



Impact of patent litigation on the subsequent patenting behavior of the plaintiff small and medium enterprises in Japan



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ABSTRACT

This paper examines the impact of patent litigation on the subsequent patenting behavior of the plaintiff small and medium enterprises (SMEs) in Japan. The results show that plaintiff SMEs tend to reduce patent applications after patent litigation. Although there are several possible interpretations for this finding, we argue that it is most likely due to the negative effects of the high cost of patent litigation on the R&D activities of the plaintiff SMEs during the period of patent litigation. Moreover, we also find that the strength of patent rights applied for by the plaintiff SMEs after patent litigation increases. We argue that this is because the plaintiff SMEs realize the importance of the quality of patent rights and learn how to apply for stronger patent rights after experiencing patent litigation as plaintiffs. However, this learning effect only lasts until the fourth year after litigation and then disappears or starts to reverse beginning with the fifth year after litigation.

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1. Introduction

Although patent litigation is highly expensive, it has many benefits for patentees. First, patentees have the right to claim injunctions and damages if they win a patent infringement suit. Second, patent litigation can be used to deter potential infringement because launching an infringement lawsuit reflects a patentee's willingness to assert its patent rights. Third, patent litigation can be strategically used to license patent rights. This has been widely used in the United States (US) by the so-called "patent trolls," who aim to earn licensing fees rather than to get injunctions and damages through patent litigation. Fourth, patent litigation can be used to enhance the plaintiff's reputation, especially for large public firms. Several previous studies have affirmed this argument. Marco (2005) analyzed stock market reactions to patent litigation decisions in the US and found that patent litigation leads to positive excess returns for

patent holders if the litigated patent is ruled valid. Henry (2013) also found that patent litigation in the US leads to an increase in the plaintiff's market value when its litigated patents are ruled valid and have been infringed upon. Raghu et al. (2008) examined market reactions to patent litigation using 65 patent cases in the IT industry and found that patent litigation increases abnormal returns for plaintiff firms at both the announcement date and the settlement/termination date of patent litigation, indicating that patent litigation enhances shareholder confidence in the future profits of the plaintiff firms. Schliessler (2015) found that, regardless of the outcome of patent litigation, being a plaintiff in patent litigation in Germany has a significantly positive impact on a firm's credit rating.

However, small and medium enterprises (SMEs) have faced certain difficulties in trying to benefit from patent litigation. First, SMEs usually have little internal expertise to apply for strong patent rights, which can withstand validity challenges and have broader patent scope. Second, SMEs usually lack the resources to detect and collect evidence of infringement. Therefore, it is difficult for them to provide any proof of infringement in court, which is important for successful litigation and for calculating patent damages. Third,

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unlike large firms, SMEs usually have limited financial capacities, so the high cost of patent litigation may be a heavy burden for them. For such firms, patent litigation may even adversely affect their reputation rather than enhance it, because patent litigation may increase their possible risk of bankruptcy (Bessen and Meurer, 2008). In brief, these factors place SMEs at a disadvantage when they try to benefit from patent litigation, either in terms of acquiring direct benefits such as licensing fees, injunctions, and damages, or by acquiring indirect benefits such as discouraging imitations and firm reputation.

Nevertheless, we argue that patent litigation can benefit SMEs in some ways. In this paper, we examine whether patent litigation provides an opportunity for SMEs to learn to apply for stronger patent rights. Moreover, we also examine the changes in patenting activities of the plaintiff SMEs. This paper is organized as follows. Section 2 describes the hypotheses. Section 3 describes the data and variables. Section 4 presents the regression results. Section 5 discusses the results. Section 6 concludes this paper.

2. Hypotheses

Patent litigation usually lasts for several years. During this period, plaintiffs must afford a large amount of the direct and indirect costs of patent litigation. The direct costs include legal fees to the court and attorney fees to the lawyers and patent attorneys. On the other hand, the indirect costs of patent litigation include the significant time and manpower required for the lawsuit. Bessen and Meurer (2008) systematically analyzed the private costs of patent litigation. They argued that business activities can be interrupted because managers and researchers must commit significant time to preparing for litigation and appearing in court. Moreover, cooperative relations between the two parties are destroyed by litigation. Some firms with weak fiscal capacities even face the danger of bankruptcy.

Shane and Somaya (2007) provided empirical evidence that patent litigation has an adverse effect on university licensing activities because it disrupts the overall activities of technology licensing offices (TLOs) and reduces the time and resources available for TLOs to market technologies and establish licenses. Similar to universities, most SME firms also have limited resources for their regular business activities, which make them vulnerable to the high cost of patent litigation. All of these direct and indirect costs of patent litigation may impose such a heavy burden on the plaintiff SMEs that their research and development (R&D) activities are negatively affected, both in terms of monetary and manpower investments during the period of litigation and shortly thereafter. Moreover, the plaintiff SMEs who litigate process patents may also be aware that it may be more appropriate to protect an invention of a process for producing a product in the form of trade secrets rather than patent rights. Both of these matters will lead to a decrease in patent applications filed by the plaintiff SMEs after patent litigation. Therefore, we hypothesize the following:

H1. Patent applications by plaintiff SMEs decrease after patent litigation.

In Hypothesis 1 (H1), we do not distinguish patent litigations according to their magnitude. However, if the plaintiff SMEs' R&D activities are significantly and negatively affected due to the high burden of litigation costs, the decrease in patent applications filed by the plaintiff SMEs will be even more significant for the litigations with extremely high costs. As theoretically, the direct and indirect costs of the plaintiffs increase with the litigation stakes, we define the litigation with extremely high costs as that in which the claimed damages are 100 billion Japanese yen or more. We hypothesize the following:

H2. The effect of Hypothesis 1 (H1) is more significant for patent litigations with extremely high costs.

Limited by weak fiscal capacity, SMEs usually have no internal intellectual property departments or intellectual property experts. This hinders them from using the patent system as an effective way to protect their inventions or innovations. On the one hand, Holgersson (2013) found that entrepreneurial SMEs use patents more often as a marketing tactic to attract customers and venture capital, than as a means to protect innovations. If this is a common phenomenon among SMEs, it is logical to expect that many SMEs attach more importance to whether or not the patent application will be granted and neglect the strength of patent rights when applying for a patent. On the other hand, lacking knowledge about the patent system, SMEs usually fail to provide adequate information about their patented technologies, which would enable their patent attorneys to submit stronger and broader claims, even when they intend to apply for stronger patent rights. Both of these factors inhibit SMEs from applying for stronger patent rights.

However, this situation changes after SMEs experience patent litigation as plaintiffs. During the period of patent litigations, the plaintiff SMEs interact frequently with lawyers, patent attorneys, court judges, and their alleged infringers. Through these interactions, SMEs gain plenty of explicit, and tacit knowledge about the patent system. First, they learn about the importance of the enforceability of patent rights. Although patent applications with narrow claims are easier to pass patent examinations, the granted patent rights will have a low enforceability in patent litigation. Experiencing patent litigation will motivate them to attach more weight toward the strength of patent rights. Second, they will learn about the characteristics of strong patent claims which can withstand validity challenges in trials for patent invalidation, and easily prove infringement in court. All of these experiences help SMEs apply for stronger patent rights. We hypothesize the following:

H3. Plaintiff SMEs learn to apply for stronger patent rights after patent litigation.

3. Datasets and variables

3.1. Data collection

Our litigation data are the Japanese patent infringement cases collected from the intellectual property (IP) case history database provided by the Supreme Court of Japan. The plaintiff party is patent holders or exclusive licensees and the defendant party is alleged infringers. It should be noted that patent rights, utility model rights, and design rights are three separate IP rights in Japan. As the value of patents is usually higher than that of utility models and designs, we focus our study on patent infringement litigation. Patent data was downloaded from the commercial patent database, PatentSQUARE, which is provided by Panasonic Solution Technologies Co., Ltd.

To make the impact of patent litigation more or less consistent in our sample, we collected a sample of plaintiff firms using the following criteria. First, we collected the plaintiff firms of the patent cases decided in Japan during the period from 2000 to 2008. Second, as it is logical to expect that SMEs are more likely to be influenced by litigation events than large firms, we focus on SMEs in this study. SMEs are defined here as the firms with fewer than 300 employees, which is the standard used by the Small and Medium Enterprise Agency in Japan. Third, because manufacturing firms are the central sources of technological innovation, we exclude non-manufacturing SMEs, such as sales companies and construction firms, from our analysis. Fourth, as most foreign SMEs do not locate their R&D centers in Japan, we exclude them from the analysis. Fifth, as firms registered in different districts can have the same name, it would be misleading for us to trace patenting history by firm

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