12 Fiscal 2007 Survey on the Application Behavior for Industrial Property Rights of Japanese Companies

The strengthening of management with emphasis on the creation and exploitation of intellectual property is an important challenge for Japanese companies in increasing competitiveness. The "Intellectual Property Strategic Program 2007," compiled in May 2005, also advocates that, in order to make Japan an "intellectual property-based nation" and enhance the international competitiveness of Japanese industries, it is important for Japanese companies to carry out management that emphasizes the exploitation of intellectual assets, etc., which are sources of competitiveness. In light of the above, this survey report conducts eight empirical analyses in total with regard to the impact of M&A, which has become increasingly important in recent years, on companies' intellectual property-related activities, the characteristics of intellectual property-related activities of SMEs or unlisted companies, the effect of the pro-patent policy relating to software patents and the strategic use of design rights and trademark rights, which have not been studied much in the past. Furthermore, regarding the "Survey of Intellectual Property-Related Activities," which is used for these analyses and is the only statistical survey of intellectual property-related activities in Japan, this study report conducts the review of the questionnaire sheet, as well as the review of the estimation method and the classification of types of industry.

I Introduction

The strengthening of management with emphasis on the creation and exploitation of intellectual property is an important challenge for Japanese companies in increasing competitiveness. The "Intellectual Property Strategic Program 2007," compiled in May 2005, also advocates that, in order to make Japan an "intellectual property-based nation" and enhance the international competitiveness of Japanese industries, it is important for Japanese companies to carry out management that emphasizes the exploitation of intellectual assets, etc., which are sources of competitiveness.

Under such circumstances, corporate reorganizations for enhanced competitiveness have been rapidly increasing in Japan since the latter half of the 1990s. In addition, although most of the past analyses of companies' intellectual property-related activities were focused on patent rights due to data constraints and other reasons, design rights and trademark rights are also supposed to be important tools for intellectual property strategies for companies. Moreover, clarification of the relationships between the competitiveness and intellectual property-related activities of SMEs, which form the basis of Japanese industries, is expected to give important suggestions for the growth strategies of SMEs and contribute to maintaining and enhancing the vitality of the Japanese economy.

In light of the above, this survey report conducts eight empirical analyses in total with regard to the impact of M&A, which has become increasingly important in recent years, on companies' intellectual property-related activities, the characteristics of intellectual property-related activities of SMEs or unlisted companies, the effect of the pro-patent policy relating to software patents and application and use behaviors for design rights and trademark rights, which have not been studied much in the past. All of the analysis themes are on issues whose analysis is expected to become increasingly needed in the future. This survey report offers the results of pioneering research in these fields.

The results of such research are expected to be used as a baseline for the planning of the

intellectual property policy or as a baseline for the formulation of intellectual property strategies by companies, etc. Moreover, this survey included the review of the estimation method, classification of types of industry and questionnaire sheet adopted for the "Survey of Intellectual Property-Related Activities" (Japan Patent Office). Due to such review, the coverage of the data source and the accuracy of estimation are expected to be increased, which will further improve the reliability of future research.

(Sadao NAGAOKA)

II Analysis of Intellectual Property-Related Activities of Japanese Companies

1 Impact of Corporate Reorganizations on the Application and R&D Trends: Case Study-Based Empirical Analysis

The number of M&A deals in Japan has been rapidly increasing in recent years. This chapter analyzes how such corporate reorganizations make changes in the application and R&D trends of companies. In particular, analysis is conducted from the following perspectives with a focus on horizontal mergers between companies in the same trade for the purpose of expanding market share, which have recently become more important among M&A deals in Japan: (i) Will the number of patent applications filed by a company increase due to such merger?; (ii) Will the opportunities for inventions, for which applications have been filed before merger, to be used increase due to such merger? In this regard, the capacity to work/exploit technology is expected to be increased due to integration of business assets through a merger, which will cause an increase in the number of patent applications filed after the merger and a rise in the rate of filing requests for examination for inventions, for which applications have been filed before the merger. In addition, it is also expected that the amount of R&D expenses will be reduced due to elimination of overlapping investment in activities that have been separately carried forward and that the number of applications will decrease (application behavior will become more efficient). Moreover, even if the amount of R&D expenses experiences no change between before and after merger, R&D productivity may increase due to acquisition of know-how, technology and knowledge.

The result of the analysis revealed that the application/request for examination behaviors of a parent company and its group companies as a whole differ in some cases before and after corporate reorganization. This is probably because the role that each parent company expects its subsidiaries to play is different. As a whole, the number of applications and that of requests for examination filed by parent companies tend to decrease after corporate reorganizations. However, after eliminating the influences of the technology market and industrial attributes, it was confirmed that the number of applications and that of requests for examination increase due to corporate reorganization in many fields. This is probably because R&D productivity and the capacity to use technology are enhanced due to the effect of integration of business assets through reorganization and other synergy effects. In addition, the effect of a corporate reorganization largely differs depending on the purpose thereof. In particular, the analysis indicated that, seen at the level of business, a business integration for which the purpose is considered to be streamlining causes a decrease in the number of applications.

(Isamu YAMAUCHI and Sadao NAGAOKA)

2 Impact of M&A in the Pharmaceutical Industry on R&D/Intellectual Property Departments

In recent years, M&A has become increasingly common among Japanese companies. Japanese drug manufacturers are also actively carrying out M&A. However, it can hardly be said that there is sufficient knowledge about the impact of such M&A on R&D activities or intellectual property-related activities of companies in the entire industry, including companies concerned with M&A. This chapter analyzes the impact of M&A between

drug manufacturers on R&D activities and intellectual property-related activities of companies in an empirical manner. This chapter is characterized by the point that it pays attention not only to a traditional thesis, i.e. what impact such M&A has on R&D activities (positive or negative) but also to the impact thereof on intellectual property-related activities, which constitute a representative R&D-related indirect department. If an indirect department, which is a cost center, can be cut down through merger, the productivity of the entire company can be increased. Does merger contribute to increasing operating efficiency in such a manner?

The results obtained in this chapter are as follows. In the past research, M&A was considered to have both positive and negative impacts on the R&D activities of companies, and both impacts were empirically confirmed. However, the analysis in this chapter reached a conclusion that M&A in the pharmaceutical industry, in particular, merger of companies, vitalizes R&D activities. This result can be said to be indicating that merger in the pharmaceutical industry leads to the merit of scale or scope, or improvement of appropriability. On the other hand, it was empirically revealed that merger has a negative effect on the number of persons engaged in intellectual property-related activities. This fact indicates that merger contributes to increasing efficiency through reduction of overlapping operations in the indirect department, and it can thus be said to be showing the possibility of increased productivity for the company as a whole.

(Koichiro ONISHI and Akiya NAGATA)

3 Impact of Intangible Assets on Corporate Value

This chapter analyzed the relationships between intangible assets and corporate value in terms of manufacturing companies that are listed on the first section of the Tokyo Stock Exchange, with the use of financial reports and the panel data of the "Survey of Intellectual Property-Related Activities" for four years from fiscal 2002 to 2005. Specifically, impact on Tobin's q as a proxy variable for corporate value was analyzed assuming R&D assets, advertising assets, personnel assets and intellectual property rights as the constituent factors of intangible assets. The result of the analysis showed that R&D expenses, which were set as a proxy variable for a company's technical capabilities, have a positive effect on Tobin's q. This supported the results of past empirical research. However, the analysis indicated that R&D expenses have a negative impact on the number of applications for patent rights. This hinted at a tendency of excessive patent acquisition among companies which were taken as samples. Regarding the stock of advertising expenses as well as design and trademark rights, all of which were set as proxy variables for brand, the result of the analysis showed that all of them have a positively significant effect on Tobin's q. Out of them, the effect of design rights was found to be larger compared to that of other kinds of intellectual property.

In addition, a tendency that foreign applications have more positive impact on corporate value than domestic applications was observed through estimation conducted by dividing applications for intellectual property rights based on the place of filing. Other than these, as a result of analysis on the mutually alternative/complementary relationships among patent rights, design rights and trademark rights, all of which are intellectual property rights, alternative relationships were significantly estimated between design rights and trademark rights, and complementary relationships were hinted at between patent rights and trademark rights. Regarding personnel assets, a variable, excess personnel expenses, was created based on the difference between the average wage of the company in question and the average wage of companies in the relevant industry. This variable was found to have a positive impact on Tobin's q.

(Yozo AOKI and Hiroyuki ODAGIRI)

4 Quantitative Analysis of Determinant Factors for Design Applications

This chapter aims at quantitatively

clarifying determinant factors for domestic design applications with the use of the "Survey of Intellectual Property-Related Activities." Main results are as follows.
(i) The more R&D-intensive a company is, the higher the productivity of its designs. In addition, the designs of such companies are likely to be copied since the products thereof are of high quality. Therefore, such companies actively file applications for design rights. (ii) Moreover, under the situation where patent-based appropriability is low, R&D-intensive companies have more expectations of the complementary functions of design rights than other companies; therefore, they file many design applications. (iii) For companies oriented toward differentiation from other companies based on the novelty of designs, it is important for maintaining their competitive advantage that the relevant designs are protected by law. Therefore, such companies file many applications for design rights. (iv) Diversified companies, which develop various product portfolios, are active in filing applications for design rights since they have the risk that a decline in their reputation due to counterfeits will extend in many directions. (v) The longer lifecycle of a product in the market is, the longer the product is exposed to the risk of copying. Therefore, for such products, companies can enjoy the effect of protection of rights based on registration of designs over a long period of time. In addition, it is easier to disperse fixed costs that are necessary for filing applications. For these reasons, it is indicated that the incentive for filing a design application is higher for products with a longer lifecycle.

(Kenta NAKAMURA and Hiroyuki ODAGIRI)

5 Empirical Analysis of Foreign Trademark Applications and Trademark Licensing

This chapter conducted an analysis of foreign applications and licensing (introduction), emphasizing a focus on trademarks among intellectual property rights. For Japanese companies suffering damages from counterfeits in foreign countries, the way to file trademark applications in foreign countries is one of the important subjects of decision-making. In addition, it has been an important issue whether or not a licensor of technology gives a license for the relevant trademark to another company at the time when it gives a license for the technology thereto. The analysis in this report revealed the following matters.

Firstly, the more diversified technologies a company has and the more difficult copying the company's products is, the less applications the company files in Asia. Conversely, this indicates that trademarks are more important for companies whose products can be easily copied.

Secondly, companies that belong to an industry with higher patent-based appropriability in Japan file more trademark applications in foreign countries. In addition, such tendency was seen more strongly in terms of Asia than the United States. This indicates that it is especially difficult to exercise patent rights in Asia and that trademarks are more important for companies that place emphasis on protection by patents in Japan.

Thirdly, among companies that are granted licenses for patent rights, there was a tendency that companies with higher absorption capacity (R&D-intensive companies) are also granted licenses for trademarks. To put it the other way around, this indicates that it is difficult for companies with low absorption capacity to use other companies' trademarks since they are likely to reduce the value of a brand that they have introduced.

Moreover, the effect of such absorption capacity was found to be larger for high-tech industries. This indicates that absorption capacity is not always important in introducing a patent and a trademark together but absorption capacity is especially important in industries in which high technical capabilities are required. However, the result of the analysis of trademark rights in foreign countries indicated that companies with higher absorption capacity are more likely not to be granted trademarks as they can be powerful competitors.

(Tomoyuki SHIMBO and Sadao NAGAOKA)

6 Research on the Intellectual Property Management Systems of SMEs

In order to maintain industrial competitiveness in the future, it is important for Japan to enhance the competitiveness of SMEs which form the basis of industrial competitiveness.

Therefore, this chapter gave an overview of the actual conditions with regard to the characteristics (the number of persons in charge of intellectual property, expenses for intellectual property-related activities, etc.) of the intellectual property management systems of Japanese SMEs, and also analyzed their impact on the rate of return of companies and their tendency in the acquisition and possession of patents.

According to the analysis, in order to enhance competitiveness, it is important for both SMEs and large companies to improve the quality of inventions and create an environment for exploiting them, or to possess patents that are like essential patents, and thereby secure their own business fields (to increase the rate of foreign patents possessed and the utilization rate thereof).

On the other hand, the element that is especially necessary for SMEs to enhance their competitiveness is the existence of an in-house patent attorney. Though the rate of SMEs that have an in-house patent attorney is very low, the profit rates of companies with an in-house patent attorney are significantly higher than those of companies without in-house patent attorney. That is, for SMEs, creating an environment that enables having an in-house patent attorney and holding in-house personnel who can handle intellectual property-related operations professionally to some extent without depending on outsourcing will lead to a rise in the profit rates.

In addition, with regard to creation of intellectual property in the previous step of exploitation of intellectual property, necessary matters are common to SMEs and large companies. The analysis showed the importance of the existence of complementary assets, which are useful in working inventions, and of proactive efforts for R&D activities and activities to lead inventions to intellectual property.

(Isamu YAMAUCHI and Koichiro ONISHI)

7 Analysis of R&D Activities of Unlisted Companies and Their Acquisition and Use of Patents

This chapter analyzed the characteristics of R&D activities and intellectual property-related activities of unlisted companies, as well as whether or not those characteristics can be explained based on the unique characteristics of unlisted companies, which are demonstrated through comparison with listed companies. The analysis in this chapter revealed the following matters.

Firstly, the structure of unlisted companies was revealed. Specifically, compared to listed companies, unlisted companies more actively carry out R&D activities (R&D intensity) and exploit their patents in-house in terms of their sizes. On the other hand, listed companies show a high tendency to acquire patents even for trivial inventions.

Secondly, listed and unlisted companies were divided into five types. Out of these five types of companies, quantitative analysis was conducted with regard to determining factors for the characteristics of the R&D activities and intellectual property-related activities of three types of companies. The analysis revealed that the characteristics of activities of delisted companies and purely unlisted companies could be originated in their ownership structures (rate of shares held by board members in Hypothesis 1).

Thirdly, with a focus on companies that were listed or delisted within the analysis period, quantitative analysis was conducted with regard to the impact of their listing or delisting on R&D activities and intellectual property-related activities. According to the result of analysis in this report, it can hardly be said that listing has a significant impact on R&D activities and intellectual property-related activities. On the other hand, it is inferred from the result of the analysis that delisting has a significant impact on R&D activities and intellectual property-related

activities. However, due care is required in interpreting the result because the timing of the explanatory variable and the timing of the explained variable are off the restriction of the analysis period.

This analysis is valuable as it provided a starting point to see the outline of the entire picture of R&D activities and intellectual property-related activities of unlisted companies. However, it is still a preliminary analysis. Firstly, there is an undeniable possibility that unlisted companies taken as samples in this analysis have originally actively implemented R&D activities and intellectual property-related activities because, according to "Nikkei Financial Data," there is a considerable difference between the rates of listed companies and unlisted companies that answered the "Survey of Intellectual Property-Related Activities." Some sort of action has to be taken to reduce such sample bias. Secondly, there is a lack of information on listed and unlisted companies, information on the change of the listing condition, and information on the listing market. Therefore, accurate analysis results can probably be obtained by conducting analysis again after acquiring a considerable amount of such information. Full-scale and rigorous analysis is to be required in the future.

(Yoichiro NISHIMURA and Sadao NAGAOKA)

8 Analysis of the Pro-Patent System and Application Trends in Software Patents

In terms of movements related to software patents in Japan, software media became patentable in 1997. Starting with this, software that is provided on-line became patentable in 2000, and software came to be treated as a "product" as prescribed in the Patent Act in 2002. This report analyzed, using patent data, the impact of such institutional changes relating to software patents on patent applications and innovations relating to software.

First of all, the characteristics of patent applications filed by companies specialized in software were examined based on the "Survey of Intellectual Property-Related Activities" and the "Survey of Selected Service Industries." Out of patent applications filed by such companies, those that seem to be related to software were found to be classified into the following five types: those related to (i) e-commerce, (ii) information search and database, (iii) image data processing, (4) program control and (v) information system/control within computer. In addition, the type of patent applications filed differs depending on the type of the software company. The ratio of patent applications related to information search and database is high for companies dealing with packaged software for business use. Moreover, information service-related companies file relatively many patent applications related to program control while companies producing software by order file relatively many patent applications related to e-commerce.

In addition, analysis was conducted with regard to the relationships between institutional revisions relating to software patents and application trends by extracting not only software companies but also companies which file applications for software-related patents. The rate of software-related patents gradually increased throughout the 1990s both in terms of the number of patents and the number of claims. Then, it rapidly increased in 2000 and 2001. Through detailed study of the result, it was found out that the rapid increases in 2000 and 2001 were owing to companies which newly entered the field of software patents (the time when a company acquires such a patent for the first time is considered to be the time of entry). Moreover, according to the result of regression analysis, the tendency to file applications for software patents has been increasing since the latter half of the 1990s, particularly, in terms of the total number of claims, and the institutional revisions relating to software patents have had some sort of impact on software innovation.

(Kazuyuki MOTOHASHI)

III Consideration of the "Survey of Intellectual Property-Related Activities"

1 Regarding the Review of the Method of Extended Estimation

Some problems have been pointed out with regard to the current estimation method. The first problem is a large discrepancy between the predicted and estimated number of applications to be filed in the future and the number of applications actually filed. The second problem is difference in the stratification standards for the number of applications depending on the item subject to estimation. The third problem is difficulty in recurrence due to complexity of the method of filling missing data. With the aim of overcoming these problems, estimations were conducted on trial by two methods, specifically, linear estimation and generalized regression estimation, with the use of data that was available at the time of the survey. In addition, the analysis of the results provided suggestions with regard to the direction for the improvement of the estimation method and the data necessary therefor.

Although the linear estimation attempted in this survey is a very simple method, from the perspective of prediction, better results were obtained with regard to the number of patent applications and that of design applications, compared to the current estimation method. In terms of the number of utility model applications and that of trademark applications, estimate values obtained by linear estimation were remarkably inferior to those obtained by the current method. This is considered to be mainly attributable to the stratification standards.

Regarding the results of generalized regression estimation, estimate values for the number of utility model applications and that of trademark applications were considerably better compared to those obtained by linear estimation. Therefore, this generalized regression estimation is likely to be used for extended estimation in the future.

Possible directions of future research include more detailed consideration of the method of filing missing data and the stratification standards, as well as the analysis of discrepancy between estimate value and actual value with respect to each class. In doing so, accuracy of estimation can be further increased by using data such as the number of applications by the class of the number of applications under each of four intellectual property laws and the frequency of filing, as well as the number of applications by the class of capital in the population.

(Takahiro TSUCHIYA and Fumio FUNAOKA)

2 Classification of Types of Industry in the Survey of Intellectual Property-Related Activities

The 12th revision of the Japan Standard Industry Classification was conducted in November 2007. In the 12th revision, the classification was reviewed in full scale, including establishment of new large items of classification, so as to correspond to changes in the industrial structure after the 11th revision, such as the sophistication of information and telecommunications. In response to this, there is a call for changes to the classification of types of industry in the Survey of Intellectual Property-Related Activities.

This is because it is necessary to enable conducting analysis that reflects the current industrial structure more accurately and to Industry Classification.

Statistical classification is a standard for extracting valid information from statistical data. Use of a common statistical classification for statistics contributes to promoting systematic development of statistics and increasing convenience.

Rigorous consideration based on data is basically necessary with regard to the validity of applying the Japanese Standard Industry Classification to the classification of types of industry in the Survey of Intellectual Property-Related Activities. However, in this chapter, proposed new classification of types of industry was formulated due to data constraints, placing emphasis on the continuity with the past results and consistency with the "Survey of Research and Development" conducted by the Ministry of Internal Affairs

and Communications with regard to R&D activities, in the same way as the Survey of Intellectual Property-Related Activities.

The Survey of Research and Development is a survey focused on R&D inputs while the Survey of Intellectual Property-Related Activities is a survey emphasizing R&D outputs. Therefore, much useful information can be obtained by using the results of these surveys together.

It is a future challenge to analyze what standards should be set for the classification of intellectual property-related activities from the viewpoint of homogeneity and to what extent the classification of types of industry based on the standards is valid, by using information on intellectual property-related activities and information on industry classification together.

(Fumio FUNAOKA and Takahiro TSUCHIYA)

3 Regarding the Review of the Questionnaire Sheet

The "Survey of Intellectual Property-Related Activities" is a statistical survey which the Japan Patent Office conducts with the aim of contributing to strengthening the intellectual property management activities of companies, etc. by gaining a quantitative understanding of intellectual property-related activities of companies, planning and verifying the intellectual property policy of Japan and providing relevant information to industrial circles.

The "Survey of Intellectual Property-Related Activities" provides a considerable amount of information that is useful in analyzing and understanding the intellectual property-related activities of companies, etc., including information on the license revenues of companies and the status of exploitation of industrial property rights by companies. Although the fiscal 2008 survey marks the seventh time, the survey has been continuously reviewed in the past for further increase in its utility.

This survey committee also discussed the problems of the questionnaire sheet and necessary improvements thereto in order to gain a more accurate understanding of the actual conditions of intellectual property-related activities in Japan and to reduce the burden of answering questions.

In doing so, the committee conducted a review mainly on the items for which many respondents made inquiry. In particular, the committee made it possible to check the logic by clarifying definitions, adding and correcting notes and changing layout. In addition, the committee considered possible improvements to reduce errors in answering and the burden of answering questions.

Moreover, in the review of this time, the committee also considered the introduction of a question asking the number of persons engaged in standardization activities as well as measures for the case where a company subject to the survey cannot independently answer a question. Through introduction of such a question, it will become possible to understand the actual conditions of standardization activities, which have recently become increasingly important. In addition, by taking such measures, accurate values can be obtained even where a holding company or parent company manages intellectual property rights in a lump amid the progress of corporate reorganization, and the response rate can also be increased.

(Researcher: Isamu YAMAUCHI)