

7 The Trends of Applications for Industrial Property Rights in Japan

In Japan, the government formulates the “Intellectual Property Strategic Program” with the aim of strengthening international competitiveness and revitalizing economy, and is implementing measures concerning intellectual property. With the recent development of intellectual property-related policies, companies are also strengthening activities concerning the protection and exploitation, etc. of their own intellectual property. In planning the intellectual property-related policies of Japan, it is considered important to deepen discussions with a common view that is based on statistical analysis.

In light of such circumstances, in this survey, we conducted eight empirical analyses in total with regard to the relationship between corporate reorganization, which has been actively conducted in many industries in recent years, and patent filing/R&D investment, the existence of a solid patent production function designed to make it possible to predict the number of patent applications, uncertainty in the substantive examination of patents and its influence on companies’ application behavior, the relationship between design rights and corporate value, use structure of patents and profitability of R&D, pro-patent system reform and innovation, and measurement of patent premium.

I Introduction

In Japan, the government formulates the “Intellectual Property Strategic Program” with the aim of strengthening international competitiveness and revitalizing economy, and is implementing measures concerning intellectual property. With the recent development of intellectual property-related policies, companies are also strengthening activities concerning the protection and exploitation, etc. of their own intellectual property. In planning the intellectual property-related policies of Japan, it is considered important to deepen discussions with a common view that is based on statistical analysis.

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activities in Japan.

Moreover, for the “Survey of Intellectual Property-Related Activities” that was used for these analyses and is the only statistical survey of intellectual property-related activities in Japan, we discussed the review of the survey itself as well as the review of the method of estimating the entirety and the classification of types of business, based on the results of the analyses in this report, with the aim of further increasing the accuracy of data.

It is desired that these studies will be used as basic data for planning intellectual property policies in Japan and used as basic data when companies, etc. formulate intellectual property strategies. In addition, in this survey, we also discussed the review of the method of estimating the entirety/the classification of types of business/survey sheet, which are used for the “Survey of Intellectual Property-Related Activities.” This review is expected to result in the improvement of data source coverage and accuracy of estimation and the further improvement of the reliability of future studies.

(Sadao Nagaoka)

II Analysis of Intellectual Property-Related Activities of Japanese Companies

1 Change in the Organization Structure of a Business Group Due to Shift to the Holding Company System and Its Effects on Patent Application Behavior.

Corporate reorganization with the use of a holding company has been relatively frequent in recent years. The ban on pure holding companies under the Antimonopoly Act was lifted in 1997, and the equity swap system and the equity transfer system were introduced in 1999 with the revision of the Commercial Code. The corporate divestiture system was introduced through revision of the Commercial Code of 2001, and the consolidated tax system was also introduced in 2002. These system changes concerning pure holding companies are considered to constitute one of the background factors of today's increase in the number of holding companies.

This Chapter revealed how business activities/R&D activities/intellectual property-related activities of a business group as a whole have changed due to corporate reorganization through a shift to the holding company system. The main results are as stated below. First, it was confirmed that, through a shift to the holding company system, most business activities are placed under the control of not holding companies, which are parent companies, but operating companies, which are subsidiaries/affiliate companies. At the same time, it was also confirmed that most R&D activities are placed under the control of not holding companies, which are parent companies, but operating companies, which are subsidiaries/affiliate companies.

Secondly, the result of precise quantitative analysis revealed that, through a shift to the holding company system, companies come to have a higher tendency to file patent applications only for high-quality inventions, such as those with many claims. Therefore, it was revealed that the intellectual property management of a business group as a whole has become more efficient in the point that companies file applications by selecting inventions for which they file applications based on the quality of inventions. In addition, it was also confirmed that, through shift to the holding company system, a business group as a whole liquidates and consolidates business property and thereby

enhances the ability of using technologies that companies possess. Consequently, it is indicated that intellectual property management has become more efficient in the point that the ability of using technologies that companies possess is enhanced.

(Yoichiro Nishimura)

2 Impact of Corporate Merger on R&D Activities – Analysis of the Pharmaceutical Industry as an Example –

In this Chapter, we conducted empirical analysis of the influence of a merger in the pharmaceutical industry on R&D activities in the entire industry, which includes competitors as well as companies concerned in the merger. Before conducting the analysis, we prepared a market distance variable, which is to measure pre-existing competition with a merged company with the use of sales data by the area of medicinal benefits, by using Jaffe's method of measuring technological distance (1986, 1989). The results of estimation revealed that a merger in the pharmaceutical industry has a stronger effect of increasing R&D investment on companies that are in fiercer competition with the companies concerned in the merger before the merger. This result indicates that the phenomenon of merger has a strong influence not only on companies concerned in the merger but also on the decision-making for R&D investment of competitors whose market is close to the market of the companies concerned in the merger. Where a merger is conducted, companies involved in the merger are apt to gather attention, and competitors' trends are often neglected. The results of this study are regarded as indicating that it is necessary, when examining the adequacy of a merger, to pay attention not only to the trends of the companies concerned in the merger but also to those of the entire market including competitors. On the other hand, the results of this study also point out problems with earlier studies. The past studies of merged companies implicitly have assumed that a merger and the business behavior of companies other than the companies concerned in the merger are independent from each other, that is, a merger does not affect the R&D investment of competitors. The results of this Chapter indicate that such assumption is not sufficiently fulfilled at least in the pharmaceutical industry.

(Koichiro Onishi/Akiya Nagata)

3 Analysis of Patent Filing Behavior and Examination Requesting Behavior

In order to make it possible to predict the number of patent applications, the existence of a solid patent production function must be confirmed. It is known from many earlier studies that there is a high correlation between real R&D expenses and the number of patent applications. However, R&D expenses and the number of patent applications are not in a simple correspondence relation, and there is a possibility that the wider use of the multiple claim system, the existence of innovation lag, difference in inclination to patent and innovation costs and difference in R&D productivity constitute destabilizing factors. Thus, as a result of estimation of a patent production function based on the pooling data of 101 major Japanese companies, a stable relationship was found between the number of patent applications and real R&D expenses. However, it was found that claim-weighted patent applications are difficult to predict as they are strongly affected by R&D productivity.

In addition, we conducted analysis on companies' examination requesting behavior. The business value of a considerable number of companies' inventions does not become clear until sufficient time passes. Therefore, the request for examination system, which gives applicants time to determine the business value of inventions, has the advantage of promoting the saving of examination costs and preventing unnecessary obtainment of rights for inventions. However, since the period of filing a request for examination is limited to three years, there are inventions for which a request for examination is filed before their business value is revealed (deadline effect). Such inventions may include those for which applications must have typically been withdrawn (inventions for which a request for examination has been unnecessarily filed). With that, we conducted verification of deadline effect like this and estimation of the number of inventions for which a request for examination has been unnecessarily filed. As a result of that, a very strong deadline effect was confirmed, and it was revealed that requests for examination had been unnecessarily filed for 21.6% of patent applications.

(Setsuo Yamada/Yasuyuki Ishii)

4 Substantive Examination of Patents and Firms' Patent Application Behavior

In this Chapter, we first examined the source of uncertainty of patent examination, and then confirmed whether there is a tendency that is consistent with the result. First, it is believed that the rate of applications for which a decision of refusal is rendered in patent examination (rate of decision of refusal) is higher when there are large differences in the ability of searching publicly-known documents and in the determination of patentability between applicants and the JPO. The rate is actually high in the high-tech fields in which such differences are likely large. In the same way, many fields in which the rate of cases in which a request for a trial against an examiner's decision of refusal is filed is high are high-tech fields. On the other hand, fields in which a trial against an examiner's decision of refusal is highly likely to be established on the condition that a request for trial has been filed are likely fields for which determination of inventive step, etc. within the JPO is steady and errors in decisions are apt to be corrected without fail. It was observed that such likelihood tends to be high in low-tech fields.

Post-grant objection and trial for invalidation are likely frequent in fields in which the exercise of patent rights is relatively easy and for which examination at the JPO is more difficult. In fact, it was observed that the rate of cases in which a request for a trial for invalidation is filed tends to be low in fields in which infringement lawsuits seem to be avoided through cross-licensing and other methods.

In this Chapter, we also analyzed the temporal trends of the rate of decision of refusal, the rate of cases in which a request for a trial against an examiner's decision of refusal was accepted and the rate of cases in which a request for a trial for invalidation was accepted. We confirmed that their temporal changes have a strong correlation as a whole and by individual technical field. We also confirmed that, from the middle of the 1990s onward, trials have been conducted at a higher level as the level of inventions that are patented at the examination stage has become higher.

In the end, we statistically analyzed the influence of the level and stability of patentability in patent examination and trials on the filing of patent applications. As a result of that, we found that although the number of patent applications is reduced if the level of inventions that are

patented through an examiner's decision or a trial is higher, an increase in the uncertainty of the level tends to increase the number of patent applications.

We would like to point out that the results above are largely preliminary and it is necessary to take more time to deepen empirical analysis in order to obtain more robust knowledge.

(Sadao Nagaoka/Tomoyuki Shimbo)

5 Exploratory Study on the Development of/Application for / Maintenance of Design Rights and Their Impact on Corporate Value

This Chapter aimed at obtaining exploratory and fact-finding results concerning Japanese companies' various efforts relating to designs with the use of extensive data on design rights.

The study consists of five parts. In Section (3), trends of creation, filing and exploitation of designs were indicated by industry in line with time from creation to filing and to exploitation. The following three sections conducted analysis with the intention of finding facts, focusing attention on the creators of designs. In Section (4), the relationship between the characteristics of the industry and products and the form of development of designs was discussed through analysis of the average number of creators per design. In the analysis in Section (5), we classified creators into three types, i.e., in-house designers, designers at affiliate companies and external designers, and discussed whether there is a difference in choice between in-house and external designers between the fields of products and between companies. In Section (6), we measured the degree of interaction between designers and engineers, taking up printers and cell phones on a trial basis. The conclusion that is drawn from a series of analyses is summarized in the following point. That is, the effect that a design right is expected to have differs significantly depending on the type of business, and therefore, the technical characteristics of the industry and the field of products to which each company belongs serve as important determining factors in any of the creation, filing and possession of designs .

This was also confirmed in regression analysis in Section (7), in which the influence of the filing of applications for design rights on corporate value was verified. Through analysis targeting all industries, no significant relationship was detected between design rights and

corporate value. However, the following point was indicated through analysis conducted by dividing samples in consideration of relevance between technology and design. In other words, it was indicated that it is possible to seek purely excellent designs by employing external designers in industries, in which technology that constitutes the essence of a product and design pertaining to the product have little relevance, since the development of design is not constrained by the development of technology. It was also indicated that corporate value is enhanced as a result of obtaining rights for designs that have been created in that manner. On the other hand, it was indicated that, even for the types of business for which differentiation by design is considered important, designs created by in-house designers who are presumed to have better understanding of technology enhance corporate value for the types of business in which designs supported by technology are required.

(Kenta Nakamura/Yoichi Matsumoto)

6 Analysis of the Patent System by the Use Structure of Patents and Its impact on the Profitability of R&D

It is indispensable to understand the use structure of patents in order to analyze the influence of the patent system on R&D. For example, where many patent rights are used not for in-house exploitation but for the blocking of other companies' inventions, such use has a strong effect of impairing other companies' profits from R&D. Therefore, the influence of the patent system on the profitability of R&D is not necessarily positive for the industry as a whole (existence of prisoner's dilemma). Moreover, even where a patent has been licensed to another company, exclusiveness is not exerted in some cases as the license is based on a cross-license agreement.

In this Chapter, we conducted analysis with the aim of contributing to the understanding of the influence of the patent system on R&D through examination of the difference in the profitability of R&D due to difference in the use structure of patents. The main conclusions are as follows.

First, the analysis revealed that the rate of operating profit to net sales is higher for companies of which the patent utilization rate is higher. Secondly, the analysis indicates that, among companies of which the patent utilization rate is high, companies of which the rate of

patents that are exclusively exploited in-house is higher acquire more profits from businesses for which their own inventions/technologies are exploited. Thirdly, the analysis indicates the possibility that a situation like “patent thicket,” in which the average rate of cross-licensing by industry/the average rate of blocking patents by industry are high and companies in the same trade possess patents that are necessary for other companies’ business in a dispersed manner and cannot implement the businesses, has occurred and the profitability of companies belonging to the industry has been worsening.

From the above, the analysis indicates that the current Japanese patent system is appropriately functioning to give incentives for the commercialization of inventions and technologies. Specifically, it is not possible to increase the possibility of exclusive use of the results of R&D unless a company uses its own patented invention for its own business, of course, on the condition that it appropriately gives incentives for the development of product or technology. In addition, even if a company uses its patented invention for excluding other companies, such use will not result in its own profits.

(Sadao Nagaoka/Yoichiro Nishimura)

7 Analysis of the Influence of Reform of the Pro-Patent System on Innovation Activities in High-Tech Industries

In this Chapter, we examined the relationship between pro-patent policy and innovation, taking up the spread of patent rights to software and the patent term extension system for pharmaceutical products. In high-tech industries, including the software industry and the pharmaceutical industry, protection of inventions by patent rights has the effect of enhancing incentives for innovation. On the other hand, however, strengthening of patent rights will reduce the motivation of following companies that conduct cumulative innovation. In order to discuss the relationship between pro-patent policy and innovation, it is necessary to study the balance between them. In this Chapter, we conducted analysis focusing attention on patentees as the first step of the study.

First, regarding the relationship between the spread of patent rights to software and innovation, it was found that possession of patents is deeply related to moving away from the subcontracting structure that consists of made-to-order software companies and making a shift to independent

software companies. In addition, as a relationship like this was especially observed in companies that started filing patent applications from the latter half of the 1990s onwards, there is the possibility that patent system reform relating to software that started in the latter half of the 1990s has had influence. However, no statistically-significant relationship was observed between the package rate, which is another indicator of innovation, and patents possessed. It was not possible to confirm the existence of a clear relationship between the status of filing of patent applications at pure software companies and the system reform.

With regard to the patent extension system for pharmaceutical products, etc., we went no further than the confirmation of the status of use of the system. According to measurement, the substantive period of validity of a patent is from 10 to 12 years, of which about four years is the period that was extended based on the system of registration of extension. The extension of the substantive period of validity of a patent by one-third can significantly improve the opportunity for early-started manufacturers to make profit. In addition, as a result of verification concerning the extended period, it was found that the system reform of 2000 expanded the subject scope by a little less than 20%. At the same time, it was also confirmed that, in considerable cases, the extended period reaches the ceiling at five years. It is necessary to consider the issue concerning the duration of a patent, specifically, the issue of setting of a ceiling under the current system, from more macro perspectives, including the way of thinking for an appropriate balance between new drugs and generic drugs.

(Kazuyuki Motohashi/Masayo Kani)

8 Economic Evaluation of the Patent System Based on the Measurement of Patent Premium

The contemporary patent system is expected to play a role as an industrial policy that enhances the value of innovation and promotes R&D activities by granting exclusive rights for companies’ inventions. However, there had been no empirical study that clearly measures how much the granting of exclusive rights enhances the value of innovation. Arora, Ceccagnoli and Cohen (2008) defined a multiplier that indicates how many times the value of innovation is enhanced owing to the granting of patent rights as “patent premium,” and measured it. In this

Chapter, efforts are made to measure patent premium in Japan by referring to earlier studies and utilizing the to the granting of patent rights as rigtent premium,” and measured it. In this ty of a patenking for an a is the possibility that the patent system sufficiently stimulates companies’ R&D activities since the value of innovation for which a company has chosen to obtain a patent is significantly enhanced though patenting is not necessarily regarded as an advantageous means of exclusive use for average innovation.

(Setsuo Yamada/Yasuyuki Ishii)

III Consideration Concerning the “Survey of Intellectual Property-Related Activities”

1 Review of a Method of Estimating the Entirety

The parent population of the Survey of Intellectual Property-Related Activities consists of individuals, juridical persons and public research institutes, including universities, in Japan, which have filed one or more applications for any of patent, utility model, design and trademark in the year two years before the year of the survey. However, answers to the survey can actually be obtained only from some of them. Therefore, in order to understand the intellectual property-related activities of the entire parent population, it is necessary to conduct an extended estimation based on valid answers. In this study, we considered adopting generalized regression estimation, which uses the rank based on the number of applications for types of business and for four laws as auxiliary variables, as a method of giving weight for estimation to companies, etc. from which answers were collected. The advantage of this estimation is the point that it is not necessary to change weight according to the item subject to estimation since one weight is given to each company. Then, it was indicated that it is possible to estimate, with high accuracy, the number of applications by type of business for all of the four laws with the use of the weight obtained here.

(Takahiro Tsuchiya/Fumio Funaoka)

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

Intellectual property-related activities form a part of economic activities; therefore, the

classification of types of business in the Survey of Intellectual Property-Related Activities should be made responsive to the Japan Standard Industry Classification, which systematically classifies similar economic activities, in some form. In doing so, it is probably possible to draw up a more useful classification of types of business by integrating the classification items of the Japan Standard Industry Classification on the basis of an evaluation index that indicates the level of intellectual property-related activities. On the other hand, we obtained results that indicate the necessity of segmenting the existing classification of types of business for the information and telecommunications industry. In addition, the unit of application of the Industry Classification is business office while the unit of survey of the Survey of Intellectual Property-Related Activities is company. In classifying the types of business, the perspective of what industries each type of business by the unit of company diversifies into through expansion of business offices is also important. Moreover, we also obtained results that indicate that it is necessary to understand intellectual property-related activities on a business group basis beyond a company basis, as intellectual property-related activities are conducted based on the strategic decision-making of a company as a whole.

(Fumio Funaoka/ Takahiro Tsuchiya)

3 Review of the Survey Sheet for the Survey of Intellectual Property-Related Activities

The “Survey of Intellectual Property-Related Activities” is a statistical survey, which the JPO has been conducting from fiscal 2002 with the aim of understanding the actual conditions of intellectual property-related activities of Japanese companies, etc. in order to develop basic data for planning intellectual property policies of Japan.

This statistical survey provides much information that is very useful for study, which only companies, etc. can know, including the status of activities of intellectual property departments and the status of use/exploitation of industrial property rights. In addition, surveys that aggregate and provide such information are rare worldwide.

The survey marks the seventh year in fiscal 2008. By continuously conducting such statistical survey, it is possible not only to understand the interannual intellectual property trends of

companies, etc. but also to accumulate data for verifying the effects of intellectual property policies. The survey is thus expected to become increasingly useful.

The survey committee consisting of intellectuals has held repeated discussions on the survey items of the “Survey of Intellectual Property-Related Activities” over the past several years. The committee in this study also considered ideas for improvement in order to gain more precise understanding of the actual conditions of intellectual property-related activities in Japan as well as in order to increase the accuracy of the survey itself by improving the rate of collection through reduction of the burden of answering.

Problems with items concerning licensing were discussed in the review this time. In addition, problems that have a bearing on the central point of the survey were also raised.

(Researcher : Tomoyuki SHINBO)