Strategic Dimensions of International Patent Litigation – The Experience of Taiwanese Firms in the US Legal Jurisdiction

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This paper aims to assess the characteristics and impact of patent disputes by investigating cases of litigation between Taiwanese and US firms. The research reported is based on a design that combines insights gained from interviews with an in-depth case study of two significant US International Trade Commission (ITC) actions. In the former, semi-structured interviews were conducted in six firms while in the latter, the strategic response and potential impact of US patent disputes of two significant ITC investigations associated with Taiwanese firms were analysed to unravel the impact and strategic dimensions of cross border patent litigation. This paper finally arrives at recommendations to reconcile the strategic dimensions of patent litigation in an international trade environment.

Keywords: International patent litigation, patent enforcement, patent infringement, patent strategy

Taiwan is well-known for its manufacturing capabilities, but leading edge technologies are usually controlled by multinational firms. Taiwanese firms typically cross-license all patents in a field of use to ensure adequate access to the technology or to ensure design freedom or freedom to manufacture. For example, Taiwan’s major computer and semiconductor firms make extensive use of cross-licensing to avoid the possibility of external parties blocking their products by claiming infringement of core patents. However, patent infringement actions occur in the US jurisdiction, sometimes legitimately due to ignorance of the terms of patent rights on the part of Taiwanese producers, and sometimes due to strategic reasons on the part of US producers.

While several studies have shown strategic motivation behind patent litigation, the full understanding of how firms react to the cross border enforcement environment has not been fully explored. Different patent enforcement mechanisms in different regions operate differently and these infringement suits may in turn influence the choice of a firm’s patent strategies. This paper aims to assess the characteristics and impact of patent litigation by investigating cases of litigation between Taiwanese and US firms. The research reported is based on a research design that combines insights gained from interviews with an in-depth case study of two significant US International Trade Commission (ITC) actions. In the former, semi-structured interviews were conducted with six firms (most interviewees have not been named to satisfy confidentiality criteria) while in the latter, the strategic response and potential impact of two ITC investigations associated with Taiwanese firms were analysed to unravel the impact and strategic dimensions of patent litigation. Consequently, this paper intends to understand fully how patents are enforced in business and how enforcement options affect firms’ strategies and behaviours in an international trade environment.

Literature Review

Research with the market power in perspective argues that trade-relevant patent enforcement may effectively deter international trade flow, in particular, firms may employ patent litigation as an isolating mechanism to maintain their market power. In order to avoid an exporter penetrating the market, domestic firms can withdraw the licensing agreements and claim patent infringement in both civil and trade regulation jurisdictions to increase the degree of threat brought about by lawsuits. Domestic firms expect higher rents either from their efforts to protect patent rights by potentially excluding competitors’ products, or from the royalty fees. In other words, these observations from the strategic interactions of competitors in different regions may be beneficial to understanding the central point of market power arguments from the literature and its implications on trade-relevant patent protection.

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Empirical analysis has shown that different patenting strategies are used to avoid infringement suits.\(^5,6,8,9\) A fencing strategy is often adopted for patenting activities. This strategy involves establishing a series of patents, typically a range of possibly different technical solutions to achieve a similar functional result, in order to block certain lines or directions of R&D.\(^8\) For example, key integrated circuit (IC) component patents in CD/CDR are required to improve the data transfer system as a means of avoiding infringement actions and capturing market share. Apart from the fencing strategy, a surrounding strategy is one where patents surrounding a core or basic technology patent are filed. Such patents are used to get access to the central technologies, for example through cross-licensing.\(^4\) Patenting strategies are therefore, required to integrate the intellectual property opportunities into an overall business strategy.

Since a patent system is designed as an incentive mechanism for firms to invest resources in R&D, the issue of whether the R&D strategies are influenced by the cost of litigation is addressed in the paper. This is particularly the case in high risk predatory litigation industries.\(^8\) Such an adverse effect may be exacerbated by trade-relevant regulation that is concerned with restricting imported production in the short term. Consequently, when technologies are cumulative, a product must combine several patented technologies; thus mutual hold-ups will become a threat to new product development.

Litigation becomes an efficient method for the restriction of imported production and is a strategic tool with which follow-up innovation based on an existing technological standard can be controlled. The study by Aoki and Prusa\(^6\) however, cast some doubts and showed that discriminatory protection may not increase R&D incentives for domestic firms. The effect of asymmetric patent protection depends on pre-existing rival products, the costs of R&D, and the value of the potential innovation. In addition, direct legal costs of litigation are enormous; larger businesses may benefit due to economies of scale in legal activities. For example, large firms with a specific patent legal division may be able to reduce the cost of legal action marginally as compared to those firms without it. Consequently, larger firms are more likely to be complainant firms.\(^10,11\)

Somaya’s study deals with the extent to which firm-level differences in patent strategies may vary by industry, by size of firm or market.\(^5\) With regard to the litigation process, a firm’s technological capabilities are partly related to the quality of its R&D personnel and reflected in the strength of its patent portfolios. Harhoff and Reitzig,\(^10\) for example, showed that in the European Patent Office, the rate of patent opposition cases for firms with large portfolios is lower than in the case of those with smaller portfolios. Consequently, firms could enhance in-house technological capabilities or build so-called ‘free design or manufacture’ by licensing from leading firms or by gaining external knowledge through mergers and acquisitions.\(^1,12\)

Finally, financial distress occurs when a litigation event has an indirectly adverse effect on firms’ sales and other financial income, apart from direct cost of legal actions.\(^13\) For example, in order to avoid infringement claims, and the threat of exclusive orders by Intel, VIA Technologies, a Taiwanese firm, acquired several firms to broaden its patented technology base. Therefore, a sound financial structure may provide breathing space for survival during costly litigation. In addition, litigants with different resources decide upon their negotiation position during the period of litigation.\(^11,13\) The expenditure in litigation may also involve indirect costs. This indirect impact may cause decline in sales due to the threat of injunctive relief because customers prefer to reduce the risk of interrupted supplies due to legal action. A study by Mutti & Yeung\(^13\) found that complainant firms were typically larger and no less profitable than a reference sample of firms in the same industry.

While patent enforcement is a cross-cutting issue based on fairly unexplored area in the legal framework, technological development and firm’s strategic behaviour, any explanation should be a well-informed one with a multi-disciplinary approach that combines strategic management, economics of legal actions and patent law. The current author takes a critical realist’s position to consider that the events of litigation observed (and not observed) are caused by a variety of different and conflicting business interests, making it difficult to see what exactly the rationale is, behind patent infringement. In addition, many scholars have debated whether a patent right is desirable at the appropriate level of such protection.\(^14-17\) It has also been noted that all pro-patent allegations against the ITC should be re-evaluated through other border enforcement.\(^14\) Therefore, this paper does not intend enter above debate, instead the author examines the issues that arise in cases where patent litigations are related to trade regulatory protection in circumstances...
Advocating critical realism, the author believes that there exists an objectively knowable, mind-independent reality, while acknowledging the role of individual perception and cognition. In such cross border circumstances, a variety of different and conflicting mechanisms determine what happens in any particular situation, making it difficult to identify the causes of any event. This paper benefits from a critical realist perspective as its philosophical stance in two ways. First, it provides a meta-theoretical tool with which to develop appropriate methodological and theoretical framework that helps to present an appropriate empirical work. Second, the critical realist point of view can expand our knowledge of the complex issues or events that lie outside statistic propositions and contradict the positivist viewpoint. In doing so, this study intends to enhance the scientific value of the study by providing new methodologies to address the impact of cross border patent litigation.

Interviewing evidence and the two ITC investigative cases were selected to demonstrate strategic interactions in cross border patent litigation. The interview evidence presented was gathered by a combination of face-to-face interviews, email communication and telephone interviews. Three samples of interviewees were with the semiconductor industry and three were with computer peripheral manufacturers. All the interviewees were directly involved with the litigation process on behalf of their companies. Following are the key features of six firms that were interviewed:

<table>
<thead>
<tr>
<th>Disputes</th>
<th>Industries</th>
<th>Litigation experience</th>
<th>Product</th>
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<tr>
<td>Intel Corporation v VIA</td>
<td>IC design</td>
<td>ITC, FDC, multi-jurisdictions</td>
<td>CPU and chipset</td>
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<td>Oak and Zoran v Mediatek</td>
<td>IC design</td>
<td>ITC, FDC</td>
<td>DVD controller chipset</td>
</tr>
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</table>

Firm A is a semiconductor manufacturing firm. It has a successful business model and a leading position in IC manufacturers. While it has experienced litigation action, this has not occurred frequently. Firm B too, is a semiconductor manufacturing firm. Its main products including IC solution and memory IC, were involved in several legal battles with US semiconductor manufacturers and others in the Federal Courts and the ITC.

Firm C was established in 2001 and provides solutions for system on chips (SOCs) in the consumer market. It focuses on PC display products, including flat-panel monitors and televisions. A leading US firm in controller chipsets filed a patent infringement suit against company C in ITC.

Firm D is a computer peripheral company. Its main product is the traditional computer monitor, but has recently moved to producing liquid crystal display (LCD) and display panel products. It has experienced litigation in the Federal District trials in the US in 2001 and also litigation in other jurisdictions.

Firm E is also a computer peripheral company. This is a competitor of Company D in that its main product is the traditional monitor. Firm F is a motherboard manufacturer and its relevant product line includes lap-top computers. Both E and F have encountered litigation in the US due to the use of infringed upstream products.

Table 1 shows the key features of two ITC investigative case studies for which a more detailed analysis is undertaken. The main Taiwanese parties are two IC design firms: VIA Technologies Incorporation (VIA) and Mediatek Incorporation (Mediatek). Both firms experienced infringement suits by ITC investigations and FDC. Their disputed products, VCD drivers and CPU, were related to personal computers.

Empirical Results and Discussion

Interview Evidence

It is widely believed that IPR protection is more beneficial to domestic firms and less friendly to foreign firms. To what extent does patent protection change firms’ behaviours is an issue that has been discussed at length in literature. Therefore, from the
perspective of Taiwanese firms supplying products to a major market like the US, it is a major setback to incur litigation actions initiated by domestic producers. In addition, ITC and litigation actions triggered by domestic firms contribute to the hold-up problem but how do these actions influence the strategic behaviours of importers? This section in terms of interviewing evidence attempts to address above issue by exploring two practices of firms: patent filing and the direction of R&D.

Patenting Behaviour
A (Taiwanese) firm’s patent portfolio assumes great importance whenever disputes or litigation occur. One of the reasons for this is because the more related patents a firm holds, the better placed it is to negotiate its way out of trouble. Furthermore, if the firm holds core patents in a given technology, these may decrease the possibility of a lawsuit because it opens up the possibility for cross-licensing. This view has been confirmed in a number of the interviews (interviewee, Firm A). However, one interviewee (Firm C), pointed to an information asymmetry with respect to the portfolio size. Firms with small portfolios are vulnerable, even if their own patents are infringed, since taking legal action against larger firms or firms with large portfolios is a time-consuming and costly exercise. Here cross-licensing is not necessarily a viable option and they expect to pay higher rates in royalty fees.

Litigation, as discussed below, is one of the strategies to reduce market competition by large firms. Lanjouw and Schankerman show that patentees with small portfolios are at a significant disadvantage in protecting IPRs due to the fact that they do not have a large patent portfolio to trade and to facilitate cooperative resolution of disputes. Taiwanese firms are generally in the small to medium category in terms of their capital base but are highly flexible in response to the change in the market. Given that profitability and survival become a priority at the start of business, the size characteristics may mean that firms are more vulnerable to litigation. But, interestingly, one of the interviewees (Firm B) suggested that one of the advantages of her company is that they are flexible enough to overcome the restriction of patent litigation. She stated that, ‘Small firms are not always in the weak position under threat of litigation in IC design industries. Small firms are flexible in their response to market demand. Sometimes even if one firm becomes bankrupt, the entrepreneur creates a new firm to continue to produce the same product. Litigation becomes a useless strategy in this instance.’

A connection between the size of the patent portfolio and the venture capital investment was also made by several interviewees, in particular from small firms (like Firm C). In general, they suggested that with a valuable patent portfolio, firms find it easier to gain financial and capital support in the event of litigation. Of course the smaller/younger the firm, the less likely it is that it will hold a wide portfolio. In this case, the quality of the patent will be paramount. Overall cost of defending a litigation should not exceed expected benefits from patent enforcement, including probabilities of deterrence, detection, favourable settlements by courts or otherwise, and damages or licensing payments. If this is not the case, defending litigation actions will not be the best option, as it would lead to a waste of resources. In such circumstances it would be better to negotiate a settlement i.e. either pay a royalty or not use the infringed patent at all. A subsequent interview with a patent attorney confirmed the financial implications behind the patent portfolio, which can attract stakeholders or business partners (interviewee, Firm A).

This is consistent with the previous literature that the size of a firm’s patent portfolio may affect the prospect of patent litigation. Semiconductor firms build infringement-proof patent portfolios in order to have enough assets against possible lawsuits. However, interviewees also pointed out that there is a financial consideration when they build their patent portfolio in order to avoid possible lawsuits (interviewee, Firm A).

In many cases of litigation disputes between Taiwanese and US firms, the outcome has usually been a settlement with regard to the disputed patent. This will involve compensation in the form of royalty payments. Taiwanese firms often end up paying large amounts of the royalty because of weak negotiating skills. Partly because of this, one pre-emptive measure that many firms follow is to patent as much as possible. They encourage engineers to apply for patents even when the invention represents only a slight improvement over the existing technology. The cost of application is considered secondary to the possibility of building a strong portfolio as a defence against litigation. Moreover, it is easy to abandon patent rights by not paying maintenance fees (interviewee, Firm A).
There is little doubt that patenting practice has expanded in recent years and the USPTO is a popular destination for registering patents for Taiwanese firms. When the author asked the question of what has essentially changed in IP practices during the last few years, interviewees spoke of the organisation (or reorganisation) and scale of IP department. One of the interviewees (Firm B) explained that their IP department was controlled by the CEO, because of the need to integrate the legal aspect of patenting with the overall corporate strategy. In his opinion, most Taiwanese firms still had the IP department as a separate legal department, which just dealt with associated legal documentation and tasks. Some firms however, followed a different strategy. Compared to other firms interviewed, the new entrant, Firm C, uses a US-based patent attorney to apply for patents and maintain its patent administration. There is no specific legal division in this company.

In addition, with widening patent portfolios and increasing experience of litigation Taiwanese firms have become more aggressive, for example, in their litigation strategies, getting involved in counter-suits, instead of waiting to defend the action or settling to their disadvantage (interviewee, Firm A).

The above discussion seems to confirm the defensive mechanism of patent protection. Aware of the importance of US patents, Taiwanese firms have emphasised on patenting quantity, focusing on many minor developments. They appear to be aggressive in their patent application strategy, applying for patents even with marginal improvement early in the R&D and innovation process. Holding a wide patent portfolio gives the firm an added advantage in the event of litigation. In addition, developing an extensive patent information database is perceived as an important resource for R&D and business strategies. With the increase in frequency of patent litigation and infringement, interviewees highlighted that they were concerned with the blocking powers of their competitors to restrict their market access.

**Direction of R&D**

Before analysing how Taiwanese firms respond to US litigation, it is important to understand their view on why the litigation occurs. Interviewees emphasised that profits and market share were the main reason for the disputes, not solely infringement. Denying infringement in many cases, they felt the timing of legal action as being important and a direct result of business strategies (interviewee, Firm A).

With emphasis by interviewees on market competition and timing of marketing products, it is no surprise that they highlighted the importance of maintaining upstream and downstream relationships when lawsuits were triggered. Litigation has the effect of disrupting the customer-supplier relationship, and therefore, plaintiffs and in fact litigants will probably sue all of the product chain in order to have a better bargaining position. While downstream customers usually have multi-suppliers to negotiate the supply price and risk; in the face of litigation action against any one firm, there is still a chance that the firm may be able to retain its customers.

Firms embroiled in litigation try to convince their customers that such action will not affect product supplies. Moreover, in the case of an initial ITC determination, they will work with customers to negotiate with the US tariff authorities to ensure continuation of supply. But ultimately those with high technological capabilities will develop replacement products through reverse engineering, of equivalent function designed around the litigated technology (interviewee, Firm B).

Apart from that, an interview with a US attorney revealed that the scope of patent claim, one of the proxies of its overall quality, is considered an important factor in the patent suit determination. The litigants are required to evaluate the scopes of patent claims in order to respond to the litigation action properly, because the cost of litigation will rise. Moreover, with the added threat of exclusion order, firms are required to have capabilities to design and replace infringed products under ITC investigations and that too in a relatively short period of about 18 months. This result is also consistent with previous literature, which shows that the risk of follow-on suits, the risk of court imposed constraints, and rising transaction costs, including the threat of bankruptcy, may add to the litigation expense of defendants.6,8,12

Furthermore, reverse engineering and designing a product of equivalent function around the litigated technology is not always possible. This is due to the limited technological capabilities of firms. One of the interviewee states: ‘Strategies that invent around and patent around are more likely to fail. This is because opponents recognize your attempt of imitation. They have done their best to design mechanisms to prevent imitation, and our R&D capabilities limit this strategy’ (interviewee, Firm E).
Litigation increases transaction costs in business by damaging a firm’s reputation and its relations with its trading partners, in particular, when a firm with limited R&D capabilities cannot supply its customers with replacement products. The costs and risks of litigation may increase if the litigation action lasts for a long period.

A major impression, which emerges from the interviews, is that in many cases patent litigation results in a change in patenting activities and patenting behaviour. Prior literature has shown that new entry biotech companies, for example, avoid applying for the patents in some contested patent classifications. In discussing this behaviour with interviewees, they confirmed the change in patenting behaviour brought about by the threat of litigation. For example, ‘If competitors have litigation in similar product areas, we may probably take this experience into consideration. Maybe we will not produce the same product or replace the possible litigated design to avoid infringement action’ (interviewee, Firm F).

A litigation decision is no longer a legal or even technical decision but a corporate strategic decision. Facing a potential legal action can either enhance the competitiveness of a firm in the market place or cause it to suffer financial loss.

**Patent Dispute Cases in the US ITC**

Table 2 below shows the key features of two patent disputes in the US ITC. Both cases were concerned with patent infringement of IC chipsets. The first case is a patent infringement suit between Intel Corporation (Intel) and VIA Technologies Corporation. From 1999 to 2004, both parties were involved in mutual lawsuits. The dispute was initiated by Intel’s lawsuit against VIA in 1999 charging them with breach of contract and patent infringement. This dispute was eventually resolved on 4 July 2004. The stakes and impact of this case were huge as the dispute encompassed 11 pending cases in five countries involving several enforcement mechanisms, such as ITC, FDC (Federal District Court) and CAFC (US Court of Appeals for the Federal Circuit). Other downstream Taiwanese firms were listed as defendants during this litigation. The Intel-VIA case therefore presents a unique opportunity for studying cross-border patent litigation and firms’ litigation strategies.

The second case is the patent dispute between Oak Technologies (Oak) and Mediatek Incorporation (Mediatek). At the beginning of the litigation, Oak filed a complaint in the ITC against United Microelectronics Companies (UMC) in 1997. Mediatek, a spin-off firm from UMC, was also one of the defendants in this ITC investigation. Although both companies reached a settlement in 1998, a further dispute of patent infringement occurred again in 2004 again. Oak, which had merged with Zoran, filed a suit against Mediatek and other relevant down-stream Taiwanese DVD driver manufacturing companies in 2004. This dispute reflects the intensive global competition in VCD and DVD control chipsets.

**Intel v VIA: Background**

VIA was established in 1995. Its main products included system logic ICs and peripheral ICs, which accounted for more than half of total sales. Other products including ICs and CPUs (central processing unit) account for less than 10 per cent sales. Similar to the early phases of development of most Taiwan ICT firms, VIA licensed from leading technology corporations. For example, VIA negotiated a licence from Intel in 1998 to produce AGP (Accelerated Graphic Port) compatible products. After that, VIA grew quickly by focusing on low cost chipsets for CPU and other Intel products.

The dispute in the VIA-Intel case arose from the application of dynamic random access memory (DRAM) chipsets that all personal computers (PCs)
use to increase the speed of processors. At that time, the available synchronous dynamic random access memory (SDRAM) chipset was not compatible with Intel’s newest and most profitable processors, the Pentiums. Intel decided to back a powerful and radically new type of memory chip invented by Rambus Inc. By 1999, Intel spent two years and hundreds of millions of dollars trying to establish Rambus Memory as the new industry standard among Taiwan’s motherboard and memory chip makers. Rambus DRAM was twice as fast as SDRAM, but it was a lot more expensive and complex to produce. Despite the effort to establish Rambus DRAM as the new industry standard, Intel struggled to build a chipset that could support it. The end result was a series of product delays and an embarrassing recall of motherboards.22

At the same time, VIA introduced a slightly less radical solution with low end product strategies based on the previous product standard. This new chipset was 33 per cent faster than the existing standard, not as fast as Rambus, but a lot cheaper and easier to integrate into existing PC architecture. With this success, VIA also forayed into the CPU market, which was dominated by Intel at the time. For example, the first CPU product, VIA Cyrix II, was announced in February 2000. This posed a threat to Intel’s market and during this time the licensing and patent dispute between Intel and VIA worsened.

Litigation Events in the Dispute

From 1999 to 2003, Intel and VIA were engaged in a legal battle over microchips for CPU platform and microprocessors.22 Broadly speaking, there were five main litigation events and two settlement agreements between VIA and Intel. These are listed chronologically in Table 3. There were two main disputes, including several litigation events, in the Intel-VIA case. The first lawsuit resulted from a breach of contract and patent infringement suit filed by Intel on 7 June 1999. VIA had licensed a new industry standard from Intel for certain computer-chip specifications AGP in 1998. The new standard related to the electronic interface and signal protocols by which devices in a computer system communicated with each other. From 1996 to 1998 Intel announced two AGP interface specifications, namely, AGP I and AGP II.22 But the dispute arose when VIA promoted its own product, Apollo 133 chipsets which was backward compatible with older CPU’s. Intel argued that this contravened the AGP licence. Intel Corporation withdrew the licence on 23 June 1999 and claimed that VIA infringed this technology (main litigated patent was the US Pat No 6,006,291).

As a result of this dispute several lawsuits between Intel and VIA were announced worldwide. Multiple litigation events occurred between the two parties; including the Northern District Court of California in July 1999 and the ITC investigation in January 2000 in the US. Furthermore, Intel widened the legal action, to include alleged infringers in Singapore and the UK. VIA Technologies responded to Intel lawsuits with several counter-suits in the above jurisdictions. Settlement was reached on 5 July 2000 for some parts of the dispute. But Intel modified the scope of the lawsuit to continue the action. Intel alleged that VIA’s chipsets supporting non-Intel processors, such as its AMD-compatible chipsets, violated Intel’s patents. The first settlement did not cover these claims. Intel continued its appeal of the case.

The second stage of dispute related to whether VIA technologies infringed five ‘Pentium 4’ microprocessor patents. Intel filed the suit in the US state of Delaware and in three different jurisdictions: Germany, Great Britain and Hong Kong. Similarly, VIA Technologies responded to this legal action by several counter-suits and accused Intel of anti-competitive behaviour in Taiwan’s Fair Trade Commission. VIA claimed that some of the patents belonging to Cyrix, the former CPU division at US-based National Semiconductor

Table 3 — Comparison between the patent disputes: VIA and Mediatek as defendants

<table>
<thead>
<tr>
<th>Features</th>
<th>Case I: VIA Technologies</th>
<th>Case II: Mediatek</th>
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</thead>
<tbody>
<tr>
<td>Industries</td>
<td>IC design</td>
<td>IC design</td>
</tr>
<tr>
<td>Relevant product</td>
<td>CPU and compatible chipset</td>
<td>CD driver chipset controller</td>
</tr>
<tr>
<td>Multiple cases</td>
<td>ITC+FC+CAFC</td>
<td>ITC+FC+CAFC</td>
</tr>
<tr>
<td>Main dispute</td>
<td>Twice</td>
<td>Twice</td>
</tr>
<tr>
<td>Background of capital</td>
<td>Formosa Plastics Corp. (FPG)</td>
<td>UMC group</td>
</tr>
<tr>
<td>Timing of suit</td>
<td>4th quarter of the year</td>
<td>4th quarter of the year</td>
</tr>
<tr>
<td>Counter suit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Relevant suit</td>
<td>Antitrust suit by VIA</td>
<td>Anti-competition by Mediatek</td>
</tr>
<tr>
<td>Result of disputes</td>
<td>Settlement</td>
<td>Settlement and continuing</td>
</tr>
<tr>
<td>Summary of CAFC judgement</td>
<td>Non-infringement</td>
<td>Non-infringement (except in 1 patent)</td>
</tr>
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22 From 1999 to 2003, Intel and VIA were engaged in a legal battle over microchips for CPU platform and microprocessors.
Corp, and Centaur Technology, another US-based chip designer purchased by VIA, were infringed by Intel corporation. This dispute ended on 14 Feb 2003. The CAFC ruled in favour of VIA by declining the liability of patent infringement by VIA technologies. This final settlement was also reached on 7 April 2003.

The Intel and VIA case was an unusual case due to the reason that foreign and relatively small sized firms are more likely to avoid cross-border litigation. However, VIA Technologies responded to the Intel threats by filing counter-suits several times. The dispute has been cited by Rivette and Kline as a case in which relatively small firms challenged the leading chipset giant successfully.

Zoran v Mediatek: Background

Mediatek Inc is a fabless IC company established in 1997 (ref.17). The firm originated from the Taiwan-based IC manufacturing: UMC. According to the report of IC insight, Mediatek grew 91 per cent between 2001 and 2002 and became one of the leading suppliers to IC fabless firms. Mediatek Technologies Corporation was acquired by the Zoran Corporation in 2003. Both are US based firms providing digital solutions-on-a-chip for applications in consumer electronics, such as DVD, digital camera, DTV and imaging products. In the IC optical storage industry, Zoran was an important rival to Mediatek.

The dispute in this case concerned the technology related to the transfer of information stored on a CD-ROM (compact disk-read only memory) to a host computer which in the context of this case contained a CD-ROM drive, that managed the communication of data between the CD-ROM disk and the host computer. The CD-ROM drive itself contained a device known as a CD-ROM drive controller, typically implemented as a semiconductor integrated circuit. Therefore, the invention described and claimed in the disputed patent was concerned with an improved CD-ROM drive controller that provided faster and simplified data communication.

The Progress of Disputes

There were two main disputes between Mediatek and Oak Technology. The first dispute began in 1997 and the second in 2004 after Oak Technology merged with Zoran Corporation.

The original dispute arose between Mediatek and Oak Technology over a patent on CD-ROM drive controllers. This was close to a settlement after protracted negotiation. Before it was reached, Oak filed a complaint with the International Trade Commission (ITC) in December 1997, against Mediatek and UMC for violation of Section 337 of the Tariff Act of 1930, claiming that Mediatek’s CD-ROM controller IC chipset infringed Oak’s patent. The ITC ruled that Mediatek did not infringe Oak’s patent right, but Oak filed an appeal in the US Court of Appeals for the Federal Circuit (CAFC) against ITC’s decision. In May 2001, CAFC held that the reason for Oak’s appeal was not sustained, and affirmed the final determination of ITC.

With regard to the second dispute, Zoran and Oak sued Mediatek on 10 March 2004 in the ITC. They claimed that Mediatek’s CD-ROM drivers and DVD player chips had infringed upon three patents of Zoran and Oak (i.e., US Pat Nos 6466736, 6584527 and 6546440) in violation of Section 337. Before this complaint, Zoran and Oak also filed a lawsuit with the Central District Court of California on 18 March 2004 on the three patents with a claim for indemnity for the patent infringement. On 17 May 2005, ITC announced its initial determination that Mediatek’s IC did not infringe Zoran and Oak’s patent 6466736 and patent 6546440, but some of Mediatek’s old model chips were found to have infringed patent 6584527.

This dispute between Mediatek and Oak reflected intense competition in the optical drive controller market. In addition to the above lawsuits, for instance, Mediatek also battled other competitors during this period. Those lawsuits included ESS Technology Inc in 2002, and VIA Technology and Aopen Incorporation from 2002 to 2003.

ITC Investigation Cases: Discussion

Both cases were similar in that they involved cross-border actions and multiple litigations in the Federal District Court, ITC investigations and CAFC. The duration of disputes lasted more than five years and involved counter-suits by defendants. In addition, the timing of litigation by the plaintiff was designed to punish the defendant financially because it occurred in the fourth quarter of the year, the most important part of the selling season in personal computer and IT products industry (Table 3).

However, both firms responded to legal action in different ways and the impacts of litigation are diverse and multiple. A general theme that has run throughout this section – and made explicit in the discussion of enhancement of trade-relevant patent enforcement – has been that neither legal protection nor patent strategies alone are sufficient in understanding cross-border patent litigation.
Strategic Considerations in Avoiding Litigation

The above analysis provided evidence of hostile behaviour involving infringement suits towards Taiwanese firms. However in both cases, these firms had attempted to develop a production strategy that focused on producing comparable products within the existing standards rather than competing products on the basis of new standards. For example, VIA had licensed technology from Intel from the onset for developing chipsets. Mediatek has focused on IC and chipsets compatible for optical storage drives, following the standards set for core technology for optical storage drives controlled by Japanese firms.

Such behaviour is consistent with the observations of the development model of Taiwan ICT industries. With the value chain of Taiwanese ICT industries, the business model for initial development is to focus on the improved manufacturing and process innovation. VIA developed an IC chipset compatible with Intel CPU and Mediatek improved the function of transferring data in VCD drives. In addition, semiconductor industry’s structure also supplied reliable products to downstream firms, such as manufacturing firms of motherboard and personal computers. For example, United Micro-Electronics Corporation (UMC), a leading Taiwanese IC foundry was a main IC manufacturing partner for Mediatek’s products. VIA also interacted very closely with downstream motherboard firms, which were joint defendants in the VIA v Intel lawsuit. Mediatek was a spin-off firm from UMC. VIA was one member of Wang’s family business, Taiwan’s largest or second industrial conglomerate. 18

The literature suggests that young firms avoid litigation in the early stages of development because of the cost and risk of litigation. 19 Taiwanese firms avoided those risks by developing Original Equipment Manufacturing (OEM) and Original Design Manufacturing (ODM) business models. Those models provide a protective umbrella for development. In addition, it is quite evident that from the start both firms attempted to avoid the damaging effect of patent disputes by licensing or cross-licensing with the leading technology firms.

Strategic Response to Patent Infringement

Both plaintiffs in the two litigation cases demanded a product constraint (exclusive order) against the two Taiwanese defendants in the ITC. For Taiwanese firms such actions lead to increased costs of maintaining their product supplies to customers. This is partly because litigation signals to the market (either fairly or unfairly) that defendants produced illegal products. This strategy can isolate defendants’ trade relations with customers, distributors and investors etc., and damage their reputation. Therefore, firms respond in several ways but if they are to survive they have to promise customers competitively priced replacement products that involves extra investment on their part.

In the VIA-Intel case, some downstream firms using VIA products, such as motherboard manufacturers and distributors were also involved in the disputes. 22-24 At the same time, Intel was cooperating with two of VIA’s Taiwanese competitors: Acer Labs and Silicon Integrated Systems. Both had obtained licences from Intel to make chipsets to be used with Pentium 4, as Intel isolated VIA. Similarly, Zoran also employed the isolated strategies to block the Taiwanese competitors and relevant products from entering the US market. For example, Zoran also filed suits against the CD ROM manufacturers, Lite-On and Aopen. The intention of these actions (suits) is very clear; it is the use of the ITC-efficient product constraint to isolate the defendants’ trade partner relations.

To counter this, defendants need to convince their trading partner that the suit was unjustified or that the company would indemnify all its claims particularly, if it was found to be an infringer. 13 The strategic implications from both cases are as follows:

Counter-suit Strategies

If defendants are more concerned with product sales than the cost of attorney’s fees, they may extend the duration of lawsuits by their counter-suit action. This is particularly so in the short product life cycle industries, such as computer and semiconductor industries. Such a strategy creates the opportunity to continue selling irrespective of a guilty or not guilty of infringement verdict. Counter-suit actions create an uncertain legal environment for plaintiffs as well. Furthermore if the defendant is found not guilty, other defendants in a similar position may believe that the possibility of winning the suit is favourable as in the Telex-IBM dispute which was specifically about antitrust violation. 30 This is also the case in patent invalidation suits. Once the court ruled a patent invalid in a patent infringement suit based on the fact that prior art existed, the plaintiff loses the patent right. Thus, counter-suits can also help defendants convince their trade partners that a company is confident in its product and its quality of patents even when such action is expensive in terms of attorney fees.
In both cases, when Intel employed litigation suits to maintain its rights, several counter-suits by VIA Technologies were used to postpone the threat of litigation. VIA did not seek the settlement as soon as possible in the beginning of the lawsuits. There are some reasons highlighted in newspapers. While the sales of PC133 products peaked with the announcement of litigation, VIA’s strategy was to extend the lawsuit to introduce uncertainty in the environment in order to continue selling. Similarly, Mediatek employed the same strategy to postpone the effect of litigation through counter-suits and broadening disputes under ITC jurisdiction.

Promising a Competitive Replacement Product
Reverse engineering is generally a lawful way to acquire know-how about manufactured products for the purpose of making a competing product. With the purpose of avoiding infringement claims, reverse engineering aims to design around and produce a competitive replacement product to maintain supply to customers.

The chip manufacturing capabilities of both Taiwanese defendants also helped to reduce the cost and time required to make exact or near-exact competing chips. In particular, the Mediatek strategy depended more on its high quality of staff whose technological capabilities were flexible enough to enable a design around product to avoid infringement. Mediatek had provided a more efficient solution than other competitors during the lawsuits. VIA, on the other hand, preferred to continue providing a low end product to maintain its sales, while Intel was trying to establish a new product standard.

Using the Cross-Licensing Agreement of Other Firms
The use of the cross licensing defence against infringement can also be seen in the case of VIA which strategically allied with Trident and the National Semiconductors Corporation. Both of these companies were covered by licensing deals with Intel and in so doing VIA was able to sell products with the Intel brand and not be the brunt of patent infringement suits. Such an alliance also increased VIA’s negotiation position by widening its patent portfolio. Due to the asymmetric bargaining position in litigation, VIA had to protect itself more aggressively and strengthen its position within the industry by acquiring the Cyrix unit of National Semiconductor Corp and the Centaur Design Operations of Integrated Device Technology Inc. Thus, despite Intel’s dominant patent portfolio, VIA’s negotiation power improved in the patenting domain.

Mediatek also started by licensing from several leading companies but went on to develop process innovations to deal with electronic signals between IC and CD drivers. They were thus able to develop better and cost-effective solutions in-house, which they went on to patent and licence to other firms. Through these developments Mediatek improved their negotiation stakes with Zoran and at the same time became a leading competitor in the control IC technology of system-on chip.

Formation of Alliances with Trade Partners
VIA cooperated with Advance Micro Devices (AMD), a long-term Intel rival, to defend its market and infringement action brought against it. For example, VIA and AMD filed a complaint against Intel charging, ‘Intel had abused its dominant position by tying makers of personal computers to rebate deals that were conditional on not buying chips from Intel’s rivals’. In addition, during the litigation, VIA shifted towards producing an AMD-compatible processor and quickly accounted for about half of this market.

Similarly, Mediatek was able to form alliances with several downstream firms to jointly defend the litigation, and this had the effect of protecting their trade-partners’ sales. For example Lite-On, a Taiwanese DVD manufacturer, also listed as a defendant in the Mediatek-Zoran case, cooperated with Mediatek and continued using Mediatek’s products.

Uncertain Influences of Patent Litigation
Firstly, the competitiveness of IC chipsets and optical data storage markets are the main foci behind legal disputes. While the VIA case draws particular attention to competition of CPU platforms and compatible chipsets, Mediatek highlights the competitiveness of optical storage IC. In the VIA case, in particular, it can be observed how the product standards and litigation operated together in order to control or extend markets. During litigation with Intel, VIA and AMD, the world’s second largest CPU maker behind Intel, jointly launched the double data rate (DDR) 333 chipset standard in an attempt to capture the leading position in competition with Intel. At the same time, Intel even as it awarded licences to Taiwanese companies seeking to build chipsets compatible with the new Pentium 4 processor, refused to provide VIA such a licence. It filed a suit in the US District Court in Delaware, charging VIA with patent infringement to isolate its market potential.
With regard to Mediatek, as a majority of PC users moved toward high volume video multimedia and document processing, the need grew for high-capacity removable optical storage. This shift of interest also made optical storage products and digital consumer electronics increasingly attractive. With increasing demand, most optical storage manufacturers dropped prices to augment their market share. This resulted in intensive competition in the supply chain of optical storage products to supply a low-cost and efficient solution. The increased competition in this market also spilled over to the legal environment as Mediatek, one of the technology leaders in this area, also had legal disputes with several competitors at the same time, including an infringement suit in FDC brought by Matsushita Electric Industrial Co in August 2005 and VIA Technologies in 2004.

Secondly, key differences between the two cases relate to the firms’ characteristics. The asymmetry in characteristics of such cases may be found in the firms’ size, patenting behaviour and sales. The size issue is clear in the contrast between \textit{VIA v Intel} due to Intel’s dominant position in computer and IC industries, although this did not seem to be an important issue in the Mediatek case. In the case of patenting behaviour, VIA employed generally more aggressive acquisition and merger strategies to extend its patent portfolio during the litigation. Its sales downturn was partly due to the global decline of personal computers and the successful marketing of the Intel Pentium 4 processor. Mediatek on the other hand did not respond to the litigation in this manner. It quickly developed replacement products for its customers and consequently its sales continued to rise in contrast to VIA. Although Mediatek subsequently bought out the IP and R&D department from Pixtel Communications in 2004, this had more to do with securing itself in the wireless business than a specific response to patent infringement action.

Thirdly, and related to the above, the ‘time to market’ has become an important factor in market competition, ITC investigations were used strategically to delay or isolate the competitor’s new products and imports in both case studies. The threat of ITC investigation also gives a strong signal to an importer’s potential customers. In VIA’s case, CAFC affirmed a District Court’s judgement of non-infringement for VIA and no invalidity for Intel patents.\cite{23} However, VIA’s sales performance did not improve with this victory and they eventually reached an agreement with Intel to manufacture the Pentium 4 which was expected to boost their sales.\cite{22,23} Furthermore, despite VIA having established strategic alliances and having carefully managed its relationship with third-party providers, it was Intel which held the stronger bargaining position in litigation enabling it to globally challenge VIA’s network relationship with customers, suppliers, investors and cross-licensors.

In contrast, the final determination (in September 2005) of the ITC found that Mediatek infringed Zoran’s patent. At the same time the ITC dismissed a counter-suit that had been filed by Mediatek against Zoran. Given the relatively short period of time elapsed since the ITC judgment the author is unable to assess the impact of these judgements. However, Mediatek claims that they avoided infringement claims by their new model of design-around chipsets and their sales continued to improve. Finally, if one views litigation experience as a learning curve, both firms have learnt how the strategic use of patent enforcement can protect their market in the long term.

Finally, patent strategies must be undertaken cautiously and involve marketing and management strategies to compete successfully in the global economy. The \textit{VIA v Intel} case study highlights the importance of identifying and overcoming linkages between vertically related products and firms during the litigation. In particular, Intel’s linking of two product markets - the CPU and its compatible chipsets - enabled it to exploit market power in one market in order to win a litigation battle. Similarly, the Mediatek-Zoran case illustrates that there are strong private gains in capturing a key component of a technology system by patent fencing strategies.

With regard to the trend of patent infringement lawsuits involving Taiwanese firms, several features from other representative cases in the ITC archive can be considered. Firstly, during the 1980s most Taiwanese firms involved in ITC disputes were as third party infringers due to the manufacturing mechanism resulting from earlier industrialisation in Taiwan. After that, Taiwanese firms had become more directly involved in intensive patent litigation, because the computer and IC industries began booming since 2000 and Taiwan proposed to establish a suitable IP management system in the context of the US.\cite{33} Secondly, in the majority of cases, Taiwanese companies acted as defendants and only in a few cases as plaintiffs. Not surprisingly, the jurisdiction
advantages are always a case in home countries. While an ITC investigation is recognised as an effective mechanism to protect IPRs, US firms attempt to employ this mechanism to prevent foreign infringement. When small firm attempts to settle with complainants, the ITC investigation is a powerful mechanism for the complainant to hold an advantage in the settlement process.

However, there have been cases where Taiwanese firms were the complainants. For example, the 337-TA-450 case in 2001, where United Microelectronics Corporation, a Taiwan-based firm, initiated an investigation against Silicon Integrated Systems Corp, another Taiwanese firm, claiming infringement of their (UMC’s) own ICs. Similarly, in investigation 337-TA-523 Mediatek Inc and in 337-TA-525 Taiwan Semiconductor Manufacturing Company, sued Taiwanese firms and Chinese firms, respectively. These cases are very significant in showing the shifting attitude of Taiwanese firms towards a more aggressive approach than a defensive one. In addition, these firms faced similar infringement suits in the ITC from other competitors. These litigation experiences therefore may help to build firm capabilities to survive the litigation.

This empirical result is consistent with previous literature. Firms in ITC may be acting strategically to threaten importers and increase their risks, and not solely to protect their valuable patent rights. Unlike district courts, the injunctive relief granted by ITC almost automatically could make patentees necessarily defend infringement. These features have been justified as needed to prosecute foreign infringers who would otherwise evade US district courts. According to Chien’s study based on an analysis at the ITC from 1995 to mid-2007, plaintiffs at the ITC were more likely to win than plaintiffs in district court. Furthermore, at least 65 per cent of the time litigants filed an infringement suit in both district court and ITC, which led to the possibility of duplicate litigation and inconsistent results. These mechanisms of the ITC, therefore, are regarded as strategic use of litigation that may also lead to inefficiency in US patent law.

Conclusion

This paper has attempted to demonstrate the dynamic competitive process of litigation and its potential strategic behaviours. The case studies of two ITC investigations and the interview evidence presented enable a highly particular and localised set of explanations for the strategic response of Taiwanese firms toward patent litigation. These empirical cases contribute a number of key agenda to the phenomenon of trade relevant patent litigation.

Firstly, the findings highlight market competition as a key variable in legal strategic calculations. Both litigants appeared to not take the cost of legal fees into serious consideration by filing similar suits in different jurisdictions. The firms also sued the relevant upstream and/or downstream firms of the targeted litigant in order to isolate the market relationship of competitors.

Secondly, the findings suggest ways in which foreign firms can employ domestic mechanisms to their advantage. Indeed, it has been seen that both Taiwanese firms organised their legal actions to respond to the plaintiffs’ claims. These cases have demonstrated a strategic shift from merely avoiding litigation to employing the legal environment to contest claims against them. As the Mediatek case demonstrates, Taiwanese firms also use this mechanism to defend their markets.

Thirdly, litigation also brings about specific temporary alliances. The Mediatek case points out that a unified defence against litigation was a viable strategy to the infringement suits. This short-term cooperation reflects closely the long term localised vertical cooperation among Taiwanese ICT firms.

Fourthly, the analysis presents the strategic response from defendants who have limited technological capabilities but who are able to overcome these limitations in several ways. But the initial loss of sales and the cost of acquiring or developing technologies in the short term may weigh them down.

While these empirical results in the paper do not make a strong claim for positive or adverse impact of patent disputes on innovation activities, this study has shown that innovation and commercialised products are complex processes, and mechanisms efficiently restricting imported products may increasingly incline firms to utilise legal enforcement strategically. The findings on the importance of the strategic use of litigation in market competition address the deficiency of the patent strategy theory at the firm level. In addition, patenting litigation strategies are still an emergent area of research, and theories for explaining patent-relevant questions are often not well
developed. In order to build a comprehensive understanding of cross border patent litigation and strategies, following research agendas can be valuable for further developing fields of patent strategies, such as strategic organisational decisions associated with the role of patents and innovation, patent strategies of young technology-based firms, etc. With each improvement, the results gained provide a more solid basis for making decisions about theories and policies.

References
19 Personal computers with memory management information stored in external memory and related materials, Investigation 337 TA-352, USITC, Washington DC (1994), US International Trade Commission. This case involved Twin-Head International Corp, which is a notebook computer manufacturer.
20 Dynamic random access memory controllers and certain multi-layer integrated circuits, as well as chipsets and products containing same, Investigation 337 TA-388, USITC, Washington DC (1997), US International Trade Commission. This case is involved United Microelectronics Corp (UMC) and SIS, which are semiconductor manufacturers. Settlement was reached with Intel before the trial.
21 CD-ROM controllers and products containing same, Investigation 337 TA-401, USITC, Washington DC (1997), US International Trade Commission. This case involved Winbond, which is a semiconductor manufacturer. Settlement was reached with Intel before the trial.