Abstract

We study the novel business models of patent acquisition services and assess their implications for intellectual property markets and patent litigation. Through qualitative case studies and descriptive analyses of patent and litigation data, we find that the most recent innovations in the area of defensive patent acquisition business models are indeed distinct from offensive models and from practicing entities’ strategies in the markets for intellectual property. There is also substantial variation among the defensive business models themselves, in particular, depending on their for-profit vs. non-profit objectives, and public vs. private ownership. In the patent and litigation data, defensive acquisition services stand out particularly in terms of the higher quality of their patents and their impact on the settlement and timing of lawsuits. We finish by discussing the broader context of the patent wars, and how defensive patent acquisition business models may endogenously evolve or be forced to change through competitive and regulatory pressure.
Introduction

We examine the recent phenomenon of technology companies supporting organizations that provide patent aggregation or acquisition services. Patent aggregation services are different from patent pools and intellectual property (IP) exchanges that have previously been extensively studied. In contrast to pools, the goal of patent aggregators is not to cross-license more efficiently among member firms but to share risks and costs of patent litigation and associated patent transactions. We argue that patent aggregators represent a novel and important organizational response to the legal problem posed by the evolving and extremely aggressive market for technology. According to venture capitalist Izhar Armony, “the most sophisticated [tech companies] are inventing more and filing more patents. They buy more defensively, assert more patents, do more cross-licensing deals, and participate in defensive groups like RPX”1. Defensive patent aggregation is an emerging strategy the implications of which are not yet understood. We highlight the potential ramifications for technology company strategies and competitive outcomes. Both can be substantial, as these organizations may usher in a new phase in the IP wars, for better or for worse. Regulators will need to closely watch this area to support desirable competitive and legal outcomes. The goal of our exploratory research is to highlight fundamental facts about and generate essential insights into this new business model and its implications for the market for technology.

Our study focuses on the strategies, characteristics, and implications of defensive patent aggregators. Through analysis of three cases, we describe how patent aggregators operate, examine quantitatively their perceived strategies in patent acquisition and litigation, and discuss their potential impact on the IP marketplace and on the so-called patent wars. In particular, we highlight the fine line between defensive and offensive IP tactics and the parties who appear to provide services in both sides, and consider the commitment of defensive aggregators to not litigate their patents. The quantitative patent reassignment and litigation data are helpful to better understand how defensive and offensive patent acquisition companies operate in the IP market and litigation and how their strategies differ from those of major technology companies. We finish by discussing the longer-term implications of cooperative ownership of IP assets for innovation and standard-setting strategies of operating companies.
Literature on intellectual property intermediaries

The rise of Non-Practicing Entities

Because strong patent rights create opportunities to develop and trade intellectual property rights, the market for technology has become more lucrative and allowed entry by new types of IP intermediaries with innovative business models. However, because of the non-rival and only partially excludable nature of intellectual assets, unintended flows of technological knowledge must be resolved through the legal system. As a result, the necessary complement to a vibrant IP marketplace is a vibrant litigation scene. Moreover, a patent’s intrinsic (technological) value may differ from its exclusion value, which makes it possible that marginal inventions, from a technological viewpoint, may obtain exorbitant valuations in lawsuits and settlements, depending on their strategic implications within complex technical systems.

Consequently, according to industry estimates, there were 550 IP lawsuits in 2010 against 3000 defendants, that is, over 2000 unique companies (some of which were sued more than once). Many of these legal cases are concentrated in the communication technology industry, particularly smart phones, and an estimated 17% of lawsuits were brought by Non-Practicing Entities (NPEs, firms that acquire intellectual property rights without using them to produce a final good) in 2008.

According to Wang and Hagiu and Yoffie, there are two kinds of patent aggregators, offensive and defensive. Offensive patent aggregators develop or acquire patents in the IP marketplace to generate revenue through licensing or litigation, whereas defensive aggregators acquire patents to provide freedom of operation and safety from litigation for their members or operating company partners. The business opportunity for defensive services rises from the legal challenges from NPEs. Steiner and Guth observe that offensive NPEs, also called Patent Assertion Entities, often buy patents and then wait until the associated product market takes off. Once irreversible investments have been made, manufacturers are not easily able to stop using the technology. Then, NPEs are able to obtain compensations that are higher than what potential licensees would have been willing to pay ex ante.

There are relatively few empirical studies of NPEs’ acquisition and litigation strategies. Fischer and Henkel underline that the probability that a traded patent is acquired by an NPE
rather than a practicing entity increases in the scope of the patent, in the patent density of its technology field, and in the patent’s technological quality. Many other empirical analyses confirm these findings and argue that NPEs in fact hold patents of similar or even higher quality than “practicing” entities (firms that also manufacture goods for the product market) and do not engage in flighty litigation as it has sometimes been alleged by critics. Levko et al. suggest that NPEs differ from practicing entities in terms of litigation strategies. For instance, they tend to name multiple defendants to maximize settlement revenues and minimize legal costs. NPEs also seem to be less successful in their litigation than practicing entities (29% rate of success compared with 41% for practicing entities).

**Competitive effects of patent aggregation services**

Patent acquisition or aggregation services pool the licensing contracting related to external patents. For example, RPX may negotiate licenses with external NPEs to license or acquire their IP that is alleged to be infringed by RPX members. Thus, RPX pools the bargaining power of its members to obtain licenses to relevant IPRs. This may reduce the licensing or acquisition prices paid to IP sellers.

Evaluation of the impact on competition of pooled licensing is complicated in the IP market. In the IP context, each “product” is unique and, in a sense, a market and a monopoly onto itself. There cannot be a competitive market for a single blocking patent, because it only can have one seller, and that one seller is likely to negotiate with one potential buyer at a time, for reasons discussed by Gans and Stern. Then, the analysis of market power and collusion has to be done from a different point of departure than in more traditional product or service markets. For example, competition in the IP markets must be defined in different terms than simply the number of IP sellers, because the goods that they provide are usually not substitutes. These types of “natural” monopolies in other industries are often regulated.

The competitive impact of both defensive and offensive patent aggregation will be tested in courts. A lawsuit was brought by Cascades Computer Innovation (CCI) against RPX and its members HTC, LG, Motorola, Dell, and Samsung in 2012. CCI argued that by monopsonizing the buy side, RPX is artificially depressing licensing prices and raising entry barriers for inventors and other NPEs to enter the licensing market, thereby restricting IP competition. Relatedly, a European Commission complaint was filed in 2012 by Google against Mosaid and its members Microsoft and Nokia. Google blames the two members of
Mosaid for collusion concerning the acquisition, in September 2011, of 2000 Nokia patents by Mosaid.

A counterargument by the industry participants to the collusion allegations is that, in appropriately designed and managed patent aggregation services, members actually do not influence or interact with the investment decisions or licensing negotiations of the aggregation service provider. Moreover, the fact that the clients of aggregation services also engage in direct bilateral negotiation with the patent seller should be evidence of more competition for the patent, not less. Nevertheless, considering that there is a monopoly on the sell side, monopsonization of the buy side seems strategically highly appealing.

The allegation that aggregation service facilitates monopsonistic collusion probably cannot be sustained if there is no trail of interference of its members in the negotiations—no evidence of collusion. However, in practice the boundary is not clear, as for example, the members of Allied Security Trust (AST) do appear to participate in licensing or acquisition decisions and RPX appears to compare license price information with its clients/members.

Patent pools are different and more thoroughly studied organizational arrangements also intended to solve complex licensing problems within industries. They can form for two main reasons. For inventions that are substitutes in the marketplace, pools can help inventors avoid price competition in the marketplace, whereas for inventions that are complements, pools can help inventors avoid the double-marginalization issue leading to excessive licensing costs. Lerner and Tirole suggest that only pools that consist of complementary inventions are potentially welfare improving, as pools with substitute inventions are more likely to be used to reduce competition. In the current United States context, mainly pools containing essential patents for a standard appear to be acceptable.

Patent aggregation services are not patent pools, but their effects may perhaps be highlighted through the analogy. Aggregation services are independent organizations that directly own or negotiate licenses to patents that are potentially blocking with respect to the portfolios of aggregators’ members. However, the patents held by an aggregation service are not necessarily complements, even though they are likely to be blocking to some of the members. Aggregating these potentially blocking patents may or may not alleviate the double-marginalization problem often found in information and communication technology systems. To what degree aggregation services monopsonize upstream markets depends on their organizational structures and practices.
Moreover, even if patent aggregators operate as pure intermediaries between non-practicing patent holders and practicing company members/clients, double marginalization may still ensue in certain technology areas where there are very strong blocking patents, depending on the contractual relationship between aggregators and their members. Aggregation intermediaries could potentially become very powerful parties in the value chain. The competitive effects of patent aggregation on the IP marketplace are thus not clear a priori. They may facilitate negotiations and transactions, which would increase liquidity of the market, and they may accumulate market power and facilitate buy-side collusion.

Case studies of patent acquisition services

Fuelled by the emergence of NPEs and furious patent litigation among practicing entities themselves, technology manufacturers have come up with novel organizational strategies to fend off legal threats: Defensive patent acquisition involves collectively acquiring patents so that they do not end up in the hands of parties that are likely to assert them. The acquisition service then provides member companies a license to the patents in exchange for some type of payment.

We have selected three patent acquisition services for closer examination, RPX, AST, and Intellectual Ventures. RPX and AST are purely defensive in orientation, and their stated goals include pooling risks, costs, and transaction activities of acquiring or licensing problematic patents in high-technology industries. However, the business models of these two companies are quite distinct and therefore merit comparative analysis. Intellectual Ventures also provides defensive acquisition of NPE patents, but it also engages in more offensive licensing of its massive patent portfolio, including litigation. These three services arguably well represent the breadth of approaches in defensive patent acquisition and aggregation.

RPX Corporation

RPX Corporation was founded in 2008 to help e-commerce, financial services, networking, software, and wireless companies reduce the risk of NPE patent assertion and litigation. Its initial clients included IBM and Cisco Systems, and, by 2012, it boasted 120 members including Sony, Sharp, Samsung, Nokia, Google, Ericsson, and many other major companies that paid a subscription fee on a sliding scale between sixty thousand and six million US dollars depending on their revenues and profitability.
RPX completed an initial public offering in 2011. RPX aimed to actively operate in the market for patents in order to act before NPEs. This requires extensive market intelligence. A patent aggregation service can do this on behalf of and together with a larger pool of companies that are likely to have partially overlapping technology interests. In contrast to a patent pool that enables cross-licensing among members, a patent aggregation service pools the members’ interests in purchasing potentially dangerous patents in the marketplace to avoid litigation. According to an anonymous member company, RPX had also offered to develop a cross-licensing platform service, essentially a patent pool, but this did not meet with great enthusiasm among many of its members who preferred to carry out cross-licensing negotiations bilaterally.

RPX mostly bought patents in the open market. It was one of the biggest buyers of patents, carrying out around 25% of all patent transactions. It then provided a termed license to its whole portfolio to all members. After three years of membership the termed license would turn into a perpetual one, to provide incentives for members to stay. RPX did not sell individual licenses to its patent portfolio, nor did it enforce the patents it owns through litigation.

RPX acquired or licensed patents, to be sublicensed further to its members. Acquisitions might have taken place through auctions, such as in the recent sales of the Nortel or Adaptix portfolios where RPX attempted to create a holding company to collectively acquire the portfolio for a subgroup of its members, or through bilateral transactions. Up to one third of patents are bought directly from ongoing litigation, where RPX may facilitate settlement negotiation among the parties, provide patents to its clients in countersuits, and license or acquire the disputed patents. The company is in constant discussion with its members about potential acquisitions, in order to stay up to date on their threats, as well as to distribute its investments more or less evenly across members’ expressed interests.

For members, the value proposition involved sharing the information about and costs of problem patent acquisition and thereby reducing the risk of litigation. RPX was potentially able to reduce the prices of patents or licenses to “wholesale” levels, because it was buying in bulk for over 100 members and therefore it often obtained a discount. Members were also able to share price information they received from IP sellers, which put RPX at an information advantage in negotiations. RPX was further able to aggregate other types of information about the market from members, such as specific patents, vendors, or portfolios,
which created a network effect and associated economies of scale: the more members, the more valuable the service.\(^{24}\)

Whereas the above factors propelled the growth of RPX, expansion into increasingly unrelated technology areas would potentially dilute the advantages of growth and large scale. From the members’ point of view, RPX needed to constantly justify its existence by demonstrating that it is effectively reducing litigation threats. However, if growth implied more diversified fields of technology, availability of increasingly irrelevant licenses might not justify the cost of subscription from an individual member’s point of view.

Another tension in RPX’s business model involved free-riding on its non-assertion pledge by non-members. Since RPX had declared not to assert its portfolio, there was little reason for a company potentially infringing on the patents it held to join. The incentive to join was created by the members’ ability to influence future acquisitions and from the possibility that RPX sold its patents back into the hands of an assertive entity, with licenses attached to its members only. This type of an assertion entity could even be a holding company of RPX itself.\(^{25}\) The company explicitly mentions this as a possibility in its Initial Public Offering document submitted to the United States Securities Exchange Commission\(^{26}\). The problem is that in attempts to convince new firms to join its membership roster, it may have needed to engage in less than friendly communications.\(^{27}\)

A related concern mentioned in the 2011 US Securities and Exchange Commission (SEC) filing was that the commitment of RPX to not assert its patents might not be very credible. In fact, Intellectual Ventures initially made the same promise, although somewhat more vaguely, but in 2011 it engaged in extensive litigation to speed up the realization of licensing revenues and to maximize the returns to its investment funds. Whereas litigation would devastate RPX’s reputation as a defensive aggregator, there was nothing that irreversibly committed it to non-assertion, and as a publicly-traded company it faced tremendous pressure for continued income and profit growth from its investors. However, it could potentially both engage in a defensive strategy and utilize the threat of offensive activities by outsourcing litigation – selling patent assets to external parties including its own holding companies that are not committed to this pledge. In its IPO filing for the SEC, RPX discussed the mechanism of structured acquisitions that facilitates trades that are too large to finance from its existing membership funds or only affect a small number of members. In these cases RPX may create a holding company funded by a subset of its members interested in controlling a particular,
often larger, portfolio. Similarly, RPX might create a holding company to which it can externalize the patents it wants an outside party to litigate in order to incentivize membership.

**Allied Security Trust**

Allied Security Trust (AST) was a defensive patent acquisition company that operated with a business model quite different from RPX. Founded in 2008 by Cisco, Ericsson, Google, Hewlett-Packard, Verizon and a few other firms, AST was not exactly a patent aggregator, although it pooled the interests of members in acquiring a patent. Since its inception, AST had examined over 40,000 patents and only purchased 400. The goal was to identify very relevant and high-quality assets.

In 2011, for an annual fee of USD 200,000 (and USD 150,000 one-time initiation fee), member companies received information about thousands of patents available for bidding. AST pre-screened the assets it offered to members through analysis of each patent’s application area as well as technological implications and quality to help its members identify valuable assets. In this way AST facilitated identification of common interests and acted as a neutral third party in communicating among members without divulging their specific interests. This helped similarly-situated companies to more rapidly identify patents of interest while ensuring members could individually and anonymously decide whether and how much to bid for a patent.28

When AST acquired patents, it apparently created an independent legal entity to execute the trade in order to obscure its identity and to enhance confidentiality for its members.29 If buyers and sellers realized that their counterparts are a coalition of large technology companies, prices might be adversely affected. Usually 20-30 percent of members participated in any transaction through the funds on their escrow accounts.

When a patent had been acquired, all members could decide whether to get a license. However, AST did not hold onto the patents it had acquired. It followed a “catch, license, and release” model, by which it sold the assets after non-exclusive licenses had been secured for the interested members. Members who participated in the acquisition also received their share of the sales price, or they could be the buyer themselves, compensating the other members who participated in the acquisition. If none of the original bidders wanted to buy the patent, it was sold through a broker with the licenses “attached.” AST had stated that 80 percent of the funds spent on acquisitions had been returned to the members30.
AST’s model created value through identifying potential problem patents, through aggregating the members’ views about IP threats, and inconspicuously executing the trades without the revelation of the interested members’ names. Its Chief Executive Officer Brian Hinman has stated that the long-term objective is not to make money, but to provide IP security to members.\textsuperscript{31} In fact, AST operated on a not-for-profit basis\textsuperscript{32}, which committed it to a very different growth strategy compared to IV and RPX that constantly had to generate returns to investments for their investors. For this reason, AST ran a minimal organization, outsourcing most services.\textsuperscript{33} It also was entirely defensive, meaning that it promised not to litigate the patents it bought but, instead, attempted to sell them soon thereafter. This also created the incentive for potential members to join, as the patents would quickly return to the marketplace and firms could only secure these non-exclusive licenses in the same terms if they were AST members before the acquisition.

**Intellectual Ventures**

Whereas RPX and Allied Security Trust had explicitly pledged not to assert their patents against third parties, not all patent aggregators did so. Intellectual Ventures (IV) was a privately-held company that had evolved from a defensive aggregator to an offensive patent assertion entity. IV was founded in 2000, and it began by engaging in R&D activities and providing aggregation services to clients and investors. By 2012, it was reputed to be among the top five patent holders in the United States, holding rights to some 30–60 thousand patents worldwide. The exact number of patents that it controlled was not known, because many of them were reassigned to holding companies that it had created, but it was estimated to be globally among the top 15 patent holders.

By 2010, IV had begun to directly assert its by-then extensive patent portfolio against alleged infringers. As of early 2012, IV appeared to be directly involved in 15 patent lawsuits and was a defendant in five of these.\textsuperscript{34} These suits were against companies such as Elpida Memory, AT&T Mobility, Sendai Nikon, Motorola Mobility, Canon, Hynix semiconductor, Altera, and Checkpoint Software Technologies together with McAfee, Symantec, and Trend Micro. IV may have been involved in many other legal cases indirectly through its more than 1200 holding companies\textsuperscript{35}. The company was extremely secretive of its acquisition, licensing, and litigation activities. This obscuring of its core operations suggested that IV believed that general knowledge of these highly complementary and essential business activities would
harm the company’s ability to profitably trade in the marketplace. In other words, it might be
detrimental to its power in negotiations and litigation if counterparts had full knowledge of
the breadth and extent of its activities. This strategy of secrecy was exemplified by its patent
reform counter-lobbying activities in the United States Congress\textsuperscript{36}.

According to its own description, IV pursued patent acquisition and licensing, invention,
invention collaboration, and using inventions to foster global good.\textsuperscript{37} It also reported that its
most significant and profitable activities included patent acquisition and licensing. This
involved acquiring patents or rights to patents, grouping them within appropriate portfolios,
and licensing them to major technology companies. This was described as IP arbitrage—
exploiting the differences in current and potential valuation of IP assets. Licensing efforts
included “pre-assertion due diligence, market and industry research, reverse engineering of
potentially infringing products, preparation of claim charts, face-to-face licensing
negotiations, and preparations for litigation”\textsuperscript{38}.

To carry out the above licensing activities, IV collected ample funding (estimated between 5
and 8 billion US dollars\textsuperscript{39}) from investors that included major technology firms such as
Microsoft, Intel, Nokia, Apple, Google and eBay, and several universities. In return to their
investment, such companies received licenses to the relevant IV patent portfolios and a
monetary return on investment. The key principle through which IV operated was “invention
capitalism,” which entailed funding and commercializing invention through the markets for
technology. IV appeared to have organized its activities through structures reminiscent of
private equity, particularly venture capital, whereby investors were grouped into funds that
jointly invest in the portfolio expansions and then, in case it was successful in generating
licensing revenues, collected the returns after a specific period. Investors operated much like
private-equity investors, without taking part in the ongoing decisions regarding IP investment
opportunities. On the funding side, it engaged in limited R&D activities in its own
laboratories, and it had created licensing services for small and medium-sized firms and
universities in developing countries to help them patent and commercialize their inventions.

Considering the sizable investments made in IV, and the massive portfolio it had accumulated
in a short amount of time, there was tremendous pressure on IV to monetize the portfolio
through licensing deals. This encouraged further expansion into litigation in order to realize
the potential revenues. Considering voluntary ex-ante licensing of IP appears to be rare\textsuperscript{40},
litigation was an unavoidable element of this business model. However, this business model is
also extremely risky, as it has been scaled up very rapidly before the model has thoroughly been tested. Furthermore, potential licensees of the collected patents are likely to continue to invent and expand defensive business models, some of which may be lower profile and more cost-effective than IV itself.

Quantitative evidence of the defensive patent aggregation business model: descriptive analysis of reassigned patents

In this section we compare the patenting and litigation activities of defensive patent acquisition services and other types of companies engaged in patent acquisition through analyses of patent reassignment and litigation data. These descriptive analyses complement the qualitative case studies by providing hard facts about how the novel business models work in practice.

Description of data on reassigned patents

We gathered data on patents reassigned to the defensive NPEs RPX and AST and to offensive NPEs such as Mosaid and Intellectual Ventures, and created a matched sample of patents having the same characteristics in terms of grant year, reassignment year and type of assignee that were reassigned to practicing entities. This approach sheds light on those patents that were acquired by defensive services, as most of these firms do not file their own patents.

In total, our database contains 2608 patents that were reassigned to NPEs, defensive or offensive. 865 of these were bought by the defensive aggregators Allied Security Trust and RPX Corporation, and the rest by offensive NPEs, including 1st Technology, Acacia Patent Acquisition, Arrival Star, Cheetah Omni, Innovation Management, Innovative Sonic Limited, Intellectual Ventures, IPG Healthcare 501, Mosaid Technologies, Papst Licensing, Rembrandt IP Management, Scenera Research, Tessera Technologies, Trontech Licensing, Wi-Lan Inc., and Wisconsin Alumni Research 41. In the matched sample, 2608 patents with the same general characteristics reassigned to practicing entities, consisting mostly of large technology companies 42.

Based on this database of reassigned patents, we gathered data on litigation involving these patents using the Stanford IP Litigation database. From our matched samples of reassigned patents, 284 were litigated during the period 1999-2010. 52 of these litigated patents were
reassigned to defensive aggregators, 111 to offensive NPEs, and 121 were reassigned to practicing entities.

Table 1 summarizes the main characteristics of our three samples:

**Table 1: Characteristics of the reassigned patents**

<table>
<thead>
<tr>
<th></th>
<th>Defensive NPEs</th>
<th>Offensive NPEs</th>
<th>Practising entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patents</td>
<td>865</td>
<td>1743</td>
<td>2608</td>
</tr>
<tr>
<td>Mean application year</td>
<td>1996.51 (4.83)</td>
<td>1997.28 (5.42)</td>
<td>1997.54 (3.93)</td>
</tr>
<tr>
<td>Mean forward citations</td>
<td>17.07 (28.49)</td>
<td>14.96 (23.05)</td>
<td>16.97 (25.66)</td>
</tr>
<tr>
<td>Likelihood of litigation</td>
<td>0.000 (0.24)</td>
<td>0.050 (0.22)</td>
<td>0.046 (0.21)</td>
</tr>
<tr>
<td>Average number of cases / litigated patents</td>
<td>12.73 (21.57)</td>
<td>10.17 (17.81)</td>
<td>8.98 (15.66)</td>
</tr>
</tbody>
</table>

There are a few interesting differences between the defensive, offensive, and practicing entities. Defensive entities tend to acquire patents that are significantly older and more highly cited than those of offensive and practicing entities. Although the average ages of patents reassigned to defensive and offensive entities differ by less than a year, this statistically significant age difference may reflect that defensive organizations acquire patents that are already known to be problematic, whereas offensive organizations and practicing entities might acquire patents on a more speculative basis.

Regarding the number of forward citations, the patents bought by practicing entities and defensive NPEs are indistinguishable in terms of citations, whereas offensive NPEs have bought significantly less-cited patents than the other two groups. Forward citations are usually interpreted to reflect patent quality; hence it seems offensive NPEs acquire lower quality patents.

The likelihood of litigation is the highest for patents reassigned to defensive NPEs and the lowest for those reassigned to practicing entities. This is related to the fact that defensive NPEs regularly acquire patents that are or have been involved in litigation prior to the reassignment, and these companies may never be original plaintiffs in such lawsuits. The number of lawsuits per litigated patent is also the highest for defensive aggregators, and lowest for practicing entities. This reinforces the previous result and suggests that defensive acquisition services are able to identify the most problematic patents. However, the differences in litigation rates are not statistically significant, because of the large variation around the means. Overall, these statistics suggest that the defensive NPEs RPX and AST acquire high-quality patents that are highly likely to be litigated.
**Description of data on litigation cases**

Based on the 284 patents that were litigated between 1999 and 2010, we created a final dataset organized around litigation cases. This contains 1337 litigation cases with detailed information about the name of the court, names of the parties, and the timing and outcome of the case. The following table summarizes the main characteristics of the cases according to the type of reassignee:

**Table 2: Characteristics of the litigation cases according to the type of reassignee**

<table>
<thead>
<tr>
<th></th>
<th>Defensive NPEs</th>
<th>Offensive NPEs</th>
<th>Practising entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>100</td>
<td>649</td>
<td>385</td>
</tr>
<tr>
<td>Mean length case days (SD)</td>
<td>640.55 (55.01)</td>
<td>408.45 (16.09)</td>
<td>498.84 (389.84)</td>
</tr>
<tr>
<td>Likelihood of injunction (SD)</td>
<td>0.76 (0.43)</td>
<td>0.75 (0.43)</td>
<td>0.69 (0.46)</td>
</tr>
<tr>
<td>Likelihood of settlement (SD)</td>
<td>0.13 (0.34)</td>
<td>0.25 (0.44)</td>
<td>0.25 (0.43)</td>
</tr>
</tbody>
</table>

Descriptive statistics in table 2 suggest that cases take much longer to resolve if the reassignee is a defensive NPE. This reinforces the case studies in that defensive NPEs may acquire patents out of very thorny lawsuits and in that way help put an end to them (which often leads to dismissal of the lawsuits). Offensive NPEs, in contrast, abandon their cases sooner, possibly because of litigation cost control.

Regarding the likelihood of settlement, we find that it is significantly lower after reassignment to defensive aggregators. In additional analyses that followed the same patent over time, the likelihood of settlement decreased from 36% to 8% after reassignment to a defensive NPE. The likelihood of settlement is also significantly lower after reassignment to an offensive NPE, but the likelihood that the case is ended by settlement is still considerably higher (43%) than if the patent was acquired by a defensive aggregator. This may be due to different strategies of NPEs or to the fact that defensive NPEs often acquire patents from difficult and drawn-out legal battles, and thus are more inclined to end the case in voluntary dismissal rather than settlement.

A further comparison between the two defensive services, RPX and AST (not reported in the tables), reveals that litigation cases tend to last longer when the patent holder is RPX Corporation, and AST appears to be much more likely to settle and less likely to use injunction. These dissimilarities in the characteristics of the cases cannot be explained by any structural change in the legal environment as there are no significant differences in the filing
year of the cases between the three samples. They appear to stem from business model differences between the two organizations.

Regarding timing of litigation with respect to reassignment, figure 1 highlights the differences between defensive, offensive, and practicing reassignees. For defensive aggregators, the number of cases peaks during the year of reassignment and drops rapidly thereafter, whereas it peaks two years after reassignment for offensive NPEs. The claims by the defensive organizations that they acquire patents to end litigation thus seem to be borne out by the case data. For practicing entities, the risk of litigation is not affected by the reassignment.

**Figure 1: Timing of litigation: Defensive aggregators, offensive non-practicing entities, and practicing entities**

In order to deepen the findings presented in this section, we also carried out simple regression analyses to explore whether the litigation strategies of practicing entities and NPEs, and defensive and offensive NPEs systematically differ. In the regression framework, we were able to control for basic characteristics of patents and distinguish the roles of firms as plaintiffs or defendants in the cases. We thus regressed a set of litigation strategy variables on the types of patent reassignees\(^4\). We controlled for patent characteristics such as grant year and quality using the number of forward citations.

Overall, the regression results confirm the descriptive analyses presented earlier, suggesting that patent characteristics are not driving the above correlations. Moreover, we found that
litigation strategies differ significantly depending on whether the analyzed entity is a defendant or a plaintiff in the case. For example, the likelihood of an injunction was significantly increased only if an offensive NPE was the plaintiff in the case, and the impact of offensive NPE plaintiffs on settlement is similarly large. Defensive NPEs behave in the opposite manner: when they are associated with the plaintiff side of the case (for example, by "lending" their patents to be used in counter lawsuits by their members), the likelihood of settlement is substantially lower.

Patent quality in terms of forward citations was included as a control variable, and it only had an effect on the likelihood of settlement, but not injunction. Its impact on settlement suggests that for a higher quality patent, disagreement about the value of the IP may be less intense, and hence settlement is easier to agree on. Also, it is interesting to note that lower-quality patents tend to be litigated longer and these lawsuits are filed sooner after reassignment, compared to high-quality patents.

**Conclusions**

In this paper, we analyze a new phenomenon of technology companies supporting non-practicing firms that provide defensive patent acquisition services. The goal of these services is to share the risks and costs associated with patent acquisition and litigation. Unlike patent pools, the aim of these services is not to be directly involved in cross-licensing of the field of technology but to allow “cleaning” technology markets of patents that are potentially problematic from their clients’ perspective.

We argue that defensive patent acquisition services are a new and significant organizational response to the legal problem posed by the evolving and aggressive market for technology. We compare the defensive services RPX and AST against more offensive ones such as Intellectual Ventures. We first qualitatively describe the characteristics of their business models and discuss their long-term prospects. Then, we describe their patent acquisition practices and litigation strategies.

The conceptual discussion and three case studies suggest that the organizational details of patent aggregation business models lead to very different behaviors in the IP marketplace. The key drivers of growth and litigation strategies are the commitments in terms of for-profit vs. non-profit orientation and the nature of interactions between the acquisition service and
major technology companies – whether the latter are viewed primarily as members, investors, suppliers of IP, or licensees. It is also likely that there will be more legal and regulatory challenges for and inquiries into these forms of organization as they grow larger and gain more power in the IP market.

In the quantitative analyses of our dataset, we highlight key differences in the litigation strategies of defensive and offensive aggregators. For instance, the use of injunction is not as prevalent among defensive services as it is among offensive ones. On the other hand, lawsuits in which defensive services are involved as patent reassignees seem to be much less prone than offensive ones or practicing entities to end in settlement, perhaps because of opportunities that defensive services create for voluntary dismissal. Also, the timing of lawsuits compared to reassignment differs between the two types of NPEs. Lawsuits that involve defensive NPEs tend to begin before reassignment, whereas those involving offensive NPEs begin after reassignment. We argue that these differences in litigation strategies confirm the existence of defensive and offensive business models among non-practicing entities.

Our qualitative and quantitative insights help IP practitioners who are regularly confronted with new IP strategies to better understand the drivers and implications of the patent aggregator business model. It seems clear that there has been a sea change in the intellectual property marketplace due to the innovation of new patent acquisition business models. An experienced intellectual property practitioner described to us the latest phase in the patent wars in the communication technology industry as “nuclear warfare”. Patent acquisition services can be seen to accumulate powerful “weapons of mass destruction,” and one badly-timed attack could trigger a devastating “patent world war”. One reason for the current developments is that, although many major technology companies publicly speak against the patent assertion entities’ (offensive NPEs’) tactics and have paid millions of dollars to fend off their lawsuits, they have quietly and collectively made the decision to join the game – if you cannot beat them, join them. Hence, we find some of the most admired innovators such as Apple, Nokia, and Google funding such patent assertion entities as Mosaid and Intellectual Ventures. It appears that technology innovators have concluded that under the current legal system in the United States, they cannot successfully fight against these new entities, and therefore they have to neutralize their position and hedge against litigation risks by being both on the offensive and defensive sides of the battle.
Yet another wrinkle in an already complex field is added by communication standards. A well-known patent assertion entity Mosaid recently acquired a set of Nokia’s patents related to the wireless communication standards 2G, 3G, and 4G. Mosaid stated in its annual report that litigation is a central activity in the company’s strategy. Consequently, Nokia’s rivals in communication technology such as Google and Android smartphone makers may fear that Mosaid will not cross-license these essential patents for smartphones. Thus far there is very little legal precedent in this area that is likely to become a thorny debacle. However, in the similar case of IPCom, after much litigation and “informal” discussions with the European Commission, the German IP company agreed in 2009 to honor the commitments to Fair, Reasonable, and Nondiscriminatory licensing of the essential patents it acquired from Robert Bosch. Hence, it seems that at least European regulators may not tolerate reneging on the essential patent licensing commitments of the original patent holder after patents have been reassigned to a new entity. However, the “reasonableness” of IPCom’s licensing approach was still being vigorously disputed in European courts in 2012.

It is necessary that litigation, to a degree, accompanies the market for intellectual property that is an intangible asset and hence non-rival and only partially excludable in nature. According to our interviews with practicing entity representatives, it is practically impossible for a product innovator to scan the global patent databases and get relevant licenses before developing and launching new products. The cost of such activity would be very high, and the licensing prices would likely not be sufficiently lower than those that are received from ex post licensing negotiations. Hence, as found in prior studies, ex ante licensing does not really work. As a result, inventors have been given incentives to generate a return to their R&D investments by patenting and licensing, and they need legal recourse in case negotiations fall apart.

However, scholars are concerned that the current rates of litigiousness may reduce societal welfare, because the vast costs from sustaining an army of (now extremely wealthy) IP lawyers in technology industries and consulting firms may not be covered by the marginal profits from intellectual property trading and product markets caused by patenting. Defensive patent acquisition services may alleviate lawsuits that involve unrealistic licensing requirements. However, the devil is in the details: we found significant variation in the organization and business models of defensive services, and the implications for IP markets and competition of the different models may be quite distinct, as seen in the quantitative analyses of their acquired patents and litigation behavior. Moreover, it is not yet clear how
sustainable these defensive business models are. If they end up in a weaker financial condition, they might become inclined to monetize their assets and expertise through patent assertion rather than only defense. In this case, some of these extensive IP portfolios might become powerful ammunition in a “patent world war.”

NOTES


3 Chien, op.cit., p. 325.


14 Ibid.


16 Cascades Computer Innovation v. RPX, HTC, LG, Motorola, Dell, Samsung (N.D. Cal. 2012). 


18 Practitioner interview.


20 Ibid.


22 Practitioner interview.

23 Practitioner interview.
24 Practitioner interview and RPX, op. cit.
25 Apparently, this type of “privateering” was the original strategy of Intellectual Ventures, too, see A. Layne-Farrar, The Brothers Grimm Book of Business Models, paper presented at George Mason University (February, 2012).
26 RPX op.cit: 17.
30 Chien, op.cit., citing Marketwire article from Jan 26, 2010
33 IPBiz op.cit.
38 Ibid: p. 4.
39 Avancept op.cit.
41 However, we were unable to reliably distinguish the reassignments to Intellectual Ventures, because the company appears to operate through so many different funds, subsidiaries, and limited liability companies that this would require substantial amount of detective work to compile (cf. Avancept, op.cit.).
42 The most represented practicing entities in our database are: NEC (211 patents), Infocus Corporation (44 patents), Nortel Networks (36 patents), Siemens AG (28 patents), Harris Corporation (27 patents), Infineon Technology (27 patents), Electronic Data System Corporation (19 patents), Legerity Inc. (19 patents), AT&T Corporation (15 patents) and Fujitsu (15 patents)
43 However, it is important to consider that in the case of defensive NPEs, the litigation was typically initiated before the reassignment, hence these are not litigation strategies selected by the defensive NPEs themselves.
45 Lemley, op.cit.