Microeconomic Analysis
Term Paper

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I review the following paper, as the term-paper in the microeconomic analysis :

'Charactaristics of patent litigation : a window on competition'
Lanjouw and Schankerman (2001) *RAND Journal of Economics*

1 Summary

This paper summarized the pattern of individuals'/firms' litigation strategies about intellectual properties, depending on the charactaristics of the patents, patent owners, or the field of industries involved. Using cases in the U.S., they showed that patent litigation is highly correlated with its variety of innovations.

1.1 Framework

They exploited following Cooter and Rubinfield (1989)'s assumption of the key determinants of litigation, specifying the their context :

1. Potentially litigious situation
   : Difficulty in detecting an infringement of patent rights
2. Asymmetry of information and expectation about the outcome of a trial
   : In immature fields, also legal procedure itself is changing.
3. Size of stakes
   : Value of the patent right and its indirect returns
4. Cost of trial
   : Relative to cost of settlement, which can occur between domestic/foreign or corporate/individual patentees.

In addition, they devided litigation into two types : infringement and challenge suits, in which plaintiff claim the patent is invalid. The latter is different from the former in its possible positive externality, that enables all firms to utilize the original

innovation freely and raise the incentive of conducting R&D.

1.2 Data

They constructed patent-case-level data in the U.S. about whether the patent had been taken into the court or not, how often cited, whether the patent is owned by an indibidual, or a corporate, its nationality, and technology group (Drugs and health, Chemical, Electronic, Mechanical and Others) . The dataset is obtained from the U.S. Patent and Trademark Office (PTO), covering the period 1975-1991 and including 5,452 (3,887 is that in the U.S.) patent cases. For matching estimation, they created a control group from the population of all U.S. patents.

One possible issue is selection bias, caused by lack of report from U.S. federal courts to PTO. Especially in 1977-1979, only 22% of patent disputes were recorded. They had dealt with this problem by checking differences between the reported groups and unreported ones.

Each patnet contains the elements below :

- Number of claims
  : A patent consists of a set of claims which provide the boundaries of each intellecual property right, what is new in the claim. The patent examiner try to narrow its range before granting.
- IPC assignments
  : Technology-based classfication system of the patent.
- Citations
  : Classfied into two types : backward (prior related patents cited for the corresponding one) and forward (patents that cites the corresponding one). They also consider self-citation, in which the patentee cites his own existing patent.
- Ownership
  : Nationality (domestic, Japanese, and other foreign) and type of ownership (individual and corporate).
- Case type (for patents into litigation)
  : Infringement suits versus challenge ones, predicted by whether the patent owner is plaintiff or the defendant in the court.

1.3 Result

- **Prevalence of litigation**
  First, despite of the adjusting the possible overestimation because of error from

that foreign pantentees regist its nationality as domestic, domestic patents are far more frequently involved in litigation. This is because, they say, cost of litigation is higher for foreign owner.

Also, there are difference among technology fields : low litigation rate for chemical patents and high for drugs and health. They cited previous literature saying that pharmaceutical innovation is regarded as holding more value by protecion. Also, they points out more frequency occurs in biotechnology, which is relatively immature and lacks in disuputes.

Finally, they showed that individuals are more likely to be involved in litigation, certainly because corporates have greater adevantages in reaching settlement agreement, rather than proceeding to trials.

- **Patent citations**

  In this article, they regard the number of citation indicates the value of the patent. Statistics say that litigated patents are much more frequently cited than the randomly chosen patent. Taking nationality into account, foreign litigated patents are also more frequently cited, even though they have less citation as a whole, because of the high litigation and detecting cost.

  Considering the difference between foward and backward citation, forward citation tends to be similar to the original patent, according to the similarity index. For forward citation, in addition, similarity index is higher for litigated patent, which indicates close patents have more risk and disclosing the willingness to go to court, "reputation effect," is important.

  There may be reverse causality that litigation make the patent well-known and more frequently cited, "publicity effect." However, they say that the effect is too small to explain the higher number of citation.

  Moreover, "self-citation" also raises the risk of litigation. If patent owners are engaged in subsequent invention, the incentive to protect the series of patent will increase.

- **Patent claims**

  Claims are correlated with patent values, by the correlation with forward and backward citaion, and with R&D expenditures. Although there was an increase in the cost of protection, the mean number of claims has been rising. Then, litigated patents are likely to cite fewer prior patents per claim, which indicates invention is in a relatively new technology area. There is little information available, which leads to litigation. An alternative hypothesis that lack of enough citation cause infringement challenge was rejected.

- **Technology classifications**

According to Lerner(1994), "broad patents," regarded as plural technology fields, have more potential competitor and so likely to be litigated. In this survey, however, narrower patents tend to be more often litigated. They explained this contradiction by difficulty to detect infringement in other fields.

- **Econometric analysis**

  Summing up the discussion above, they conducted probit regression to the probabilty of infringement suits and challenge ones. For infringement suits, results are consistent with the former estimation, and its effect and substantial. Especially, the number of claims enhances the probability of litigation, indicating the importance of patent value. The existence of reputation effect was also proved.

  For challenge suits, the result was similar as a whole. They stressed the existance of positive externalities generated by the success of invalid suit. In addition, they argued that each effect to challenge suits is relatively small, so the benefit is limited.

1.4 Conclusion

They emphasized the existance of a relationship that links the variation in the charastaristics of the patents and its litigation risk. As the next step, they suggested assessing risks and costs to examine owners' actual behavior decision-making : proceeding to trial and the range of trials. Also, they refferred to construction of a large dataset. Finally, they mentioned matching the data with licensing contracts and property insurance.

2 Comment

2.1 Contribution

First, this paper is new in aggregating the data from federal court and the characters about the patent and enables us to conduct statistical investigation.

Moreover, specifying the determinants of the risk of the each patent being litigated enables to serve more accurate insurance plan on intellectual properties. As is mentioned in introduction of the paper, suppliers are forced to limit their plan to pooling price when these key charactaristics are unobservable.

2.2 Extention

There should be needed some following research, revising dataset used in this paper, as they mentioned. Even though the selection bias check was conducted, they did not made any time-series research for testing the robustness. As is mentioned in 1.2, as much as 78% of the cases were dropped for 1977-1979, while 85% of the all cases was collected for 1985-1987. Now we can obtain the latest information from PTO, so following research to the paper can give some contribution.

As is described in the article, patent is one of the important factor for strategic decision-making of the firms. Nowadays, the influence of the intellectual property on the competition or entry/exit is getting larger, because of the increase of the "virtual" goods circulated in the market. Some time-series analysis, therefore, also contributes to specify this importance. Structual estimation that exmaminates the impact of patent litigation to the competition or entry/exit strategies may also be of some contribution.