

**The Japanese Business System:
Key Features and Prospects for Change**

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Abstract

This paper argues that the Japanese business system cannot be adequately understood without extending the focus of analysis beyond the individual firm to the vertical keiretsu, or business group. The vertical group or keiretsu structure was first identified and studied in the auto and electronics industries, where it is most strongly marked, but it characterizes virtually all sectors, service industries as well as manufacturing. Large industrial vertical keiretsu are composed of subsidiaries engaged in three distinct types of activities (manufacturing, marketing, and quasi-related business.) The coordination and control systems are built on the flows of products, financial resources, information and technology, and people across formal company boundaries, with the parent firm controlling the key flows. The paper examines the prevailing explanations first for the emergence and then for the persistence of the vertical group structure, and looks at the current pressures for change and adaptation in the system.

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Introduction

In the late 1980s, the efforts of the business media and academic researchers to analyze the Japanese business system were spurred primarily by the desire to explain the success of Japan's economy and its firms. In the mid-1990s, however, with the Japanese economy mired in a prolonged recession, the business press virtually unanimously has portrayed a system in crisis, whose past successes contain the seeds of current and future difficulties, as it faces a changed international and domestic environment and unprecedented strains on its internal structures and processes (e.g. *Economist*, 3 June, 1995).

The image of the Japanese business system in the popular press has changed much more dramatically than the system itself. But the image of the business system among academic researchers has also changed over the years. The intensified scrutiny to which Japan was subjected in the 1980s provided a model of the Japanese business system that built on previous work, particularly on the human resource management and decision-making systems of the large Japanese firm. But additional elements were added: assessment of strategic behavior in the mid-

1980s, and an analysis of the corporate form known as the vertical keiretsu in the last decade. The evolving model of the business system suggests that both paradigms and the business system itself are changing. This paper provides an analysis of the key features of the Japanese business system, with a particular focus on the most recent addition to the portrayal of the business system, the vertical group structure; looks at some of the pressures for change; and indicates directions for future research in assessing the prospects for change in the business system in Japan.

2. The Analysis of Japanese Industrial Firms

In 1958, James Abegglen's pioneering study first demonstrated to a Western audience the existence of an interrelated set of distinctive organizational characteristics in Japanese manufacturing companies. Since then, both Japanese and Western social scientists have expended considerable effort on exploring, re-defining, and explaining those characteristics. By the late 1980s, there was general agreement among both Western and Japanese social scientists that large Japanese firms exhibited strongly institutionalized and interrelated patterns in four areas: human resource management, governance and control systems, strategy, and structure¹.

The distinctive features of the human resource management systems were the first aspect of Japanese companies to draw attention (Abegglen 1958), and for over three decades they have been seen as a defining feature of the Japanese business system. Those features are by now so familiar as to need little elaboration: the reliance on recruiting new graduates with a generalist education (high school graduates as blue collar workers, Bachelors graduates as management recruits, Masters graduates rather than Ph.D.s as technologists and researchers); a strong but

unwritten commitment of long-term employment and the assumption by the company of the responsibility for providing training and for shaping the individual's career; and a key role for seniority in promotion. This system facilitates a career structure that emphasizes rotation across positions, the development of personal networks (*jimmyaku*) as a basis for horizontal information exchange, and intense competition among employees over the long term for the rewards that come with being identified as a high-commitment and highly capable employee. The centrality of the human resource management system in the coordination systems of the firm and the strong company commitment to assuming the responsibility for the careers of employees has led several Japanese social scientists to identify the key distinction between the US and Japanese business systems as the critical role of human resources instead of financial resources in the company (e.g. Aoki 1988; Itami 1987, 1994b; Odagiri 1992).

The critical role of employees as stakeholders is reflected in the governance systems of Japanese firms, which give little scope for the role of shareholders that is so central to the economic theories of the firm of the 1970s and 1980s in the United States. Boards of Directors are made up of current and former top managers of the company, and the position of Director is one of the most coveted rewards in the internal career ladder. External representation on the Board is rare: the lead bank sometimes has a Board representative, but other shareholders, however sizeable their ownership stakes, do not (as the American corporate raider T. Boone Pickens discovered to his chagrin when he attempted to bring American-style takeovers to Japan in the late 1980s). Shareholding in Japan is dominated by institutional shareholders of two types: "portfolio" shareholders, including trust banks and insurance companies, who have traditionally looked to long-term growth in the value of the firm as a consequence of growth strategies rather than to

dividends or short-term gains from trading shares) and relational investors (companies related to the firm who hold shares as a symbol of that relationship, including the firm's lead bank, key suppliers, and affiliated firms). Neither type of shareholder has traditionally taken an active interest in monitoring the management of the firm, and a 1988 survey by MITI found that fewer than 1% of the top managers who responded rated "increasing value for shareholders" as either the most or the second most important goal of the firm. The separation of ownership and control so marked in the large Japanese firm is accompanied by an internal coordination and control structure that emphasizes decision-making at the operating level, accompanied by dense information exchange and interaction in the decision-making process. As early as the 1960s, Western social scientists became aware of the "consensus-oriented", information intensive coordination system embodied in the ringisei, a system whereby a single document detailing a decision is circulated to every department affected, collecting the seals of managers to indicate assent (Yoshino 1968). The ringisei itself was much less important than the interaction-intensive processes it symbolized, which Ikujiro Nonaka (1988) has dubbed "middle-up-down management".

Researchers were slow to extend their focus beyond workplace dynamics within firms on the one hand and below the system level of governmental industrial policy on the other to a realization that the large industrial enterprise itself differed significantly in strategy and structure from its Western counterparts. By the mid-1980s the growing competitive success of Japanese firms led to a focus on the patterns in the ways in which Japanese firms competed domestically and internationally. This focus on strategy led to several studies that portrayed Japanese firms as having a widely-shared set of strategic behaviors: employing incremental strategies of continuous

improvement and related diversification that built on their existing businesses and technologies, exiting from unprofitable businesses much more slowly than their US counterparts, and being much less integrated vertically and diversified horizontally and more strongly oriented to growth strategies (Goto 1982; Kono 1984; Abegglen and Stalk 1985; Kagono et al 1985; Itami 1987; Aoki 1988). Until the latter part of the 1980s this pursuit of growth focused on expanding market share; in the last decade it has increasingly emphasized the development of high value-added products and businesses based on technological innovation. In their pursuit of growth-oriented strategies, Japanese companies are seen to have a high propensity to engage in cooperative networks (the kind of inter-firm cooperation dubbed “strategic alliances” in the management literature of the 1980s) with suppliers, customers, and even competitors in order to develop technologies and markets (Prahalad and Hamel 1990).

However, the data on individual firms that indicated much lower levels of vertical integration and horizontal diversification did not capture the fact that each major firm extended its reach both horizontally and vertically well beyond its formal boundaries, through extensive networks of subsidiaries and affiliated firms. Each of Japan’s leading industrial firms (and indeed its commercial firms as well) sits at the top of a “group” that bears its name: the Toyota group, the Hitachi group, the Toray group, etc. These vertical groups are dominated -- indeed created -- by a single lead (or “parent”) firm, which focuses its own activities on technology development and high value-added manufacturing (or, in other terms, R&D and final assembly).

This paper argues that neither the human resource management systems nor governance and control systems nor strategies in the Japanese business system can be adequately understood

without extending the focus of analysis beyond the individual firm to the vertical group. The following section provides a more detailed profile of this latest element to join the portrayal of the Japanese business system.

3. The Vertical Group

The vertical group or keiretsu structure was first identified and studied in the auto and electronics industries, where it is most strongly marked, but it characterizes virtually all sectors, service industries as well as manufacturing. Interest in these vertical *keiretsu* grew in part because of a surge of interest among social scientists in “intermediate forms” of organization between market and hierarchy (Imai and Itami 1984; Powell 1987, 1990; Hamilton and Biggart 1992; Eccles and Nohria 1992). But more pragmatically, the interest in the keiretsu extended well beyond academic circles into public policy debates and the pages of the business press, largely because of the difficulties experienced by Western businessmen in penetrating Japanese markets for industrial goods and in benchmarking their companies against their Japanese competitors. After tariff barriers had been dismantled, Western firms found that entry into industrial markets in Japan was complicated by vertical sourcing relationships in which large Japanese firms had “inside” and “outside” suppliers for most inputs. In these relationships the “insiders” seemed to have privileged positions: Western firms complained that large firms channeled information and innovations from the outside to the inside suppliers, which were legally separate companies, but had some proportion of the ownership held by the parent firm. Entrance into Japanese consumer markets also encountered the keiretsu system, as foreign companies found that many Japanese manufacturers (especially in autos and electronics) had subsidiaries engaged in sales and distribution, even to the retail level.

Simultaneously, when US firms tried to benchmark their organizations against their increasingly formidable Japanese competitors, they were often frustrated by the apparently small size of the incorporated enterprise: in 1989, for example, only eleven Japanese firms had more than 40,000 employees, in terms of the unconsolidated data on which the Japanese government and business press provided the most detailed financial and product information. The data in basic Japanese sources such as the Japan Company Handbook were and continue to be data on the individual company, according to Japan's domestic accounting practices. Although in the mid-1980s Japanese accounting standards were changed to mandate the reporting of consolidated data (in line with international practice, which demands that firms consolidate the financial performance of subsidiaries in which they own half or more of the shares), even today the individual incorporated enterprise, without the financial data even from its wholly-owned subsidiaries, remains the major unit on which performance is measured within Japan -- in the annual rankings of company size and performance published in the business press, for example.

In 1987, for example, when General Motors had over 765,000 employees, Toyota was listed in the Japan Company Handbook as having only 65,000, Canon as having just over 15,000 (compared to Xerox with 113,000), Fuji Photo as having just over 11,000 (compared to Kodak's 145,300). Clearly a more appropriate target for benchmarking was the group rather the lead firm in the group. But a General Motors trying to benchmark itself against the Toyota group instead of the parent company alone ran into difficulties of how to establish comparable boundaries, and both managers and academics began to realize that the problems of defining boundaries signalled fundamental differences in corporate form. Comparative analysis, in other words, had to face the

question of whether the key economic actor in the Japanese business system was “the firm” as understood in Western business literature, or a different kind of corporate form, the vertical group or keiretsu. But taking the vertical group as the key economic actor in the Japanese business system ran into the very pragmatic problem that whereas the formal boundaries of the corporation are defined by law, the boundaries of the group are not: they are defined by the group itself and by outside analysts as those in which the lead firm has some ownership stake, but many of the ownership stakes are too small to be identified without massive efforts in data collecting.

This creates some very real problems of cross-border comparison, and even problems of comparison across Japanese companies themselves. For example, measured by sales of the individual firm, Matsushita Electric is Japan’s largest electronics firm, with 4.55 trillion yen in sales in 1992. However, Hitachi, with sales of 3.81 trillion yen in 1992, claims to be the largest electronics firm in Japan, because when its consolidated sales rather than its company sales are taken as the unit of analysis (which means including the sales of the 818 subsidiaries in which it has an ownership stake of 50% or more), its sales total 7.53 trillion yen (Murayama 1994: 12), whereas Matsushita’s consolidated sales, with its mere 440 consolidated subsidiaries, only reach 7.1 trillion. On the other hand, one could argue that the overall sales of the Matsushita group as a whole might well exceed Hitachi’s total, since the group includes 706 companies, over a third of which are not consolidated. Among those unconsolidated subsidiaries are six that are listed on the Tokyo stock exchange, including one of Japan’s largest prefab housing firms (National Jutaku), one of its top elevator manufacturers (Nippon Otis) and a leading bicycle producer (Miyata Kogyo).

This complex group structure is not confined to the electronics industry. Toray Industries, a synthetic fibers and chemicals company that is listed as a single industry company in most diversification studies (e.g. Fruin 1992). However, it sits atop the Toray group of 186 companies, only 88 of whose sales are consolidated. The group includes 42 companies in the textile industry, 18 in housing and engineering, 12 in trade and distribution, and 60 in various new businesses (including, for example, Toray Medical, established in 1980, a pioneer in the synthesis of Interferon).

Examining the vertical groups in Japanese industry immediately raises questions about the relative importance of location effects, particularly country effects; industry effects; and individual firm effects on business systems in Japan. Comparative business system analysis explicitly that country level effects -- those that have nation-wide influence on social systems -- are the most important, overriding industry and company effects (Whitley 1992; Hamilton and Biggart 1992). The principal factors assumed to produce country effects include late development (the effects on a country's social systems attributable to the timing of its industrialization, which affects the kind of technology and organizational models available, the distribution of resources for development within the society, and the world system context of the nation's economy and polity -- see Dore 1973); the configuration of national institutions such as the legal system, political system, the financial system, the education and training system; and the labor system (Whitley 1992).

In contrast, some of the researchers who take an institutional approach emphasize location effects below the national level, focusing instead on sub-national regions or geographic clusters (Kogut 1993). Such work is likely to take into consideration the interaction effects between industry and location, since subnational clusters tend to be industry-specific. However, industry effects themselves, independent of locational factors, are assumed to be similar (though of course not identical) across countries. They are produced by the inherent features of the industry: its technology, the nature of its markets, and the structure of competition. Institutionalists would undoubtedly add an additional category of industry effects: cross-border learning within an industry, such that the organizational systems of the leading firms serve as models for emulation by other firms in the industry, whatever their home country. So-called “global industries”, dominated by a small number of firms who compete across countries, are particularly likely to be characterized by cross-border learning and adaptation (Westney 1992). Subnational studies usually analyze the interaction of location effects and industry effects.

Both country and industry effects are evident in Japanese vertical groups, although the country effect dominates. The vertical group structure clearly has a strong country component: it is the dominant mode of business enterprise in large Japanese firms across industries. A recent publication mapping the major industrial groups (one of a stream of popular publications on the subject in Japanese) provides overviews of the vertical groups of 40 of Japan’s major firms, covering all major industries: construction, food and beverages, chemicals, energy, steel, electronics, autos, trading companies, department stores, transportation, and real estate. Each has the same fundamental structure: a lead firm with a network of subsidiaries. For manufacturing firms, the subsidiaries tend to be of three major types: supplier firms, involved in

steps in the manufacturing processes which the lead firm dominates with final assembly; distribution and sales firms that handle products made by the lead firm (and its subsidiaries); and firms in diversified businesses.

Exhibit 1 provides 1993 data on average number of group companies per parent firm by industry for manufacturing firms, taken from the annual publication, Nihon no Kigyo Guru-pu (Japan's Industrial Groups), which compiles information on the related firms of companies listed in the first section of the Tokyo Stock Exchange.

Exhibit 1 about here

The average number of companies per group in all of industry, including the 826 non-manufacturing firms as well as the 1,003 manufacturing companies, was 22.6. Of the 33 industry categories tabulated by the publication (of which Exhibit 1 shows a representative subset, somewhat biased toward the industries where the groups are larger), only three have an average of fewer than 10 affiliated companies per parent: machine tools (19 firms with an average group size of 9.8 subsidiaries), ceramics (34 firms, with 9.8), and bicycles (9 firms, with 9.4). And although for many Western companies, most of their subsidiaries are their foreign operations, incorporated separately out of necessary deference to local commercial law, the Japanese groups are primarily domestic, as the exhibit makes clear: only in consumer electronics do foreign subsidiaries outnumber domestic, and then by only a very small margin. The group is clearly a widespread mode of organizing within Japan.

On the other hand, some industries are clearly oriented to larger groups -- or are populated by companies with larger groups -- than others. The industries which have both a fairly large

population of listed firms and relatively large groups are those which have been most internationally competitive and most widely studied: electronics, heavy electrical equipment, and autos. As one of the articles in the current Nihon no Kigyo Guru-pu points out, these industries lend themselves to specialization by subsidiary both in the manufacturing process (components and subsystems) and in distribution. And in these industries the major companies adopted a what the Japanese call a “full set” strategy: to have a full range of products in their major businesses, with all supporting activities and technologies contained within the group -- although not necessarily exclusively within the group (virtually all companies try to keep at least one outside supplier of key subsystems or components, as well as their “group” company).

But firm effects as well as industry effects are important. A closer look at the leading firms in the electronics (including both heavy electrical firms and consumer electronics firms) and auto industries reveals considerable variation across firms in the more fine-grained aspects of the structure of the vertical groups. Exhibit 2 shows the number of companies in the vertical groups of nine leading electronics and nine auto firms.

Exhibit 2 about here

The first observation that springs from these data is the variation across the size of the groups. For the three integrated electrical firms (Hitachi, Toshiba, and Mitsubishi Electric, which cover large systems as well as consumer electronics), the number of companies in each group roughly follows the scale of the firm: Hitachi, the largest, has the largest group. But Matsushita has a smaller group than Sony, its smaller rival; NEC than the less-diversified Fujitsu, and -- perhaps most surprising to those unfamiliar with Japanese groups -- Toyota’s group is smaller by half

than that of the number two firm in Japanese automobiles, Nissan. The size of the group is clearly determined not by the size of the parent's sales, but by the parent's history.

Some of that history is revealed by the data on how the group companies are distributed across two categories of "related companies" (kankei-gaisha in Japanese), both classified by their historical relationship to the lead firm. One type is the kogaisha, literally "child company".

These are companies created by the lead firm, usually by spinning out a division or department from its own organization. To take just one example, Matsushita Denshi Buhin (Matsushita Electrical Components) is Japan's -- and perhaps the world's -- largest electrical components manufacturer, and is a kogaisha of Matsushita Electric. The parent company began making electrical components in 1931, when it set up a Parts Department in its Radio Division. In the early 1960s, the department was elevated to the status of a division in its own right; in the early 1970s, it became a Components Group within the parent. Finally, in 1976 it was spun off into a separate company, of which Matsushita Denki owns 98.6% of the shares, making it a consolidated subsidiary (Shimura 1986).

In both the electronics and auto industries groups, kogaisha outnumber the second category of group company: the kanren-gaisha, usually translated as "affiliate" -- with the exception of two companies, both in the auto industry, Mazda and Fuji Heavy Industries. Affiliates are formerly independent companies with which the lead company has developed a long-standing relationship (usually as a supplier company), culminating in the lead company bringing the company into the group through the purchase of an equity stake. Often this is at the invitation of the affiliate. The size of the equity stake taken by the lead firm varies considerably, depending on the circumstances. One famous example in the electronics industry is Aiwa, a electronics company

established in 1951, which was brought into the Sony group in 1969 when Sony bought a substantial proportion of its shares, and which has continued to produce consumer electronics under its own brand name. It is, however, now a consolidated subsidiary of its lead firm.

As the previous example shows, either kogaisha or kanren-gaisha can also belong to another category of group company: the consolidated subsidiary, in which the lead firm has more than a set proportion of the equity . As was pointed out above, the consolidated subsidiary is a classification created by the introduction of more internationally accepted standards of accounting. There is enormous variation across companies in the extent to which the lead firm owns what Western management texts customarily call “a controlling share” in the firms in their vertical group. Some companies, like Hitachi, Sony, and Suzuki, own majority stakes in over four-fifths of the companies in their groups. Others, like Toshiba, Sanyo, Toyota, Nissan, Mazda, and Fuji Heavy Industries, own majority stakes in fewer than one-fifth of their group companies. But in most groups, the consolidated subsidiaries are a distinct minority of the group companies: in only 3 of the 9 electronics firms and 1 of the 9 auto firms are consolidated subsidiaries in the majority.

There is another categorization of group companies which has long been institutionalized in data on the groups: differentiation by function. Historically, each firm in the group tended to fit into one of three categories: manufacturing, sales and distribution, and quasi-related diversification. *Manufacturing subsidiaries*: These produce subassemblies and components, and in turn have a set of subcontracting affiliates that produce simpler components, in a production value chain that stretches across multiple formal company boundaries. Most of these firms also supply other

firms outside the group; few are totally tied to the lead firm in their group. And the lead firm rarely relies completely on the group firm for components, although group firms are preferred suppliers. The participation in the open market disciplines pricing on both sides and allows both the lead firm and the subsidiary to maintain a certain level of flexibility in their operations.

Turning once again for an example to Matsushita Denshi Buhin, the *kogaisha* that is Japan's largest producer of electronic components in the Matsushita group, we find that in the mid-1980s sales of its components to its parent and to other Matsushita group companies accounted for 45% of its total sales; the rest were to companies outside the Matsushita group (13% to customers overseas). Matsushita Denshi Buhin estimated that it supplied 50% of the internal Matsushita market for the kinds of components it produced; its President declared then that he aspired to raise that to 70-80% (Shimura 1986: 163). This was a goal that would be difficult to reach, given that other companies inside the Matsushita group produced some of the same kinds of components (the parent company itself produced film condensers and small motors like those produced by its subsidiary). But the very fact that it was publicly articulated gives some insight into the complex dynamics of competition within the vertical groups. Like other major manufacturing group companies, Matsushita Denshi Buhin has a small vertical group of its own: it has 7 *kogaisha* in Japan, and manufacturing plants offshore in 13 countries (Shimura 1986).

Many of the larger manufacturing subsidiaries have their own strong technology development capabilities; particularly in the automobile and electronics industries they work closely with their lead firms in new product development (Westney 1994). A small number of subsidiaries develop such strong capabilities in producing certain technology-intensive components or subsystems

that they become an industry leader in that sector (and in an even smaller minority of cases the sole supplier of the component not only for the lead firm but also for virtually all the firms in the industry). For example, Nippon Denso of the Toyota group has achieved this position in some areas of automobile componentry.

Sales and Distribution Subsidiaries: The lead firms in most industries have tended to put the sales and distribution function into separate subsidiaries, often on a regional basis. These firms concentrate on the activities involved in physically getting final products to the customer, especially supplying and supervising the retail outlets that are dedicated to selling the product lines of the parent company. The leading firms in consumer electronics as well as in autos have built up their own chains of retail stores. Matsushita's market dominance in Japan is widely attributed to the 25,000 National (Matsushita's major brand in Japan) shops distributed throughout Japan; Toshiba and Hitachi each have about 15,000, and Mitsubishi Electric about 5,500 (Murayama 1994). Most of these stores are owned by individuals, but their activities are closely supervised by the regional sales subsidiaries. Marketing strategy and the direct interactions with lead users that feed into new product development are still the province of the lead firm.

Exhibit 3 shows the distribution across functions of the consolidated subsidiaries within the groups for the eighteen firms in the electronics and auto firms covered by Exhibit 2 (detailed information on functional distribution is only readily available for the consolidated companies, and not even for all of those for the Hitachi and Toshiba groups: those two companies provide this data only for their major consolidated subsidiaries).

Exhibit 3 about here

Clearly the electronics and auto industries differ somewhat in the relative salience of sales subsidiaries, at least among the consolidated subsidiaries: in all but one of the auto firms, domestic sales subsidiaries substantially outnumber manufacturing subsidiaries, whereas their weight in the electronics industry is much less substantial. The pattern of setting up separate kogaisha in manufacturing and sales is carried overseas, making, as we shall see below, for some interesting challenges in international management.

Subsidiaries in Quasi-related Businesses: Most of Japan's leading industrial groups are involved in a wider array of businesses than those of the lead firm. The lead firm assiduously develops new business areas that are closely related to its core capabilities; businesses that involve substantially different technological or market capabilities are usually put into separate subsidiaries. For example, both Toyota and Matsushita have a subsidiary in their group engaged in producing and selling prefabricated housing. Most of the large industrial firms set up financial services and real estate subsidiaries during the "bubble" years of the 1980s, when the profit opportunities in those sectors vastly overshadowed those in manufacturing. Such subsidiaries are rarely brought into the group by acquisition; they are "kogaisha" set up by the parent firm, sometimes in joint ventures with other firms, both domestic and foreign, and often staffed largely by the parent's employees, who are transferred or "dispatched" to the new venture. In addition, particularly in the electronics industries, some of the subsidiaries are engaged in final assembly of relatively mature products whose profit margins have been eroded by competition, products which at earlier stages of the product life cycle were assembled by the parent but whose production has been hived off into separate subsidiaries.

4. Coordination and Control in the Vertical Group

How the lead firm in the vertical group manages this extended network is still a matter of speculation rather than analysis. As we saw in Exhibit 2, ownership strategy, viewed as a basic control mechanism in North America, constitutes an important but complex element of the vertical group. The boundaries of the group are defined by the fact that the lead firm has a direct ownership stake in many of its member companies and an indirect stake in others, in the form of equity held in third or fourth tier companies by its direct subsidiaries. But the size of the ownership stake varies considerably across firms. As we saw, although Honda and Toyota have built groups of roughly comparable size, Honda has a “controlling” stake in a much larger proportion of its group companies than does Toyota (57% compared to 14%), and yet Toyota is widely seen as having stronger control over its group than Honda.

Clearly ownership is only one aspect of the coordination and control system of the vertical group. Other elements, however, are much more difficult to measure: unlike shareholding, they are not a matter of public record. They include: the interconnections of the value chains (that is, the flow of “things” across the formal boundaries of the companies); the flows of financial resources in forms other than equity; flows of information and technology, and, most importantly, flows of people.

Flows of “things”: The flow of components and sub-assemblies up an extended chain of manufacturing subcontractors is probably the model of the vertical group most frequently encountered in the Western business literature. Often this literature does not make a clear distinction between the suppliers that are regarded as members of the group (both internally and

in the eyes of the outside world) and those that are not. Even recent analyses that acknowledge that two types of suppliers co-exist (the group and the independent suppliers) avoid the issue of whether the two groups are treated differently (e.g. Dyer and Ouchi 1993).

The potential power of the mutual interest of supplier and customer in a value chain is one of the key elements in the concept of the “network” models of the corporation in the West (for example, Kanter 1989; Dertouzos et al 1989). However, the supplier flows of “things” is only one element of the flows in the group: the other major element is the flow of products to the sales and distribution companies from the parent and from those subsidiaries engaged in making complete products (more common in the electronics than the auto industry). Clearly the sales and distribution companies within the group are the most dependent on the parent: they sell and distribute only the products of the parent company, and produce none themselves. And the group companies in quasi-related businesses are least dependent on the parent and other group companies for flows of components, products, and materials. The complexities of the Japanese case, where suppliers fall into two categories, where one is used to discipline the other into efficiency, and where supplier management is part of a larger pattern of network management, have yet to be adequately explored.

Some recent data suggests that we may find significant industry effects on these network relationships. The latest volume of one of the standard reference works on the vertical groups (Nihon no Kigyo Guru-pu '94) contains an analysis of the profitability of the groups in autos and electronics over the last five years-- admittedly based on the very small subset of the companies in each group for which detailed performance data are available. The analysis shows

that the profits of the group companies in the auto industry were much more closely related to those of the parent firm than in the electronics industry, and that the group companies were consistently less profitable than the parent. In electronics, there was much greater variation in pattern across groups, and often (NEC for three years 1989-91, Fujitsu 1989 and 1990, Mitsubishi Electric in 1989, 1991, 1992, and 1993) the group companies were collectively more profitable than the parent. The analyst attributes this industry difference to the greater parent company control of transfer prices in the auto industry, due to its greater power in an industry of relatively few end users, and the greater proportion of the business of the electronics group companies that involved producing their own end products, as opposed to components and subsystems. This indicates that where the group companies are engaged in a “food chain” where assembly of the final product tends to be monopolized by the parent firm, parent control of the relationship is much stronger.

Flows of financial resources: Equity is only one means by which the lead firm supports its subsidiaries financially. The others are direct loans or shared financing of necessary investments in equipment (including information systems), and the facilitation of bank loans, which are often easier for a subsidiary to obtain if they are guaranteed by the lead firm. The company for which the financial control system is best known is Matsushita, famous in Japan both as a firm that relies heavily on financial controls and as the pioneer of organization by business divisions (Matsushita claims to be an independent originator of the multi-divisional enterprise, introducing it in the early 1930s). The Matsushita system, put in place by the founder, Matsushita Konosuke, is that no Matsushita business division or group company can raise financing on its own initiative: it must come to the headquarters to borrow the needed resources. Headquarters

generates this funding by taking 60% of the profits of each division or related company. In this system, no distinction is apparently made between the internal business divisions, the kogaisha (called bunsha in the Matsushita lexicon, meaning companies spun out from the parent), and the kanren-gaisha. Matsushita also states that if a division of group company loses money for three quarters, top management will be replaced (Murayama 1994: 130). Matsushita clearly has ways of drawing financial resources from its group companies in addition to the obvious routes of returns on its shares (a mechanism probably more often used for wholly-owned subsidiaries) or transfer pricing (maintaining prices advantageous to the lead firm in terms of lower prices for subassemblies and components bought in from subsidiaries and higher transfer prices on products sold through the sales and distribution subsidiaries).

Personnel: The lead firm transfers its own employees to its subsidiaries in two ways: on temporary assignments, both as a mode of career development for the individual and as a way of improving the operations or the control of the subsidiary, and on permanent transfer. Often at the time of transfer it is not clear to the employee whether the assignment is temporary or permanent, and in many cases the lead firm's personnel department itself may be reserving judgment, depending on the employee's performance over the term of his posting. The flow of personnel is overwhelmingly from the parent to the subsidiary; reverse transfers tend to be shorter in duration and clearly designated as project-linked and temporary.

This outflow of personnel from lead firm to subsidiaries has several functions, and is critically important in the human resource management systems of the lead firm in the group. It clearly maintains strong communications links across the boundaries of the firms; it facilitates the

transfer of technology and knowhow between lead firm and subsidiaries; and it enables the lead firm to stay “lean” and to select only the high-commitment and high-performance employees from its labor pool; and to provide senior management positions for its managers who have “plateaued” in the lead firm. The ability of lead firms to relegate lower-performing employees to subsidiaries helps to explain the Japanese employees’ continuing commitment to work and performance that so bemused Western analysts of Japanese firms in the 1970s and early 1980s. Commitment is sustained in a regime of “permanent employment” and the seniority wage system in part because of the ever-present prospect of transfer into the lower prestige and lower reward subsidiaries. And yet the move to subsidiaries was not in itself de-motivating in the new context: it provided the prospect of rising to the high-prestige position of company president or director for hundreds of managers who did not have such an opportunity in the lead firm. There is only one president of Hitachi; there are over 800 presidents in the Hitachi group.

Exactly how extensive this movement really is can be difficult to establish. Aoki (1988: 66) cites data from Japan’s Central Labor Commission showing that in 1985 8.2% of the total employees in manufacturing firms with over 1,000 employees were on assignment in group companies. Whether this figure would be larger or smaller if only the lead firms in the major vertical groups were included is a matter of speculation. These data cover all employees, rather than just managers. The Nihon Kigyo no Guru-pu ‘94 provides some interesting data on the transfer of the top management levels (Exhibit 4).

Exhibit 4 about here

As of 1993, for (again) a very limited subset of the consolidated subsidiaries, the proportion of company officers (including the Chairman, President, Vice-Presidents, Directors, and Auditor)

coming from the parent company was substantial: well over a third in 6 of 7 electronics firms, and from nearly a quarter to a third in the three auto firms for which data were compiled. The industry effect here is demonstrable: the electronics firms show a remarkable similarity across companies, and the proportion is much higher than in the auto industry. This suggests that the various modes of coordination and control are inversely related: in the auto industry, where the flow of “things” makes the group companies more dependent on the parent, the flow of officers is a less important mechanism. That the one exception in the electronics industry is Matsushita provides some support for this hypothesis: Matsushita’s justifiably famous tight control of financial flows may serve to lower the importance of the flow of company officers as a control mechanisms.

Flows of Information and Technology: While the transfer of personnel is an extremely important vehicle for transferring information and technology across the vertical group, it is by no means the only method. The density of information flow between lead firms and their suppliers in general has been traced in particular detail in the automobile industry. The flow of information of all kinds, particularly between the lead firms and their manufacturing and sales subsidiaries, is extremely dense, and carried out both in highly standardized formats and through constant interpersonal interactions. It should be noted that until very recently, these systems have been managed without the benefit of the high-performance information systems made possible by the development of personal computers, local area networks, etc.

Individual firms vary considerably in the way they balance these various means of coordinating and controlling their subsidiaries, and relatively little empirical research exists on the topic.

Hitachi, for example, has a propensity for higher levels of ownership, and consequently has a larger “vertical group” than many other firms. Aside from the ownership linkages, however, the flows of resources within the vertical network are extremely difficult to trace. One of the most interesting questions for the management researcher -- the extent to which these coordinating mechanisms vary between subsidiaries in the vertical network and companies outside the group with which the lead company has a long-term relationship -- is one which in these sensitive times Japanese managers are unlikely to want to have measured.

5. Explanations for the Emergence and Persistence of the Vertical Network:

The dominance of the vertical group as a corporate form across industries in Japan suggests that there is a country-level explanation for its development, and indeed not surprisingly, country-level explanations have dominated discussions of the phenomenon. Just as the financial controls and management systems of the U.S. multi-divisional form of the corporation are seen to owe much to the historical circumstances and business environment of the United States (Chandler 1962; 1977), so the vertical network of the Japanese industrial firm is regarded as a product of the Japanese postwar business environment.

One factor that looms large in explanations of the development of the vertical keiretsu is fundamentally political: the postwar labor settlement. As part of the extensive management-labor compromise that ended the fierce conflicts of the immediate postwar years, management agreed that members of the enterprise union (which included all employees, including college graduates up to their first promotion into management) would receive wages calculated on homogenized criteria, in which education and seniority were the factors most heavily weighted. In consequence, it was extremely difficult for management to differentiate across jobs or departments depending on the value added by their activities. Wages and salaries were pulled to

the highest common denominator. This constituted a powerful incentive for management to put lower value adding activities into separate subsidiaries, in which wages were internally homogeneous but differentiated from those in the parent firm.

Another set of explanations looks at strategic adaptations to the postwar business environment.. In this approach, the use of subsidiaries for horizontal diversification by the lead firm in the group invokes risk-shifting: that is, in new business areas, where the firm is stretching its capabilities, a separate enterprise avoids putting the name and the resources of the parent firm at risk. This is seen as particularly important in the Japanese business context, where the lifetime employment system imposes serious barriers to exit from unsuccessful business and where reputation is seen as a more important business asset than in the United States (Aoki 1988).

Still another set of factors has been invoked to explain the resort to smaller, more focused companies through the vertical network: the limitations on the face-to-face, relational kinds of coordination and control systems favored in Japanese companies. Itami Hiroyuki has established that Japanese firms seem to run up against limits to scale more quickly than their U.S. counterparts, and has suggested that this may be due to the fact that, given the enormous complexities of the Japanese written language, Japan never really experienced the first office revolution introduced by the typewriter (Itami 1984). Whatever the technological basis, it is clear that the coordination and control systems of Japanese firms today do rely heavily on face-to-face interactions, and that these clearly function less effectively in very large, vertically integrated firms than do more impersonal, less information-intensive systems.

All these explanations portray the emergence of the vertical de-integration of the firm as a response to problems and constraints, both those imposed on the firm from the business environment (labor cost explanation, risk shifting) and those rooted in the limitations of the firm's own coordination and control systems. It is difficult to assess the validity of these historical explanations, however plausible they may seem, in the absence of detailed case studies of the evolution of some of the vertical groups over time.

But once the system developed, it was clear that it conferred a set of advantages on those firms who were able to use it effectively. Those advantages have sometimes been invoked to explain why the vertical group exists. These functionalist explanations are better viewed as reasons why the group has persisted and the prospects for its serving as a model for other business systems, rather than as explanations for its original development.

The vertical network form of the corporation that emerged as the dominant form in postwar Japan turned out to have a number of unanticipated consequences, many of which constituted an improvement on more vertically integrated firms.

- The disaggregation of activities along the value chain made costs more transparent and therefore controllable.
- The lead firm focused on core activities, which were primarily the high value adding activities of technology development and high value added manufacturing. This focus on technology-intensive activities made technology a more salient element of corporate strategy, and contributed to the technological dynamism of the firm;

- Even large firms stayed relatively small: in 1990, only eleven Japanese manufacturing firms employed more than 40,000 people. This smaller size also contributed to the flexibility and dynamism of the firm, helping it to move quickly into new related technologies and product markets;
- The lead firm was able to achieve a greater efficiency in wages, keeping only high value adding activities on its employment roster and rewarding its high commitment, high value adding employees appropriately;
- The ability of the lead firm to send employees into subsidiaries, often in positions higher, at least in terms of titles, than those to which they could have aspired in the parent firm constituted an important incentive system in a status-oriented incentive system. It has only been recently that analysts of Japanese business have realized the extent to which the large firm's implicit contract with employees to ensure their employment up to retirement age meant employment within the vertical group, not necessarily employment within the lead firm. But for managerial employees the prospect of employment outside the parent, in other group firms, came with the implicit promise of a rise in status. On the other hand, the highest-status positions remained those within the parent. The lead firm was able to keep -- or to recall -- the best employees. The lead firm has thereby been able to monopolize not only high value-adding activities in its value chains, but also high value-adding, high-commitment employees.

Imai Ken'ichi has also pointed to an advantage of the vertical network for the business system as a whole: the rapid diffusion of technology and knowhow through the industrial system. The fact that relatively few of the firms in the value chain produce exclusively for the lead firm means that

innovations in product and process tend to diffuse fairly rapidly through the system. While this may be a short-term disadvantage for any single innovative lead firm, even that firm benefits in the long run from the greater dynamism and efficiency of the system as a whole.

On the other hand, the vertical network form is not without its disadvantages. The ties between the lead firm and its subsidiaries make it difficult for new firms to break into the networks of the lead firms, which are Japan's "lead users" and key players in the development of innovations. This may have constituted a brake on the expansion of new firms in Japan's major industries. A second disadvantage is that the group ties make it even more difficult for firms from abroad to break into the marketplace -- which may constitute a short-run advantage for Japanese firms, but which has made the system vulnerable to outside pressures, and has contributed to the strengthening of the yen, which has in turn threatened to negate the cost advantages conferred by the vertical network. Another consequence of the vertical network, which has neither clear advantages or disadvantages, is that because one of the key management skills is managing the linkages across firms in the network, managerial capabilities are less transferable across firms/groups than in industrial forms that depend more heavily on analytical skills and impersonal coordination and control systems. The lower inter-firm mobility in Japan may therefore be as much a function of the pervasiveness of the vertical network as it is to any cultural preferences for loyalty and stability of employment.

Finally, internationalization of the vertical network is a more complex process than for more integrated forms of organization. The lead firm's focus on final assembly means that it faces serious managerial challenges when it locates production abroad. If it continues to draw its

subassemblies and components from its subsidiaries in Japan, it will negate many of the cost advantages of locating production offshore and will contribute to the direct rather than the inverse link between foreign direct investment and trade that has been the hallmark of Japanese FDI. If it tries to recreate its vertical network in the new location by drawing its subsidiaries in its wake, it will be criticized for trying to “Japan-ify” the local business system. Recreating the vertical network using local firms is a politically preferable option, but it takes time and puts at risk the efficiency of the final assembly process -- and local firms with the required capabilities may simply not be available. Internationalization of production therefore becomes a relatively slow and incremental process, one that for Japanese firms has been overtaken by the speed of the strengthening of the Japanese currency.

6. Prognosis for the Future: The Evolution of the Japanese Business System

The last decade has seen a growing body of analysis describing the essential “system-ness” -- the close interrelationship and mutual reinforcement among various elements -- of the Japanese business system (e.g. Itami 1987; Aoki 1988; Whitley 1988; Imai and Komiyama 1994). The flow of employees from the lead firm into the subsidiaries of the vertical group is a critical element sustaining the long-term employment commitment and the human resource management system of the lead firm, as we noted above, and reinforces and mirrors its diffuse coordination and control system. Long-term employment and the company’s control of its employees careers make the intra-firm and intra-group coordination and control system possible. The human resource management system, the coordination and control system, and the vertical group all contribute to the preference for incremental and growth-oriented strategies.

In addition to the intra-system reinforcement, key institutions in the external environment have also evolved in a mutually supporting system. The lead firm's strong control over the careers of its employees is made possible by the nature of Japan's labor markets, in which the large industrial firms have an implicit agreement not to "poach" each other's mid-career employees, but to recruit instead primarily new graduates, giving mid-career employees little alternative of lucrative employment outside their current employer. Mid-career employees, particularly mid-career managers, have been unlikely to find comparable jobs if they leave their company because they are reluctant to accept a posting to a subsidiary, for example. The conservatism of Japanese banks and the relatively less developed equity markets of postwar Japan have also served in the past to reinforce the importance of the financial advantages that a lead firm could bestow on its subsidiaries. And the cultivation of the hierarchical nature of supplier-customer relations cultivated by Japanese firms as a source of competitive advantage for the most deferent and cooperative supplier meant that the "food chain" of suppliers could more easily be dominated by the lead firm -- the ultimate customer.

Many Japanese economists over the last decade directed considerable effort to demonstrating that the features of the Japanese business system, particularly the human resource management system, were rational adaptations to an environment of high growth rates, technology followership, and scarce human resources (see the various articles in the Imai and Komiyama collection 1994). The question facing Japanese managers and researchers focused on the Japanese business system is therefore whether the business system must change significantly to adjust to the changes in the environment of the post-Bubble era within Japan. Exhibit 5 presents the data on what many believe to be the two greatest challenges facing the business system: the domestic

recession, which has persisted for the last four years and shows few signs of alleviating, and the strong yen.

Exhibit 5 about here

The strong yen reinforces the need for Japanese companies to internationalize production more rapidly, intensifying the challenges for the vertical network structure outlined in the previous section.. But more vulnerable to the economic changes is the human resource management system. Many Japanese firms responded to the onset of the recession by cutting back drastically on their hiring of new graduates. As the recession persisted, many continued to hold back on hiring, creating problems for the new graduates each year, whose employment prospects became increasingly uncertain. Japan's demography has complicated the problem: the "second baby boom" -- the children of the first postwar baby boom of 1947-49 -- is now entering the job market. The number of college graduates in 1995 was the highest in Japan's history, but it will be surpassed by the size of the graduating class of 1996 (JEI Report No. 43B: 5). The difficulties for many companies are compounded by the fact that they hired unprecedentedly large numbers of college graduates during the "Bubble" years of the late 1980s and early 1990s. A seniority-based system finds it extremely difficult to cope with major imbalances in the size of cohorts, imbalances sustained over three to five years.

What are the prospects for changes in the Japanese business system? Most academic researchers and indeed most leading Japanese executives do not share the apocalyptic visions of impending transformation signaled by such headlines in the popular press as "Japan Inc's Demise" (Time International July 10, 1995). But, to oversimplify considerably, one can identify three differing perspectives on change in the business system. One is the strategic or rational perspective, most

strongly represented among economists, that emphasizes the role of environmental selection regimes. For this group, the low growth environment constitutes a selection regime that will reward companies that experiment successfully with alternative modes of organization. Some of these may be new companies, such as arose in Japan in the wake of World War II; some may be old companies experimenting with new forms. A key indicator in this approach is whether we see a change in the demography of key industries, involving the rise or the growth of companies experimenting with new organizational forms. One of the current problems is the high level of uncertainty over what those new forms might be. A featured set of articles in the July 1994 issue of President, the Japanese equivalent of Fortune, asserted that the Japanese personnel system was likely to change. However, most of the writers and the numerous personnel managers and executives they interviewed admitted that they had no clear ideas of how it would change.

A second perspective is the political, which sees change as driven by shifts in the power of internal and external stakeholders in a business system. In this perspective, the demographic factors inside and outside the corporation may be the most significant, creating cohorts of managers who have little to gain from the perpetuation of the current system in view of the demographic imbalances in the firm. In this perspective as well, the human resource management system is the most vulnerable element of the Japanese business system, and given its centrality in its “system-ness” as presented in current analyses, this would affect the entire system. The changes that would have the greatest import for the system as a whole do not concern the specifics of the reward and employment system, but are changes that would weaken the company’s control over the individual career, and hence weaken the company’s ability to move

people freely across departments and across company boundaries as part of the coordination and control system of the vertical group.

Finally, those who emphasize the centrality of institutional elements in the business system are skeptics that significant changes will occur. In the language of institutional theorists, the Japanese business system may be in a period of “de-institutionalization”, in which both its normative and cognitive institutional aspects -- the belief in its value and the extent to which it is taken for granted -- are both under siege. However, given the embeddedness of the Japanese business system, the current process of de-institutionalization will not necessarily lead to a new process of institutionalization of alternative forms. At most, in a highly institutionalized system, one can expect to observe adaptations of existing elements of the business system. There may, however, be a prospect that just as the Japanese firm has followed incremental innovations and incremental strategies to a point of genuine change and innovation, so the business system will evolve incrementally to significantly different patterns.

¹ See, for example, the English translation of a 1988 volume on the Japanese business system, Business Enterprise in Japan edited by Kenichi Imai and Ryutaro Komiya (translation edited by Ronald Dore and Hugh Whittaker, MIT Press, 1994), which has five sections: the first two (“The Firm” and “Intercorporate Relations”) cover the features summarized here under “governance and coordination” and “structure”; the third, “Enterprise Behavior”, covers strategy, and the fourth “Human Resources”. The fifth covers public and cooperative enterprises.

² Source: Nihon Kigyo no Guruppr '94, p. 17.

**EXHIBIT 1: AVERAGE NUMBER OF COMPANIES IN A VERTICAL GROUP 1993, BY
INDUSTRY**

Industry	Affiliates per parent	No. of parent cos	No. of subsidiaries	Domestic subs.	% of subs in Japan
All manufacturing	24.2	1,003	24,320	18,038	74.17
Cement	90.3	3	271	262	96.7
Shipbuilding	73.9	10	739	599	81.1
Petroleum	60.4	10	604	493	81.6
Consumer Electronics	55.4	36	1,996	994	49.8
Heavy Electrical	54	29	1,566	1132	72.3
Autos, parts	40.2	53	1,905	1311	68.8
Chemicals	31.6	116	3,670	2,841	77
Steel	30.9	25	772	628	81.3
Textiles	28	60	1,684	1,439	85
Precision instruments	25.9	34	869	520	59.8
Food products	22.1	80	1,604	1,398	87.1
Rubber	16.9	17	738	554	75.1
Commercial equipment*	13.8	86	1186	820	69.1
Metal products	12.2	45	545	490	89.9
Machine tools	9.8	19	187	106	56.7

EXHIBIT 2: Composition of Vertical Groups, Electronics and Autos 1993

Company	Total number of group firms	Kogaisha (Child Co's)	Affiliates	% of group Kogaisha	Consolidated Subsidiaries	% consolidated
Hitachi	1004	818	186	81.47	818	81.47
Toshiba	689	532	157	77.21	134	19.45
Mitsubishi El.	237	145	92	61.18	98	41.35
NEC	293	164	129	55.97	105	35.84
Fujitsu	531	438	93	82.49	365	68.74
Matsushita*	706	706			313	44.33
Sharp	68	43	25	63.24	20	29.41
Sony	885	836	49	94.46	749	84.63
Sanyo	242	146	96	60.33	44	18.18
Toyota	319	182	137	57.05	45	14.11
Nissan	696	550	146	79.02	100	14.37
Honda	374	281	93	75.13	214	57.22
Mitsubishi Motors	260	199	61	76.54	63	24.23
Mazda	217	69	148	31.80	11	5.07
Isuzu	223	157	66	70.40	61	27.35
Daihatsu	83	56	27	67.47	33	39.76
Suzuki	144	130	14	90.28	124	86.11
Fuji Heavy Ind.	116	46	70	39.66	20	17.24

*Matsushita does not provide data that distinguish between the categories of subsidiaries.

EXHIBIT 3: CONSOLIDATED SUBSIDIARIES, BY COMPANY BY FUNCTION
LEADING ELECTRONICS AND AUTO FIRMS, 1993²

Company	Consolidated Subs.	Domestic: Manuf.	Domestic: Sales	Domestic: Other	Overseas: manuf.	Overseas: Sales	Overseas: Other	% Con: Domestic
Hitachi	818	25*	10*	8*	14*	4*	1*	
Toshiba	134	19*	7*	8*	16*	10*	4*	
Mitsubishi El.	98	23	26	22	11	10	4	
NEC	105	37	19	27	10	8	4	
Fujitsu	365		119		246			
Matsushita	313	40	22	14	70	23	144	
Sharp	20	2	4	3	6	4	1	
Sony	749	68	3		53	34		
Sanyo	44	7	18	3	10	6		
Toyota	45	3	4	1	7	8	22	
Nissan	100	7	58	10	4	12	9	
Honda	214	8	156	6	21	13	10	
Mitsubishi Motors	63	4	40	3	2	5	9	
Mazda	11	2	3	2		4		
Isuzu	61	2	53	3	3			
Daihatsu	33	3	25	3	2			
Suzuki	124	10	96	5	4	9		
Fuji Heavy Ind.	20	3			1	3	13	

*Data on categories of subsidiaries provided only for a subset of the subsidiaries.

Exhibit 4: Dispatch of Company Officers to Subsidiaries, Selected Companies

COMPANY	Number of Subsidiaries included	Total Number of Company officers	Number Dispatched from Parent	Number Dispatched from other subs
Hitachi	22	382	148 (38.7%)	5
(<20% owned)	18	18	6 (33.3%)	
Toshiba	11	184	69 (37.5%)	
Mitsubishi El.	7	129	47 (36.4%)	
NEC	10	176	66 (37.5%)	
Fujitsu	10	167	79 (47.3%)	
(<20% owned)	1	9	4 (44.4%)	
Matsushita	12	214	38 (17.8%)	21
Sony	4	60	34 (56.7%)	3
Toyota	17	400	96 (24.0%)	6
(<20% owned)	9	204	32 (15.7%)	
Nissan	26	397	129 (32.5%)	6
(<20% owned)	5	114	5 (4.4%)	
Isuzu	6	103	25 (24.3%)	
(<20% owned)	2	34	3 (8.8%)	

Exhibit 5: Economic Indicators 1985-1994

YEAR	% change in Gross Domestic Product from previous year	Yen/US\$ Exchange rate
1985	6.2%	238.5
1986	4.3%	168.5
1987	4.6%	144.6
1988	6.4%	128.2
1989	6.7%	138.0
1990	7.5%	144.8
1991	5.3%	134.7
1992	0.4%	126.7
1993	-0.4%	111.2
1994	0.5%	102.2

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