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Business Diversification/De-diversification of Japanese Companies : An Empirical Analysis Using Firm-level Micro-data

Masayuki Morikawa

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Abstract

This article, by using micro data obtained through "Basic Survey of Business Structures and Activity" on a corporate level, tries to clarify business structure of Japanese companies, including diversification, de-diversification, and transfer of some activities into subsidiaries. It also aims to reveal the factors affecting them and their effect on corporate performance.

There was a tendency that companies select and limit industries in the process of business restructuring. This is not only for parent companies , but also for subsidiaries and affiliates.

The factors affecting diversification included corporate scale, R&D, average wages, and establishment year. Growths in core business sales, corporate scale, R&D, average wages, employment fixity, existence of parents, initial structure of operations had relations with 'changes' in business structures. The factors affecting the business structure of subsidiaries and affiliates included corporate scales, R&D, and establishment year (of parents). Some differences were observed between the determinants of holding domestic and overseas subsidiaries and affiliates. Relations between the breadth of business activity of a parent and that of its subsidiaries and affiliates are complimentary.

Positive effects upon profitability by de-diversification of business were observed in some of the cases, but the effects are not so definite. No systematic relations were observed between subsidiary development and profitability.

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Counsellor, Embassy of Japan in Australia

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1. Introduction

(1) Background[*1]

Faced with the prolonged economic recession Japanese companies have introduced a variety of restructuring measures, which include controlled recruitment and the rationalization of indirect sections. In addition, they have concentrated managerial resources into their strong business areas, while abandoning unprofitable sections under the catchphrase of 'selection and concentration'. In the restructuring of 'structurally stagnant industries' in the 1970s and 1980s, companies apparently tended to diversify into new areas, as their main operations grew stagnant. Current restructuring efforts seem considerably different from those in the past.

Such concentration of corporate efforts on their strong areas has also been frequently observed in the U.S. since the latter half of the 1980s. The U.S. cases are characterized by changes in business areas through active M&A. In the meantime, it has been pointed out that theoretically speaking, agency problems have led to excessive diversification. Many empirical studies have shown that the 'de-diversification' or 'corporate focus' by U.S. companies has positively affected management performance, productivity, etc (Wernerfelt and Montgomery [1988], Lichtenberg [1990, 1992], Markides [1995], Berger and Ofek [1995], Comment and Jarrell [1995], etc.).[*2]

As for Japanese policies, the Industrial Structure Council, since 1993, has suggested the necessity for 'specialization into strong areas' by companies. The council has also proposed the introduction of systematic reforms to that end, including the lifting of a ban upon shareholding companies, relaxation of regulations upon corporate mergers, simplification of merger procedures provided by the Commercial Code, and enhanced liquidity of the labor market.[*3] Some of the proposals have already been realized.

Discussions have recently focused on legal reforms, as well, aiming to allow the smoother establishment of a subsidiary with responsibility for particular business activities of the parent. Traditional industrial policies have given top priority to the promotion of growth industries. Industrial policies of today, however, focus their attention upon 'companies', instead of 'industries'. In other words, their emphasis has been shifted to the promotion of new, vigorous companies and the creation of an environment facilitating the restructuring of existing companies. The purpose of this report will firstly be to clarify what types of companies are making active efforts for structural changes, in order to examine problems surrounding future industrial policies.

In considering such corporate activities, it is necessary to pay attention not only to parents, but also their subsidiaries. It is very important managerially to decide which part of the business will be placed under charge of the parent and which part will be handled by its subsidiaries.

Recently many people seem to have positive views towards the establishment of subsidiaries. According to such people, subsidiaries are more suitable for the flexible operation of companies, or the establishment of subsidiaries results in improved corporate management efficiency. At some time in the past, however, the importance of economies of scale, economies of scope, and 'synergy effects'[*4] was emphasized. In light of these, many studies are being conducted upon the 'boundaries of companies' and 'separate operation of particular business activities through subsidiaries'. Some argue that trading costs affect the decision to establish a subsidiary.[*5]

In consideration of such situations, this research makes quantitative analysis of (1) the realities of diversification/de-diversification of business activities at Japanese companies, (2) factors affecting diversification/de-diversification, (3) effects produced by diversification / de-diversification upon management performance of respective companies, in the first half of the 1990s.[*6] The analysis are based upon micro data quoted from "Basic Survey of Business Structures and Activity" conducted by the Ministry of International Trade and Industry. Activities of both parent companies and their subsidiaries and affiliates are analyzed. This article aims to clarify to what degree the tendency of 'corporate focus' has become apparent in Japan and how the scope and range of companies are related to profitability and growth.

Many empirical studies have been conducted concerning corporate diversification.[*7*8*9] Most of them, however, cover a relatively limited number of large companies. On the other hand, this article utilizes thousands of companies including small companies as samples. In the meantime, analyses in many of the other studies conducted so far are based upon sectional data shown in the "Annual Securities Report" prepared by relevant companies, or questionnaires. As a result, figures representing the ranges of business activities are far from objective. In comparison, the data used in this article, namely sales breakdown by industrial line and distribution of subsidiaries, follows the statistical, three-digit industrial classification. In other words, the measurement of business activities follows objective and uniform criteria.

In addition, only a few studies have quantitatively compared business activities of a parent and its subsidiaries. This article analyzes not only business activities of parents but also the activities of their subsidiaries.

(2) Data and Processing

The data used in this report are quoted in principle from the individual sheets included in the "Basic Survey of Business Structures and Activity" (1992 and 1995) conducted by the Ministry of International Trade and Industry. The subject companies (4,491 companies in total) are headquartered in Tokyo and were surveyed in both 1992 and 1995. The statistical survey was first conducted in 1992 for clarifying the status quo of corporate activities. It covers companies of a specified scale or larger (with 50 or more employees and capital worth ¥30 million or more) that are engaged in mining, manufacturing, or the distribution industry.[*10] The research includes data on sales by industrial lines of business at respective companies in compliance with the three-digit industrial classification[*11] and provides extremely useful information for the analysis of developments and changes in business activities of respective companies. One of its important

characteristics is that it gives information by 'company,' while many of the traditional statistics are based on respective 'establishments.'

The 4,491 samples account for only 17 to 18% of the surveyed companies (throughout Japan) in terms of the number of companies but generate over 50% of total sales. Thus, the coverage of the research is relatively wide.[*12] Further, the samples included 2,186 small and medium companies (as defined by the Basic Law on Small and Medium Sized Enterprises) in 1992 and 2,196 in 1995. Hence, the research covers companies of various sizes, from small to large companies.

Covering such samples, matrices showing the distribution of sales by industrial line were produced for 1992 and 1995, respectively (refer to Table 1). The number of active industries, core business ratios, Herfindahl indices, etc. were calculated based upon the matrices for each year. Secondly, data for each company for the two years was combined for the calculation of 'changes' in the number of active industries, core business ratios, Herfindahl indices, as well as the scales of business conversion (structural change indices, etc.). Matrixes showing the number of subsidiaries and affiliates in each industrial lines of business (three-digit industrial classification) were also prepared, because no data are available on sales of subsidiaries and affiliates. The number of active industries, ratios of core business subsidiaries, etc. were calculated based upon the latter matrixes.

At the same time, a data set concerning corporate characteristics, industrial characteristics, etc. was produced for the analysis of determinants for the diversification of business activities, relations between business diversification and management performance, and so forth. The data cover growth of core business, corporate scales, profitability, capital intensity, R&D intensity, wage levels, capital structures (existence or non-existence of a parent and shares of foreign capital), history of the company (number of years since its establishment and form of foundation), etc. In addition, data on industrial characteristics, such as the scale and growth rate of each industry as a whole, were prepared from the "Census of Manufacturers", the "Census of Commerce", the "Basic Survey on Particular Service Industries", and the "Input-Output Tables". As for details of the processing of data, refer to the "Appendix."[*13*14]

(3) Organization of the Paper

Section 2 gives an overview of actual diversification / de-diversification by Japanese companies. Not only business conducted by main bodies (or parents), but also that through the establishment of subsidiaries will be examined. In section 3, the factors affecting the breadth of the business and its change will be analyzed. In this section, the most careful attention will be paid to the influence of corporate characteristics - including corporate scales, types of managerial resources held, and capital structures - upon the structure of business. Section 4 analyzes relations between the structure of business and corporate performance. The conclusion of this article will be summarized in section 5.

2. Diversification, De-diversification, and the Establishment of Subsidiaries

(1) Development of Business Activities of Main Bodies (Parents)

The number of industries handled by each company (NI) in our sample shows that the number of companies engaged in only one industry (NI=1) was 1,494 (33.3%) in 1992 and 1,547 (34.4%) in 1995. As the NI increases, the number of companies becomes smaller (Table 2). Of the companies whose core business is manufacturing (2,180 companies in 1992 and 2,169 in 1995), over 50% (1,212 companies, or 55.6%, in 1992 and 1,171, or 54.0%, in 1995) are engaged also in 'some form of distribution industry'. Of the companies whose main activity is distribution (2,268 companies in 1992 and 2,279 in 1995), nearly 20% (404 companies, or 17.8%, in 1992 and 365, or 16.0%, in 1995) are engaged in 'some form of manufacturing', as well.

The average number of industries handled by one company fell from 2.46 in 1992 to 2.37 in 1995. The NI rose in 930 companies, remained unchanged in 2,405, and declined in 1,156. Thus, the number of companies that expanded business scope was smaller than that of the companies that slimmed down their activities. This is in line with the recent tendency towards a 'narrowing down of business range.'

An analysis of classified totals by corporate scale (according to the number of employees) shows that, as expected, NI tends to become larger as the corporate scale becomes greater (Table 3). The average NI for companies with up to 100 employees is around 2, while that for large companies staffed with over 10,000 employees is 4.6. In any classification of scales, the average in 1995 was smaller than that in 1992.

For core business sales ratios (CBR)[*15], were 90% or over in 2,140 companies (47.7%) in 1992 and 2,210 (49.2%) in 1995. They were 80% or over in 2,674 companies (59.5%) and 2,727 (60.7%), and 70% or over in 3,138 (69.9%) and 3,132 (69.7%), in respective years (Table 4). Thus, the CBR is significantly high for many companies.

In the three years from 1992 to 1995, the shares of sales generated by core business (1) rose in 1,931 companies, (2) remained unchanged in 809, and (3) decreased in 1,751. The number of companies showing a tendency to specialize in selected business lines is slightly larger. The simple average of CBR for the sample companies went up 0.5% point from 80.3% in 1992 to 80.8% in 1995.

Nonetheless, in an observation of shares of 'core business,' according to the 1992 industrial rating, showed that the number of companies with declining core business shares was larger than that of companies with increasing core business shares. The share went up in 1,508 companies, remained unchanged in 707, and went down in 2,276. The simple average of the shares held by 'core business,' as defined in 1992 to total sales, went down 13.6% point to 66.7% in 1995.[*17] In other words, the above-mentioned concentration upon main activities does not necessarily mean higher a weight for traditional 'core business' (core business as defined in 1992). In many cases, minor sectors have become the major business operation as a result of changes in business structure. As a matter of fact, 986 companies (22.0%) out of the 4,491 sample companies

underwent business conversion at a company level (changes of core activities, or changes in industrial grading as far as statistics are concerned) over the three years. The figures are considerably higher than equivalent figures on an establishment level.[*18*19]

Secondly, I examined the scope of business areas (diversification/de-diversification) by calculating Herfindahl indices (HI). Our examination revealed that HI, as well as CBR, is notably high for most companies (Table 5).[*20] As for changes in the three years, HI rose in 1,803 companies, remained unchanged in 1,096, and declined in 1,592. Changes in HI, as well as those in CBR, showed that the number of companies whose HI went up, or that tended to de-diversify their activities, was slightly larger than the number of diversifying companies.

As a whole, the above facts seem to suggest that many companies place increased emphasis upon their main activities, or comparatively important business lines, while abandoning or slimming down minor activities, amid the 'Heisei Recession'.

Sales composition change index (DSC) can be defined as $\sum |\Delta s_i|$ with s_i representing the ratio of sales generated by each activity to total sales. This index shows changes in the sales breakdown by industrial line, regardless of whether or not it is the core activity of the company. In other words, it is an index to show the 'conversion of industrial structure within the company'.[*21] The simple average of the indices for the sample companies was 0.486, which proves that sales compositions of respective companies have changed considerably in general.

(2) Business Structure via Subsidiaries and Affiliates

The number of subsidiaries and affiliates (SUB) (total of domestic and overseas subsidiaries and affiliates, abbreviated as 'subsidiaries, etc.' hereinafter if necessary) increased 6.4% for 30,104 companies (6.7 companies per one parent) in 1992 to 32,028 (7.1 per one parent) in 1995.[*22] The number of subsidiaries increased for 1,000 companies, remained unchanged in 2,534, and decreased in 957. The number of companies whose subsidiaries, etc. increased was larger than for companies with fewer subsidiaries, etc. in 1995.

An analysis of the distribution of the numbers of subsidiaries and affiliates of respective companies shows that many of the companies (1,853 companies in 1992 and 1,948 in 1995) have no subsidiaries or affiliates. The number of companies holding subsidiaries, etc. went down slightly from 2,638 companies (58.7%) out of the 4,491 samples to 2,543 (56.6%). On the other hand, quite a few companies have five or more subsidiaries, etc. - 978 companies (21.8%) in 1992 and 881 (16.5%) in 1995. Forty seven companies had more than 100 subsidiaries and affiliates in 1992 and forty nine subsidiaries and affiliates in 1995 (Table 6). The company holding the largest number of subsidiaries and affiliates in 1992 had 775 subsidiaries and affiliates. The equivalent company in 1995 had 1,135 subsidiaries and affiliates. Considerable differences exist in the numbers of subsidiaries and affiliates held by respective companies.

An analysis by the scale of parent shows that larger parents tend to hold a larger number of subsidiaries and affiliates (Table 7). Companies staffed with 100 or less employees hold only one subsidiary on the average, while large companies with 10,000 or more employees have an average

of 120 subsidiaries and affiliates.

An analysis by subsidiary type shows that wholly-owned subsidiaries have increased significantly. This may reflect the increased establishment of a companies to control separate operations for part of the parent's activities. On the contrary, 'affiliated companies' where equity shares of the parent are low, have decreased.

I have also calculated 'the number of gross increases' and 'the number of gross decreases' of subsidiaries and affiliates between 1992 and 1995. A comparison was made between distributions by industrial line of subsidiaries, etc. of each company in 1992 and 1995. 'The number of gross increases' represents the total of increases in respective industries and 'the number of gross decreases' represents the total of such decreases.[*23] Although the number of net increases was only 1,924 companies, while gross increases were as large as 14,356 companies, while gross decreases were 12,432. This represents the total of 26,788 companies, or about 13.9 times the number of net changes. The restructuring of business sections operated through subsidiaries/affiliates, as well as the business on a head office level, and was far more active than observed net changes on an aggregation level.

The average number of industries handled by subsidiaries and affiliates per one parent (IS) was 1.96 in 1992 and 1.88 in 1995. The total for the samples decreased from 8,797 in 1992 to 8,450 in 1995. An analysis by company shows that 778 companies expanded the range of activities, 2,817 companies showed no changes, and 896 companies narrowed down the range. This means that the number of companies that narrowed down the range of activities through subsidiaries and affiliates was larger than the number of companies that expanded such a range. As mentioned earlier, the number of subsidiaries has increased, but as for the breadth of activities, subsidiaries, as well as parents, tend to de-diversify.

An analysis of the distribution of the numbers of industries handled by subsidiaries and affiliates (Table 8) shows that the number of (parents) companies becomes smaller as activity types increase. It should be noted, however, that subsidiaries are engaged in a wider range of activities than parents are. The parent that was engaged in the most wide activities through subsidiaries in 1992 handled 56 industries, while the equivalent company in 1995 was engaged in 78 industries. The scope of activities of subsidiaries, etc. is considerably larger than that of the activities of parents (refer to Table 2).

An analysis of totals by corporate scale (of the parent) reveals that IS is larger in parents of a larger scale (Table 7). The average IS for companies with 100 employees or less is 0.6, while that for large companies with over 10,000 employees is 16 to 18. A comparison between 1992 and 1995 shows that the range of activities of subsidiaries have become smaller at each level of the scale, as in case of parents.

An analysis by the type of subsidiary (<1> domestic/overseas, <2> wholly owned/partially owned/affiliated) reveals an apparent tendency that overseas subsidiaries/affiliates are engaged in a smaller range of activities. The average for domestic subsidiaries, etc. in 1995 was 1.72 industries while that for overseas subsidiaries was 0.47. This suggests that overseas subsidiaries and affiliates are mainly engaged in activities close to the main industrial line of the parent. It

should be noted, however, that the average IS for domestic subsidiaries went down while that for overseas subsidiaries rose slightly. The range of activities of overseas arms has originally been narrow, while overseas activities of Japanese companies are expanding. Consequently, many companies are expanding overseas activities through subsidiaries, instead of slimming them down. An analysis by shareholding ratio of the parent shows that wholly owned subsidiaries are engaged in a comparatively wide range of activities. This result does not coincide with the generally accepted idea (or some of the results of preceding studies[*24]). This will be explained later.

As no data are available on sales by industry type of subsidiaries, etc., core business ratios were calculated based upon the number of subsidiaries and affiliates. That is to say, ratios of the number of subsidiaries/affiliates engaged in the main industrial line of the relevant parent to the total number of subsidiaries/affiliates were calculated. The core business ratio covering the entire sample companies was 24.9% (7,496 companies out of 30,104) in 1992 and 25.1% (8,040 companies out of 32,028) in 1995. The ratios are slightly lower than those for the parents, but show a tendency to concentrate more on core activities.

An analysis by subsidiary type of all samples (Table 9) does not show significant differences between domestic and overseas subsidiaries. However, an observation of limited samples of 'companies holding subsidiaries and affiliates' shows that ratios of core business subsidiaries are apparently higher at overseas subsidiaries. The fact that core business ratios are higher abroad suggests that geographical distance and differences in corporate regulations among respective countries are some of the causes for the tendency to establish subsidiaries abroad for the separate operation of some activities. In other words, overseas branches (not subsidiaries) cannot take advantage of economies of scale, while their flexible business activities in respective countries might be impeded.

An analysis by shareholding ratio of the parent shows that core business subsidiary ratios are higher in subsidiaries with lower shareholding ratios. Furthermore, in affiliates (with shareholding ratios between 20% and 50%), the core business subsidiary ratios rose in the three years from 1992 to 1995. This is unexpected, as in case of the number of industrial lines. The general understanding is that companies tend to jointly advance into industries with weaker relations with their core activities with companies in other industries, thereby aiming to cover the shortage in managerial resources. This seems to reflect the tendency to take advantage of economies of scale by leaving the core business to the parent instead of establishing a separate company.

(3) Relationship between Business Conducted Directly by Parents and Business through Subsidiaries/Affiliates

I also calculated the total number of industries actually handled by parents and their subsidiaries/affiliates. They represent the numbers of activities operated, with an industrial line operated by the parent or any of its subsidiary/affiliate counted as 1. In this calculation, 'boundaries of companies' are understood in the widest concept. The total number of industrial lines handled by the sample companies decreased by 552 fields from 16,910 fields (3.77 per one

company) in 1992 to 16,358 fields (3.64 per one company) in 1995. This means that the range of industries has been narrowed on a corporate group level covering both the parent and its subsidiaries and affiliates.

An analysis of the distribution of the numbers of industrial types shows a tendency similar to that observed in parents or subsidiaries/affiliates. Many companies belong to areas with a few types of industries, and the number of companies rapidly decreases as the number of industrial lines increases (Table 10).

A comparison between the distribution of industrial lines of the parent and that of subsidiaries/affiliates shows a clear tendency that companies operate a wider range of activities through subsidiaries/affiliates (Figure 1).

As mentioned earlier, subsidiaries engaged in the core business of the parent account for about one fourth of the total. In the meantime, subsidiaries and affiliates (including both the domestic and overseas) engaged in 'any of the industries handled by the parent', (which does not necessarily mean the 'core business',) represented 44.8% (13,499 companies out of 30,104) in 1992 and 44.2% (14,157 companies out of 32,028) in 1995. Thus a considerable share of subsidiaries are in the same broad field as the parent.

3. Corporate Characteristics and Diversification/De-diversification

(1) Determinants of Breadth of Business Structure ('Levels')

I conducted regression analysis for 1992 and 1995, respectively, with (1) the number of industries (NI), (2) core business ratios (CBR), and (3) Herfindahl index (HI) as dependent variables.[*25] Explanatory variables are:

(1) Corporate scale (sales(logarithm)(LSL))
(2) Variables concerning managerial resources (<1> capital intensity (KL), <2> R&D intensity (ratio of researchers to total employees (RDL), <3> proxy for human capital (WAGE))
(3) proxies for employment fixity (ratio of non-part time permanent male workers to total employees (RML), gross rates of reallocation among different sections of the relevant company (RGJR)[*26]
(4) Variables concerning shareholdings (foreign capital ratio (FCR) and existence or non-existence of parent company (PC))
(5) Corporate history (<1> year of establishment (EST) and <2> establishment form dummy (establishment through merger (MEST) and establishment through separation (SEST)).[*27*28]

An industry that is given a wide definition is likely to cover a wide variety of activities. In consideration of this, (6) industrial scale of the 'core business' (domestic production in 1992 (MKT)) was used as a control variable.[*29] A correlation matrix between explanatory variables is shown in Table 11.

The corporate scale and the existence of managerial resources are expected to have positive effects upon the level of diversification (NI) (negative effects upon CBR and HI, which become

closer to 1 when corporate activities are more de-diversified). As for employment fixity, some people argue that Japanese companies have strong internal pressure for corporate growth reflecting its long-term employment practices. If this argument is correct, employment fixity is expected to have positive effects upon diversification. It should be noted, however, that companies have recently become more active in developing their operations through subsidiaries. Because of this, employment fixity may not strongly affect the range of business activities of parents. Variables concerning shareholders may have negative effects, if companies with foreign shareholders or a foreign parent can easily abandon unprofitable areas. It is expected that older companies have achieved a higher level of diversification. As the variable used in this analysis is the year of establishment, it is expected to have negative effects upon NI. As for establishment forms, companies established as a result of merger are expected to be engaged in a wider variety of industries, while those established through separation are likely to handle a more limited variety of activities. Strictly speaking, conglomerate-type mergers and horizontal mergers should be considered separately. The data for both types of mergers, however, have not been separated and the dummies include horizontal mergers.

The analysis show that corporate scales (LSL) (positive effects upon diversification), R&D intensity (RDL) (positive), average wage levels (WAGE) (negative), year of establishment (EST) (negative), etc. had significant relations with the diversity of corporate activities.[*30] It should be noted, however, that coefficients of determination are not very high and regression equations as a whole do not have much explanatory power. In the meantime, the coefficient for the industrial scales of 'core business' (MKT) was significantly positive. This suggests that companies that are engaged mainly in narrowly defined industries show a higher level of diversification, affected by the industrial classification. Variables concerning shareholding structures (FCR and PC) did not have significant relations with the exception of limited cases. Capital intensity ratios (KL) and establishment forms (MEST and SEST) did not show significant coefficients. No essential differences were observed between the results for 1992 and 1995.

The results for corporate scale, R&D, and establishment year are as expected. Larger companies that have longer histories and are more R&D intensive are engaged in a wider variety of activities. In particular, companies more active in R&D show a stronger tendency towards diversification, which coincides with the results of some of the preceding studies. As for corporate scale, a company of a dowbled scale has around 0.12 to 0.13 more sections. The coefficient for wage levels was contrary to our expectation. This means that companies with abundant human capital are not necessarily more active in diversification. Wage levels may have become higher in regulated industries because of labor rent sharing and are therefore not quite appropriate as an proxy for human capital. The results may suggest that companies engaged in regulated industries cannot diversify their activities because of restrictions upon advancement into other industries. However, my conclusion is not based exclusively upon these analyses.

The proxy for employment fixity (RML) had only insignificant effects, with very few exceptions (as mentioned later, RML has partially positive effects upon the breadth of business of

subsidiaries).[*31] For the present, we can understand that strong internal growth pressure originating in long-term employment practices promotes diversification. Among the explanatory variables, WAGE and RML have a relatively strong correlation, which suggests the possibility of multicollinearity. In consideration of this possibility, I conducted estimations without either of the variables, but the estimations did not produce different results. RML did not have significant effects in an estimation equation that excluded WAGE.

Similar analyses were conducted after dividing sample companies according to their core activities. In particular, they were divided into (1) sub-samples engaged mainly in manufacturing industries and (2) those engaged mainly in the distribution industry (wholesale and retail). The number of companies whose core business was manufacturing was 2,180 in 1992 and 2,169 in 1995, while the number of companies whose core business was distribution was 2,268 in 1992 and 2,279 in 1995. Basically, both of the sub-samples showed the same results as in the whole samples. One of a few differences is that manufacturing companies with higher capital intensity showed a higher concentration on their main activities, while wholesale/retail companies with higher capital intensity operated more diversified activities.

(2) Determinants for Changing Business Structures

I also conducted regression analysis to explain 'changes' in business structures, namely (1) changes in core business ratios (DCBR), (2) changes in Herfindahl indices (DHI), and (3) structural change indices (DSC). The explanatory variables used in the analysis are mostly the same as those used in regression with regard to 'levels'. Nonetheless, growth in sales generated by main activities of respective companies (ICDSL),[*32] initial profitability (ROA), and initial scope of business activities (CBR, HI) were added, while the year of establishment and establishment forms were excluded.[*33]

According to the results, changes in core business sales (ICDSL)(positive), corporate scales (LSL) (negative), R&D intensity (RDL) (negative), average wages (WAGE) (positive), core business ratios at the beginning of the term (CBR) (or Herfindahl indices (HI)) (negative) had significant effects upon 'changes' in core business ratios (DCBR) and 'changes' in Herfindahl indices (DHI) (Table 13).[*34] Industrial scale of core business (MKT) had significantly negative effects, although the significance level was lower than that of effects upon 'levels' of diversification. This means that companies whose main industrial lines belong to a more widely defined industry tend to concentrate more on their main activities.

The following tendencies are observed in addition to the above:

(1) Companies whose main activities are more stagnant are more active in diversification.
(2) Large, R&D intensive companies, other things being equal, tend to further diversify their operations.
(3) Companies that have already diversified their operations to a considerable level tend to de-diversify their activities, aiming to correct excessive diversification.

Upon 'structural change indices' (DSC) as defined earlier, changes in core business sales (negative), profitability (positive), corporate scales (negative), R&D (positive), average wages

(negative), foreign capital ratios (positive), parent companies (positive), and initial business scopes (negative) had some effects (Table 13). Companies whose main operations are going favorably do not change their structures frequently. These results mean that smaller companies restructure operations more drastically compared with larger companies and that foreign companies or companies with a parent are more prompt in changing structures.[*35]

As in analysis concerning 'levels' of diversification, the samples were divided into (1) manufacturing companies and (2) wholesale/retail (distribution) companies, according to their initial main operations, for analyzing 'changes' in the business structure. The analysis produced some different results. For example, (1) manufacturing companies whose initial profitability (ROA) is higher tend to raise their core business ratios, while no such relations were observed in distribution companies. In the meantime, (2) distribution companies with high initial profitability (ROA) change sales structures more drastically.[*36]

(3) Determinants for Breadth of Business Structure through Subsidiaries/Affiliates

Dependent variables used in the regression for identifying determinants for the 'levels' of business development through subsidiaries/affiliates were:

<1> Ratios of investment and loans to affiliates to total assets (ISA)

<2> Number of subsidiaries and affiliates (SUB); and

<3> Number of industrial lines handled by subsidiaries, etc. (IS)

Because a considerable number of companies do not own subsidiaries, estimations were made using the TOBIT model. As for explanatory variables, almost the same variables as those used for analysis of parents were used, while levels of initial business activity of parents (NI) were also considered. Thus, an effort was made to clarify whether the scope of business structure of a parent and its subsidiaries was supplementary or substitutable, when other factors are controlled. In other words, I tried to find out whether parents engaged in a variety of industries have many subsidiaries or only a few.

Similar estimations were made to explain 'changes' in business structure of subsidiaries/affiliates with <1> changes in the numbers of subsidiaries, etc. (DSUB) and <2> industries handled by subsidiaries/affiliates (DIS) as dependent variables. As for explanatory variables, growth in core business sales of parents (ICDSL), initial profitability of parents (ROA), and initial level of subsidiary activity (SUB or IS) were added, while establishment year of parents (EST), the number of business parents engaged in (NI), and scales of industries (MKT) were excluded.

This analysis showed that corporate scale of parents (LSL) (positive), R&D intensity (RDL) (positive), existence of (grand) parent company (PC) (negative), foreign capital ratios (FCR) (negative), establishment year (negative), scope of business activity of parents (NI) (positive), etc. had significant effects upon the levels of business development of subsidiaries, etc (Tables 14, 15, and 16). The results for corporate scale, R&D intensity, and establishment year are the same as those for parents (main bodies). According to the results of the estimation with the numbers of industries as the dependent variable, the coefficients for corporate scale and R&D

intensity are larger in subsidiaries than in parents. When the corporate scale doubles, the number of industries handled increases by around 0.5. Foreign capital ratios (FCR) and the existence of parents (PC) did not have significant effects upon business activity for main bodies, but had significant, negative impacts upon that of subsidiaries. Only a few companies operate their business through subsidiaries of the subsidiaries. This suggests that companies tend to prefer activities through direct subsidiaries, which can be controlled directly by the relevant parent.

Wage levels of parents (WAGE), which can be considered as an proxy for human capital or a factor to induce the slimming down of parents, had been expected to have positive effects upon subsidiary development. My analysis, however, showed that they hardly had any impact.[*37] On the other hand, significantly positive relations were observed in an proxy for employment fixity (RML) in some of the equations (including the number of subsidiaries in 1995 and the industries handled by subsidiaries as dependent variables). As explained later, such relations are not observed in overseas subsidiaries but only in domestic subsidiaries, etc.[*38] Such relations were not necessarily observed in parents, either. This suggests that internal growth pressure originating in long-term employment practices has led to active subsidiary development in recent years. In equations using in-company job reallocation ratios (RGJR), instead of RML, as well, coefficients were significantly negative. This shows that companies flexibly transferring employees within the company are less active in subsidiary development.

Companies of a larger scale and with longer histories have more widely developed subsidiaries and affiliates. This is what I expected.

The scope of business activity of parents (NI) had significantly positive effects upon subsidiary development when corporate scale and other factors are controlled. In other words, parents engaged in a wide variety of business activities tend to operate business widely through subsidiaries, as well. This suggests that business diversification of a parent and that of its subsidiaries are not substitutable.

R&D intensity (RDL) positively influences business diversification of both parents and subsidiaries/affiliates. This may suggest the existence of economies of scope in research and development, or reflect corporate behavior aiming to raise the appropriability of R&D results.[*40]
In the meantime, estimation equations, including changes in the numbers of subsidiaries and those in industrial lines handled by subsidiaries as dependent variables, did not fit well. It became apparent, however, that corporate scales of parents (LSL) (positive), initial numbers of subsidiaries (SUB) (positive), foreign capital ratios (FCR)(negative), and existence of parents (PC)(negative) affected 'changes' in subsidiary development.

I also made a comparison between determinants for subsidiary developments, dividing subsidiaries into <1> domestic subsidiaries and <2> foreign subsidiaries (Tables 17 and 18).

Capital intensity (KL) had positive effects upon the numbers of subsidiaries (SUB) and those of industrial lines handled by subsidiaries (IS) at home, although significance levels were low. On the other hand, such ratios had negative effects upon equivalent numbers abroad. This may be because capital stock can function as a managerial resource for the development of subsidiaries in Japan, while it does not function in such a manner abroad, but functions as an

entry barrier.

Average wages (WAGE) had significantly negative effects only upon the numbers of the industrial lines handled by overseas subsidiaries. This seems to suggest that many of the companies with lower wage averages belong to an industry without comparative advantages and, consequently, actively advance into other nations with a cheaper labor force.

Proxies for employment fixity tended to have positive effects upon the numbers of subsidiaries (SUB) and industrial lines handled by subsidiaries (IS) in Japan, but negative effects abroad. This is likely to suggest that internal growth pressure (or the necessity to employ staff members in a company belonging to the same group), which originates in long-term employment practices, promotes the development of domestic subsidiaries.

A comparison by shareholding ratios (wholly-owned subsidiaries, partially owned subsidiaries (over 50% and below 100%), and affiliates) revealed no significant differences among the 'levels' of the development of subsidiaries among companies with different shareholding ratios. It should be noted, however, that the explanatory power of corporate characteristics of parents tends to become more apparent in subsidiaries with higher shareholding ratios.

4. Diversification/De-diversification and Corporate Performance

This section examines relations between the scope of business structure and corporate performance. In other words, it analyzes relations between indices representing the scopes of business structure of respective companies (the numbers of industrial sections (NI), core business ratios (CBR), and Herfindahl indices (HI)) and ratios of operating profit to total assets (ROA) as well as their changes (DROA), growths in sales (DSL), etc. Regression equations explaining profitability will be analyzed based upon data for 1995.[*42] As for control variables, those that are available and generally used for traditional empirical studies to explain profitability are used. In particular, corporate scales (LSL), capital intensity (KL), R&D intensity (RDL), sales growth rates (DSL), and small enterprise dummies (SMED) are used. These variables are expected to have positive effects.

I also conducted estimations in consideration of proxies for market concentration and market share of core business of the subject company. Nonetheless, no relationship was observed between these variables and profitability. In this context, Lichtenberg (1990) has shown in his empirical analysis of U.S. manufacturing companies, that diversification has negative effects upon productivity when the number of establishments of respective companies are controlled. In consideration of this, I conducted estimations of the numbers of establishments of respective companies (NPL). This did not show a significant relationship, either. Additionally, I conducted estimations including industrial dummies based upon a two-digit level industrial classification, in controlling for the effects of industrial characteristics. This estimation did not produce significantly different coefficients or significance levels. Therefore, I will only discuss estimation results excluding these variables.

In the meantime, the regression equation to explain sales growth rates (DSL) is an equation whose explanatory variables includes the level of business diversification in 1992. Corporate scale (LDL), capital intensity (KL), R&D intensity (RDL) and small enterprise dummies (SMED) were used as control variables.[*43]

According to the analysis, the estimation equations as a whole did not fit very well. Some of the regression equations, however, showed that profitability is higher at companies that concentrated more on their core operations and lower at more diversified companies (Table 19). The analysis results have not shown such a tendency on an aggregate level (Morikawa. [1997]). This tendency was particularly apparent when samples were limited to manufacturing companies. Besides variables concerning business diversification, corporate scale (positive), small enterprise dummies (positive), R&D intensity (positive), sales growth rates (positive), etc. had significant effects. Profitability tends to become higher as the corporate scale becomes larger. Interestingly enough, although as expected, the existence of supportive measures for small enterprises had positive effects upon profitability.[*44] In the literature, some argue that the diversification of companies positively affects profitability to a certain degree but excessive diversification has negative impacts.[*45] I also conducted estimations including the square terms of respective variables. The coefficients for the square terms were insignificant, however.

The explanatory power of the regression equation with sales growth rate as an dependent variable was even lower. Still, I could observe a tendency that companies engaged in a narrower range of activities show higher profitability.[*46]

The result of the analysis, that more diversified companies show lower profitability (or lower growth rates), suggests the possibility of excessive diversification, as has been pointed out in preceding studies in Western countries. The result is also in line with the hypothesis of risk dispersion.[*47] In other words, companies hoping to avoid risks try to minimize fluctuations (dispersion) in profitability, even if overall profitability becomes lower.

In the regression equation including 'changes' in profitability (DROA) as dependent variables, core business ratios (CBR) and Herfindahl indices (HI) showed highly significant, negative coefficients. This means that companies that concentrate more on main operations show lower growth rates (or larger declines in profitability). It should be noted, however, that the subject period (1992 to 1995) was a recessionary period and average profitability was lower. In light of this, I suppose that the result supports the hypothesis of risk dispersion through diversification.[*48]

Finally, I conducted similar analysis concerning relations between subsidiary development and corporate performance of the main bodies (parents). According to analysis concerning profitability, both the numbers of subsidiaries (SUB) and industrial lines handled by subsidiaries (IS) have significantly negative impacts upon the levels of parents' profitability (ROA). Companies that are active in subsidiary development do not enjoy higher profitability. Or rather, their profitability tends to be lower (Table 20). In the regression equation including 'changes' in profitability (DROA) as dependent variables, all the coefficients concerning subsidiary development (SUB, IS, DSUB, and DIS) were insignificant. This means that companies that

have developed subsidiaries to a considerable level (or widely) or promoted the establishment of subsidiaries during the period have not necessarily achieved higher profitability.

The promotion of subsidiary establishment during the period did not reduce wage costs at parents (ratios of personnel costs to operating expenses) or total employment (the numbers of employees). Conversely companies that have widely developed subsidiaries increased the numbers of employees at parents. This result is considerably surprising. Nonetheless, there are a variety of reasons for the establishment of subsidiaries, including positive ones such as advancement into a new industry as well as negative ones, such as the separation of some departments for the restructuring of the parent. Generally speaking, companies actively establishing subsidiaries may be regarded as growing companies.

5. Conclusion

This article, tries to clarify business structure of Japanese companies, including diversification, de-diversification, and transfer of some activities into subsidiaries. It uses micro-data obtained through "Basic Survey of Business Structures and Activity" on a corporate level. It also aims to reveal the factors affecting them and their effect on corporate performance.

Major results of the analysis are as follows.

(1) There was a tendency that parents select and limit industries in the process of business restructuring.

(2) The factors affecting the 'levels' of business diversification included corporate scales, R&D, average wages, and establishment year (corporate history).

(3) Growth in core business sales, corporate scale, R&D, average wages, employment fixity, existence of parents, initial structure of operations, etc. had some relations with 'changes' in business structures.

(4) Although the absolute number of subsidiaries, etc. is increasing, subsidiaries and affiliates, like their parents, tend to de-diversify their scope of business operations. A comparison between domestic and overseas subsidiaries revealed a clear tendency that core business ratios are higher at overseas subsidiaries while their scope of business is narrower. An analysis by shareholding ratio of the parent showed an unexpected result that wholly owned subsidiaries are engaged in a wider variety of activities, while affiliates where respective parents hold smaller shares show higher core business ratios.

(5) The factors affecting the business structure of subsidiaries and affiliates included corporate scales, R&D, and establishment year (of parents). Other interesting observations were that subsidiaries of a parent engaged in a wider variety of operations tend to develop their business more widely (when corporate scales, etc. are controlled) and that companies that have a parent (grandparent) company tend to be engaged in a smaller range of operations. Some differences were observed between the determinants of domestic development of subsidiaries/affiliates and those of overseas development.

(6) Relations between the breadth of business activity of a parent and that of its subsidiaries / affiliates are complimentary, rather than substitutable.

(7) Positive effects upon profitability by de-diversification of business were observed in some of the cases, but the effects are not so definite. No systematic relationship was observed between subsidiary development and profitability either.

[Appendix] Outline of Data Used for analysis

1. Sales Growth Rate
   - Gross sales growth rate (DSL): change in gross sales of the relevant company (1995/1992)
   - Core business sales growth rate (ICDSL): Change in sales in 'core business' of the relevant company (1995/1992)

2. Profitability
   - Ratio of operating profit to total assets (ROA): operating profit (¥ million) / total assets (¥ million)

3. Corporate Scale, etc.
   - Natural logarithm of gross sales (¥ million) (LSL)
   - Number of establishments per company (NPL)

4. Capital Intensity
   - Tangible fixed assets (¥ million)/total number of employees

5. Research and Development (RDL)
   - Number of R&D staff / total number of employees

6. Average Wage (WAGE)
   - Total salaries paid (¥ million)/total number of employees

7. Fixity/Liquidity of Employment
   - Employment fixity in company (RML): Number of non-part time permanent male workers/total number of employees
   - Reallocation rate between different sections of the same company (RGJR): The total of absolute value of changes in the number of employees in respective sections of each company ($|\Delta L_i|$) in the three years from 1992 to 1995 divided by the total number of employees in 1992 and that in 1995 ($L_{i92} + L_{i95}$). Sections of each company are divided into Head Office Research and Planning Division, Head Office Information Processing Division, Head Office International Business Division, Head Office Mining Business Division, Head Office Manufacturing Business Division, Head Office Commercial Business Division, Mining Stations, Manufacturing Establishments, Commercial Establishments, Laboratories, Information Processing Centers, Commercial Product Exhibition Halls/Service Centers, Warehouses & Transportation/Distribution Centers, and Others.

8. Foreign Capital Ratio (FCR)

• Ratios of foreign capital to total capital (%)

9. Existence of Parent Company (PC)

: Dummy variables with a company with a parent that is holding over 50% of its shares is 1 and a company without one is 0.

10. Small Enterprise Dummy (SMED)

: Dummy variables with a company subject to the Basic Law on SMEs is 1 and a company not subject to the Law is 0.

11. Establishment Year/Form

• Establishment year (EST): year of foundation of each company
• Merger establishment (MEST): dummy variables with a company established through merger is 1
• Separated establishment (SEST): dummy variables with a company established through separation is 1.

12. Business Development

• Number of industries of parent (NI): number of industrial lines that generate sales at the relevant company according to the three-digit industrial classification
• Core business sales ratios (CBR): sales in core business line (¥million) / total sales (¥million)
• Sales Herfindahl index (HI): HI = $\sum s_i^2$ (s_i represents the ratio of sales of each industrial line.)
• Changes in sales constitution (DSC): DSC = $\sum |\Delta s_i|$

13. Subsidiary Development

• Investment in affiliates (ISA): investment and loans to affiliates (¥million)
• Number of subsidiaries/affiliates (SUB): total number of subsidiaries and affiliates of the company
• Industries of subsidiaries/affiliates (IS): number of industries handled by subsidiaries and affiliates according to the three-digit industrial classifications.

14. Scale of Industry(MKT)

: Gross domestic product of the industry where the 'core business' of the relevant company belongs. Figures shown in "Input-Output Table 1992 (extended table)" are used in principle. As for part of the services that do not belong to any of the sub-classifications of the table, figures in "Basic Survey on Particular Service Industries" are used after conversion into figures in line with the input-output table.

[Notes]

*1 This article is a revised version of Morikawa [1998]. I conducted the analysis constituting the base of this report as part of the research and study project led by Research and Statistics Department, the Ministry of International Trade and Industry. Staff of the Enterprise Statistics Division of the Ministry kindly helped me with the use of data. Participants in the research project, including Prof. Masahiro Kuroda and Prof.Yoshio Higuchi, provided valuable comments. Dr.Roger Farrell helped to improve the article. The earlier version of the draft was written while I was an Associate Professor of the Saitama University and a Special Research Fellow of MITI/RI.

*2 Merits of diversification were emphasized also in the U.S. in the 1960s and the 1970s, when the U.S. experienced active conglomerate mergers. A variety of explanations were given as theoretical grounds for diversification, including (1) technological push, (2) hypothesis of maximizing corporate growth, (3) economies of scope, (4) incompleteness of external capital market (deep pocket hypothesis), and (5) anti-trust hypothesis.

*3 Refer to the Industrial Policy Bureau, the Ministry of International Trade and Industry [1993].

*4 Initial studies to demonstrate the merits of diversification through economies of scope and 'synergy effects' include Baumol and Braunstein [1977] and Carter [1977]. In Japan, some studies have shown economies of scope in the financial industry.

*5 Refer to Ito and Hayashida [1996] and Ito, Kikutani and Hayashida [1997].

*6 I have already obtained some interesting results from preliminary analysis using the published (aggregated) data in "Basic Survey of Business Structures and Activity" (Morikawa [1997]). Nonetheless, analysis using cross-industry data at an aggregated level are subject to some restrictions.

*7 Refer to Morikawa [1997], which has surveyed diversification and de-diversification of business activities in detail.

*8 Yoshihara et al. [1981] is one of the representative studies covering Japanese companies, although the study is rather old.

*9 Recently, Bank of Japan [1991] and the Fair Trade Commission [1992] have collected data on corporate diversification, based upon questionnaires or interviews. The two researches do not cover so many samples but have given consideration to diversification through subsidiaries, as well.

*10 All companies that operate a mining, manufacturing, or distribution industry as part of their activities are also covered, even if they are engaged mainly in a service, transportation, or communication industry. The number of companies surveyed in the research was 24,345 in 1992 and 25,278 in 1995. The research has been conducted annually since the 3rd research survey in 1996.

*11 The three-digit industrial classification used in this statistics is slightly different from the three-digit classification shown in "Standard Industrial Classification (SIC)". Compared with categories according to SIC, some of the categories are broader while others are narrower. The classification used in the research divides corporate activities into 119 industries in total.

*12 The Basic Law on Small and Medium Sized Enterprises defines SMEs as (1) a mining or manufacturing company with capital of no more than ¥100 million or no more than 300 regular employees, (2) a retail or service company with capital of no more than ¥10 million or no more than 50 regular employees, or (3) a wholesaler with capital of no more than ¥30 million or no more than 100 regular employees.

*13 The samples with partially incomplete data (22 companies) have been excluded. Consequently, the regression analysis cover 4,469 companies.

*14 The data set used in this article, after some processing, can be used for the analysis of factors affecting 'entry into new industries' or 'withdrawal from some of the industries'. Morikawa [1998a] has made some analysis concerning 'entry and withdrawal'.

*15 A 'core business sales ratio' represents the ratio of sales generated by core business to total sales. "Basic Survey of Business Structures and Activity" adopts a two-step classification method for deciding core business. Under this method, the industrial classification of each company is decided on a first-digit level (mining, manufacturing, wholesale/retail, and others) according to sales. Then, companies are further divided into industrial classifications on a three-digit level according to the industrial line that generates the largest sales.

*16 The number of companies whose 'core business ratio' is 100% does not coincide with the number of companies engaged exclusively in one industry or the number of companies whose Herfindahl index is 1. This is because 'unclassifiable' sales are included in the denominators in the calculation of core business ratios.

*17 It should be noted, however that significant declines in some of the companies pulled down the average. The decline in the average weighted by sales is much smaller, from 56.1% in 1992 to 55.5% in 1995.

*18 The ratio of the companies that went through business conversion on the level of three-digit industrial classification for manufacturing industries (changes of industrial classifications) in the "Census of Manufacturers" to all the companies was 8.2% in the three years from 1990 to 1993. The equivalent ratio on the level of three-digit industrial classification shown by "Establishment Directory Maintenance Survey" (Management and Coordination Agency) was 0.6% in the three years from 1991 to 1994.

*19 When cross-industry data on an published (aggregated) level at different points of time are compared, it is necessary to consider that a considerable portion of the sample companies move between different industries. In addition, sample companies covered by the industrial aggregation data are not necessarily the same, because of the establishment or closing down of some companies as well as changes in corporate scales (transfer between subject and non-subject companies).

*20 Herfindahl indices calculated here are $\sum s_i^2$ (s_i represents the shares of sales by section 'i' to total sales). The index for a company that is engaged in only one industrial line is 1, while the index for a diversified company is between 0 and 1. As the company diversifies its operations to a further degree, its index becomes lower.

*21 For example, even if the sales composition of a company which have two sections is reversed from (0.6, 0.4) to (0.4, 0.6), the company's Herfindahl index remains unchanged at 0.52. The structural change index of the company, however, rises to 0.4 (0.2 + 0.2).

*22 "Basic Survey of Business Structures and Activity" defines a 'subsidiary' as a company where the parent holds over 50% of its shares and an 'affiliate' as a company where the parent holds 20% to 50% shares. The research divides subsidiaries further into 'wholly-owned (100%) subsidiaries' and 'partially owned subsidiaries'.

*23 They do not represent an increase through start-up or a decrease as a result of closing down. Existing subsidiaries may shift from an industry to another or a new subsidiary may be established (including acquisition cases) at the same time as the closing down of another subsidiary (including sales to other company) in the same industry.

*24 Hennart [1991] analyzed determinants of shareholding ratios of parents in U.S. subsidiaries of Japanese companies (224 companies in 1985), although the analysis covers only overseas subsidiaries. The analysis shows that companies tend to establish a joint company when they need managerial resources of other companies.

*25 The number of industrial lines (NI) becomes larger as the company diversifies its operations to a further degree. The coefficient for NI shows the sign opposite to that of the coefficients of

core business ratios and Herfindahl indices.

*26 'Inter-department gross job reallocation rate (RGJR)' is an application of the concept of 'gross job reallocation rate', which is defined by Davis et al. [1996] for reallocation of jobs between different establishments or companies, to reallocations between different sections of the same company. RGJR is defined as $\sum |\Delta L_i| / (L_{i92} + L_{i95})$ with 'L_i' representing the number of employees of each section of a company. "Basic Survey of Business Structures and Activity" classifies sections of each company into 'Head Office Research and Planning Division', 'Head Office Information Processing Division', 'Head Office International Business Division', 'Head Office Mining Business Division', 'Head Office Manufacturing Business Division', 'Head Office Commercial Business Division', 'Mining Stations', 'Manufacturing Establishments', 'Commercial Establishments', 'Laboratories', 'Information Processing Centers', 'Commercial Product Exhibition Halls/Service Centers', 'Warehouses & Transportation/Distribution Centers', and 'Others'. A higher RGJR means higher liquidity of labor force inside a company (higher frequency in reallocation) and a lower RGJR suggests higher fixity.

*27 I would like to give brief explanation here about preceding researches relating to explanatory variables used. It is naturally expected that corporate scale has a positive relationship with diversification. For example, Yoshihara et al. [1981] considers this variable. Many of the researchers point out the possibility that a variety of managerial resources lead to diversification. As for capital intensity, Jovanovic [1993] argues that it is an important factor affecting diversification. Many researchers show that R&D has a positive relationship with diversification, including Yoshihara et al. [1981], Gorecki [1975], and MacDonald [1985]. In the meantime, some researchers, which are not quoted in this article, argue that advertising expenses, as a managerial resource, promote diversification. As for shareholding structures, Denis et al. [1997] has shown that the existence of major shareholders, which has a checking function for the management, negatively affects diversification.

*28 Besides, industrial dummies could be included. Nonetheless, many of the companies whose core business is manufacturing are engaged also in distribution, or vice versa, as mentioned earlier. It is not very useful to control industry characteristics of respective companies according to their 'core business' dummies.

*29 Industrial scale of 'core business' was included in explanatory variables because companies engaged in an industry that has been narrowly defined by the industrial classification has a higher possibility of advancing into other industries, and the influence by this should be controlled. This reflects the suggestion by Prof. Yoshio Higuchi (Keio University). It should be noted, however, that the variables themselves were significant, but the inclusion of them did not affect the signs of coefficients or significance of other variables.

*30 Sales (logarithm) were used as an index to show corporate scale. The results, however, were similar to those based upon employee or capital scale. The results, based upon figures before conversion into logarithm were also similar. As for an indicator to show R&D intensity, ratios of R&D staff members to all employees (RDL) were used. Ratios of R&D expenses to sales, or the number of patents held to the total number of employees, produced similar results, while their significance was higher in some cases.

*31 It should be noted, however, that in-company gross job reallocation rates (RGJR) have significantly negative effects. This means that companies changing employees' positions more flexibly are less active in diversification.

*32 Real (deflated) terms have not been calculated in the analysis of this article. The influence of inflation can be ignored, because commodity prices remained extremely stable during the subject period in Japan. In addition, appropriate deflators corresponding to the industrial classifications do not exist. It is naturally expected that companies whose core operations show higher growth rates tend to concentrate more intensively on their main activities.

*33 This is because corporate histories are not likely to affect 'changes' in recent years so much, although they are expected to affect the present 'levels'.

*34 An analysis using RGJR instead of RML did not show a significant relationship, either. In the meantime, estimations excluding either of WAGE and RML were also conducted, in consideration of the possibility of multicollinearity between them. The estimations did not however produce different results.

*35 A calculation using 'gross sales change rates' mentioned earlier as explanatory variables showed similar results as those based upon structural change indices.

*36 According to Morikawa [1998], more profitable companies 'withdraw' more frequently, resulting in large structural changes.

*37 An estimation was made excluding RML in consideration of possibility of multicollinearity with RML, which also did not show significant impacts from WAGE.

*38 The variable RGJR did not have a significant relationship with diversification.

*39 For strict examination, however, it is necessary to check what industries companies have entered into.

*40 Jovanovic [1993] has pointed out that the internalization of R&D spillover induces

diversification.

*41 The reason why the variables have negative effects in foreign subsidiaries, instead of being insignificant, is unknown.

*42 The analysis were made only for 1995, because data on sales growth rates for 1992 (compared with a few years earlier) are not available.

*43 Few of the recent studies have analyzed relations between diversification and corporate growth. Nonetheless, some of the older researches, including Berry [1971] and Jacquemin and Berry [1979], show that more diversified companies enjoy higher growth rates.

*44 The ratios of operating profit to total assets used here are based upon the figures before tax deduction, and do not reflect preferential taxation measures for small enterprises. The results do not necessarily prove the 'desirability' of policies for small enterprises, but only point out the fact that actual policies for small enterprises may have a bias advantageous for small enterprises.

*45 Markides [1995] conducted an analysis including square terms as part of analysis of data on U.S. companies, confirming the existence of the most appropriate diversification level.

*46 An analysis using growth rates of the number of employees as an explanatory variable instead of sales growth rates produced similar results.

*47 Marshall et al. [1984] shows that diversification contributes to risk dispersion.

*48 Data for a longer period are required for direct verification that more diversified companies show smaller fluctuations (dispersion) in profitability.

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Table 1 Sales Matrix

Firm No.	Industry No. 51	52	53	・・・	・・・	j	・・・	・・・	・・・	・・・	880	890
・・・・	0	0	0	・・・	252	53	2	0	0	・・・	0	41
・・・・	0	0	0	・・・	0	0	0	0	0	・・・	0	0
・・・・	0	0	0	・・・	0	214	639	11	0	・・・	0	5
・・・・	0	0	31	・・・	0	0	0	0	0	・・・	0	0
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
i	・・・	・・・	・・・	・・・	・・・	Sij	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・	・・・・・
・・・・	0	0	0	・・・	2982	3541	201	0	11	・・・	0	0
・・・・	0	0	0	・・・	0	0	0	0	0	・・・	0	0
・・・・	0	0	0	・・・	0	210	0	10	0	・・・	0	6
・・・・	0	0	0	・・・	0	0	0	63	35	・・・	0	0

(note) Sij represents the sales in industry j by company i.
The figures in respective cells are examples.

Table 2 Distribution of numbers of industries of main bodies (parents)

Number of industries	1992		1995	
1	1494	33.3%	1547	34.4%
2	1351	30.1%	1396	31.1%
3	764	17.0%	745	16.6%
4	420	9.4%	370	8.2%
5	225	5.0%	227	5.1%
6	97	2.2%	95	2.1%
7	63	1.4%	51	1.1%
8	32	0.7%	25	0.6%
9	21	0.5%	15	0.3%
10	8	0.2%	11	0.2%
11	10	0.2%	6	0.1%
12	5	0.1%	2	0.0%
13	0	0.0%	0	0.0%
14	0	0.0%	1	0.0%
15～	1	0.0%	0	0.0%

(note) The figures represent the numbers of companies.

Table 3 Corporate scale and average number of industrial lines

Classification	1992	1995
～100	2.06	1.98
～1000	2.37	2.31
～10000	3.72	3.50
10001～	4.66	4.56

Table 4 Distribution of core business sales ratios

Core business sales ratio	1992		1995	
100%	1162	25.9%	1279	28.5%
90%-	978	21.8%	931	20.7%
80%-	534	11.9%	517	11.5%
70%-	464	10.3%	405	9.0%
60%-	414	9.2%	430	9.6%
50%-	459	10.2%	454	10.1%
40%-	235	5.2%	236	5.3%
30%-	153	3.4%	151	3.4%
20%-	65	1.4%	65	1.4%
10%-	22	0.5%	17	0.4%
-10%	5	0.1%	6	0.1%

(note) The figures represent the numbers of companies and their ratios.

Table 5 Distribution of Herfindahl indices

H.I.	1992		1995	
1.0	1494	33.3%	1547	34.4%
0.9～	543	12.1%	549	12.2%
0.8～	343	7.6%	357	7.9%
0.7～	336	7.5%	325	7.2%
0.6～	389	8.7%	353	7.9%
0.5～	608	13.5%	585	13.0%
0.4～	347	7.7%	352	7.8%
0.3～	278	6.2%	286	6.4%
0.2～	129	2.9%	121	2.7%
0.1～	24	0.5%	16	0.4%

(note) The figures represent the numbers of companies and their ratios.

Table 6 Distribution of the numbers of subsidiaries and affiliates held (1995)

Number of subsidiaries and affiliates	Grand total	Domestic	Overseas	100% subsidiaries	50-99% subsidiaries	affiliates
0	1,948	2,101	3,522	2,748	3,157	2,926
1	680	699	353	605	580	614
2	428	408	179	340	245	291
3	252	250	96	154	124	139
4	202	189	62	111	71	106
5	118	116	36	83	54	79
6	116	81	40	61	40	33
7	84	84	18	49	36	39
8	60	70	19	30	19	31
9	52	34	19	27	17	24
10	53	44	16	17	12	20
11	32	32	11	22	13	17
12	29	29	12	21	8	10
13	28	31	6	15	14	12
14	31	21	7	11	6	13
15～20	100	79	26	59	33	40
21～50	151	127	51	94	46	64
51～100	78	63	8	29	10	21
101～	49	33	10	15	6	12
Total	32,028	24,014	8,014	14,266	7,068	10,694
	(30,104)	(23,599)	(6,505)	(12,563)	(6,802)	(10,739)

(note) Figures represent the numbers of companies holding the respective number of subsidiaries.
Total in the lower columns are the grand total of subsidiaries and affiliates.
Figures in parenthesis in the last columns are the numbers of subsidiaries and affiliates in 1992.

Table 7 Corporate scale and subsidiaries/affiliates

①Average Number of Subsidiaries/Affiliates

Scale	1992	1995
～100	1.02	0.83
～1000	3.04	3.02
～10000	31.68	34.89
10001～	120.76	129.36

②Average distribution of industries of subsidiaries/affiliates Held

Scale	1992	1995
～100	0.60	0.56
～1000	1.37	1.33
～10000	7.13	6.89
10001～	18.88	16.93

(note) Scale is classified by number of employees.

Table 8 Number of industries handled by subsidiaries/Affiliates

Number of industries	Grand Total	Domestic	Overseas	100% subsidiaries	50-99% subsidiaries	Affiliates
0	1,948	2,101	3,522	2,748	3,157	2,926
1	1,144	1,089	607	917	813	895
2	502	479	162	328	215	297
3	270	245	83	150	105	123
4	171	157	39	142	78	92
5	116	106	15	34	28	24
6	63	62	23	28	15	29
7	48	43	7	29	21	21
8	39	39	14	21	5	20
9	29	27	2	17	13	11
10	28	21	2	9	10	10
11	19	17	3	12	5	9
12	18	16	2	7	4	5
13	11	6	2	9	0	6
14	5	6	0	4	5	4
15〜	80	77	8	36	17	19
Total	8,450	7,734	2,104	4,724	3,066	3,877
	(8,797)	(8,091)	(2,032)	(4,763)	(3,196)	(3,997)

(note) The figures represent the numbers of subsidiaries handling the relevant number of industries.
The figures in "Total", however, are the grand totals of industries.
The figures in parentheses in the last columns are the figures for 1992.

Table 9 Distribution of the ratios of core business subsidiaries/affiliates

Ratio of core business subsidiaries	Grand Total	Domestic	Overseas	100% subsidiaries	50-99% subsidiaries	Affiliates
100%	532	456	368	384	327	377
100>,>=90	14	10	1	5	2	6
90>,>=80	36	30	15	18	12	21
80>,>=70	50	41	10	21	14	29
70>,>=60	88	78	32	54	39	35
60>,>=50	200	171	61	122	64	95
50>,>=40	74	51	10	28	21	29
40>,>=30	138	118	40	62	44	45
30>,>=20	118	117	41	74	41	54
20>,>=10	105	107	23	58	45	43
10>,>0	89	80	24	46	31	33
0%	1099	1131	344	871	694	798
Number of companies holding subsidiaries / affiliates	2543	2390	969	1743	1334	1565

(note) The figures represent the numbers of subsidiaries handling the relevant number of industries.

Table 10 Number of industries (parents+subsidiaries/affiliates)

Number of industries	1992	1995
1	1,039	1,096
2	1,140	1,185
3	795	752
4	478	452
5	296	312
6	189	181
7	127	127
8	102	87
9	57	58
10	46	44
11	35	34
12	32	29
13	21	15
14	18	12
15～	116	107

(note) The figure represents the number of companies.

Figure 1 Number of industries of parents and that of subsidiaries/affiliates

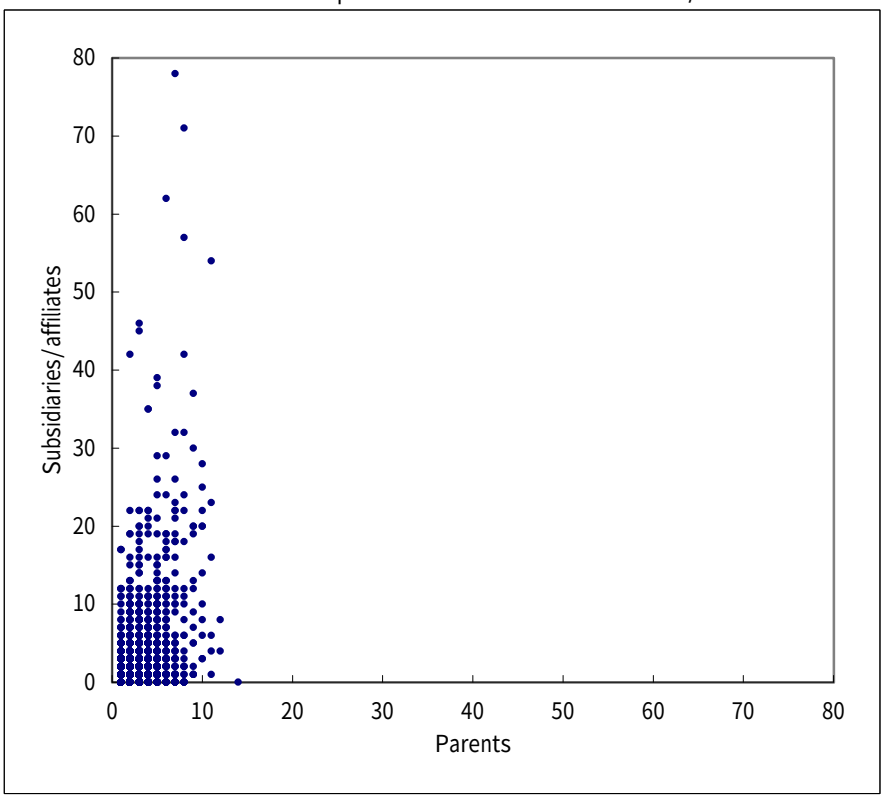

Table 11 Correlation matrix between explanatory variables

1992

	LSL92	KL92	RDL92	WAGE92	RML92	FCR92	PC92	EST92	MEST92	SEST92	MKT92
LSL92	1.0000										
KL92	0.1802	1.0000									
RDL92	0.1133	0.0679	1.0000								
WAGE92	0.3065	0.1562	0.1028	1.0000							
RML92	0.1614	0.1442	0.1413	0.3660	1.0000						
FCR92	0.0837	0.0135	0.1249	0.1547	0.0247	1.0000					
PC92	0.0700	-0.0462	-0.0240	0.0721	0.0031	0.2399	1.0000				
EST92	-0.1358	-0.0337	-0.0430	-0.0383	-0.1402	0.2030	0.4373	1.0000			
MEST92	0.0725	0.0006	-0.0242	0.0392	0.0349	0.0136	0.0887	0.1208	1.0000		
SEST92	0.0760	-0.0132	0.0001	0.0502	0.0151	0.0078	0.2307	0.2545	-0.0556	1.0000	
MKT92	0.0442	-0.0097	0.0189	0.0171	0.1109	0.0114	-0.0399	-0.0257	-0.0047	-0.0122	1.0000

1995

	LSL95	KL95	RDL95	WAGE95	RML95	FCR95	PC95	EST95	MEST95	SEST95	MKT92
LSL95	1.0000										
KL95	0.1888	1.0000									
RDL95	0.1185	0.0367	1.0000								
WAGE95	0.3137	0.1564	0.0913	1.0000							
RML95	0.1387	0.1359	0.1428	0.3621	1.0000						
FCR95	0.1842	0.0418	0.1422	0.1684	0.0460	1.0000					
PC95	0.0666	-0.0474	-0.0211	0.1017	-0.0104	0.1785	1.0000				
EST95	-0.0929	-0.0305	-0.0514	-0.0023	-0.1183	0.1271	0.3922	1.0000			
MEST95	0.0757	0.0143	-0.0018	0.0315	0.0365	0.0252	0.0973	0.1207	1.0000		
SEST95	0.0807	-0.0018	-0.0083	0.0560	0.0118	0.0375	0.1968	0.2148	-0.0600	1.0000	
MKT92	0.0365	-0.0089	-0.0015	0.0014	0.1301	0.0228	-0.0300	-0.0260	0.0016	-0.0073	1.0000

TABLE 12 Business structure and corporate characteristics

1992

	Number of industries	(NI92)	Core business ratio	(CBR92)	Herfindahl index	(HI92)
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
C	36.5616	8.6043	-2.98315	-5.2056	-3.94175	-6.0532
LSL92	0.365666	21.4923	-0.023056	-10.0483	-0.028632	-10.9815
KL92	1.674380E-03	1.4918	3.709880E-05	0.2451	-1.070470E-04	-0.6223
RDL92	1.16426	2.9694	-0.215012	-4.0663	-0.275578	-4.5864
WAGE92	-0.030119	-2.5785	4.289830E-03	2.7232	6.252560E-03	3.4929
RML92	-0.104119	-0.7157	-0.010565	-0.5385	-0.023458	-1.0522
FCR92	6.178210E-06	0.0437	-1.444530E-05	-0.7571	-2.694170E-05	-1.2427
PC92	-4.348690E-03	-0.0734	6.939950E-03	0.8688	4.748380E-03	0.5231
EST92	-0.019003	-8.8363	2.030200E-03	7.0000	2.525940E-03	7.6644
MEST92	0.164067	0.9930	-0.033521	-1.5044	-0.049968	-1.9735
SEST92	0.038391	0.5264	2.013860E-03	0.2047	4.278700E-03	0.3828
MKT92	-1.835150E-08	-4.9558	2.068210E-09	4.1414	2.595960E-09	4.5745
Adjusted R-squared		0.1407		0.0508		0.0619
F-statistic		67.5072		22.7513		27.7980
Number of observations:		4469		4469		4469

(note) Estimated by OLS.

1995

	Number of industries	(NI95)	Core business ratio	(CBR95)	Herfindahl index	(HI95)
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
C	33.9892	8.6078	-2.46011	-4.3945	-3.27117	-5.1779
LSL95	0.32641	20.2681	-0.0226	-9.8983	-0.02667	-10.3507
KL95	3.473560E-03	3.3820	-1.149230E-04	-0.7892	-2.982970E-04	-1.8152
RDL95	0.890993	2.5041	-0.235654	-4.6714	-0.275718	-4.8432
WAGE95	-0.038346	-3.3589	7.085310E-03	4.3775	9.167810E-03	5.0191
RML95	-0.204548	-1.4865	-0.024158	-1.2383	-0.026	-1.1810
FCR95	1.997850E-04	1.6776	-2.088420E-05	-1.2369	-3.907900E-05	-2.0510
PC95	-0.022824	-0.4155	-1.690240E-04	-0.0217	-2.721470E-03	-0.3097
EST95	-0.017491	-8.7323	1.762110E-03	6.2050	2.172610E-03	6.7794
MEST95	0.084584	0.5787	-0.015827	-0.7638	-0.024187	-1.0343
SEST95	7.025590E-03	0.1018	9.760800E-04	0.0998	-5.656830E-04	-0.0512
MKT92	-1.499690E-08	-4.2175	2.111280E-09	4.1879	2.557850E-09	4.4959
Adjusted R-squared		0.1289		0.0471		0.0546
F-statistic		61.1221		21.0797		24.4714
Number of observations:		4469		4469		4469

(note) Estimated by OLS.

Table 13 Changes in business and corporate characteristics (1992-1995)

	Changes in core business ratios (DCBR)		Changes in Herfindahl indices (DHI)		Structural change index (DSC)	
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
C	0.26932	13.7595	0.244466	11.8611	1.91518	28.1168
ICDSL	0.068814	18.5000	0.052289	12.9098	-0.568319	-42.4572
ROA92	0.021173	0.8525	0.036428	1.3445	0.173432	1.9368
LSL92	-9.911140E-03	-6.0870	-9.246550E-03	-5.1883	-0.052647	-8.9385
KL92	-2.984530E-06	-0.0277	-4.701260E-05	-0.3993	-3.327420E-04	-0.8552
RDL92	-0.111592	-2.9525	-0.099597	-2.4147	0.228371	1.6753
WAGE92	3.355680E-03	2.9825	3.541170E-03	2.8837	-7.232410E-03	-1.7821
RML92	-4.040650E-03	-0.2911	-8.875540E-04	-0.0586	-0.042896	-0.8571
FCR92	2.286500E-06	0.1696	-2.125280E-07	-0.0145	9.034600E-05	1.8591
PC92	4.365430E-03	0.8502	3.863010E-03	0.6899	0.055037	2.9741
CBS92	-0.305717	-28.6983				
HI92			-0.281913	-27.6513	-0.572433	-16.9893
MKT92	6.662760E-10	1.8655	7.000960E-10	1.7964	-1.238660E-09	-0.9617
Adjusted R-squared		0.2156		0.1724		0.3308
F-statistic		112.647		85.6193		201.762
Number of observations:		4469		4469		4469

(note) Estimated by OLS.

Table 14 Investment and loans to subsidiaries/affiliates and corporate characteristics

	1992 (ISA92)		1995 (ISA95)	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	0.751287	3.1571	0.669565	2.5401
LSL	0.014207	14.2211	0.02219	19.9765
KL	2.222400E-04	3.7353	-1.101440E-05	-0.1684
RDL	0.142415	6.5868	0.141697	6.3211
WAGE	-1.665880E-03	-2.3679	-6.506550E-04	-0.8573
RML	-0.021398	-2.5656	-8.208020E-03	-0.8767
FCR	-1.575840E-05	-1.8572	-1.156250E-05	-1.4714
PC	-0.011692	-3.5144	-4.617920E-03	-1.2854
EST	-4.457990E-04	-3.6976	-4.668220E-04	-3.4897
NI	4.668200E-03	5.7187	8.665150E-03	9.2372
MKT	1.853190E-10	0.8957	4.297230E-10	1.8566
SIGMA	0.079866	70.6873	0.083978	60.5221
Log of likelihood function		1917.64		959.777
Number of observations:		4469		4469

(note) Estimates on Tobit model.
The dependent variables (ISA) represent investment & loans to subsidiaries/affiliates divided by total assets.

Table 15 Numberot subsidiaries & affiliates and corporate characteristics

	1992 (SUB92)		1995 (SUB95)	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	197.967	2.1373	346.463	2.8193
LSL	14.2438	36.7862	17.1042	33.1150
KL	0.015979	0.7291	-0.015701	-0.5206
RDL	30.314	3.6711	21.454	2.0562
WAGE	0.138228	0.5656	-0.059354	-0.1770
RML	-0.074384	-0.0228	7.49972	1.7075
FCR	-0.014887	-4.3142	2.484610E-03	0.6690
PC	-10.9906	-8.5164	-14.6753	-8.6219
EST	-0.175986	-3.7494	-0.270765	-4.3427
NI	3.18571	10.4188	4.2242	9.7399
MKT	8.059440E-08	1.0033	1.895820E-07	1.7575
SIGMA	29.3127	73.2992	39.3757	71.9840
Log of likelihood function		-13396.2		-13733.5
Number of observations:		4469		4469

(note) Estimates on Tobit model.

Table 16 Number of industrial lines of subsidiaries/affiliates and corporate characteristics

	1992 (IS92)		1995 (IS95)	
	TOBIT		TOBIT	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	51.1501	4.2714	71.3953	5.4432
LSL	2.18828	43.6180	2.18915	39.6177
KL	5.660690E-03	1.9785	2.589890E-03	0.8211
RDL	6.25066	5.8643	5.02086	4.5134
WAGE	-0.020171	-0.6330	-0.018746	-0.5213
RML	0.594944	1.4076	1.02846	2.1937
FCR	-2.422770E-03	-5.3917	1.204750E-05	0.0303
PC	-1.85237	-11.0836	-1.98877	-10.9398
EST	-0.037243	-6.1361	-0.047883	-7.1933
NI	0.694776	17.5328	0.729229	15.7304
MKT	-2.297450E-09	-0.2206	4.507420E-09	0.3892
SIGMA	3.83758	71.5065	4.25626	70.1348
Log of likelihood function		-8188.98		-8228.48
Number of observations:		4469		4469

(note) Estimates on Tobit model.

Table 17 Number of domestic and overseas subsidiaries & affiliates

1992	Domestic		Overseas	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	-111.881	-41.1355	-103.859	-28.5831
LSL92	10.6064	39.1081	9.09883	25.9922
KL92	0.022495	1.4456	-0.02524	-1.3721
RDL92	20.5704	3.5401	45.9529	6.9292
WAGE92	-0.011727	-0.0685	-0.113005	-0.4816
CRLM92	5.63342	2.4606	-9.38629	-3.2088
FCR92	-0.012249	-5.0254	-9.570720E-03	-2.8092
PC92	-9.43224	-11.3038	-10.503	-9.1069
NI92	2.42296	11.3998	1.50417	5.9064
MKT92	1.273380E-08	0.2234	1.822640E-07	2.7076
SIGMA	20.3848	71.1715	19.776	44.1064
Log of likelihood function		-11894.6		-5079.73
Number of observations:		4469		4469

(note) Estimates on Tobit model.

1995	Domestic		Overseas	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	-125.976	-39.8771	-159.965	-26.6658
LSL95	11.6479	37.6215	13.1993	23.3284
KL95	0.010916	0.6278	-0.081399	-2.0878
RDL95	10.074	1.5988	60.2245	5.8553
WAGE95	-0.197878	-0.9919	-0.492877	-1.1883
CRLM95	10.834	4.1249	-4.20268	-0.8694
FCR95	2.482360E-03	1.1305	-1.941570E-03	-0.5037
PC95	-11.4614	-12.0083	-17.612	-9.3471
NI95	2.7817	10.8655	2.75602	6.3531
MKT92	4.219770E-08	0.6411	3.923740E-07	3.6387
SIGMA	23.2342	69.5343	32.3981	44.1442
Log of likelihood function		-11753		-5556.89
Number of observations:		4469		4469

(note) Estimates on Tobit model.

Table 18 Number of industries of domestic and overseas subsidiaries & affiliates

1992	Domestic		Overseas	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	-21.8055	-45.0407	-16.6622	-29.5034
LSL92	2.12673	44.0612	1.49424	27.5948
KL92	4.443080E-03	1.5990	-2.034880E-03	-0.7345
RDL92	5.61967	5.4605	8.5034	8.4275
WAGE92	-0.019345	-0.6325	-0.073357	-1.9168
RML92	1.41106	3.4691	-0.938679	-2.0929
FCR92	-2.752650E-03	-6.3137	-1.565680E-03	-3.0207
PC92	-2.14705	-14.4677	-1.83957	-10.4758
NI92	0.693579	18.3369	0.283213	7.2957
MKT92	-1.104690E-08	-1.0869	2.563470E-08	2.4910
SIGMA	3.66651	69.3365	3.08493	41.3590
Log of likelihood function		-7755.65		-3400.22
Number of observations:		4469		4469

(note) Estimates on Tobit model.

1995	Domestic		Overseas	
Variable	Parameter Estimate	t-statistic	Parameter Estimate	t-statistic
C	-22.1783	-41.5144	-19.6283	-28.0247
LSL95	2.11655	40.3503	1.67685	25.4953
KL95	2.860490E-03	0.9705	-7.733850E-03	-1.7938
RDL95	3.82662	3.6008	9.26023	7.8946
WAGE95	-0.027855	-0.8221	-0.093876	-1.9126
RML95	1.90541	4.3008	-0.199369	-0.3583
FCR95	-2.185600E-04	-0.5824	-3.804930E-04	-0.8542
PC95	-2.30265	-14.2648	-2.3184	-10.7193
NI95	0.717674	16.5367	0.375524	7.5408
MKT92	-9.816450E-09	-0.8767	4.312480E-08	3.4621
SIGMA	3.98559	67.5463	3.79314	41.7722
Log of likelihood function		-7695.7		-3587.22
Number of observations:		4469		4469

(note) Estimates on Tobit model.

Table 19 Diversification / de-diversification and profitability (1995)

Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
C	-0.055412	-6.3875	-0.060974	-6.2374	-0.060502	-6.3404
LSL95	4.931750E-03	5.6502	4.566140E-03	5.3635	4.581370E-03	5.3776
KL95	1.068230E-05	0.2379	6.779560E-06	0.1511	7.758610E-06	0.1728
RDL95	0.067155	4.3657	0.067401	4.3707	0.067574	4.3808
DSL	0.036502	14.6695	0.036558	14.6862	0.036538	14.6769
SMED95	9.985300E-03	4.0453	9.888670E-03	4.0042	9.887800E-03	4.0040
NI95	-1.507250E-03	-2.3254			6.202150E-03	1.5248
CBS95			6.670040E-03	1.4508		
HI95					6.202150E-03	1.5248
Adjusted R-squared		0.061876		0.061182		0.061229
F-statistic		50.1165		49.5296		49.5688
Log of Likelihood Function		5903.98		5902.32		5902.43
Number of Observations		4469		4469		4469

(note) Estimated by OLS.

Table 20 Holding subsidiary and profitability

Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
C	-0.067051	-7.1572	-0.07196	-7.4637
LSL95	5.876500E-03	6.2575	6.588090E-03	6.6321
KL95	3.753260E-06	0.0837	9.992720E-06	0.2230
RDL95	0.066218	4.3117	0.070022	4.5512
DSL	0.036053	14.4716	0.035691	14.3041
SMED95	0.011276	4.5196	0.011143	4.4895
SUB95	-1.093640E-04	-3.5303		
IS95			-1.176730E-03	-4.1265
Adjusted R-squared		0.063356		0.06431
F-statistic		51.3701		52.1813
Log of Likelihood Function		5907.5		5909.78
Number of Observations		4469		4469

(note) Estimated by OLS.