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# **Market Reactions To Patent Infringement Lawsuits In Information Technology Industry**

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# **Market Reactions To Patent Infringement Lawsuits In Information Technology Industry**

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## **Introduction**

Over the years the number of patent infringement lawsuits in the Information Technology industry has increased tremendously. The increase in patent disputes can be partly attributed to the increase in the number of patents issued. The number of patents issued for software developments alone has risen from 25 in 1970 to 600 in 1991. The total number of patents issued till 1992 was about 9000. The damages awarded to patentees in such litigations is substantial. It is argued that some of these high technology companies are using the intellectual property rights laws as a weapon to thwart competition in their markets. In the US, while the inventor is waiting for the patent on the invention, manufacturers may develop and begin using similar technology, but once the patent has been issued, the inventor can demand the damages from the manufacturer using the technology. Many of the top executives believe that it is beneficial to settle infringement cases than dispute it in a court of law. This view is again raised in the patent infringement

dispute between Intel Corp. and AMD Corp., who spent almost \$200 million on the patent dispute over several years.

To our knowledge no empirical study has been undertaken to study the impact of patent infringement lawsuits on the information technology companies involved. Though markets analysts have suggested that the market value of the firms fluctuates in accordance with the direction of the lawsuit proceedings, no concrete evidence of these effects have been shown in the literature. This study aims to study the impact of the patent infringement lawsuits and the lawsuit decisions on the IT companies involved. The impact on the stock holder returns is used as the empirical evidence of the impact of the litigation on the IT company. Findings of the study are expected to provide valuable insights into market perception of the ethical issues in a high technology industry. More specifically, how does the market view the ethical conduct of an IT company? Does it impose a high risk on a company suspected of unethical conduct in its business strategies?. In addition to the ethical issues involved, the economic viability of fighting a law suit is also examined, i.e., does the market perceive a net benefit or loss to the company as a result of fighting a law suit? Does the market perceive a net benefit or loss to the company as a result of the decision made on the law suit?. The findings of the study would be useful to both the policy formulators and managers alike.

## **Methodology**

Event study methodology has been extensively used in the finance literature to study abnormal returns on stocks around the days the event took place [Muoghalu et. al.,(1990), Loderer and Mauer(1992), Dos Santos et. al.,(1993)] . The basic assumption in the event study methodology is that the market is efficient to provide an estimate of the change in the value of the firm resulting from the litigation [Fama(1976)].

## **Data Collection**

The study focuses on two groups in the patent litigation lawsuits : the firms that are claiming damages for infringement and the target firms of lawsuits. The impact on the stock returns are measured around the day the announcement of litigation is made and the day the lawsuit is settled. Thus four sets of results would be obtained as shown in Figure 1.

Data on patent infringement lawsuits filed and settled are collected over the period between 1983 and 1995 for the study. The data is collected from the LEXIS/NEXIS database. The data is restricted to patent litigation lawsuits filed in the computer and information technology industries. PR Newswire and Computergram International covered nearly one half of the news stories found on the LEXIS/NEXIS database. The news stories collected from the database were then closely analyzed to identify the real date of the announcement of the lawsuit and the day of the judgment or settlement. We have identified 156 instances of patent litigations in the Information Technology industry between 1983 and 1995. Among these instances, many recent litigations are still in on trial. Out of the 156 litigations, 115 patent infringement lawsuits have been identified for

the purposes of analysis of impact at the announcement of litigation. Also, a total of 50 judgment and settlement of patent infringement suits have been identified to study the impact at the end of the litigation. Out of the 50 conclusions of the litigations, 15 cases were settled out of court and 35 cases were concluded through judicial procedure. We have classified the litigations under different segments in the Information Technology industry. The breakup by individual segments is given in Table 1. In 15 of the 50 decided litigations the targeted firms were favored in the judgment/settlement. In the remaining 35 settlement/judgment decisions the firms filing the suit against the patent infringement were favored. The slightly higher rate of success in the patent litigation suits could also be a factor in the increase of patent litigations in recent years.

	Day of Announcement	Day of Judgment
Firm Filing the Law suit	Impact on Stock Returns	Impact on Stock Returns
Target Firm	Impact on Stock Returns	Impact on Stock Returns

**Figure 1 : Classification of the Impact on Stock Returns**

Segment	Number of Litigations
Electronic Hardware	56
Semiconductor Chips	38
Software	29
Telecommunications	33
Total	156

**Table 1 : Patent Litigations breakup for different segments in the IT Industry**

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### Event Study

The Dodd and Warner (1983) methodology is used for the event study. This method has been previously used in another event study in waste management lawsuits [Muoghalu(1990)]. The event in the study is the day the announcement of a patent infringement lawsuit, and the announcement of a decision in court on a patent infringement lawsuit or a settlement reached out of court.

It is assumed that the daily common stock returns of a company are described by the Capital Asset Pricing Model (CAPM). The normal returns on the firms stocks are predicted by using the CAPM, given by :

$$R_{it} = a_i + B_i R_{mt} + E_{it} \dots \dots \dots (1),$$

Where,

$R_{it}$  = Rate of return for the firm  $i$  on day  $t$

$R_{mt}$  = Rate of return for the market portfolio on day  $t$

$a_i, B_i$  = Estimated Parameters

$E_{it}$  = Error Term for firm  $i$  on day  $t$ .

The event date is the day the lawsuit is announced in the media (or equivalently the day a settlement or judgment is announced) and is noted as the reference day 0. The event window is from day -1 to 0. The daily stock returns for each firm are used over a 230 day interval, day -251 to -20, to estimate the parameters,  $\alpha_i$  and  $\beta_i$  in Equation (1). The parameter values are then used to estimate the expected daily stock returns in the event window. Deviations of the actual stock returns recorded in the stock markets from the predicted values in the event window constitute abnormal returns. The abnormal returns are considered as the reaction of the market to the patent litigation. Abnormal returns for each firm are computed for the event window from day -1 to 1 [Muoghalu, 1990].

The abnormal return for the security  $i$  on day  $t$  is computed as

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \dots\dots\dots (2)$$

Where  $AR_{it}$  = The abnormal return on stock  $I$  on day  $t$

The abnormal returns are summed over the event window and the statistical significance of the abnormal returns of the stocks are examined by finding the  $z$  -statistic as explained by Loderer and Mauer (1992).

The methodology assumes that the announcement of the Patent infringement lawsuit or the judgment is not anticipated by the market before public announcement. However, if the announcements were anticipated by the market the abnormal stock returns provide a lower bound estimate of the impact of the litigation on the stock returns [Dos Santos, et al, 1993].

## **Concluding Remarks**

The market reactions to unethical business strategies in the IT industry is the focal point of the study. The empirical study proposed here is also intended to provide valuable insights to managers, investors and policy formulators alike. The study intends to derive specific statistical results of the impact of patent litigation lawsuits on the companies involved. The current research could be extended to relate the stock price impacts of the litigant and the defendant firms to such variables as product mix, product position in the revenue stream, R&D spending etc.

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