

THE MARKET RESPONSE OF PATENT LITIGATION ANNOUNCEMENT TOWARDS DEFENDANT AND RIVAL FIRMS

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ABSTRACT

This paper investigates whether a patent infringement announcement would have influences on the stock price and trading volume of the defendant firm and its rival firms as well. Hypotheses were tested by the sample with 78 patent litigation events from Taiwanese electronics industry collected during the period from 1997 to 2008. Empirical findings show patent litigation infringement announcement would bring negative impacts on the abnormal return and trading volume of the defendant firm's stock price. Moreover, we find that the responses of stock price and trading volume on the rival firms are also negative and significant, which indicates that the information-signaling effect resulting from patent infringement litigation outweighs the competitive effect.

Keywords: patent; litigation; market response; strategy; intellectual property right.

INTRODUCTION

In the era of knowledge-based economy, technology firms are increasingly building their competitive advantage through the intellectual property rights (Rivette and Kline, 2000), albeit huge loss caused by rival firms' patent infringement. Strategic management scholars argue that patent litigation may be an effective way to protect firms' proprietary assets or/and to obtain the patent cross-licensing opportunities (Somaya, 2003). A study on business misconduct indicates copyright and patent infringements are not associated with statistically significant shareholder losses (Murphy, Shrieves, and Tibbs, 2009). While some scholars find the news of patent infringement litigation is indeed unfavorably accepted in the stock market for the defendants in the information technology industry (Raghu, Woo, Mohan, Rao, 2008).

On the basis of extant studies, three points should be mentioned to clarify the potential contributions of the present study. First, few studies have explored the effect of patent litigation on the market response to defendant firms and yet have not reached consistent conclusions as well. Second, prior literature mainly relies on one single indicator, i.e. abnormal return of the stock price, to measure the market response, while neglecting to incorporate other possible proxies, such as abnormal trading volume. Last, to date, there has been no assessment of the stock price effects for the competitors of patent litigation defendant firms. This study tries to make contributions on fitting the theoretical gap and providing suggestions to management practices.

LITERATURE AND HYPOTHESES

Previous literature has tried to unpack the role patent plays in firm strategy and the economy, which covers firm valuation (Raghu et al., 2008), predatory behavior (Lerner, 1995), and suit-filing decisions (Somaya, 2003). According to literature review, the theory interpreting the effect of patent litigation

announcement on the market response towards defendant firms and their peer firms has still been developing. We will briefly summarize the conclusions of extant studies and construct the research hypotheses in the following sections.

The Effect of Patent Litigation Announcement on Defendant Firms

The efficient capital market theory states that market value of the firm at any time fully reflects the available information at that time (Fama, 1970). A patent infringement litigation announcement should convey information about the plaintiff and defendant firms. Comparing with plaintiff firms, defendant firms are taking more risk when involved in patent litigation events either plaintiff firms adopting the settlement strategy or not. Thus, we mainly focus on the effect of patent infringement litigation on the defendant firms in the present study. Hypothesis 1 was constructed as follows:

Hypothesis 1-1: The initial announcement of patent infringement litigation will lead to negative abnormal returns for the defendant firms.

Hypothesis 1-2: The initial announcement of patent infringement litigation will lead to negative abnormal trading volumes for the defendant firms.

The Industry Effects of Patent Litigation Announcements

While recent studies have explored the patent litigation impacts on both plaintiff and defendant firms (e.g. Raghu et al. 2008), none of studies has put concern on expanding the research scope to rival firms, namely the competitive effect and contagion effect derived from the defendant firm's patent litigation. Scholars have shown that the event announcements, such as bankruptcy (Lang and Stulz, 1992), foreign acquisition (Akhigbe and Martin, 2000), and reorganization filing (Chi and Tang, 2008) of the target firms would also affect the rival firms' stock price through contagion effect or/and competitive effect. Hypothesis 2 and 3 are constructed as two contrasting hypotheses based on the contagion effect and competitive effect respectively.

Hypothesis 2-1: The initial announcement of patent infringement litigation on the defendant firm will lead to negative abnormal returns for the competitive firms.

Hypothesis 2-2: The initial announcement of patent infringement litigation on the defendant firm will lead to positive abnormal returns for the competitive firms.

Hypothesis 3-1: The initial announcement of patent infringement litigation on the defendant firm will lead to negative abnormal trading volume for the competitive firms.

Hypothesis 3-2: The initial announcement of patent infringement litigation on the defendant firm will lead to positive abnormal trading volume for the competitive firms.

METHODOLOGY

Following the standard procedure of event-study method to generate abnormal returns and abnormal trading volumes of the sampling events (Chae, 2005), we used the Taiwanese value-weighted index return as the proxy for market return. As interested in the price diffusion effect between event and matching firms, we adopted a longer event period from -10 to 10. In addition, we use cumulative abnormal return (CAR) and cumulative abnormal trading volume (CATV) to study the different market reaction between event and match firm group.

Data

We collected secondary data from the UDN database, which includes the most popular newspapers in Taiwan. There are two main reasons to select the Taiwanese electronics industry as the research context. First, since patent is closely related to the commitment of R&D, high-tech industries such as the electronics industry are appropriate to be the targeted industry. Second, patent infringement prevails over developing countries which include Taiwan. 78 patent litigation events with matching events were used for final analysis.

EMPIRICAL EVIDENCE

The descriptive statistics of our event firms indicates that foreign institutions own the 18.16% shares on average and the maximal ownership reaches 73.06%. The average MV is 10.42 and the maximal value is 14.31. The high values of the MB ratio and PE ratio indicate that most of the event firms are at their growth stage. The mean of RD is 5.33% and the maximal value is 25.12%.

The event window of (-10, 10) detecting the market reaction around the litigation event shows the abnormal return at the announcement date ($t=0$) or before the announcement date ($t=-1$) is -0.903 and -1.353. Both of these two date abnormal return are negative and significant at 1 percent level.

Empirical result shows that patent infringement litigation announcement on defendant firms is a negative signal for investors. Investors may expect that event firms will incur high lawsuit and organizational cost, or/and have detrimental impact on their corporate reputation, which in turn, results in negative abnormal returns. Hypothesis 1-1 was supported.

Empirical evidence reveals the abnormal return would turn to positive from the second day ($t=2$) to the fourth day ($t=4$) after the announcement date, which indicates the investors initially overreact to the patent litigation announcement. The pattern of CAR in Figure 1 also reveals the market overreacts to the patent litigation news, which illustrates the CAR slightly increase after the announcement date.

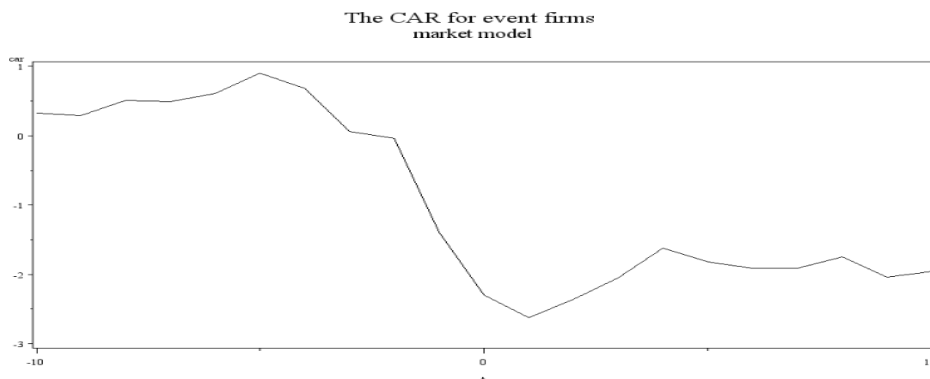


Figure 1: Cumulative abnormal return around the event window

Regarding the abnormal trading volume during the event window, there is no significant negative impact on the investors' trading volume. However, Figure 2 indicates CATV drops 10% during the event window. Investors are unwilling to trade stocks which are involved with patent lawsuit and hence the trading volumes decreases. Hypothesis 1-2 was supported.

To examine whether the investors change their cognition towards those firms involved patent lawsuit over 1997 to 2008. We further divided the sampling period into two horizons. The cutting point was set in July, 2002, at the time Taiwan Stock Exchange initiated important regulations. There were 15 events in the period before July, 2002, and 64 events after July, 2002.

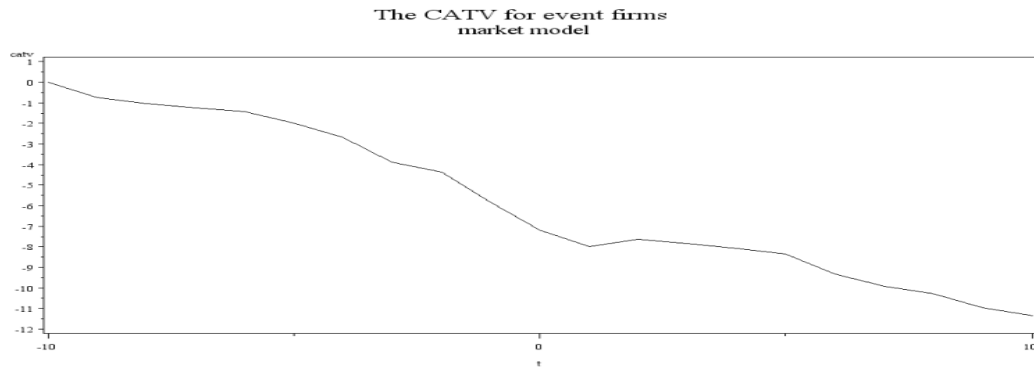


Figure 2: Cumulative abnormal trading volume around the event window

Figure 3 shows the pattern of CATV during the period 1. We find the cumulative trading volume increases after the announcement date. Investors might expect the operating conditions of event firms would be highly uncertain, which make shareholder structure change violently.

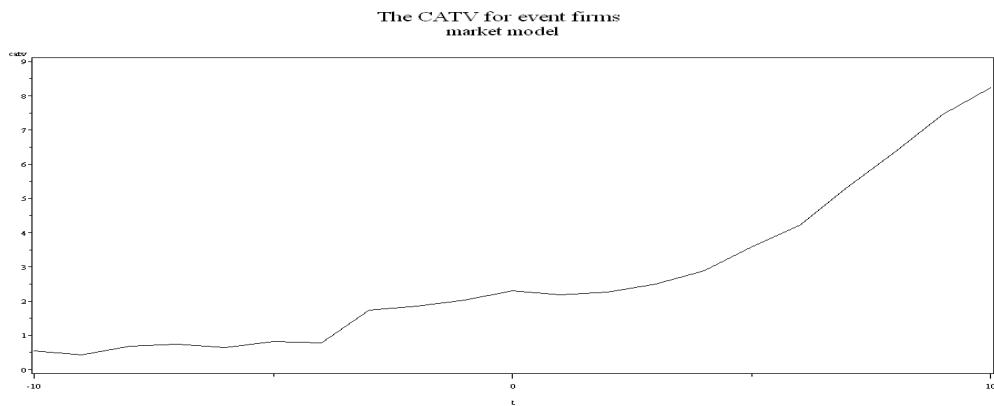


Figure 3: Cumulative abnormal trading volume around the event window: 199701~200206

Figure 4 shows the pattern of CATV in the period 2. We find the cumulative trading volume decreases after the announcement date. Investors may learn experience from past experience, and understand the lawsuit may last longer than two years. Shareholder structure became more stable during the event period from July 2002 to December 2008.

Moreover, we examined the determinants of price impact on defendant firms. The regression analysis shows that the coefficient of Continue is negative but not very significant, which implies investors could learn from the negative information of the focal event, so the successive patent litigation would not have significant influence on the defendant firm's stock price. That the coefficient of RD is positive and significant indicates R&D expenditure not only creates firm's value in the future, but also buffers the negative impact of the patent litigation event.

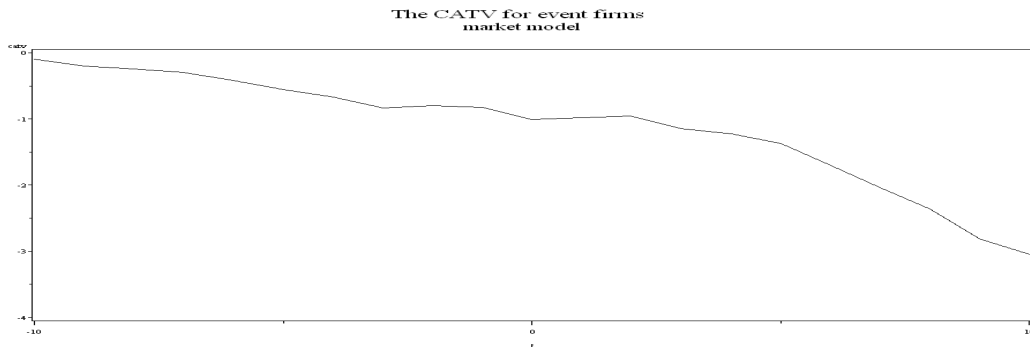


Figure 4: Cumulative abnormal trading volume around the event window: 200207~200812

Figure 5 reports the abnormal returns of the event (defendant) firms and the rival firms (matching firms). We find the event firms' pattern of the abnormal returns is similar with that of matching firms. The announcement of patent infringement litigation has contagion effect on the rival firms within the same industry, which represents the patent infringement litigation announcement is industry-wide rather than firm-specific information. Hypothesis 2-1 was supported.

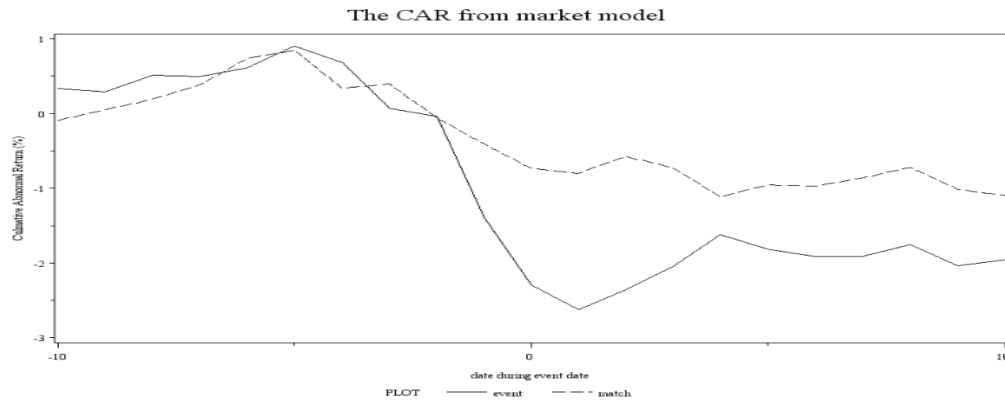


Figure 5: The event and matching firm's cumulative abnormal returns around the event window

Empirical finding that relates to the abnormal trading volumes of the event and rival firms is similar with that of the abnormal return. The abnormal trading volume is significant at the announcement date and the next date in both event and rival firms. The contagion effect also exists within the industry when the trading volume is used to be the proxy of market reaction. Figure 6 shows the cumulative trading volume of rival firms drops even more than that of the event firm. Hypothesis 3-1 was supported.

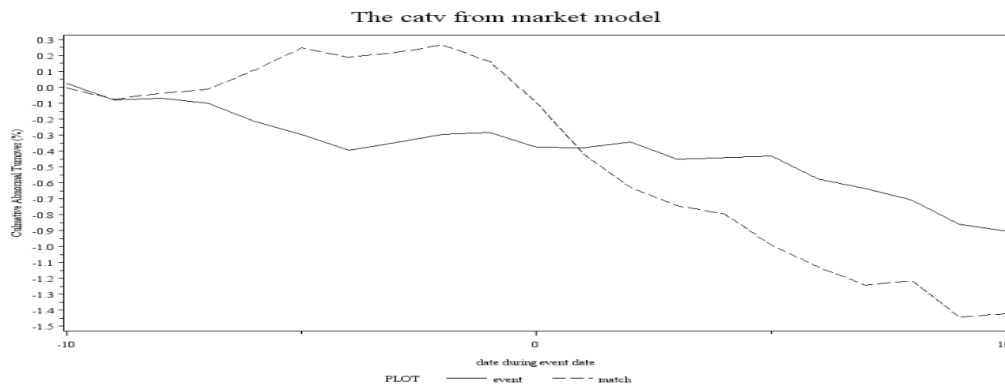


Figure 6: The event and match firm's cumulative abnormal trading volumes around the event window

CONCLUDING REMARKS

Empirical results reveal that patent infringement litigation announcement would bring negative influence on the stock price and trading volume of the defendant firms. The reason may be attributed that investors can not easily interpret the patent infringement litigation information and estimate the potential damage on the firm's value in the future. In addition, plaintiff and defendant firms often unwillingly disclose all related patent litigation information to the public. In order to protect intellectual property rights and build world-wide competitive advantage, cross-border patent litigation is more popular among those knowledge-base industries. Whatever the plaintiff firms' motives of initiating the lawsuit strategy are, we find patent infringement announcement have a negative impact on the cumulative abnormal return and trading volume of the defendant firm within ten days around the announcement date.

For managers, to reduce the adverse impacts on the stock price and liquidity, it is better to develop a standard operating procedure (SOP) to respond to the patent lawsuits. Besides, firms should keep surveillance on the domestic and global news of patent litigation in order to guard themselves against subsequent patent lawsuits. Since the contagion effect of patent litigation is harmful for the whole industry, defendant firms may consider forming strategic alliances to counteract the plaintiff firms.

For investors, on average, the abnormal return of the defendant firm would be positive between the second and the fourth day after the announcement date. Long-term investors could buy the stocks of the defendant firm one day after the announce date; short-term investors could entry the market at the first day after the announce date and exit the market at the fourth day after the announcement date, so that on average they could earn the highest abnormal return within the ten-day event window according to the conclusions drawn from the present study.

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