

7 FY2012 Analysis of Economic Growth Arising from Applications for Industrial Property Rights in Japan ^(*)

Intellectual property systems, such as the patent system, are some of the most important parts of the infrastructure supporting innovative activities; and patent data plays a vital role as an indicator for measuring the research and development activities of companies and other entities.

This analytical study incorporated the research outcomes accumulated to date, while also making use of the Survey on Intellectual Property-related Activities conducted by the Japan Patent Office (JPO) and databases such as PATSTAT and a Chinese patent database. In this study, a total of seven empirical analyses were carried out: (1) relational analysis between the number of patent applications filed in Japan and the number filed in foreign countries, focusing on Japanese applicants; (2) influence of the length of time before the commencement of examination on the examination results and stability thereof; (3) analysis of complementary use of the design system and the patent system; (4) statistical analysis of patent applications filed by Japanese joint venture companies in the East Asian region, excluding Japan; (5) analysis of the stability of rights in relation to trials for invalidation; (6) review of methods of estimating the number of requests for examination in Japan; (7) statistical analysis of intellectual property rights and advantage in financing. In addition, the revision of the survey design of the Survey on Intellectual Property-Related Activities was also considered.

I Introduction

Intellectual property systems, such as the patent system, are some of the most important parts of the infrastructure supporting innovative activities; and empirical study on innovation and intellectual property systems has been carried out vigorously worldwide. This report first provides a review of the global trends in using patent systems and an analysis of why the number of patent applications filed in Japan has been sluggish in the midst of the global growth in patent filing, from the perspective of the correlation between international filing and domestic filing by Japanese companies. The report also covers an analysis of the trends in filing in China by applicants, including Japanese joint venture companies, with the use of data released by the Chinese patent office.

The report provides an analysis of the quality of patents. It points out the possibility that the reduction in the length of time before the commencement of examination has made it difficult to perform high-quality examinations, and also reveals the fact that the longer it takes to file a request for a trial for invalidation after the registration of rights, the less likely it is for the request to be accepted.

Furthermore, an analysis was conducted on the reality of complementary use of the design system and the patent system; and an attempt

was also made to analyze the influence that companies' possession of intellectual property rights have on their financing conditions.

In addition to the abovementioned analyses, this report presents findings on the current status of the patent data, developed and provided by the European Patent Office (EPO), and the international research trends, while providing a summary of the Patent Statistics for Decision Makers Conference and the PATSTAT User Day Meeting, both held in November 2012 and attended by the members and secretariat of this study committee.

In Part III of this report, the Survey on Intellectual Property-related Activities is discussed. The report provides a review of the improvements for the survey that have been proposed and implemented to date, and summarizes the results of the interviews with the entities that carry out the survey. It also presents the deliberation on whether or not it would be appropriate to include the actual and estimated numbers of requests for trials in the survey items, which led to a negative conclusion.

(Sadao NAGAOKA)

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II Analysis of Behavioral Trends in Filing Applications for Industrial Property Rights

1 Relational Analysis Between the Number of Patent Applications Filed in Japan and the Number Filed in Foreign Countries, Focusing on Japanese Applicants

In this study, the correlation between the number of patent applications filed in Japan and the number filed in foreign countries by Japanese applicants was analyzed chronologically and by a statistical approach. This analysis revealed that the correlation differs depending on technical fields. The major findings are summarized as follows.

- (1) Focusing on the 197 major Japanese companies, their behavioral trends in filing applications only domestically were somewhat different from such trends in relation to all domestic applications filed in Japan. The number of applications filed only domestically by those major Japanese companies began to show a slight decline in the early 1990s, a little earlier than the decline of the total number of domestic applications filed in Japan, which began in the early 2000s.
- (2) While the number of applications filed only domestically has been gradually declining since the early 1990s, the number of applications filed both domestically and internationally has been on the rise. The most popular foreign country chosen by Japanese companies filing applications both domestically and internationally is the United States. In recent years, the number of those filing applications in China in addition to Japan has been increasing.
- (3) The statistical analysis of the correlation between applications filed only domestically and applications filed only internationally indicates that these two types of applications deal with substitution to some degree. However, since the ratio of applications filed only internationally, which was used as an explanatory variable in this statistical analysis, was a very small value, a large coefficient was used for estimation. Therefore, the degree of substitution between domestic applications and international applications cannot be discussed solely on the grounds of said

analysis result.

- (4) In the analysis of international applications filed in the United States and China, it became clear that in the case of Chinese applications, in particular, the market size and the indicator of the protection capability of intellectual property systems have a statistically significant influence on the number of applications. In the future, an analysis by patent family should be attempted in addition to an analysis by company.

(Yoichiro NISHIMURA)

2 Influence of the Length of Time Before the Commencement of Examination on the Examination Results and Stability Thereof

This study analyzed how the reduction in the time lag between the filing and the commencement of examination, which was achieved by speeding up the patent examination process, has influenced the scope of prior art search conducted by examiners and the stability of the examination results. In this analysis, in order to identify the cause-and-effect relationship between the early commencement of examination and the quality of examination, an instrumental variable approach was applied (by using the reduced period for allowing a request for examination as an instrumental variable).

As a result of the analysis, it became clear that as the length of time before the commencement of examination is reduced by exogenous factors, such as the reduced period for allowing a request for examination, the scope of prior art search conducted by examiners was reduced and the prior art documents to be used for examination were limited to old documents that had been published long before the application subject to examination was filed. It was confirmed that the reduction in the time lag before the commencement of examination would increase the rate of trials against examiners' decisions, and at the same time, it would also increase the rate of decisions of registration. Thus, the analysis suggested the possibility that the reduction in the length of time before the commencement of examination would result in the decrease in the number of prior art documents available to examiners and the decline in the quality of examination. Meanwhile, with regard to the correlation with trials for invalidation, no significant effect was observed by

an instrumental variable approach. This point should be further studied in the future.

When a decision to grant a patent is issued prior to the publication of the application and when accelerated examination is conducted, the reduced time lag before the commencement of examination had a greater influence on the quality of examination. In fields where the issue of a patent prior to the publication or the accelerated examination frequently occurred, even when the time lag was controlled, the rate of filing and the rate of acceptance of requests for trials for invalidation increased. The availability of feedback from third parties may be one of the factors behind these trends. Further study would be necessary on this point.

In conclusion, in order to both increase the speed of examination and ensure the quality of examination, it is important to enhance the JPO's examination ability and also to reinforce the mechanism for having the information held by third parties reflected in the examination process by promoting submission of information by third parties and introducing a post-grant opposition system. In addition, since accelerated examination requires more resources in order to ensure precision, it would be worth considering raising the amount of fees for a request for examination to an appropriate level.

(Sadao NAGAOKA, Isamu YAMAUCHI)

3 Analysis of Complementary Use of the Design System and the Patent System

As the first step toward grasping the actual conditions of the mixing (combination) of intellectual property rights, this chapter explores the possibility of complementary use of the design system and the patent system. Specifically, a regression analysis was carried out on the applicant level by using the number of applications for design rights as a dependent variable, so as to investigate whether incentives for applying for design rights would increase to make up for the inappropriability of innovation in certain situations. An example situation would be when sufficient protection of intellectual property rights could not be expected under the patent system due to the difficulty of obtaining patents or the amount of time it takes to establish patent rights. The major analysis results are summarized as follows.

There was no such correlation suggesting that applicants who belong to fields where obtaining design rights is easier would file more

design applications. It was not found that the more difficult it is to obtain patent rights, the greater the incentive would be to apply for design rights, or that the more difficult it is to obtain patent rights, the more design applications would be filed because of the possibility to obtain design rights easily. The fact that it is possible to obtain design rights quickly did not show an effect of increasing the incentive to apply for design rights. It was not found that the longer it takes before the establishment of patent rights, the more applications would be filed for design rights, or that the longer it takes before the establishment of patent rights, the more design applications would be filed because of the possibility to obtain design rights quickly.

Thus, the results of the analysis using the number of design applications as a dependent variable did not demonstrate any correlation suggesting that design rights are applied for with a view to making up for the inappropriability of innovation under the patent system. However, some estimated equations showed that more applications would be filed for design rights in technical fields where the period of patent examination is short. Assuming that the length of the time lag before the decision to grant a patent depends on the complexity of the invention or the difficulty of examination arising therefrom, it is presumed that in technical fields where this time lag is short, more applications would be filed for inventions that are relatively closer to commercialization, rather than inventions still in basic research. In such fields, there may be a greater incentive to protect technical innovation by both patent and design rights, or to use a design right to protect the outer design or package of the product, and this may lead to an increase in the number of design applications. In short, the analysis suggests that complementary use of the design system and the patent system does not arise from a sort of negative intention (i.e., applying for design rights due to the impossibility of protection under the patent system), but obtaining both design rights and patent rights is rather intended to achieve stronger protection of products.

(Kenta NAKAMURA)

4 Statistical Analysis of Patent Applications Filed by Japanese Joint Venture Companies in the East Asian Region, Excluding Japan

This study investigated the trends of patent

applications filed by Japanese joint venture companies in China and analyzed the rate of requests for examination, the period between the request for examination and the registration of rights, and the status of maintenance of rights, targeting all Chinese patents. The major analysis results are summarized as follows.

- (1) Among the 315 Japanese joint venture companies based in China subject to the investigation, 69 of them filed 528 applications with the Chinese patent office. This number is very small compared to the number of applications filed with the Chinese patent office by applicants residing in Japan. Most of those 528 applications were filed by companies in semiconductor and home appliances since the 2000s.
- (2) The tabulation of data of all applications filed with the Chinese patent office, in terms of the period before the request for examination, the period before the registration of rights, and the status of maintenance of rights, revealed a large gap between applications filed by applicants residing in China and those filed by applicants residing overseas. Looking at the trends of applications filed in 2000, the average period before the request for examination was 12 months among applicants residing in China and 23 months among applicants residing in Japan. The average period between the request of examination and the registration of rights was 33 months among applicants residing in China and 47 months among applicants residing in Japan. Furthermore, focusing on the registered patent rights applied for in 1990, 85% of such registered patent rights obtained by applicants residing in Japan were maintained ten years after the registration, whereas the maintenance rate among the registered patent rights obtained by applicants residing in China was 25%. With regard to applicants residing in other foreign countries, the period before the request for examination, the period required for examination, and the period of maintenance of rights are longer than those for applicants residing in China.
- (3) From the regression analysis carried out by using the time lag between the request for examination and the registration of rights and the time lag between the filing of applications and the expiration of rights, it became clear that even under the controlled

conditions relating to the quality of inventions (e.g., the number of claims, the number of times cited), the period of examination and the period of maintenance of rights in respect of applications filed by applicants residing in China were significantly short in statistical terms.

(Naotoshi TSUKADA, Kenta KOSAKA)

5 Analysis of the Stability of Rights in Relation to Trials for Invalidation

This chapter provides an analysis of trials for invalidation requested against the patents applied for in 1990 and thereafter, with the aim of empirically demonstrating factors that contribute to the stability of rights. Specifically, focusing on the procedural developments during the examination stage and the trial stage, estimation was carried out by a regression-analysis approach to find factors that lead to the acceptance of a request for a trial for invalidation, and thereby identifying factors that contribute to the creation of stable rights. The following results were obtained from the estimation by a logit and ordered logit models.

In the examination procedure, neither the number of pre-grant submissions of information by third parties nor the number of interviews with applicants in the examination process had a significant effect on the probability of invalidation. The former factor was expected to improve the quality of examination because it was presumed to be effective at increasing the amount of information available to examiners and putting the examination resources within the JPO intensively into applications that claim inventions of greater importance. However, given that the stability of rights or quality of examination is evaluated on the basis of the outcome of the trial for invalidation, none of the expected effects was detected. As for interviews with applicants during the examination process, this procedure was expected to narrow the gap in available information between the applicant and the examiner, and thereby improve the quality of examination. However, this effect was not confirmed. On the other hand, it was found that the outsourcing of the prior art search contributes to the creation of stable rights. In addition, it became clear that patents granted through accelerated examination have been invalidated frequently in recent years. This suggests that if an examination is requested at an early stage, the opportunity for third parties to submit

information would be limited and examiners would face more difficulties in accessing prior art information concerning the latest research achievements, which might result in the reduced quality of examination. The analysis also indicated that the larger the number of amendments, the less likely patents are to be invalidated, whereas the larger the number of notices of reasons for refusal, the more likely patents are to be invalidated.

In connection with the trial procedure, the analysis focused on, in particular, whether patents that have been subjected to oppositions but have been maintained would be able to survive a trial for invalidation. According to the estimate, patents that have continued to exist after being subject to oppositions are less likely to be invalidated even when a trial for invalidation is requested. Since most patents subject to oppositions are for important inventions, it is highly likely that a trial for invalidation will be requested if an opposition is dismissed. The estimate result indicates that the examination in response to an opposition increases the stability of rights. It was also revealed that the longer it takes between the registration of rights and the request for a trial for invalidation, the less likely it is for the request for a trial for invalidation to be accepted. This suggests that the probability that valid grounds for invalidation are found does not increase along with the passage of time, but rather a trial for invalidation supported by valid grounds is requested at an earlier stage.

(Kenta NAKAMURA)

6 Review of Methods of Estimating the Number of Requests for Examination in Japan

In this study, an attempt was made to review and improve the current method of estimating the number of requests for examination in Japan. The major findings are summarized as follows.

- (A) According to the basic analysis and statistical analysis of the applicants' behavioral trends in filing requests for examination, it became clear that not only do the year of filing, the number of years that have passed since the filing, and the filing route have an influence on such behavioral trends, but so do other factors such as the technical field, the number of claims, and the number of inventors.
- (B) In light of the point mentioned in (A), it may be theoretically reasonable to focus on the

three factors applied in the current estimation method (i.e., the year of filing, the number of years that have passed since the filing, and the filing route) and use the running average of these factors in the past three years as the estimated values for the next year.

- (C) Empirically, or when an estimation is made by using actual data, the current estimation method is slightly inferior in accuracy to the improved method proposed in this study. However, the current method is more convenient than making up for such inferiority in accuracy.

(Yoichiro NISHIMURA)

7 Case Study on Economic Analysis Methods Applied in Relation to Industrial Property Rights in Foreign Countries

This chapter reviews the study reports presented at the Patent Statistics for Decision Makers Conference held in Paris (OECD Congress Centre) in the fall of 2012; and the economic analysis reports on industrial property rights presented at the PATSTAT User Day Meeting held before the conference, and compiles the examples of economic analysis methods.

The PATSTAT User Day Meeting consisted of (i) the reports on the PATSTAT and other related databases and services, (ii) the reports on the link between the PATSTAT and non-patent databases, and (iii) the Q&A sessions. The topics addressed in these reports included the next version of the PATSTAT, the link between the PATSTAT and other databases including those containing corporate data and literature data, and with regard to Chinese patents in particular, it was pointed out that the number of applicants and the number of inventions available on the PATSTAT are smaller than those numbers available on the patent database provided by the Chinese patent authorities.

The Patent Statistics for Decision Makers Conference consisted of six sections, under the following titles: Innovation Modes and Firm Performance; The Value of Innovations; New Challenges; IP Systems and the Role of Policy; Innovation and Financing; and The Location of Innovations. At this conference, 19 study reports were presented.

The specific topics of the reports included the following: co-ownership of intellectual property; the role of geographical factors in the

markets for technology in biotechnology industry; new methods for valuing patents; analysis of patents for technologies peripheral to technical standards in the ICT industry; the impact of environmental inventions on industrial profitability; the impact of patents on the IPO market; the seasonal characteristics of patent filing in China; the impact of patent ownership transfer on patent litigation; patents and venture capital investments; and the inflow of inventors and the growth of local companies.

The tendency of the recent OECD meetings on patent statistics is that reports reviewing the trends of the use of the PATSTAT and suggesting its availability in research are presented at the PATSTAT User Day Meeting, and reports on a wider array of topics are presented at the Patent Statistics for Decision Makers Conference. At the 2012 conference and meeting, innovation was a popular theme in the reports.

(Kenta KOSAKA, Kenta NAKAMURA)

8 Statistical Analysis of Intellectual Property Rights and Advantage in Financing

This study reviewed whether financing is easier for companies with more intellectual property rights or for companies with more tangible fixed assets that can be used as collateral. In other words, it reviewed which types of companies have a greater advantage in financing. The major findings are as follows.

- (1) Along with the increase in the number of patent rights that a company owns, the amount of new long-term loans the company can receive would increase.
- (2) Companies with a larger number of design rights can receive a larger amount of new long-term loans.
- (3) Along with the increase in the amount of tangible fixed assets that a company owns, the average interest rate for new long-term loans that the company can receive would decrease. Companies with a larger amount of tangible fixed assets can receive new long-term loans at a lower average interest rate.

These findings made clear that assets with a high potential for serving as collateral, such as tangible fixed assets, have an influence on the interest rate upon receiving loans, whereas assets with a low potential for serving as collateral, such as patent rights and design rights, have an influence on the amount of loans upon receiving

loans. This may be good news to those companies that have already used most of their tangible fixed assets as collateral for loans and do not retain a lot of tangible fixed assets available as collateral, or to companies that do not have a lot of tangible fixed assets but retain intellectual property rights including patent rights and design rights.

(Yoichiro NISHIMURA)

III Revision of the Survey Design of the Survey of Intellectual Property-related Activities

1 Revision of the Questionnaire Used in the Survey Design of the Survey of Intellectual Property-related Activities

This study reviewed the improvements for the survey that have been proposed and implemented to date, and then identified those proposed but not yet implemented. As a result, it was found necessary to standardize and prioritize the error-checking and query procedures, make a shift to the online survey, and give an additional note on licensing income and expenditure.

In addition, interviews were conducted with the entities that carry out the survey to discuss details of the survey, including the survey method, survey items, and the layout design of the questionnaire. The main opinions and proposed improvements are summarized as follows.

The error-checking and query procedures are performed in full at present. The problem is that the initial responses contain so many errors that it would be difficult to ask the respondents to resubmit their responses to all questions in the query procedure. Other problems peculiar to this survey that are not found with other types of surveys are that the survey items are difficult to understand and that, for some, it took considerable time to complete the query procedure because personnel in their intellectual property departments were often out of office.

As for the layout design of the questionnaire, some held the opinion that it is difficult to understand the relevance between the total number and each number included therein. The present layout has room for improvement, so respondents can perceive such relevance intuitively. As for the notes, some respondents stated that this survey has more notes than other surveys. In this respect, it was proposed that the questionnaire and the instructions (including the notes) be prepared in separate volumes, or that the questions be put on the left pages and the

notes be put on the right pages. Improvements that may be relatively easy were also proposed, such as changing the character font, adding headings for notes, indicating the fiscal year of the survey, and revising the number of digits (thousand or larger).

With regard to the cover sheet, the current version enables a respondent to enter all member companies of its corporate group. This style allows arbitral grouping and causes a variation in responses. One possible solution to this problem is to ask all respondents, including those that exist as holding companies, to respond as a single entity, while treating holding companies as another type of business.

In light of these findings, there is room to consider drastic reform to the layout design of the questionnaire in order to improve the response rate and accuracy.

(Koichiro ONISHI, Kenta KOSAKA, Atsushi NISHIO)

2 Review of the Survey Items of the Survey of Intellectual Property-related Activities

In order to more effectively gain understanding of the reality of companies' intellectual property-related activities, this study considered whether or not it would be appropriate to include the actual and estimated numbers of requests for trials in the survey items of the Survey of Intellectual Property-related Activities, while taking into account the following merits and demerits of this idea.

One possible merit is that if the JPO were to obtain the estimated number of requests for trials to be filed by individual companies through their responses to the survey, it could estimate the total number of requests for trials to be filed in the future more accurately. The extent of this merit would depend on the accuracy of the estimated number actually given by individual companies in their responses. Hence, it would be important to assess the accuracy of the estimated number to be given by respondents.

On the other hand, the inclusion of the number of requests for trials in the survey items would increase the burden on the respondents and result in a decline in the response rate.

In consideration of such merits and demerits, a questionnaire survey was conducted to consider whether or not it would be appropriate to include the actual and estimated numbers of requests for trials in the survey items. This questionnaire

survey targeted the top 100 entities in number of requests for trials filed, and asked them whether they would be able to give the estimated number of requests for trials, by type of intellectual property and by type of trial, when responding to the Survey of Intellectual Property-related Activities.

Most respondents answered that they would not be able to give that number, which suggests that the response rate for this additional question would be low and this addition would increase the burden on the respondents. It was also made clear that it is difficult for companies to estimate the number of requests for trials that they would file in the future.

These findings indicated that the inclusion of the actual and estimated numbers of requests for trials in the survey items would be considerably detrimental as it could lead to a decline in the response rate and an increase in burden on respondents. At the same time, since this reform does not guarantee high accuracy in the estimate, it would not be so beneficial in estimating future administrative costs. Therefore, a deliberate stance would be required toward including the actual and estimated numbers of requests for trials in the survey items.

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