

The Structure of Interfirm Personal Relations among Large Firms in Japan

Fumitaka IWANAMI*

Introduction

In the 1990's, resulting the collapse of the "bubble economy" and the continuing recession, the structure of corporate rule has given rise to a number of serious problems. Indeed, in Japan recent years executive directors carried out activities such as the unfair and illegal acquisition of capital, such as the violation of commercial law, and the like. The issue arose of how the activities of executive directors could be regulated.

Relating to the recent debate on corporate governance, we consider that intercorporate relations influence directors' activity, especially corporate rule / strategic management / top-management function of individual companies by the way of constraint conditions. In order to elucidate these relations, we will apply the techniques of social network analysis. The intercorporate personal relations are measured by the techniques of social network analysis. Social network analysis is a technique which applies the graph theory of mathematics to social structure analysis.

In this paper the focus is the structure of intercorporate personal relations around large manufacturing company known as Mitsubishi Heavy Industry belonging to Mitsubishi enterprise group: one of six large enterprise groups and one of former Zaibatsu enterprise groups.

We attempt to elucidate the structure of interlock network in recent business depression in Japan.

1. Corporate control and strategic management

The large corporations of the leading capitalist nations take an active part through various intercorporate relations. Taking notice of this point, it is needed that corporations are grasped not merely inside corporations but through a perspective of intercorporate network. According to M. Zeitlin [Zeitlin, (1974)], such a research must focus on the outset of the complex relationships in which the single corporation is itself involved: the relationships between one corporation and other corporations.

We refer to the relationship between corporate control and corporate strategic decision making. John Scott [Scott, (1993)] contends that corporate control must be distinguished from corporate rule. Control is a structural relationship through which particular agents have the capacity to exercise the legal powers of ownership. Those who control corporations have the power to determine the

*Department of Management Technology, Instructor (Business Management Theory)
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composition of the board and to dominate voting in corporate affairs. Rule is the actual exercise of power in decision-making. The rulers of corporations are drawn from both controllers and non-controllers, with the ruling group exercising decision-making powers within the constraints set by the structure of control.

The corporate rule, therefore, signifies strategic management and is just top-management function.

2. Top-management organization in Japan

Top-management, a peculiar management structure to current enterprise was introduced into Japan after the second world war. Japanese commercial law provide a duty of setting the meetings of stockholders, the board of directors, and the institutions of auditing in corporations. Top-management, so-called the board of directors, is composed of 3 directors or more and decision making in the management is executed (Section 260 of Japanese commercial law). The board of directors is composed of all selected directors and do not only decide the transaction of business, but also manage directors' affairs. The board of directors has authorities in relations the transaction of business, without the matters of authorities of the meetings of stockholders by commercial law, and certificate of incorporation (Sub-section 1, section 260 of commercial law). And, in Japan, directors with positions like the president, vice-president, senior directors (SENJU TORISHIMARIYAKU), junior directors (JOUNU TORISHIMARIYAKU), and non-executive directors are selected and a board of directors has a characteristic of hierarchy.

The functions of top-management consist of trusteeship function, general management function, and administrative function. The function of the board of directors as trusteeship function means to represent shareholders, to determine the basic policies, to apprise the adequacy of over-all results and to make the most effective use of the company's assets with a view to protecting and furthering the interests of shareholders. These functions are carried out by the board of directors. The board of directors carry out assuring that major plans are designed to meet objectives, approval of major company decision, checking on results, disposition of company profits and assets, mergers and acquisitions, and the like, namely the strategic decision making.

In Japan, the board of directors is commonly held about once a month and the transactions of business are entrusted to a representative director including the president. There are hierarchical relations between the directors of a single company. Generally, after organization of deliberation of the matters submitted to conference of the boards: a board committee (managing board), called "JOUNMUKAI (executive committee, in USA)" is set. In fact it is a informal board not described in Japanese commercial law. The managing board is composed of officials over a director and consists of only representative directors, a president, one or several vice-president and several senior directors and junior directors, without non-executive directors. The managing board is a conferential system which is composed of the members over a director and refers to the matters belonging to the general management or administrative function in the conference and also refers to the matters discussed in a conference of the board of directors. The managing board performs trust the trusteeship function

as a vicarious execution. Generally, the managing board is doing general management or administrative. This conferential system of transaction of business has a role of consult organization. And, commonly, presidents occupy the seat of chairman of the board of directors as well as chairman of the managing board [Takahashi, (1992) p.309].

An auditor of the organization in corporation's auditing, which is established in organization, is chosen by the decision of the meeting of stockholders (Section 280 of commercial law). The auditors have the competency of directing the execution of directors and auditing accounts (Section 274-1 of commercial law). The auditors do not take part in a fundamental course and regard the auditing of the transactions of business as the object of inspection. As is commonly known, the board's competence transfer to the managing board. To execute effectively pre-auditing, it is necessary that the auditors attend the managing board and make a statement of an opinion. As to the auditors which take charge of a function like this, to function optimally a revision of a commercial law is applied: the number of inspectors must be 3 and more, one of the auditors must be a person who has not been a director, a manager or an employee of the company and the subsidiary company (Section 18-1 of peculiar case of a commercial law). So called, the auditors out of a company must be established. Lately an institution of auditing is regulated by a legal organization (Section 18-2 of peculiar case of a commercial law). The term of auditor is extended after two years to three years (Section 1 of a commercial law).

As mentioned above, an auditor or auditing conference do not take part in decision making of the board of directors, because an auditor's duty is only to inspect a decision making of the board of directors and business transactions, which is treated as the board of directors' function indirect part. In this paper, both the director and the auditor are the members of top-management in corporations, those are collectively called directors.

3. Top-management and intercorporate personal relations

In Japan, the corporations are active based on the formation of a group of corporations through a manifold of relations among corporations. For example, the typical type is six large enterprise groups. An agent composing intercorporate relations are connected to others, each of whom has similar connections to further agents. As a results, there exists a definite network of relations between agents. Various intercorporate relations which connect corporations are composed of capital, commercial, and personal relations. In this paper, in order to grasp intercorporate relations at a level of persons undertaking strategic decision making, namely a level of top-management, we focus intercorporate personal relations.

Intercorporate relations are composed through the various connections of capital, commercial, and personal among individual corporations. As intercorporate personal relations are interlock among corporations in a strategic decision making level, namely top-management level, this paper focuses intercorporate personal relations¹.

Analysis of the intercorporate personal relations can be classified into a view of an organization, social background, inter-organization, and class-hegemony. On perspective of interorganization

intercorporate relations are regarded as a factor of a environment around individual companies and as a factor to decide individual companies' operation. In this paper, we will attempt a analysis of intercorporate personal network based on perspective of interorganization.

In Japan, intercorporate personal relations on the level of top-management in the six large enterprise groups are formed by the presidents' club, the dispatching directorates, and interlocking directorates. The member companies of the presidents' club are large banking, finance, trading, real estate, and manufacturing corporations. The Meetings of the presidents' club are usually held once a month and are attended by the presidents of the corporate members or the chairman of the board. The purpose of the presidents' club is to share information on economic conditions or the like. For example in Mitsubishi enterprise group the president of Mitsubishi individual corporations formed Mitsubishi's presidents' club, called "KINYOKAI", and regularly began to come together to manage Mitsubishi's trademark right in about 1955 [Kosei Torihiki Iinkai (1994)]. The dispatching directorate is an intercorporate relation by which personnel from a specific company, who are neither directors nor auditors or who have retirement, are recruited by the directors or auditors from another company. These persons are called dispatched directors. Interlocking directorate is an intercorporate relation which is created when one person is a member of two or more company boards. The person is called multiple directors. In this case, directors include auditors.

As not all interlocks have equal significance, this research attempt to distinguish between different types of interlock. There are three types. The most intense interlock is the tight interlock. The tight interlock exists, when a person takes up an executive director's post in both one company and another company. A primary interlock exists, when a person holds inside / executive director's post in one company and holds outside / non-executive director's post in another company. The primary interlock has often a direction of a line from one company to another company. A loose interlock is the least intense type of interlock. The loose interlock exists, when a person holds outside / non-executive director's post on two boards [Scott and Griff, (1984) p.25].

Multiple directors have a chance to approach inside information of individual companies, with have a role to communicate from one company to others companies. Specially outside directors bring information and opinions from outside the company and have function as advisers on ideas evolved within the executive. Multiple directors play a role as representative persons of systems of financial capital as a whole.

Intercorporate personal relations on the level of top-management, therefore are considered the channel of information which influences the strategic decision making of top-management². As interlocking directorate exists relatively independent of intercorporate shareholding, we consider that it is instructive to observe the structure of interlocking directorate.

4. Interlocking directorate surrounding Mitsubishi Heavy Industry

We will specify a structure of interlocking directorates through methods of social network analysis³. At first, we will measure a score of centrality of individual corporations composing a network. Local centrality (after this, called 'centrality') refers to the immediate connections of a

Table 1 Centrality in Network of Interlocking Directorate

1991 corporation adjacency	tight-interlock	primary-interlock	1994 Corporation adjacency	tight-interlock	primary-interlock
Mitsubishi	33	0	Imperial Hotel	45	0
Japan Airport Terminal	20	0	Tokyu Railway	37	1
Mitsubishi Electric	19	0	Dai-ichi Mutual Lif Ins.*	34	0
Tokyo Marin & Fire Ins.	16	0	Hitachi	30	0
Japan Air Line	13	0	Mitsubishi	29	1
Mitsubishi Heavy Industry	12	0	Tokyu Recreation	25	1
Mitsubishi Perto Chemical	12	0	Tobu Railway	25	1
Mitsubishi Bank*	12	0	Tokyu Car Manufacturing	23	0
Mitsubishi Logistics	11	0	Izu Railway	23	0
Meiji Life Ins.*	10	0	Nippon Life Ins.	23	0
Nohmi Basai	10	0	Mitsubishi Electric	11	0
Godo Steel	10	0	Tokyu Hotel Chain	21	0
Nippon Meet Packers	8	0	Asahi Breweries	20	1
Japan Kentucky Fried Chicken	8	0	Matsushita Electric Industry	17	0
Chukyo Coca-Cola	8	0	Shochiku	17	2
Mitsubishi Estate	8	0	Toei	17	1
Mitsubishi Motors	8	0	Japan Airport Terminal	16	0
Nikon	8	0	Tokyu Construction	15	1
Nissin Foods Product	7	0	Tokyu Store	15	0
Nihon Syokuhin Kako	6	0	Tokyu Department Store	15	0
Nitto Flour Mealing	6	0	Tokyu Travel Agency	15	1
Chubu Steel Plate	6	0	Fukoku Life Ins.*	15	0
Dai Nippon Toryo	6	0	Meiji Life Ins.*	14	0
Sanyo Coca-Cola	6	0	NKK	14	0
Mitsubishi Oil	6	0	Shiroki Manufacturing	14	0
Mitsubishi Steel Manufacturing	6	0	Chubu Electric Power	14	0
Ryoden Trading	5	0	Mitsubishi Heavy Industry	13	0
Mitsubishi Kakoki	5	0	Mitsubishi Oil	12	0
Diamond Lease	5	0	Keihin Ele. Ex. Railway	13	0
Kirin Breweries	5	0	Arabian Oil	12	0
Honda Motor	4	0	Odakyu Realestate	12	0
Nihon Kentestu	4	0	Mitsubishi Bank*	11	0
Nihon Chemical	4	0	Mitsubishi Motors	11	0
Toyo Takasago Dry Battery	4	0	Mitsubishi Estate	10	0
SPC Electronics	4	0	Japan Air Line	10	0
The Kodensha	4	0	Mitsubishi Construction	9	0
Kinki Coca-Cola	4	0	Mitsubishi Material	9	0
Nichirei	4	0	Matsuya	9	0
Diamond City Estate	4	1	Nikon	8	0
Nippon Yusen	3	0	Ryoden Trading	8	0
Nippon Unisys	3	0	Diamond Lease	8	0
Toyo Engineering Works	3	0	Mitsubishi Logistics	8	0
Tokai Kulp & Paper	3	0	Mitsubishi Steel Manufacturing	7	0
Tokyo Senpaku	3	0	The Koudensya	7	0
Optic Dai-Ichi Denko	3	0	Chubu Steel Plate	7	0
Taiheiyo Metal	3	0	Nohmi Bosai	7	0
kanaden Trading	3	0	Mitsubishi Trust Bank*	7	0
Okamura Engineering Works	3	0	Tokyo Marin & Fire Ins.*	7	0
Nippon Transport Engineering	2	0	Nisshin Food Product	6	0
Sizuki Electric	2	0	Godo Steel	6	0
Pasco	2	0	Okamura Engineering Works	6	0

Source: Toyo Keizai Shinposya (1991) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya and Toyo Keizai Shinposya (1994) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya.

Note 1: Corporations holding relatively high score of centrality are noted in this table.

2: The mark of * shows financial insutstitutions.

company and is typically measured by its adjacency. A central company, therefore, has a large number of distance one neighbors. By measuring the centrality, it is possible to identify those company which hold relatively individual central positions.

Centrality is measured without considering the directionality of a line, in the second hand, it is measured considering intensity of interlocking directorate (see Table 1). Without considering a directionality of a line, the number of corporations in the proportion 10 or more interlocks count to 12 in 1991. In this network, especially, general trading company, Mitsubishi, have 33 interlocks, having the highest degree of adjacency. 8 corporations of these 12 belong to Mitsubishi presidents' club. 3 corporations (city bank, insurance and so on) of 8 are financials. These 3 corporations have relatively many interlocks.

We will, now, consider a directionality of a line. Only Diamond City has tight-interlock. 12 corporations possess primary interlocks. Corporations holding relatively high score of centrality shows a tendency to hold primary interlock. 6 corporations belong to Mitsubishi presidents' club. Those have relatively many interlocks, especially Mitsubishi has the highest interlocks with 24 corporations.

In 1991, in an interlock network, core corporations (Mitsubishi, Mitsubishi Heavy Industry, Mitsubishi Electric, Mitsubishi Bank, etc.) of Mitsubishi presidents' club have relatively a lot of interlocks. Especially, a general trading company, Mitsubishi holds most interlocks in this network.

In 1994, we will measure corporations one by one in interlock network. Without considering a directionality of a line, we will measure interlocks. In this network, 35 corporations hold 10 or more interlocks. There are 5 financial institutions among 35 corporations. Those are 1 bank and 4 mutual life insurance companies. 12 companies in Tokyu Railway group have relatively many interlocks.

We try to measure a centrality of tight-interlock and primary, we simultaneously consider the directionality of lines. 9 corporations have tight-interlocks. One of 11 holds 2 interlocks, others hold just 1 interlock. Among those corporations, there are 4 corporations in Tokyu Railway group and 2 of Mitsubishi presidents' club. 37 corporations hold primary-interlocks. 8 of those are financial institutions. In the network the corporations which hold the relatively high score of interlocks have a tendency to hold the high score of primary interlocks.

Through measuring the centrality, individual corporations which hold relatively high level score of centrality increase, and their high level score of adjacency gain in 1994 compared to 1991. And in 1994 corporations that belong to Hitachi group, Matsushita Electric group, and Tokyu Railway group compose the network of range of 2 distance from Mitsubishi Heavy Industry, those have relatively high level score of centrality⁴.

In the second place, we will analyze a cohesion of a network. The cohesiveness of the network express the features of the network as a whole. In this, the single most frequently used measure of cohesiveness is density. The density is that the ratio of the actual number of lines in the network to the number of lines which would be presented if all points were connected to all others. We think that density is usefully employed in longitudinal comparisons of the same partial network over time. Density is calculated of the following formula [Scott (1991),p.74.].

$$d=L/N(N-1)/2$$

L is the number of lines.

N is the number of points.

In the network with directed lines, however, the density is $L/N(N-1)$. L is the number of directed lines.

In 1991 and 1994, the majority of corporations are interlocked. The overall density of the network decrease from 0.065 to 0.025. The score of density measure may vary from 0 to 1. In 1991 a density figure of 0.065 that 6.5 per cent of the possible lines are actually present. In 1994 it's score of 0.025. This figure is low, but maximum density declines with network size. There is an overall decrease in the cohesiveness of the network. These changes in cohesiveness are consequences of changes in the number of lines. Namely, the number of individual corporation's lines relatively increasing, but, the number of corporations, of which a network is composed, increasing, so density is falling and the cohesiveness of the network is weakening.

We think that these changes in cohesiveness are affected by the collapse of the 'bubble economy' and the continuing recession. Furthermore, in the range of 2 distance in these networks, the inter-corporate relations are thought to have the tendency of being reorganized as resulting changes of the number of corporations of which the networks are composed.

In the third place, we will identify an internal structure of a network as nesting of components. The basic image in a nested analysis is that of a contour map, or each component being nested within a larger component. The method of nesting has been proposed that a based on the use of the multiplicities of the lines as a measure of intensity. The multiplicity based measure results in the identification of m-cores. In this paper, an m-core is referred to nested component. A nested component is a chain of points connected by lines of the specified multiplicity. In this, a cut-off criteria is the average or more of the multiplicity of lines. In 1991 a cut-off criteria is 1.14, in 1994 it is 1.26. Both years it is set up a degree of 2 or more.

In 1991, 33 corporations compose nested components in a network. The nested components were identified to 2 components of criteria 2 and 3 (Table 2). A component of criteria 3 holds 1 financial and 2 non-financials. 1 financial is Tokyo Marine & Fire Insurance. A component of criteria 2 involves 30 corporations. Among these components there are 11 corporations of Mitsubishi presidents' club. Financials that compose these components is 3 financials: Mitsubishi Bank, Meiji Life Insurance, and Tokyo Marine & Fire Insurance. These financials are the member companies of Mitsubishi presidents' club. Further the component of criteria 2 includes general trading company Mitsui that is a member of Mitsui enterprise group: one of 6 large enterprise groups.

In 1994, the nested components of cut off criteria 2 or more in a network are discriminated to 6 components (Table 2). These components hold 71 corporations. The components of higher criteria decrease the number of corporations. All the corporations of 3 components of criteria 5 or more are the member of Tokyu Railway group. In the component of highest criteria 7, there is Tokyu Railway being core company of Tokyu Railway group. Tokyu companies belonging to components of higher criteria hold a lot of multiplicity of interlocks in Tokyu Railway group. It is said that interlocks among the member company of Tokyu Railway group tends to overlap. This point is said to be a characteristic of the companies of Tokyu Railway group.

Table 2 Nested-Component in Interlocks Network

Member Corporations of Component in 1991	Criteria	Member Corporations of Component in 1994
	7	Tokyu Railway, Izu Railway
	6	Tokyu Engineering, Tokyu Construction
	5	Tokyu Hotel Chain, Shiroki Engineering Tokyu Car Manufacturing
	4	Tokyu Realestate, Tokyu Recreation, Tokyu Travel Agency, Tokyu Store, Tokyu Department Store, Toubu Railway, Toubu Store, Shouchiku, Toei, Toei Chemical, Kabuki-za, Fukoku Life Ins.
Tokyo Marine & Fire Inq., Secom, Nohmi Bosai	3	Mitsubishi Heavy Industry, Mitsubishi Motors, Torii Drug, Nikka Whisky, Asahi Breweries, Kaigen, Nohmi Bosai, Secom, Sakai Chemical, Dowa Mining, Matsushita Electric Industry, National Home, Fujita Tourist,
Mitsubishi Heavy Industry, Mitsubishi Motors, Mitsubishi Steel Manufacturing, Mitsubishi, Mitsubishi Electric, Meiji Life Ins., Mit- subishi Oil, Mitsubishi Petro Chemical, Mitsubishi Bank, Kinki Coca-Cola, Nikon, Nihon Kentetsu, Jusco, Japan Battery, Kanaden, Japan Kentucky Fried Chikin, Diamond City Estate, Nitto Flour Mealing, Nippon Steel, Nihon Syokuhin Kako, Sdhon Musen Mitsubishi Bank, Japan Air Line, Syowa Soda, Kyoto Hotel, Mitsui, Tokyo Sempaku, Nippon Yusen, Nichirei, Japan Unisys, Nippon Transport Engineering	2	Mitsubishi, Mitsubishi Steel Industry, Mitsubishi Electric, Meiji Life Ins., Tokyo Marine & Fire Ins., Mitsubishi Bank, Mitsubishi Estate, Mitsubishi Constructor, Diamond City Estate, Kinki Coca-Cola, Nikon, Kanaden, Asahi Breweries Systems, Okura Trading, Nippon Musen, NKK, Tokyo Cyaring, Godo Steel, Nippon Steel, Sippon Steel Chemical, Mitsubishi Copper, Mitsubishi Material, Dai-ichi Electric, Hitachi, Hitachi Power Line, Hitachi Software Engineering, Hitachi plant Con- structor, Hitachi Credit, Nissei Industry, NEC, Jusco, Sotetsu Trunsite, Matsu- shita Electric Construcccion, Imperial Hotel, Tokai Steemship, Dai-ichi Hotel, TokyoDome, Toyo Engineering Works

Source: Toyo Keizai Shinposya (1991) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya and Toyo Keizai Shinposya (1994) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya.

13 corporations belonging to a component of criteria 3 contain 2 Mitsubishi industrials, Matsushita Electric Industry being core company of Matsushita group, and what not. 39 corporations belong to a component of criteria 2. 11 corporations of 39 are the member of Mitsubishi presidents' club. This component holds Mitsubishi companies Mitsubishi, Mitsubishi Electric, Mitsubishi Steel, etc. and Nippon Steel with its associated companies (KEIRETSU), Hitachi with its associated companies, and NEC or the like.

Comparing nested components in 1991 to 1994, the corporations belonging to Tokyu Railway group occupy the components of over criteria 4. It results from the cause that Tokyu Railway, one of core corporations of Tokyu Railway group, united with a network in 1994 as a corporation of one distance from Mitsubishi Heavy Industry. That is to say that corporations composing Tokyu Railway group enter within a range of distance 2 from Mitsubishi Heavy Industry. In the components of criteria 3 or less, the composing corporations increase. In 1991, the component of criteria 3 is occupied by corporations of Mitsubishi presidents' club, on the other hand, in 1994 it is composed of Mitsubishi industrials, Mitsubishi financials, Matsushita Electric Industry, and Asahi Breweries, and what not.

5. Clique of Multiple Directors

We will extract a clique of multiple directors in the network in 1991 and 1994. In this, taking up multiple directors of Mitsubishi Heavy Industry interlocking with others, a clique of multiple directors is extracted. If a multiple director interlock an executive directors with others that belong to nested components, the director is considered to a core of multiple directors. In this case, intensities of interlock, in particular tight interlock and primary interlock, are considered.

In 1991, the number of directors in Mitsubishi Heavy Industry are 43 people. 9 people of them are multiple directors. The multiple directors hold 20.1 per cent of directorship, 2 people of them are executive directors of Mitsubishi Heavy Industry. Those 2 people, a chairman and a president of Mitsubishi Heavy Industry, have directorships of 4 Mitsubishi Industrials. The chairman that is a member of Mitsubishi's presidents' club have directorships of 3 corporations belonging to Mitsubishi SHACHOKAI. The executive director has a Mitsubishi Industrial without SHACHOKAI.

3 executive directors of other corporations have a directorship of Mitsubishi Heavy Industry (Table 3). Those 3 people are a chairman of Mitsubishi, a chairman of Mitsubishi Motors, and a chairman of Mitsubishi Bank⁵. They are the members of president's club. In 1991, the clique of multiple directors consist of those 5 people.

In 1994, the number of directorship in Mitsubishi Heavy Industry are 44 people. 9 persons of them are multiple directors. The ratio is 20.5 per cent. 5 persons of multiple directors are executive directors of Mitsubishi Heavy Industry. They hold 7 directorships. These 7 corporations are Mitsubishi industrials. The industrials are 5 members of Mitsubishi presidents' club and 2 Mitsubishi companies without the club.

3 executive directors of other corporations combine a directorship of Mitsubishi Heavy Industry. A chairman of Mitsubishi interlocks 5 corporations. A president of Mitsubishi Motors interlocks one company. A chairman of Mitsubishi Bank interlocks 4 companies. These 8 persons that interlock 13

Table 3 Mitsubishi Heavy Industry's Multiple Directors and the Interlock Companies

1991 Multiple director (managerial position)	Interlock company (managerial position)	1994 Multiple Director (managerial position)	Interlock Company (managerial position)
<u>Iida, Y.</u> (Chairman)	Mitsubishi Motors, Mitsubishi Steel Manufacturing, Mitsubishi	<u>Iida, Y.</u> (Chairman)	Mitsubishi, Mitsubishi Steel Manufacturing Mitsubishi Motors
<u>Makise, Y.</u> (Junior Director)	Toyo Engineering Works	<u>Aikawa, K.</u> (President)	Mitsubishi Constructor, Toyo Engineering Works Tokimekku
Miura, Y.	Mitsubishi (Chairman) Mitsubishi Steel Manufacturing, Mitsubishi Kakkoki Mitsubishi Electric	<u>Hineno, M.</u> (Junior Director)	
Tate, T.	Mitsubishi Motors, (Chairman)	<u>Hirata, H.</u> (Junior Director)	Kinki Coca-Cola
Kawata, H.	Chukyo Coca-Cola, Kinki Coca-Cola	Morohashi, S.	Mitsubishi (Chairman), Mitsubishi Oil, Mitsubishi Electric, Mitsubishi Motors, Mitsubishi Steel Manufactur- ing, Tokyu Railway
Matsuda, K.	Nippon Transport Engineering	Nakamura, Y.	Mitsubishi Motors, (President)
Matsubara, Y.	Kinki Coca-Cola (Auditor)	Tani, Y.	Kinki Coca-Cola, (Auditor)
Ibuki, K. (Auditor)	Mitsubishi Bank*, (Chairman) Tokyo Marine & Fire Ins.*, Mitsubishi Electric, (Auditor) Honda Motor	Ibuki, K. (Auditor)	Mitsubishi Bank* (Chairman) Meiji Life Ins.*, Mitsubishi Electric, (Auditor) Honda Motor
Tuji, K. (Regular Auditor)	Toyo Engineering Works		

Source: Toyo Keizai Shinposya (1991) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya and Toyo Keizai Shinposya (1994) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya.

Note 1: The under lines _____ of director's name show executive directors of Mitsubishi Heavy Industry.
2: Italic words of corporation's name show executive directors of there.
3: The mark* shows financial institutions.

companies are core of multiple directors.

The members of the clique increase from 5 in 1991 to 8 in 1994, both years a direction is imputed to primary interlocks. Equally, the number of corporations that they interlock increase from 8 (involving all 8 companies of above-mentioned cut off criteria 2 or more) in 1991 to 13 (involving 11 companies of above-mentioned cut off criteria 2 or more) in 1994 (see Figure 1 and Figure 2). Both years there are 2 financials. Those are Mitsubishi Bank and Tokyo Marine & Fire Insurance in 1991. Mitsubishi Bank and Meiji Life Insurance in 1994. When particular multiple director resign director's post, interlocks between Mitsubishi Heavy Industry and Mitsubishi Motors or between Mitsubishi Heavy Industry and Mitsubishi are kept intensity and durability (reinstatement) by another multiple

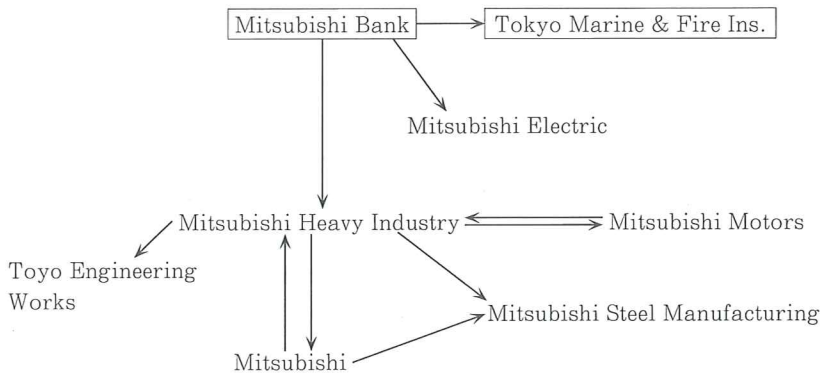


Figure 1 The Clique of Mitsubishi Heavy Industry's Multiple directors (1991)

Source: Toyo Keizai Shinposya (1991) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya.

- Note
- 1: Taken up companies interlocked by Mitsubishi Heavy Industry's directors are members of nested components of cut off criteria 2 or more.
 - 2: The mark of → shows a primary interlock.
 - 3: The mark of □ shows financial institutions.

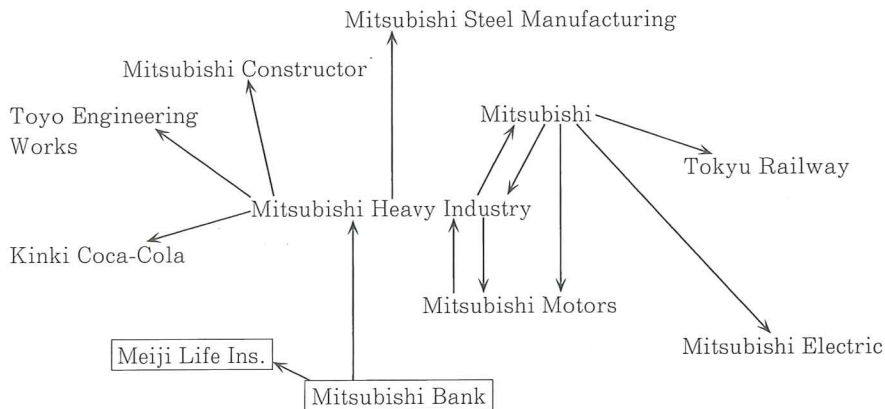


Figure 2 The Clique of Mitsubishi Heavy Industry's Multiple directors (1994)

Source: Toyo Keizai Shinposya (1994) *Yakuin Shikiho (Corporate Directors Directory)*, Tokyo: Toyo Keizai Shinposya.

- Note
- 1: Taken up companies interlocked by Mitsubishi Heavy Industry's directors are members of nested components of cut off criteria 2 or more.
 - 2: The mark of → shows a primary interlock.
 - 3: The mark of □ shows financial institutions.

director.

Basing on the core of multiple directors, in 1991 the clique of multiple directors is described as a intercorporate network. In case taken up companies are members of nested components of cut off criteria 2 or more. It is composed of 8 companies: 2 Mitsubishi financials and 5 Mitsubishi industrials.

Similarly the clique in 1994 is described. It is made up 11 companies: 2 Mitsubishi financials and 9 Mitsubishi industrials.

Both cliques in 1991 and in 1994, Mitsubishi Bank holds only primary interlock, there are primary interlock of mutual directions that specially refer to the intensity of interlock among companies: relations between Mitsubishi and Mitsubishi Heavy Industry and between Mitsubishi Heavy Industry and Mitsubishi Motors. On the other hand, Tokyu Railway and the like that are not included the clique in 1991 compose the clique in 1994. In 1994 the 5 interlocks between Mitsubishi Bank and Mitsubishi Heavy Industry, between Mitsubishi Heavy Industry and Mitsubishi Motors, between Mitsubishi Heavy Industry and Mitsubishi, between Mitsubishi and Mitsubishi Steel, and between Mitsubishi Bank and Mitsubishi Steel have the most durable relations.

From the above observations it can be said that the cliques, in 1991 and in 1994, both reflect the durable interest group and bring with the structure that holds fixed relations among Mitsubishi, Mitsubishi Bank, and Mitsubishi Heavy Industry.

Conclusion

This paper has explored the recent trends in the structure of intercorporate personal relations through the techniques of social network analysis after collapse of bubble economy in 1990's. Both in 1991 and in 1994 the structure of interlocking directorate was formed with core between main large commercial bank or financial institutions and large manufacturing corporations. In these intercorporate networks, there are commercial bank, financial institutions, and general trading company with high score of centrality. Bank and financial institutions play a role of the nodal points of adjustment in individual companies' interests. It is seen that general trading company is a center of capital, trading, and information of strategic decision making. On cohesiveness in the networks, the degree of the density decrease from 1991 to 1994. This factor is to increase corporations in the network. The individual corporations actively propel the growth of interlocks with the collapse of the 'bubble economy' and the continuing recession. The cohesiveness of the network is weakened from 1991 to 1994. Not all these factors are detailly investigated.

Through identifying nested component, cliques of multiple directors are recognized both in 1991 and in 1994. Inside the clique of multiple directors both in 1991 and in 1994 the relations between specified banks and non financial corporations form fixed and stable 'interest groups'. There is general trading company with a lot of interlocks in the clique. It can be seen that the clique consist of structural constraint conditions to strategic decision making of individual corporations.

This paper is made some changes and additions to my presentation at the conference on "Information Processing as a Competitive Advantage of Japanese Firms" Berlin, February 3-4, 1998.

Notes:

1. With regard to study on ownership and control of large enterprise groups in 1990's, see [Nakata, (1998)].

2. For business administration study's significance on interlocking directorate, see [Nakata, Hosoi, and Iwanami, (1997) pp.10-25.].
3. For detailed explanation on social network analysis, see [Freeman, L.C., White, D.R., and Romney, A. K., (1989)]. And for detailed explanation on methods of analysis in this paper, see [Scott, (1991)].
4. There are frequently dispatching directorates among main bank and industrial companies. In the analysis about dispatching directorates, we confirmed that dispatching directorates traced the structure of intercorporate ownership. See [Iwanami, (1994)].
5. Primary interlock of Mitsubishi Heavy Industry is done among related companies: Mitsubishi Motors and Toyo Engineering Works to apply to holdings law.

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