

Does The Market Care About Changes in Patent Law?

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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 it 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 Method Patents and Financial Innovation” in the wake of the *State Street* decision, which

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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 in meddling 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 from an a priori perspective, it seems equally reasonable to assume that the patent universe is Coaseian, a place where transaction costs are low and efficiency prevails regardless of law. That is, the patent community might be surprisingly nimble, finding efficient solutions (through licensing, or sometimes just ignoring the law), 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.

Another possibility is that, overall, the law on the ground has not changed all that much. Patent lawyers have long suggested, for example, that while the Federal Circuit has been expansive on the patentability side (expanding patentable subject matter, for instance), it has been restrictive on the patent enforcement side (such as by narrowing the doctrine of equivalents) (cite here). Conceivably, the potential inefficiencies just cancel each other out.

The problem is that it is almost intractably hard to tell. 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

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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, “patent law worked.” *This* patent system is the only one that *this* country has, so no natural experiment presents itself that compares business environments with different patent law environments.

One significant category of putatively interested parties has not had their opinion polled, as it were: investors in companies that might be affected by major patent decisions. We therefore attempted that survey. We have conducted an event study to ask whether there is any evidence that Wall Street cares about the content of patent law, and in particular the outcomes of major patent decisions. The study is skewed in favor of finding such evidence. We have selected cases that received mainstream media coverage, and have focused on the companies with the most direct interests in those cases: the litigants themselves, and the public companies that defined themselves as being interested in the outcome by filing *amicus curiae* briefs.

Studying the market value (in terms of stock price movements) of amicus brief filers is our main contribution. These filers will not be affected by the money judgment or injunctive relief a court renders, only by the law that the court promulgates. In assessing whether the market views the patent doctrine flowing from a decision – rather than the judgment itself – as good or bad, the amicus brief filers make themselves the most realistic group of companies to study.

For litigants that win major patent decisions, we find some evidence of cumulative abnormal positive returns following the rendering of the decision. For litigants that lose, we see no abnormal returns following the decision.

For amicus brief filers, we find that companies backing litigants that eventually lose suffer cumulative abnormal negative returns following both the grant of certiorari (in Supreme Court cases) and the oral argument. The abnormal negative returns are relatively small, significant at a ten percent level only, and significant for the generalized sign test only. These same companies do not suffer abnormal negative returns after the decision is rendered. For amicus brief filers backing litigants that eventually win, we find no significant effects following the grant of certiorari, the oral argument, or the final decision. Some individual cases are consistent with these patterns, while other are not. We discuss these cases individually after the presentation of the overall results.

Where does this leave us? We fail to reject the null hypothesis that major patent decisions are not associated with abnormal returns for amicus brief filers. One explanation for this result is that the market anticipates patent decisions. That is, the decisions themselves do not come as a “surprise”; no new information is conveyed when they are rendered and, as a result, we observe no effects following the decision. While this theory of complete anticipation is plausible, the scholarly discussion and the agitation the patent bar that has followed many of these cases suggests otherwise. In addition, for this theory to explain the results, not only must the market participants 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 cert. in this case, it will definitely reverse and issue a bright line rule). There is weak statistical evidence for this: we observe a negative effect for losing amici after these two events. However, we observe no positive effects for winning amici.

These somewhat equivocal results, taken together with the absence of significant abnormal returns following decisions, call into question the claims made by many patent commentators and members of the patent bar that judicial decisions affecting patent doctrine can have robust economic consequences. Even with the relatively small sample size, if such consequences were present, by focusing on the most interested firms on the dates when new information could first have been processed, our study should have sniffed them out. It may be that the Federal Circuit and the Supreme Court, as they split patent hairs, are having limited economic impact. While the two courts might be doing little to advance the Constitutional imperative of promoting innovation, they may also, at least in the judgment of the stock market, be doing little economic damage.

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

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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 abnormal returns due to actions that are significantly beneficial to the firm. In the similar vein, investors in efficient markets devalue firms based on their expectation of future negative abnormal returns when firms engage in activities or lack thereof that are significantly detrimental to the future of the firm. When there is a consensus amongst 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 of the kinds of events that have been studied 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.

Two recent event studies have examined events related to patents. Raghu et al. (2008) examined the effects of patent infringement litigation on plaintiffs and defendants. As in the corporate litigation studies, they found that announcement of an infringement suit had a significant negative effect on defendants’ stock prices. They also discovered, however, 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.

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 announces the approval of a business method patent. The effect has been particularly strong in the post-*State Street* era.

We used an event study to ask a somewhat different question about patents: whether the outcome of high-profile patent cases has an effect on the market value of the most interested companies.

I. Research Design

The charge of the patent system is to foster innovation. Tweaks to 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 like this 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 of the entire market or even a subset of

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technology firms is unlikely to yield answers. There is too much noise to tease out results. Changes in the stock price of winning firms may cancel out changes in the stock price of the losing firms, with the inclusion of the 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—one that we have made—is whether the remarket rewards winning litigants and punishes losers. That inquiry tells us little about the value of patent law itself, however. Appellate decisions – where much of patent law is made – involve statements about law and a corresponding judgment affirming, reversing, and/or remanding the case. An examination of stock price movements for litigants alone cannot disentangle the “law” effect from the “judgment” effect.

What to do? Three ingredients are needed for a market-based study of major patent decisions: (1) a determination of what counts as a major patent decision; (2) a measure of “interested” firms and (3) a metric for deciding whether the decision was good or bad for these firms.

This paper supplies these ingredients and conducts just such a study. We define a major patent decision as a Federal Circuit or Supreme Court decision on the merits that got substantial publicity, as evidenced by having been reported by the New York Times.¹

“Interested” firms are the litigants and those other public companies that filed an amicus brief on behalf of one of the litigants (as opposed to a nominally neutral brief) in the case. Amicus firms (or, more precisely, the in-house lawyer for these firms) cared

¹ To locate decisions, the following Boolean search was run in Lexis: [“patent” w/5 “case” and “federal circuit” or “supreme court” and “New York Times.”] From the retrieved sample, we eliminated district court cases and cases unrelated to patents.

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enough about the patent decision 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. “Winning” amici are those that filed on behalf of a litigant that ultimately prevailed; “losing” amici supported losing litigants.

In constructing a metric for evaluating effect, we considered three event dates for each case: (1) the decision date; (2) the argument date; and (3) for cases decided by the Supreme Court, the date the Court granted certiorari. The market could conceivably get information on any of these dates. The information released on the decision date is obvious. Questioning at the oral argument might provide information as to which direction the justices or judges are leaning. The grant of certiorari means the Supreme Court will hear and decide an appeal. Since Supreme Court review of patent decisions is discretionary and relatively rare, investors might care that Court has decided to resolve the issues a case presents.

For amici, we grouped the filers in a given case into “portfolios” of winners and losers. For example, 13 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 a similar or the exact same shock on the same day (MacKinlay 1997: 27). Consequently, the analysis was run on the total number of portfolios (which is twice the number of cases) rather than the number of amicus filers.

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

² 126 S. Ct. 1837 (2006)

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

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 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) are the sum of the abnormal daily returns for each day in the event window.

Test Statistic Used in the Study

Boehmer, Musumeci and Poulsen (1991) have used the following notation and formula to compute the test statistics fundamental to an event study:

N	number of stocks (firms) in the sample
A_{jE}	stock (firm) j 's abnormal return on event day
A_{jt}	stock (firm) j 's abnormal return on day t
T_j	number of trading days in stock j 's estimation period, equal to 200 if there is no missing return
\bar{R}_m	average market index return during the estimation period
$\hat{\sigma}_j$	stock j 's estimated standard deviation of abnormal return during the estimation period
SR_{jE}	stock j 's standardized abnormal return on the event day

$$SR_{jE} = \frac{A_{jE}}{\hat{\sigma}_j \sqrt{1 + \frac{1}{T_j} + \frac{(R_{mE} - \bar{R}_m)^2}{\sum_{t=-255}^{-1} (R_{mt} - \bar{R}_m)^2}}}$$

$$j_t = \begin{cases} 1 & \text{if } A_{jt} > 0, \\ 0 & \text{otherwise} \end{cases}$$

In this study, we use the Patell (1976) standardized residual test. Patell test 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

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independent and normally distributed. Therefore, each standardized prediction error has a Student t distribution. The test statistic then is computed as follows:

$$Z = \frac{\sum_{j=1}^N SR_{jE}}{\sqrt{\sum_{j=1}^N \frac{T_j - 2}{T_j - 4}}}$$

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

II. Summary Statistics and Results

Our sample consists of 41 total cases, with 26 Supreme Court cases and 15 Federal Circuit cases. The earliest case in the sample is *Montecatini Edison S.P.A. v. E.I. Du Pont De Nemours & Co.*³ decided on April 18, 1969. The most recent case is *Microsoft v. AT & T*,⁴ decided on April 30, 2007. The leading patent law casebooks excerpt or discuss most of the cases in our sample. The cases are listed in the Appendix. 575 entities filed amicus briefs supporting either a petitioner or a respondent. These entities can be broken down into five categories: (1) publicly traded companies; (2) privately held companies; (3) associations; (4) individuals; and (5) government.

Of the 575 amicus filers, 147 were publicly traded companies. These companies form the core of the event study. The Center for Research in Security Prices (CRSP) provided the database for daily stock returns. These returns are adjusted for stock splits and dividend payments.

Chart one demonstrates the shifting nature of amicus filers over time. Two important things should be noted here. First, the total number of amicus filers in our major patent case sample has increased dramatically in the last two years. Second, as a

³ 410 U.S. 187 (1969).

⁴ 127 S. Ct. 1746 (2007).

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percentage of amicus filers, publicly traded companies have increased substantially over that same time-frame.

[Insert chart one about here]

Chart one suggests that companies increasingly believe that major patent cases and, presumably, the shape of patent law in general, will have a financial impact on them. (It might be more accurate to say that the in-house counsel who write or commission amicus briefs believe this, but it is evident from the trend that corporate management is not discouraging the practice.)

There were 76 publicly traded companies that supported an eventual winning litigant and 71 publicly traded companies that supported the eventual losing litigant. We had 32 publicly traded companies actually involved in the litigation, 18 on the winning side and 14 on the losing side.

Table 1 reports the results for litigants. Table 2 reports the results for the amici. The event window is 0 to 10 days in both tables. In addition to CAR and p-values from the Patell significance test, Tables 1 and 2 report the number of securities or security groups experiencing positive and negative returns. The generalized sign-test, then, reflects whether the fraction of positive returns is statistically different from the fraction of positive returns in the estimation period.⁵ Our significant overall results all came from the generalized sign test.

⁵ There is a danger that the generalized sign test will be mis-specified when used to assess groups of securities. [Note to author, double-check on this and rerun all amici regressions using SUR regression technique for clustering instead.]

[Insert Tables 1 and 2 about here]

A. Overall Results

In the overall sample of *litigants*, we observed abnormal positive returns for winners after the date of decision. These results were statistically significant for the generalized sign test only. This finding is consistent with what Raghu et al. (2008) observed in their study of patent infringement litigation. The explanation seems straightforward: when companies prevail in any kind of highly-publicized patent litigation, investors assume that this is good for their prospects and react accordingly.

Among the sample of *amici*, there were no effects associated with the date of decision. There are several hypotheses that might account for this. One, of course, is that there may in fact be effects, but that flaws in our method have prevented us from discovering them. While this is a possibility in any study, it is hard to see how this study could have been done differently. The question was simply whether a defined event—the announcement of a decision in a well-publicized patent case—was associated with abnormal stock returns, and our data and analysis seem to pose that question directly. Nonetheless, our sample size was relatively small, which may have made it difficult to detect anything.⁶

A second possibility—and one endemic to event studies—is that the market had already reacted in advance to the decision, gradually “pricing in” an abnormal return that our method missed. In other words, the court’s decision was an event, but the event was

⁶ All is not lost with the small sample, however. A small sample will detect sufficiently large abnormal returns in an event study. On the statistical power of event studies, see MacKinlay 1997: 28-32.

anticipated. Here again, it is impossible to exclude this possibility, but we think it unlikely for two reasons.

First, while the briefing and argument of a case are public (factors we have taken into account in our method), the 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, 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. With our sample, there are only three days on which the market gets information – cert grant, argument, and the decision.

We consider each of these dates and find weak statistical evidence (generalized sign test only) for the two earlier dates: abnormal negative returns for the amici losers after oral argument and amici losers after grant of cert.⁷ The observed abnormal negative returns are relatively mild, -1.6% and -1.52% respectively, hardly enough to justify concern about the economic impact of patent doctrine.⁸

⁷ [To do note for authors, make sure we cumulate events and evaluate CAR over both cert and argued dates].

⁸ The certiorari results are plausible even though the amicus filers may not be known until after the grant of cert. The amicus brief filing culls out firms likely to be interested in a case from the pool of all possible firms. It doesn't matter that the self-selection occurs after the cert. grant. Suppose, say, that Company A fears patent trolls. As a result, company A will be interested in whether injunctive relief will be routinely available upon the finding of infringement. Investors in company A might view the Court's decision to grant cert in Ebay as a positive development and A's market price should respond accordingly. Given its keen interest, Company A might also want to influence the Court in Ebay and decide to file an amicus brief. By focusing on amici, our study locates those firms whose stock price most likely would have been affected by the Court's decision to take the case.

In assessing these overall 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

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capitalists, who generally will invest only in patented technologies. If the amici 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*.

B. Case-Specific Results

Table 3 contains the significant case-specific results for the amicus brief filers. We hesitate to draw too much from these results because they involve one company or one group of companies. Although conducting an event study on a single firm or group of firms subject to a shock on the same day is theoretically possible (see Klick and Sitkof (2008)), it can be problematic in practice. (Bhagat & Romano, 2002 I: 149). Despite these limitations, several individual cases are worthy of comment.

A. Cases Conforming to Expectations

1) *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 automatic upon a finding of infringement? The case generated an equally clear market hypothesis: limiting 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 portfolio companies. It might be argued that such an outcome would be worse for the same companies when they were enforcing their own patents, but we suspected that the

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gains would greatly 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 pattern of amicus filings gives mixed support to this story: by our count, 15 for-profit operating companies took eBay's side, whereas eight came in on behalf of MercExchange. The market validated this story as well, but only up to a point. As we expected, supporters of eBay saw an abnormal return of +2.49%. This was significant only at the .10 level, however.

2) *Merck KgaA v. Integra Lifesciences I, Ltd.*

This case involved the proper construction of the infringement exception under 271(e)(1) of the Patent Act “for uses reasonably related to the development and submission of information under a Federal law which regulates . . . drugs.” Integra alleged that Merck had willfully infringed and induced others to infringe by providing a tripeptide sequence known as RGD peptide to various researchers. The Court ruled for Merck. Writing for a unanimous Court, Justice Scalia held that “the use of a patented compound in experiments that are not themselves included in a ‘submission of information’ to the FDA does not, standing alone, render the use infringing.” Six companies filed amicus briefs in support of Merck. For a portfolio of these six companies, we found marginally significant ($p=.09$) positive abnormal returns following the oral argument only. This result makes sense. The *Merck* decision was unanimous, meaning the justices’ agreement might well have been apparent at argument. More

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importantly, this decision is fairly easy to understand. Under a broader research exception, the companies that filed as amici (Wyeth, Eli Lilly and Company, Biogen Idec, Inc., Genentech, Inc., Eon Labs, Inc. Pfizer Inc) would likely be subject to fewer infringement suits while conducting research and development.

3) *Parker v. Flook*

This case involved the scope of patentable subject matter under section 101. Flook's application claimed a method for updating alarm limits during catalytic conversion. The examiner rejected the application on the grounds that the only novel Flook's invention and the prior art was a mathematical algorithm. In ultimately vindicating the PTO's position, the Court held that such an invention did not comprise patentable subject matter: "The process itself, not merely the mathematical algorithm, must be new and useful. Indeed, the novelty of the mathematical algorithm is not a determining factor at all."

As in the *Merck* decision, we found significant results following the oral argument only. The results reflect the abnormal negative returns of the one company – Applied Data Research, Inc. (ADR) -- that supported the inventor, Flook. ADR's abnormal negative returns were large (over 15 percent). The negative result is not surprising: a company that self-identified with Flook's position would now find it harder to get patents. Moreover, unlike many patent decisions, *Flook* yielded an understandable decision. But why the significant negative returns following the oral argument, but not the final decision? Unlike *Merck*, this decision had a three-justice dissent. Perhaps the justices revealed their intentions during the argument, with any reasonable observer being able to tally likely votes.

4) *FTC v. Schering-Plough*

The event here was simply the Supreme Court’s denial of certiorari in the case, which made the Eleventh Circuit’s decision final. (Although the case involved patents, it was not technically within the Federal Circuit’s exclusive jurisdiction.) That court had held that the Federal Trade Commission could not prevent a drug company with a patented drug from paying generics to stay off the market when the patent expired and simultaneously licensing an unrelated drug to them. By letting this decision stand, the Supreme Court upheld the power of drug patents at least in an indirect way, thus giving a modest victory to brand-name drug companies. We were therefore surprised that only one company—Bayer AG—filed an amicus brief in support of Schering-Plough motion to deny cert. We were not at all surprised that Bayer saw an abnormal return of 11.35%, which was highly significant ($p=.0023$). Indeed, this event was especially unlikely to be anticipated because the government split as to whether the Court should take the case, with the Solicitor General and the FTC filing opposing briefs regarding the merits of granting certiorari.

5) *KRS v. Teleflex*

In this case, Teleflex sued KSR for infringement of a patent related to an automobile brake pedal assembly. The district court found the invention to be an obvious combination of prior art elements and entered summary judgment in favor of KSR. The Federal Circuit reversed, holding that the district court had been too loose in its application of the “teaching, suggestion, or motivation (TSM)” test. That test requires that the prior art contain not only the elements of the invention said to be obvious, but a teaching, suggestion, or motivation to combine them in the same way. A unanimous

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Supreme Court in turn reversed and remanded for reinstatement of KSR's summary judgment. The Court criticized the Federal Circuit's application of the TSM test as too rigid. Most observers believe that the holding will make it easier to invalidate patents on obviousness grounds.

The only observed market effect was that losing amici—that is, those that favored plaintiff-respondent Teleflex--suffered a marginally significant negative return after the grant of certiorari. To the extent that those amici represented a pro-patent enforcement perspective, it might have made sense for them to suffer adverse effects as of the date of decision or perhaps after oral argument, when the ultimately unanimous Court might well have telegraphed its position. It is also possible that the same market sentiment could have been triggered by the Court's very decision to take the case, on the theory that it would not have gotten involved unless a number of justices intended to change the obviousness standard as they ultimately did. We acknowledge, though, that this interpretation is attenuated at best.

6) *Warner-Jenkinson v. Hilton Davis*

Hilton Davis sued Warner-Jenkinson for patent infringement under the doctrine of equivalents. Warner-Jenkinson's accused ultrafiltration process was not literally infringing because it operated at a pH level below that specified in Hilton Davis's patent. The district court permitted the issue of infringement by equivalence to go to the jury, which found in favor of Hilton Davis, and the Federal Circuit affirmed. A unanimous Supreme Court endorsed the continuing existence of the doctrine of equivalents, but observed that it is limited by the related doctrine of prosecution history estoppel, under which the surrender of subject matter during prosecution may preclude its subsequent

recapture in enforcement litigation. The Court raised the question of whether the insertion of pH limits in an amendment to Hilton Davis's application constituted such a surrender. It reversed and remanded for further proceedings on that issue.

The decision, which was further refined by *Festo*, can be read as suggesting a narrowing of the enforceability of patents. In that respect, it is not surprising that losing amici would have suffered a marginally significant negative return. As in *KSR*, however, we would have expected such an effect as of the decision date, or perhaps after oral argument, when the unanimous Court might have signaled its leaning. We found an effect only as of the cert grant date, however. Again as in *KSR*, it is possible to infer that the market guessed (correctly) at the Court's intention and reacted accordingly, but the argument is equally strained here.

B. Counter-examples

1) *Illinois Tool Works v. Independent Ink Inc.*

This antitrust tying case was procedurally complex and yielded no clear winner. Nonetheless, the one company that filed in support of the (more or less) successful respondent experienced a negative abnormal return that was significant at the .09 level. The ultimate holding is that there is no presumption of market power just because the tying product is patented; rather, the plaintiff must prove market power. Independent Ink (II) was the antitrust plaintiff. Relying on the presumption that Illinois Tool Works' (ITW) patent on the tying product was conclusive proof of its market power, II submitted no further evidence on the issue. The district court rejected II's assumption and entered summary judgment against it. The Federal Circuit reversed, and that judgment was in turn vacated by the Supreme Court. The Court remanded the case back to the district

court, where II would get another chance to submit evidence of ITW's market power. It is hard to see how an investor could make any sense of this case. At most, it might be characterized as a marginal “win” for companies that try to leverage their patents (because the presumption of market power was abrogated), and, as a modest defeat for antitrust enforcement, for big companies generally. We see significant positive returns for the amici winners after the grant of cert.; significant negative returns for both the amici winners *and* the amici losers after oral argument; and significant negative returns following the decision. We have no theory to explain these outcomes.

2) *Diamond v. Bradley*

This case, a companion case to *Diamond v. Diehr*, also involved the scope of patentable subject matter under § 101. An equally divided Court affirmed the decision of the Court of Customs and Patent Appeals, which had ruled for the respondent, Bradley. The Court issued no opinion in the case. After argument, we observe significant negative returns for the amicus brief filer (Applied Data Research) that supported the eventual winner. Counting votes, this decision was obviously close. One explanation for the result might be that at oral argument, it looked as if the Court was going to rule the other way.⁹

3) *Eli Lilly and Co. v. Medtronic, Inc.*

Like *Merck KgaA v. Integra Lifesciences I, Ltd.*, this case involved the statutory construction of the Patent Act’s regulatory filing safe harbor provision, section 271(e)(1). A predecessor in interest to Eli-Lilly sued to Medtronic to enjoin the testing of a cardiac defibrillator. Medtronic defended on the grounds that section 271(e)(1) permitted this testing as “reasonably related to the development and submission of

⁹ Note to authors: read the oral argument transcript and see if this claim is plausible.

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information under a Federal Law which regulates the manufacture, use, or sale of drugs.” In an opinion by Justice Scalia, the majority ruled for Medtronic. In our sample, the amici filing on behalf of the loser, Eli Lilly, experienced positive abnormal returns following the grant of cert. This result runs counter to expectation. It suggests that investors in these amici companies -- Procter & Gamble Company, Bristol-Myers Co., Pfizer Inc. and Zimmer, Inc. – felt that if the Court granted cert, it would likely rule for Eli Lilly, and that that ruling that would benefit these other drug and healthcare products companies. Neither the oral argument nor, of course, the decision, provided any further encouragement to such investors. This is yet another strained explanation, as the result is puzzling..

IV. Conclusion

As we seek to reconcile these marginal and sometimes inconsistent findings, we are reminded of the difficulty of processing information about patent cases, even for sophisticated investors. A few of the cases in our sample can be readily understood without a patent background. But with most of the other cases, it would be extremely difficult to give an investor a succinct summary of the practical effect of the decision. It is hard to assess the likely impact of shifts in patent law doctrine on profitability. This assessment is not as clean as 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

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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. Or maybe, as our colleagues often remark, patent scholars and patent lawyers are really the only people who care about patent doctrine.

A related and perhaps complementary possibility is that investors simply disagree with amicus-filing companies about the significance of the legal doctrines that are at issue. That is, investors have a Coaseian outlook on the shape of patent law, assuming that the patent community will sort things out efficiently regardless of the law's content. More likely, we think, is that investors understand very little about patents, find what they hear about publicized cases too daunting to delve further, and take ultimate comfort in a Coaseian mindset.

These results leave a nagging question: Why do the amici bother? Why do their general counsels write—or, more realistically, hire outside lawyers to write—amicus briefs? And why do their corporate superiors permit this expenditure of resources? The in-house counsel would probably respond that, regardless of any short-term effect on stock price, the cases in which they file are likely to have a long-term effect on their respective business environments. This is plausible, and there is no obvious way to test this belief. The efficient market proponent would naturally respond that any long-term effect would be embedded into the current stock price; so this argument fails to explain the lack of abnormal returns.

Another possibility is that outside patent firms are effectively selling amicus briefs as a new product line. They certainly have abundant reasons to reinforce the amicus-filing trend. Writing briefs in complex cases is undoubtedly interesting work for patent lawyers.

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Given the specialized nature of cases like those we have studied, that work can probably be billed at premium rates. It would make sense for outside counsel constantly to remind their corporate clients that everyone else is doing it: *you just can't take a chance on letting an important case get decided without your input!* Since, in the grand corporate scheme of things, amicus legal fees are relatively small change, cautious in-house counsel succumb to the pitch. So in the end, the amicus craze may be nothing more than a manifestation of successful law firm marketing.

Chart One

Amicus Filers in Major Patent Cases

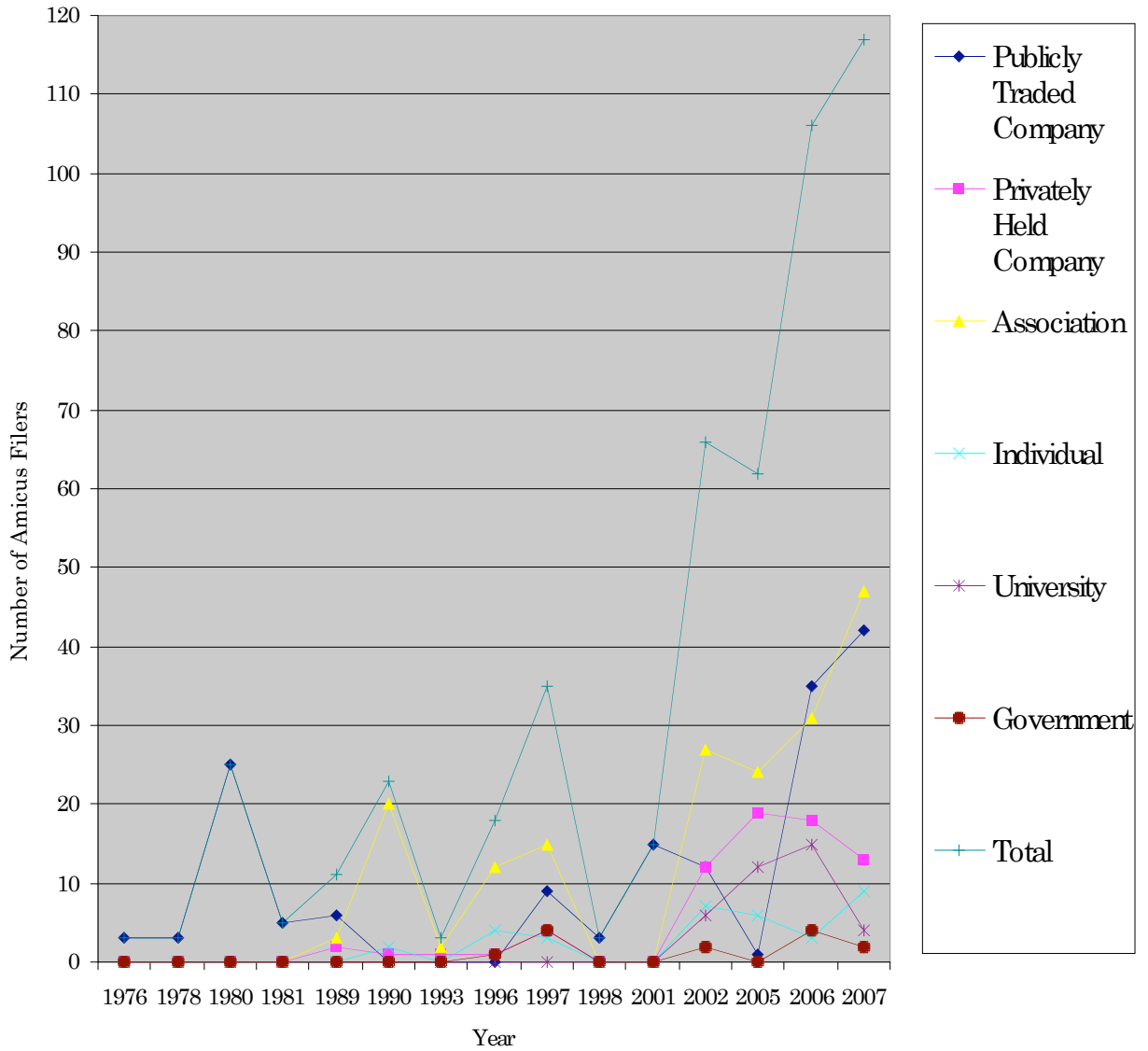


Table 1

Abnormal Returns Using the Market Model: Litigants

	N	CAR	p-value	Positive:Negative	z-statistic for generalized sign test
Decision Date					
Winners	16	1.53%	.20	11:5	1.664**
Losers	13	-3.18%	.25	8:5	0.971
Argued Date					
Winners	7	1.21%	.27	5:2	1.183
Losers	7	0.83%	.32	5:2	1.319*

The asterisk (*) denotes significant at the 10% two asterisks (**) denotes significant at the .05 % level

Estimation period ended 46 days before the event.

Companies were dropped from the analysis if not traded around the time of the event or in the estimation period

Argued date information was unavailable for some cases, resulting in a lower N.

Cert. date results are not reported for litigants because very few publicly traded firms were involved in Supreme Court as opposed to Federal Circuit cases

Table 2

Abnormal Returns Using the Market Model: Amicus Brief Filers

	N	Groups	CAR	p-value	Positive:Negative	z-statistic for generalized sign test
Decision Date						
Winners	67	14	-1.60%	.3243	6:8	-0.451
Losers	69	14	-0.83%	.3474	5:9	-0.865
Argued Date						
Winners	57	12	-1.87%	.2981	5:7	-0.446
Losers	65	12	-1.94%	.1388	3:9	-1.531*
Cert Date						
Winners	57	12	1.98%	.4424	7:5	0.689
Losers	64	11	-1.02%	.1925	3:8	-1.357*

The asterisk (*) denotes significant at the 10% level

Estimation period ended 46 days before the event.

Companies were dropped from the analysis if not traded around the time of the event or in the estimation period

Argued date information was unavailable for some cases, resulting in a lower N and fewer groups.

Table 3

Abnormal Returns Using the Market Model: Case-Specific Results For Amicus Brief Filers

I.	Significant Decision Date Results	CAR	p-value
<u>A. Amici Winners</u>			
	Ebay v. Mercexchange, LLC	2.4%	.10
	Illinois Tool Works Inc. v. Independent Ink Inc.	-9.78%	.09
<u>B. Amici Losers</u>			
	None		
<hr/>			
II	Significant Argued Date Results		
<u>A. Amici Winners</u>			
	Merck KgaA v. Integra Lifesciences I, Ltd.	4.11%	.09
	Diamond v. Bradley	-14.73%	.06
	Illinois Tool Works Inc. v. Independent Ink Inc.	-10.94%	.08
<u>B. Amici Losers</u>			
	Illinois Tool Works Inc. v. Independent Ink Inc.	-4.72	.03
	Parker v. Flook	-15.70	.03
<hr/>			
III	Significant Cert Date Results		
<u>A. Amici Winners</u>			
	Illinois Tool Works Inc. v. Independent Ink Inc.	20.55%	.02
	FTC v. Schering-Plough	11.35%	.002
	MedImmune Inc. v. Genentech Inc.	-5.85%	.03
<u>B. Amici Losers</u>			
	KRS v. Teleflex	-3.08%	.08
	MedImmune Inc. v. Genentech Inc.	-3.19%	.10
	Warner-Jenkinson Company v. Hilton Davis Chemical Company	-5.85%	.10
	Eli Lilly and Co. v. Medtronic, Inc.	5.61%	.01

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