

How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes

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Abstract

In this article, we attempt to answer some fundamental questions regarding the role played by the courts in the patent system by examining a set of patent cases in great detail. To this end, we have constructed a new database based on court docket reports for all patent cases filed in 1995 and 1997 and tracked the evolution of these cases (about 3700 cases) through to settlement or adjudication on the merits. The focus of this effort is on keeping track of a number of variables to understand the precise disposition of each case.

We have also tracked different characteristics in order to estimate patent litigation costs in each case. For instance, we note the amount of time taken by each case through to final disposition. In addition, we have devised a new proxy for measuring costs—the number of documents filed by all the parties in each case—which we believe is more closely correlated with actual litigation costs than the traditional measures of time expended and the stage of termination in each case.

Our results show that many more patent cases are adjudicated on the merits (either at the pre-trial stage through a grant of summary judgment or at trial) than is commonly thought. This work is one of the few scholarly efforts in empirical litigation scholarship that can actually estimate this amount because most other papers rely exclusively on the imprecise categorization of the Administrative Office of U.S. Courts to determine case outcomes. Our results demonstrate that in addition to the small number of patent cases going to trial (about 5%), another significant percentage of cases (about 8-9%) are resolved on the merits through summary judgment. Consequently, summary judgments are important in patent cases for determining patent validity and infringement, and the summary judgments related to patent validity occur earlier in the litigation compared to summary judgments related to patent infringement. This result is somewhat encouraging given the important role played by the courts in revoking patent rights improvidently granted at the outset by the PTO. Nevertheless, despite the fact that such rulings occur "early" in the proceedings compared to patent trials, we should still be concerned about the huge transaction costs associated with patent litigation because summary judgments in general, and summary judgment based on invalidity in particular, are expensive compared to summary judgments granted on other grounds.

In addition, there is a significant difference in duration and number of documents filed in cases resolved through summary judgment for the 1997 filed cases compared to the 1995 filed cases. This is consistent with the changes brought about by the *Markman* decision that invigorated claim construction as a threshold legal issue in patent litigation. The increased importance placed on first construing the claims before addressing infringement or invalidity after *Markman* necessitates that significant resources be allotted to the step of claim construction before (or concurrent with) filing motions for summary judgment.

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Overall, our results show that transaction costs associated with patent litigation loom large, and rulings on the merits by the courts concerning patent validity, patent infringement, and remedies for infringement (*i.e.*, injunctive relief or damages) are rare, expensive, and not pursued to completion by most litigants. Instead, most patent cases settle fairly quickly (about 12-15 months) after the filing of the complaint, thereby reducing the actual cost of patent litigation considerably.

This work has significant implications for all civil litigation in general, and for recent efforts to reform the patent system by either improving patent quality through new administrative procedures at the PTO or for substantive patent law reform. Our results strongly suggest that patent litigation is largely a settlement mechanism, and hence, any proposed change in the patent laws should be analyzed in terms of the incentives generated for prompt settlement of patent disputes. In addition, entities and interest groups seeking cheaper and/or a greater number of patent rulings concerning validity and infringement will be wise to look elsewhere, perhaps at other patent institutions such as the PTO or at other alternative dispute resolution (ADR) mechanisms that complement the courts.

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I. Introduction: Why Study the Adjudication of Patent Cases?

A patent is a powerful tool. It grants its owner exclusive rights over a particular technology by allowing him to exclude others from the use of that technology.¹ It allows the inventor to exploit his unilateral control over the technology by charging other parties for the right to use the invention (i.e., a license). Or the inventor can retain sole access to the technology, charging supra-competitive prices for a good or service that no one else can produce without permission.² Either way, the patentee retains sole control over his invention.

From an institutional perspective, the patent system is a two-stage bargain.³ At the first stage, the U.S. Patent and Trademark Office (hereafter the “PTO”) grants patent rights to inventors after conducting an examination of the prior art and of the patent application to determine whether the requirements for patentability are met.⁴ At the next stage, in order to enforce their issued patent rights, patentees have to resort to the federal courts with an action for patent infringement.⁵ Alleged infringers may counter by challenging the scope, validity, and enforceability of patent rights issued in the first stage in the courts.⁶ Thus, the patent system itself contemplates a role for the courts that involves reviewing the work of the PTO.

The patent regime is typically justified by the economic argument that the benefits it creates outweigh the costs it imposes.⁷ The possibility of high profits and licensing fees accruing to patent holders guarantees that the creator of any valuable invention will be able to recoup his costs, thereby creating incentives to invest in research and new technologies.⁸ However, these benefits of the patent system must not only outweigh the direct costs described above, but also the indirect “social costs” the system creates.⁹ For example, other inventors may face higher research and development costs as they take care to avoid the patented invention by “engineering around” it.¹⁰ Some technological areas may not be exploited or improved at all, as competitors avoid them for fear of running afoul of patented technologies to which they may not

¹ 35 U.S.C. § 271a (2005).

² *Id.* §§ 284, 289.

³ See Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763,772-73 (2002); Jay P. Kesan & Marc Banik, *Patents as Incomplete Contracts: Aligning Incentives for R&D Investment with Incentives to Disclose Prior Art*, 2 WASH. U.J.L. & POL'Y 23, 34-35 (2000) (describing how the incomplete contract aspects of a patent can be interpreted as a two-stage bargain).

⁴ The requirements for patentability are set forth in 35 U.S.C. §§ 101-103, 112.

⁵ *Id.* § 271.

⁶ Kesan, *supra* note 3, at 155 (describing how patent rights can be revoked by the courts during litigation); HERBERT F. SCHWARTZ, *PATENT LAW AND PRACTICE* 51-59 (3rd ed. 2001) (describing the grounds and procedures for declaring all or part of a patent to be invalid in the context of an infringement case).

⁷ See Partha Dasgupta & Joseph Stiglitz, *Industrial Structure and the Nature of Innovative Activity*, 90 ECON. J. 266 (1980); Pankaj Tandon, *Innovation, Market Structure and Welfare*, 74 AM. ECON. REV. 394 (1984); Oliver E. Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoff*, 58 AM. ECON. REV. 18 (1968). (discussing the comparison of the costs and benefits of patents).

⁸ See Jay P. Kesan, *Intellectual Property Protection and Agricultural Biotechnology: A Multidisciplinary Perspective*, 44 AM. BEHAV. SCIENTIST 464, 488-90 (2000) (outlining the incentives created by the patent system).

⁹ See Robert P Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH L.J. 577 (1999); See also Kesan, *supra* note 3 (describing the social costs of patents).

¹⁰ See Kesan & Banik, *supra* note 3, at 37-39 (discussing the costs created by engineering around a patent).

have legal access. For the social benefits of patents to exceed their total social costs, it is important that the fundamental bargain be retained that patents be granted only to inventions that are new, useful, and nonobvious.¹¹ Moreover, even when it is appropriate to grant a patent, it is essential that the patent rights not be overly broad, covering aspects of the technology that are beyond the invention's "non-obvious" contribution,¹² and thereby restricting access to technology that more properly lies in the public domain. Finally, a patent system that grants unwarranted or overly broad patents creates rewards for "getting some patent claims past the patent examiner" rather than promotes useful research. Thus, a patent regime that grants many "bad" patents is costly from a social welfare standpoint, imposing indirect and direct costs on numerous actors affected by the patent system.¹³

For the reasons described above, it is important that a patent be granted only in the appropriate cases where the conditions for patentability are met. It is the job of the examiners at the PTO to insure that patent rights of appropriate scope are granted when warranted.¹⁴ However, there is growing concern that the number of overbroad or so-called "bad" patents may be increasing. The doubling of both the number of applications and the number of awarded patents between 1980 and 1996 has been accompanied by complaints about the level of resources devoted to examining applications and the training, incentives, and procedures facing patent examiners.¹⁵ Moreover, patent applications have become more complex over the past twenty years,¹⁶ and patents are being granted in ever broadening areas of technology.¹⁷ Given the growing rate of patent applications and expanding areas of technology being patented, there is some concern that the number of overbroad or "bad" patents may be increasing. Consequently, there is a greater need for an efficient mechanism for revoking such overbroad patents.

The U.S. currently has two avenues for challenging the validity of a patent: the PTO's reexamination procedures and invalidation through the courts. The PTO currently has two mechanisms for reexamining previously granted patents.¹⁸ The original reexamination

¹¹ 35 U.S.C. §§ 101-103 (2005).

¹² See SCHWARTZ, *supra* note 6, at 73-75 (giving the formal requirements for a technological change to be nonobvious and therefore worthy of a patent).

¹³ See Bronwyn H. Hall et al., Prospects for Improving U.S. Patent quality via Post-grant Opposition, (May 2003), available at <http://papers.nber.org/papers/W9731.pdf> (discussing how "low quality patents" impose costs by slowing the rate of invention while at the same time spurring patent applications and placing greater burdens on the PTO).

¹⁴ See SCHWARTZ, *supra* note 6, at 18-30 (describing the process for examination and prosecution of patents).

¹⁵ See Merges, *supra* note 9, at 601 (discussing the stresses faced by patent examiners). See also John H. Barton, *Reforming the Patent System*, 287 SCI. 1933, 1933 (2000) ("A PTO examiner can give each application an average of 25 to 30 hours and may in fact give much less. This is much less than the average time spent by a lawyer in preparing an application.") (footnotes omitted).

¹⁶ See John R. Allison & Mark Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, (2002) (showing that patents now contain more claims, more cited references, and numbers of inventors).

¹⁷ Jay P. Kesan and Andres A. Gallo, *Why 'Bad' Patents Survive in the market and How Should We Change?—The Private and Social Costs of Patents*, EMORY L.J. (forthcoming 2005) (discussing the new "patentable" areas and technologies which must be evaluated by patent examiners).

¹⁸ See Stuart J. H. Graham et al., Post-Issue Patent "Quality Control": A Comparative Study of US Patent Re-examinations and European Patent Oppositions (Feb. 2002), available at <http://papers.nber.org/papers/W8807.pdf> (discussing the current U.S. reexamination procedure and comparing it with the patent opposition procedures employed by other countries); see also Hall et al., *supra* note 13; Kesan & Gallo, *supra* note 17 (discussing the Japanese patent invalidation process); Merges, *supra* note 9; Allan M. Soobert, *Breaking New Grounds in*

procedure was initiated in 1980 as a low cost method for reviewing patent validity.¹⁹ However, this procedure suffers from numerous limitations, and it is not widely used.²⁰ Third parties can request a reexamination of a patent, based on “new” prior art in the form of a patent or published work that was not considered in the original examination.²¹ They are not allowed to present other physical evidence or expert testimony to challenge the validity of the patent as they could in court. Even if the PTO determines that there is “a substantial new question of patentability,” the role that the third party can play in the patent reexamination process is extremely limited. In effect, the procedure is similar to that of the original examination and involves only the examiner and the patentee.²² If all or part of the patent is revoked, the patentee can appeal as he could after the original examination, while the third party has no forum for an appeal.²³ And if the reexamination does not revoke any patent rights, any new prior art presented during the reexamination will be weakened as potentially invalidating evidence in any subsequent litigation, because the court is very likely to presume that the PTO has already adequately evaluated it and found it to be unpersuasive.

Thus, both the grounds for requesting a reexamination and the nature of the procedure make the system unattractive to interested third parties. As a consequence, the number of reexaminations requested has reached about 20% of the number that was anticipated when the legislation was enacted—running at 200 to 400 cases a year.²⁴ Thus, while less than 1% of U.S. issued patents face reexamination, approximately 8% of European patents face oppositions.²⁵ It stands to reason that unless U.S. patent examiners are more accurate than their European counterparts by a factor of twenty, the U.S. reexamination system is not doing a good job of weeding out overbroad or unwarranted patents.

To alleviate these problems, an alternative mechanism was created.²⁶ Under the *inter partes* reexamination procedure introduced in 1999, third parties are allowed a much greater role in the examination process.²⁷ However, they have very limited ability to appeal a ruling under this procedure, and these third parties are hampered by the PTO reexamination process in subsequent infringement litigation in the courts. As a consequence, it is not surprising that this system is utilized at an even lower rate than the original system; only twenty-six *inter partes* reexaminations were requested in the first five years after its enactment.²⁸

Administrative Revocation of U.S. Patents: A Proposition for Opposition— and Beyond, 14 SANTA CLARA COMPUTER & HIGH TECH. L.J., 63 (1998) (discussing the deficiencies of the U.S. reexamination systems and a comparison of the with both the European and Japanese approach.). For a critical analysis of the current U.S. reexamination procedures, see Joseph Farrell & Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 BERKELEY TECH L.J. (2004).

¹⁹ Farrell & Merges, *supra* note 18, at 966.

²⁰ *Id.*

²¹ Merges, *supra* note 9, at 610.

²² Soobert, *supra* note 18, at 101.

²³ *Id.* at 101-2.

²⁴ Merges, *supra* note 9, at 610.

²⁵ Farrell & Merges, *supra* note 18, at 966.

²⁶ *Id.* at 967.

²⁷ *Id.*

²⁸ *Id.*

Therefore, given the limited opportunities for post-issuance patent challenges in the PTO,²⁹ much of the burden of revoking overly broad patents will fall on the courts in the context of a patent infringement lawsuit (or declaratory judgment action).³⁰ In response to the filing of such a case, the alleged infringer may mount a defense that some or all the asserted patent claims should not have been granted in the first place.³¹ If the court finds that the PTO erred in granting the patent, it can declare some or all the patent claims to be invalid.³² Thus, the courts are an integral part of the patent system, and serve as an institutional mechanism not only for protecting and enforcing valid patent rights, but also for maintaining the integrity of the process used to grant those rights.

The patent litigation system, however, has its shortcomings as a mechanism for revoking invalid patents. The only grounds for launching a suit regarding a patent is a charge of infringement, and the validity of a patent can be challenged in a counterclaim in a patent infringement suit or as part of a declaratory judgment action launched after the threat of such a suit. However, in the absence of a charge of infringement, a third party has no mechanism for challenging a patent in the courts. Even after a complaint has been filed, the courts require clear and convincing evidence in order to invalidate a patent.³³ Under current law, patents are granted a “presumption of validity” and the challenger must provide “clear and convincing evidence” rather than a “preponderance of evidence” that the patent should be totally or partially invalidated.³⁴ But these are limitations that can be dealt with through appropriate patent legislation.³⁵

There are other more fundamental problems with using the courts as a mechanism for revoking wrongly granted patent rights. There is general agreement that the cost associated with pursuing a patent lawsuit is high. Previous authors have cited legal costs of patent litigation running from half a million dollars to three million dollars per suit or \$500,000 per claim at issue per side.³⁶ These costs create incentives for the parties to settle their dispute rather than seek a final judgment on the merits. Throughout the case, the parties will be receiving additional information about the strength of their positions through the results of discovery, the court’s construction of the patent claims at issue, rulings on motions for summary judgment, rulings on preliminary injunctions, and the like. Economic theory suggests that when it becomes obvious that a patent is very likely to be invalidated, it is in the best interests of the patent holder to offer a cheap license to keep the patent rights intact, and it is in the best interests of the defendant to accept such an offer rather than incur further significant legal costs.³⁷ Specifically, it is in the

²⁹ See Merges, *supra* note 9, at 610-11; Farrell & Merges, *supra* note 18, at 967 (describing how few patents are subjected to reexamination by the PTO).

³⁰ For simplicity, we will refer to both types of cases as “patent infringement” suits.

³¹ See SCHWARTZ, *supra* note 6, at 51-52 (describing how the invalidity defense can be used in patent infringement case); *id.* at 42-44 (explaining the conditions under which a patent’s validity attacked in a declaratory judgment action).

³² *Id.* at 51-59 (describing the grounds and procedures for declaring all or part of a patent to be invalid in the context of an infringement case).

³³ Jennifer K. Bush et al., *Six Patent Law Puzzlers*, 13 TEX. INTELL. PROP. L.J. 1, 15-17 (2004).

³⁴ *Id.* at 15-17

³⁵ In fact, such a change is currently being debated. See *id.* at 16.

³⁶ See Hall, *supra* note 13, at 8.

³⁷ See Stephen C. Yeazell, *Getting What We Asked For, Get What We Paid For, and Not Liking What We Got: The Vanishing Civil Trial*, 1 J. EMPIRICAL LEGAL STUD. 943 (2004) (discussing how changes in civil procedure

interest of the alleged infringer to accept a license if its cost would be less than the cost of continued litigation.³⁸ Only patents where it is difficult to predict who will win are likely to proceed further to a final determination on the merits.³⁹

However, society may have an economic interest in seeing these disputes decided through a formal judgment, which neither the court nor the parties take into account.⁴⁰ The parties may settle when both decide that the benefits to doing so exceed their *private* costs of continuing litigation. In short, as other authors have pointed out, pursuit of patent invalidation suffers from a “free rider” problem.⁴¹ One firm may incur the court costs, but firms incurring no costs will benefit, too. Therefore, everyone has an incentive to allow someone else to take on the burden. Thus, even if the technology blocked by a “bad” patent is very useful or valuable, no one firm or even a small group of firms may pursue its invalidation. Stated alternatively, it is not just how valuable a patent is that is important, but to whom that value accrues that matters.⁴²

The courts do little to counter these incentives, because they promote settlement to save the public the expense of a trial or lengthy litigation.⁴³ Trials are expensive, and courts have limited resources, so in civil cases it is generally considerably more efficient to promote a resolution of the dispute without the expense of a lengthy trial or the expense of continuing the proceedings until some form of judgment is rendered.⁴⁴ In fact, it is considered a hallmark of efficient court management to encourage parties to resolve their disputes outside the courtroom

promoting fact-finding during discovery have created an environment in which parties are more likely to settle as their expectations of trial outcomes converge and they evaluate whether to undertake additional pre-trial expenditures or seek a settlement).

³⁸ See Yeazell, *supra* note 37.

³⁹ This is an extension of the general theory of litigation set forward by Priest & Klein, *infra* note 60, who argue that if a case has a clear cut winner and loser, the parties are likely to settle. The authors explain that only cases with a high degree of uncertainty, that is, cases in which the parties assess the odds of winning differently or where the odds are close to 50% for each, will actually go to trial. *Id.* See also John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AM. INTELL. PROP. L. ASS'N Q.J. 185, 205-7 (1998) (finding that the rate of invalidation cannot be shown to be statistically different from 50%).

⁴⁰ See Merges, *supra* note 9; see also Kesan, *supra* note 3 (describing the costs to society when bad patents are allowed to stay in force).

⁴¹ See Farrell & Merges, *supra* note 18, at 948-960 (discussing how firms which do not contribute to litigation costs will benefit from the ruling, so everyone has an incentive to let someone else incur the expense). We believe there is also a “public good” to be obtained from formal rulings of infringement, since they provide information to uninvolved third parties that may help them avoid some unnecessary expenses of engineering around a patent. Obviously, the parties benefiting from such information will not contribute to the cost of obtaining it in court.

⁴² See John R. Allison et al., *Valuable Patents*, 92 GEO L.J. 435 (2004) (arguing that patents which are litigated are likely to be the most valuable). Note that we do not dispute the argument that the patents which are litigated are likely to be valuable patents. We contend that the distribution of value matters as well; if it is distributed among many parties, the case will probably not be litigated through to a judgment on the merits. The issue is not that the wrong patents are litigated, but that too few may be reviewed in court.

⁴³ See Samuel R. Gross & Kent D. Syverud, *Getting to No: A Study of Settlement Negotiations and the Selection of Cases for Trial*, 90 MICH L. REV. 319, 320 (1991) (“[L]awyers, judges and commentators agree that pretrial settlement is almost always cheaper, faster and better than trial. Much of our civil procedure is justified by the desire to promote settlement and avoid trial.”).

⁴⁴ See *id.*

because litigation costs are also a loss to society.⁴⁵ But neither the court nor the parties include the social benefits of revoking a “bad” patent in making their private decisions about the appropriate use of their resources.⁴⁶ Third-party firms simply conclude that it is cheaper to pay for a license or engineer around an erroneously granted patent. They will not take into account the benefit of appropriately defining the scope of patent protection to other firms or to society as a whole when making their decisions. Consequently, the validity of too few patents will be reviewed on the merits by the courts.

Thus, any analysis of reform to the patent system requires a better understanding of the effectiveness and cost of the courts in adjudicating the validity, infringement, and enforceability of issued patents. It is important to know exactly how patent cases are resolved—do they settle or do they proceed to some form of adjudication on the merits? It is important to understand the costs of such cases and the magnitude of the incentives to settle. And it is crucial to know how these factors relate to the courts’ ability to correct or tailor the scope of patent rights.⁴⁷ It should be noted that we are not alone in worrying that the use of non-judicial forms of dispute resolution may have unanticipated consequences. There is a growing literature on the potential social costs of the “vanishing trial.” And while we care less about trials, *per se*, we are in agreement that the movement away from public forms of dispute resolution may be a cause for concern.

Most previous work on patent litigation, in fact, has concentrated on the small proportion of cases that go to trial.⁴⁸ Even studies that attempt to analyze all forms of adjudication employ government statistics which, while an excellent starting point, do not have the required degree of precision needed to identify which cases settle and which are adjudicated on the merits.⁴⁹ In this work, we start from the available government data sources but supplement them by studying the actual court docket reports for all patent cases filed in three recent years: 1995, 1997 and 2000, and then we follow each patent case until it is terminated. From these reports, we are able to precisely determine how each case was resolved.⁵⁰ We also expand the set of proxies for litigation costs by including a new measure available in the court docket reports—the number of documents filed in the case—which we believe should be highly correlated with the actual number of attorney “billable hours” expended on the case.⁵¹ We then determine how many

⁴⁵ See Yeazell, *supra* note 37, at 947 (“Trials, especially in the common-law tradition, are in many respects “wasteful” they produce a victor, but at great cost to both sides and to the public. . . . “[A] trial is a failure.”) (quoting Gross & Syverud, *supra* note 43, at 320).

⁴⁶ See Gross & Syverud, *supra* note 43, at 320 (discussing the cost-saving motivations behind the effort to avoid trials); see also Stephan Landsman, *So What? Possible Implications of the Vanishing Trial Phenomenon*, J. EMPIRICAL LEGAL STUD. 973, 977 (2004) (discussing possible losses to the public from the small number of trials).

⁴⁷ We are not alone in our concern that the efforts to achieve efficiency in the courts by promoting private dispute resolutions can have social consequences. There is a growing concern that the absence of trials deprives society of important information. See, e.g., Landsman, *supra* note 46, at 977 (“The evidence trials generate may be of value not only to litigants and the courts, but to the public at large. The risks posed by asbestos, cigarettes, and a host of other items would not have been broadcast without the sharing of information obtained in litigation and disseminated at trial.”). A trial is not necessary to declare the invalidity of a patent—a ruling at any stage would suffice since it must be reported to the PTO. But the principle remains the same.

⁴⁸ See *infra* Part II.C.

⁴⁹ See *infra* Part II.A.

⁵⁰ See *infra* Part III.A.

⁵¹ See *infra* Parts III.B-D.

actual rulings on the merits are made concerning infringement and invalidity, how those cases are resolved, and what their estimated litigation costs are.

Using this methodology and by tracking these cohort of cases, we are now able to provide a more complete picture of patent adjudication. As we will show, more final rulings on the merits are rendered prior to trial in patent cases than has been suggested in the previous literature.⁵² Successful final rulings of summary judgment are in fact more important than bench or jury trials in resolving patent cases.⁵³ Nonetheless, the vast majority of cases settle and all rulings, including grants of summary judgment, appear to be expensive.⁵⁴ In addition, we find that there are very few rulings of invalidity by the courts. While cases in which there is a final ruling on infringement are equally likely to terminate either at the pre-trial stage or through a trial,⁵⁵ a much higher proportion of final rulings of invalidity occur at the pre-trial stage.⁵⁶ However, despite the “early” stage at which invalidity rulings are rendered, they are among the most expensive patent cases.⁵⁷

This article is organized as follows. Part II reviews the previous literature on patent litigation. Part III describes our methodology for collecting data on patent cases and classifying them according to the precise manner in which they were resolved. We then analyze the results and insights that we gain from a study of these case outcomes. Part IV presents our analysis of the costs of patent litigation, across all cases, for cases adjudicated through final judgments and for cases with formal rulings of infringement or invalidity. In Part V, we present our conclusions.

We believe the empirical results from this work can serve as a foundation for any serious patent reform proposal.⁵⁸ For instance, the expense of rulings, particularly rulings of invalidity, suggests that use of the courts creates the wrong incentives—the incentive to settle cases, rather than the incentive to see that questionable patents are reviewed and then retained or revoked. The lack of rulings and the small number of issued patents that are revoked suggest that these incentives are inhibiting the ability of the courts to fulfill their role in the patent system. It would seem that some other new procedures, such as post-grant oppositions, are necessary to replace or supplement the courts as the primary institution for reviewing questionable patents.

⁵² See *infra* Part III.C.

⁵³ See *id.*

⁵⁴ See *infra* Parts III.C, IV.B-C.

⁵⁵ See *infra* Part III.D.

⁵⁶ See *id.*

⁵⁷ See *infra* Part IV.D.

⁵⁸ As of this writing, legislation reforming the U.S. patent system is being considered by Congress. See Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005). See, e.g., Graham et al., *supra* note 18; Hall, *supra* note 13; Mark D. Janis, *Rethinking Reexamination: Toward a Viable Administrative Revocation System for U.S. Patent Law*, 11 HARV. J.L. & TECH 1 (1997); Kesan & Gallo, *supra* note 17; F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55 (2004); Merges, *supra* note 9; Joseph Scott Miller, *Building a Better Bounty: Litigation-Stage Rewards for Defending Patents*, 19 BERKELEY TECH. L.J. 667 (2004); Arti K. Rai, *Allocating Power over Fact Finding in the Patent System*, 19 BERKELEY TECH. L.J. 907 (2004).

II. Previous Studies of Patent Litigation

Research on patent litigation is one of many topics growing out of the general study of civil litigation. The classical theoretical models of litigation focus on how defendants and plaintiffs bargain to settle a filed dispute or go to trial.⁵⁹ Under perfect information—that is, when both parties know with certainty who would win at trial—no trials would occur. There is no reason for the parties to expend resources to achieve an outcome which is determined with certainty in advance. Thus, for trials to occur, the parties must be either behaving irrationally, or there must be some uncertainty about the probability of a victory in the courtroom. In the “divergent expectations” models, uncertainty arises, because both parties are simply unsure about the prospect of victory.⁶⁰ In asymmetric information models, one party has more information than the other, and his settlement offers are intended to serve as a signal of his bargaining strength or as a mechanism for determining the strength of his opponent. Thus, models of settlement describe how the parties bargain to determine shares of the surplus that would result from avoiding the costs of a trial under conditions of uncertainty and asymmetric information.⁶¹ These bargaining models have been used to explore how differences in stakes, the cost of litigation, and legal rules influence the choice between settling the dispute or going to trial.⁶² Recent theoretical work also takes a more sophisticated view of what happens within the case by modeling both the costs and the revelation of information that occur during the discovery phase preceding trial.⁶³

Another theory explaining the existence of trials is “asymmetric stakes”; if the defendant’s loss does not equal the plaintiff’s gain, there may be no surplus from the avoidance of a trial to divide and no point in bargaining to a settlement.⁶⁴ Usually, the asymmetric stakes

⁵⁹ The literature on this topic is enormous; the important theoretical works on this topic include: Lucian Arye Bebchuk, *Litigation and Settlement under Imperfect Information*, 15 RAND J. ECON. 404 (1984); Barry Nalebuff, *Credible Pretrial Negotiation*, 18 RAND J. ECON. 198 (1987); Ivan Png, *Strategic Behavior in Suit, Settlement and Trial*, 14 BELL J. ECON. 539 (1983); George L. Priest & Benjamin Klein, *infra* note 61; Jennifer Reinganum & Louis Wilder, *Settlement, Litigation and the Allocation of Litigation Costs*, 17 RAND J. ECON., 557 (1986); Steven Shavell, *Any Frequency of Plaintiff Victory is Possible*, 25 J. LEGAL STUD. 493 (1996); Kathryn E. Spier, *The Dynamics of Pretrial Negotiation*, 59 REV. ECON. STUD. 93 (1992). An excellent summary of the early literature can be found in Robert D. Cooter & Daniel L. Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 37 J. ECON. LITERATURE, 1067 (1989). More recent work, particularly that involving multiple parties, is summarized in Andrew F. Daugherty and Jennifer F. Reinganum, *Economic Theories of Settlement Bargaining*, (April 2005), available at <http://www.vanderbilt.edu/Econ/wparchive/workingpaper/VU05-W08.pdf>.

⁶⁰ For example, each party’s estimate of winning may be drawn from a normal distribution about their true probability of winning, with most estimates close to the true value but occasionally wildly optimistic or pessimistic. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984) showed that parties are most likely to be mistaken, and trials are therefore most likely to occur, in cases where each side’s actual prospect of winning is 50%. Thus, we would expect to observe an equal number of victories for each side in trials when they do occur—this is the well known “50% rule.” *Id.*

⁶¹ See Joel Waldfogel, *Reconciling Asymmetric Information and Divergent Expectations Theories of Litigation*, 41 J. L. & ECON 451 (1998) (discussing the implications of the two models).

⁶² See Cooter & Rubinfeld, *supra* note 60 (summarizing the implications of different modeling specifications).

⁶³ For two examples, see Robert D. Cooter & Daniel L. Rubinfeld, *An Economic Model of Legal Discovery*, 23 J. LEGAL STUD. 435 (1994) and Amy Farmer & Paul Pecorino, *Civil Litigation with Mandatory Discovery and Voluntary Transmission of Private Information*, 34 J. LEGAL STUD. 137 (2005).

⁶⁴ See, e.g., Peter Siegelman & Joel Waldfogel, *Toward A Taxonomy of Disputes: New Evidence Through the Prism of the Priest/Klein Model*, 28 J. LEGAL STUD. 101 (1999) pp. 109-11.

are produced by costs and benefits created outside the courtroom, such as the reputation effects or precedents created for other litigation.⁶⁵

There is an immense and growing empirical literature testing the implications of these models, both in civil litigation in general and within specific topical areas.⁶⁶ Some of these studies examine all civil cases, but it is also common to focus on one area of litigation.

II.A Empirical Work on Patent Litigation

Patent infringement litigation is one of the few topical areas where researchers have used empirical studies to test the implications of the various theoretical models of litigation.⁶⁷ Researchers have been able to explore important questions not only about the general level of patent litigation, but also regarding important aspects of patent cases related to the general theory of civil litigation.⁶⁸ Who files a patent suit? How do parties and the courts behave once a suit is filed? These questions are crucial for analyzing what happens in patent litigation and how well the courts fulfill their role of protecting patent rights while eliminating bad patents.

Empirical research on patent litigation makes use of three basic sources of data, each demonstrating a different aspect of patent litigation and each with particular strengths and weaknesses: written opinions in patent cases available through U.S. Patent Quarterly⁶⁹ (which

⁶⁵ *Id.* at 109.

⁶⁶ *See, e.g.*, Daniel P. Kessler and Daniel L. Rubinfeld, Empirical Study of the Civil Just System (Oct. 2001), available at <http://papers.nber.org/papers/w10825.pdf>.

⁶⁷ Most of the work specifically on patent litigation has been empirical rather than theoretical. *But cf.* Michael J. Meurer, *The Settlement of Patent Litigation*, 20 RAND J. ECON. 77 (1989) (demonstrating that trials may occur in patent cases even under full information because the post-settlement duopoly price may be sufficiently less than the monopoly price after a judgment at trial to wipe out the cost savings from settling and exploring conditions under asymmetric information in which the holder of a weak patent may “bluff” through his settlement offer); Jean O. Lanjouw & Josh Lerner, *The Enforcement of Intellectual Property Rights: A Survey of the Empirical Literature* 8-9 (Dec. 1997), available at <http://papers.nber.org/papers/w6296>.

(outlining a stylized theoretical model of the choice to file and strategic behavior within a patent lawsuit is developed and predicting that the propensity to go to trial will be increasing in uncertainty about trial outcomes, the asymmetry of expectations about trial outcomes, and the cost of going to trial). *See also* Farrell & Merges, *supra* note 18 (developing a simple model of how external benefits to uninvolved firms and consumers may lead to too little investment in patent litigation and too few patents being found invalid).

⁶⁸ *See* Allison et al., *supra* note 42; James Bessen & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 24 (2005); 1; Lanjouw & Lerner, *supra* note 68; Jean O. Lanjouw & Mark Schankerman, *Characteristics of patent litigation: A Window on Competition*, 12 RAND J. ECON. 129 (2001) [hereinafter Lanjouw & Schankerman, *Patent Litigation*]; Jean O. Lanjouw & Mark Schankerman, *Protecting Intellectual Property Rights: Are Small Firms Handicapped?*, 47 J. L. ECON. 45 [hereinafter, Lanjouw & Schankerman, *Small Firms*]; Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographical Choice Affect Innovation?*, 79 N.C.L. REV. 889 (2001) [hereinafter Moore, *Forum Shopping*]; Kimberly A. Moore, *Judges, Juries and Patent Cases—An Empirical Peek inside the Black Box*, 99 MICH L. REV. 365 (2000) [hereinafter Moore, *Judges, Juries*]; Deepak Somaya, *Strategic Determinants of Decisions not to Settle Patent Litigation*, 24 STRATEGIC MGMT. J. 17 (2003) [hereinafter, *Strategic Determinants*]; Deepak Somaya, *Firm Strategies and Litigation Tactics as Determinants of Patent Suit Duration in Computers and Research Medicines* (2002), available at <http://emertech.wharton.vpenn.edu/Wharton/MiniconfPapers/SomayaPatentLitig2002c.pdf> [hereinafter Somaya, *Duration*].

⁶⁹ The United States Patents Quarterly, The Bureau of National Affairs, Washington D.C., various issues

gives information on all written opinions but, naturally, cannot provide information about cases resolved through other mechanisms or about the patents at issue in such cases); patent cases reported to the U.S. Patent Office (PTO data) and available through Derwant LitAlert⁷⁰ (which gives detailed information about the patents involved in every case reported, but does not include all cases because there is incomplete reporting to the PTO⁷¹); and the record of patent cases extracted from the data on all litigation produced by the Administrative Office of the District Courts (AO)⁷² (from which all patent cases can be extracted⁷³ but which does not give information about the patents at issue). These sources are supplemented by data on the parties involved in the litigation or patent holders through Compustat and the NBER patent database prepared by Hall et al.⁷⁴ More recent studies are also supplementing these sources by consulting the information on cases accessible through the on-line docket reports available at the PACER websites.⁷⁵

Several researchers have identified what seems to be an increase in the rate of patent litigation, even to talk of a litigation “explosion.”⁷⁶ For many of the past twenty years, the number of patent suits grew at a rapid rate that largely paralleled the growth in the total number of patents. Prakash-Canjels⁷⁷ analyzes the trend in patent cases using reported data provided by the AO and shows that the total number of patent cases filed each year increased by 111% between 1990 and 2000.⁷⁸ Lanjouw and Schankerman⁷⁹ estimate the probability of a patent being involved in litigation and find no change over the period 1978 to 1995.⁸⁰ However, Somaya,⁸¹ using the same data as Prakash-Canjels, also examines the rate of patent litigation between 1970 and 2000. His data show that the number of patent cases filed per year was stagnant until the mid-1980s and has been growing at an increasing rate since that date.⁸² Bessen and Meurer also find that patent litigation may have accelerated in the late 1990s and exceeded the growth in existent patents during that period.⁸³ Thus, it appears that the role of the courts in the patent system is growing in recent years, especially over the past ten years.

⁷⁰ Derwant LitAlert, <http://www.westlaw.com>.

⁷¹ Somaya reports that the PTO data contains about 50-58% of all cases patent cases terminating between 1983 and 1993. Somaya, *Strategic Determinants*, *supra* note 68, at 22.

⁷² Compiled by the Federal Judicial Center. See Federal Judicial Center, Federal Court Cases Integrated Database, <http://www.icpsr.umich.edu/ticketlogin> (last visited Aug. 20, 2005).

⁷³ See Somaya, *Strategic Determinants*, *supra* note 68, at 22 (finding that only 5% of all cases listed PTO data were not included among cases classified as patent cases in the AO data and that therefore the AO data is relatively complete).

⁷⁴ Bronwyn H. Hall et al., The NBER Patent Citations Data File: Lessons, Insights, and Methodological Tool (Oct. 2001), available at <http://papers.nber.org/papers/w8498>.

⁷⁵ Administrative Office of the U.S. Courts, PACER Service Center, <http://pacer.psc.uscourts.gov/> (last visited Aug. 20, 2005).

⁷⁶ Bessen & Meurer, *supra* note 68, at 24 (quoting James Bessen & Michael J. Meurer, *The Patent Litigation Explosion*, 12 (2004) (unpublished manuscript, on file with authors)).

⁷⁷ Gauri Prakash-Canjels, *Trends in Patent Cases: 1990-2000*, 41 IDEA, 283 (2001).

⁷⁸ See *id.* at 285 (showing that 1178 patent cases were filed in 1991 and 2484 were filed in 2000).

⁷⁹ Lanjouw & Schankerman, *Small Firms*, *supra* note 68.

⁸⁰ *Id.* at 55.

⁸¹ Deepak Somaya, Patent Litigation in the United States (1970-2000) (Mar. 30, 2002), available at emertech.wharton.upenn.edu/WhartonMiniConfPapers/SomayaPatentLitig2002c.pdf.

⁸² *Id.* at 4-5.

⁸³ Bessen & Meurer, *supra* note 68, at 24 (quoting Bessen & Meurer, *supra* note 75, at 12).

II.B Studies of the Characteristics of Patents Involved in Litigation

Empirical research on patent litigation has an advantage over the study of other areas of civil litigation; it is possible to identify all patents and, therefore, to identify the entire population of potential litigants. Researchers on patent litigation have exploited this advantage to produce a body of literature exploring what characteristics lead a patent or patentee to be involved in litigation.⁸⁴

One of the earliest studies of the probability of a patent being involved in litigation was done by Lerner.⁸⁵ Based on a sample of 530 biotechnology firms, he calculates the number of patent suits in which the sampled firms were involved in Massachusetts during January 1990 to June 1994 and compares that number with the number of patents they were awarded during that period.⁸⁶ This allows him to estimate that 6 cases per hundred patents held by those firms will be litigated.⁸⁷ It should be noted that this litigation rate is higher than that observed across all patents.⁸⁸ This result would support the conclusion that patents in new technologies, such as biotechnology, are more likely to be litigated than those in mature fields, because there is more uncertainty about case outcomes.

Other work relies on a more global population of potential litigants. Lanjouw and Schankerman estimate the probability of a patent being involved in litigation across a number of technological fields.⁸⁹ They use litigated patents reported to the U.S. PTO between 1975 and 1991, and after adjusting for underreporting, estimate that on average 10.7 patents per 1000 will be litigated.⁹⁰ They also construct a “control group” composed of a patent filed at the same time and having the same general characteristics (technological class, number of claims, etc.) and then perform probit (discrete choice) analysis of the impact of patent characteristics on the probability of litigation.⁹¹

The authors also explore how the probability of a patent’s being involved in litigation is related to various factors. They find support for the view that the probability of litigation increases as the stakes of the case increase. Litigation probability increases with the number of claims describing the patent’s invention⁹² and with the number of later patents that cite it as part of the prior art, defining the state of the art,⁹³ both factors are indicators of patent high value.⁹⁴ But the probability of litigation is not only increases with the stakes of the case, but also with the

⁸⁴ This question is, of course, closely related to the total volume of patent litigation, since it can be used to predict the number of cases expected in the future.

⁸⁵ Josh O. Lerner, *The Importance of Trade Secrecy: Evidence from Civil Litigation*, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=6089 (last visited Aug. 21, 2005), *quoted in* Lanjouw & Lerner, *supra* note 68, at 8-9.

⁸⁶ Lanjouw & Lerner, *supra* note 67, at 8-9.

⁸⁷ *Id.*

⁸⁸ *Compare with* Lanjouw & Schankerman, *Patent Litigation*, *supra* note 68, at 134 (estimating an overall litigation rate of 10.7 patents per thousand).

⁸⁹ *Id.* Lanjouw & Schankerman, *Patent Litigation*, *supra* note 68.

⁹⁰ *Id.* at 134.

⁹¹ *Id.* at 133.

⁹² *Id.* at 138.

⁹³ *Id.*

⁹⁴ *Id.*

“asymmetry” of those stakes, i.e., the degree to which they affect one party more than the other.⁹⁵ The chance that a patent will be involved in a suit increases with the degree to which the later patents citing it are technologically similar.⁹⁶ If the patent is in a “crowded” field, disputes are more likely and reputation building by the patent holder is important to both deter future infringement and aid in future negotiations.⁹⁷ Another form of asymmetric stakes can be seen in self citations: patents that are cited by other patents owned by the same party are also more likely to be litigated, because they form the first link in a research chain and, therefore, have value to that party that is beyond what is at issue in the case.⁹⁸

However, Lanjouw and Schankerman also find that while the probability of a patent appearing in litigation increases with the number of later patents citing it, it decreases with the number of backward citations, i.e., the number of previous patents it cites. In other words, a patent is less likely to be involved in a suit as it’s backward citations increase. The authors interpret this result as demonstrating that in new technological areas, where there is little previous work and few previous patents, there is a high level of uncertainty about the boundaries of patents and the way the courts will interpret them. Hence, it is difficult to come to agreement and parties are more likely to go to court. In general, they find support for the theoretical arguments that parties are more likely to engage in litigation when the outcome is uncertain and/or the stakes are high and asymmetric.⁹⁹

These authors use the same data in a later paper to explore whether large firms may have a strategic advantage over small firms in patent litigation because they have a large portfolio of patents whose licenses can be used as bargaining tools.¹⁰⁰ They find that having a large portfolio of patents reduces the probability of being involved in a dispute on any patent in the portfolio, although the portfolio effect is larger for smaller companies.¹⁰¹ They also find that patents in concentrated industries (i.e., those where the majority of patents are held by a few firms) are less likely to be involved in litigation.¹⁰² This also suggests that firms are engaging in cooperative play and cross-licensing to protect property rights rather than litigation.¹⁰³

A recent study of the probability of a patent’s being involved in litigation was performed by Allison, Lemley, Moore and Trunkey.¹⁰⁴ These authors used the data on patent cases terminated in 1999 to 2000¹⁰⁵ combined with the NBER database of patents filed between 1963

⁹⁵ *Id.* See also Siegelman & Joel Waldfoegel, *supra* note 64 (describing the asymmetric stakes hypothesis).

⁹⁶ *Id.* at 138.

⁹⁷ *Id.* at 132.

⁹⁸ *Id.* at 138.

⁹⁹ *Id.* at 132.

¹⁰⁰ Lanjouw & Schankerman, *Small Firms*, *supra* note 68.

¹⁰¹ *Id.* at 46-47.

¹⁰² *Id.* at 48.

¹⁰³ *Id.* at 46-47.

¹⁰⁴ See Allison et al., *supra* note 42 (determining the characteristics of litigated patents). *Id.* The author further argues that patents involved in litigation are a subset of “valuable patents,” since it would not be worth the expenditure on litigation if they were not valuable. *Id.* While this seems a reasonable claim, we will not focus on it here.

¹⁰⁵ See Kimberly A. Moore, *Xenophobia in American Courts*, 97 NW. U. L. REV. 1497, at 1506-9 (describing the patent case data used in this study).

and 1998.¹⁰⁶ They also compared a random sample of 300 patents involved in litigation during this period with a sample of 1000 patents issued between mid-1996 and mid-1998.¹⁰⁷ They find that patents are more likely to be involved in litigation if they are young, if they are issued to individuals or small, domestic corporations, and if they have a larger number of claims, citations of prior art, and spent more time in prosecution.¹⁰⁸ The authors also find that the probability of a patent's being involved in litigation varies substantially across industries.

II.C Studies of the “Costs” and Outcomes of Patent Cases

The question of who is involved in patent litigation and how they behave once a case is filed are closely related. Obviously, an out-of-court negotiation of a licensing agreement is similar to a negotiation of a settlement agreement once the case has been filed. Thus, many of the same theories are tested and many of the same variables are employed.

Lanjouw and Schankerman attempt to extend their results on filings of patent infringement cases to the outcomes of those cases, studying which cases are terminated through a trial.¹⁰⁹ They find that trials are quite rare—only 5% of all cases are terminated through a trial.¹¹⁰ And they explore whether the same strategic factors that were important in whether a case would be filed—size of stakes, asymmetry of stakes, and uncertainty¹¹¹—can also explain whether a case that has been filed goes to trial. However, none of the variables on the nature of the patent or the parties¹¹² are significant in explaining which cases are adjudicated through a trial and which settle.¹¹³ They conclude that the strategic factors they examine exercise their effect on the decision to file and have little or no impact on the case after filing. While this conclusion may be true, it is also possible that their focus on trials, rather than all adjudication on the merits, may have an impact on their results.

Other studies focus on the types of ruling arrived at through a trial, evaluating the performance of the courts in deciding patent cases through the type of decisions delivered at trials. In a series of studies,¹¹⁴ Moore uses the AO data from the 1980s and 1990s, supplemented by information from the docket reports, to analyze patent litigation cases in which final judgment was determined through a trial.¹¹⁵ She finds that while the overall decision rate is in favor of the patentee in 58% of the cases, there is a significant difference between the results when the decision is made by a jury than when it is by a judge; the decision is in favor of the patentee in

¹⁰⁶ Hall, *supra* note 74.

¹⁰⁷ The data was compiled by Allison & Lemley. See Allison & Lemley, *supra* note 16.

¹⁰⁸ Allison et al., *supra* note 42, at 438.

¹⁰⁹ Lanjouw & Schankerman, *Patent Litigation*, *supra* note 68, at 67-68.

¹¹⁰ In fact, they interpret the 5% of cases that go to trial as indicating that “post-filing settlement rates are high (about 95%), *id.* at 48,—a figure that is widely quoted. See also Jean O. Lanjouw & Mark Schankerman, *Enforcing Intellectual Property Rights* (Dec. 2001), available at <http://papers.nber.org/papers/w8656> (explaining in more detail the formulation of their data and analysis).

¹¹¹ See *supra* Part II.B, 3-5.

¹¹² See *id.*

¹¹³ *Id.*

¹¹⁴ Moore, *Forum Shopping*, *supra* note 68; Moore, *Judges, Juries*, *supra* note 69. Kimberly A. Moore, *Jury Demands: Who's Asking*, 17 BERKELEY TECH. L. J. 847 (2002).

¹¹⁵ Moore, *Forum Shopping*, *supra* note 68; Moore, *Judges, Juries*, *supra* note 68.

68% of jury trials but in only 51% of bench trials.¹¹⁶ Likewise, she finds that juries are more likely to rule that the patent is valid (by a margin of 71% to 64%) and more likely to find that it was infringed (by a margin of 71% to 59%).¹¹⁷ These results are reflected in the statistics she reports for requests for jury trials. Jury trials are requested in 78% of all cases, but 74% of patent holders request a jury while only 43% of alleged infringers do so.¹¹⁸ These results would support the view that the two sides in the case are aware of these kinds of results.¹¹⁹ In additional work, Moore examines the geographical distribution of patent cases to see whether the parties are engaging in “forum shopping,” in pursuit of the most favorable venue¹²⁰ While she finds that patent litigation is concentrated in a few districts, she does not extract the factors that might be influencing such behavior from the data at hand.¹²¹

However, while the previously described research focuses on trials, other work uses different sources to describe some aspects of adjudication both at trial and in the pre-trial stage. Allison and Lemley¹²² focus solely on rulings of invalidity in patent cases, using written rulings reported in U.S. Patents Quarterly.¹²³ They find that they cannot reject the hypothesis that half of these rulings find the patent wholly or partially invalid.¹²⁴

Finally, some recent work analyzes the propensity to settle a case or pursue a judgment, whether through pre-trial adjudication or through a ruling rendered at trial. Somaya,¹²⁵ using AO data from 1983 to 1993 supplemented by the PTO data, investigates whether the asymmetric stakes argument can be used to explain the decision to settle patent litigation.¹²⁶ He formulates two classes of hypotheses: the first concerns settlements that can be explained by asymmetric, or “strategic,” stakes of the parties in the patent at issue; some patents will be worth more to the patentee (as measured by how young the patent is) or worth more to the non-patentee, because they are active in the same technological area as the patent and do not want to abandon it (as measured by how many times their own patents cite the patent in question). The second class of hypotheses concerns the possibility of mutual hold up—one of the parties can use their other points of interaction (measured by how frequently the patentee cites other patents held by the alleged infringer) as punishment for not settling the suit.¹²⁷ He examines whether the case was resolved through a judgment¹²⁸ and whether it progressed at least through the summary judgment phase before settling¹²⁹ and finds some evidence to support the strategic stakes hypotheses¹³⁰ but

¹¹⁶ Moore, *Judges, Juries*, *supra* note 68 at 386 (noting the deviation in jury trials from the “50% rule” in jury trials).

¹¹⁷ *Id.* at 390.

¹¹⁸ See Moore, *supra* 114, at 859.

¹¹⁹ *Id.* 859.

¹²⁰ Moore, *Forum Shopping*, *supra* note 68.

¹²¹ See *id.* at 914 (demonstrating that patent cases tend to be concentrated in a small number of districts).

¹²² Allison & Lemley, *supra* note 39 at 205-07.

¹²³ See United States Patent Quarterly, *supra* note 69.

¹²⁴ Allison & Lemley, *supra* note 39, at 205-07. It should be noted that this does not mean, as commonly cited, that half of all patents in litigation are found invalid. That result may be true, but more information on the frequency of counterclaims and defenses of invalidity would be necessary to draw it.

¹²⁵ See Somaya, *Duration*, *supra* note 68.

¹²⁶ See Somaya, *Strategic Determinants*, *supra* note 68, at 19-20

¹²⁷ See *id.* at 20-21.

¹²⁸ It is not clear from the text how the full sample of adjudicated cases is constructed, although it is obvious that he is not restricting himself to decisions arrived at through a trial.

¹²⁹ Somaya, *Strategic Determinants*, *supra* note 68, at 27.

little to support mutual hold up. In related a work,¹³¹ he examines the duration of cases and finds evidence that strategic behavior may influence not only whether there is a settlement but also how long it takes to reach one. In particular, he finds evidence that parties take into account the reputations created during litigation, because the time to a settlement increases with the number of times the same patent has been involved in litigation.¹³²

Thus, we have learned much about the nature of patent litigation from the empirical work in this area. We know that a increasing proportion of patents seems to be involved in litigation. We know that the newer the technology, the greater the probability that a patent will be involved in a case.¹³³ We know that the greater the overall value of a patent (when measured by citations or the patent's age) the greater the probability of its being litigated.¹³⁴ And finally, we know that firms do seem to act strategically in patent litigation, because they are less likely to settle if they have a number of patents in the same area, or if they want to establish an aggressive reputation if the patent is involved in multiple suits.¹³⁵

However, what is still not clear is just how many patent cases are adjudicated on the merits to a final outcome. Most of the work on analyzing behavior conditional on a case being filed focuses on what happens at trial.¹³⁶ Some work has been done incorporating pre-trial adjudication, but the data used has deficiencies which may misclassify many adjudicated cases,¹³⁷ and the period covered does not cover current patent law and procedure. Moreover, to date, attempts to measure the cost of patent litigation can only use the duration of the case as a proxy¹³⁸—a measure which is notoriously inaccurate due to the idiosyncrasies of court schedules and the like. It is our hope that this work will begin to fill in some of these gaps.

¹³⁰ *Id.* at 30-35 (admitting that some asymmetric information arguments could explain the same results).

¹³¹ Somaya, *Duration*, *supra* note 68.

¹³² *Id.* at 28-29

¹³³ Lerner, *supra* note 85.

¹³⁴ Lanjouw & Schankerman, *Small Firms*, *supra* note 68; see also Allison et al., *supra* note 42.

¹³⁵ Lanjouw & Schankerman, *Patent Litigation*, *supra* note 68; Lanjouw & Schankerman, *Small Firms*, *supra* note 69, Moore, *Forum Shopping*, *supra* note 68; Moore, *Judges, Juries*, *supra* note 68.

¹³⁶ For an exception, see Somaya, *Strategic Determinants*, *supra* note 68 (making use of whether cases settle in the pre-summary judgment phase or proceed to motions on summary judgment as well as whether the case settles).

¹³⁷ Somaya seems to be relying on the AO's designation of certain cases being decided after completing the "judgment on motion" stage in selecting which cases survive without settling until summary judgment motions are complete. See *id.* at 27. As we will show, relying on the AO categories misses many final rulings and therefore cannot be used to determine the total volume of cases closed through judgments. See *infra* Part III.B

¹³⁸ See Somaya, *Duration*, *supra* note 68.

III. Classifying Case Outcomes: How Many Cases are Adjudicated on the Merits?

The principle goal of this study is to answer the questions: How many cases are adjudicated on the merits? How common are rulings of infringement or invalidity? And what can we say about the costs of such rulings? Given the inadequacies of the major litigation databases for answering these questions,¹³⁹ we have chosen to take a different approach. We examined the docket report for every patent case filed in 1995, 1997 and 2000, classified them according to the manner in which they were resolved, and then tallied the outcomes. The results of our analysis show that more patent disputes are adjudicated on the merits than is commonly believed, primarily because final judgments rendered at the pre-trial stage on motions for summary judgments seem to be important in the resolution of patent cases

Previous authors have focused largely on the 5% of cases that are terminated through a trial.¹⁴⁰ Our results are consistent with such a figure.¹⁴¹ However, this fact has come to be interpreted as meaning that “95% of all cases settle.”¹⁴² The conventional wisdom on this point ignores the fact that many cases are resolved through procedural terminations.¹⁴³ But, as we will show, 8-9% of cases are terminated through final rulings on a motion for summary judgment.¹⁴⁴ Perhaps more importantly, while there are very few rulings of patent invalidity, they, too, tend to occur in cases that terminate in a ruling in the pre-trial stage.¹⁴⁵ Thus, focusing on trials does not take into account the greater number of cases terminated through rulings that occur “earlier” in the case proceedings.

However, despite the fact that we find more final rulings than previous authors, we do not want to overstate the rate of adjudication on the merits in patent cases. We still find that approximately 80% of patent cases settle.¹⁴⁶ And, as we shall see in a later section, the fact that the majority of final rulings occur at the pre-trial stage does not mean that rulings in patent cases are necessarily “cheap”;¹⁴⁷ there is still cause for concern that the transaction costs associated with patent cases inhibit the courts’ ability to weed out improvidently granted patents.

¹³⁹ See *infra* Part II.A.

¹⁴⁰ Lanjouw & Schankerman, *Small Firms*, *supra* note 68, at 48.

¹⁴¹ See *infra* Part III.C.

¹⁴² Lanjouw & Schankerman, *Small Firms*, *supra* note 68, at 48; Hall, *supra* note 13, at 8.

¹⁴³ See Gillian K. Hadfield, *Where Have All the Trials Gone? Settlements, Non-trial Adjudications, and Statistical Artifacts in the Changing Disposition of Federal Civil Cases*, 1 J. EMPIRICAL LEGAL STUD. 705, 706 (2004) (“Cases...may be abandoned by the plaintiff. They many end in a default judgment. They may be dismissed with prejudice (and treated as an adjudication on the merits) for a litigant’s failure to comply with case management orders. They may be dismissed for failure to state a claim on which relief can be granted or on a motion for summary judgment. They may be dismissed for a lack of either personal or subject matter jurisdiction, which may or may not be a final disposition of the underlying dispute.”).

¹⁴⁴ See *infra* Part III.C.

¹⁴⁵ See *infra* Part III.D.

¹⁴⁶ See *id.*

¹⁴⁷ See *infra* Part III.C.

III.A The Data

The first step in our analysis was to construct the dataset. Rather than study a large number of patent cases litigated over a long period of time, we chose to extract the patent cases filed in three recent years. Focusing on a smaller number of cases (about 6300 cases)¹⁴⁸ allowed us to examine the history of each case in greater detail than is possible with a large dataset. In particular, it allowed us not only to exploit publicly available data on U.S. court cases,¹⁴⁹ but also to examine the docket reports for each individual case. Highly detailed knowledge of how cases are resolved will help us reach the ultimate goal of determining how patent cases are resolved, the costs involved, and how well the courts are fulfilling their role of removing “bad” patents.

Thus, the first decision was the selection of years to be studied. It was important that these years meet two criteria. First, given our focus on the resolution of cases, the years studied should be sufficiently lagged for the vast majority of cases to have terminated. However, it was equally important that the years chosen reflect current patent law and civil procedure. The years 1995 and 1997 met these criteria. Cases litigated in these years were covered by the most recent developments in patent law. For example, we found that only twenty-three of the cases filed in 1995 had terminated before the Markman decision.¹⁵⁰ But we also found that only a very few cases from these years had not terminated; only one patent case from 1995¹⁵¹ and twelve cases from 1997¹⁵² were still in litigation as of this writing. Data was also collected on cases filed in 2000, which is even more representative of current patent cases. However, among these cases, 62 (or 2.5% of the original data) had yet to terminate as of this writing. While this collection of ongoing cases is a small proportion of the total, they are by definition the longest cases, and, as will be seen,¹⁵³ their number is sufficient to blur some of the conclusions about the expenditure on cases.

Once the three years had been selected, we needed to identify the patent cases which would constitute our cohorts and collect information on how they were resolved. To do so, we relied on the annual database of court cases prepared by the Administrative Office of the District

¹⁴⁸ See *infra* Part III.E.

¹⁴⁹ See Federal Judicial Center, *supra* note 71.

¹⁵⁰ *Markman v. Westview Instruments, Inc.* 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff'd* 517 U.S. 370 (1996).

¹⁵¹ *Generation II Ortho v. Med. Tech.*, No 95-1842 (W.D. Wash. Filed Nov. 30, 1995)

¹⁵² *Pall Corp. V. Cuno Inc.*, No. 97-7599 (E.D.N.Y. filed Dec. 30, 1997); *Arterial Vascular v. Cordis Corp.*, No. 97-0700 (D. Del. Filed Dec. 26, 1997); *Roustaei v. Symbol Tech.*, No. 97-2296 (S.D. Cal. filed Dec 23, 1997); *Madey v. Duke Univ.*, No. 97-1170 (M.D.N.C. filed Nov. 5, 1997); *Zinser Text GMBH v. Electro-Jet, S.A.*, No 97-0531 (W.D.N.C. filed Oct. 15, 1997); *Buckley v. Paccar Inc.*, No. 97-3425 (D. Md. Filed Oct. 10, 1997); *McElroy MFG Inc. v. Gleasman*, No. 97-0751 (N.D. Okla. Filed Sept. 18, 1997); *Ecolab, Inc., v. Paraclipse, Inc.*, No 97-0304 (D. Neb. filed June 20, 1997); *Int'l Elec. Tech. Corp. v. Hughes Aircraft Co.*, No 97-2678 (C.D. Cal. Filed Apr. 18, 1997); *Minebea Co. Ltd. V. Papst*, No 97-0590 (D.D.C. filed Mar. 25, 1997); *Plastpro, Inc. v. Therma-Tru Corp.*, No 97-1222 (D.N.J. filed Mar. 17, 1997); *Rackman v. Microsoft Corp.*, No. 97-0003 (E.D.N.Y. filed Jan. 2, 1997).

¹⁵³ See *infra* Section IV.A

Courts.¹⁵⁴ This data includes a coding system for all court cases which identifies the type of case;¹⁵⁵ this coding allowed us to extract all patent cases.¹⁵⁶

In each year we eliminated cases which were miscoded or for which data was not available. To avoid double counting, we also eliminated cases that were transferred to other districts or consolidated with other cases. Table 1 describes the final populations for the three years.

Table 1: Construction of the Data Set

	Year		
	1995	1997	2000
Number of cases identified by the AO	1707	2127	2476
Miscoded as patent cases ¹⁵⁷	- 168	- 183	-195
Dockets not available	- 17	- 24	- 14
Transfers and Consolidations	- 152	- 163	-186
Number of Cases used for analysis	1370	1757	2081

The AO database provides a coding system for case resolutions. To verify this information and provide greater detail when the AO coding was ambiguous, we supplemented this information by examining the on-line docket reports available through the PACER system.¹⁵⁸ These reports allowed us to collect additional information on how cases were administered, resolved, and what kind of remedies were applied.

¹⁵⁴ See Federal Judicial Center, *Supra* note 72.

¹⁵⁵ See Federal Judicial Center, *Supra* not 72, Federal Court Cases: Integrated Data Base, 2003 14-16 (Dec. 2004), (explaining in the project documentation the various codes and that patent cases are given a “Nature of Suit” (NOS) code of “830”), <http://www.icpsr.umich.edu/ticketlogging>.

¹⁵⁶ As we will discuss later, a small number of the cases coded as patent cases appear to have been misidentified trademark cases, etc.. In addition, a small number of cases were in fact patent cases and did not receive the “830” code; other researchers have explored this issue and found the number negligible. See Somaya, *Strategic Determinants*, *supra* note 68 at 11. Our comparison of the cases identified as patent cases by Derwant LitAlert during our study years finds only a small number of similar cases, indicating that the number of omitted patent cases is likely to be quite small.

¹⁵⁷ We also dropped a small number of cases which were patent related but involved issues other than infringement (such as disputes over inventorship).

¹⁵⁸ Administrative Office of the U.S. Courts, PACER Service Center, <http://pacer.psc.uscourts.gov/> (last visited Aug. 20, 2005).

It should be noted that we construct our database in a different fashion than other studies of patent litigation. Most studies of patent litigation identify their samples by year of termination and examine how the method of termination or time to termination varied across characteristics.¹⁵⁹ We choose, on the other hand, to examine cases filed in three years and observe those cohorts over time. We believe that this allows us to better analyze the factors which determine the length of patent litigation.

Other authors¹⁶⁰ argue that examining suits at time of termination is more appropriate, because choosing cohorts based on filing times will lead to too many cases that have not terminated and policy conditions at termination will determine outcomes. We disagree with both contentions. As noted, most cases are resolved quickly, so we can study relatively recent cases with few ongoing cases remaining to cloud the analysis. And choosing a cohort by year of termination ignores the earlier conditions in the suit's history, while it is always possible to "control" for conditions in a termination year, as we do through our selection of sampling years. Moreover, the reasons why a five-year-old case would settle in response to a change in court procedure or policy are very different from the reasons why a five-month-old case would settle. And a five-year-old case launched in 1995 evolved in an environment that is very different from a five-year-old case launched in 1999, so simply controlling for age is insufficient. The history, past environment, and current environment in which the case evolved all contribute equally to the decision by the parties to settle at any given moment or continue to seek a judgment. The appropriate comparison would be to compare the five-year case with other cases filed at the same time to determine why some were resolved quickly and why this case took so long, including all such variables in the analysis. Only by choosing cohorts based on year of filing and controlling for all such factors, can we determine what factors influence this decision.

However, it was equally important that the years being analyzed be consistent in terms of both patent law and civil procedure; this factor is particularly crucial given our interest in settlements. Theoretical analysis of litigation suggests that parties are less likely to settle when there is a divergence of opinion as to the likelihood of the plaintiff winning at trial—if both agree that the plaintiff has a strong case, they are likely to settle.¹⁶¹ One source of differing views regarding the strength of the case is when there is uncertainty regarding the way the court will handle the case, especially the way it will evaluate the property right associated with a patent.¹⁶² Thus, the new procedure for patent claim construction, introduced after the Markman ruling, would have changed the way the parties in a case evaluated the probability of winning at trial and, therefore, the incentives to settle. It was therefore important to avoid comparing cases preceding the introduction of the new procedure with those following it. The years chosen follow this philosophy. In particular, only twenty-three 1995 cases terminated before the Markman ruling. Thus, the three cohorts were chosen to allow the maximum number of cases to be resolved, while simultaneously keeping the incentives created by courtroom procedure consistent.

¹⁵⁹ See e.g., Moore, *Forum Shopping*, *supra* 68 at 892.

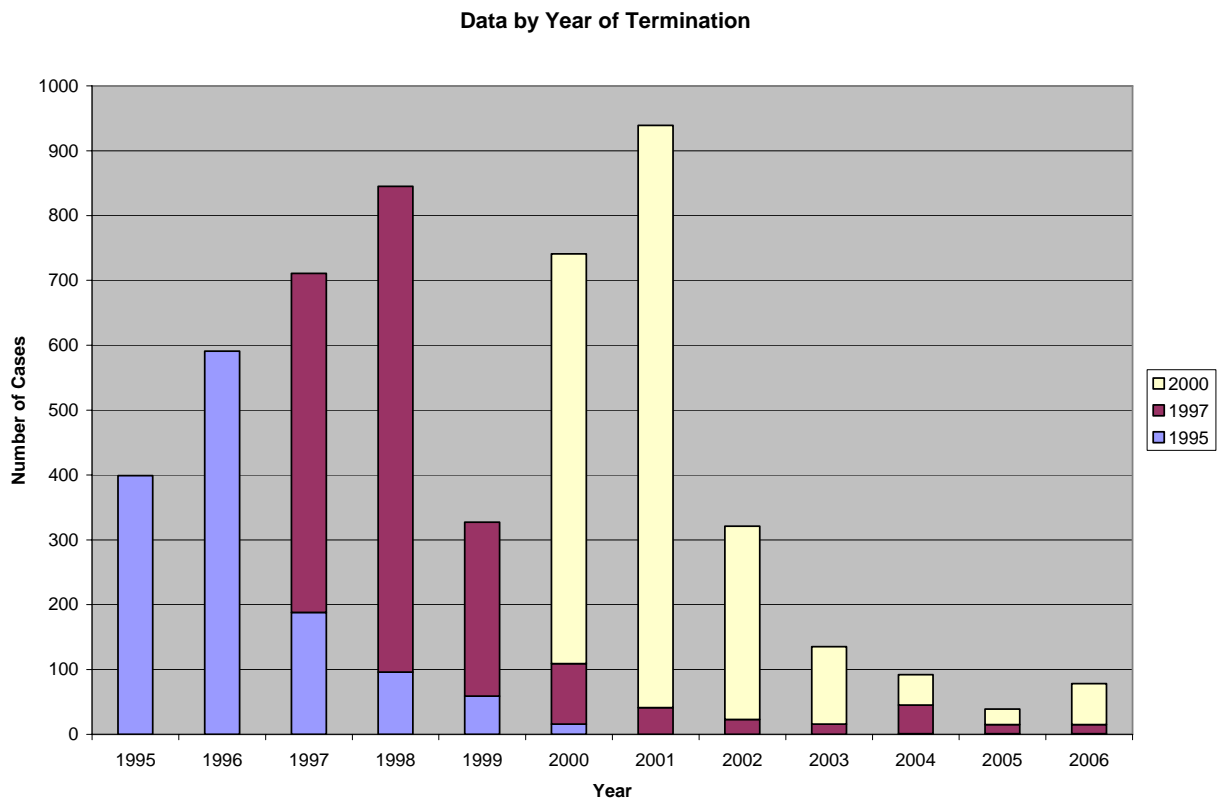
¹⁶⁰ See e.g., Somaya, *Duration*, *supra* note 68, at 9.

¹⁶¹ For a discussion of the role of uncertainty in the propensity to go to trial, see Lanjouw & Lerner, *supra* note 67, at 4.

¹⁶² *Id.*

For comparison with previous studies focusing on the year of termination, Figure 1 gives the breakdown of the cases in the final data set by the year in which they terminate. The three years we describe in this paper would loosely correspond to data on cases terminated in the late 1990s and early 2000s. Thus, our data also provides a reasonable good picture of recently-terminated cases.

Figure 1: Cases by Year of Termination



III.B Methodology for Classifying Case Outcomes

Once the dataset was created, we were able to proceed to our task of determining how patent cases are resolved, the costs involved, and what role is being played by the courts in the patent system. However, the first question to be answered concerns resolution of cases: are cases being adjudicated through to a final decision by the courts, or do parties settle their dispute without waiting for a final ruling by the courts? If the vast majority of cases are settled along the way, the courts may be fulfilling their roles of protecting patent rights at relatively low cost. However, a small number of final rulings on the merits also means that very few patents are being scrutinized to determine the scope, validity, and infringement of patent rights.

To accomplish this task of classifying case outcomes, we examined the docket reports for every patent case identified in the 1995, 1997 and 2000 cohorts, classified them according to the manner in which they were resolved, and then tallied the outcomes.

The results of our analysis show that more patent disputes are adjudicated on the merits to a final decision than is commonly believed, primarily because final judgments rendered at the pre-trial stage on motions for summary judgment or other similar motions seem to be very important in the resolution of patent cases. Previous authors have focused largely on the 5% of cases that go to trial and then infer a “settlement rate” of 95%.¹⁶³ But this figure ignores the fact that many cases are resolved through other pre-trial terminations.¹⁶⁴ Moreover, we will show that 6-9% of cases are terminated through final rulings granting a motion for summary judgment. Perhaps more importantly, while there are very few rulings of patent invalidity, they tend to occur in cases that terminate in a ruling at the pre-trial stage. Thus, focusing exclusively on trials does not take into account the greater number of cases terminated through rulings that occur earlier in the case proceedings.

Despite the fact that we find more final rulings than previous authors by including final pre-trial rulings on the merits, we do not want to overstate the rate of adjudication of patent cases. We still find that approximately 80% of patent cases settle. As we shall see in a later section, the fact that the majority of final rulings occur at the pre-trial stage does not mean that rulings in patent cases are necessarily “cheap.” There is still cause for significant concern that the high transaction costs associated with patent litigation creates incentives for parties to settle and inhibits the ability of the courts to rule on the validity and infringement of patent rights.

¹⁶³ Hall, *supra* note 13, at 8; Lanjouw & Schankerman, *Small Firms supra* note 68, at 48.

¹⁶⁴ Hadfield makes a strong case against assuming that any case that does not reach trial is automatically a settlement. Hadfield, *supra* note 143, at 706. “Cases...may be abandoned by the plaintiff. They may end in a default judgment. They may be dismissed with prejudice (and treated as an adjudication on the merits) for a litigant’s failure to comply with case management orders. They may be dismissed for failure to state a claim on which relief can be granted or on a motion for summary judgment. They may be dismissed for a lack of either personal or subject matter jurisdiction, which may or may not be a final disposition of the underlying dispute.” *Id.*

Classifying the manner in which cases are resolved is a surprisingly difficult task. The Administrative Office of the District Courts (AO) requires that each case be classified according to a “case disposition” variable.¹⁶⁵ The AO’s actual categories for case disposition are shown in Table 2. As we can see, many of these categories—e.g., “dismissed: other”; “judgment: other”—are rather ambiguous. The ambiguity of these definitions makes it difficult to track the precise disposition of each case. Moreover, while several specific categories may be needed to truly describe the final outcome of a case, the AO data allow cases to be described only in one category, and the choice of category is left up to the numerous individuals entering data in ninety districts, each with their own particular view of the appropriate category. For example, if the two parties reach an agreement and request that a consent judgment be entered, the final outcome could be coded as either a settlement, a consent judgment, or “judgment: other.” Other settlements may be coded as dismissals with or without prejudice, voluntary or stipulated dismissals, or just as dismissals. There is also some ambiguity about the coding of summary judgment rulings, because they can also be classified in the “other judgment” category, as could a consent judgment, which is more likely to be a settlement.¹⁶⁶

To overcome this problem, we compared the AO codes with information obtained from the on-line docket reports available via PACER for all the patent cases filed during 1995, 1997 and 2000. All aspects of the resolution of each patent case recorded in the docket were entered: if it was recorded that a case settled and was officially classified as a dismissal without prejudice, we recorded the outcome under both dismissal without prejudice and settlement. For dismissed cases, we tracked whether the dismissal was with or without prejudice, stipulated, or voluntary. For judgments, we tracked whether the judgment was a summary judgment, a consent judgment, or other form of final judgment, and in whose favor the case was decided. Jury verdicts were recorded as were decisions rendered in bench trials, as well as the winning party in either kind of trial, and whether any damages were awarded. In addition, appeals of the final ruling and their outcomes were also recorded.¹⁶⁷ But, in particular, the reading of the dockets focused on whether there was an *explicit* reference to a settlement,¹⁶⁸ so that we could accurately determine both the rate of adjudication on the merits (either before, during, or after trial) and the rate of settlement.

The classification of cases under the two systems was compared as a test. When we found discrepancies (e.g., AO codes as a transfer when we recorded a jury verdict), the dockets were re-examined to determine the correct classification when necessary.¹⁶⁹

¹⁶⁵ We choose to concentrate on this variable since, like Hadfield, we find the AO Disposition variable more useful than the “Procedural Progress” variable in tracking settlements. *See id.*, at 712.

¹⁶⁶ In fact, only half of the cases terminating in a successful summary judgment ruling were given the AO disposition code of “judgment on motion before trial” in 1997. Over 20% were coded as “other judgment” or “other dismissal.”

¹⁶⁷ When an appeal resulted in a reversal, the “second stage” of the case was also tracked. The numbers cited in the following tables apply to “first stage” resolutions only.

¹⁶⁸ Note that we use the term settlement to refer to resolution of the question of liability by means of an agreement between the parties; agreements occurring after a judgment has been reached are not classified as “settlements.”

¹⁶⁹ An additional benefit of “red flagging” these cases, of course, was that it tested for the inevitable data entry errors that our team may have committed despite their careful reading of the dockets.

Table 2: AO Case Disposition Codes¹⁷⁰

DISPOSITON

Cases Transferred or Remanded

- 0: transfer to another district
- 1: remanded to state court
- 10: multi district litigation transfer
- 11: remanded to U.S. Agency

Dismissals

- 2: want of prosecution
- 3: lack of jurisdiction
- 12: voluntarily
- 13: settled
- 14: other

Judgment on:

- 4: default
- 5: consent
- 6: motion before trial
- 7: jury verdict
- 8: directed verdict
- 9: court trial
- 15: award of arbitrator
- 16: stayed pending bankruptcy
- 17: other
- 18: statistical closing
- 19: appeal affirmed (magistrate judge)
- 20: appeal denied (magistrate judge)

NATURE OF JUDGMENT (only applies to disposition involving a judgment)

- 0: no monetary award
- 1: monetary award only
- 2: monetary award and other
- 3: injunction
- *: forfeiture/foreclosure/condemnation, etc.
- 5: costs only
- 6: costs and attorney fees

¹⁷⁰ See Federal Judicial Center, *supra* note 72, at 22

Finally, each case was classified in the category that was most informative about how it was resolved, especially in terms of whether the parties resolved the dispute themselves or left it to the courts to do so. In general, all forms of judgments implying some form of pre- or post-trial adjudication—verdicts, final judgments, or summary judgments—had the highest position in the hierarchy according to this principle. Thus, a case in which a settlement occurred after the court had decided the issue of liability through any sort of ruling would *not* be classified as a settlement. If a ruling on summary judgment was rendered in the case, we examined carefully whether that judgment finally allocated liability in the case. Thus, if a summary judgment on the issue of infringement or invalidity was rendered and the case terminated immediately, that case was viewed as terminating with a pre-trial ruling. However, if the summary judgment was a partial summary judgment or was followed by pre-trial conferences and the like, and *then* a settlement occurred, the case was classified as a settlement.¹⁷¹ Note that only grants of summary judgment which completely resolved the case were treated as final rulings on the merits, not denials of summary judgment, even though denials of summary judgment may also be seen, at some level, to be an adjudication on the merits of the case. Finally, cases with final judgments accompanying jury verdicts were classified as verdicts. Judgments in which the docket or the AO explicitly mentioned a ruling in a bench trial were classified as such.

After identifying cases terminating in a ruling, we then extracted cases that were identified as settlements by the docket or the AO.¹⁷² Consent judgments that were not explicitly named as a settlement by us (based on the court’s docket) or by the AO, stipulated dismissals with or without prejudice that were not named as settlements or consent judgments, and finally voluntary dismissals were all classified as non-merit dispositions or probable settlements depending on whether they occurred before or after the complaint was or was not answered, respectively.

This procedure allowed us to count each case in the category which best described whether the parties had resolved the disputes themselves at some point in the litigation or had continued litigation until a final ruling on the merits by the court. Thus, a settlement accompanied by a consent judgment would be classified as a settlement. A stipulated dismissal with prejudice would be classified as a stipulated dismissal. A jury verdict with an accompanying final judgment would be classified as a verdict. For some cases classified by the AO as “other dismissal,” there was no additional information in the docket, and, hence, these cases are left in their original category. The final classification categories are listed in Table 3.

As stated above, cases were classified as having terminated in a settlement if either the AO coded it as such and/or the docket explicitly mentioned a settlement, and there was no previous adjudication deciding liability on the merits. It should be noted that the two measures

¹⁷¹ In fact, it is highly probable that the earlier ruling was a strong inducement to settlement, since it gave information about the relative strength of the cases on both sides, clarifying the probability each side could expect to be successful, and inducing both sides to avoid litigation costs by resolving the dispute quickly.

¹⁷² Cases in which either we or the AO had indicated some form of judgment and the other indicated a settlement were examined in detail according to the principle outlined in the preceding paragraph. All remaining cases which called a settlement by us but not by the or by the AO and not by us were also examined. In every case, the disagreeing party classified the case under one of the “probable settlement” categories.

did not coincide perfectly. For the 1995 cases, after the correction of settlement after adjudication, there were 137 cases for which the docket reported a settlement, but the AO coded it differently, and among 1997 cases, there were also 137 such cases.¹⁷³ All but a handful of such cases were coded by the AO as a consent judgment, voluntary dismissal, other dismissal, or a statistical closing.¹⁷⁴ Meanwhile, in the 1995 data, there were 307 cases and, in the 1997 data, there were 371 cases that the AO, even after reexamination, reported a settlement and the docket did not.¹⁷⁵ In all of these cases, the docket reported a stipulated dismissal, consent judgment, voluntary dismissal, or an undesignated dismissal. Thus, in nearly all cases where one measure recorded a settlement and the other did not, the alternate classification was still consistent with a settlement. In the very small number of cases where one source recorded a judgment and the other a settlement, the docket was given precedence. These results imply that after our correction, the two indicators of settlements based on both the docket and the AO's codes are consistent.¹⁷⁶

We believe that the system described above provides a more complete and clearer picture for a study that focuses on determining how cases are actually resolved compared with other previous studies that have relied on the categories provided by the AO.¹⁷⁷ We are able to assign cases to the most meaningful category for the purpose of identifying settlements rather than aggregating them into overly broad groups such as “resolved by court order or judgment on

¹⁷³ In 1995 these cases were coded by the AO as: seven transfers; two dismissals for lack of jurisdiction; one judgment on default; forty-five judgments on consent; seven judgments on motion before trial; three verdicts; one bench trial; thirty-one voluntary dismissals; twenty-one “other” dismissals; two sixteen; eight “other” judgments; nine statistical closings. In 1997 the AO coded these cases as: one dismissal for lack of prosecution; one judgment on default; fifty-three judgments on consent; nine judgments on motion before trial; thirty-two voluntary dismissals; thirty-four “other” dismissals; six “other” judgments; one statistical closing;

¹⁷⁴ See *supra* note 171.

¹⁷⁵ In 1995, twenty-three of these cases terminated with consent judgments, 174 with stipulated dismissals, nine with voluntary dismissals, eighty-seven with general dismissals; in nine cases the docket did not give enough information. In 1997, twenty-seven cases terminated with consent judgments, 238 with stipulated dismissals, thirteen with voluntary dismissals, eighty-four with general dismissals, in four cases the docket did not give enough information.

¹⁷⁶ We did not worry about whether the dismissal associated with a settlement or probable settlement was with or without prejudice. It is quite common for the last entry of the docket of an explicitly settled case to be a “dismissal without prejudice.” If these settlements are in fact falling apart, then there are a very large number of cases in which the plaintiff is not exercising his/her right to re-open the case. There are a small number of cases (about a dozen) which were re-opened after a lapse of a year or more because one party was not operating in accordance with the settlement agreement. See Hadfield, *supra* note 143.

¹⁷⁷ Some researchers solve this problem by using only the most precise AO categories—settlements, trials, and rulings on pre-trial motions—and ignore consent judgments or other categories which are somewhat ambiguous. See Somaya, *supra* note 85. We examined the categories we assigned to this subset of cases, and found that the error rate should be acceptable for certain kinds of statistical analysis. We found very few firms that the AO assigned to the trial or pre-trial motion categories which were actually settled. However, many rulings would be lost, since many cases terminating through a pre-trial motion are classified in the ambiguous categories. Thus, this alternate procedure could be used for statistically analyzing how the marginal effects of characteristics of firms on cases case outcomes, though losing so many rulings will have an impact on the accuracy of such estimates and the size of standard errors associated with them. However, this alternate procedure will lead to inaccurate measures of the *global* rate of adjudication and settlement of cases, which is the focus of this study.

motion,” which can include both dismissals with and without prejudice and grants of summary judgments.¹⁷⁸

¹⁷⁸ *E.g.*, Moore *Judges, Juries, supra* note 68, at 383 (footnote 79) (“[I]n 1998, 24% of all cases were resolved without court action, 59% of cases were resolved by court order or a judgment on motion, 12.5% were resolved after the pretrial conference but before trial and 4.5% of all cases were resolved during or after trial.”).

Table 3: Key to Case Resolution Codes

<p>Dismissed without prejudice: Terminated with this category; could not be assigned to any other category.</p> <p>Lack of Jurisdiction: Case was dismissed because court found it did not have jurisdiction; usually personal jurisdiction, especially in declaratory judgment cases.</p> <p>Dismissal due to Want of Prosecution: Explicitly identified by the AO or in the docket.</p> <p>Default Judgments: Explicitly identified by the AO. In some cases classified as “other judgment” by the AO but explicit reference in the docket.</p> <p>Identified Settlements: Case was identified as settled either by the AO or by the docket. All cases where a reference to some form of judgment was found in the docket were reviewed, and those in which liability was resolved through some form of judgment other than a consent judgment were re-classified in a category referring to the appropriate form of judgment.</p> <p>Consent judgments: Explicitly identified by the AO or the docket without reference to a settlement. Not associated with any other form of judgment.</p> <p>Voluntary Dismissals: Explicitly identified by AO or the docket without reference to a settlement. If a voluntary dismissal occurred before the complaint was answered, it is classified as a non-merit disposition. Voluntary dismissals occurring after the complaint was answered were considered probable settlements. Voluntary dismissals with prejudice were also viewed as probable settlements regardless of whether the complaint was answered.¹⁷⁹</p> <p>Agreed Dismissal: Explicitly identified in the docket.</p> <p>Stipulated Dismissals: Explicitly identified by AO or the docket without reference to a settlement.</p> <p>Summary Judgment: Case terminated with a summary judgment. Not applied to cases in which there was an interim summary judgment that did not totally decide final liability.</p> <p>Judgment on Jury trial. Liability decided through a jury verdict. If a final judgment was also issued, still classified as jury trial.</p> <p>Judgment on Bench Trial: Liability decided through a bench trial¹⁸⁰.</p> <p>Judgment as a Matter of Law: Jury verdict, but change in ruling by a directed verdict.</p> <p>Dismissals with prejudice. Case dismissed with prejudice with no reference to a settlement or any other form of judgment.</p>
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¹⁷⁹ Here we also followed Hadfield’s view that voluntary dismissals may reflect a settlement if they are with prejudice. Hadfield, *supra* note 143, at 717.

¹⁸⁰ Hadfield includes hearings before magistrate judges that end with an appeal among her set of adjudicated cases; there were no cases receiving such a code from the AO among our patent cases. *See id.* at 715.

III.C Case Outcomes: How Many Cases are Adjudicated on the Merits?

The results of the classification for cases from 1995, 1997 and 2000 are shown in Tables 4, 5 and 6, respectively.¹⁸¹ Six to nine percent of the cases in our cohorts terminated in grants of summary judgment.¹⁸² About an equal number of cases terminated in a trial. As a consequence, about 15% of all cases—13% of the cases filed in 1995, 16% of the cases filed in 1997, and 12% of the cases in filed in 2000—terminated with a court decision, i.e., terminated through some sort of court ruling on the merits.¹⁸³ However, previous, authors have stated that “...settlement rates [in patent litigation] are high (about 95%).”¹⁸⁴ But this figure applies only to cases that terminated without a trial, whereas in fact successful summary judgment motions appear to be equally important. Thus, the most remarkable conclusion of our analysis is that a much larger share of cases are adjudicated to a final resolution on the merits than has been previously suggested in the literature.¹⁸⁵

Nonetheless, we still find that the vast majority of cases settle. For cases filed in both years, nearly half of all cases are definitively settlements.¹⁸⁶ Moreover, we have included in the second column of each table several entries for “probable settlements.”¹⁸⁷ Cases that terminate in a consent judgment have a high probability of being settled, because in many such cases the parties request a consent agreement/judgment to formalize the settlement.¹⁸⁸ A stipulated or agreed dismissal is also often an indication that the parties have reached some form of agreement. And a voluntary dismissal occurring after the complaint is answered can denote that the case has settled as well.¹⁸⁹ If these cases are included, approximately two-thirds of all patent

¹⁸¹ These results are largely similar; as a consequence, we believe these years should be largely representative of the current distribution of outcomes for patent cases. The percentage of summary judgments is lower among the cases filed in 2000. However, until the on-going cases are resolved, we cannot draw any conclusion from this fact. There is also a decrease in the number of voluntary dismissals among probable settlements in the 2000 data and a compensating increase in the number of stipulated dismissals. This fact has no significant meaning, and probably reflects a stylistic change in the language of docket reports.

¹⁸² For the most part, summary judgments that are not coded by the AO as such were given a code as some form of dismissal.

¹⁸³ The percentage of rulings from 2000 may be biased downward by the unresolved cases from that year..

¹⁸⁴ Lanjouw & Schankerman, *Small Firms*, *supra* note 68, at 66-67, *quoted in* Hall, *supra* note 13, at 8. Lanjouw and Schankerman were not able to obtain statistically significant results explaining the propensity to go to trial & Schankerman, . *Small Firms*, *supra* note 68. Inclusion of additional forms of adjudication, as did Somaya, may lead to more significant results, although including all adjudicated cases as we do here should reduce standard errors still further. Somaya, *supra* note 82.

¹⁸⁵ *Id.*

¹⁸⁶ See Table 4 (47 % of the 1995 cases definitively settle), Table 5 (46% of the 1997 cases definitively settle) and Table 6 (46% of the 2000 cases definitively).

¹⁸⁷ See Table 4 (18 % of the 1995 cases are classified as “probable” settlements), Table 5 (19% of the 1997 cases are probable settlements) and Table 6 (20% of the 2000 cases are probable settlements).

¹⁸⁸ These agreements are easily identified as settlements since they nearly always state that both parties are to pay their own costs, although sometimes an explicitly monetary payment is specified. They also often include an injunction. Moreover, after reading thousands of docket reports, we became familiar with the “style” of a docket report that indicated a settlement: a history of filings, rulings, and hearings which are suddenly, and often without warning, terminated by a consent judgment, stipulated dismissal, etc.

¹⁸⁹ Voluntary dismissals with prejudice may denote a settlement as well.

cases terminate in a settlement.¹⁹⁰ Because the reader may question whether all these categories should be included among the probable settlements, the various probable settlement categories are clearly identified. Having done so, the general conclusion remains the same: the majority of patent cases terminate in some form of non-adjudicated agreement.¹⁹¹

¹⁹⁰ See Table 4 (47 % of 1995 cases definitely settle and 65% of cases definitively or probably settle); Table 5 (46% of 1997 cases definitively settle and 66 % of cases definitively or probably settle) and Table 6 (46% of 2000 cases definitively settle and 66 % of cases definitively or probably settle).

¹⁹¹ We also find support for Hadfield's contention that it cannot be assumed that cases that do not adjudicated necessarily terminate with a settlement. Hadfield, *supra* note 143, at 717. Around 5% of the cases in each year terminated in some form of non-action: a dismissal without prejudice, or dismissal for lack of jurisdiction or want of prosecution. There were also a small number of default judgments

Table 4: Outcomes: 1995¹⁹²

Non-Merit Dispositions			Settlements and Probable Settlements			Rulings and Verdicts		
Outcome	Number of Cases		Outcome	Number of Cases		Outcome	Number of Cases	
Dismissed Without Prejudice	47	3%	Identified Settlements	643	47%	Summary Judgments	123	9%
Lack of Jurisdiction	9	1%	Consent Judgments	112	8%	Judgment on Jury Verdicts	66	5%
Want of Prosecution	9	1%	Stipulated Dismissals	63	5%	Judgment on Bench Trials	17	1%
Default Judgments	6	0%	Agreed Dismissals	3	0%	Judgment as a Matter of Law ¹⁹³	0	0%
Voluntary Dismissals (complaint not answered)	171	13%	Voluntary Dismissals (answered complaint)	65	5%	Dismissals With Prejudice	12	1%
						Arbitration	1	0%
Sub Totals ¹⁹⁴	242	18%		886	65%		219	16%
Other Dismissals							17	
Total of Outcomes							1364	
On-going							1	
Unidentified							5	
Total							1370	

¹⁹² Ten cases resolved through a ruling were settled after appeal. We therefore do not believe that use of post-appeal outcomes would introduce a substantial qualitative change in our results.

¹⁹³ Directed Verdict

¹⁹⁴ Percentages may not total due to rounding.

Table 5: Outcomes, 1997¹⁹⁵

Non-Merit Dispositions			Settlements and Probable Settlements			Rulings and Verdicts		
Outcome	Number of Cases		Outcome	Number of Cases		Outcome	Number of Cases	
Dismissed Without Prejudice	64	4 %	Identified Settlements	798	46%	Summary Judgments	133	8%
Lack of Jurisdiction	23	1%	Consent Judgments	120	7%	Judgment on Jury Verdicts	41	2%
Want of Prosecution	19	1%	Stipulated Dismissals	95	6 %	Judgment on Bench Trials	17	1%
Default Judgments	28	1%	Agreed Dismissals	0	0 %	Judgment as a Matter of Law ¹⁹⁶	9	0%
Voluntary Dismissals (complaint not answered)	221	13%	Voluntary Dismissals (answered complaint)	126	7%	Dismissals With Prejudice	24	1%
						Arbitration	1	0%
Sub Totals ¹⁹⁷	355	20%		1139	66%		225	13%
Other Dismissals							15	
Total of Outcomes							1734	
On-going							14	
Unidentified							8	
Total							1756	

¹⁹⁵ Eleven cases resolved through a ruling were settled after appeal. We therefore do not believe that use of post-appeal outcomes would introduce a substantial qualitative change in our results.

¹⁹⁶ Directed Verdict

¹⁹⁷ Percentages may not total due to rounding.

Table 6: Outcomes, 2000

Non-Merit Dispositions			Settlements and Probable Settlements			Rulings and Verdicts		
Outcome	Number of Cases		Outcome	Number of Cases		Outcome	Number of Cases	
Dismissed Without Prejudice	58	3%	Identified Settlements	927	47%	Summary Judgments	126	6%
Lack of Jurisdiction	28	1%	Consent Judgments	146	7%	Judgment on Jury Verdicts	44	2%
Want of Prosecution	41	2%	Stipulated Dismissals	227	12%	Judgment on Bench Trials	31	2%
Default Judgments	31	2%	Agreed Dismissals	0	0%	Judgment as a Matter of Law	5	0%
Voluntary Dismissals (complaint not answered)	241	12%	Voluntary Dismissals (answered complaint)	39	2%	Dismissals With Prejudice	21	1%
Sub Totals	399	20%		1339	68%		227	12%
Other Dismissals							7	
Total of Outcomes							1972	
On-going							62	
Unidentified							47	
Total							2081	

III.D Rulings of Infringement and Invalidity

The results from the docket reports support the view that very few patent cases are finally adjudicated on the merits. As a consequence, the number of cases in which a court has ruled that a patent was infringed or that at least one claim of the patent was invalid were also small in number. We considered there to have been a ruling of infringement if the docket explicitly stated so or there was a ruling for the plaintiff or a default judgment for the plaintiff in a non-declaratory judgment case. By this measure, an explicit final ruling of infringement or a judgment for the patent holder that could be interpreted as an infringement ruling was found in only 277 cases across the three cohorts:—eighty-four (or 6.1%) in cases from 1995; 103 (or 5.9%) in cases from 1997, and ninety (or 4.4%) among cases from 2000. However, since a settlement is usually accompanied by some form of licensing agreement,¹⁹⁸ the patentee has, at least to some extent, preserved and/or protected her patent rights.

However, it is certainly possible that some of these patent disputes that were resolved through a settlement implicate patent rights that were improvidently granted at the outset. Given this scenario, the results for rulings of patent invalidity (involving at least one claim) are perhaps a greater cause for concern. One claim or more of a patent was ruled invalid in only twenty-nine of the 1995 cases (2.1%), forty-one (2.3%) of the 1997 cases and forty-eight (2.3%) of the 2000 cases. Thus, despite the greater ability of the court system to review all evidence pertaining to the validity of patents, only a very small number appear to be “weeded out” in a given year. While the number seems exceedingly small, it is in fact consistent with that found by other researchers.¹⁹⁹ Combined with the small number of reexaminations resulting in total or partial revocation of a patent, it seems that on the order of 300 improvidently granted patents were invalidated each year in the mid-1990s, while around 300,000 patents were issued each year.²⁰⁰ It seems much more likely that in the face of a high probability of loss of part of her patent rights, the patentee would offer the alleged infringer a license that she found more advantageous to take compared with continuing further costly litigation proceedings in court. This situation once again emphasizes the basic economic calculus at issue here, which takes into account the probability of being adjudicated an infringer and the subsequent remedy or damage award at issue, the probability of having one’s patent rights invalidated (or rendered unenforceable) in whole or in part, the litigation cost that has been incurred by the parties, and the additional cost of litigation that looms ahead.

There is also a substantial difference in the stage of the adjudication process in which rulings of infringement and invalidity occur. In the 1995 cohort, fifty-five out of the eighty-four

¹⁹⁸ It should be noted that many consent agreements (nine in 1995, six in 1997, nine in 2000) as well as definitive settlements (fifteen in 1995, fourteen in 1997 and fifteen in 2000) include an explicit ruling of infringement in the docket to formalize the agreement.

¹⁹⁹ Allison and Lemley, using final written decisions on validity, find only 299 patents in 239 cases between 1989 and 1996—an average of just over forty-two patents a year. Allison & Lemley, *supra* note 39, at 205-7. Since approximately half were ruled invalid, this would mean approximately twenty-one rulings of invalidity a year. *Id.* Moreover, the authors argue that the number of invalidity ruling should be increasing, so our findings of twenty-eight rulings of invalidity in 1995 and forty-one in 1997 seem reasonable. *Id.*

²⁰⁰ There was a formal ruling of invalidity in twenty-nine of the 1370 cases in 1995 and forty-one of the 1756 cases in 1997.

rulings of infringement occurred as a result of a trial, while twenty-three were as a result of a grant of summary judgment. Similar results were seen from 1997; for that year, forty-four rulings of infringement were as a result of a trial and thirty were as result of a summary judgment. Among the 2000 cases, fifty-five of the ninety rulings of infringement occurred in a trial while five were the result of a summary judgment. Thus, across the three cohorts, 155 out of the 277 rulings of infringement--approximately 56%--occurred at trial.²⁰¹ However, cases with rulings of invalidity are much more likely to terminate without ever going to trial. For 1995, only eight out of twenty-nine rulings of invalidity occurred as the result of a trial; 15 were the result of a successful summary judgment motion.²⁰² The difference between infringement and invalidity rulings is even more apparent in the cases filed in 1997. For that year, only five out of forty-one rulings of invalidity were granted as a result of a trial, while thirty-one were a result of a summary judgment ruling which terminated the case.²⁰³ And among the 2000 cases, seven of the 48 rulings of invalidity occurred in a trial while 31 occurred in cases that terminated in a summary judgment.²⁰⁴ Thus, it appears that rulings of invalidity tend to occur at an earlier procedural stage compared with rulings of infringement.

These results suggest that the issue of invalidity is dealt with earlier in the proceedings. Most frequently, when a patent is ruled totally or partially invalid, the case terminates with a pre-trial judgment for the alleged infringer, although sometimes it settles or litigation continues on other remaining issues. This result might seem encouraging, because it implies that invalid patents can be revoked by the courts without resorting to an expensive trial. However, as we will show in Section IV, obtaining a pre-trial ruling—particularly pertaining to invalidity—can be very expensive in patent cases.²⁰⁵ In short, termination at an early procedural stage does not necessarily mean that the case has been resolved “cheaply.”

III.E Remedies

Given the small number of rulings of infringement, it is not surprising that damages are only awarded in a small number of cases. Damages were awarded in only forty-two non-settled cases from 1995 (of which twenty-nine were jury verdicts), 54 non-settled cases from 1997 (of which twenty-three were jury verdicts) and 30 non-settled cases from 2000 (of which nineteen were jury verdicts). The average amount awarded in these cases was \$7.4 million, \$3.3 million, and \$2.1 million respectively. Consent agreements and settlements also sometimes carried awards that were listed in the docket; there were fourteen such cases from 1995, twenty-three from 1997, and thirty-three from 2000. The amount changing hands in such cases was sometimes substantial. There were three cases with consent judgments that carried major damages from 1995: one for \$1.5 million in central California and two for approximately \$5

²⁰¹The remaining forty-four percent occurred through default judgments.

²⁰² The others occurred in cases that later settled before going to trial.

²⁰³ Two rulings of invalidity occurred in cases that were dismissed with prejudice; three occurred in cases that went on to settle on remaining issues.

²⁰⁴ Eight additional rulings of invalidity were in summary judgments rulings in cases which went on to settle, one was in a cases that proceeded to trial on other issues, and one was in a summary judgment ruling in a case that is ongoing.

²⁰⁵ See *infra* Part IV.D

million each in south Iowa.²⁰⁶ From 1997, one case in Connecticut with a consent judgment cited damages of \$1 million.²⁰⁷ Among all cases filed in 2000, fourteen cases awarded damages in excess of \$1 million,²⁰⁸ one of which was a case in the Eastern Virginia district in which \$2 million and another was a case in the Central District of California in which \$4.9 million was awarded in settlement agreements.²⁰⁹

Permanent injunctions are more common, though they seem to play a different role in the process. As shown in Table 7, injunctions are most commonly found in consent judgments and even formal settlements, most likely as a mechanism for formalizing the agreement. They are also sometimes employed in default judgments as a way of controlling an infringing party who has not presented himself in court. However, they are rare in adjudicated cases; only 19% of cases ending in trials and only 4% of those terminating in summary judgments included an injunction.²¹⁰ Note that these numbers correspond only to those cases involving grants of permanent injunction and not to any grants of preliminary injunctions in patent cases.

²⁰⁶ *Chiuminata Concrete v. Cardinal Indus.*, No 95-4995 (C.D. Cal. Feb. 2, 1997); *Johnson v. Van-Wall Equip.*, No 95-80853 (S.D. Iowa, July 1, 1996); and *Portec Inc. v. Hustler Conveyor Co.*, No 95-80637 (S.D. Iowa January 16, 1996).

²⁰⁷ *Omega Eng'g v. Kokusai Chart*, No 97-1373 (D. Conn. May 12, 1998).

²⁰⁸ *Rates Tech. v. All Computer Tech.*, No. 00-256 (S.D. N.Y. Jan. 13, 2000); *Bic Corp. v. First Prominence Co.*, et. al., No. 00-7155 (S.D. N.Y. Sept. 21, 2000); *TI Group Auto. Sys. (USA), Inc.*, No. 00-432 (D. Del. April 25, 2000); *BBA Nowovens, et. al. v. Superior Nonwovens, et. al.*, No. 00-2764 (D. S.C. Sept. 6, 2000); *IP Global, Ltd. v. Thomson Consumer, et. al.*, No. 00-361 (E.D. Va. May 15, 2000); *Poly-America, Inc. v. Serrot Int'l*, No. 00-1457 (N.D. Tex. July 6, 2000); *Monsanto Co. v. Ralph*, No. 00-135 (E.D. Mo. Jan. 28, 2000); *Asian Communications, et. al. v. Zi Corp., et. al.*, No 00- 989 (N.D. Cal. March 21, 2000); *DSU Medical Corp. v. JMS Co, Inc., et. al.* No. 00-1826 (N.D. Cal. May 22, 2000); *O2 Micro Int'l. Ltd. v. Monolithic Power Systems, Inc.* No. 00-4071 (N.D. Cal. Nov. 3, 2000); *Int'l Rectifier v. IXYS Corp., et. al.*, No. 00- 6756 (C.D. Cal. June 22, 2000); *Suntiger Inc., et. al. v. Ronald Anson, et. al.*, No. 00-6875 (C.D. Cal. June 26, 2000); *Laser Technology Inc. v. Nikon, Inc.*, No. 00-272 (D. Colo. Feb. 8, 2000); *Hodgdon Powder v. Clean Shot*, No. 00-8394 (S.D. Fla. May 15, 2000).

²⁰⁹ *IP Global, Ltd. v. Thomson Consumer, et. al.*, No. 00-361 (E.D. Va. May 15, 2000) and *Suntiger Inc., et. al. v. Ronald Anson, et. al.*, No. 00-6875 (C.D. Cal. June 26, 2000), respectively.

²¹⁰ Over the three years, thirty-two of the 221 cases terminating through a trial granted a permanent injunction, while seventeen out of the 382 cases terminating on a final ruling through summary judgment granted an permanent injunction.

Table 7: Injunctions

INJUNCTIONS								
	1995		1997		2000		Total	
	Number of Cases	Percent of Injunctions	Number Of Cases	Percent of Injunctions	Number of Cases	Percent of Injunctions	Number of Cases	Percent of Injunctions
Summary Judgment	11	9%	5	4%	1	1%	17	4%
Jury Verdict	13	12%	8	6%	9	6%	30	7%
Bench Trial	4	4%	2	2%	6	4%	12	3%
Definitive Settlement	43	36%	60	47%	66	41%	169	42%
Consent Judgment	43	38%	38	29%	65	40%	146	36%
Default Judgment	1	1%	9	7%	12	7%	22	5%
Other	1	1%	6	4%	2	1%	9	2%
Total	116	100%	129	100%	161	100%	405	
Percent of All Cases	8.4%		7.4%			7.7%	7.9%	

IV. Expenditure on Cases

As discussed in the previous section, the use of court docket reports, in addition to the information provided by the AO, demonstrates that more patent cases are decided through final rulings on the merits than was previously thought. Nonetheless, nearly 80% of all patent cases settle.²¹¹

Economic theory suggests that the high rate of settlement witnessed in patent cases is a mechanism used by the parties to avoid high litigation costs.²¹² If a ruling—especially a ruling of invalidity—turns out to be expensive, the incentive to settle the dispute will be high. Individuals will balance their private benefits against the costs of continuing litigation.²¹³ However, they will not include in their calculus the public benefits in reduced research costs or the cheaper production of goods when a wrongly granted patent is ruled invalid.²¹⁴ Thus, if

²¹¹ See *supra* Part III.C.

²¹² See Lanjouw & Lerner, *supra* note 67. See also Yeazell, *supra* note 37.

²¹³ See Lanjouw & Lerner, *supra* note 67. See also Yeazell, *supra* note 37.

²¹⁴ See Gross & Syverud, *supra* note 46. See also Landsman, *supra* note 46.

rulings—particularly rulings of invalidity—are expensive, too few cases will be pursued to a final adjudication of validity or infringement on the merits.

For this reason, we were particularly interested in measuring the costs associated with the case resolutions identified in the previous section. Unfortunately, it is nearly impossible to directly measure litigation costs for the general population of patent cases. To overcome this problem, we have developed three proxies for costs: length of time to termination, number of documents filed in court, and, for the 1997 and 2000 cohorts, whether the cases reached the stage of filing a motion for summary judgment. Time to termination is a traditional measure of the resources expended on a court case. However, while it has a strong intuitive appeal, it is also likely to be inaccurate. There can be long delays in scheduling court hearings and periods of inactivity that are not necessarily associated with higher costs. The number of documents filed in the case is probably more closely correlated with actual costs, particularly in the form of “billable hours” of attorney time. However, this measure has lower intuitive appeal, because it is less obvious what constitutes “a lot” of documents than what is a “long duration” case. Finally, costs begin to escalate when cases reach the claim construction or summary judgment stage. Even if the case settles after that point, there will have been a considerable expenditure of resources. Therefore, reaching the stage of filing a motion of summary judgment can be an indication that the level of expenditure in the case was moderate to high.

Using these three measures, we will show that the average level of expenditure over all patent cases is relatively modest. However, final rulings by a court after a trial or a grant of summary judgment are found to be expensive. In other words, even cases that do not reach the trial stage but terminate with a successful motion for summary judgment involve a considerable expenditure of resources. As a consequence, our previous finding that rulings of invalidity commonly occur at the summary judgment stage may be somewhat misleading or at least incomplete: terminating early, prior to trial, does not necessarily imply little expenditure of resources.

IV.A Level of Expenditure: All Cases

Tables 8 and 9 report our results for the duration of cases filed in 1995, 1997 and 2000. These results demonstrate that on the average, expenditures in patent cases are not excessively high. Among cases in the 1995 cohort, the average number of days to case termination was 418, while the median number of days to termination was 298.²¹⁵ Among the cases filed in 1997, the average number of days to termination was 466, while the median number of days was 299.²¹⁶ For cases filed in 2000, the mean and median of duration was 443 and 295 days respectively. Thus, in all three years, 50% of cases were resolved within ten months.²¹⁷ However, as shown in Figure 2, there are a small number of cases with exceedingly long durations. In particular, as the

²¹⁵ See Table 7.

²¹⁶ See Table 8.

²¹⁷ Although there are a small number of cases with very long durations and numerous documents filed. One case from 1995, twelve from 1997 and 62 from 2000 were still on-going as of this writing. . For the 1995 and 1997 cohorts, the on-going cases are largely irrelevant in analyzing case duration. Given the significant number of on-going cases from 2000, these cases were assumed to “terminate” on February 15, 2006 to reduced the downward bias of duration calculations by as much as possible.

larger difference between the mean and the median demonstrates, the 1997 curve has a somewhat longer “tail.” Sixty-six cases filed in that year had a duration which equaled or exceeded five years.

As noted above, one problem with using time to termination as a measure of expenditure is that it is possible for some cases to have long periods of inactivity. These periods are still a problem for the parties: no firm or manager likes to have unresolved legal issues, and there may be financial implications such as market valuation. Moreover, such periods reduce the accuracy of time as a measure of expenditure on patent cases. Thus, a second measure of expenditure on cases was employed by exploiting the enumeration of documents filed in the docket reports. The number of documents filed may give a better indication of the number of “billable hours” paid by the parties and, therefore, direct expenditures.

The number of documents filed in patent cases supports the conclusion that expenditure on most cases may not be large. As shown in Table 9, the average number of documents filed was approximately sixty-five while the median was twenty-five across all three years. Figure 3 demonstrates that, as with the time to termination, the number of documents filed in cases has a long tail of cases with numerous documents.²¹⁸ However, by this measure, expenditure on patent cases was strikingly similar for the three cohorts, both in terms of the distributions displayed in Figure 3, and in the summary statistics describing that distribution summarized in Table 9.

Finally, we determined which cases had reached a stage at which a motion for summary judgment had been filed. Certain events such as claim construction or motions for summary judgment during the course of litigation indicate that the parties are investing significant resources in the litigation. Filing a motion for summary judgment is one such event. We found that in 473 cases in the 1997 cohort—i.e., approximately 27% of all cases filed that year—a motion for summary judgment was filed.²¹⁹ In the 2000 cohort, a summary judgment motion was filed in 490, or 24%, of all cases. The significance of this measure will be seen later when we examine the characteristics of cases terminating with various outcomes.²²⁰

²¹⁸ The maximum number of documents was 1042 in 1995 1386 in 1997. The actual averages were sixty-six in 1995 and sixty-five in 1997. The medians were twenty-five and twenty-four respectively.

²¹⁹ We found 473 out of 1756 cases where a motion for summary judgment had been filed.

²²⁰ We also attempted to track cases in which Markman claim construction hearings were held but found that even in 1997 and 2000, only 10-12% of the case dockets explicitly mention even an exchange of documents discussing claim construction. Since the Markman hearing to construe the claims of the patents at issue is now so common in patent litigation, we are unsure whether this result reflects the fact that the procedure was not effectively integrated into the court system even as late as 2000 or if it was simply not common to report the proceedings in docket reports as of that date.

Table 8: Time to Resolution: All Cases

	1995		1997		2000 ²²¹	
	Number	Percentage	Number	Percentage	Number	Percentage
1 Quarter	196	14	211	13	255	12
2 Quarters	250	18	344	20	409	20
3 Quarters	195	14	245	14	299	14
4 Quarters	152	11	213	12	253	12
5 Quarters	128	9	164	9	169	8
6 Quarters	100	7	104	6	144	7
7 Quarters	74	5	86	5	110	5
8 Quarters	37	3	64	4	80	4
More Than 8 Quarters	238	17	325	19	362	17
Total	1370	100	1756	100	2081	100
Average Number of Days	418		466		443	
Median Number of Days	298		299		295	

²²¹ Case durations for 2000 are calculated using the assumption that the 62 ongoing cases terminate on 2/15/2006. The reader should note that truncating the case history in this manner will reduce the estimated mean and percentiles, especially the higher percentiles

Table 9: Number of Documents Filed: All Cases

	1995		1997		2000 ²²²	
	Number ²²³	Percentage	Number	Percentage	Number	Percentage
Less than 10	362	26%	461	26%	491	24%
10-19	235	17%	347	20%	387	19%
20-49	326	24%	392	22%	523	25%
50 or More	443	34%	556	32%	680	33%
Total	1366	100%	1756	100%	2081	100%
Average Number of Documents	66		65		65	
Median Number of Documents	25		24		24	

²²² The tallies of documents for 2000 are calculated using the number of documents for the 62 ongoing cases is that observed on 2/15/2006. The same caveat as used for case durations applies.

²²³ Number of documents was not available for four cases in Nevada for 1995 and 1997 due to the format of the on-line docket reports.

Figure 2: Duration of Patent Cases

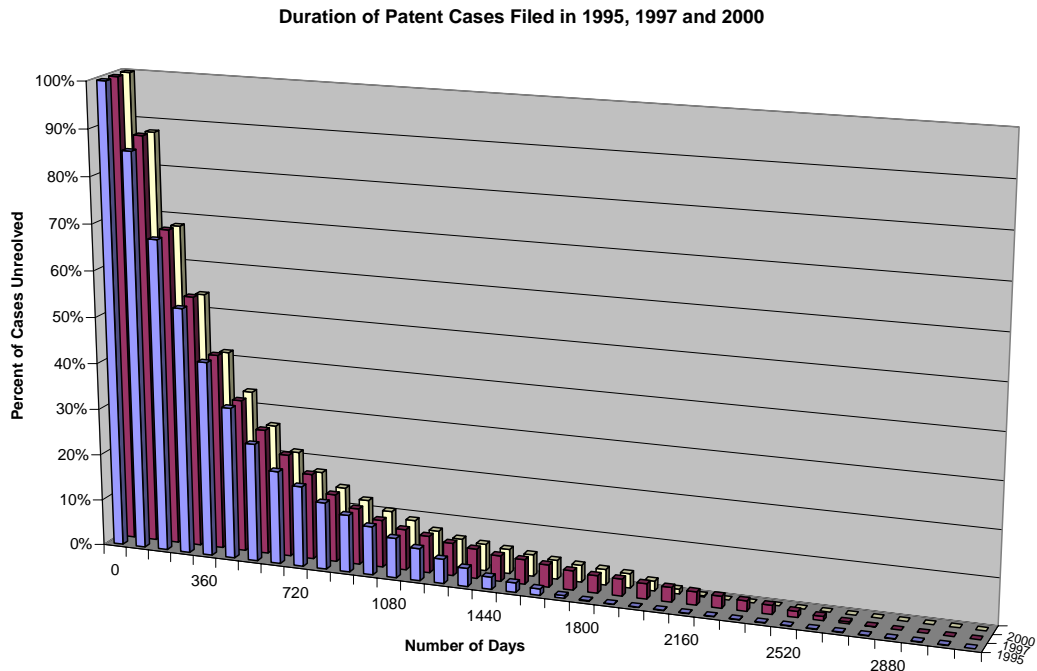
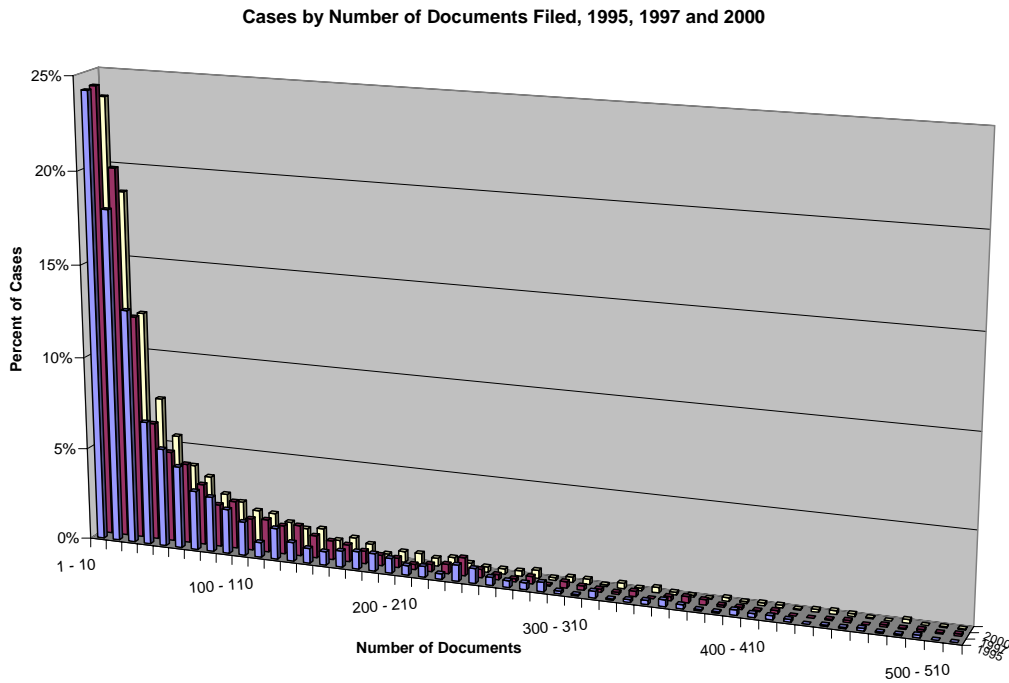


Figure 3: Number of Documents Filed



IV.B How do Expenditures in Cases Differ across Outcomes?

As we have shown, despite the conventional wisdom, the actual expenditure on patent cases may be relatively modest. However, it is also true that the vast majority of patent cases settle. The question remains: is the low level of expenditure actually due to the high number of settlements?

Tables 10 and 11 break down the expenditures levels by the manner in which the case was resolved. As might be expected, cases which proceed to a final court ruling on the merits²²⁴ entail a greater expenditure of resources than those which settle. The average number of days to termination for cases with a final court ruling was 680 for 1995, 855 for 1997 and 780 for 2000; the averages among settlements were 422, 439 and 392, respectively.²²⁵ The contrast was equally stark when the number of documents filed was used as a measure of expenditure. The average number of documents for cases terminated with a final court ruling was 174 for 1995, 183 for 1997, and 214 for 2000; for settlements, it was fifty-five, fifty-six and forty-nine, respectively.²²⁶ Thus, over three times as many documents were filed in the average case terminating in a ruling than in the average case that settled.²²⁷ As demonstrated in Figures 7, 10 and 14, this result means that the vast majority of cases terminating through rulings had more than fifty documents filed, while only a small proportion of those terminating in a settlement fell into this category.²²⁸

Given the “long tails” associated with expenditure on patent cases, Tables 10 and 11 also compare the distribution of expenditure levels between settled and adjudicated cases. The contrast in expenditure is again quite startling: in 1997, the median duration for cases which terminated in a ruling was approximately twice that of cases which settled, while the median number of documents filed was over four times as great.²²⁹ In fact, the median case terminating in a ruling from 1997 would have fallen at the 96th percentile among settled cases in terms of number of filed documents. Apparently, the relatively low average expenditure observed across all patent cases is biased downward by the low expenditures in the settled cases. The distributions of documents filed in the 2000 cohort displays similar trends.

²²⁴ Summary judgment, verdict or judgment in a trial, dismissals with prejudice.

²²⁵ The total number of days across cases with rulings was 148,920 in 1995 and 192,375 in 1997 while the number of cases with rulings was 219 and 225, respectively. The total number of days in cases terminating through settlements was 271,346 in 1995 and 350,322 in 1997, while the number of cases were 643 and 798, respectively.

²²⁶ The total number of documents across cases with rulings was in 38,106 1995 and 41,175 in 1997 while the number of cases with rulings was 219 and 225, respectively. The total number of documents in cases terminating through settlements was 35,365 in 1995 and 44,688 in 1997, while the number of cases was 643 and 798, respectively.

²²⁷ In 1995, 174 documents in cases with rulings versus fifty-five in cases which settled; in 1997, 183 in cases with rulings versus fifty-six in cases which settled.

²²⁸ In 1995, 197 out of 642 cases terminating through settlements versus 171 out of 219 cases terminating through final rulings had more than fifty documents. In 1997, 244 out of 798 cases terminating through settlements versus 175 out of 225 terminating through final rulings had more than fifty documents.

²²⁹ In 1997, the median number of days to termination of a case terminating through a final ruling was 685 days, while the median among cases which settled was 328 days. Also, in 1997 the median number of documents among cases terminating through rulings was 118, while the median among settled cases was twenty-five.

A final method for measuring the level of expenditure on cases is to determine the stage in the litigation process at which the case terminated. For example, at what stage in the litigation process did the settlements take place?²³⁰ Certain events in the course of litigation are indicators that the parties have invested considerable resources. One such event is the filing of motions for summary judgment. We found that a motion for summary judgment was filed in 27% of all cases filed in 1997 and 24% of the cases filed in 2000 as of this writing. However, a summary judgment motion was filed in only 25% of the cases from 1997 that definitively settled and 20% of the 1997 cases that definitely or probably settled. For the 2000 cases, summary judgment motions were filed in 18% of the settled cases and 20% of the probable settlements. Thus, all our measures suggest that the relatively low expenditure on patent cases is, at least in part, due to the propensity to settle these disputes.

²³⁰ “[S]ettlement at an early stage, before a pre-trial motion is decided, takes place under information conditions that differ from those that will prevail on the eve of trial; discovery may or may not proceed while the parties wait for a decision on a pre-trial motion.” Hadfield, *supra* note 144, at 708.

Table 10: Distribution of Number of Days to Termination by Type of Outcome

	1995						1997						2000 ²³¹					
	Mean	Percentiles					Mean	Percentiles					Mean	Percentiles				
		10 th	25 th	50 th	75 th	90 th		10 th	25 th	50 th	75 th	90 th		10 th	25 th	50 th	75 th	90 th
Rulings	680	166	318	564	1002	1358	855	217	414	685	1001	2110	780	213	399	658	1067	1636
Settlement	422	105	188	329	540	920	439	103	182	328	558	883	392	95	179	313	520	795
Settlement or Probable Settlement	421	96	172	322	540	957	440	93	176	315	533	922	404	91	171	314	532	852
All Cases	418	74	139	299	545	1012	466	77	151	299	575	1015	443	81	143	295	566	1043

Table 11: Distribution of Number of Documents Filed by Type of Outcome

	1995						1997						2000 ²³²					
	Mean	Percentiles					Mean	Percentiles					Mean	Percentiles				
		10 th	25 th	50 th	75 th	90 th		10 th	25 th	50 th	75 th	90 th		10 th	25 th	50 th	75 th	90 th
Rulings	174	24	56	112	236	394	184	34	64	118	228	442	214	30	70	120	260	440
Settlement	56	7	14	27	60	130	55	7	13	25	63	129	49	8	14	25	55	117
Settlement or Probable Settlement	54	7	13	25	58	134	56	7	13	25	61	129	52	7	13	26	58	125
All Cases	66	4	10	25	70	180	65	4	10	24	68	158	64	4	10	24	67	155

²³¹ In addition to the previous caveats, the reader should remember that we do not know how the ongoing cases from 2000 will be terminated

²³² Again, these results are preliminary pending resolution of the on-going cases from 2000.

Figure 4: Duration of Cases Terminated with Settlements or Probable Settlements

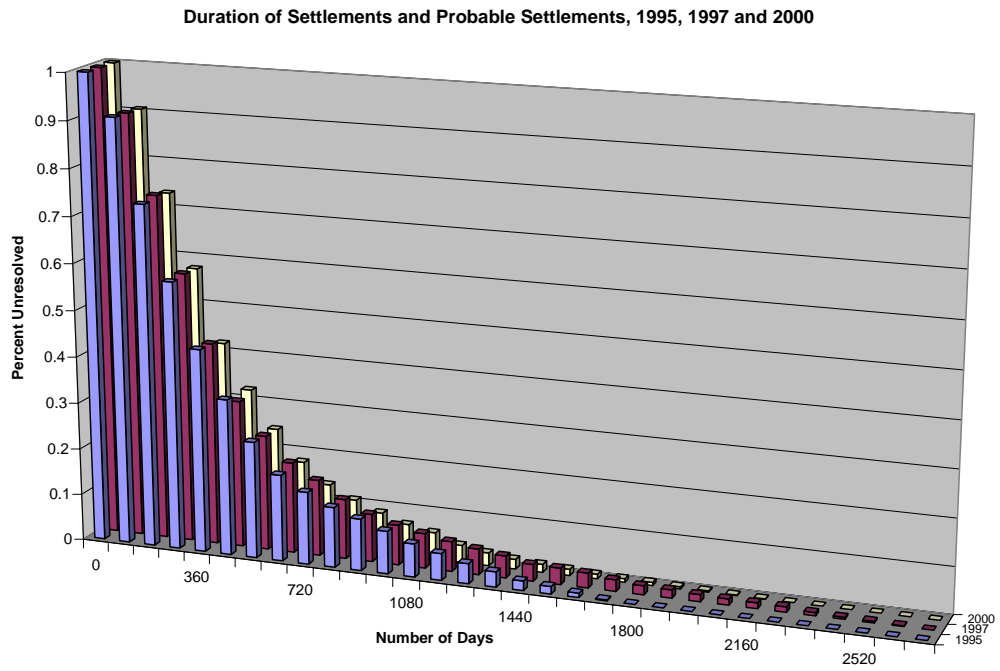


Figure 5 Duration of Cases Terminating in Rulings

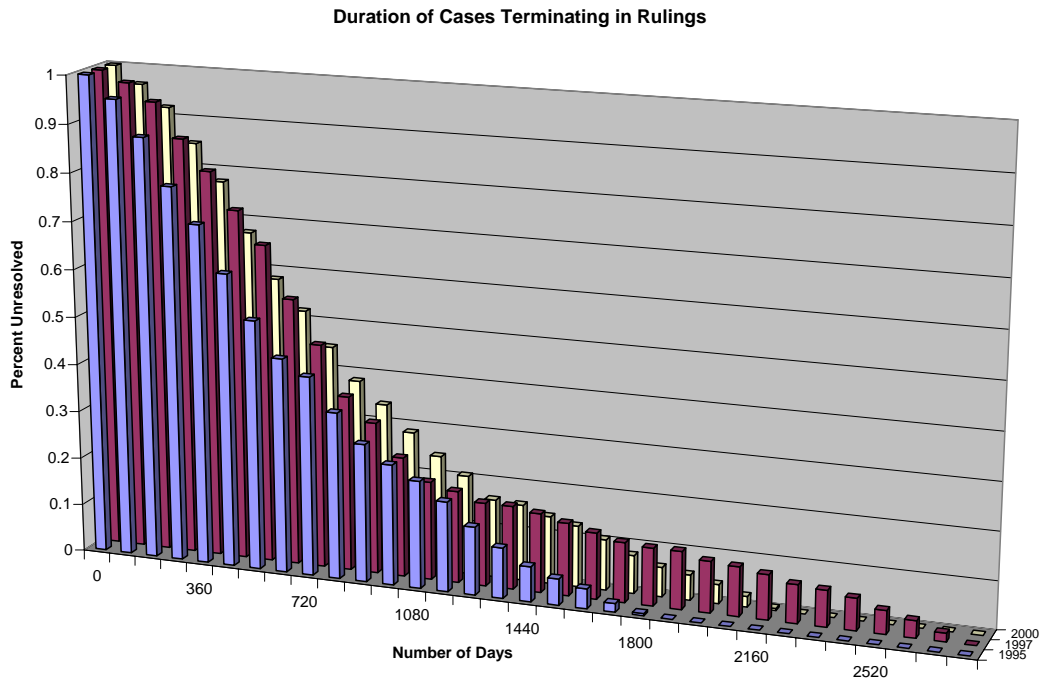


Figure 6: Documents Filed in 1995 Cases which Settled or Probably Settled

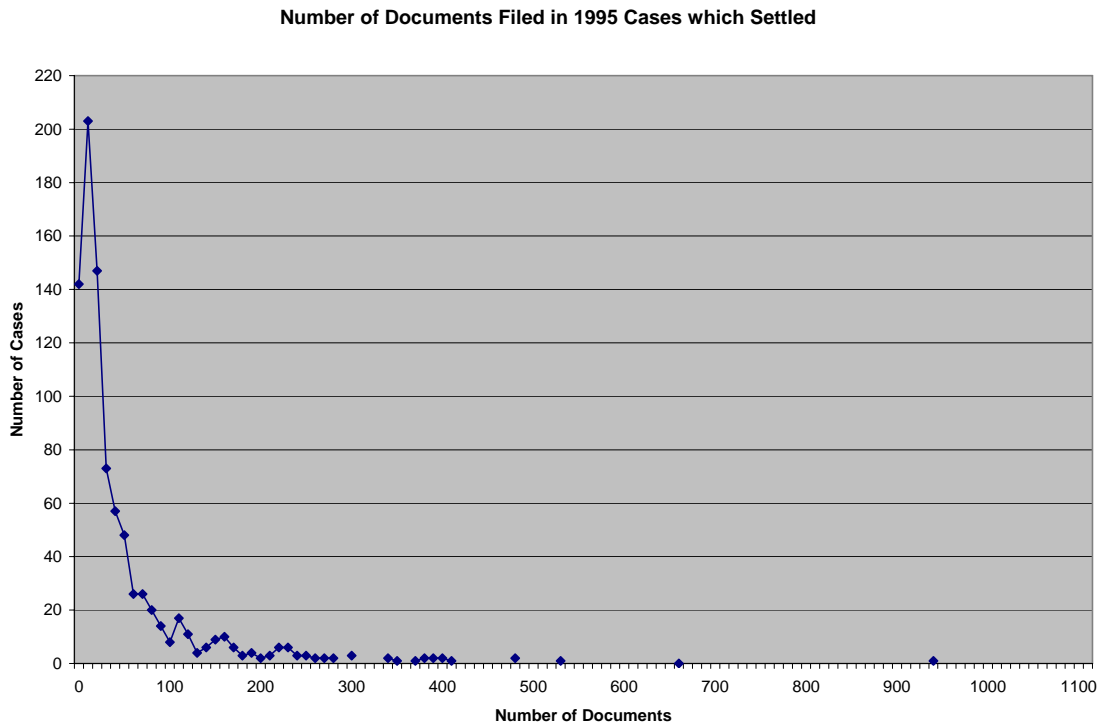


Figure 7: Documents Filed in 1995 Cases with Rulings

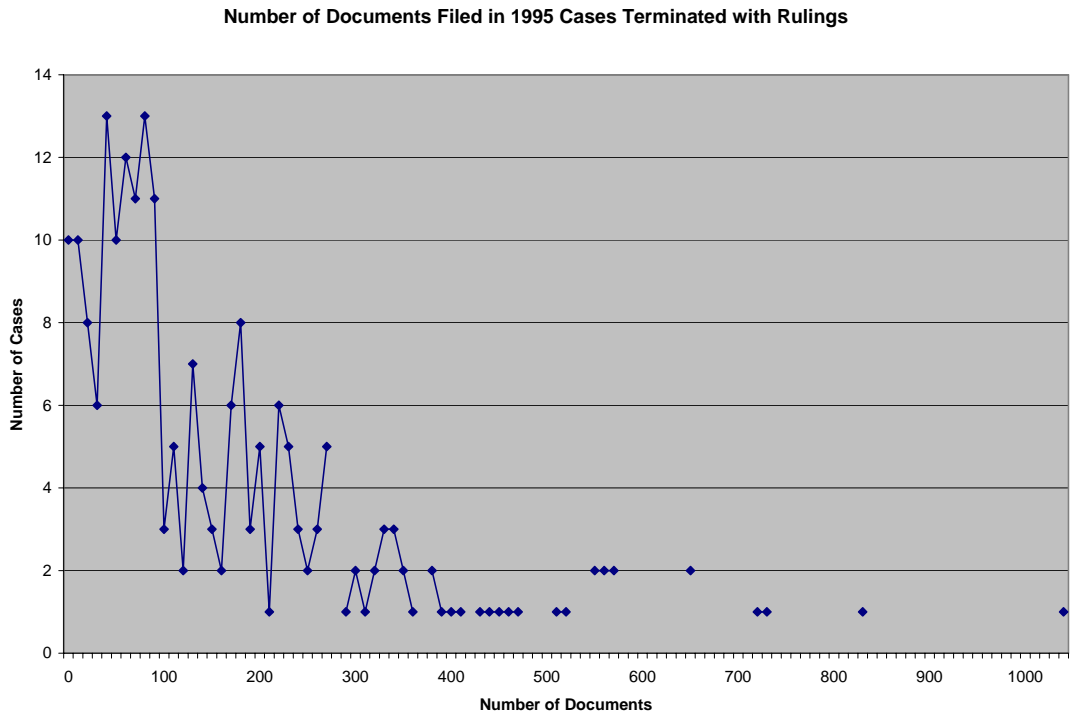


Figure 8: Number of Documents Filed by Type of Outcome, 1995

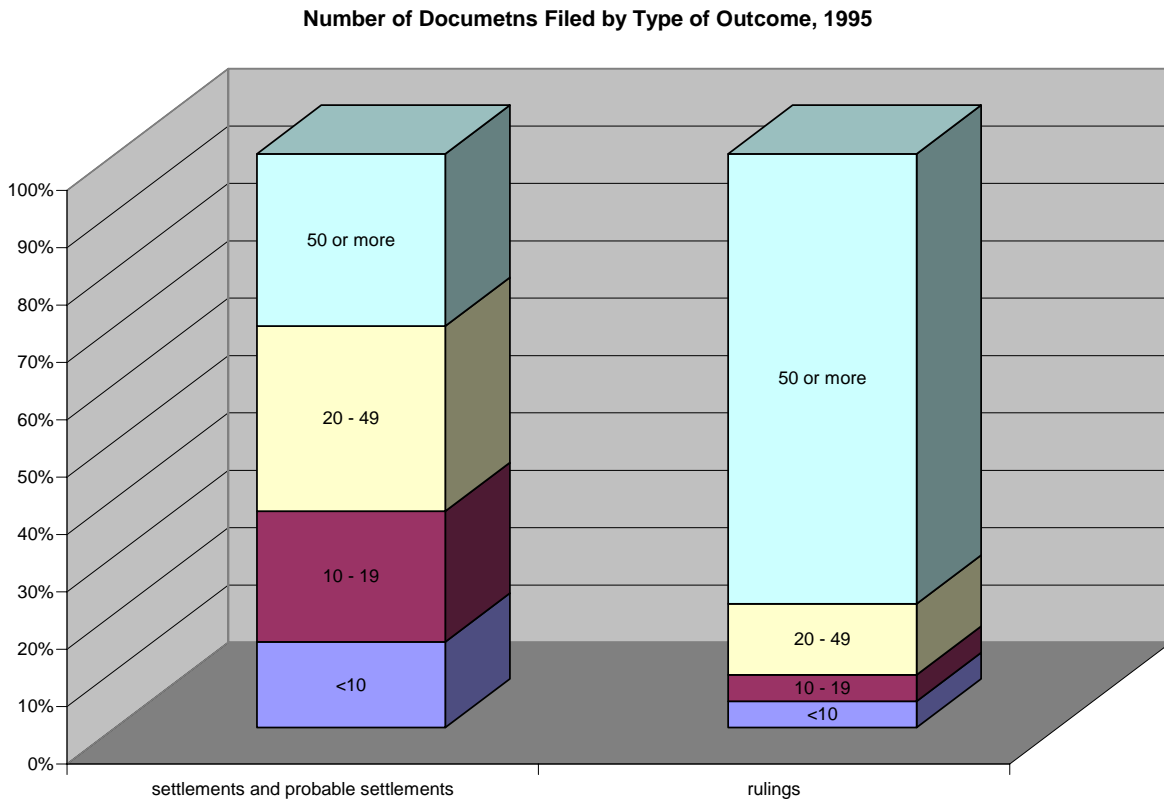


Figure 9: Documents Filed in 1997 Cases which Settled or Probably Settled

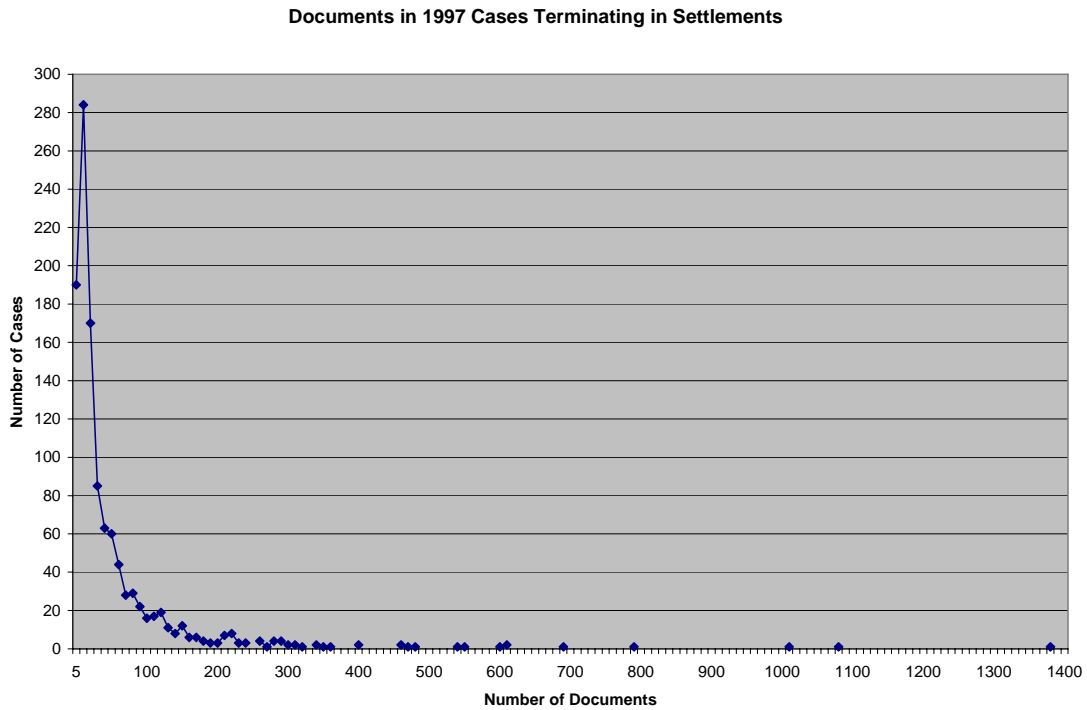


Figure 10: Documents filed in 1997 Cases Terminating in Rulings

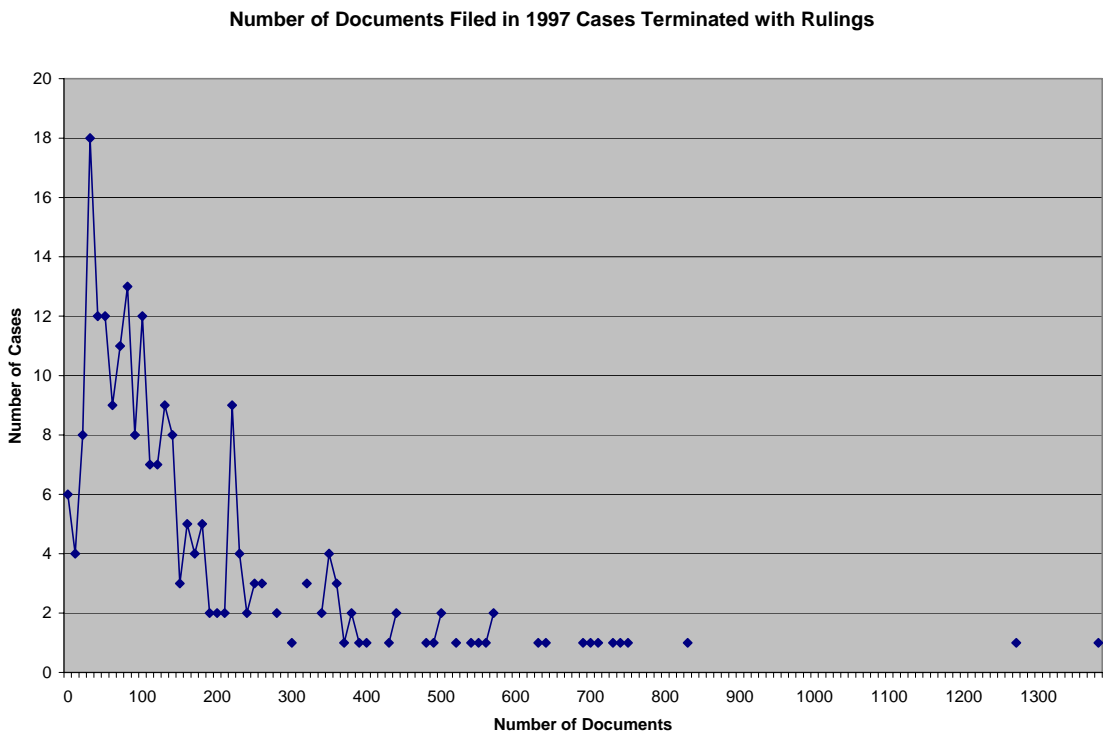


Figure 11: Number of Documents Filed by Type of Outcome, 1997

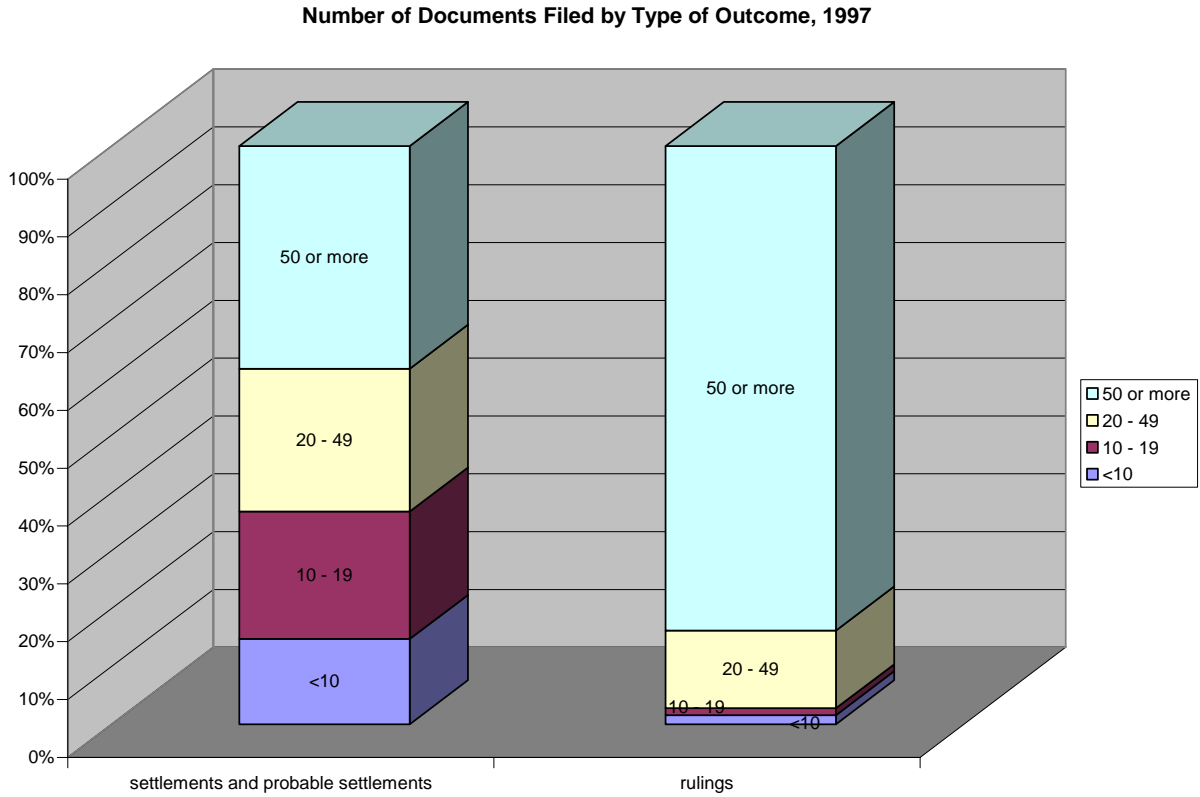


Figure 12: Documents Filed in 1997 Cases which Settled or Probably Settled

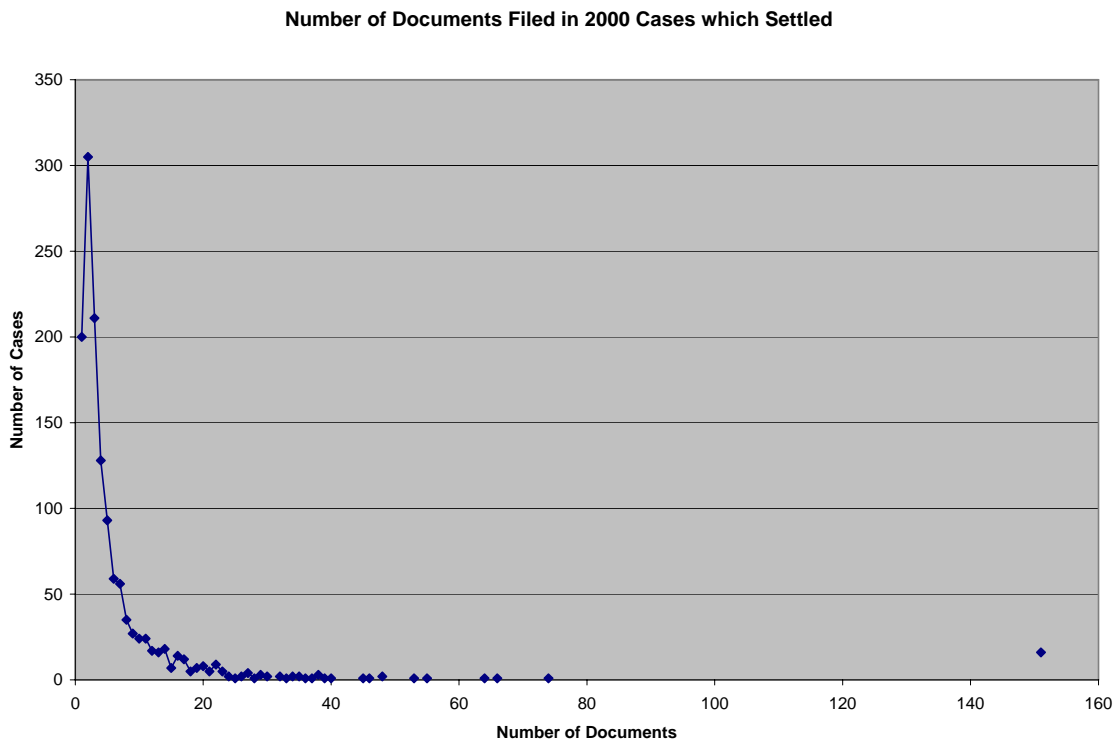


Figure 13: Documents filed in 1997 Cases Terminating in Rulings

Figure 14: Number of Documents in 2000 Cases Terminating with Rulings

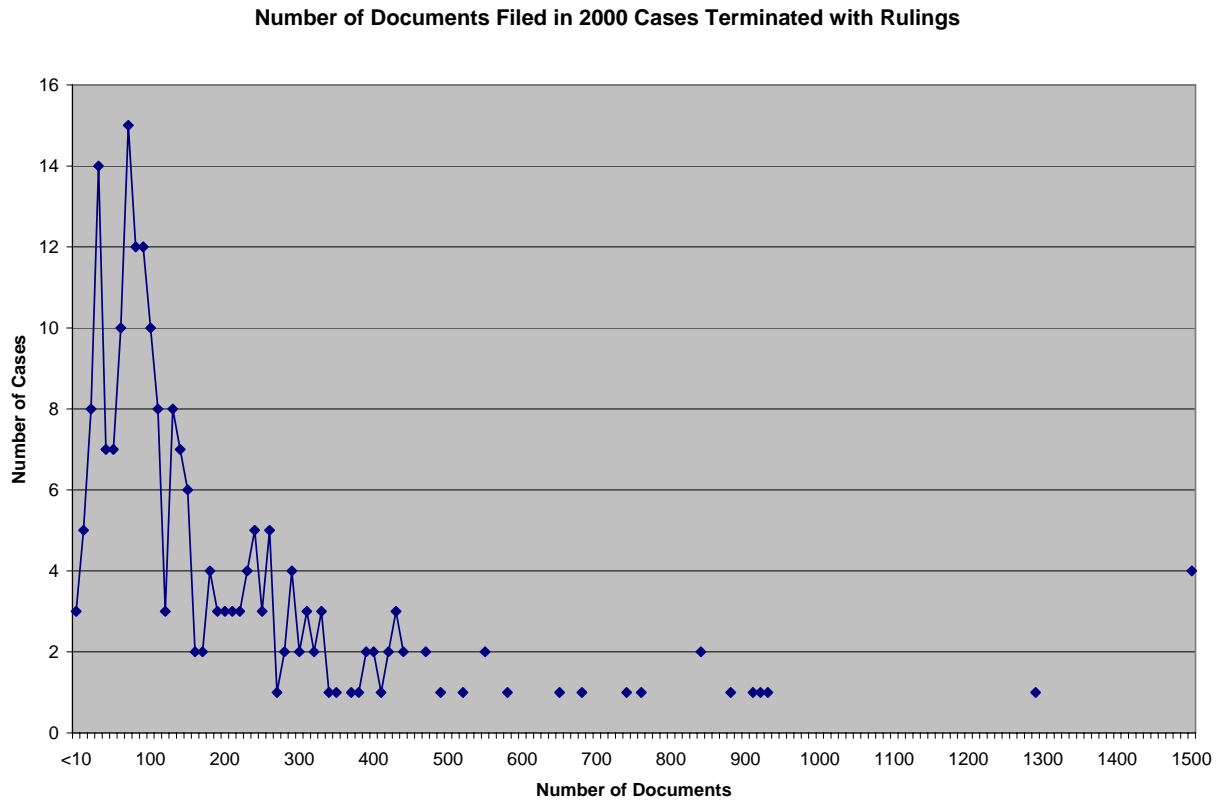
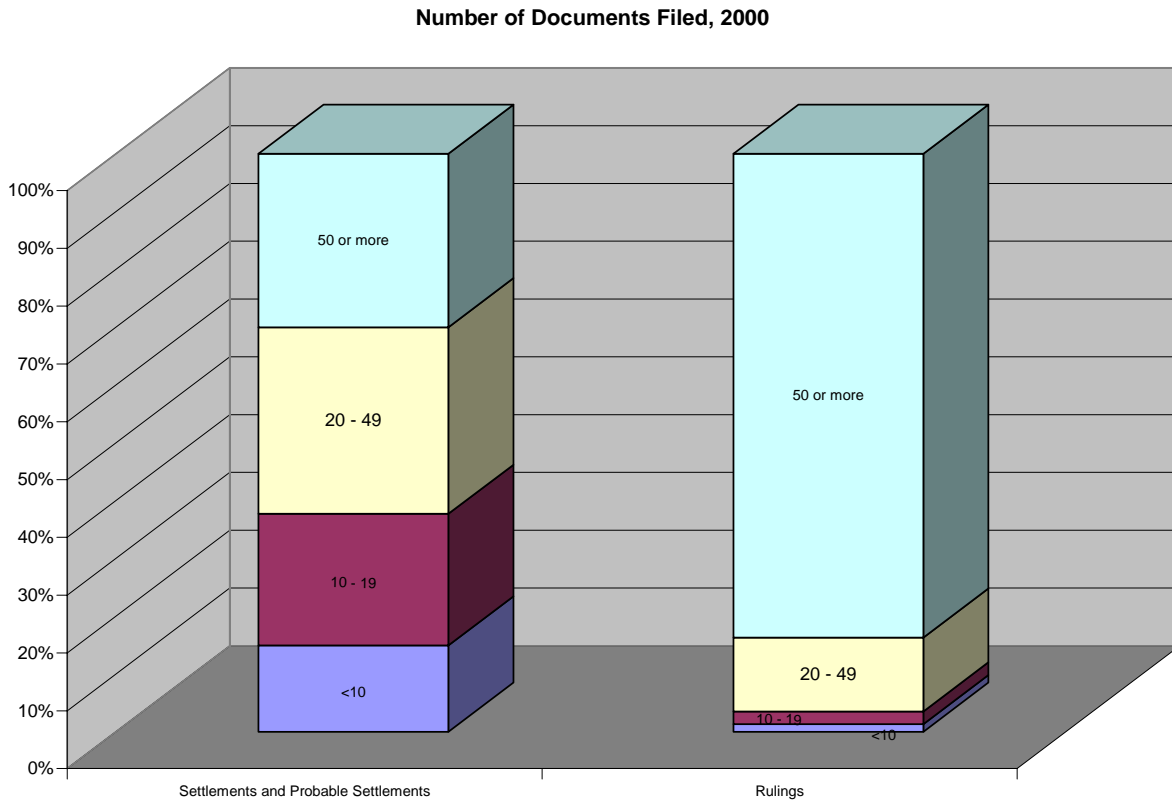


Figure 15: Number of Documents Filed by Type of Outcome, 1997



IV.C Expenditure by Type of Ruling: Trials and Summary Judgments

In general, it is assumed that the most expensive cases are those that go to trial.²³³ As shown in Table 11, our results verify this assertion. However, it is also obvious that the cases that terminated through successful summary judgments motions also required a significant level of resources, particularly in 1997. The average case from 1997 terminating through a trial endured just under two-and-a-half years; however, cases from that year terminating through a successful summary judgment ended in only about two fewer months.²³⁴ A similar result can be observed when medians are compared: 50% of cases terminating through a trial lasted approximately two years, while the median among cases terminating through a summary judgment was only about four months fewer than that figure.²³⁵ And the decline in the ratio of expenditure on trials to expenditure on summary judgments is even more evident when measured in terms of documents filed. For 1995, the average number of documents filed in cases that ended with trials was two-and-a-half times the average number filed in cases terminating in successful summary judgments, and the median number filed was about three times as great.²³⁶ In 1997, the average number filed in cases with a trial was only about 60% greater, and the median was about twice as great.²³⁷

To some extent, these results suggest that there may be a trend in the level of expenditure across the two types of rulings. As shown in Table 10, the average duration of a case terminating through a trial grew by only about 9% between the 1995 and 1997 cohorts. The median length actually decreased.²³⁸ However, the average duration of cases terminating with summary judgments from 1997 was nearly double that of 1995, increasing from 567 days to 900 days.²³⁹ The median duration among summary judgment cases increased by about 50%.²⁴⁰ A similar result can be seen in Table 11 among the number of documents filed, which showed very little change among cases terminating in trials. However, the median number of documents among cases terminating through a summary judgment increased by about 40%.²⁴¹ Whichever measure of expenditure is used, the overall cost of a trial seems relatively stable and may have decreased

²³³ See Gross & Kent D. Syverud, *supra* note 43 at 320

²³⁴ The average length of a case terminating through a trial was 951 days in 1997; the average for cases terminating in a motion for summary judgment was 900.

²³⁵ In 1997, the median length for cases ending in a trial was 776 days; for cases ending in a summary judgment the median length was 651 days.

²³⁶ In 1995, on the average 282 documents were filed in cases ending through a trial and 110 in cases ending in a summary judgment. The median number of documents was 233 for cases ending in a trial versus 79 for cases ending in summary judgments.

²³⁷ In 1997, the average number of document in cases ending in a trial was 276 and in cases ending through a summary judgment 169. The median number for tried cases was 224 and for cases ending in a summary judgment. 105.

²³⁸ The average length of a cases terminating through a trial was 873 days in 1995 and 951 days in 1997. The medians were 862 and 776, respectively.

²³⁹ See *supra* Table 11.

²⁴⁰ From 445 days to 651 days.

²⁴¹ The average number of documents in cases terminating through trials grew from 282 to 276 while the median went from 233 to 224. The average number of documents in a case terminating in a summary judgment grew from 110 to 169 while the median grew from seventy-nine to 105.

slightly, while that of a summary judgment is increasing and is only somewhat less costly than a trial in the later year. These results can also be seen in Figures 12 and 13. These diagrams demonstrate somewhat of a shift towards longer trial cases, and a more pronounced shift among summary judgment cases.

The significant difference in duration and number of documents filed in cases resolved through summary judgment for the 1997 cases compared with the 1995 cases are consistent with the changes brought about by the Markman decision that invigorated claim construction as a threshold legal issue in patent litigation. As a preliminary matter, the number of cases resolved through summary judgment did not change significantly between the 1995 and 1997 cohorts (see Tables 4 and 5—121 cases (9%) resolved through summary judgment in the 1995 cohort and 134 cases (8%) resolved through summary judgment in the 1997 cohort); the 1997 filed cases simply took much longer. The increased importance placed on first construing the claims before addressing infringement or invalidity after Markman necessitates that allotment of significant resources to the step of claim construction before (or concurrent with) filing motions for summary judgment. Hence, it is not surprising that in the 1997 cases more resources were expended earlier in the litigation. It follows that this early emphasis on claim construction would show up in the form of more expenditures in cases such as those resolved through a grant of summary judgment after Markman hearings had taken a foothold in 1997 compared with the days prior to or just following the Markman decision in 1995.

These results call into question the conventional view that cases which go to trial are much more expensive than those cases where there is a final court ruling in the pre-trial stage. Figures 16 and 17 make this result even more obvious. As these figures demonstrate, for 1995 the majority of cases ending with final rulings lasting two years or more went to trial.²⁴² But for 1997, the majority of such cases terminated through a pre-trial final ruling.²⁴³ The results are similar when expenditure is measured by the number of documents. In 1997, among cases terminating through a final ruling in which more than 100 documents were filed, 60% terminated in the pre-trial stage.²⁴⁴

Of course, two years are insufficient to truly diagnose any form of long term trend. This caveat is especially true given the fact that a significant number of cases from the 2000 cohort are unresolved, and the preliminary data reported in Tables 10 and 11 suggest a slight reversal of the trend observed between the 1995 and 1997 cohorts. Nonetheless, the ratio of expenditures on trial terminations to that of summary judgment terminations is still less in cases from 2000 than it was in the 1995 cases. Moreover, the preliminary results from the latest year in which nearly all cases are resolved—1997--suggest that despite the fact that they may occur earlier in the process of litigation, summary judgments are increasingly being used to resolve complicated patent cases. The fact that few cases go to trial does not mean that there are only a few cases with a

²⁴² In 1995, fifty-four cases terminating through a trials lasted more than two years, while only thirty-six cases terminating through a successful motion on summary judgment lasted that long.

²⁴³ In 1997, thirty-one cases terminating through a trial lasted more than two years, while sixty-two cases terminating on a motion for summary judgment did so.

²⁴⁴ And these results do not take into account the cases in which summary judgment motions were filed which did not lead to a resolution, but the case settled before going to trial. In fact, about half of the 300 cases where more than a 100 documents were filed actually settled; in 75% of these, a motion for summary judgment had been filed.

high level of expenditure. In other words, expenditures in patent cases are not as closely related to the initiation of a trial as might be commonly thought.

Table 12: Expenditure on Cases with Rulings by Type of Ruling

	Number of Days						Number of Documents					
	1995		1997		2000 ²⁴⁵		1995		1997		2000 ²⁴⁶	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Cases Terminating in Summary Judgments	567	445	900	651	707	589	110	79	169	105	150	99
Cases Terminating through Trials	873	862	951	776	1049	959	282	233	276	224	310	276

²⁴⁵ See *infra* 231.

²⁴⁶ *Ibid.*

Figure 16: Duration of Cases Terminating with Summary Judgment

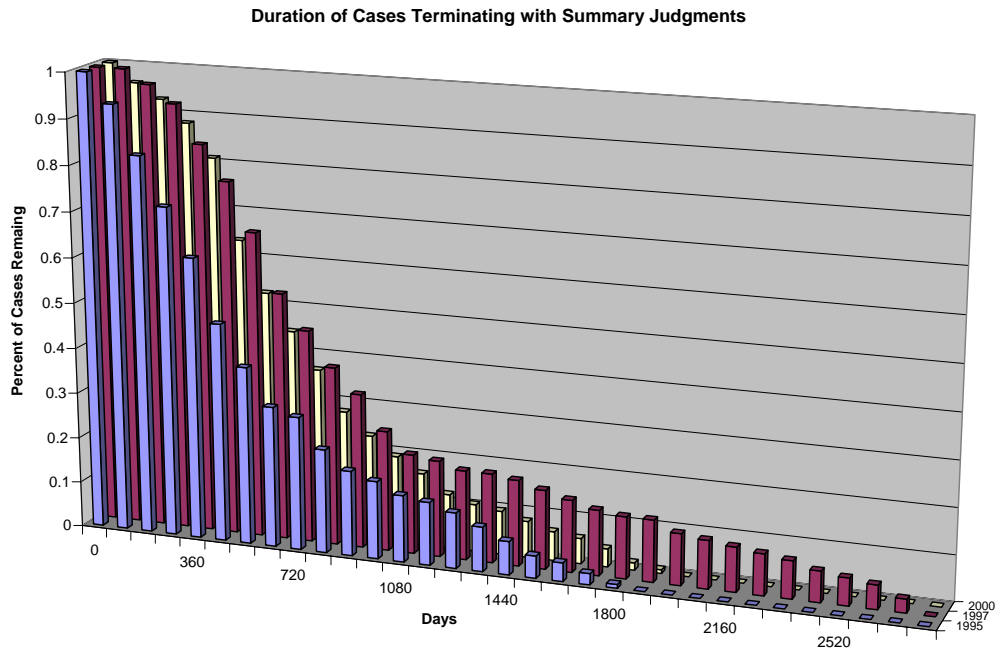


Figure 17: Duration of Cases Terminating through Trials

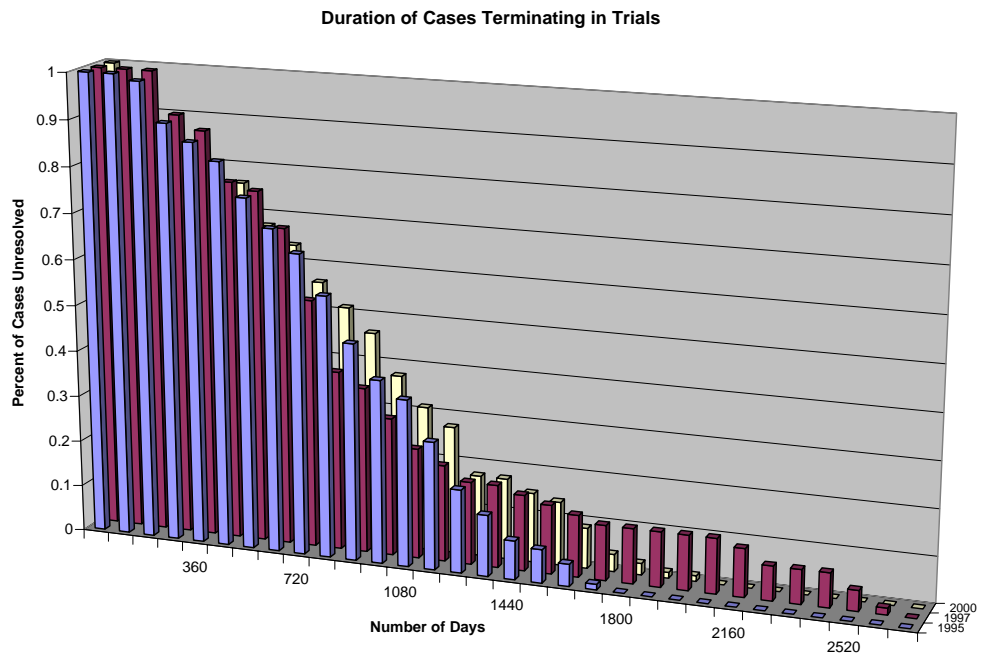


Figure 18: Duration of Cases with Rulings, 1995

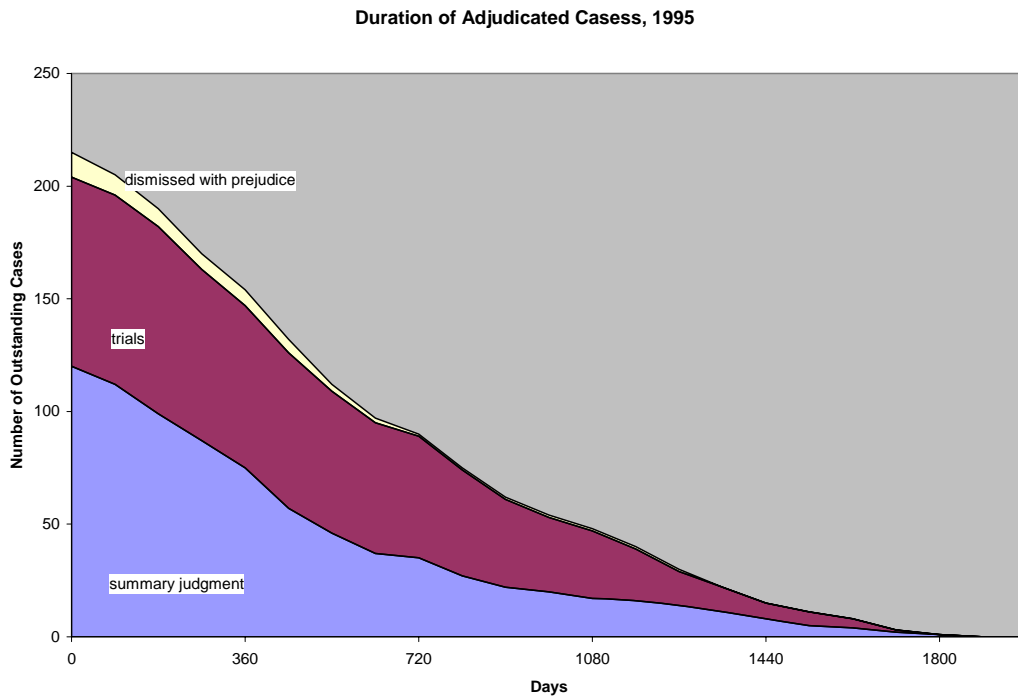


Figure 19: Duration of Cases with Rulings, 1997

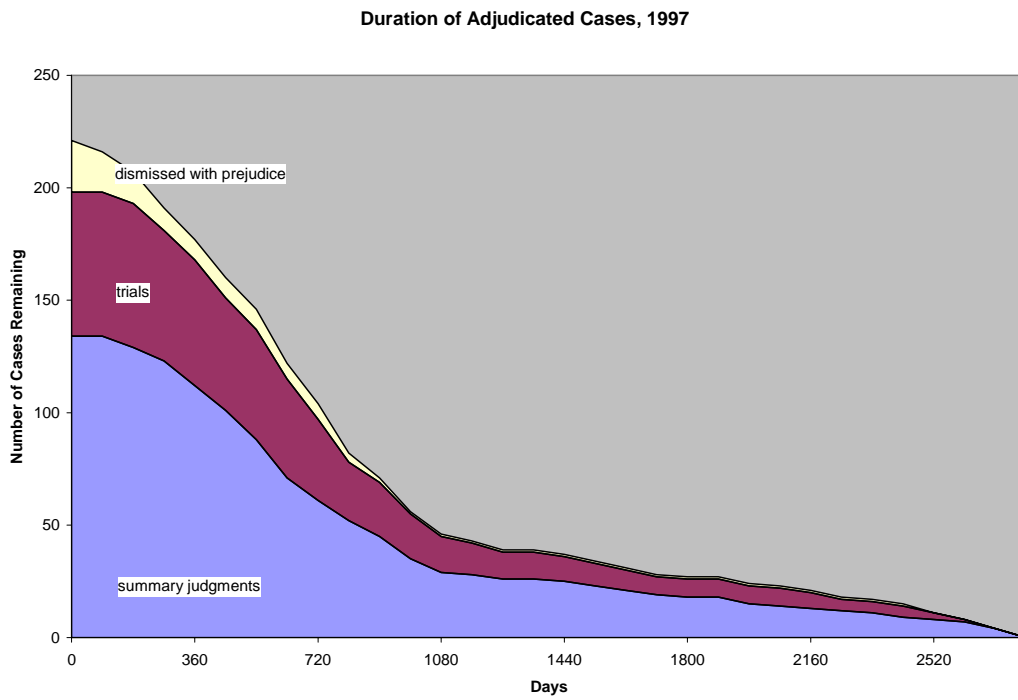


Figure 20: Duration of Cases with Rulings, 2000

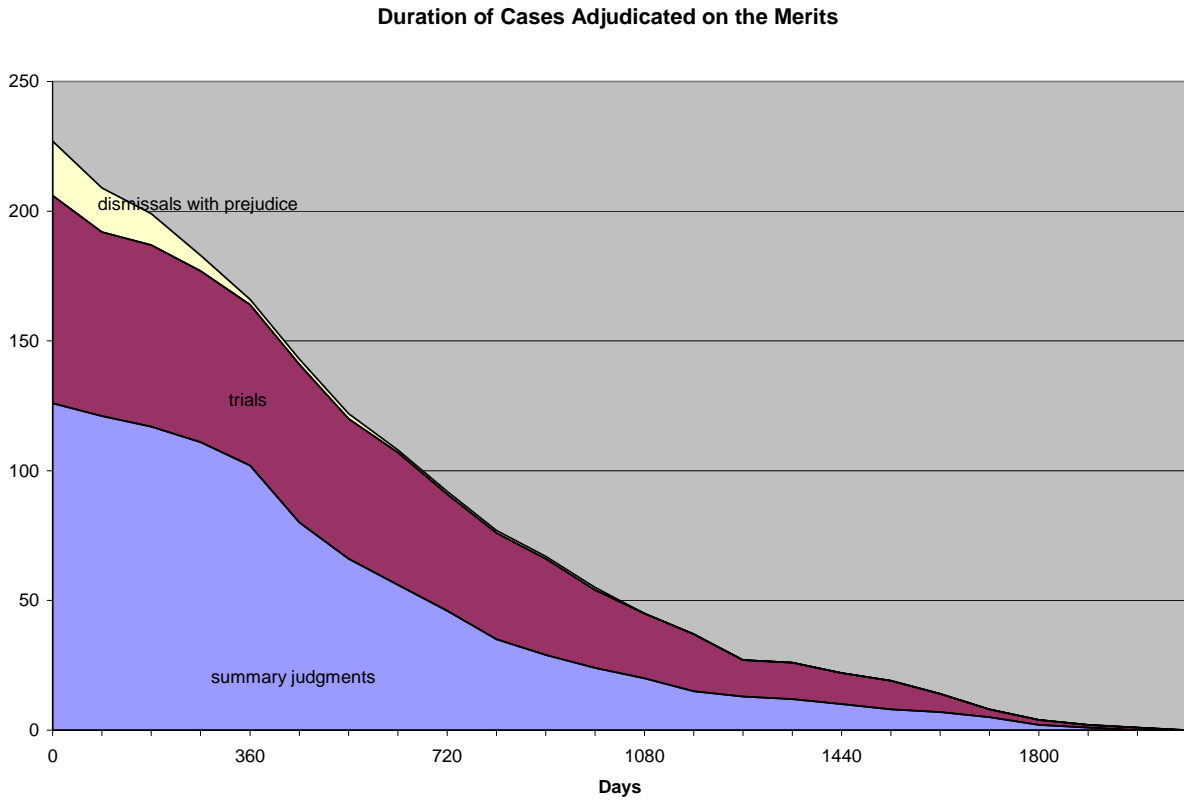


Figure 21: Number of Documents in Cases Terminating with Summary Judgments

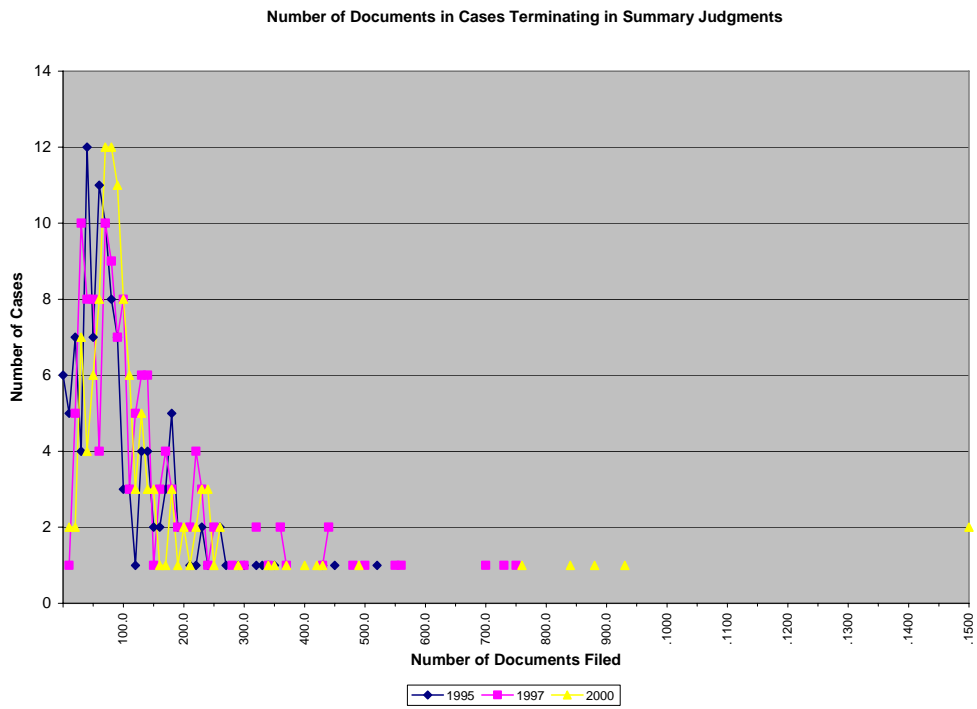
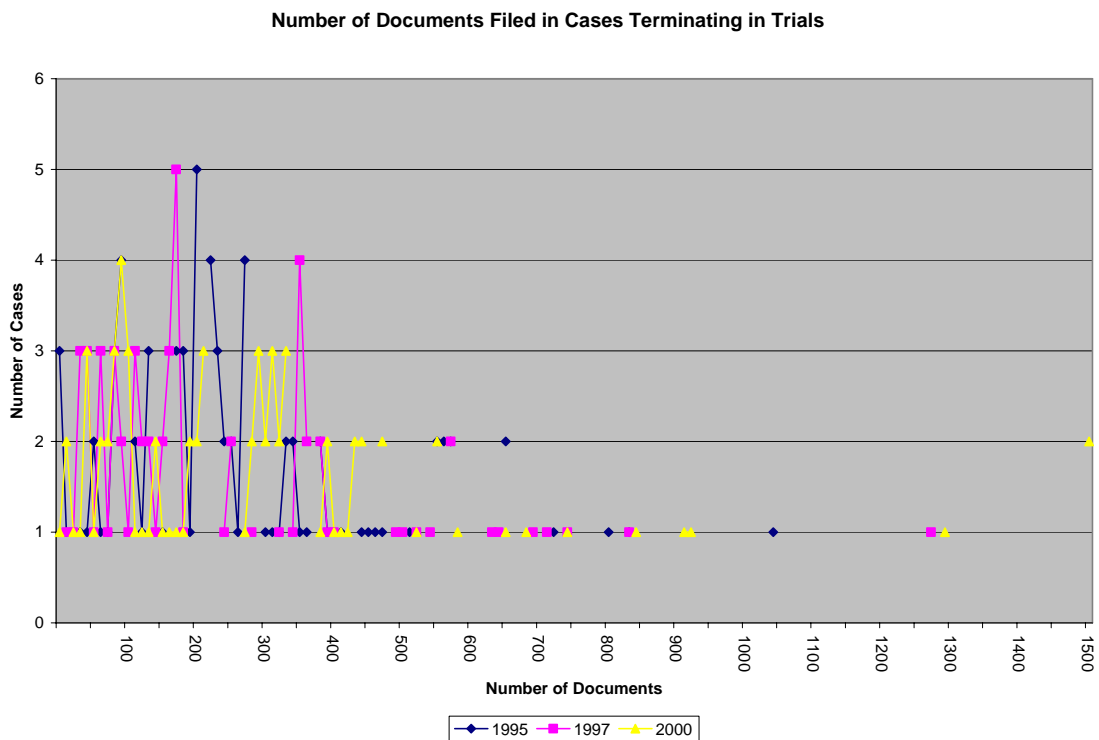


Figure 22: Documents Filed in Cases Terminating through Trials



IV.D Invalidity Rulings: The Cost of Revoking an Improvidently Granted Patent

We can no longer make the case that a case which terminates through a pre-trial ruling is necessarily much less expensive than one which goes to trial. This fact is particularly worrisome given the small number of rulings of invalidity observed in the data and the stage at which those rulings are made. We previously noted the fact that such rulings of invalidity tend to occur at an early stage in the litigation: half of the twenty-nine rulings of invalidity rendered for 1995 cases were through summary judgments and three quarters of the invalidity rulings for 1997 cases occurred through a pre-trial judgment.²⁴⁷ Given the conventional view of the expense of trials, such a result might be considered encouraging, implying that the courts can dispose of the validity issue somewhat early in the process. If this were the case, we would have less cause to worry that the expense of seeking a ruling of invalidity is inhibiting defendants from pursuing such a ruling.²⁴⁸

However, given the trend in expenditures for cases terminating in rulings of summary judgment, it is clear that there is still cause for concern. The average number of days to termination in cases with a ruling of invalidity was 714 days (median 589) for 1995, and the average number of documents filed was 187 (median 178).²⁴⁹ For 1997, the average number of days to termination in such cases was 853 days (median 612), and the average number of documents was 225 (median 121).²⁵⁰ Among cases from 2000, the average number of days to termination in cases with a ruling of invalidity was 874 (median 808) while the average number of documents was 221 (median 140). Thus, despite their tendency to be adjudicated “early” without a trial, rulings of invalidity are not less expensive than rulings on patent infringement which seem to come later.²⁵¹

These results suggest that much of the expense associated with patent litigation occurs long before the parties appear before a jury. The process of filing motions for summary judgment of invalidity involves intensive investigation and study of the relevant prior art, including activities of third parties, and testimony by expert witnesses. As the costs mount, the defendant in an infringement suit is likely to find an offer of a license more and more attractive. And he will only be taking his own costs—not the potential benefits or costs to society—into account in deciding whether or not to accept such an offer.

²⁴⁷ See *supra* Part III.D.

²⁴⁸ Rulings of infringement obtained at the pre-trial stage can also be expensive.

²⁴⁹ Total number of days among rulings of invalidity was 13,566 in 1995, while the total number of documents filed was 5,423; the number of rulings of invalidity was twenty-nine.

²⁵⁰ Total number of days among rulings of invalidity was 34,973 in 1997, while the total number of documents filed was 9,225; the number of rulings of invalidity was forty-one.

²⁵¹ Among the 1997 cases, nineteen of the forty-one cases with a ruling of invalidity had a duration greater than the median among all cases proceeding to rulings; twenty-one such cases were above the median number of filed documents in cases which proceeded to rulings.

V. Conclusions

This work is part of a growing empirical effort among economists and patent law scholars to understand the patent system and its workings. In this article, we attempt to answer some fundamental questions regarding the role played by the courts in the patent system by examining a set of patent cases in great detail. To this end, we have constructed a new database based on court docket reports for all patent cases filed in 1995, 1997 and 2000, and tracked the evolution of these cases (about 6300 cases) through to settlement or adjudication on the merits. The focus of this effort is on keeping track of a number of variables to understand the precise disposition of each case.

We have also tracked different characteristics in order to estimate patent litigation costs in each case. For instance, we note the amount of time taken by each case through to final disposition. In addition, we have devised a new proxy for measuring costs: the number of documents filed by all the parties in each case, which we believe is more closely correlated with actual litigation costs than the traditional measures of time expended and the stage of termination in each case.

Our results show that many more patent cases are adjudicated on the merits (either at the pre-trial stage through a grant of summary judgment or at trial) than is commonly thought. This work is one of the few scholarly efforts in empirical litigation scholarship that can actually estimate this amount, because most other papers rely exclusively on the imprecise categorization of the Administrative Office of U.S. Courts to determine case outcomes. Our results demonstrate that, in addition to the small number of patent cases going to trial (about 5%), another significant percentage of cases (about 6-9%) are resolved on the merits through summary judgment.

Consequently, summary judgments are important in patent cases for determining patent validity and infringement, and the summary judgments related to patent validity occur earlier in the litigation compared with summary judgments related to patent infringement. This result is somewhat encouraging given the important role played by the courts in revoking patent rights improvidently granted at the outset by the PTO. Nevertheless, despite the fact that such rulings occur “early” in the proceedings compared to patent trials, we should still be concerned about the huge transaction costs associated with patent litigation, because summary judgments, in general, and summary judgment, based on invalidity in particular, are expensive compared with summary judgments granted on other grounds.

In addition, there is a significant difference in duration and number of documents filed in cases resolved through summary judgment for the 1997 filed cases compared with the 1995 filed cases. This is consistent with the changes brought about by the Markman decision, which invigorated claim construction as a threshold legal issue in patent litigation. The increased importance placed on first construing the claims before addressing infringement or invalidity after Markman necessitates that significant resources be allotted to the step of claim construction before (or concurrent with) filing motions for summary judgment. Hence, it is not surprising that

in the 1997 filed cases more resources were expended earlier in the litigation compared with the 1995 filed cases.

Overall, our results show that transaction costs associated with patent litigation loom large, and rulings on the merits by the courts concerning patent validity, patent infringement, and remedies for infringement (i.e., injunctive relief or damages) are rare, expensive, and not pursued to completion by most litigants. Instead most patent cases settle fairly quickly (about 12-15 months) after the filing of the complaint, thereby reducing the actual cost of patent litigation considerably.

This work has significant implications for all civil litigation in general, and for recent efforts to reform the patent system by either improving patent quality through new administrative procedures at the PTO or for substantive patent law reform. Our results strongly suggest that patent litigation is largely a settlement mechanism, and, hence, any proposed change in the patent laws should be analyzed in terms of the incentives generated for prompt settlement of patent disputes. In addition, entities and interest groups seeking cheaper and/or a greater number of patent rulings concerning validity and infringement will be wise to look elsewhere, perhaps at other patent institutions such as the PTO or at other alternative dispute resolution (ADR) mechanisms which complement the courts.