

Does The Market Care About Changes in Patent Law?**Scott Baker*****John Conley******Arvind Malhotra*******I. Introduction**

There is a vast literature on the economic efficiency of patent law. Patent scholars and economists tend to be highly critical of the present state of the law, condemning the proliferation of “bad” patents and calling for reform (Jaffe & Lerner 2004; Lemley & Lichtman 2007; Ayres & Parchomovsky 2007). The proposals have included changes in the substantive standards for patentability, enhanced initial scrutiny of applications by the Patent and Trademark Office, limits on extortionate enforcement by patent “trolls,” and encouragement of inter partes review. Some of these proposals have been embodied in various versions of the long-pending but still-stalled patent reform legislation, while the Supreme Court acted against trolls in its 2007 decision in *eBay v. MercExchange*. The premise of all this discussion, of course, is that the substance of patent law and the specifics of patent procedure have tangible economic effects: it is important to get the contours of the patent system right.

At the same time, patent law scholars and practitioners anxiously await decisions from the Federal Circuit and, on rare occasions, from the Supreme Court. High-profile patent cases can be the subject of constant speculation while they are pending and endless dissection after they are handed down. In 2003, for example, the Federal Reserve Bank of Atlanta devoted its annual Financial Markets Conference to the topic of “Business

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Method Patents and Financial Innovation” in the wake of the *State Street* decision, which the keynote speaker characterized as “rais[ing] the flag of surrender” and “the impetus for what may be characterized as a new ‘patent flood’” (Stanford 2003:v). Two particularly common themes in this discourse are that the Supreme Court is in way over its head when it meddles in patent law, while the Federal Circuit has trouble saying the same thing twice in a row. Once again, the underlying assumption is that the content of patent law—whether the standards for patentable subject matter, obviousness, and the like are broader or narrower; whether or not injunctions are automatic—truly matters to the real-world companies that the patent system serves.

But how do we know whether patent law decisions matter to the market? And if they do, which ones matter most? From an a priori perspective, it seems equally reasonable to assume that the changes in patent law embedded in court decisions have little real effect. Yes, it is important to have a patent system, this contrarian argument says, but the exact contours of that system are inconsequential. In fact, the patent community might be surprisingly nimble, finding efficient solutions (through licensing, or sometimes just ignoring the law, as Lemley (2008) has recently suggested) regardless of the ebb of flow of patent rights and responsibilities. Maybe those patent thickets that worry academics (e.g., Heller and Eisenburg 1998) are really gardens. The question is whether it is worth devoting substantial resources to tweaking the rules of the patent game.

This question is exceedingly difficult to answer. There are a number of elegant models of the inefficiencies of the current system (Lemley & Shapiro 2007; Shapiro 2006, Bessen & Meurer 2006). But those who must live with that system are less sure, as

evidenced by the conflicting responses of scientists to surveys about the impact of biotechnology patents on their research (Demaine & Fellmeth 2002). In addition, although one can compare economic outcomes across countries with different patent systems, there is simply too much noise to be able to say that a particular kind of patent system is more or less efficient than other kinds.

In attempting to resolve this dilemma, it occurred to us that there is one category of parties that have defined themselves as being especially interested in the outcomes of patent cases: companies that file amicus briefs. Using event study methodology, we have polled the market, as it were, about whether patent decisions matter to such self-identified interested parties, examining movements in their stock price during a narrow window after the announcement of the relevant decision. Since amicus filers are not litigants that will be directly affected by a money judgment or injunction, any stock price effects associated with the decision will presumably be attributable to the law that the court promulgates. By filing briefs in particular cases, the companies tell us that those cases are important to their business model. The event study methodology enables to assess whether investors agree.

We collected and analyzed data on all patent cases in the Supreme Court and the Federal Circuit (the court that hears all patent appeals) during the period 1971-2007 in which publicly-traded companies filed amicus briefs. Overall, we found no significant association between case outcomes and the behavior of the stock prices of amicus filers. This result is unsurprising, given the relatively small number of cases we had even after considering the entire universe of cases with amicus filers. We did, however, find significant results in three individual cases.

The group of amici backing the eventual winner in *Ebay v. Mercexchange* experienced significant and positive abnormal returns following the decision, as did the amici backing the winner in *Markman v. Westview*. On the other side, the group of amici backing the eventual loser in *Gottschalk v. Benson* experienced significant and negative abnormal returns.

As we will discuss in more detail below, these three cases tell interesting stories. All three share a property that is relatively unique in patent law: the rulings are clear and easy to explain to non-patent lawyers. Each case involved a fundamental issue that companies cannot readily ignore or bargain around: the almost automatic entitlement to an injunction against an infringer (*Ebay*), whether the judge or the jury construes the claims of the plaintiff's patent (*Markman*), and the patentability of software-based inventions (*Benson*). Before each decision, scholars offered competing reasons why the Court should go one way or the other, and reached a consensus that the case would have major consequences. And in each instance the market agreed.

II. Event Studies

Finance and corporate law scholars have used event studies to study “the movement of stock prices due to specific events (unexpected actions by managers or policy makers that are expected to affect firm values)” (Bhagat and Romano 2001/I:2). Specifically, “an event is said to have an impact on the financial performance of a firm [that is, a publicly traded company] if it produces an abnormal movement in the price of the stock” (*ibid.*:3). The basic tenet of event study methodology is that markets are

efficient (Fama et al. 1969). Investors in efficient markets value firms based on their expectation of future positive returns due to actions that are significantly beneficial to the firm. Likewise, investors in efficient markets devalue firms based on their expectation of future negative returns when firms engage in activities or lack thereof that are significantly detrimental to the future of the firm. When there is a consensus among a large set of investors, the market creates a positive or negative abnormal stock market return for the firms' stock around the date of announcement of the underlying actions/events.

Event studies involve defining the relevant event and its announcement day or period, estimating the expected performance of the stock during the announcement period in the absence of the announcement, measuring the stock's actual performance, and calculating and assessing the significance of any difference. Defining "announcement" can be tricky, since news of many kinds of events leaks before the official announcement date. To account for leakage and other forms of anticipation, event studies have often measured stock performance during a "window" extending a number of days before and after the actual announcement date.

A small but growing number of studies have used event studies to assess judicial decisions (see McCubbins & Lax 2005, Hersh 1994; Huth and McDonald 1989), while two recent studies have examined events related to patents.

First, Raghu et al. (2008) examined the effects of patent infringement litigation on plaintiffs and defendants. As in more general corporate litigation studies (see, e.g., Bhagat, Bizjak and Coles (1998)), they found that the announcement of an infringement suit had a significant negative effect on defendants' stock prices. They also discovered

that there was a similar negative effect at the date of settlement or other termination, and that plaintiff firms enjoyed significant abnormal positive returns on both dates.

Aggregating abnormal returns for plaintiffs and defendants, litigation had an overall negative wealth effect.

Second, Boscaljon et al. (2006) investigated the economic effects of business method patents on the companies that pursue them. They found statistically significant abnormal positive returns in the two days after a company announced the approval of a business method patent. The effect has been particularly strong in the post-*State Street* era.

III. Methods

The Constitution charges the patent system with fostering innovation. Changes in the system can be evaluated by reference to whether they enhance or detract from this goal. Does the change in, say, the availability of injunctive relief after *eBay Inc v. MercExchange, L.L.C.*, reduce the power of patent trolls and thereby spur innovation? Patent policy questions, however, are difficult to answer in the abstract. They can only be imperfectly answered by reference to patent counts (Jaffe & Lerner 2004) or the number of litigated patents (Allison et. al 2004) or the stock market valuation of a firm's patent portfolio (Hall et al. 2005).

Some firms may “win” in an economic sense from a change in the law; others may “lose.” A large number of firms may experience no impact one way or the other. Given this reality, studying the reaction across the entire market or even across a subset

of technology firms is unlikely to yield answers. There is too much noise to tease out effects directly related to the specific legal change. Changes in the stock price of winning firms may cancel out changes in the stock price of the losing firms, with the inclusion of unaffected firms muddying the analysis further.

A more precise option is to study the market's response to firms that are actually involved in patent litigation (see, e.g., Raghu et al. 2008). An initial inquiry is whether the market rewards winning litigants and punishes losers. That inquiry tells us little about the impact of patent law itself, however. Appellate decisions--where most of the changes in patent law are made--involve statements about law and a corresponding judgment affirming, reversing, and/or remanding the case. An examination of stock price movements for litigants cannot disentangle the "law" effect from the "judgment" effect.

What to do? To assess the impact of changes in law, we examined the stock price reaction of companies filing amicus briefs in patent cases. These companies form a useful basis for study for three reasons.

First, as noted earlier, unlike litigants, companies filing amicus briefs are not directly bound by the judgment rendered, only the law. As non-parties, they will not receive or have to pay damages, nor will they be subject to any injunction that the court issues. Accordingly, we can strip away any judgment effect and focus exclusively on the relationship between the content of the law articulated by the court and stock price performance.

Second, amicus firms (or, more precisely, the in-house lawyers for these firms) cared enough about the case to file a brief. By going to the trouble and expense of

commissioning a brief, a public company was making a clear statement that it had an economic interest in the outcome of the case.

Third, the amicus brief filing provides a basis for predicting how a decision will influence the filing firm's value. Instead of speculating (perhaps incorrectly) that a specific patent decision is, say, good for high-tech companies and bad for biotech companies, we let the firms self-report their assessment of the law's likely impact. In our sample, "winning" amici are those that filed on behalf of a litigant that ultimately prevailed; "losing" amici supported losing litigants.

For each case, the event date of interest was the date the court handed down decision.¹ We defined the event window as the five days following the decision date. We grouped the amicus filers in each case into "portfolios" of winners and losers. For example, 12 firms filed on behalf of the petitioner, eBay, in *eBay v. MercExchange, LLC*.² Ebay won. As a result, these firms were classified as "winners" in *eBay* and grouped together into a single portfolio to analyze returns; a second portfolio of "losers" was also created. Grouping or clustering is necessary when multiple firms experience an identical or similar shock on the same day (MacKinlay 1997: 27).³ Consequently, the overall analysis was run on the total number of portfolios (which is twice the number of cases) rather than the number of amicus filers.

¹ As a robustness check, we also examined stock price movements around the other two dates the market could conceivably receive information about the case: the date of argument and, for Supreme Court cases, the date the court granted certiorari. We found no significant overall effects.

² 126 S. Ct. 1837 (2006).

³ The portfolio approach is one of two approaches used when a number of firms are affected by the same event on the same day. An alternative approach uses a GLS estimator. See McKinley (1997) and McCubbins and Lax (2006).

The market model is used to predict returns.⁴ In the estimation window, ordinary least squares estimates the following equation:

$$(1) \quad R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}$$

In this equation, R_{jt} is the return on a security or group of securities j at date t ; R_{mt} is the rate of return on a market index at date t ; ε_{jt} is an error term with a zero mean. The assumption is that the error term is uncorrelated with R_{mt} . The predicted return combine the estimated coefficients from (1), $\hat{\alpha}_j$ and $\hat{\beta}_j$, with the actual market return during event window as follows:

$$(2) \quad R_{jt}^{\text{predict}} = \hat{\alpha}_j + \hat{\beta}_j R_{mt}$$

The difference between the actual return and the predicted return is the abnormal return on a specific date. Cumulative abnormal returns (CAR) sum the abnormal daily returns over each day in the event window.

Our initial question is whether, considering all the cases together, the amici groups on the winning or losing side experienced abnormal returns. This statistical analysis employs the Patell (1976) residual test, which standardizes the event-date prediction error for each stock by its standard deviation. The essence of the test is that individual prediction errors are assumed to be cross-sectionally independent and normally distributed. Therefore, each standardized prediction error has a Student t distribution.

⁴ Alternative estimation approaches that assume a theoretical structure, like the Capital Asset Pricing Model or the Arbitrage Pricing Model, have not been shown to outperform the market model (MacKinlay 1997:19).

The Patell test is considered more powerful than tests that do not assume cross-sectional independence (Brown and Warner 1985).⁵

The second question, which we address in detail below, is whether the group of amici filing on behalf of the winning or losing litigant in a specific case experienced abnormal returns. In other words, does the analysis pluck certain cases from the universe of cases with amici filers, suggesting that those cases have a significant effect on the market value of the amici firms?

IV. Sample, Summary Statistics, and Overall Results

A. Sample Selection

The construction of the sample of cases and companies filing amicus briefs involved four steps. First, in Westlaw's Supreme Court database, we searched for all opinions that reference "patentability", "patent validity," or "patent infringement." For each decision the search uncovered, we hand-checked whether any amicus briefs were filed and by whom. If any publicly traded companies filed a brief in the case expressly supporting one of the litigants, that case and those companies were placed in the dataset. The case was not included if the amicus filed a brief that supported neither litigant.⁶

Second, in the database containing all of the opinions of the Federal Circuit, we did the same search, but added the term "amicus" in the attorney field.⁷ This search returned the federal circuit cases where amicus had filed briefs. Again, if a case involved

⁵ In addition to the Patell test, we report the results of the non-parametric generalized sign test for the entire sample of cases. The generalized sign-test considers whether the fraction of positive returns is statistically different from the fraction of positive returns in the estimation period. This test also resulted in no overall results.

⁶ Filing a non-committal amicus brief is common among companies interested in patent law that want to take a position on the law, but are uncomfortable arguing how that law should be applied in a specific case.

⁷ In the Westlaw Supreme Court database, only amicus brief filers who actually argued before the court are included in the "attorney" field. In the Federal Circuit database, the amicus filers, whether they argued or not, are listed in the attorney field. That is why the two databases did not have identical searches.

a publicly traded company or set of companies expressly supporting one of the litigants, that case and those companies were placed in the dataset.⁸ Third, each case was coded for “winning” and “losing” litigants and the corresponding “winning” and “losing” amici. Finally, the Center for Research in Security Prices (CRSP) provided the database for daily stock returns.⁹ These returns are adjusted for stock splits and dividend payments.

B. Sample Characteristics

Our sample consisted of 41 cases, with 23 Supreme Court cases and 18 federal circuit cases. The earliest case in the sample is *Blonder-Tongue Laboratories, Inc. v. University of Illinois Foundation*, decided by the Supreme Court in 1971. The most recent case was *Integra Lifescience, Ltd. v. Merck KGaA*, decided by the Federal Circuit in 2007. The leading patent law casebooks excerpt or discuss most of the cases in our sample. Across all the cases, we had a total of 192 public companies filing amicus briefs expressly supporting a litigant. There were 107 amici filers that supported an eventual winner and 85 that supported an eventual loser.

C. Overall Results

Table 1 reports the overall results for the winning and losing companies on the decision date. Among the sample of *amici*, we fail to reject the null hypothesis that there are no abnormal returns associated with the date of decision. One plausible reason for this is that the small sample size (in terms of number of cases) made it hard to detect anything. It is also possible, as we discuss in the Conclusion, that most patent decisions are too complex to be factored into investment decisions.

⁸ Discarded from this sample are cases where an amicus filed only to support or oppose a petition for rehearing or rehearing en banc.

⁹ On occasion, a parent company and its subsidiary jointly filed a brief in a case. In these situations, we only included the stock of the parent company when conducting the analysis.

The next question is: For which cases did the group of amici filing briefs experience abnormal returns? Focusing on a single company or group of companies following an event (here a single court decision) has been done in several studies (see, for example, Klick and Sitkoff (2007), McCubbins & Lax (2006), and Carow and Haron (2002)). There are theoretical difficulties associated with examining the returns of a single stock's reaction to an event (see Bhagat & Romano, 2002 I: 149); in particular, any observed abnormal returns might just reflect the underlying variance in that stock's price rather than the market reaction to an event. Here, for most court decisions, we focus on a number of different amici company stocks subject to the same shock on the same day, which minimizes the concern that we are simply picking up noise rather than a response to the event of interest.

V. Case-Specific Results

A. *eBay v. MercExchange*

This was the case about which we had the strongest a priori expectations. The issue was clear: will injunctions continue to be virtually automatic upon a finding of patent infringement, or will the court be required to conduct a multi-step analysis as in other injunction cases? The case generated an equally clear market hypothesis: eliminating automatic injunctions (the actual result) would be good for operating companies that use patent-heavy technologies, because they would be less vulnerable to patent extortion by patent portfolio companies, or “trolls.” Such an outcome would be worse, of course, for the same companies when they were enforcing their own patents, but we suspected that the gains would outweigh any such loss. Operating companies want to operate, and presumably are more interested in the efficient resolution of

intellectual property disputes than the occasional opportunity to threaten an infringer with extinction. Indeed, the prevailing wisdom has long been that making patent thickets less dangerous would be good for the market as a whole. The issue had been dramatically framed by the litigation over the Blackberry device, in which, shortly before the Supreme Court decided *eBay*, the proprietor of Blackberry had paid \$600 million to a patent portfolio company to avoid a shut-down injunction.

This prevailing wisdom is illustrated by one of two academic amicus briefs filed in the case, by Stanford law professor Mark Lemley (2006) on behalf of “52 Intellectual Property Professors.” Lemley argued that the automatic injunction rule promotes “holdups” wherein “patentees can obtain revenue in excess of the value of their technology by threatening to enjoin products that are predominantly noninfringing and in which the defendant has already made significant irreversible investments” (Lemley 2006:6). Washington University law professor F. Scott Kieff (2006) took an opposing view on behalf of “Various [9] Law & Economics Professors.” Kieff and his collaborators, who included Chicago’s Richard Epstein, argued that the holdup/troll problem was vastly overrated, and was in any event more than outweighed by the benefits of the simplicity and predictability of the automatic injunction rule.

Other accounts of the case argued that the automatic injunction rule threatened some kinds of operating companies but favored others (Beylkin, 2007). For example, companies with computer-based technologies and novel online business models might be especially vulnerable to obscure patents—exactly what happened in *eBay* itself. Conversely, the automatic injunction rule was said to favor pharmaceutical and

biotechnology companies, whose entire wealth can derive a small number of patented products.

The pattern of amicus filings by publicly traded operating companies gave partial support to the latter story. Against the prevailing wisdom, publicly traded operating companies came in on both sides; by our count, 12 on eBay's side (against the automatic injunction rule), and eight on behalf of MercExchange. Consistent with the computer versus biotechnology story, the eight supporters of MercExchange included the biotech drug company Biogen, as well as five large companies with significant drug and/or medical device product lines: Proctor and Gamble, Johnson & Johnson, 3M, E.I. Dupont, and GE. Equally consistent, those supporting eBay included the web-based companies Yahoo, Google, Amazon, and IAC Interactive, the multimedia conglomerate Time Warner/AOL, and the computer-related equipment manufacturers Cisco, Applied Materials, and Infineon Technologies.

Other filings are harder to explain. Qualcomm and Tessera, which filed in support of MercExchange, have product lines that overlap with those of Cisco, Applied Materials, and Infineon. Although MercExchange supporter GE is heavily involved in medical devices, it also competes in other lines with Xerox, which filed on behalf of eBay. Finally, it is hard to discern why the oil companies Chevron and Shell would have supported eBay's position.

The market validated the conventional wisdom. Investors rewarded those companies that successfully opposed the automatic injunction rule. The group of 12 winning amici experienced a positive abnormal return of 2.43%, which is significant at the .04 level. In dollar terms, a portfolio of those 12 companies would have had a market

capitalization of 44.7 billion dollars on the decision date.¹⁰ A 2.43 percent increase on this portfolio is a little over 1 billion dollars. The market did not punish the losing amici, however; those eight companies did not see a significant abnormal return in either direction.

Interpreting these results, we conclude that the market agreed with those companies that took a public stand against the automatic injunction rule. These companies made a statement that their interests would be better served by a flexible injunction rule that might limit the power of patent holdup artists. Voting with their dollars, investors agreed, provoking a significant surge in the amici winners' stock prices. The cost of the winners' filings was apparently money well spent. But on the other hand—at least in the case of this small sample of self-identified interested companies—there is no evidence that investors bought the pharmaceutical/healthcare/biotech story. If they had, they presumably would have devalued the amici that supported the automatic injunction rule

Overall, the Supreme Court's attack on patent trolls increased the collective wealth of the amicus companies filing on the winning side, meaning that this change in patent law had significant and positive wealth effects for those companies.

B. *Markman v. Westview Instruments*

In its 1996 decision in *Markman*, the Supreme Court upheld a 1995 Federal Circuit decision that shifted the responsibility for interpreting patent claims from the jury to the judge, usually after a preliminary “*Markman* hearing” on the issue. Claim interpretation is a critical step in patent infringement litigation, as it determines the scope

¹⁰ The market capitalization of the portfolio of “winning” amici is the sum of the market capitalization of each company, weighted by its share in the portfolio (1/12).

of the patent alleged to be infringed. After finding that the constitutional right to a jury trial did not apply to claim construction, the Court compared the putative expertise of judges and jurors and concluded that “[t]he construction of written instruments is one of those things that judges often do and are likely to do better than jurors.” The Court also predicted that claim construction by judges would promote uniformity. Supporters of the Court’s approach further suggested that the preliminary determination of the scope of the claims would provide an impetus to settlement before the issue of infringement went to the jury.

Patent lawyers differ about whether these assumptions about judicial expertise, uniformity, and efficiency have proved valid. One clear consequence of *Markman*, however, has been a spike in appellate reversals. If claim construction is treated as fact-finding by the jury, then the construction can be reversed on appeal only if it is clearly erroneous and not supported by substantial evidence. However, claim construction by the judge is reviewed *de novo*, meaning that the appellate court—the Federal Circuit in patent cases—can substitute its judgment for that of the district court without giving it any deference. Reversal rates for claims constructions regularly run at about 50%, creating a huge element of unpredictability that might be assumed to be an impediment to settlement. Moreover, appeals of claim constructions are generally not heard until after final judgment, resulting in time-consuming and expensive remands and retrials.

In the Supreme Court, four public companies supported Westview, the ultimate winner: Matsushita Electric (now called Panasonic); United States Surgical, a medical instrument manufacturer; Airtouch, a wireless provider; and Honeywell, Inc. a manufacturer of automotive and airline parts. All four had market capitalizations of a

few billion dollars in 1996. The major player on the other side was Exxon, whose market capitalization exceeded 100 billion dollars even in 1996.

In their briefs, the four winning amici emphasized the predictability that the judge would bring to claim construction, and, conversely, the danger of turning lay jurors loose on complex technical questions. In Matsushita's words, "there has been a widespread realization that decisions in complex patent trials by juries have become arbitrary games of chance in which the merits are circumvented." Exxon, with commendable prescience, emphasized the problem of de novo review, which, it argued, would "undermine[] the accurate and predictable adjudication of infringement actions."

The position of the four winners is readily understandable. As moderately large corporations, we would have expected them to have a general aversion to juries. But Exxon's position is puzzling in two respects. First, one would think that a company like Exxon would want to avoid juries in any context. Second, why was Exxon so concerned about de novo review? As Exxon anticipated, de novo review has led to more appeals and retrials, which has presumably made patent cases longer and more expensive. Yet wouldn't the prospect of expensive litigation deter small actors from filing infringement actions and, hence, be beneficial to Exxon, the litigant with the deepest pockets in corporate history?

In the wake of the decision, the market rewarded the four winners; they experienced an abnormal positive return of 4.30%, which was significant at the .02 level. As a portfolio, the winners' market capitalization increased by \$246 million. Exxon's return did not change significantly. The most plausible inference is that investors agreed that substantial corporations would generally benefit from less exposure to juries. In

Exxon's case, the company may be just too large for a decision like *Markman* to make any difference. Finally, it is worth noting that two of the three cases with significant results—*eBay* and *Markman*—involved patent litigation *procedure* rather than substantive patent law issues such as patentability and the nature of infringement.

C. *Gottschalk v. Benson*

A third case that produced borderline significant results was *Gottschalk v. Benson*, an early (1972) Supreme Court contribution to the evolving law of the patentability of computer program-based inventions. The Court (in an opinion by the inveterately patent-hostile William O. Douglas) sustained the rejection of a claim to “a method for converting binary-coded decimal numerals into pure binary numerals,” intended to be implemented by computer. The Court held that patenting the invention as claimed would be tantamount to patenting an abstract idea. The Court's 1981 decision in *Diamond v. Diehr* (which distinguished *Benson*) and the Federal Circuit's 1998 decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* largely superseded *Benson* and tilted the law much more in favor of the patentability of software-based inventions.

Three amici filed in support of *Benson*, the patent applicant: Mobil Oil, IBM, and the computer and circuit board manufacturer Applied Data. The latter two had an obvious interest in promoting software patents (IBM dominated the early days of software patenting; see Soma and Smith 1989), while Mobil's economic interest is less clear-cut. No amici filed on the other side. The market agreed (albeit weakly) that software patentability was important to the three losing amici: they suffered a negative

abnormal return of 5.82%, which was significant at the .06 level. The losers lost a staggering \$936 million (in 1972 dollars) in aggregate market capitalization, a number attributable in large part to IBM's leviathan status.

It is not surprising that only three companies came in as amici, since few companies were involved in software patenting in 1972. Given that, it is somewhat surprising that the market took an apparent interest in software patents at that early date. It is a bit more surprising that only one public company filed amicus briefs in *Diehr*¹¹ nine years later, and it is absolutely astonishing that none filed in *State Street* in 1998. Whereas only 262 software patents were issued in the ten years 1978-87 (26% of them to IBM)(Soma & Smith 1989), about 4500 per year were being issued in the mid-1990s (Blatt 1995). Yet not a single public company saw the significance of the case (which also revolutionized business method patents) and thought it worthwhile to file.

VI.: Possible Objections

There are a few possible objections to this study. First, perhaps the market anticipated the decision in the cases lacking abnormal returns. That is, the decisions themselves did not come as a surprise; no new information was conveyed when they were rendered and, as a result, there were no effects. While this theory of complete anticipation is plausible in the abstract, the scholarly discussion and the agitation the patent bar that has followed many of these cases suggests otherwise. In addition, for this

¹¹ Notably, *Diamond v. Diehr*, 450 U.S. 175 (1981) is one of two cases that showed significant abnormal returns in an unexpected direction. In *Diehr*, Chevron filed on behalf of the eventual winning litigant, the patent applicant Diehr. Over the five day window, Chevron experienced a significant and negative abnormal return. In *re Zletz*, 893 F.2d 319 (Fed Cir. 1989) is the second case that went counter to expectation. There, a single company, Phillips Petroleum, filed on behalf of the eventual winner and yet experienced a significant negative abnormal return. In addition to being theoretically untenable, both *Diehr* and *Zletz* involved a single company filing as amicus, making us less confident in these results.

theory to explain the results, not only must the market anticipate which party will win the litigation, they also must anticipate the changes to patent doctrine the court will ultimately make – a rather hefty and risky task.

A more specific version of the anticipation theory is that the relevant players learn the likely doctrinal path after observing oral argument or seeing the grant of certiorari (i.e., if the Court grants certiorari in this case, it will definitely reverse and issue a bright line rule). We checked for abnormal returns following argument and certiorari with no change in the overall results.

Unlike event studies of legislative changes (Dam and James (1982), Carow & Heron (2002)), which do show an anticipation effect, appellate court decisions are not debated in the public arena at many different points in time. They do not involve multiple hearings, conference sessions, and subcommittee meetings, each of which might be “the” event the market reacts to. More to the point, while the briefing and argument of a case are public, the appellate decision is made in secret. There is often public speculation about the outcome of a case, particularly a Supreme Court case, but consultation with Supreme Court and Federal Circuit litigators and ex-clerks confirms that neither the timing nor the content of such decisions is subject to leakage.

Second, in assessing the results, note that corporate event study specialists have been skeptical of the value of studying judicial decisions as events. According to Bhagat and Romano (2001/II:12),

judicial decisions are not “events,” except for the litigants for whom a decision effects a wealth transfer. Decisions in corporate law cases are not likely to effect firms other than the litigants because other firms and investors are able to contract around the rule and recalibrate the costs and benefits. They are therefore only of limited value as subjects for the event study methodology—we can use the methodology to learn how a specific

decision affects the parties, but it will not be valid for analyzing the decision's impact on nonlitigants.

Further complicating event studies of judicial decisions is the interaction between the court and state legislature . . . A judicial decision with a significant adverse impact on firms stands an excellent chance of being overturned . . .

We believe, however, that the patent decisions discussed here are sufficiently different to be properly characterized as events. Decisions about patentability and enforcement standards can clearly have effects that go far beyond the litigants. *State Street*, for example, was believed to have altered radically the entire legal landscape of business methods, while *eBay* has been seen as fundamentally upsetting the balance of power between patent trolls and their potential targets. Perhaps recognizing this reality, the non-litigants that we studied stood up and expressly stated that they cared about the outcome of the cases in which they filed.

Moreover, despite the importance of licensing, in patent cases it is not always true that “other firms and investors are able to contract around the rule and recalibrate the costs and benefits.” The scope of patentability, for example, is not negotiable between private parties. Although trade secret protection can be powerful in some contexts (the Coke formula, to take the classic example), there is no private substitute for a patent, no contractual means to create broad exclusionary rights that are enforceable against the world under a strict liability standard. Ask venture capitalists, who generally will invest only in patented technologies. If the amicus companies we studied could easily circumvent any decision, why did they bother to file amicus brief in the first place? And finally, a patent decision stands very little chance of being “overturned” by Congress. On the contrary, as *eBay* illustrates, “reform” is more likely to originate in the courts, while

Congress has shown little taste for revisiting such fundamental and controversial decisions as *Chakrabarty* and *State Street*.

VII. Conclusion

As measured by stock price, the filing of amicus brief by public companies appears not to make a difference in the aggregate. However, it has made a significant difference in a few cases—three out of 41, to be precise. And in those cases, the difference has been practically as well as statistically significant. In *eBay*, for example, the abnormal returns for the winning amici added up to more than a billion dollars in additional market capitalization. In *Benson*, that number approached a billion 1972 dollars (admittedly attributable mostly to IBM's vast bulk, and in *Markman* it approximated a quarter-billion 1996 dollars.

An initial question is why we observed no aggregate effect. It could be an artifact of sample size. Although we used all patent cases in which there were adversarial amicus briefs, there were only 41 such cases. Perhaps if someone does a similar study 50 years from now significant effects will emerge simply because there will be many more cases.

It may also be the case that patent cases tend to be impenetrably complex to everyone but patent lawyers. In most patent cases, it would be extremely difficult to give an investor a succinct summary of the practical effect of the decision, let alone its likely impact on profitability. It is a far messier assessment than when, say, a company reports earnings lower than expected. At best, the hypothetical investor would have to seek an interpretation from a patent lawyer, and even then the practicalities might get lost

in the arcana of patent law. What, for example, would a patent lawyer say about the practical effects of *Festo* on any class of companies? It may be the case that, when it comes to factoring patent decisions into investment strategy, the transaction costs are often high and sometimes insurmountable.

It is therefore striking that the two most significant cases in our study, *eBay* and *Markman*, announced straightforward rules of procedure rather than obscure patent doctrines. Any literate lawyer advising an investor could say of *eBay*, “It’s going to be harder for patent owners—especially trolls—to threaten infringers with being shut down. There won’t be any more Blackberry cases” Even *Benson’s* basic rule—no patents for inventions that amount to mathematical algorithms—is simple by the standards of patent law.

A second question is whether it is worthwhile for public companies to invest in the filing of amicus briefs. Our answer is a resounding “yes.” The cost of writing or commissioning a brief was relatively trivial for most of the public companies in our sample. The outcome of the case did not usually matter to the stock price of the filers, but when it did (three times out of 41), it really mattered. One does not have to be a shill for the patent bar to urge corporate counsel for public companies to take the plunge and file if they believe that the outcome of the case could affect the way they do business.

Finally, and for the same reasons, our findings lend at least modest support to the proposition that the appellate courts’ interpretation of patent law makes a difference in the real world. While it may be true that only a patent lawyer can love patent litigation, everyone in the business world should pay attention to it. When a billion dollars of

wealth can be created within five days of a decision about the standards for injunctive relief, that is strong statement that patent law matters.

Table 1

Abnormal Returns Using Market Model

	N	CAR	p-value	Positive:Negative	z-statistic for generalized sign test
Decision Date					
Winners	27	-1.39%	.18	13:14	-.082
Losers	22	-.12%	..40	10:12	-.187

Companies were dropped from the analysis if not traded around the time of the event or in the estimation period, which took place 46 days before the event.

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