Corporate Groups: Some International and Historical Perspectives," in *Structural Impediments to Growth in Japan*, ed. Magnus Blomström, Jennifer Corbett, Fumio Hayashi and Anil Kashyap, (Chicago, 2003), 259-84.

[6] Nakatani, "The Economic Role of Financial Corporate Grouping," and Michael L. Gerlach, *Alliance Capitalism: The Social Organization of Japanese Business* (Berkeley, Calif., 1992).

In reviewing the existing literature, we examine the long-term transition of corporate performance in twentieth century Japan, and revisit these views of the determinants of corporate performance. We briefly summarize a theoretical framework for understanding the impact of corporate governance structure on corporate performance, stressing the managerial discipline through monitoring by large shareholders and main banks, as well as the unique risk-sharing role of corporate groups.

Long-Term Transition of Performance

How do we capture the change in performance of Japanese firms in the twentieth century? As a first round trial, we focused on ROA and the standard deviation of ROA, because ROA is a measure that we can consistently get throughout the twentieth century.[7] We also checked the annual growth ROA and its standard deviation, because ROA is sometimes a trade-off of firms' growth.[8]

Beginning with the prewar period, because database construction is still ongoing, we tentatively picked the top one hundred firms from the list provided by W. Mark Fruin in 1918 and from our own top hundred large firms list in 1937 (both asset based).[9] Then, using two sources,[10] we checked whether or not firms' financial data were available from 1914 to 1942. Financial data are available for44 firms for the entire period, and for 50-70 firms for at least 5 years. To illustrate the size of Japanese firms in 1913, the ten largest manufacturing firms in Japan are compared to their European counterparts in Table 1. Even including large *zaibatsu*, which were multi-divisional with diversified business structures including banking and trading at times, the Japanese firms were far smaller than their European counterparts; the largest *zaibatsu* approximately 25 percent, and the largest manufacturer (Kanegafuchi) 17 percent, of their European counterparts.

For the postwar period, we first chose the manufacturing firms with sales more than 50 billion yen in the 1990 fiscal year (353 firms).[11] From these, we selected firms with data available from 1962 to 2000 (268 firms).[12] We obtained financial data from *Corporate Finance Data Bank* (Development Bank of Japan). Table 2 includes comparisons of Japanese

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[7] This is because the format of income statements in the prewar period was so simple that we could not use operating profit, ordinary profit, or value added.

[8] For more details, see Data Appendix at the end of this paper.

[9] W. Mark Fruin, *The Japanese Enterprise System: Competitive Strategies And Cooperative Structures* (Oxford, U.K., 1992).

[10] *Company Yearbooks* (*Kabushiki Gaisha Nenkan)* issued by *Toyo* Keizai Shimposha and the *Business Analysis of Japanese Firms* (*Honpo-Jigyo Seiseki Bunseki*) issued by Mitsubishi Economic Research Institute.

[11] We exclude mining firms because the presence of mining industry is negligible after the high-growth era.

[12] In 1961, the second section of Tokyo Stock Exchange was founded.

firms to their counterparts in the United States, United Kingdom, and Germany in the early 1950s. The Japanese firms were far smaller than their U.S. counterparts, while European counterparts were much smaller than Japanese firms in some industries (textile, primary metal, electric machine, and transportation machine). Table 3 shows the comparison between Japan and European firms in 2000.

Figures 1 and 2 show the transition of ROA on average and the standard deviation of ROA calculated from our database. Sample periods are 1913-1942 and 1950-1999. Figure 1 is drawn using data for the firms with financial data available throughout each period, whereas Figure 2 includes data from all firms in the sample; the number of firms is inconsistent because some disappear due to mergers or bankruptcies during the period.

The figures reveal that the prewar period was characterized by relatively high profitability with large volatility. During and immediately after World War I, the average ROA among sample firms was extremely high, and reached 18 percent in 1917. The ROA on average was drastically lower by 1923, when the Great Kanto Earthquake struck Japan. It stayed around 5-6 percent (except in 1927, the time of the financial crisis), which is as high as the ROA averaged during the high growth era in the postwar period. Volatility of ROA, however, increased during the 1920s and reached at its peak during the Showa Depression (1929-1932). In the early 1930s, increasing ROA was associated with decreasing volatility. During wartime, the ROA tended to decline while the volatility of ROA remained at low levels partly because of wartime subsidies to firms.

The postwar period could be characterized as one of decreasing profitability with less ROA volatility. The overall level of ROA in the postwar period is around 4 percent up to the end of "high growth era" (1955-70), and 2-3 percent after the oil shock in 1973. Then, the average made a sluggish transition, staying at a relatively low level even during the boom period often called "bubble economy." In the 1990s after the collapse of the "bubble economy," it fell to less than 1 percent, except for a transient improvement in 1995 or 1996. The downward trend can be understood as the result of the maturation of the economy (diminishing business chances, increasing capital coefficient, and excess saving over investment in macro economic balance), but the low performance in the 1990s seems to represent a discontinuity from the previous trend.

Volatility of ROA from 1950 to 1990 was quite low level compared to the prewar period. A small exception is after the oil crisis when the standard deviation of ROA far exceeded the average ROA. However, in the latter half of the 1990s, the standard deviation moved drastically upwards. Thus, what was different in Japan in the late 1990s was the extraordinarily low level of profitability with its high variance among firms.

TABLE 1
Manufacturing Firms in 1913

		Europe			Japan		
Rank	Industry	Firm	Assets	Industry	Firm	Assets	JPN/EU
1	Iron and Steel	Frier. Krupp AG	142.62	Mining, trading and banking	Mitsui Gomei	36.11	0.253
2	Electrical Equipment	Siemens & Halske	122.05	Mining, shipbuilding and banking	Mitsubishi Goshi	22.34	0.183
3	Food(Tobacco)	Imperial Tobacco Company	116.86	Textile	Kanegafuchi Spinning	19.29	0.165
4	Electrical Equipment	AEG	110.24	Shipbuilding	Kawasaki Shipyard	15.90	0.144
5	Textile	J.P Coats LTD.	99.96	Food	Dai-Nihon Sugar Manufacturing	14.32	0.152
6	Mining	Gelsenkirchener Bergwerksverein	94.05	Mining	Hokkaido Colliery & Steamship	13.94	0.152
7	Food(Tobacco)	British-American Tobacco Co	80.23	Iron and Steel	Japan Steel Works	13.94	0.174
8	Electrical Equipment	Siemens-Schuckert	76.90	Food	Taiwan Sugar Manufacturing	13.82	0.180
9	Chemical	Lever Brothers Ltd.	68.08	Textile	Fuji Gas Spinning	11.08	0.163
10	Metal	Deutsch-Luxemburgische Bergwerksund H	66.19	Petroleum	Japan Oil	9.14	0.138

TABLE 2
The Size of the Largest Firms in Japan Relative to Their U.S., U.K., and German Counterparts

Industry	SIC Code	Industry Rank	Overall Rank	Japan 1952 Name	$ in Millions	U.S. 1948 Japan/U.S.	U.K. 1948 Japan/U.K.	Germany 1953 Japan/Germany
Food	20	1	72	Asahi Breweries, Ltd.	21.2	0.04	0.06	0.25
		5	87	Dainippon Sugar Manufacturing Co., Ltd.	16.2	0.05	0.21	1.45
Textile	22	1	4	Toyo Spinning Co., Ltd.	91.1	0.36	0.57	1.24
		5	21	Asahi Chemical Industry Co., Ltd.	43.3	0.34	1.29	2.67
Paper	26	1	38	Oji Paper Co., Ltd.	33.7	0.10	0.48	0.83
		5	60	Honshu Paper Co., Ltd.	24	0.31	1.16	1.01
Chemical	28	1	18	Showa Denko K. K.	47.2	0.04	0.09	0.18
		5	50	Toyo Koatsu Industries. Inc.	28.4	0.10	0.45	0.48
		10	83	Mitsui Chemical Industry Co., Ltd.	17.9	0.14	0.77	0.58
Petroleum & coal	29	1	8	Mitsui Mining Co., Ltd.	69.7	0.02	0.12	0.65
		5	19	Hokkaido Colliery & Steamship Co., Ltd.	45.8	0.04	0.29	0.94
		10	47	Sumitomo Metal Mining Co., Ltd.	30.4	0.05	-	-
Rubber		1	94	The Yokohama Rubber Co., Ltd.	15.1	0.04	0.10	0.28

Stone, clay & Glass	32	1	36	Onoda Cement Co., Ltd.	34.6	0.15	0.44	1.52
		5	115	Osaka Cement Co., Ltd.	9.6	0.11	0.36	1.12
Primary Metal	33	1	1	Yawata Iron & Steel Co., Ltd.	268.4	0.11	3.00	1.03
		5	12	Sumitomo Metal Industries, Ltd.	57.3	0.11	0.97	0.37
		10	101	Daido Steel Co., Ltd.	13.1	0.04	0.35	0.14
Machine	35	1	86	Kubota Iron & Machinery Works, Ltd.	16.7	0.02	0.34	0.23
		4	120	Komatsu Manufacturing Co., Ltd.	8	0.04	0.47	0.37
Elec. Machine	36	1	5	Hitachi, Ltd.	88.5	0.08	1.13	0.50
		5	88	Matsushita Electric Industrial Co., Ltd.	15.9	0.16	0.64	1.24
Transportation	37	1	9	Shin Mitsubishi Heavy Industries, Ltd.	65.4	0.02	0.59	0.80
		5	40	Mitsubishi Nippon Heavy Industries, Ltd.	33.4	0.19	0.99	0.80
		10	68	Ishikawajima Heavy Industries Co., Ltd.	22.2	0.15	0.99	0.91

Sources: Alfred D. Chandler, Jr., *Scale and Scope* (Cambridge, Mass., 1994); *Business Analysis of Japanese Firms*, issued by Mitsubishi Economic Research Institute (1954).

TABLE 3

Manufacturing Firms in 2000

Rank	Industry	Firm	Turnover	Japan			JPN/EU
				Industry	Firm	Turnover	
1	Petroleum	Royal Dutch/Shell	149146.0	Transportation Equipment	Toyota Motor	71005.7	0.476
2	Petroleum	BP	148062.0	Electrical Equipment	Matsushita Electric	43409.4	0.293
3	Transportation Equipment	DaimlerChrysler	146982.3	Electrical Equipment	N E C	36828.3	0.251
4	Petroleum	Total Fina Elf	103691.6	Electrical Equipment	Hitachi	36078.1	0.348
5	Transportation Equipment	Volkswagen	77440.3	Electrical Equipment	Toshiba Corporation	33051.9	0.427
6	Machinery	Siemens	70964.0	Electrical Equipment	Fujitsu	30385.8	0.428
7	Transportation Equipment	Fiat	52136.8	Petroleum	Nippon Oil Corporation	28091.4	0.539
8	Food	Nestle	48719.8	Transportation Equipment	Honda Motor	27329.5	0.561
9	Food	Unilever	43069.0	Electrical Equipment	Sony	27020.1	0.627
10	Petroleum	Eni	41984.4	Transportation Equipment	Nissan Motor	26773.4	0.638

FIGURE 1
ROA and Its Standard Deviation Using Balanced Data

Year[a]
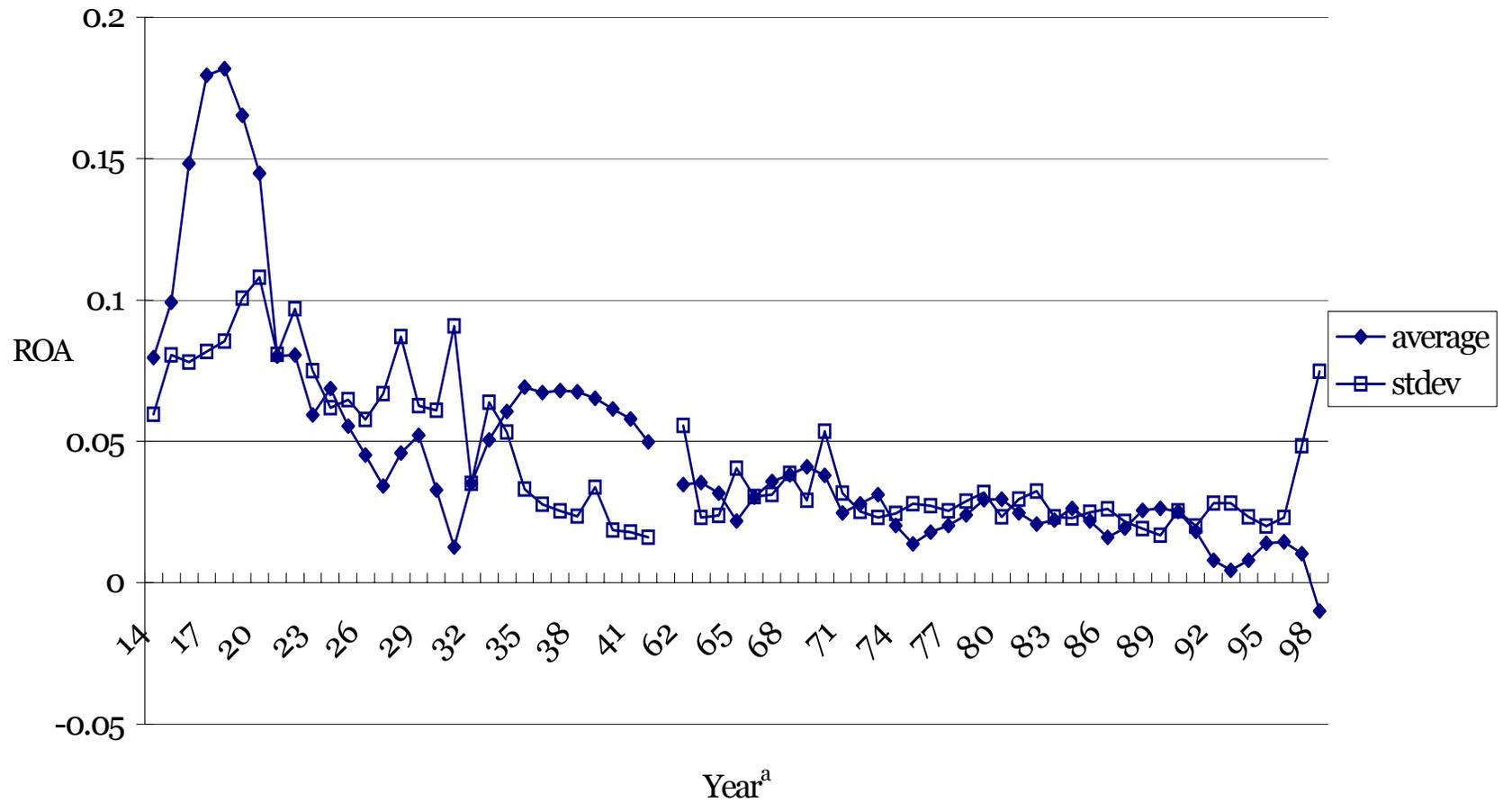
[a] There were 44 firms in 1914-1942 and 268 firms in 1962-1999.

FIGURE 2
ROA and Its Standard Deviation Using Unbalanced Panel Data

Year[a]
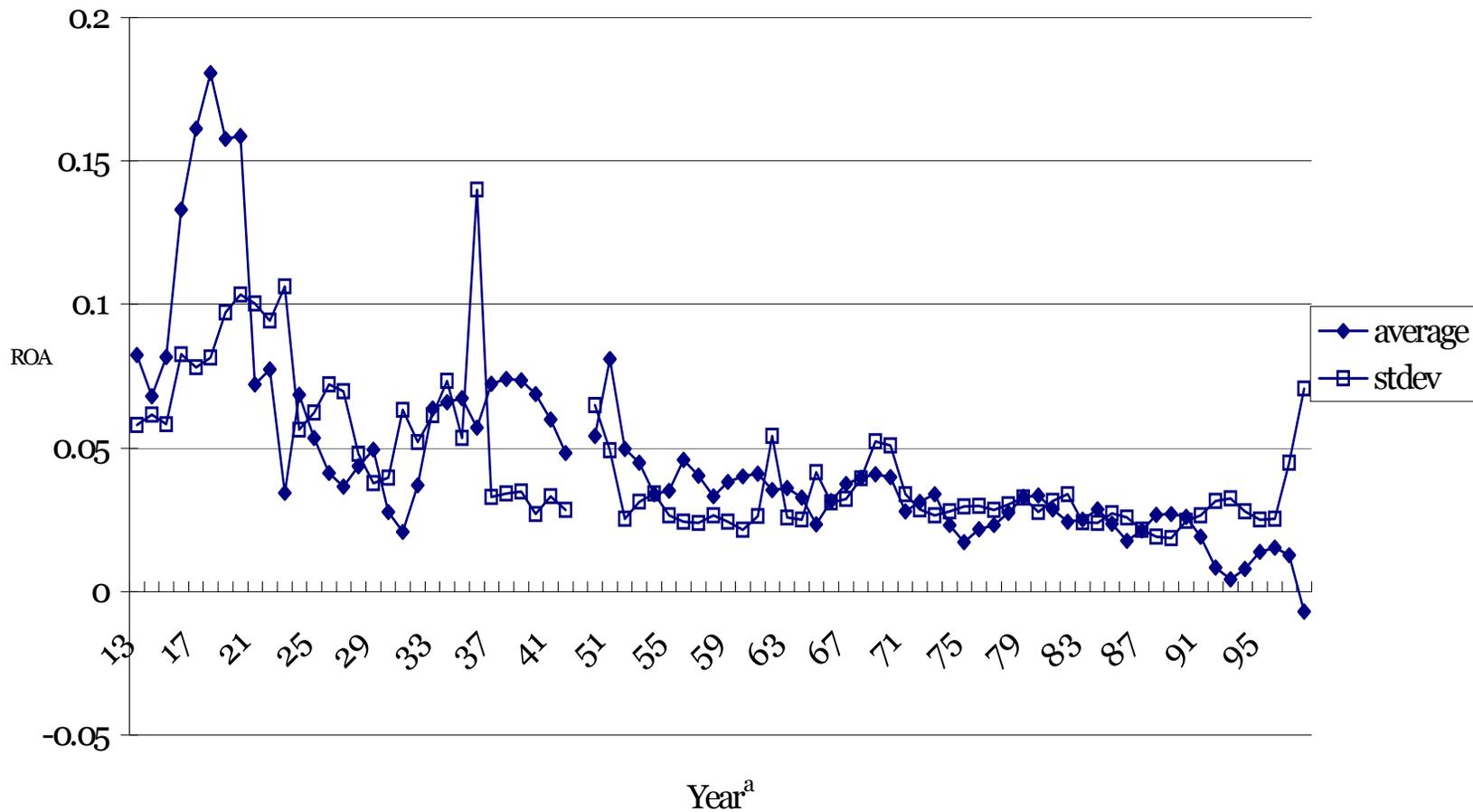
[a] The prewar period is 1913-43 and the postwar period is 1950-99.

The variance of performance among firms as well as performance itself fluctuated throughout the twentieth century, and the standard deviation increased, particularly during recession. This indicates the importance of using micro level data to analyze firm performance. What makes performance good or bad, stable or unstable? In the next section, we approach the factors that affect firm performance, focusing on corporate governance structure and institutional properties.

Monitoring and the Role of the Corporate Group

Corporate governance structure and institutional properties could influence firm performance though various paths. In this paper, we focus on monitoring by outsider investors and risk sharing among corporate group members. Corporate governance structure in Japanese firms changed drastically during the twentieth century. In the prewar period shareholder's right to control was much stronger than in the postwar period, as others have discussed.[13] Given the prewar legal framework, which was less regulated and less protective for shareholders and debt holders, individual investors and family-owned holding companies were relatively important and the role of institutional investors was still limited. The average share held by the largest outside shareholder (a), that is a proxy for shareholder monitoring incentive, was over 21.6 percent with a 25.1 percent standard deviation in 1928.[14] In addition to these characteristics, the ownership structure was noticeably diversified among large firms ranging from highly concentrated *zaibatsu* subsidiary firms to relatively dispersed managerial firms (for instance, firms in the cotton-spinning industry). Under the diversified ownership structure, a large shareholder is expected to monitor the management.[15] If this monitoring were effective, firm performance would be higher than firms with dispersed ownership. However, it is also possible that extremely strict monitoring by a large shareholder diminishes managerial incentives.[16] In

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[13] See Takafusa Nakamura, *The Postwar Japanese Economy: Its Development and Structure* (Tokyo, 1988); Tetsuji Okazaki, "Japanese Firm under Planned Economy," *Journal of Japanese and International Economies* 7 (June 1994): 175-203; and Juro Teranishi, "The Fall of the Taisho Economic System," in *Finance, Governance, and Competitiveness in Japan*, ed. Masahiko Aoki and Gary R. Saxonhouse (Oxford, U.K., 2000), 43-63.

[14] If the Chief Executive Officer of the firm was the largest shareholder, we chose the second largest shareholder.

[15] Small shareholders cannot afford to bear monitoring costs, so free rider problems become serious under the dispersed ownership structure. Andrei Shleifer and Robert W. Vishny, "Large Shareholders and Corporate Control," *Journal of Political Economy* 94 (June 1986): 461-88.

[16] Mike Burkart, Denis Gromb, and Fausto Panunzi, "Large Shareholders, Monitoring, and the Value of the Firm," *Quarterly Journal of Economics* 112 (Aug. 1997): 693-728.

this case, firms with a high concentration of ownership might show a decrease in managerial effort level, performing much worse than firms with a low concentration of ownership.

Zaibatsu-affiliated firms were monitored by holding companies such as *Mitui Gomei* or *Mitsubisi Goshi*. Holding companies exclusively controlled their subsidiary firms, that is, for shares held by holding companies on average, a, is quite high, 54 percent in 1928, although some of them began to go public in the 1930s. Under the high concentration of ownership, families delegated professional managers to monitor their subsidiary firms. Unlike individual shareholders, holding companies had a research and monitoring division. They also required annual reports from their subsidiary firms, and monitored them through ratification of investment projects proposed by subsidiary firms. Holding companies also intervened in financial decisions and dividend payout policies of their subsidiaries. If holding companies' monitoring was effective, the performance of *zaibatsu*-affiliated firms should be relatively high compared to firms with dispersed ownership and high shares of individual shareholders.[17] However, if holding companies' monitoring was too strict, reducing incentives for top managers, then the performance of *zaibatsu*-affiliated firms might be relatively low.

Another possible function of the *zaibatsu* system in firm performance is the risk sharing that Nakatani originally suggested for postwar corporate groups.[18] Through empirical study of postwar corporate groups called *keiretsu*, he suggested that the function of corporate groups is to stabilize the member firms' profitability and growth. Because *zaibatsu* is well known for its diversified businesses in many (unrelated) industries, it is plausible that the prewar *zaibatsu* system could carry out the same function as *keiretsu* in the postwar period, that is, the *Zaibatsu* system might make the performance of subsidiary firms less volatile. The *Zaibatsu* system may reduce the volatility of performance among subsidiary firms through the internal capital market. Firms in trouble may expect low-interest funding (a kind of subsidy) from holding companies or subsidiary firms that is not available for independent firms.

There were two types of *zaibatsu* in terms of the extent of their diversification. The first type includes subsidiary firms of old *zaibatsu*,

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[17] Actually, Okazaki and Okuno-Fujiwara, *The Japanese Economic System and Its Historical Origins*, and Okazaki, "The Role of Holding Companies in Pre-war Japanese Economic Development" examine the role of *zaibatsu* holding company in corporate governance, by comparing ROE between *zaibatsu* affiliated firms and non-*zaibatsu* firms, and reveal that the ROE of *zaibatsu* affiliated firms were higher. In contrast, Jennifer L. Frankl, "An Analysis of Japanese Corporate Structure, 1915-1937," *Journal of Economic History* 59 (Dec. 1999): 997-1015, reports that *zaibatsu* did not make their subsidiary firms' profitability (ROA) high.

[18] Nakatani, "The Economic Role of Financial Corporate Grouping."

typically represented by *Mitsui, Mitsubishi,* and *Sumitomo.*   We also include *Asano, Kuhara,* and *Kawasaki* line firm as a second rank *zaibatsu.* They have diversified their businesses ranging from the capital-intensive industries such as metal, shipbuilding, electric machine, mining, through resource-based industries, to financial services and trading.

The second type includes the subsidiary firms of new *zaibatsu*, *Nihon Sangyou* (*Nissan*)*, Nihon Chisso* (*Nicchitsu*)*, Mori,* and *Nihon Soda* (*Nisso*) line firms. The entrepreneur-founder took the presidential position and initiated strategic decision making in these firms. Their ownership structure was relatively dispersed.   Because external shareholders held only a small share and were highly dispersed, they could be protected from external intervention. New *zaibatsu* participating in relatively limited areas such as shipbuilding, mining, and other new industries (chemicals, airplanes, and automobiles) during the interwar period and did not have any financial institutions. Our concern is whether or not these characteristics of *zaibatsu* could affect firm performance.

The diversified corporate governance structure of the prewar period changed during wartime and the postwar economic reform. Shareholders' control rights were restricted by the wartime planned economy through regulation of dividend policies and managerial rewards beginning in 1939 and the revision of commercial law in 1943.[19]   However, the ownership structure was relatively stable under the strict regulation of the capital market that made ownership transfer inactive. Postwar reform completely changed the ownership structure of the prewar Japanese firms.[20]   The "Americanization" of the economic system, initiated by the General Headquarters Supreme Commander for the Allied Nations (GHQ), created a discontinuous transformation of the economic system [21]

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[19] Tetsuji Okazaki, "Japanese Firm under Planned Economy," *Journal of Japanese and International Economies* 7 (June 1994): 175-203.

[20] Hideaki Miyajima, "The Privatization of Ex-*zaibatsu* Holding Stocks and the Emergence of Bank centered Corporate Groups," in *Corporate Governance in Transitional Economies: Insider Control and the Role of Banks*, ed. Masahiko Aoki and Hyung-Ki Kim (Washington, D.C., 1995), 361-403; Hideaki Miyajima, *Transformation of Economic System: A Reappraisal of Occupation, Working Paper No.99-02*, The Institute For Research in Business Administration, Waseda University, 1999.

[21] Although stricter comparative studies represent a further research agenda, we understand that the impact of American reform on economic institutions in Japan was far more drastic than that in both Germany and Italy. In the case of Germany, introduction of an antitrust framework was quite important in the sense of dissolving the prewar cartel activities; Volker R. Berghahn, *The Americanisation of West German Industries, 1945-1973* (New York, 1986). However, the economic purge implemented in Germany was not so drastic, despite the thorough elimination of Nazi influence from political areas (*Entnazifizierung*). Similarly, close bank-firm ties were not severely affected. More importantly, the universal-banking tradition was not touched at all.

The corporate governance structure in the postwar period had particular characteristics. Boards of directors were composed mainly of corporate insiders promoted within firms. The cross-shareholding among firms prevented shareholders from exerting both voice and exit. The main bank, which had a long-term relationship with firms, played an important role in its clients' firm's corporate governance, and possibly mitigated moral hazard problems of top management. *Keiretsu* represent such postwar governance structures.[22]

The ownership structure of Japanese firms in the postwar period was characterized by cross-shareholding among firms. These stable shareholders were bound by implicit contract not to assert the voice or exit option unless the business performance of their invested firms clearly failed, and this freed managers from stock market pressures. It was the main banks rather than shareholder control that imposed discipline on managers.[23] Main banks (which as the largest debt holders had long-term relationships with firms) monitored client firms' managers, and might mitigate possible moral hazard problems associated with cross shareholding. If the monitoring by main banks were really effective, performance of firms with close main bank ties would be higher than firms without close main bank ties (effective monitoring view).

However, it is also plausible that main banks' commitments to client firms worsened the firms' performance, partly because "bailing out" a client firm in financial distress becomes a rational choice for the main bank if that firm has borrowed too much. Taking the possibility of main bank rescue into consideration, managers may reduce their effort, generating moral hazard problems.[24] In this case, the performance of

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According to Wendy Carlin, "West German Growth and Institution, 1945-90," *CEPR Discussion Papers Series*, (1993), 896, "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. See Giovanni Federico, "Harmful or Irrelevant? Italian Industrial Policy 1945-1973," in *Policies for Competitiveness: Comparing Business-Government Relationships in the 'Golden Age of Capitalism,'* ed. Hideaki Miyajima, Takeo Kikkawa, and Takashi Hikino (New York, 1999), 309-36.

[22] Hideaki Miyajima, "Regulatory Framework, Government, Intervention and Investment in Postwar Japan: The Structural Dynamics of J-type Firm-Government Interaction," in *Policies for Competitiveness Comparing Business-Government Relationships in the 'Golden Age of Capitalism,'* ed. Hideaki Miyajima, Takeo Kikkawa, and Takashi Hikino (New York, 1999), 40-80.

[23] Masahiko Aoki and Hugh Patrick, eds., *The Japanese Main Bank System: Its Relevance for Developing and Transforming Economies*, (Oxford , U.K., 1994).

[24] Mathias Dewatripont and Eric S. Maskin, "Credit and Efficiency in Centralized and Decentralized Economies," *Review of Economic Studies* 62 (Oct. 1995): 541-75.

firms with close main bank ties might be lower than firms without such close ties (moral hazard view). Another possible reason for poor performance is rent extraction by main banks from client firms based on high negotiating power (rent extraction view).[25]

With respect to the role of postwar *keiretsu*, the conventional wisdom is that corporate groups reduce asymmetric information and keep top managers free from external market pressures. The effect of these *keiretsu* characteristics is unclear because insulating managers from the pressures of external markets could cause management discretion, resulting in poorer firm performance. However, it is plausible that the *keiretsu* system increased the corporate growth of its affiliated firms compared with independent firms, because *keiretsu* members were free from the external pressure of the capital market.[26] In other words, the *keiretsu* system made it possible for top management to put a priority on growth rather than profit.

In the meantime, Nakatani proposed a risk-sharing hypothesis of corporate groups in an empirical study about postwar *keiretsu*.[27] The fact that corporate groups such as *keiretsu* include firms in many industries stabilizes the firms' performance through cross-shareholding. Furthermore, k*eiretsu* member firms could expect rescue from other *keiretsu* member firms if they faced financial distress. Because of this insurance mechanism, the performance of *keiretsu* member firms was less volatile than non-*keiretsu* members.[28]

We used profitability and stability as performance indices. ROA and the standard deviation of ROA among firms were the dependent variables. Regressing these variables on corporate governance variables and some control variables, we analyze the effects of corporate governance structure and institutional properties on firm performance. The estimation formula is as follows:

$$ROA_t = F(GOV_{t-1}, DAR_{t-1}, SIZE_{t-1}, IND, YEAR) \qquad (1)$$

$$SDROA = F(GOV, MeanDAR, MeanSIZE, MeanROA, IND) \quad (2)$$

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[25] This idea is suggested by financial literatures, and applied to Japanese case by David Weinstein and Yishay Yafeh, "On the Costs of a Bank-Centered Financial System: Evidence from the Changing Main Bank Relations in Japan," *Journal of Finance* 53 (April 1998): 635-72. Horiuchi and Hanazaki (1999) reported that main banks did not affect the firm performance focusing on productivity measures (TFP).

[26] In addition, their results imply that the risk-sharing mechanism of *keiretsu* was limited in the 1980s and 1990s. Note that, we cannot assume internal capital market in postwar *keiretsu* because holding companies were completely dissolved.

[27] Nakatani, "The Economic Role of Financial Corporate Grouping."

[28] This observations has been confirmed in Yishay Yafeh, "Japan's Corporate Groups: Some International and Historical Perspectives," (2001), mimeo.

Here *ROA* is return on asset, *SDROA* is the standard deviation of ROA, and *GOV* refers to variables representing the corporate governance structure and institutional properties. *DAR, SIZE, IND,* and *YEAR* are introduced to control other factors that could affect firms' performance and their volatility. *DAR* is firm's leverage, which is estimated by the ratio of total debt to total assets. *SIZE* is the logarithm of total assets, which is introduced to control for industry specific shock. *YEAR* is a dummy variable, which is expected to control for macroeconomic change.

Given the organizational features described earlier, we set the corporate governance variables as follows:

ZAIBATSU is a dummy variable: whether or not a firm belongs to the *Mitsui, Mitsubishi, Sumitomo, Asano, Suzuki, Kawasaki,* or *Kuhara* group. These firms, with few exceptions, were diversified into many businesses, the initiatives of salaried managers, the effective and strict monitoring of holding companies, and the possibility of the existence of an internal capital market. *ZAIBATSU* is assigned to 20 out of 171 firms in 1928.

The variable α adds ownership structure to our estimation. It is the percentage share held by large external shareholders with strong incentives to monitor firms. To estimate α, we used the percentage share held by the largest shareholder unless the largest shareholder was the owner-manager. Accordingly, α represents any one of the largest shareholders: individuals, holding companies, or other firms.[29]

Sample firms for the prewar period are approximately 174 firms in the manufacturing and mining sectors. They were selected from firms for which data are available from 1928 to 1936 in our WIFS database.[30] Information concerning the governance structure of our prewar samples is summarized in Tables 4 and 5.

After World War II, economic reform dissolved the *zaibatsu* system and prohibited formation of holding companies. The corporate governance system in Japanese firms was drastically renewed. Through this process, the so-called J-type governance structure gradually emerged. The banking relationship known as main bank system was established during this period, while former *zaibatsu*-related firms reorganized corporate groups with cross shareholding.

Given these changes, we included a dummy variable for main bank (*MB*) that represents the long-term relationship between bank and client

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[29] When constructing these ownership variables, we mainly used the ten largest shareholders list from the *Yearly book of Joint Stock Companies* (*Kabushiki Gaisha Nenkan*) issued by *Toyo-Keiz*ai and other sources.

[30] Here the financial statements were obtained from the *Business Analysis of Japanese Firms* (*Honpo-Jigyo seiseki bunseki)* issued by Mitsubishi Economic Research Institute, and partly supplemented by other sources (company history books and annual reports).

firm (Aoki and Patrick 1994). *MB* equals one if the bank identified by a firm as its main bank remains unchanged for 2 years (main bank at t-1 period and t period is same), and the bank is both the largest lender and the largest shareholder among banks.[31]

Another feature of the postwar corporate governance structure is corporate group membership (*KEIRETSU*). *KEIRETSU* is the dummy variable for firm membership in one of the six corporate groups (*Mitsui, Mitsubishi, Sumitomo, Fuji, Dai-ichi kangyo,* and *Sanwa*). Corporate groups are based on the classification of *Studies on Financial Corporate groupings* (*Keiretsu no Kenkyu*). See Table 6 for changes in the number of firms in the *Keiretsu* who had long-term relationships with main banks.

TABLE 4
Information about Governance Structure and Institutional
Properties: Percentage of shares held by block holder (α)

α	Year	Obs.	Mean	S.D.	Median	Qtr. 1	Qtr.3
Zaibatsu	1928	20	0.530	0.385	0.542	0.097	0.960
	1933	19	0.510	0.335	0.500	0.173	0.850
Others	1928	141	0.171	0.189	0.092	0.046	0.239
	1933	144	0.181	0.207	0.101	0.048	0.219
All samples	1928	161	0.216	0.251	0.100	0.046	0.290
	1933	163	0.220	0.248	0.248	0.053	0.272

TABLE 5
Number of Firms belonging to the Z*aibatsu*

Year	*Zaibatsu*	Others
1928	20	149
1929	20	150
1930	20	150
1931	21	148
1932	21	151
1933	19	149
1934	19	149
1935	18	148
1936	19	144

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[31] We used the top of the correspondent bank list in *Japanese Company Handbook* (*Kaisha Shikiho*) issued by Toyo Keizai, Inc. as the firm's main bank and followed the methodology developed by Michael S. Gibson, "Can Bank Health Affect Investment? Evidence from Japan," *Journal of Business* 68 (July 1995): 281-308.

Ideally, governance variables should be identified every year. Given the high cost of manually inputting yearly data, however, we identified them every 4 or 5 years starting in 1955. [32] In our estimation, we assume that governance variables for 1955 apply to the firms from 1956 to 1959. Information about the governance structure of our postwar samples is summarized in Table 6.

For the postwar sample, we considered manufacturing firms with sales of more than 50 billion yen in the 1990 fiscal year (353 firms). We divided the postwar period into three sub-periods and estimated the ROA model for each period. These periods are the high growth era (1956-73),

TABLE 6
Number of Firms Belonging to the *Keiretsu*

Year	*Keiretsu*	MB[a]	All samples
1964	108	94	310
1974	191	187	338
1994	222	174	347

[a]MB stands for strong relationship between bank and client firm

the adjustment period after the oil crisis (1974-1985), and the recent depression era (1991-1999).[33]

As for the analysis of the standard deviation of ROA, in order to capture the effect of governance structure and corporate groups on the stability of the ROA, we focused on the period when the standard deviation is relatively high (see Figure 3). Thus, our sample from the prewar period was from the Great Depression (1928-32), while during the postwar period we sampled the later phase of the high growth era (1965-70) and the recent long-term recession (1991-99). The standard deviation of ROA in the sample periods was used as an independent variable.

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[32] Subsequent years are 1959, 1964, 1969, 1974, 1979, 1984, 1989, and 1995.
[33] Firms in the bubble period achieved high, less volatile performance. Therefore, there it is possible that governance structure does not matter; considering this possibility, we omitted the bubble period from the sample.

FIGURE 3
ROA and Its Standard Deviation Using Balanced Panel Data in the Postwar Period
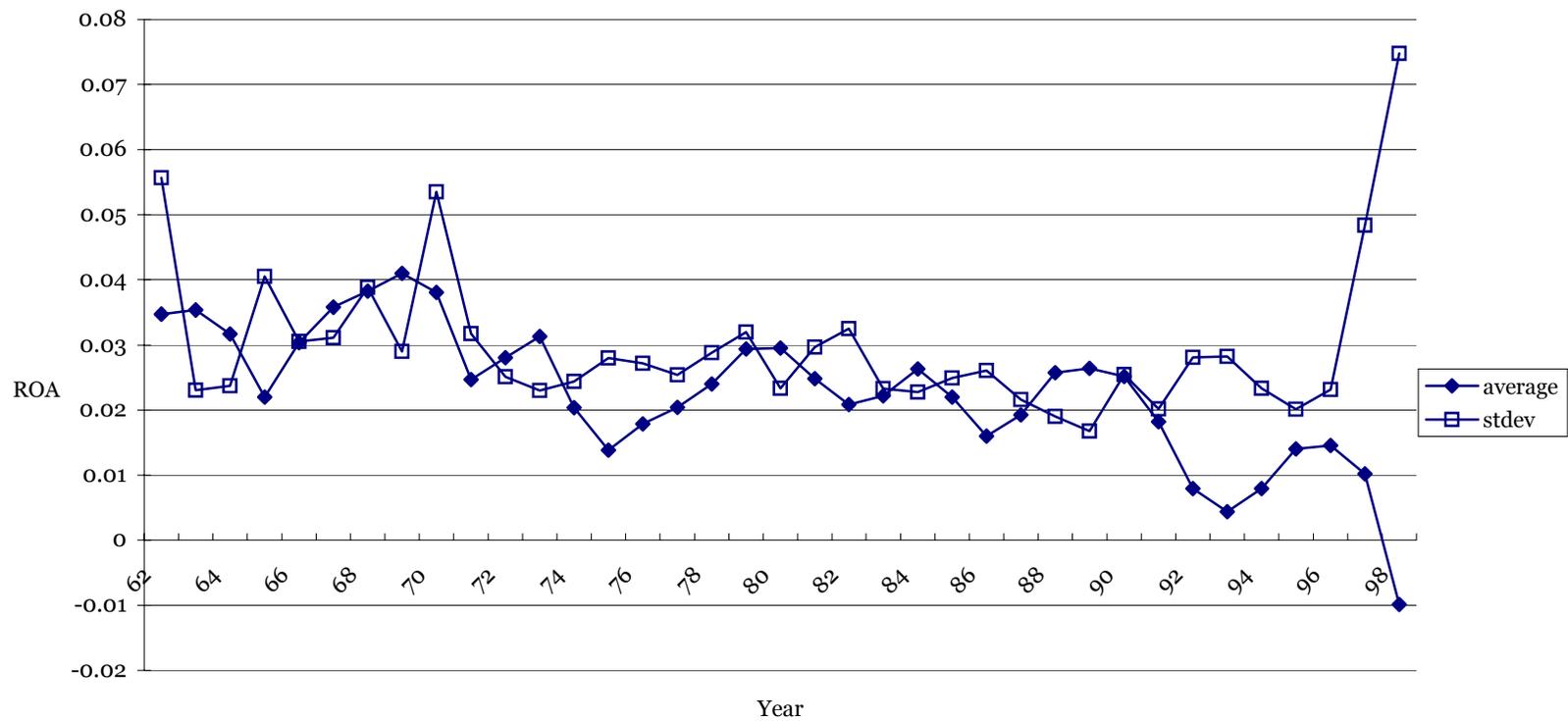
Effects of Corporate Governance on Profitability

In Table 7 we summarize the average ROA of *zaibatsu* affiliated firms and non-*zaibatsu* firms during the sample periods. The profitability of *zaibatsu*-affiliated firms is slightly higher than that of non-*zaibatsu* firms. During the period from 1928 to 1936, the average ROA of *zaibatsu*-affiliated firms was 5.6 percent, while that of non-*zaibatsu* firms was 5.4 percent (not significantly different).

TABLE 7
Performance and Risk of Groups for Prewar *Zaibatsu* and Non-Z*aibatsu* and Postwar *Keiretsu* and Non-*Keiretsu*

Difference in mean ROA			Difference in mean standard deviation of ROA		
1928-1936			1928-1933		
Difference	*Zaibatsu*	Non-*zaibatsu*	Difference	*Zaibatsu*	Non-*zaibatsu*
0.002	0.056	0.054	0.002	0.030	0.028
(0.22)			(0.19)		

Difference in mean ROA between group and non-group			Difference in mean standard deviation of ROA between group and non-group		
1956-1973			1965-1970		
Difference	*Keiretsu*	Non-*keiretsu*	Difference	*Keiretsu*	Non-*keiretsu*
-0.006***	0.032	0.038	-0.006***	0.010	0.016
(-6.26)			(-3.26)		
1974-1985			1991-1999		
Difference	*Keiretsu*	Non-*keiretsu*	Difference	*Keiretsu*	Non-*keiretsu*
-0.007***	0.023	0.029	-0.004*	0.012	0.016
(-7.00)			(-1.90)		

1991-1999		
Difference	*Keiretsu*	Non-*keiretsu*
0.002	0.007	0.005
(1.35)		

t-statistics reported in parentheses; ***, **, and * denote significance at *p* = 0.01, 0.05 and 0.1 levels, respectively.

Next, we determined if such a difference is found even when we control other factors that could influence performance. In Table 8, we report the estimation result of the ROA determinants model.   The coefficients of *ZAIBATSU* and *NEW* are negative, but they are insignificant in all models. The coefficient of α is significant (and positive) at $p = .05$ in Model 1.   This result is consistent with the conjecture that large shareholders played a significant role for corporate monitoring. On the other hand, the coefficient of *ZAIBATSU* is not significant (Model 2). This result is inconsistent with the monitoring view, which suggests that *zaibatsu* holding companies kept their subsidiary firms' performance high.[34]

Because the ownership structures of *zaibatsu* firms are highly concentrated, we introduced α and the *ZAIBATSU* dummy variable simultaneously (Model 3). This model tests whether or not the *zaibatsu* system has a unique function that could be attributed to high α. The result is that α is still significantly positive, and again, *ZAIBATSU* is not significant.   Monitoring by outside shareholders enhanced the firm performance, and the *zaibatsu* system did not inherently affect the performance of subsidiary firms.

It is plausible that the low ROA is associated with the aggressive strategy of top management putting priority on corporate growth rather than profit. In order to check this possibility, we estimate a model with growth rate of total assets as the dependent variable instead of ROA. The result (see Table 9) shows that the coefficient of α is positive and significant. *ZAIBATSU* is positive, but not significant. This implies that the monitoring by large shareholders disciplined managers and led to an appropriate level of investment.   Moreover, monitoring by large shareholders may mitigate the asymmetric information between firm insiders and external capital sponsors; the mitigation of asymmetric information raises the investment level.   This is consistent with the historical narratives that the entrepreneur firms known as the new *zaibatsu* (*Nissan, Nihon Chisso,* and *Showa* Fertilizer) implemented aggressive investment projects.

To change our focus to the postwar period, we saw in Table 7 that the average ROA of *keiretsu* member firms is lower than that of non-*keiretsu* firms. From 1956 to 1973, the average of *keiretsu* members is 3.2 percent and that of non-*keiretsu* members is 3.8 percent. Similarly, from 1974 to 1985, the average of both sub-samples are 2.3 percent and 2.9 percent, respectively. The differences between *keiretsu* member firms and

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[34] Tetsuji Okazaki, "The Role of Holding Companies in Pre-war Japanese Economic Development: Rethinking *Zaibatsu* in Perspectives of Corporate Governance," *Social Science Japan Journal* 4 (Oct. 2001): 243-68. Our sample period (1928-36) is different from Okazaki's (1932-36). In addition, Okazaki's sample included non-manufacturing industries. There is a possibility that these sample differences explain the difference in results.

non-*keiretsu* firms are statistically significant for both periods at $p = .01$ level. From 1991 to 1999, however, the difference was not significant.
Next, we report the estimation results using equation (1). According to Table 10, the coefficient of *MB* is significantly negative (at p = .05) for sample Period I (1956-73). This means that, other things being equal, firms with strong main bank ties had 0.3 percent lower ROA compared with those without such strong ties. Even in Period II (1974-85) and Period III (1991-99), the *MB* coefficient is significantly negative. Furthermore, in the 1990s, the negative effect of main banks became stronger (the coefficient is -0.004). This result is not consistent with the effective monitoring view of main banks, but consistent with the rent extraction or moral hazard view.

However, the *KEIRETSU* coefficient is also significantly negative except for Period III (1991-99). The coefficients of *KEIRETSU* in the period I and II are -0.002 and -0.003, respectively, suggesting that the membership of corporate groups reduces ROA by approximately 0.3 percent comparing to 2.6 percent of ROA on average in the period II. In the 1990s, however, the *KEIRETSU* coefficient is not significant, suggesting that the unique function of corporate groups disappeared in the 1990s.

TABLE 8
Regression Analysis of ROA in the Prewar Period (1928-36)

	Model 1	**Model 2**	**Model 3**
C	0.000	0.0109	0.000
	(0.007)	(0.647)	(0.006)
SIZE	-0.007***	0.006***	0.007***
	(5.153)	(5.062)	(5.295)
DAR	-0.092***	-0.088***	-0.091***
	(13.233)	(13.000)	(13.039)
A	0.013**		0.015**
	(2.028)		(2.258)
ZAIBATSU		-0.003	-0.006
		(0.635)	(1.218)
Industry dummy	Yes	yes	Yes
Year dummy	Yes	yes	Yes
Adjusted R^2	0.258	0.236	0.258
Observations	1,348	1,496	1,348

The dependent variable is ROA, *SIZE* is the logarithm of total assets, α is the percentage share held by largest external shareholder, *DAR* is the debt-asset ratio, and *ZAIBATSU* is a dummy variable equal to one if a firm belongs to *Mitsui, Mitsubishi, Sumitomo, Asano, Suzuki, Kawasaki,* or *Kuhara. t*-statistics are reported in parentheses;***, **, and * denote significance at $p = 0.01$, 0.05, and 0.1 levels, respectively.

TABLE 9
Regression Analysis of Growth Rate of Assets in Prewar Period (1928-36)

	Model 1	Model 2	Model 3
C	-0.056	0.049	-0.055
	0.79549	0.783465	0.788766
SIZE	0.004	-0.001	0.004
	0.807	0.121	0.912
DAR	-0.083***	-0.082***	-0.081***
	3.239	3.222	3.159
α	0.069***		0.072***
	2.878		2.937
ZAIBATSU		6.03E-03	-0.011
		0.322943	0.59525
Industry dummy	Yes	yes	Yes
Year dummy	Yes	yes	Yes
Adjusted R^2	0.103	0.101	0.103
Observations	1,371	1,527	1,371

The dependent variable is growth rate of assets, SIZE is the logarithm of total assets, α is the percentage share held by external large shareholders, DAR is debt-asset ratio, and *ZAIBATSU* is a dummy variable that equals to one if firms belong to *Mitsui, Mitsubishi, Sumitomo, Asano, Suzuki, Kawasaki*, or *Kuhara*. *t*-statistics are reported in parentheses. ***, **, and * denote significance at p = 0.01, 0.05 and 0.1 levels, respectively.

TABLE 10
Regression Analysis of ROA in postwar period

Period I: 1956-1973

	Model 1	Model 2	Model 3
C	0.129***	0.148***	0.145***
	(26.124)	(25.806)	(23.760)
SIZE	-0.002***	-0.002***	-0.002***
	(4.452)	(6.001)	(4.709)
DAR	-0.121***	-0.128***	-0.128***
	(29.530)	(29.193)	(29.136)
KEIRETSU	-0.002**		-0.002
	(2.159)		(1.439)
MB		-0.003**	-0.003**
		(2.582)	(2.505)
Industry dummy	Yes	yes	yes
Year dummy	Yes	yes	yes
Adjusted R^2	0.250	0.255	0.255
Observations	4707	4346	4346

Period II: 1974-1985

	Model 1	Model 2	Model 3
C	0.093***	0.096***	0.093***
	(21.216)	(22.360)	(21.256)
SIZE	0.0005	0.0002	0.0006*
	(1.440)	(0.676)	(1.649)
DAR	-0.101***	-0.100***	-0.099***
	(40.299)	(39.269)	(39.099)
KEIRETSU	-0.003***		-0.003***
	(3.527)		(3.445)
MB		-0.003***	-0.003
		(3.699)	(3.620)
Industry dummy	Yes	yes	yes
Year dummy	Yes	yes	yes
Adjusted R^2	0.357	0.357	0.359
Observations	4120	4120	4120

Period III: 1991-1999

	Model 1	Model 2	Model 3
C	-0.024***	-0.020**	-0.023
	(2.626)	(2.025)	(2.426)
SIZE	0.004***	0.004***	0.004
	(5.380)	(5.208)	(5.285)
DAR	-0.050***	-0.045***	-0.046
	(12.210)	(9.753)	(10.405)
KEIRETSU	0.002		0.002
	(1.074)		(1.299)
MB		-0.005***	-0.004
		(2.822)	(2.600)
Industry dummy	Yes	yes	yes
Year dummy	Yes	yes	yes
Adjusted R^2	0.124	0.125	0.126
Observations	3085	3085	3085

The dependent variable is ROA, *SIZE* is the logarithm of total assets, *DAR* is debt-asset ratio, *KEIRETSU* is a dummy variable that is equal to one if firms belong to corporate groups (*keiretsu*). The classification of *keiretsu* is based on *Keiretsu no Kenkyu*. *MB* is a dummy variable which equals one if a firm identifies a bank as its main bank, that remains unchanged for 2 years, and it is both the largest lender and the largest shareholder among banks. *t*-statistics are reported in parenthesis. ***, **, and * denote significance at *p* = 0.01, 0.05 and 0.1, levels respectively.

So, what is the effect of main bank ties and *keiretsu* affiliation on corporate growth? We summarize the estimation results in Table 11. The

TABLE 11
Regression Analysis of Asset Growth in the Postwar Period

Period I: 1956-1973

	Model 1	Model 2	Model 3
C	0.376***	0.310***	0.340***
	(10.227)	(7.252)	(7.507)
SIZE	-0.030***	-0.026***	-0.029***
	(9.840)	(8.398)	(8.400)
DAR	0.017	0.045	0.044
	(0.554)	(1.339)	(1.291)
KEIRETSU	0.020**		0.017**
	(2.563)		(1.999)
MB		-0.018**	-0.019**
		(2.218)	(2.298)
Industry dummy	Yes	yes	yes
Year dummy	Yes	yes	yes
Adjusted R^2	0.119	0.125	0.125
Observations	4049	3688	3688

Period II: 1974-1985

	Model 1	Model 2	Model 3
C	0.311***	0.334***	0.312***
	(14.179)	(15.501)	(14.207)
SIZE	-0.006***	-0.008***	-0.006***
	(3.517)	(4.937)	(3.367)
DAR	-0.177***	-0.175***	-0.172***
	(14.461)	(14.034)	(13.847)
KEIRETSU	-0.019***		-0.018***
	(4.740)		(4.697)
MB		-0.009**	-0.008**
		(2.317)	(2.229)
Industry dummy	Yes	yes	yes
Year dummy	Yes	yes	yes
Adjusted R^2	0.188	0.184	0.189
Observations	3442	3442	3442

Period III: 1991-1999			
	Model 1	Model 2	Model 3
C	-0.004	-0.011	-0.005
	(0.166)	(0.445)	(0.191)
SIZE	0.002	0.003	0.002
	(0.968)	(1.550)	(0.983)
DAR	-0.050***	-0.051***	-0.051***
	(4.591)	(4.343)	(4.413)
KEIRETSU	0.009**		0.009**
	(2.284)		(2.236)
MB		0.002	0.001
		(0.552)	(0.306)
Industry dummy	Yes	yes	Yes
Year dummy	Yes	yes	Yes
Adjusted R^2	0.048	0.046	0.048
Observations	2416	2416	2416

MB coefficient is significantly negative except for Period III (1991-99), implying that strong *MB* ties did not increase firms' growth.[35] However, changes in the *KEIRETSU* coefficient show a different result: the coefficient is positive for Periods I and III, indicating that *keiretsu* affiliation makes it possible for member firms to grow more than non-*keiretsu* firms, but this was not the case in the period II. Determining why we found these contradictory results and identifying the most important reason for the rise and decline of member firms' growth are topics for further research.

Effects of Corporate Governance on Stability

Let us change our focus to the volatility of performance (ROA). We first compared the standard deviations of ROA sub-samples (*zaibatsu*-affiliated firms and non-*zaibatsu* firms) using data for 5 years (1928-1932) during which the Japanese economy suffered a serious depression. In Table 7, we showed that the standard deviations of the non-*zaibatsu* firms are slightly lower than those of the *zaibatsu*-affiliated firms (3.0 percent versus 2.8 percent; the difference is not significant).

We next examined the governance characteristics for the volatility of firms' performance if we control for other factors that could influence volatility. The estimation results of equation (2) are summarized in Table

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[35] This result is consistent with the results of David E. Weinstein and Yishay Yafeh, "Japan's Corporate Groups: Collusive or Competitive? An Empirical Investigation of *Keiretsu* Behavior," *Journal of Industrial Economics* 43 (Dec. 1995): 359-76.

12. The *ZAIBATSU* coefficient is significantly negative at *p* = .05 in Model 2 and *p* = .10 in Model 3. Thus, we can tentatively conclude that the *zaibatsu* system reduced the volatility of ROA among subsidiary firms.

What makes the performance stable? One possibility is the internal (capital) market of a holding company. When a subsidiary firm is in trouble due to a shock to that particular industry, *zaibatsu* holding companies encourage the other subsidiary firms to provide support through preferential purchase, supplying funds with low interest rates, and so forth. An alternative interpretation is that the *zaibatsu* system made it impossible for top managers of subsidiary firms to take on risky projects, compared with independent firms, especially firms with managerial ownership, stabilizing the performance of *zaibatsu*-affiliated firms.

This interpretation is also consistent with the fact that the *NEW* coefficient is not significant. This result suggests, first, that the industrial network of new *zaibatsu* is limited to the related industries, and thus new *zaibatsu* system could not play any significant role as internal market, and second, that top managers of new *zaibatsu* with high ownership shares did not hesitate to on take risky projects.

TABLE 12
Regression Analysis of Standard Deviation of ROA in Prewar Period
(1928-1932)

	Model 1	Model 2	Model 3
C	0.058***	0.043**	0.047**
	(2.896)	(2.181)	(2.254)
ROA	-0.697***	-0.698***	-0.700***
	(10.072)	(10.319)	(10.204)
SIZE	0.002	0.004	0.003
	(0.929)	(1.655)	(1.460)
DAR	-0.065***	-0.063***	-0.063***
	(4.852)	(4.792)	(4.739)
A	-0.011		-0.005
	(1.176)		(0.465)
ZAIBATSU		-0.017**	-0.015*
		(2.155)	(1.798)
Industry dummy	Yes	yes	Yes
Adjusted *R*²	0.444	0.456	0.454
Observations	140	143	140

The dependent variable is the standard deviation of ROA calculated for 1928-1932, *SIZE* is the period average rate of total assets, *α* is the percentage share held by the largest external shareholder, *DAR* is the period average rate of debt-asset ratio, and *ZAIBATSU* is a dummy variable that equals to one if firms belong to *Mitsui, Mitsubishi,*

Sumitomo, Asano, Suzuki, Kawasaki, or Kuhara. t-statistics are reported in parenthesis. ***, **, and * denote significance at *p* = 0.01, 0.05, and 0.1 levels, respectively.

We reported the volatility of performance of *keiretsu* member firms and non-*keiretsu* firms in Table 7. The standard deviation of ROA was calculated by using data for 5 years (1965-1970). It should be noted that the standard deviation of *keiretsu* member firms (1.0 percent) is significantly lower (*p* = .01) than that of non-*keiretsu* firms (1.6 percent). Combined with the low profitability of *keiretsu* member firms, the postwar *keiretsu* function seems to be similar to that of prewar *zaibatsu*.

Table 13 shows the estimation result of equation (2) in the postwar period. In Period I (1965-70), the *KEIRETSU* coefficient is negative (*p* = .01) in Model 1. The *MB* coefficient is significantly negative (*p* = .05) in Model 2. This is consistent with Nakatani's and Yafeh's results.[36] Because one of the features of *keiretsu* is that group firms (for instance, firms belonging to the *Mitsubishi* group) have long and stable relationships with their member bank (*Mitsubishi* bank), firms with strong main bank ties sometimes coincided with *keiretsu* firms. To control for this duplication, we introduced both dummy variables simultaneously. The result (Model 3) indicates that *keiretsu* affiliation has a unique function, not attributable to the main bank relationship.

TABLE 13
Regression Analysis of Standard Deviation of ROA in Postwar Period

Period I: Standard deviation of ROA for 1965-70

	Model 1	Model 2	Model 3
C	0.078***	0.080***	0.081***
	(5.648)	(5.716)	(5.868)
ROA	-0.409***	-0.409***	-0.421***
	(6.598)	(6.544)	(6.807)
SIZE	-0.259***	0.000***	-0.259***
	(2.645)	(3.447)	(2.665)
DAR	-0.051***	-0.053***	-0.053***
	(3.216)	(3.272)	(3.367)
KEIRETSU	-0.006***		-0.006***
	(3.049)		(2.854)
MB		-0.005**	-0.004**
		(2.351)	(2.099)
Industry dummy	Yes	yes	yes

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[36] Nakatani, "The Economic Role of Financial Corporate Grouping"; Yafeh, "Japan's Corporate Groups."

Adjusted R^2	0.246	0.236	0.255
Observations	307	307	307

Period II: Standard deviation of ROA for 1991-1999			
	Model 1	Model 2	Model 3
C	0.072***	0.071***	0.072***
	(10.300)	(10.314)	(10.340)
ROA	-1.263***	-1.267***	-1.264***
	(29.940)	(30.098)	(29.962)
SIZE	0.000	0.000	0.000
	(0.120)	(0.243)	(0.090)
DA	-0.052***	-0.051***	-0.050***
	(7.263)	(6.882)	(6.754)
KEIRETSU	-0.003		-0.003
	(1.107)		(1.063)
MB		-0.002	-0.002
		(1.084)	(1.038)
Industry dummy	Yes	yes	yes
Adjusted R^2	0.769	0.769	0.769
Observations	312	312	312

The dependent variable is the standard deviation of ROA. The standard deviation of ROA is calculated for 1965-70 and 1991-1999. *ROA* is the period average rate of *ROA, SIZE* is the period average rate of total assets, *DAR* is the period average rate of debt-asset ratio, and *KEIRETSU* is a dummy variable that equals to one if firms belong to corporate groups (*keiretsu*). The classification of *keiretsu* is based on *Keiretsu no Kenkyu*. *MB* is a dummy variable which equals one if a firm identifies a bank as the main bank and remains unchanged for 2 years, and at the same time it is both the largest lender and the largest shareholder among banks. *t*-statistics are reported in parentheses. ***, **, and * denote significance at *p* = 0.01, 0.05 and 0.1 levels, respectively.

Main banks serving as an insurer when client firms face financial distress, helping client firms avoid extremely poor performance, could explain the lower volatility in firms with strong main bank ties. Combined with the fact that strong main bank ties reduce firms' profitability through rent extraction, it would be natural that firms with strong main bank ties have lower volatility of ROA than firms without such ties.

However, the lower volatility of ROA that accompanies *keiretsu* firms' high growth rate seems to be a different mechanism than that of the main bank relationship, because other estimation results suggest that *keiretsu* firms tend to take on risky projects (if we assume that high growth rates are normally associated with risky projects). It is plausible

that such reductions in volatility were mitigated in *keiretsu* firms through the rescue operations offered by member firms when a member was in trouble, while increases in volatility were not.   This asymmetric relationship of lower volatility in *keiretsu* firms may differ from the lower volatility among firms with strong main bank ties where fluctuations in volatility were reduced. As mentioned, however, this is all still conjecture; further research is required.

The difference between *keiretsu* member firms and non-*keiretsu* firms has decreased since the 1960s; during the 1990s, the difference in the standard deviation of ROA was much smaller (1.2 percent for *keiretsu* versus 1.6 percent for non-*keiretsu*) than it was during the 1960s. According to the 1990s estimation (Period II), the stabilizing effects of both *keiretsu* and main banks disappeared. The *MB* and *KEIRETSU* coefficients are not significant contributors to the variance in all models.[37] It is often pointed out that former characteristics of Japanese firms such as cross shareholding and the main bank relationship dissolved during the 1990s. These institutional changes might cause declines in the unique function of the main bank relationship and corporate groups.

Conclusions

We have outlined the first results concerning twentieth-century Japanese corporate performance using our newly constructed comprehensive database. At this stage, our tentative results are as follows:

First, during the prewar period the performance of large firms can be characterized as high ROA with high volatility, while during the postwar period relatively low profitability with less volatility was more likely. In the 1990s, Japanese firms showed extraordinarily low levels of performance and high volatility.

Second, large shareholders enhanced firm performance in the prewar period. However, *zaibatsu*, *keiretsu*, and main bank relationships did not enhance performance during the postwar period. *Keiretsu* group affiliation raised firms' growth at the expense of profitability during the postwar period.

Third, *zaibatsu* membership prewar, and main bank relationships and the *keiretsu* system during the postwar period reduced performance volatility. This stabilizing effect was partly brought about by risk or profit-sharing mechanisms, and partly by strict monitoring (*zaibatsu*) and rent extraction (main bank). The main bank and *keiretsu* systems lost their performance volatility reducing function during the 1990s.

All these results and interpretations are still tentative, however. We intend to check the robustness of these findings, and examine other topics using this new database in future research.

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[37] We estimated the model using 5 years volatility (calculated in 5 years for 1991-95) too. But the result is same as that of 9 years volatility.

Appendix

The Institute of Financial Studies in Waseda University (WIFS) has been constructing a comprehensive database of Japanese firms in the twentieth century. [38] The database covers the entire twentieth century (consisting of some sub-periods) and contains most large Japanese firms for each period. It also includes financial data (balance sheets, income statements, and statements of appropriation), stock prices, ownership structure, and board composition. Based on this database, we researched the relationship among corporate governance structure, corporate behavior, and performance. This paper is the first and preliminary result of this research project. The WIFS Database is constituted as follows:

WIFS Database Sample

The number of large Japanese firms in our database for the three sub-periods 1900-43, 1946-55, and 1956-99 is presented in Table 14.

TABLE 14
Large Japanese Firms in WIFS database

Sub-Periods	# of Firms
1900-1943	
1900-1912	50
1913-1930	150-200
1931-1942 (first half of 1943)	300-400
1946-1955	
	126[a]
1956-1999	
1956-1985	350
1986 to 2000	1200

[a]Number to be expanded.

Data Composition

Our database is composed of several components: financial data, stock price, ownership structure, and board composition. The data sources used to construct these components are summarized in Table 15.

      Financial Data. Our financial database includes balance sheets, income statements, and statements of appropriation, which are the basis of our econometric analysis.

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[38] http://www.waseda.ac.jp/finance/e-index.html

Stock Prices and Tobin's q.   To study the market valuation of sample firms, we made a stock price database. Using this database, we will calculate Tobin's q, which is a typical index of market valuation and the explanatory variable for the corporate investment.

TABLE 15
Data Sources for WIFS Database

Database Component	Data Source
Financial data	
1900-1943	Company Year books; Business Analysis of Japanese Firms (*Honpo-Jigyo seiseki bunseki*)
1946-1955	Year Book of Listed Firm
1956-1999	Corporate Finance Data Bank
Stock prices	
1900-1943	20-Years History of Stock Price (*Kabu-Kai 20-nen*); 50-Year History of Tokyo Stock Exchange (*Tokyo Kabusiki Torihikijo 50-nenshi*), and 50-Year History of Osaka Stock Exchange (*Daikabu 50-nenshi*)
1946-1955	Annual Report of TSE (Tokyo Shoken Nenpo)
1956-1999	Survey on Stock Price (Kabuka Soran)
Ownership structure	
1900-1943	*Company Year Books* (*Kabushiki Gaisha Nenka)*
1946-1955	*Company Year Books* (*Kabushiki Gaisha Nenka)*
1956-1999	*Annual Corporate Report* (Kaisha Nenkan), *Overview of Firm Keiretsu* (Kigyo Keiretsu Soran)
Board composition and presidential turnovers	
1900-1943	*Company Year Books* (*Kabushiki Gaisha Nenkan*)
1946-1955	*Annual Corporate Report* (*Kaisha Nenkan*)
1956-1999	*Annual Corporate Report* (Kaisha Nenkan)

Ownership Structure.   We constructed a database of corporate ownership to analyze the effects of corporate governance structure on investment behavior or corporate performance.

For Periods 1 and 2 we produced a list of the 10 largest shareholders; note that getting data before 1913 is quite difficult.

For Period 3, from the list of 10 (or 20) largest shareholders in our sources we constructed a dataset of the percentage of shares held by banks, trust banks, life and casualty insurance companies, non-financial corporations, foreign investors, and individuals. Using this database, we will analyze the relationships among ownership structure, investment decisions, and corporate performance.

Board Composition and Presidential Turnover.   Who occupies a firm's board of directors is one of the key factors in understanding corporate governance structure. It is also critical to determine if the relationship between the presidential turnover and bad performance is actually observed. For this purpose, we produced the presidential turnover database. Because of problems with data availability, this database is imperfect for Periods 1and 2.

Research Agenda

Our research objective is to gain insight into the relationships among corporate finance, corporate governance structure, corporate behavior, and performance in twentieth century Japan. Research topics we plan to include in this database include investment behavior, dividend policy, compensation scheme and its determinants, capital choice, presidential turnover, and corporate performance.

Investment Behavior. We will analyze the effects of corporate finance and corporate governance on the investment behavior (capital expenditure, and research and development expenditure). The model to be applied is a popular one, which includes Tobin's q and other financial factors. Using this model, we will test to see if corporate investment is constrained by the amount of internal capital or its leverage and if corporate governance structure mitigates (or exacerbates) the relationship.

$I = F(Q, CF, DA, CF*Gov, DA*Gov, YD)$

I: Investment
Q: Tobin's q (or other variables such as growth rate of sales)
CF: Cash flow
DA: Debt-asset ratio
Gov: Governance variables
Ownership structure
Capital composition or bank-firm relationship
Board composition such as the participation of shareholders, family members, and so on.
Zaibatsu affiliation or affiliation of business groups

Dividend Policy. We will highlight the effects of corporate governance structure on dividend policy. The question is if and how

sensitivity of dividends to profits are affected by corporate governance structure. The basic regression formula is as follows:

Div = F(Prof, Gov, Pro*Gov)
Div: Dividend
Prof: Net income
Gov: Governance variables

Compensation Scheme and its Determinants.   Along with monitoring by outside shareholders, the compensation system is another way to solve the agency problems.   We will explore the relationship between corporate performance and compensation.   Moreover, the effects of the corporate governance structure on the compensation scheme will also be tested.   The estimation formula is:

Bonus = F(P, Pi, Gov, P*Gov)
Bonus: Directors' bonuses
P: Corporate performance
Pi: Average performance of the industry the firm belongs
Gov: Governance variables

Capital Choice.   In contrast with the period from1937 to the end of 1970, when the financial market and bond issuance were highly regulated by government, Japanese firms in the prewar period freely chose their financial resources.   We will study the determinants of capital choice (equity or debt, borrowing or bond) and the effects of corporate governance structure on capital choice.   The basic estimation formula is:

D = F(Q, Gov, Q*Gov)
D: Variables that represent capital structure
Q: Tobin's q (or other variables that represent business chance such as growth rate of sales)
Gov: Governance variables

Presidential Turnover.   Effective governance must be associated with the end norm that incumbent top management is replaced for poor performance.   We will test whether or not there is a relationship between presidential turnover and poor performance.   The effects of corporate governance structure on this relationship will also be examined.   The estimation formula is:

Turn = F(Per, Tenure, Gov, Per*Gov)
Turn: Dummy variable that equals 1 when the presidential turnover is observed, and 0, otherwise
Tenure: Tenure of the president
Gov: Governance variables

Corporate Performance.   In addition to the estimations described, we will estimate the effects of corporate governance structure on corporate performance directly.   ROA, ROE, growth rate of sales, and

Tobin's q will also be used as corporate performance variables. If the data allow, we also plan to estimate the standard production function model.

P = F(Size, Ind, Gov)
Y = F(K, L, Gov)
P: Performance
Size: Firm size (such as logarithm of book-value total asset)
Y: Output
K: Capital stock
L: Labor input
Gov: Governance variables