WHAT'S THE CONNECTION BETWEEN REPEAT LITIGATION AND PATENT QUALITY? A (PARTIAL) DEFENSE OF THE MOST LITIGATED PATENTS

7/11/2012
(Last edited 11/10/2012)

16 *Stan. Tech. L. Rev.* ___
(forthcoming winter 2013)

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ABSTRACT

Patent litigation is notoriously expensive but few patents are ever litigated. Among the fraction that are, only a small group dubbed the "most litigated patents" by Allison, Lemley & Walker (2009, 2011) are asserted by repeat patent plaintiffs in many lawsuits. While repeat patent plaintiffs are responsible for a disproportionate share of litigation costs, economic theory predicts their patents will be higher quality such that they offset the costs they generate in winning more disputes. Allison, Lemley & Walker (2011), however, find the owners of the most litigated patents overwhelmingly lose in court, suggesting that repeat patent plaintiffs tend to burden innovation by irrationally litigating weak patents through trial. Because of their troubling results, in this paper I revisit the relationship between the number of lawsuits a patent is asserted and its owner's litigation success. I find owners who assert their patents in more lawsuits generally win more judgments and that this relationship extends to a comparison of most litigated to once litigated patents. These results support an optimistic view of the impact of repeat patent plaintiffs. This optimism does not, however, extend to repeat software patent plaintiffs, who I find are not more likely to win infringement judgments. This fact is not inconsistent with rational software patent owner behavior but is best explained by Bessen and Meurer's (2008) theory that software patents possess more uncertain boundaries.

INTRODUCTION

Skeptics of the U.S. patent system's recent effectiveness in promoting innovation fear the impact of increased costs imposed on firms that bring new products to market because of the explosion in patent litigation during the 1990s. (Bessen & Meurer 2008) Despite the litigation surge, however, few patents are ever litigated. (Lemley & Shapiro 2005) Within the tiny set of litigated patents, a small subset are asserted by repeat patent plaintiffs in many lawsuits and are thus responsible for a disproportionate share of all patent lawsuits. In studying their characteristics and litigation success, Allison, Lemley & Walker (2009, 2011) dub these the "most litigated patents".

If repeat patent plaintiffs tend to assert patents with higher innovation value and tend to win more of their litigated disputes, then the higher litigation costs they generate are at least partially offset by greater benefits to both these patent owners individually and society as a whole. In their first paper on the most litigated patents, Allison, Lemley & Walker (2009) find these patents in fact possess characteristics that have been associated with greater quality and private value. However, in their second paper, they find these patents are overwhelmingly likely to lose adjudication. (Allison et al. 2011)

These conflicting results suggest several troubling implications beyond the possibility that the additional costs repeat patent plaintiffs impose are not offset by additional benefits. First, repeat patent plaintiffs, among the most experienced patent litigants, may be irrational by settling too few of their cases before trial. Second, patent characteristics may be poor proxies for patent value. Third, Allison et al.'s (2011) finding that the most litigated patents have been overwhelmingly asserted by non-practicing entities and cover software may supports critics who argue that on balance these patents harm innovation. Because of the importance of these implications to our understanding of the economics of patent litigation, in this paper I reexamine the litigation success of repeat patent plaintiffs.

Despite Allison et al.'s (2011) results, I hypothesize owners asserting their patents in more cases should be more successful. My argument begins with Allison et al.'s (2004) logic for the connection between litigation and private patent value: 1) Litigation is costly; 2) Rational owners will not incur litigation costs without a positive expected return; and 3) More valuable patents tend to have a greater

expected return. I extent this logic by arguing that since repeat patent plaintiffs tend to incur more litigation costs during their patents' lives, they will tend to possess higher private value. Further, because repeat patent plaintiffs more aggressively utilize litigation to reap their patents' value, they will tend to be higher quality and thus more likely judged valid and infringed. Finally, with divergent expectations as to the quality of asserted patent, repeat patent plaintiffs should in fact win more of these decisions.

I test these ideas empirically with a sample of 1978 patents litigated through final judgment on infringement and/or validity in 1186 lawsuits filed between 2000 and 2010. I measure litigation success three ways—final judgment that a patent is infringed, not invalid, or both such that the owner won the case. Across my sample, I find a positive relationship exists between the number of lawsuits asserting a patent and success. Comparing only once litigated patents to the most litigated, which like Allison et al. (2009, 2011) I define as those asserted in eight or more filed lawsuits, I find in contrast with Allison et al. (2011) that the most litigated patent owners have been significantly more successful.

Several factors account for my results. First, I count single adjudications that were applied to multiple procedurally related lawsuits as one judgment. Second, most litigated patents identified by Allison et al. (2011) have been adjudicated valid and infringed eleven more times since their study ended. Third, I identify 87 adjudicated most litigated patents not included in Allison et al.'s (2011) sample.

Allison et al. (2011) attributed the poor performance of most litigated patents to the prevalence of software and NPE-owned patents that rarely win within that group. These patents are a smaller but still large share of my most litigated patent sample. Additionally, I confirm their finding that software and NPE-owned patents lose more decisions regardless of the number of lawsuits in which they are asserted. Nevertheless, consistent with my hypothesis, software and NPE-owned most litigated patents win more validity decisions and NPE-owned most litigated patents win more fully adjudicated lawsuits.

Most litigated software patent owners are not more likely to win infringement decisions. I argue this is not inconsistent with rational owner behavior but supports Bessen and Meurer's (2008) idea that software patents have particularly uncertain boundaries. The selection effects model I utilize to explain my results predicts that with greater uncertainty, repeat software patent plaintiffs will lose as many

infringement decisions as other software owners even if they possessed a high estimated chance of winning prior to filing suit. Whether or not this explanation is correct, my results demonstrate that software patent plaintiffs are more likely to assert weak claims through trial, thus more frequently gaining no direct benefit from their litigation while generating more litigation costs.

In Part I, I explain the importance of better understanding the behavior and success of repeat patent plaintiffs, particularly in light of Allison et al.'s (2009, 2011) earlier work. In Part II, I argue that we should observe a positive relationship between the number of cases a patent is asserted, patent quality and litigation success. In Part III, I describe my data, method of analysis and results and in Part IV discuss their possible explanations and implications.

I. Why We Should Understand the Litigation Success of Repeat Patent Plaintiffs

Patent litigation is notoriously expensive and for that reason has been described as the "sport of kings". (Kline 2004) Legal fees for one case can range from $500,000 through summary judgment to over $4 million through trial. (Bessen & Meurer 2008) Further, the federal courts undoubtedly expend significant resources adjudicating patent disputes. These direct costs, however, are likely dwarfed by the social cost of patent litigation in reduced incentives for producers to bring innovative products to market. (Bessen et al. 2011) Bessen and Meurer (2008) go so far as to argue that since the number of patent lawsuits doubled during the 1990s the corresponding increase in litigation risk has created conditions in which patent protection now generates a net disincentive to innovate in most industries.

Nevertheless, only about 1.5 percent of granted patents are ever litigated.[1] Thus, over 98 percent of granted patents never generate direct litigation costs. Furthermore, the number of lawsuits each litigated patent is asserted appears to be highly skewed with most being asserted in a single case.[2] In two recent papers, John Allison, Mark Lemley and Joshua Walker analyze the characteristics and litigation

[1] Lemley & Shapiro (2005). See also Kesan et al. (2012) who report that the "total number of in-force patents is presently around two million, with approximately 30,000 of those likely to wind up in litigation."

[2] Both Moore (2005) and Kesan et al (2012) report statistics suggesting the ratio of distinct patents litigated each year to the number of filed patent lawsuits is about 1.5 (e.g., Moore (2005) reports that at the time of her paper, approximately 4500 patents were asserted in 3000 separate lawsuits filed each year). In Part III, I report the skew in the number of lawsuits in which litigated patents are asserted for my sample of adjudicated patents.

success of the outliers among litigated patents that have been asserted by repeat patent plaintiffs in many separate lawsuits. (Allison et al. 2009; 2011) They dub these the "most litigated patents" ("MLPs").

By definition, MLPs are responsible for a disproportionate share of costly patent litigation and their significant characteristics are worth investigating for that reason alone. Further, if MLPs are significantly more likely to win their adjudicated disputes, it suggests the costs they impose may be at least partially offset by the benefits their owners more frequently gain. I argue my results in this paper, however, reveal something even more important—evidence supporting Bessen and Meurer's (2008) argument that software patents generate relatively more litigation risk because they suffer from particularly uncertain boundaries. But before turning to my own work, I summarize Allison et al.'s prior analysis of MLPs and the challenging implications of their results that spurred me to conduct this investigation of the relationship between the number of lawsuits a patent is asserted and litigation success.

In "Extreme Value or Trolls on Top?", Allison et al. (2009) study the characteristics of 106 MLPs they identified from the Stanford Intellectual Property Litigation Clearinghouse ("IPLC") as being asserted in eight or more lawsuits filed between January 2000 and February 2009. Compared to a control group of once-litigated patents, the authors found these patents possess characteristics such as more claims and prior art citations long associated with greater private value. (Allison et al. 2009)

Allison et al. (2009) found these "valuable" MLPs are much more likely than once litigated patents to cover software and be owned by non-practicing entities ("NPEs"). This is surprising given the widespread criticism of these species of patents. However, Allison et al. (2009) caution that these patent characteristics may capture value in the narrow sense that some patents "are optimized for litigation, because they are better protected against the vagaries of claim construction and against validity challenges based on uncited prior art." In other words, the characteristics of MLPs may signify that their owners are more likely to win adjudicated cases because MLPs are more likely to be found valid and infringed.

In "Patent Quality and Settlement among Repeat Patent Litigants", Allison et al. (2011) essentially test this litigation optimization idea by analyzing the litigation success of MLP owners. They specifically argue, however, that MLP owners should be more successful because of nonmutual collateral

estoppel ("NCE"). What is NCE? All alleged infringers are entitled to prove the defense of invalidity, even if others failed to prove it in earlier cases. Thus, a decision that a patent is not invalid is not binding on other alleged infringers in subsequent or concurrent litigation. In contrast, if one court invalidates a patent then that decision is adopted in all other lawsuits asserting that patent. Allison et al. (2011) argue rational owners knowing this, facing many infringers, and unsure of their patents' validity, will join all infringers into a single lawsuit to fight invalidity challenges once. Their corollary is that owners asserting their patents in many cases are rational only if their patents are less likely to be invalidated.

Comparing the litigation success of their MLPs to a sample of 343 once litigated patents, Allison et al. (2011) were surprised to find their MLPs were much more likely to lose adjudicated cases.[3] Combined with their findings in Allison et al. (2009), this suggests both that patent characteristics are poor value proxies, even for "litigation optimization", and that MLP owners should have settled their disputes more frequently or joined alleged infringers in a single suit. Because MLP owners are by definition among the most experienced patent litigants, the possibility they often act irrationally is particularly unsettling for scholars who apply rational choice models to litigation decisions.

Combined with the prevalence of much maligned software and NPE-owned patents among the MLPs, the conflicting results of Allison, Lemley and Walker's two papers necessitate further study of the relationship between the number of lawsuits a patent is asserted and litigation success. I begin this task by considering whether repeat patent plaintiffs should theoretically win more adjudicated disputes.

II. Theoretical Relationship Between Repeat Litigation and Adjudication Success

As explained, Allison et al. (2011) hypothesize that because of nonmutual collateral estoppel ("NCE") repeat patent plaintiffs will only assert their patents in many lawsuits if they are more likely to be judged not invalid. In considering what relationship may exist between the number of lawsuits a patent is asserted and litigation success, I first reviewed the outcome of MLP lawsuits for evidence MLP

[3] Allison et al. (2011) recognize that NCE only impacts invalidity decisions. Patent owners must prove infringement for each alleged infringer regardless of whether these are joined in one lawsuit. This distinction is obscured, however, because their primary test of MLP owner success is how frequently their patents win fully adjudicated patent lawsuits, i.e., are found infringed and not invalid. However, some MLP owners lost on infringement and not validity. These outcomes are irrelevant to the idea MLPs should be higher quality with respect to validity.

owners were harmed by NCE. Finding little, I conclude the risk of invalidity by collateral estoppel has been unlikely to predict repeat patent plaintiff litigation success. Despite this conclusion, I believe repeat patent plaintiffs should enjoy greater litigation success. But before explaining why, I defend my conclusion that NCE has been largely irrelevant to this relationship between litigiousness and success.

A. NCE Has Not Predicted Repeat Plaintiff Success Because Validity Was Rarely Re-Litigated

Allison et al. (2011) specifically premise their hypothesis that repeat patent plaintiffs should have greater litigation success on the existence of NCE. However, they report no evidence that MLP owners were specifically harmed by NCE. To determine if such evidence exists, I searched the IPLC for all lawsuits filed between 2000 and 2010 that assert one or more of Allison et al.'s 105[4] MLPs.

Certain outcomes would support their hypothesis that NCE makes it more risky to adopt a litigation strategy of filing many separate lawsuits. In order of support for Allison et al.'s (2011) hypothesis, these include: 1) MLPs judged not invalid in one lawsuit but judged invalid in another; 2) MLP validity independently adjudicated in multiple lawsuits; and 3) MLPs judged invalid by collateral estoppel ("CE") based on one court adopting the invalidity judgment of another.

Appendix Table A1 summarizes the outcome of the 955 filed lawsuits I identified involving Allison et al.'s MLPs. Because many MLPs share owners and tend to be asserted in the same cases, I group outcomes by MLP owner. I include whether the owner lost any validity judgment by CE and a summary of the number of lawsuits having particular outcomes, including owner wins and settlements.

Review of Table A1 shows the first pattern supporting Allison et al.'s (2011) hypothesis—a not invalid judgment in one case and an invalidity judgment in another—is absent for all MLPs. The second, independent validity adjudication in separate lawsuits, only occurred for Monsanto patents 5,352,605 and re39247. However, both of these patents were found not invalid each time they were judged.

[4] My search of the IPLC for lawsuits involving U.S. Patent number 6,482,516, included in Allison et al.'s (2009, 2011) sample of the 106 most litigated patents, resulted in 7 lawsuit hits. However, this patent was asserted in only one of these (*Banner Pharmacaps, Inc. v. Perrigo Co*). Inspection of the remaining hits shows they are false, related to lawsuits asserting different patents. I thus conclude the '516 patent is not an MLP as defined by Allison et al.

Concerning the third pattern, three owners were estopped from asserting MLPs because of an invalidity finding in another lawsuit. These MLPs were Barr Laboratories' 4,663,318 patent, Cygnus Telecommunications' 5,883,964 and 6,035,027 patents, and Orion IP's 5,367,627 patent. A fourth owner, Ablaise, had five separate lawsuits asserting the 6,961,737 dismissed after the end of stays pending adjudication in a sixth lead case which invalidated that patent.[5]

While these loses by CE and dismissals after stays are the outcomes Allison et al. (2011) predict owners of weak patents should seek to avoid by filing fewer lawsuits, I stress that they rarely occurred. More importantly, considering the practical effect of CE in these cases I argue owners who lost by CE would not have been better off had they originally joined all defendants in one action. In each case, there was one substantive judgment on validity. Owners expended negligible additional resources prosecuting the cases stayed or dismissed by CE. The validity of each MLP was briefed, argued and adjudicated once, which would have been true had the owners initially joined all alleged infringers in a single lawsuit.

I thus conclude there is little evidence that owners of Allison et al.'s MLPs were harmed by NCE. This conclusion is buttressed by the fact that the vast majority of filed MLP lawsuits either settled or were consolidated with other pending lawsuits. 353 of the 955 (37.0%) MLP lawsuits I identify were combined for purposes of validity adjudication through some procedural mechanism. These included: 1) Multidistrict litigation[6]; 2) Transfer to another district court[7]; or 3) Consolidation for determination of validity by one court.[8] I include the number of filed lawsuits combined for validity through any of these

[5] In addition, Hoffman-LaRoche's assertion of patent number 6,294,196 in one pending lawsuit has been stayed pending adjudication in a pending lead case.

[6] Multidistrict litigation ("MDL") is authorized by 28 U.S.C. § 1407, which states in part: "When civil actions involving one or more common questions of fact are pending in different districts, such actions may be transferred to any district for coordinated or consolidated pretrial proceedings." Claim construction and patent validity are common questions frequently resolved once for all combined cases in MDL.

[7] Under 28 U.S.C. § 1400(b), a patent infringement suit may be brought in any district where 1) "the defendant resides" or 2) the defendant has "committed acts of infringement and has a regular and established place of business." "For the convenience of parties and witnesses, in the interest of justice, a district court may transfer any civil action to any other district … where it might have been brought." 28 U.S.C. § 1400(a)

[8] Before enactment of the America Invents Act ("AIA") on September 16, 2011, related patent cases were regularly consolidated, in whole or for claim construction and validity determination, under the permissive standard set forth in F.R.C.P. 20. Many courts interpreted this rule as allowing joinder on the basis that the same patent was at issue and the accused products of alleged infringers in different cases were not dramatically different. (Taylor 2012)

procedural mechanisms under the "Joined" column of Table A1. Finally, of the remaining 602 cases, 526 (87.4%) settled before patent validity was determined.

All of these observations suggest Allison et al.'s (2011) hypothesis is based on the false idea that repeat patent plaintiffs have faced a significant risk of re-litigating their patents' validity. In fact, MLP validity was almost never adjudicated more than once. This is true because like all patent litigation, MLP litigation usually settles quickly. When it has not, courts have routinely utilized stays and permissive joinder rules to limit the resources both they and the parties expend in determining validity. I thus conclude NCE has been an inadequate basis to predict the litigation success of repeat patent plaintiffs.

Important for future research, however, is the possibility that since enactment of the America Invents Act ("AIA") patent owners may seriously consider NCE in determining how many separate infringement actions to file. Section 19 of the AIA prohibits courts from consolidating infringement actions on the sole basis that defendants are alleged to infringe the same patent. (35 U.S.C. 299) Since this paper, like Allison et al. (2011), only analyzes the outcome of lawsuits filed prior to the AIA, I conclude NCE did not drive the choice of how many lawsuits the owners we analyze should file.

B. A Cost-Based Theory of the Relationship between Repeat Litigation and Success

Despite my skepticism of the basis for Allison et al.'s (2011) prediction, I also hypothesize repeat patent plaintiffs should be more successful. Put simply, I argue that owners asserting their patents in more lawsuits should tend to believe they possess high quality patents because they tend to incur more litigation expenses. I begin my explanation of this argument by defining patent quality.

As property rights over an underlying technology, patents are made more valuable by both an increase in the value of the technology and an increase in the strength of the property right. (Lerner 1995) Patents with strong property rights possess broad patent scope and a high chance of being found valid. (Lerner 1995) The strength of patent rights is "probabilistic" in the sense that both the scope and validity of patents are uncertain prior to adjudication. (Lemley & Shapiro 2005) Nevertheless, high quality patents ex ante possess stronger property rights and are thus more likely to be found valid and infringed.

Given this definition of patent quality, there are three parts to my argument that patents asserted in more lawsuits should have greater litigation success: 1) Repeat patent plaintiffs should expect a higher return from litigation because as a group they chose to incur more litigation expenses; 2) Because return depends on the probability an owner's patent will be found valid and infringed, repeat patent plaintiffs as a group will tend to assert higher quality patents; and 3) With divergent owner and alleged infringer beliefs about patent quality, repeat patent plaintiffs should win more judgments.

The first part extends the empirically-supported idea that litigated patents tend to be more valuable to their owners than non-litigated patents.[9] Two of the authors of Allison et al. (2011) explain this idea in "Valuable Patents." (Allison et al. 2004) They note patent litigation is very expensive, with the median legal fees equaling $1.5 million per side in 2001.[10] They argue rational patent owners will not incur the high costs of litigation unless their expected return exceeds them. (Allison et al. 2004) In contrast, they note owners of two thirds of all patents choose not to incur the few thousand dollars in PTO fees required to maintain their patents through their entire term. (Lemley 2001) Combined, these facts suggest the average litigated patent is more valuable to its owner than the average non-litigated patent.

I extend this logic for litigated patent value by arguing that in filing more lawsuits, repeat patent plaintiffs as a group demonstrate higher confidence in their patents' value. This is because litigation expenses tend to increase with the number of lawsuits an owner files. There are exceptions to this tendency. For example, an owner who sues a ten firms in one lawsuit may expect to incur more expenses than one who sues three firms in three lawsuits. Additionally, some technologies may possess more potential infringers. But controlling for such differences, repeat plaintiffs likely incur more expenses.

As I explained in seeking evidence for Allison et al.'s (2011) hypothesis, prior to enactment of the AIA concurrent lawsuits asserting the same patents were often consolidated. As owners likely expected consolidation, there was little difference in expected cost between filing ten lawsuits on the

[9] See Allison et al. (2004, pg. 9 n. 31) for a list of other work supporting the connection between litigation and value.

[10] Allison et al. (2004), citing the AIPLA's Report of Economic Survey (2001). More recently, Bessen and Meurer (2008) calculate the average legal fees incurred in patent disputes litigated through summary judgment as $500,000 and the cost through trial as $4,000,000.

same day against ten different infringers and filing one against all ten. However, even those who expect consolidation will expect to incur higher litigation costs since costs undoubtedly rise with the number of alleged infringers sued. (Allison et al. 2011) This is true whether or not the owner expects alleged infringers to settle. If so, it must still negotiate that settlement with each alleged infringer. If not, it must prove each infringed its patent. Thus, even when consolidation is expected repeat patent plaintiffs should tend to have higher expected returns from litigation because they tend to incur higher litigation costs.

Turning to the second part of my hypothesis, I argue that as a group repeat patent plaintiffs' will expect higher return because they tend to believe their patents are high quality, and not only cover more valuable technology. I base this argument on the obvious fact that repeat patent plaintiffs more heavily rely on litigation to gain the value of their patents. Owners asserting their patents in litigation seek a combination of damages for past infringement, licenses for future use or an injunction barring use. The expected value of any of these rewards increases in the value of the protected technology. However, owners win nothing unless they prove their patents were infringed and are not invalid or at least convince alleged infringers there is a good enough chance that the owner will prevail that they should settle.

By filing more lawsuits than other litigating owners, I argue repeat plaintiffs demonstrate greater confidence in the quality of their patents such that they believe they can win or at least convince their targets to settle. If, as I assume, repeat plaintiffs are rational, then their greater confidence will be justified on average and as a group they will tend to assert higher quality patents. Thus, because of their willingness to incur more expenses and their greater reliance on litigation to gain a return on their patents, I assume owners who assert their patents in more lawsuits will tend to assert higher quality patents.

Selection Model

To explain why higher repeat plaintiff patent quality should be reflected in greater litigation success, the third part of my hypothesis, I utilize Waldfogel's (1995) version of the Priest/Klein (1984) model for the selection of disputes for trial, as specified and applied to patent disputes by Marco (2004). In short, this model predicts that with divergent owner and infringer beliefs as to patent quality, alleged

infringers will not settle as many lawsuits brought against them by repeat patent plaintiffs as they should. Thus, repeat patent plaintiffs will win more judgments.

Turning to the model, if patent disputes are distributed along a single "case quality" dimension, z, with legal standard z^*, an owner with individual case quality z' will only win if $z' > z^*$. Case quality depends on the likelihood a patent is found valid and infringed. (Marco 2004) However, in each dispute, the owner ("*P*") and alleged infringer ("*D*") err in measuring case quality such that:

$$z'_P = z' + e_P \quad (1)$$

$$z'_D = z' + e_D \quad (2)$$

Where z'_P and z'_D are the owner and alleged infringer's estimate of the owner's case quality.

I assume both e_P and e_D, the parties' error in measuring case quality, are drawn from a normal distribution. I assume that e_P has a mean of 0 with standard deviation σ. However, I argue alleged infringers have systematically divergent beliefs. (Cooter & Rubinfield 1989) For simplicity, I assume they estimate case quality based on the quality of the average dispute involving that type of patent and that type of owner, z'_A. When the quality of the individual case diverges from the average dispute, then $e_D = z'_A - z' + e_A$, where e_A is the alleged infringer's error in measuring z'_A. Like e_P, I assume e_A is normally distributed with mean 0 and standard deviation σ. Thus, alleged infringers measure case quality:

$$z'_D = z'_A + e_A \quad (2^*)$$

The owner calculates its probability of winning, w_P, as

$$w_P = \Phi\left(\frac{z'_P - z^*}{\sigma}\right) = \Phi\left(\frac{z' - z^* + e_P}{\sigma}\right) \quad (3)$$

and the alleged infringer calculates its probability of winning, w_D, as

$$w_D = \Phi\left(\frac{z'_D - z^*}{\sigma}\right) = \Phi\left(\frac{z' - z^* + e_D}{\sigma}\right) = \Phi\left(\frac{z_A - z^* + e_A}{\sigma}\right) \quad (4)$$

where Φ is the cumulative distribution function for the standard normal distribution.

When the owner wins it gains v_P and the infringer loses v_D. The expected payoffs from going to trial are $w_P\, v_P - c_P$ for the patent holder, and $- w_D\, v_D - c_D$ for the alleged infringer, where c_i is the

litigation cost to each party i. Thus the owner will require $w_P v_P - c_P$ to settle the dispute and the alleged infringer will pay no more than $w_D v_D + c_D$. There is no bargaining surplus and trial occurs when

$$w_P v_P - c_P > w_D v_D + c_D \quad (5)$$

Within the terms of this model, I assume that based on the first two parts of my hypothesis, owners who assert their patents in more lawsuits will tend, as a group, to assert patents with higher quality, z', than in the average dispute brought by that type of owner asserting that type of patent, z'_A. Thus, alleged infringers will tend to underestimate repeat plaintiff patent quality.

According to equations (1) through (4), this means that w_P will tend to be higher than w_D for patents asserted in more cases. This in turn makes it more likely that the trial condition in equation (5) will be satisfied such that disputes are less likely to settle. Of course, because I assume z' is higher than z'_A, z' is more likely to be greater than the decision standard, z^*, and owners who assert their patents in more cases will be more likely to win validity and infringement judgments.

III. Analysis of the Relationship Between Repeat Litigation and Success

A. Data and Method of Analysis

I created two distinct sets of data to test my hypothesis that rational owners who assert their patents in more lawsuits will have more litigation success. Like Allison et al. (2011), I obtain my litigation data from the Stanford IPLC. I obtain characteristics of the patents in my sample from searches of the PTO's online patent database. I describe these characteristics as I use them in my analysis.

I use two data sets in order to analyze litigation success using two different measure of repeat litigation. In the first, I test the relationship between the raw number of lawsuits a patent was asserted between 2000 and 2010 and its success. To create this set, I searched the IPLC for patent lawsuits in which the court entered final judgment on the merits on either infringement or validity for at least one asserted patent.[11] I identified 1,186 such lawsuits with final judgments related to 1,978 different patents.

[11] Using the IPLC's "advanced" search function, I obtained 14,319 hits for patent cases filed between 1/1/2000 and 12/31/2010 that reached the "milestone" of summary judgment—the earliest stage at which final judgment can be made. After screening out cases with pending appeals or which ended after the mere denial of summary judgment, I

Prior research on patent litigation outcomes suggests my sample includes a high percentage of the population of the lawsuits with judgments. Kesan and Ball (2006) estimated that courts make final rulings on infringement or invalidity in about five percent of filed patent cases. The 1,186 lawsuits in my sample comprise 4.2 percent of the 28,234 distinct patent cases included in the IPLC that were filed between 2000 and 2010. This suggests I have captured around 80 percent of the population.

The mean number of lawsuits the patents in my sample were asserted is 3.2 with a standard deviation of 6.6. That repeat patent plaintiffs are rare is demonstrated by the skewed distribution of the number of cases asserted. 873 (44%) patents were asserted in a single case and another 433 (22%) in two. Only 121 (6%) were asserted in eight or more cases. This skew lends credence to my argument that repeat patent plaintiffs as a group tend to invest more in litigation than owners of other litigated patents.

I generate a second data set to repeat Allison et al.'s (2011) method of comparing the litigation success of the MLPs asserted in eight or more lawsuits to those only asserted once. For once litigated patents I include the 873 I identify in my first data set. I identify 87 MLPs in my first set that were not included in Allison et al.'s (2009, 2011) study.[12] That set also includes final judgments related to 32 of Allison et al.'s (2009, 2011) MLPs. Because I expected to miss some judgments in my first set, I scoured the IPLC and LexisNexis for additional lawsuits asserting Allison et al.'s MLPs. In this way, I identified and added lawsuits asserting 7 other Allison et al. MLPs for a total of 41.[13] Because some MLPs were adjudicated more than once, my second data set includes 148 patent-lawsuit decision pairs for the 128 total MLPs I identify as being subject to a final judgment on validity and/or infringement.

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was left with 2,046 distinct patent-lawsuit decision pairings in my sample. Note that some of the 1,978 patents in my sample were independently adjudicated in more than one unrelated lawsuit.

[12] These include the following patents numbered: 4595894, 4596900, 4661491, 4,753,789, 4804663, 4879288, 4958226, 5006528, 5025372, 5045268, 5138459, 5165938, 5196525, 5227878, 5253275, 5307459, 5355964, 5382600, 5422370, 5424780, 5434872, 5464826, 5471593, 5487069, 5490216, 5547988, 5550863, 5569652, 5575925, 5633435, 5658590, 5721832, 5722067, 5732094, 5737054, 5737981, 5748575, 5784584, 5793302, 5805689, 5809125, 5812650, 5894554, 5932247, 5972401, 5973199, 5979350, 5994329, 6002720, 6012811, 6034918, 6063608, 6073124, 6085192, 6094219, 6096341, 6157823, 6189787, 6233010, 6240362, 6246558, 6254887, 6259615, 6277405, 6323899, 6327812, 6331415, 6385537, 6396722, 6401222, 6411897, 6415335, 6416198, 6426916, 6666420, 6725854, 6785021, 6847822, 6892944, 6944905, 7074430, 7077313, 7216651, 7334540, 7387793, re36098, re37709.

[13] The fact I captured decisions for 34 of the 41 Allison et al. MLPs that were subject to any final judgment on infringement or validity (83%) further supports my confidence that my first data set is a large representative sample.

For both data sets, I measure litigation success three ways: 1) Final judgment that a patent was infringed; 2) Final judgment that a patent is not invalid; and 3) Final judgment that a patent was both infringed and not invalid such that the owner won the lawsuit. The third measure is the fullest indicator of owner success because some owners win on validity and not infringement and vice versa. However, Marco (2004) finds that there are significantly different selection effects between validity and infringement ruling. By including measures of success for validity and infringement alone, I will be able to better explain my results in terms of the selection model I detail at the end of Part II.B.

Finally, I repeat these six comparisons for the subsets of decisions in my sample involving software and NPE-owned patents—the two types of patents Allison et al. (2011) found to perform particularly poorly in litigation. I adopt the same definitions of software and NPE-owned patents as Allison et al. (2009, 2011). Software patents include those with "at least once claim element" consisting of "data processing". (Allison et al. 2009) NPEs include all owners except those identified as selling products or services. The NPEs in my sample primarily include patent licensing firms and individual inventors but also a few universities and other research institutions.

I first analyze the relationship between each of the two measures of repeat litigation and litigation success using bivariate comparison.[14] I then confirm the robustness of significant relationships with logit regression. For my regression analysis I include as control variables many of the patent, party and adjudicator characteristics that I describe in Miller (2012) and that theoretically predict litigation success.

B. Results

1. Bivariate Comparison

MLPs versus Once Litigated Patents

I begin my analysis of the relationship between the number of lawsuits a patent is asserted and litigation success by comparing the litigation success of MLPs versus once litigated patents. Along the way, I explain why my results differ from those in Allison et al. (2011). I first compare decisions in my

[14] For MLPs versus once litigated patents, I test the null that there is no difference in the success rate using both Chi-square and Fisher's exact tests. For the raw number of lawsuits asserting a patent, I use independent samples t-tests. I report *p* values for each measure of litigation success in bivariate results Tables 1 through 6.

sample involving MLPs identified by Allison et al. (2011) to once litigated patents in my set. I then expand this comparison to include "new" MLPs I identify. For both comparisons, I report the number and percentage of patents winning and losing each of the three measures of litigation success in Table 1.[15]

Using patent-lawsuit pairs as their unit of analysis, Allison et al. (2011) found MLPs won eight adjudicated lawsuits and lost 67, for a 10.7% win rate. This is significantly lower than their 47 percent win rate for once-litigated patents in their sample. The 28 percent win rate for once-litigated patents in my sample is lower than that reported by Allison et al. (2011). Two thirds of this difference, however, is due to the fact Allison et al. (2011) count default judgments as owner wins whereas I do not.[16] Subtracting the 10 default wins they identify, Allison et al.'s (2011) once litigated patents won 35 percent of adjudicated lawsuits, still higher but much closer to the win rate of once litigated patent owners in my sample.

Allison et al. (2011) attempted to avoid double counting decisions by excluding transfers. Replicating their method, I find their MLPs won 15 and lost 68 fully adjudicated cases, for a higher but still poor 18.1% win rate. However, reviewing these lawsuits reveals that some involve the same patents, were argued concurrently in the same court, and were combined for validity adjudication. Counting these related lawsuits as a single decision, I report at the top of Table 1 my finding that the MLPs identified by Allison et al. ("Allison et al. MLPs") won 21 fully adjudicated disputes and lost 26 for a 44.7% Owner Win rate.[17] This win rate is significantly higher than the rate for once litigated patents in my sample. Allison et al.'s (2011) MLPs also won 50 percent of infringement and 51.4 percent of validity judgments, but neither rate is significantly different than the corresponding rate for once litigated patents.

My comparison of MLP and once litigated patent success continues by adding the 87 adjudicated MLPs I identify that Allison et al. (2011) did not analyze. They naturally excluded most of these because

[15] In bivariate results tables I identify significant differences: * (p value ≤ 0.1); ** ($p \leq 0.05$); and *** ($p \leq 0.01$).

[16] In my research, I find alleged infringers default for many reasons that are unrelated to the quality of a patent owner's case. For example, cases stayed because alleged infringers are bankrupt frequently end in default.

[17] 11 more Allison et al. (2011) MLPs won adjudication after February 2009, the newest data included in their paper. This largely accounts for the greater number of MLP wins I find. All asserted claims of 4 patents owned by Ronald A. Katz Technology Licensing, LP, have been adjudicated against some but not all parties on appeal in *In re Katz Interactive Call Processing Pat. Litigation* (the "*Katz*" patents). I include final judgments for these patents in my infringement and validity analysis but exclude them from my analysis of owner wins. 5 other *Katz* patents have been adjudicated on appeal for all parties and I include these in the 26 owner loses I observe.

they only "became" MLPs in late 2009 or 2010. This large group of new MLPs suggests that while repeat patent plaintiffs are rare, they are not as rare as Allison et al.'s (2009, 2011) work suggests.

Table 1

LITIGATION SUCCESS OF MLP VERSUS ONCE LITIGATED PATENTS

	Owner Win?		Infringed?		Not Invalid?		Significant Difference?
	Yes	No	Yes	No	Yes	No	
Allison et al. MLPs							
MLP v	21 (44.7)	26 (55.3)	22 (50.0)	22 (50.0)	19 (51.4)	18 (48.6)	Win: p = 0.01*** Infringe: p = 0.22 Invalid: p = 0.65
Once	223 (27.8)	579 (72.2)	281 (40.7)	410 (59.3)	296 (47.5)	327 (52.5)	
All MLPs							
MLP v	67 (48.9)	70 (51.1)	77 (58.8)	54 (41.2)	81 (68.1)	38 (31.9)	Win: p = 0.00*** Infringe: p = 0.00*** Invalid: p = 0.00***
Once	223 (27.8)	579 (72.2)	281 (40.7)	410 (59.3)	296 (47.5)	327 (52.5)	

Including independent patent-lawsuit adjudications involving all identified MLPs ("All MLPs"), I report at the bottom of Table 1 that MLPs won 67 fully adjudicated cases and 70 lost, for a 48.9 percent win rate. Further, MLPs won 58.8 percent of final infringement judgments and 68.1 percent of final validity judgments. Each of these win rates is significantly higher than my rates for once-litigated patents, which supports my hypothesis that MLPs tend to possess higher legal quality.

Relationship between Number of Cases and Litigation Success

I next determine whether a general relationship exists between the number of cases a patent is asserted and that patent's litigation success. Using my first data set, I compare the mean number of cases asserting patents that won each measure of litigation success to the mean number of cases asserting patents that lost. At the top half of Table 2, I report that the difference in means is only significant for fully adjudicated patents and not for separate infringement and validity judgments.

Allison et al. (2011) suggest the *Katz* litigation is an outlier and it certainly is when comparing the number of lawsuits asserting these patents to those asserting other MLPs.[18] The mean number of cases asserting the 9 *Katz* patents with any final judgment is 81.1 compared with 16.4 for the 119 other MLPs

[18] *Katz* filed over 100 separate lawsuits asserting infringement of 30 patents against 165 defendants. See *In Re Katz Interactive Call Processing Patent Litigation*, 656 F.3d 1293 (Fed. Cir. 2011).

in my sample. In the bottom half of Table 2 I report that excluding the *Katz* judgments winning patents are asserted in significantly more cases, regardless of the measure of litigation success. Thus, excepting the repeat patent plaintiff asserting far more patents in far more lawsuits than any other, there is a strong positive relationship between the number of cases a patent is asserted and its owner's success.

Table 2

RELATIONSHIP BETWEEN PATENT LITIGATION SUCCESS & NUMBER OF LAWSUITS ASSERTED

	# of Observations	Mean # of Suits Asserted	Standard Deviation	p value
All Judgments				
Owner Win	608	4.24	9.11	0.00***
Owner Loss	1242	3.09	6.74	
Infringed	758	4.00	8.30	0.13
Not Infringed	858	3.38	8.30	
Not Invalid	803	3.68	6.95	0.57
Invalid	739	3.45	8.95	
All but *Katz* Patents				
Owner Win	608	4.24	9.11	0.00***
Owner Loss	1237	2.74	3.69	
Infringed	758	4.00	8.30	0.00***
Not Infringed	852	2.78	4.06	
Not Invalid	803	3.68	6.95	0.00***
Invalid	731	2.58	2.63	

Software and NPE Patents versus Non-Software and Product Firm Owned Patents

Allison et al. (2011) found software and NPE-owned patents have little success and comprised a disproportion share of MLPs. 28 (68.3%) of the 41 MLPs in my sample that Allison et al. (2011) identified cover software and 25 (61.0%) are NPE owned. In contrast, only 34 (39.1%) and 38 (43.7%) of the additional 87 MLPs I identify are respectively software or NPE-owned.[19] To investigate whether so many new non-software and non-NPE-owned MLPs account the difference in our results, I analyze the success of non-software and product firm owned patents versus software and NPE-owned patents.

[19] Of the 873 once litigated patents in my sample, 26.9 percent cover software and 24.1 percent are NPE-owned. Thus, my results confirm Allison et al.'s (2009) finding that MLPs are much more likely to cover software and be NPE-owned than once litigated patents.

Non-Software and Product Firm Owner Litigation Success

As evident in Tables 3 and 4, non-software and product firm owned patents asserted in more lawsuits are overwhelmingly more successful regardless of the measure of litigation success. In Table 3, I report non-software MLPs won 67.1 percent of fully adjudicated cases and 82.4 and 80.0 percent of infringement and validity judgments. In contrast, once litigated non-software patents won 31.6, 44.1 and 53.1 percent of these judgments. The difference in each success rates is highly significant.

Table 3

NON-SOFTWARE & PRODUCT-FIRM-OWNED PATENT SUCCESS (MLP VS. ONCE LITIGATED PATENTS)

	Owner Win?		Infringed?		Not Invalid?		Significant Difference?
	Yes	No	Yes	No	Yes	No	
Non-Software							
MLP v	53 (67.1)	26 (32.9)	61 (82.4)	13 (17.6)	56 (80.0)	14 (20.0)	Win: p = 0.00*** Infringe: p = 0.00*** Invalid: p = 0.00***
Once Litigated	187 (31.6)	404 (68.4)	224 (44.1)	284 (55.9)	243 (53.1)	215 (46.9)	
Product Firms							
MLP v	50 (65.8)	26 (34.2)	58 (80.6)	14 (19.4)	54 (80.6)	13 (19.4)	Win: p = 0.00*** Infringe: p = 0.00*** Invalid: p = 0.00***
Once Litigated	196 (32.4)	409 (67.6)	247 (46.3)	286 (53.7)	254 (52.7)	228 (47.3)	

In Table 3, I also report the success rates of product firm owned MLPs versus once litigated patents. Given 55 of 65 (84.6%) product firm owned MLPs in my sample also do not protect software, I naturally find the success rates of product firm owned MLPs are near those of non-software MLPs.[20] Regardless of the measure, product firm owned MLPs are significantly more successful.

Table 4 confirms that the strong relationship between success and number of lawsuits for non-software and product firm patents extends beyond the comparison of MLPs to once litigated patents. Successful non-software and product firm patents are asserted in significantly more individual lawsuits. Further, comparing Table 3 to Table 1 I note the win rates for product firm and non-software owners are much higher than the rates for all patents. Thus, these owners are more successful than the NPEs and

[20] In contrast, 52 of 63 (82.5%) NPE-owned MLPs in my sample do cover software.

software owners who made up a larger share of Allison et al.'s (2011) MLP sample. I now determine if the relationship between success and lawsuits extends to patents that cover software or are NPE-owned.

Table 4

RELATIONSHIP BETWEEN NON-SOFTWARE AND PRODUCT FIRM SUCCESS & NUMBER OF LAWSUITS

	# of Suits	Mean	Std. Dev	p value
Non-Software Decisions				
Owner Win	501	4.33	9.76	0.00***
Owner Loss	821	2.41	2.23	
Infringed	615	4.09	8.88	0.00***
Not Infringed	543	2.26	2.09	
Not Invalid	625	3.62	7.49	0.00***
Invalid	479	2.47	2.16	
Product Firm Decisions				
Owner Win	509	4.26	9.77	0.00***
Owner Loss	832	2.36	2.20	
Infringed	630	3.98	8.86	0.00***
Not Infringed	567	2.25	2.05	
Not Invalid	641	3.57	7.49	0.00***
Invalid	500	2.40	2.08	

Software and NPE Litigation Success

In Table 5 I compare the success of first software and then NPE-owned MLPs to those asserted once. I find mixed support for my hypothesis for software and NPE-owned patents. Concerning software alone, I find that MLP owners were more likely to win fully adjudicated lawsuits and validity judgments than once-litigated owners. However, only the difference for validity is significant. Owners asserting software MLPs were slightly, but not significantly, less likely to win infringement judgments.

Excluding the *Katz* patents, the comparison of software MLPs and once litigated patents is more favorable to my hypothesis. Software MLPs are more successful across all three measures of success. However, the differences for both fully adjudicated cases and infringement decisions remain insignificant.

Interestingly, NPE-owned MLPs were more successful than software MLPs. Even including the NPE-owned *Katz* patents, NPE-owned MLPs are uniformly more successful than once litigated NPE-owned patents. The difference for infringement judgments is insignificant but becomes so when I exclude *Katz* patents. Thus, the data largely supports the conclusion that while software and NPE-owned patents

lose more judgments than other patents, those repeatedly asserted are more successful. The one clear exception is that software MLPs are not more (or less) likely to win infringement judgments.[21]

Table 5

SOFTWARE & NPE-OWNED PATENT LITIGATION SUCCESS (MLP VERSUS ONCE LITIGATED)

	Owner Win?		Infringed?		Not Invalid?		Significant Difference?
	Yes	No	Yes	No	Yes	No	
Software							
MLP v	14 (24.1)	44 (75.9)	16 (28.1)	41 (71.9)	25 (51.0)	24 (49.0)	Win: p = 0.22 Infringe: p = 0.66 Invalid: p = 0.02**
Once Litigated	36 (17.1)	175 (82.9)	57 (31.1)	126 (68.9)	53 (32.1)	112 (67.9)	
Software but *Katz*							
MLP v	14 (26.4)	39 (73.6)	16 (31.4)	35 (68.6)	25 (61.0)	16 (39.0)	Win: p = 0.12 Infringe: p = 0.98 Invalid: p = 0.00***
Once Litigated	36 (17.1)	175 (82.9)	57 (31.1)	126 (68.9)	53 (32.1)	112 (67.9)	
NPEs							
MLP v	17 (27.9)	44 (72.1)	19 (32.2)	40 (67.8)	27 (51.9)	25 (48.1)	Win: p = 0.01** Infringe: p = 0.10 Invalid: p = 0.00***
Once Litigated	27 (13.7)	170 (86.3)	34 (21.5)	124 (78.5)	42 (29.8)	99 (70.2)	
NPEs but *Katz*							
MLP v	17 (30.4)	39 (69.6)	19 (35.8)	34 (64.2)	27 (61.4)	17 (38.6)	Win: p = 0.00*** Infringe: p = 0.04** Invalid: p = 0.00***
Once Litigated	27 (15.9)	170 (84.1)	34 (27.4)	124 (72.6)	42 (29.8)	99 (70.2)	

In Table 2, I reported that I must exclude judgments involving the *Katz* patents to find a significant relationship between the number of cases a patent is asserted and litigation success. This is even more necessary when analyzing judgments involving software and NPE-owned patents. In Table 6, I find that even excluding *Katz* judgments, the mean number of cases asserting winning patents is only significantly greater for validity judgments. This is true for both software and NPE-owned patents.

Summarizing the results of my bivariate analysis, I find that MLPs have been significantly more successful than once litigated patents, regardless of the measure of litigation success. Beyond the comparison of MLPs to once litigated patents, patents that win fully adjudicated cases are asserted in significantly more lawsuits. When I exclude the *Katz* patents from my analysis, this result extends to

[21] That software MLPs fail to win infringement judgments explains why they win fewer fully adjudicated lawsuits.

infringement and invalidity decisions. The connection between the number of lawsuits asserted and litigation success is unambiguous and much stronger for non-software and product firm owned patents.

Table 6

RELATIONSHIP BETWEEN SOFTWARE AND NPE PATENT SUCCESS & NUMBER OF LAWSUITS ASSERTED

	# of Suits	Mean	Std. Dev	p value
Software but *Katz*				
Owner Win	107	3.79	5.08	0.49
Owner Loss	416	3.38	5.48	
Infringed	143	*3.64*	5.11	0.93
Not Infringed	309	*3.69*	6.04	
Not Invalid	178	3.88	4.60	< 0.01***
Invalid	252	2.80	3.35	
NPEs but *Katz*				
Owner Win	99	4.10	4.37	0.32
Owner Loss	405	3.51	5.54	
Infringed	128	*4.10*	4.65	0.66
Not Infringed	285	*3.83*	6.26	
Not Invalid	162	4.12	4.20	< 0.01***
Invalid	231	2.98	3.51	

However, the same is not true of software and NPE-owned patents. NPE-owned MLPs are significantly more successful than NPE-owned once litigated patents, but the result for infringement decisions is only significant when I exclude *Katz* judgments. Software MLPs are uniformly more likely to be found not invalid. Even when excluding the *Katz* patents, they are no more likely to win infringement judgments and thus no more likely to win fully adjudicated cases. Comparing means, there is only a significant positive relationship between the number of lawsuits asserting software and NPE-owned patents and the likelihood these patents win validity judgments.

2. Multivariate Analysis

I now determine if my bivariate results are robust to logistic regression controlling for other patent, party and adjudication characteristics that theoretically predict litigation success. I test this both based on the raw number of cases each patent in my first data set was asserted and comparing the success of MLPs to once litigated patents in my second set. For both measures of repeat litigation, I run specifications with each of my three measures of litigation success as the dependent variable.

Table 7 reports my results comparing the success of the 128 MLPs in my sample to the 873 once litigated patents. Key independent variables indicate whether a decision involved a MLP, software or an NPE-owned patent. I include the number of months between the PTO application date and grant date ("Application Duration"), grant year, natural logarithm of the number of claims and average citations per claim per year as additional patent characteristics. Additional party characteristics include: 1) Whether the patent owner or alleged infringers are large product firms; 2) Whether the owner or alleged infringers are foreign entities; 3) The number of patents asserted in the lawsuit; and 4) The number of alleged infringers in the lawsuit. Finally, I include several adjudication characteristics including: 1) Whether judgment was after the *KSR* decision[22]; 2) Whether the lawsuit was a declaratory action brought by alleged infringers; 3) Whether the final adjudication was made on appeal after summary judgment or trial; and 4) Whether the final decision was made on summary judgment without appeal. I detail the theoretical connection between each of these controls and litigation success in Miller (2012).

In short, the patent and party characteristics theoretically capture selection effects including dispute value, cost or asymmetric stakes. The adjudication characteristics theoretically capture differences in the legal standard of judgment or judicial bias.

In Table 7 I report that controlling for these characteristics, MLP owners remain significantly more likely win fully adjudicated cases, infringement and validity judgments. Regardless of the measure, software and NPE-owned patents are significantly less successful.[23] In unreported regressions, I repeat the specifications in Table 7 first including only NPE-owned patents and second only software patents. I find NPE-owned MLPs are significantly more likely to win across all three measures of success. In contrast, software MLPs are only significantly more likely to win validity judgments.

In my logit analysis of the likelihood of litigation success given the number of lawsuits each of the 1978 adjudicated patents in my first data set were asserted, I include all patent, party and adjudicator

[22] In *KSR Int'l Co. v. Teleflex, Inc*, 550 U.S. 398 (2007), the U.S. Supreme Court empowered lower courts to consider more types of evidence of obviousness than previously available. I theorize alleged infringers might have won more decisions after this opinion. See Simic (2009) for details of the theoretical impact of *KSR*.

[23] Though NPE-owned patents are only less likely to win validity determinations at the 90% confidence level.

characteristics described above. Further, because I am not limited by the lack of technology variety in my MLP sample, I not only include a software indicator, but independent variables for each of the industries and technologies described and utilized by Allison et al. (2009). My results are reported in Table 8.

Table 7

LOGIT ESTIMATION OF LIKELIHOOD OF MLP VERSUS ONCE LITIGATED PATENT SUCCESS

Specification:	Owner Win	Infringed	Not Invalid
MLP	1.53*** (.23)	1.51*** (.23)	1.59*** (.30)
Software	-.755*** (.248)	-.650*** (.220)	-.548** (.234)
NPE	-.933*** (.272)	-.939*** (.255)	-.693** (.284)
Patent:			
Application Duration	-.0002 (.0002)	-.0002 (.0002)	-.0001 (.0001)
Grant Year	-.002 (.019)	.035* (.019)	-.050** (.020)
Log # Claims	.112 (.114)	.056 (.112)	-.010 (.116)
Ave Citations / Clm / Yr	.219 (.703)	-.653 (.532)	.613 (.816)
Ave Citations Squared	.009 (.360)	.212 (.151)	.283 (.500)
Party:			
Large Product Firm Owner	.061 (.223)	.377* (.213)	.008 (.232)
Foreign Owner	-.553** (.273)	-.541** (.268)	-.131 (.283)
Foreign Defendant	.735*** (.220)	.398* (.215)	.260 (.243)
Large Defendant	-.476** (.209)	-.148 (.197)	-.561** (.222)
# Patents Asserted	-.007 (.018)	.001 (.022)	-.021 (.018)
# Defendants in Suit	-.008 (.007)	-.020* (.011)	-.022* (.013)
Adjudication:			
Decided after KSR	.083 (.177)	.024 (.178)	-.033 (.184)
Declaratory Judgment	-.625* (.348)	-.537* (.332)	-.375 (.348)
On Appeal	-1.48*** (.209)	-.711*** (.211)	-1.07*** (.22)
On Summary Judgment	-1.78*** (.259)	-1.59*** (.26)	-.786*** (.268)
Constant	4.5 (37.0)	-69.6* (38.7)	101** (40)
Log-likelihood	-441	-442	-401
Prob > Chi-squared=	0.000	0.000	0.000
Observations	881	768	679

Note.—Sample includes 128 MLPs and 873 once litigated patents subject to final judgment on infringement and/or validity in lawsuits filed between 2000 and 2010. Robust standard errors in parenthesis.
*, **, and *** denote significance at the 10%, 5% and 1% confidence level.

Once again, I find software and NPE-owned patents are significantly less likely to win, regardless of the measure of litigation success. However, software patents are only significantly less likely to win validity judgments to a 90 percent confidence level. The number of cases is a statistically significant positive predictor that a patent owner will win regardless of the measure of success. My logit analysis thus confirms the existence of a positive relationship between repeat patent litigation and owner success.

Table 8

LOGIT ESTIMATION OF LIKELIHOOD OF PATENT OWNER LITIGATION SUCCESS

Specification:	Owner Win	Infringed	Not Invalid
Number of Cases	.054*** (0.012)	.054*** (.014)	.093*** (.020)
Industry:			
Computer	.006 (.255)	-.062 (.247)	.034 (.242)
Semiconductor	.802* (.411)	-.617* (.377)	1.08** (.44)
Electronics	.233 (.250)	-.143 (.254)	.254 (.252)
Medical	.101 (.219)	-.328 (.214)	.690*** (.242)
Pharmaceutical	.558* (.293)	.604* (.319)	-.173 (.317)
Chemical	.012 (.388)	.931** (.413)	.011 (.379)
Communications	-.026 (.223)	-.172 (.215)	.272 (.213)
Transportation	.146 (.254)	-.093 (.248)	.129 (.278)
Energy/Utility Service	.687** (.303)	.031 (.335)	.702** (.359)
Financial	-.670 (.500)	-.139 (.438)	.213 (.495)
Consumer Good/Service	.068 (.186)	-.178 (.185)	.327 (.203)
Construction	-.110 (.329)	-.188 (.332)	.351 (.345)
Other	-.073 (.315)	-.140 (.300)	.227 (.337)
Technology:			
Software	-.686** (.333)	-.914*** (.350)	-.575* (.328)
Mechanical	-.089 (.224)	-.060 (.234)	-.213 (.228)
Electronics	-.138** (.237)	.066 (.243)	-.385 (.236)
Optics	.692** (.326)	.788** (.366)	.150 (.318)
Imaging	-.827* (.477)	.074 (.485)	-.314 (.361)
Biotechnology	-.069 (.328)	-.446 (.328)	-.033 (.345)
Chemistry	-.006 (.243)	-.093 (.254)	-.045 (.255)
Other	-.676** (.343)	-.668** (.344)	-.596* (.359)
Other Patent:			
Application Duration	-.0001 (.0001)	-.00002 (.00011)	-.0001 (.0001)
Grant Year	-.014 (.013)	.025* (.013)	-.065*** (.013)
Log # Claims	.190** (.082)	.139* (.076)	.082 (.081)
Ave Citations / Clm / Yr	.505 (.438)	.291 (.186)	1.15** (.45)
Ave Citations Squared	-.174** (.165)	-.015 (.011)	-.422** (.186)
Patent Owner:			
NPE	-.739*** (.186)	-.496*** (.173)	-.514*** (.190)
Large Product Firm	-.034 (.166)	.249 (.165)	-.062 (.175)
Party:			
Foreign Owner	-.473** (.185)	-.343* (.185)	-.256 (.196)
Foreign Defendant	.350** (.151)	-.062 (.151)	.189 (.167)
Large Defendant	-.257* (.153)	-.209 (.155)	-.355** (.163)
# Patents Asserted	-.010 (.013)	.031** (.014)	-.006 (.012)
# Defendants in Suit	-.026*** (.008)	-.037*** (.009)	-.056*** (.012)
Adjudication:			
Decided after KSR	.012 (.126)	-.122 (.129)	.161 (.133)
Declaratory Judgment	-.864*** (.211)	-.799*** (.200)	-.547*** (.196)
On Appeal	-1.53*** (.15)	-.880*** (.155)	-1.06*** (.15)
On Summary Judgment	-1.68*** (.19)	-1.63*** (.19)	-.799*** (.185)
Log-likelihood (Prob > Chi-sq)	-901 (0.00)	-875 (0.00)	-855 (0.00)
Observations	1716	1485	1395

Note— Estimation of 1978 patents subject to final judgment on infringement and/or validity in 1186 lawsuits filed between 2000 and 2010. Robust standard errors in parenthesis.

*, **, and *** denote significance at the 10%, 5% and 1% confidence level.

IV. Discussion

In contrast with Allison et al.'s (2011) results, mine suggest that as a group repeat patent plaintiffs do not irrationally litigate weak patents through trial. As I now explain that within the selection model I adopt higher repeat plaintiff patent quality is the most likely explanation for my results. Thus, repeat patent plaintiffs appear quite rational in more vigorously enforcing their rights. Further, that repeat software patent plaintiffs are not more likely to win infringement decisions is not inconsistent with rational behavior. Instead, it is most likely due to software patents possessing more uncertain boundaries.

A. Patents Asserted in Many Lawsuits Likely Tend to be Higher Quality

In Part II of this paper I adopted a model of the selection of disputes for trial that predicts that with higher individual case quality, patent owners will be more likely to win tried disputes. However, other variables in this model also influence patent owner win rates. Perhaps one of these, and not higher quality, explains my finding that owners who assert their patents in more lawsuits are more successful.

Because I do not analyze settlement data, I cannot definitively foreclose this possibility. Of the variables affecting win rates, however, case quality most likely explains my results. To explain why, I first explain two assumptions I make. First, I examine win rates in infringement and validity decisions separately because Marco (2004) found that patent adjudication more closely conforms to the predictions of selection effects models when these judgments are separately analyzed. This is not surprising since they are in fact legally separate determinations.

Second, I assume the win rate of all judgments in my first, representative, sample is closer than the MLP win rate to the population win rate we would observe if all patents were adjudicated. This makes sense given that disputes involving repeat patent plaintiffs are rare. MLPs comprised 6 percent of my first data set. I thus determine whether other selection effects likely explain my results by comparing the success of all MLPs I analyze to the average of all adjudicated patents in my first set. The average win rates for all 1978 patents in my first set are 47 and 52 percent for infringement and validity judgments respectively. Tellingly, both of these rates are very near the 50 percent conditional win rate prediction of the Priest-Klein (1984) model. In contrast MLPs won 59 and 68 percent of these decisions.

Marco (2004) details the predicted relationship between selection variables and the observed win rate. I do not repeat the logic behind these relationships but simply explain why the higher win rates I observe for MLPs is unlikely due to anything other than the tendency for MLP owner disputes to possess higher case quality, *z'*. Referencing Table 2 in Marco (2004), higher *z'* in a particular category of disputes results in a higher observed win rate. Thus, the higher win rate I observe for MLPs is consistent with the selection model, my hypothesis and results.

In contrast, higher litigation costs, c_i, drive the win rate towards 50 percent. However, the MLP win rates are much farther from 50 percent than the average win rates I observe. I find it difficult to believe that the parties in the average dispute anticipate higher costs than the parties in an MLP dispute.

MLP owners may perceive lower "costs" as conceived in a litigious plaintiff model. (See, e.g., Eisenberg & Farber 1997) Within such a model, some plaintiffs like MLP owners may be less adverse to litigation and thus more likely to pursue disputes through trial. However, the result is that litigious plaintiffs are more likely to lose, which is the opposite of what I observe for MLP owners. (Eisenberg & Farber 1997) I thus conclude my results are not likely explained by differences in litigation costs.

Further, asymmetric stakes are unlikely to explain my results. If disputes involving MLPs tend to have more asymmetric stakes, then the selection model actually predicts that MLPs will win fewer decisions. Thus, the average dispute would have to be more asymmetric for stakes to explain my results. This seems doubtful, particularly since I find NPEs are more likely to assert MLPs.

Finally, greater uncertainty, σ, and larger awards, *v*, in a particular type of dispute both drive win rates towards the population rate. If these variables controlled the relationship between number of lawsuits asserted and litigation success, I would observe insignificant differences in the win rates of MLPs in comparison to both the average conditional and unconditional population win rates.

I thus conclude that the most likely explanation for my general result that owners of patents asserted in more lawsuits are more likely to win validity and infringement decisions is that their patents tend to have higher legal quality. Again, I argue that this connection makes economic sense. Litigation is

costly and more litigation is more costly than less. Rational patent owners do not incur the higher costs of filing multiple lawsuits against many alleged infringers unless they expect a high return.

Expected return in patent litigation necessarily depends on the likelihood an owner's patent would be found valid and infringed. Thus, all else equal, we can expect that owners who incur greater litigation costs believe their patents are more likely to be found valid and infringed. Given the information alleged infringers possess, they do not entirely believe high repeat patent plaintiff confidence is justified. They thus do not settle as frequently as they should and lose a larger percentage of decisions than those disputing the assertions of less confident owners who assert their patents in fewer cases.

B. The Additional Litigation Costs That Repeat Patent Plaintiffs Generate Are At Least Partially Compensated By the Fact They Tend To Assert Higher Quality Patents

My finding of a positive relationship between the number of lawsuits a patent is asserted and litigation success suggests that, in general, the higher costs repeat patent plaintiffs impose on the courts and the product firms they sue are at least partially offset by the fact they are more likely to reap benefits from their litigation. Further, my critique of Allison et al.'s (2011) hypothesis in Part II of this paper reveals the additional costs that repeat patent litigants impose have been minimized though consolidation of related disputes. However, the joinder provision of the AIA may limit such cost savings in the future.

These generally positive results do not extend to owners who assert software patents in many lawsuits. Throughout my analysis, the one exception to my hypothesis is that software patents asserted in more cases are not more likely to win infringement judgments. Further, I found that repeat software patent plaintiffs are less successful than other repeat patent plaintiffs regardless of the measure of success. Finally, software patents comprise a larger fraction of MLPs than of all litigated patents.

These findings suggest software patent owners are more likely to "waste" judicial, producer and their own resources in more frequently litigating losing cases through complex adjudication. While some reform proponents have been hesitant to target particular types of patents (*See*, e.g., Jaffe & Lerner 2004), increased early scrutiny of software patents may be welfare improving. But before proposing specific reforms we must understand why software patent owners are more likely to lose judgments.

C. Software Patents, Infringement and Inadvertent Evidence of Uncertainty as the Cause of the Surge in Patent Litigation

Why are repeat software patent plaintiffs not more likely to win infringement decisions? Bessen and Meurer (2008) provide an explanation consistent with my model and results. They argue the surge in patent litigation during the 1990s was mainly caused by a breakdown in notice of what particular patents protect. A major source of this breakdown was the explosion in number of software patents, which also account for over one-fourth of the increase in patent lawsuits during the 1990s. (Bessen & Meurer 2008) Bessen and Meurer (2008) argue software patents claim more abstract ideas and that with abstract ideas it is harder to "relate the words that describe patent boundaries to actual technologies."

While more uncertain patent boundaries undoubtedly impact validity judgments, they are most relevant to infringement.[24] What litigation outcomes would we expect with greater uncertainty over infringement of software patents? Bessen and Meurer (2008) argue their idea that abstract claims create greater uncertainty explains their finding that software patents are more likely to be litigated. Marco's (2004) selection model also predicts this relationship. In his words, as "uncertainty increases, the trial rate increases since divergent beliefs become more sizeable." (Marco 2004)

But what about the predicted win rate? When disputes of more uncertain case quality are tried, "the conditional win rate will approach the unconditional win rate." (Marco 2004) In other words, large uncertainty over patent boundaries drives the infringement win rate of software patents towards the population rate we would observe if all software patents were litigated. Thus, uncertain scope plausibly explains why software patents asserted in many cases are not more likely to win infringement decisions. If this is correct, my results support Bessen and Meurer's (2008) hypothesis that the proliferation of software patents with more uncertain scope was a key cause of the surge in patent litigation that occurred during the 1990s.

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[24] Patent claims define the property boundaries of patents and since *Markman v. Westview Instruments, Inc*., 52 F.3d 967, 970-71 (Fed. Cir. 1995), district court judges alone have defined disputed claim language, typically prior to summary judgment. (Moore 2001) While claim construction is the first step to both infringement and validity analysis (*Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, (Fed. Cir. 1998)), Schwartz (2008) finds that claim construction is much more frequently disputed in appeals from infringement and not validity judgments.

D. The Economic Calculus of *Katz* and Other NPEs

My selection model predicts that both greater uncertainty and greater expected damages may result in insignificant differences in repeat patent plaintiff win rates. However, uncertainty seems the best explanation given that repeat software patent plaintiffs are more likely to win validity decisions. If damages were the cause, these owners should be no more likely to win on either infringement or validity.

Still, given the example of *Katz* and other high profile losing NPEs, high expected damages is an appealing explanation. Recall that the extreme number of lawsuits *Katz* filed and its lack of litigation success account for discrepancies between my hypothesis and bivariate results. The size of this litigation and long list of prominent defendants suggests *Katz* expected an enormous award if it had won.[25] With a high expected award, *Katz* and like-minded NPEs may estimate a positive return in going the distance, even if they also believed their patents are fairly likely to be found invalid or not infringed.

This is consistent with the notion that NPEs tend to be more risk neutral. (Bessen & Meurer 2005) But besides selecting patents that may reap large damage awards from the inadvertent infringement of large independently inventing product firms, scholars have theorized NPEs strategically assert patents with more uncertain scope against more risk adverse targets. (Bessen & Meurer 2005) That 52 percent of NPE-asserted and only 22 percent of product-firm-asserted patents in my sample are software supports this idea, as does the fact that 40 percent of MLPs I analyze are software and NPE-owned.

If uncertain patent scope is the key reason so many NPEs and other software owners lose judgments, then a new legal mechanism to define the scope of software claims prior to litigation may eliminate repeat litigation of weak software patent. Alternatively, the Federal Circuit could allow interlocutory appeals of disputed software claim construction. Of course these solutions would generate their own costs. I defer specific recommendations to my next paper, where I will seek more conclusive evidence that greater scope uncertainty explains why software owners are more likely to lose infringement decisions regardless of whether they assert their patents in many lawsuits or in a few.

[25] *Katz* filed over 100 separate lawsuits asserting 30 related patents against 165 defendants. Alleged infringers include American Airlines, FedEx and Time Warner. See *In Re Katz Interactive Call Processing Patent Litigation*, 656 F.3d 1293 (Fed. Cir. 2011).

CONCLUSION

Repeat patent plaintiffs, i.e., patent owners who assert their patents in many separate lawsuits, generate a disproportionate share of the patent litigation costs borne by the courts, producers and ultimately consumers. Because these owners also chose to incur more litigation expenses, economic theory suggests they should tend to expect and in fact obtain larger benefits from their enforcement activities, thus at least partially offsetting the higher social cost of their litigation. However, Allison et al.'s (2011) finding that repeat patent plaintiffs overwhelmingly lose adjudicated lawsuits suggests a less optimistic negative relationship between the number of lawsuits a patent is asserted and patent quality.

With the benefit of additional data, in this paper I determine whether Allison et al.'s (2011) troubling results are robust or whether patents asserted in more lawsuits instead tend to be higher quality as theory predicts. In contrast with Allison et al. (2011), I find that patents asserted in more cases generally do win more validity and infringement decisions, suggesting the higher litigation costs repeat patent plaintiffs impose are at least somewhat compensated by the fact they assert higher quality patents. This result does not hold, however, for repeat software patent plaintiffs.

I find software patents asserted in more lawsuits are not more likely to win adjudicated cases because they are not more likely to win infringement judgments. Consistent with Bessen and Meurer's (2008) theory of the cause of the patent litigation surge of the 1990s, I argue this is most likely the result of software patents possessing more uncertain scope. In my next paper I will seek direct evidence that uncertainty explains the failure of repeat software patent plaintiffs to win more infringement judgments.

No matter why repeat software patent plaintiffs are less successful, my results suggest adjudicated software patent disputes are less likely to generate net social benefits. Regardless of the number of cases asserted, software patent owners are more likely to lose validity and infringement judgments. Further, repeat patent plaintiffs are more likely to assert software patents but those that do are not more likely to win on infringement. Thus, the generally poor performance of software patents is exacerbated by the fact the increased costs repeat software plaintiffs impose are not offset by an increase in case quality. This suggests policy makers should continue to consider technology-specific patent reform.

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Appendix

Table A1. Outcome of Lawsuits Filed between 2000 and 2010 that Assert Allison et al. (2011) MLPs, by MLP Owner

MLP Owner	CE	Cases Joined	Summary of Case Outcomes
Ablaise Ltd.	Y	2 of 14	6 lawsuits quickly settled or owner plaintiff's voluntary dismissal ("PVD"). 1 transfer. 1 consolidated into 1 lead (*Dow Jones & Co. v. Ablaise Ltd.*). Lead ended in alleged infringers winning (patent no. 6,961,737 invalidated and no. 6,295,530 not infringed). 5 other lawsuits won by alleged infringers after stay pending decision in lead.
Acacia / Computer Acceleration Corp.	N	9 of 9	All lawsuits related and dismissed after claims 1 and 2 of patent no. 5,933,630 invalidated in lead (*Computer Acceleration Corp. v. Microsoft Corp*).
Acacia Media Technology Co.	N	18 of 18	2 lawsuit dismissed by owner PVD. Remainder combined in MDL (*In re: Acacia Media Tech. Corp.*).
Antor Media Corp.	N	0 of 8	1 lawsuit settled. Remaining 7 stayed pending PTO reexamination of patent no. 5,734,961.
Anvik Corp.	N	12 of 13	10 lawsuits pending in the Southern District of New York associated for validity. 1 transferred to another pending Southern District of California case. 1 procedural dismissal.
Arrival Star, Inc.	N	2 of 47	44 of 47 lawsuits settled. 2 lawsuits consolidated and 1 pending.
Aventis Pharmaceuticals	N	7 of 22	13 lawsuits settle. 2 consolidated. 5 associated with court invalidating claims 1 and 2 of patent no. 5,738,872 on summary judgment ("SJ"). 2 alleged infringer wins on SJ (not infringed).
Barr Laboratories / Janssen Pharmaceutical	Y	6 of 13	5 lawsuits consolidated into 1 lead (*In re: '318 Patent Infringement Litigation.*) which invalidated patent no. 4,663,318. 4 others stayed pending decision in lead. 2 early PVDs. Last case won by alleged infringers on claim estoppel (based on lead).
Barry Thomas	N	8 of 12	8 lawsuits related for claim construction ("CCO") and validity. All 12 lawsuits settled but 2 settled after partial alleged infringer win on SJ (laches barred pre-suit damages).
BCE Emergis	N	0 of 15	13 lawsuits settled. 2 other alleged infringer wins on SJ (not infringed).
Billingnetwork.com	N	0 of 25	22 settlements but 1 after partial SJ (not infringed). 1 procedural dismissal and 2 cases pending.
Cygnus Telecommunications	Y	12 of 13	11 lawsuits combined in 1 MDL (*In re: Cygnus Telecommunications Tech.*) with alleged infringers winning after patents no. 5,883,964 and 6,035,027 invalidated on SJ. 1 later lawsuit won by alleged infringer on claim estoppel (based on MDL decision).

"CE" indicates whether an owner lost a lawsuit by collateral estoppel based on finding of invalidity in an earlier case.
"Cases Joined" indicates the fraction of MLP cases for each owner combined by MDL, transfer, or consolidation (at least for validity determination).

Table A1 (continued). Outcome of Lawsuits Filed between 2000 and 2010 that Assert Allison et al. (2011) MLPs, by MLP Owner

MLP Owner	CE	Cases Joined	Summary of Case Outcomes
Datatreasury Corp.	N	9 of 22	13 settlements. 9 lawsuits transferred or consolidated into lead (*Datatreasury Corp. v. Wells Fargo Et al.*). Owner won lead at trial after patents no. 5,910,988 and 6,032,137 survive PTO reexamination.
Digital Development Corp.	N	0 of 10	8 settlements. 2 procedural dismissals.
Eon-Net, LP / Millennium	N	4 of 49	41 settlements. 4 transfers. 1 alleged infringer win (stipulated not infringed). 1 owner win on default judgment. 2 procedural dismissals.
F & G Research, Inc.	N	5 of 48	34 settlements. 2 lawsuits transferred and 3 consolidated. 2 alleged infringer wins on SJ (not infringed). 6 lawsuits end on procedural grounds. 1 owner win by default judgment.
Fresnel Technologies	N	2 of 11	Owner won first lawsuit. Next 7 lawsuits settle. 2 others transferred and 1 procedural dismissal.
Hoffman-La Roche, Inc.	Y	15 of 19	2 early lawsuits consolidated into 1 lead (*Hoffman-La Roche v. Teva et al.*) which settles. 12 later cases associated or consolidated and pending. 3 other settlements. 1 stayed pending associated cases.
Laughlin / Great Neck Saw Mfg. Inc.	N	3 of 12	7 settlements. 1 consolidated. 2 transferred. 1 procedural dismissal. 1 alleged infringer win on SJ (not infringed).
Laughlin Products, Inc.	N	42 of 54	41 lawsuits combined or transferred into 1 MDL (*In re: Laughlin Prods., Inc. Patent Litigation*). Stipulated dismissal of MDL after owner requested PTO reexamination of patent no. 5,922,333 (where its validity was confirmed). 10 other lawsuits settled, 1 procedural dismissal and 1 owner win by default judgment.
Millennium, LP	N	3 of 43	39 lawsuits settled, 3 transferred, and 1 procedural dismissal.
Monsanto Co.	N	3 of 80	Owner wins first case (valid and infringed). 5 more owner wins and 67 settlements. 1 owner won by default judgment. 6 other lawsuits pending.
NCR Corp.	N	0 of 22	All 22 lawsuits settled.
Oakley, Inc.	N	0 of 24	23 settlements. 1 owner win by default judgment.

"CE" indicates whether an owner lost a lawsuit by collateral estoppel based on finding of invalidity in an earlier case.
"Cases Joined" indicates the fraction of MLP cases for each owner combined by MDL, transfer, or consolidation (at least for validity determination).

Table A1 (continued). Outcome of Lawsuits Filed between 2000 and 2010 that Assert Allison et al. (2011) MLPs, by MLP Owner

MLP Owner	CE	Cases Joined	Summary of Case Outcomes
Orion IP, LLC	Y	5 of 31	24 settlements. 4 lawsuits consolidated and 1 transferred. Alleged infringers won 2 lawsuits. In the first, claims 1, 7 and 8 of patent no. 5,367,627 were found invalid and claims 1 and 11 of 5,615,342 found not infringed. The second adopted these findings.
Ortho-McNeil Pharmaceuticals	N	7 of 12	Owner wins first 2 lawsuits: 1) First finds valid and infringed; and 2) Second finds no inequitable conduct. 5 consolidated with these wins. 1 more owner win and 4 settlements.
Parker-Hannifin Corp.	N	0 of 9	7 settlements. 2 alleged infringer wins: 1) The first finds patent no. 6,777,095 not infringed. Second enforces prior settlement against owner.
Patriot Scientific Corp.	N	3 of 17	11 settlements. 3 related and pending. 1 transferred. 2 early cases disputed patent ownership.
RareDomains.com	N	10 of 10	10 lawsuits related but owner PVD before validity determined.
Rates Technology Inc.	N	2 of 41	38 settlements. 2 lawsuits transferred and 1 other procedural dismissal.
Rembrandt Technologies, LP	N	16 of 16	All lawsuits consolidated or transferred into MDL (*In re: Rembrandt Technologies LP*). 1 of these settled. MDL appeal is pending after alleged infringer won on SJ (not infringed).
Ronald A. Katz Technology Licensing, LP	N	100 of 101	99 lawsuits transferred to or affiliated with 1 MDL (*In re: Katz Interactive Call Processing Patent Lit.*). Alleged infringers in 31 of the 99 settled and in 7 won on SJ. MDL remains pending. Final lawsuit settled before it was transferred to MDL.
Sanofi-Aventis U.S.	N	16 of 22	15 lawsuits consolidated into 1 lead (*Sanofi-Aventis U.S., LLC v. Sandoz, Inc.*). Lead settled with a consent judgment (infringed and valid). 6 other settlements.
Teva Pharmaceuticals	N	10 of 17	10 lawsuits related for discovery but settled before validity determined. 7 other lawsuits settle.
Tillotson Corp.	N	0 of 22	Owner won second lawsuit on SJ (valid and infringed). 20 other lawsuits settled. 1 lawsuit dismissed on procedural grounds.
Trading Technologies Int'l	N	8 of 26	Owner won first lawsuit. 14 settlements thereafter. 7 cases consolidated with 1 pending lead. 1 consolidated into 1 other pending case. 1 other lawsuit pending.
Tristrata Technology	N	0 of 11	Owner won first lawsuit at trial. Subsequently 9 more settlements and 1 owner win by default.
Warner-Lambert / Pfizer	N	14 of 17	13 lawsuits combined into 1 MDL (*Pfizer Inc., Et al. v. Teva, Et al.*). The MDL settled after alleged the Federal Circuit reversed infringer win on SJ (not infringed). 3 more settlements.

"CE" indicates whether an owner lost a lawsuit by collateral estoppel based on finding of invalidity in an earlier case.
"Cases Joined" indicates the fraction of MLP cases for each owner combined by MDL, transfer, or consolidation (at least for validity determination).