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## HOW ARE PATENT CASES RESOLVED? AN EMPIRICAL EXAMINATION OF THE ADJUDICATION AND SETTLEMENT OF PATENT DISPUTES

JAY P. KESAN\*  
GWENDOLYN G. BALL\*\*

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\* Professor & Director, Program in Intellectual Property and Technology Law, University of Illinois College of Law.

\*\* Post-Doctoral Fellow, University of Illinois College of Law.

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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.<sup>1</sup> 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.<sup>2</sup> Either way, the patentee retains sole control over his invention.

From an institutional perspective, the patent system is a two-stage bargain.<sup>3</sup> At the first stage, the U.S. Patent and Trademark Office (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.<sup>4</sup> 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.<sup>5</sup> Alleged infringers may counter by challenging the scope, validity, and enforceability of patent

1. 35 U.S.C. § 271(a) (2000).

2. See *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, 30–33 (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 (2000).

5. See *id.* § 271.

rights issued in the first stage in the PTO.<sup>6</sup> 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.<sup>7</sup> 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.<sup>8</sup> 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.<sup>9</sup> For example, other inventors may face higher research and development costs as they take care to avoid the patented invention by “engineering around” it.<sup>10</sup> 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 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 “non-obvious.”<sup>11</sup> Moreover, even when it is appropriate to grant a patent, it is essential that the patent rights not be overly broad, i.e., covering aspects of the technology that are beyond the invention’s “non-obvious” contribution<sup>12</sup> 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 promoting useful research.<sup>13</sup> Thus, a patent

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6. Kesan, *supra* note 3, at 773 (describing how patent rights can be revoked by the courts during litigation); HERBERT F. SCHWARTZ, *PATENT LAW AND PRACTICE* 51–59 (3d 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) (comparing 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 38–39 (discussing the costs created by engineering around a patent).

11. 35 U.S.C. §§ 101–103 (2000).

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. Jay P. Kesan & Andres A. Gallo, *Why “Bad” Patents Survive in the Market and How Should*

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.<sup>14</sup>

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.<sup>15</sup> 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.<sup>16</sup> Moreover, patent applications have become more complex since the 1970s,<sup>17</sup> and patents are being granted in ever broadening areas of technology.<sup>18</sup> 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. At present, the PTO will reexamine patents via two mechanisms: reexamination and *inter partes* reexamination.<sup>19</sup> The original

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*We Change?—The Private and Social Costs of Patents*, 55 EMORY L.J. 61, 69 (2006).

14. See Bronwyn H. Hall et al., *Prospects for Improving U.S. Patent Quality via Post-grant Opposition* (Nat’l Bureau of Econ. Research, Working Paper No. 9731, 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).

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

16. See Merges, *supra* note 9, at 601; see also John H. Barton, *Reforming the Patent System*, 287 SCIENCE 1933, 1934 (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.” (citations omitted)).

17. See John R. Allison & Mark A. 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 more inventors).

18. Kesan & Gallo, *supra* note 13, at 67 (discussing the new “patentable” areas and techniques which must be evaluated by patent examiners).

19. See 35 U.S.C. §§ 302–05, 311–14 (2000); Stuart J. H. Graham et al., *Post-issue Patent “Quality Control”: A Comparative Study of U.S. Patent Re-examinations and European Patent Oppositions* (Nat’l Bureau of Econ. Research, Working Paper No. 8807, 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.,

reexamination procedure was initiated in 1980 as a low-cost method for reviewing patent validity.<sup>20</sup> However, this procedure suffers from numerous limitations, and it is not widely used.<sup>21</sup> 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.<sup>22</sup> They are not allowed to present other physical evidence or expert testimony to challenge the validity of the patent as they could in court.<sup>23</sup> Even if the PTO determines that there is “a substantial new question of patentability,”<sup>24</sup> the role that the third party can play in the patent reexamination process is extremely limited.<sup>25</sup> In effect, the procedure is similar to that of the original examination and involves only the examiner and the patentee.<sup>26</sup> 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.<sup>27</sup> 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.<sup>28</sup>

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.<sup>29</sup> While less than 1% of U.S. issued patents face reexamination, approximately 8% of European patents

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*supra* note 14; Kesan & Gallo, *supra* note 13, at 114 (discussing the Japanese patent invalidation process); Merges, *supra* note 9; Allan M. Soobert, *Breaking New Grounds in 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 comparing them with both the European and Japanese approaches). 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. 943 (2004).

20. See Farrell & Merges, *supra* note 19, at 965–66.

21. *Id.*

22. See 35 U.S.C. § 301 (2000); Merges, *supra* note 9, at 610.

23. Farrell & Merges, *supra* note 19, at 965–67.

24. Schwartz, *supra* note 6, at 51–52.

25. Soobert, *supra* note 19, at 101.

26. 35 U.S.C. § 305 (2000). Soobert, *supra* note 19, at 101–02.

27. Soobert, *supra* note 19, at 101–02.

28. *Id.* at 103.

29. Merges, *supra* note 9, at 610.

face oppositions.<sup>30</sup> 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.<sup>31</sup> Under the *inter partes* reexamination procedure introduced in 1999, third parties are allowed a much greater role in the examination process.<sup>32</sup> 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.<sup>33</sup> As a consequence, it is not surprising that this system is utilized at an even lower rate than the original reexamination system; only twenty-six *inter partes* reexaminations were requested in the first five years after its enactment.<sup>34</sup>

Therefore, given the limited opportunities for post-issuance patent challenges in the PTO,<sup>35</sup> 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).<sup>36</sup> 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.<sup>37</sup> If the court finds that the PTO erred in granting the patent, it can declare some or all the patent claims to be invalid.<sup>38</sup> 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

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

31. *Id.* at 967.

32. 35 U.S.C. §§ 311, 314 (2000); *see also* Farrell & Merges, *supra* note 19, at 967.

33. Farrell & Merges, *supra* note 19, at 964.

34. *Id.*

35. *See* Farrell & Merges, *supra* note 19, at 967; Soobert, *supra* note 19, at 100–01 (describing how few patents are subjected to reexamination by the PTO).

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

37. *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).

38. *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).

as part of a declaratory judgment action launched after the threat of such a suit. 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.<sup>39</sup> 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.<sup>40</sup> These limitations, however, can be dealt with through appropriate patent legislation.<sup>41</sup>

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 costs associated with pursuing a patent lawsuit are high.<sup>42</sup> Previous authors have cited legal costs of patent litigation running from \$500,000 to \$3 million per suit or \$500,000 per claim at issue per side.<sup>43</sup> These costs create incentives for the parties to settle their dispute rather than seek a final judgment on the merits.<sup>44</sup> 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.<sup>45</sup> Specifically, it is in the interest of the alleged infringer to accept a license if its cost would be less than the cost of continued litigation.<sup>46</sup> Only patent disputes where it is difficult to predict who will win are likely to proceed further to a final determination on the merits.<sup>47</sup>

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

40. 35 U.S.C. § 282 (2000) (presumption of validity); 35 U.S.C. § 273(b)(4) (2000) (burden of proof); see also Bush et al., *supra* note 39.

41. In fact, such a change is currently being debated. See Bush et al., *supra* note 39, at 16.

42. See Hall, *supra* note 14, at 8; Barton, *supra* note 16, at 1933.

43. Hall, *supra* note 14, at 8.

44. 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).

45. 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 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).

46. See Yeazell, *supra* note 45.

47. This is an extension of the general theory of litigation set forward by Priest & Klein who

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.<sup>48</sup> 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.<sup>49</sup> One firm may incur the court costs, but firms incurring no costs will benefit from an invalidation ruling, too. Therefore, everyone has an incentive to allow someone else to take on the burden. 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.<sup>50</sup>

The courts do little to counter these incentives. Instead, courts promote settlement to save the public the expense of a trial or lengthy litigation.<sup>51</sup> 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.<sup>52</sup> In fact, it is considered a hallmark of efficient court management to encourage parties to resolve their disputes outside the courtroom because litigation costs are

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argue that if a case has a clear-cut winner and loser, the parties are likely to settle. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984). 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 AIPLA Q.J. 185, 205–07 (1998) (finding that the rate of invalidation cannot be shown to be statistically different from 50%).

48. 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).

49. See *Farrell & Merges*, *supra* note 19, at 948–60 (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, because 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.

50. 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). 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.

51. See *Gross & Syverud*, *supra* note 44, at 320 (“[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.”).

52. See *id.*



also a loss to society.<sup>53</sup> 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.<sup>54</sup> In a similar fashion, third-party firms simply conclude that it is cheaper to pay for a license or engineer around an erroneously granted patent than to challenge it. 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 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. 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.”<sup>55</sup> 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.<sup>56</sup> 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

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53. See Yeazell, *supra* note 45, at 947–48 (“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 44, at 320).

54. See Gross & Syverud, *supra* note 44, 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*, 1 J. EMPIRICAL LEGAL STUD. 973, 977–78 (2004) (discussing possible losses to the public from the small number of trials).

55. See Gross & Syverud, *supra* note 44; Landsman, *supra* note 54, 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.”); Yeazell, *supra* note 45; John Lande, *Replace “The Vanishing Trial” with More Helpful Myths*, 23 ALTERNATIVES TO HIGH COST LITIG. 161 (2005); Martin H. Redish, *Summary Judgment and the Vanishing Trial: Implications of the Litigation Matrix*, 57 STAN. L. REV. 1329 (2005).

56. See *infra* Part II.C.

on the merits.<sup>57</sup> 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.<sup>58</sup> We then follow each patent case until it is terminated. From the reports, we are able to precisely determine how each case was resolved.<sup>59</sup> 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.<sup>60</sup> We then determine how many actual rulings on the merits are made concerning infringement and invalidity, how those cases are resolved, and what their estimated litigation costs are.<sup>61</sup>

Using this methodology and by tracking these cohorts 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.<sup>62</sup> Successful final rulings of summary judgment are in fact more important than bench or jury trials in resolving patent cases.<sup>63</sup> Nonetheless, the vast majority of cases settle and all rulings, including grants of summary judgment, appear to be expensive.<sup>64</sup> In addition, we find that there are very few rulings of invalidity by the courts.<sup>65</sup> 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, a much higher proportion of final rulings of invalidity occur at the pre-trial stage.<sup>66</sup> Despite the “early” stage at which invalidity rulings are rendered, they are among the most expensive patent cases.<sup>67</sup>

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

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57. *See infra* Part II.A.

58. *See infra* Part III.

59. *See infra* Part III.A.

60. *See infra* Part IV.

61. *See infra* Parts III.D, IV.

62. *See infra* Part III.C.

63. *See infra* Part III.C.

64. *See infra* Parts III.C, IV.B–C.

65. *See infra* Part III.D.

66. *See infra* Part III.D.

67. *See infra* Part IV.D.

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.<sup>68</sup> 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.

## 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.<sup>69</sup> Under perfect information—that is, when both parties know with certainty who would win at trial—no trials would occur.

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68. 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 also Graham et al., *supra* note 19; Hall, *supra* note 14; 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 13; F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55 (2003); 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); Soobert, *supra* note 19.

69. 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); Priest & Klein, *supra* note 47; 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 & Jennifer F. Reinganum, *Economic Theories of Settlement Bargaining* (Dep't of Econ. Vanderbilt U., Working Paper No. 05-W08, 2005), available at <http://www.vanderbilt.edu/Econ/wparchive/workpaper/vu05-w08.pdf>.

There is no reason for the parties to expend resources to achieve an outcome which is determined with certainty in advance. For trials to occur, either the parties must be 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.<sup>70</sup> 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.<sup>71</sup> 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.<sup>72</sup> 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.<sup>73</sup> 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.<sup>74</sup>

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.<sup>75</sup> Usually, the asymmetric stakes are produced by costs and benefits created outside the courtroom, such as the reputation effects or precedents created for other litigation.<sup>76</sup>

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70. 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. Priest & Klein, *supra* note 47, 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.*; see Joel Waldfoegel, *Reconciling Asymmetric Information and Divergent Expectations Theories of Litigation*, 41 J.L. & ECON. 451 (1998) (describing the “50% rule”).

71. Priest & Klein, *supra* note 47, at 1.

72. See Waldfoegel, *supra* note 70 (discussing the implications of the two models).

73. See Cooter & Rubinfeld, *supra* note 69 (summarizing the implications of different modeling specifications).

74. 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).

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

76. *Id.* at 109.

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.<sup>77</sup> Some of these studies examine all civil cases, but it is also common to focus on one area of litigation.

#### 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.<sup>78</sup> 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.<sup>79</sup> 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

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77. See, e.g., Daniel P. Kessler & Daniel L. Rubinfeld, *Empirical Study of the Civil Justice System* (Nat'l Bureau of Econ. Research, Working Paper No. 10825, 2004), available at <http://papers.nber.org/papers/w10825.pdf>.

78. Most of the work specifically on patent litigation has been empirical rather than theoretical. But cf. Jean O. Lanjouw & Josh Lerner, *The Enforcement of Intellectual Property Rights: A Survey of the Empirical Literature 2-7* (Nat'l Bureau of Econ. Research, Working Paper No. 6296, 1997), available at <http://papers.nber.org/papers/w6296.pdf> (outlining a stylized theoretical model of the choice to file and strategic behavior within a patent lawsuit 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; 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—if the post-settlement duopoly price is sufficiently less than the monopoly price that would have been generated by a judgment, thereby wiping out the benefits of a settlement; and exploring conditions under asymmetric information in which the holder of a weak patent may “bluff” through his settlement offer). See also Farrell & Merges, *supra* note 19, at 955–60 (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).

79. See Allison et al., *supra* note 50; James Bessen & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 24 (2005); Lanjouw & Lerner, *supra* note 78; 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 (2004) [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 Somaya, *Strategic Determinants*]; Deepak Somaya, *Firm Strategies and Litigation Tactics as Determinants of Patent Suit Duration in Computers and Research Medicines* (2002), available at <http://bmg13-notes.umd.edu/Faculty/KM/papers.nsf/6de61a84f4107c9d852567f2006c7c0e/d12fe6c7b19cf47f85256ba6005f2a4f?OpenDocument> [hereinafter Somaya, *Duration*].

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. Patents Quarterly*<sup>80</sup> (which 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 Derwent LitAlert<sup>81</sup> (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 PTO<sup>82</sup>); and the record of patent cases extracted from the data on all litigation produced by the Administrative Office of the U.S. Courts (AO)<sup>83</sup> (from which all patent cases can be extracted<sup>84</sup> but which does not give information about the patents at issue). These sources are supplemented by data on parties or patent holders available through Compustat and the National Bureau of Economic Research (NBER), a patent database prepared by Hall et al.<sup>85</sup> More recent studies are also supplementing these sources by consulting the information on cases accessible through the online docket reports available at the PACER websites.<sup>86</sup>

Several researchers have identified what seems to be an increase in the rate of patent litigation, some even talking of a litigation “explosion.”<sup>87</sup> For most 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.

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80. U.S.P.Q. (BNA) (various issues).

81. Derwent LitAlert, <http://www.westlaw.com>.

82. Somaya reports that the PTO data contains about 50–58% of all patent cases terminating between 1983 and 1993. Somaya, *Strategic Determinants*, *supra* note 79, at 22.

83. Compiled by the Federal Judicial Center. See Federal Judicial Center, Federal Court Cases Integrated Database, <http://www.icpsr.umich.edu> (last visited Aug. 20, 2005) (Access to this data compiled by the Inter-University Consortium for Political Science and Social Research (ICPSR) requires registration and log-in.).

84. See Somaya, *Strategic Determinants*, *supra* note 79, at 22 (finding that only 5% of all cases listing PTO data were not included among cases classified as patent cases in the AO data and that therefore the AO data is relatively complete).

85. Bronwyn H. Hall et al., *The NBER Patent Citations Data File: Lessons, Insights, and Methodological Tools* (Nat'l Bureau of Econ. Research, Working Paper No. 8498, 2001), available at <http://papers.nber.org/papers/w8498.pdf>.

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

87. Bessen & Meurer, *supra* note 79, at 24 (quoting James Bessen & Michael J. Meurer, *The Patent Litigation Explosion*, 12 (2004) (unpublished manuscript, on file with authors)).

Prakash-Canjels<sup>88</sup> 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.<sup>89</sup> Lanjouw and Schankerman<sup>90</sup> estimate the probability of a patent being involved in litigation and find no change in this probability over the period from 1978 to 1995.<sup>91</sup> However, Somaya,<sup>92</sup> using the same data as Prakash-Canjels, also examines the rate of patent litigation between 1970 and 2000. His data shows 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 time.<sup>93</sup> Bessen and Meurer<sup>94</sup> also find that patent litigation may have accelerated in the late 1990s and exceeded the growth in existent patents during that period.<sup>95</sup> Thus, it appears that the role of the courts in the patent system has grown in recent years, especially over the past ten years.

### *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—or at least potential plaintiffs. 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.<sup>96</sup>

One of the earliest studies of the probability of a patent being involved in litigation was done by Lerner.<sup>97</sup> Based on a sample of 530 biotechnology firms, he calculates the number of Massachusetts patent suits in which the sampled firms were involved during January 1990 to June 1994 and compares that number with the number of patents they

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

89. *Id.* at 284–85 (showing that 1178 patent cases were filed in 1991 and 2484 were filed in 2000).

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

91. *Id.* at 55–56.

92. Deepak Somaya, *Patent Litigation in the United States (1970–2000)* (Mar. 30, 2002), available at [http://bmg1-notes.umd.edu/Faculty/KM/papers.nsf/225f2e46a850b27885256a560076708a/d12fe6c7b19cf47f85256ba6005f2a4f/\\$FILE/Somaya2002c.pdf](http://bmg1-notes.umd.edu/Faculty/KM/papers.nsf/225f2e46a850b27885256a560076708a/d12fe6c7b19cf47f85256ba6005f2a4f/$FILE/Somaya2002c.pdf) [hereinafter Samaya, *Patent Litigation*].

93. *Id.* at 4–5.

94. Bessen & Meurer, *supra* note 79.

95. Bessen & Meurer, *supra* note 79, at 24.

96. 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.

97. Josh O. Lerner, *The Importance of Trade Secrecy: Evidence from Civil Litigation*, available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=6089](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=6089) (last visited Aug. 21, 2005); Lanjouw & Lerner, *supra* note 78, at 8.

were awarded during that period.<sup>98</sup> This allows him to estimate that six cases per hundred patents held by those firms will be litigated.<sup>99</sup> It should be noted that this litigation rate is higher than that observed across all patents.<sup>100</sup> 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.<sup>101</sup> They use litigated patents reported to the PTO between 1975 and 1991, and after adjusting for underreporting, estimate that on average 10.7 patents per thousand will be litigated.<sup>102</sup> They also construct a “control group” composed of patents 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.<sup>103</sup>

Lanjouw and Schankerman also explore how the probability of a patent 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 invention<sup>104</sup> and with the number of later patents that cite it as part of the prior art or as defining the state of the art.<sup>105</sup> Importantly, both factors are indicators of patent high value.<sup>106</sup>

The probability of litigation not only increases with the stakes of the case, but also with the “asymmetry” of those stakes, i.e., the degree to which they affect one party more than the other.<sup>107</sup> 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.<sup>108</sup> If the patent is in a

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98. Lerner, *supra* note 97.

99. *Id.*

100. Compare with Lanjouw & Schankerman, *Patent Litigation*, *supra* note 79, at 134 (estimating an overall litigation rate of 10.7 patents per thousand).

101. *Id.*

102. *Id.* at 134.

103. *Id.* at 133.

104. *Id.* at 138.

105. *Id.*

106. *Id.*

107. *Id.*; see also Siegelman & Waldfoegel, *supra* note 75, at 109–11 (describing the asymmetric stakes hypothesis).

108. Lanjouw & Schankerman, *Patent Litigation*, *supra* note 79, at 138.



“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.<sup>109</sup> Another form of asymmetric stakes can be seen in self citations; patents that are cited by other patents owned by the same party are more likely to be litigated because they form the first link in a research chain and, therefore, have value to that party beyond what is at issue in the case.<sup>110</sup>

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 cited by the patent at issue.<sup>111</sup> In other words, a patent is less likely to be involved in a suit as its 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.<sup>112</sup> 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.<sup>113</sup>

Lanjouw and Schankerman 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.<sup>114</sup> 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.<sup>115</sup> 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.<sup>116</sup> This also suggests that firms are engaging in cooperative play and cross-licensing, rather than litigation, to protect property rights.<sup>117</sup>

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109. *Id.* at 132.

110. *Id.* at 138.

111. Lanjouw & Schankerman, *Patent Litigation*, *supra* note 79, at 144.

112. *Id.* at 145.

113. *Id.* at 132.

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

115. *Id.* at 46.

116. *Id.* at 48.

117. *Id.* at 46–47.

A recent study of the probability of a patent being involved in litigation was performed by Allison, Lemley, Moore and Trunkey.<sup>118</sup> These authors use the data on patent cases terminated from 1999 to 2000<sup>119</sup> combined with the NBER database of patents filed between 1963 and 1999.<sup>120</sup> They also compare a random sample of three hundred patents involved in litigation during this period with a sample of one thousand patents issued between mid-1996 and mid-1998.<sup>121</sup> 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, if they spent more time in prosecution, and if they have a larger number of claims and citations to prior art.<sup>122</sup> The authors also find that the probability of a patent being involved in litigation varies substantially across industries.<sup>123</sup>

### 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 analysis of filings of patent infringement cases to the outcomes of those cases, studying which cases are terminated through a trial.<sup>124</sup> They find that trials are quite rare—only 5% of all cases are terminated through a trial.<sup>125</sup> They also explore whether the same strategic factors that were important in whether a case would be filed—size of stakes, asymmetry of stakes, and uncertainty<sup>126</sup>—

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118. Allison et al., *supra* note 50 (determining the characteristics of litigated patents). The authors further argue that patents involved in litigation are a subset of “valuable patents” because 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.

119. Allison et al., *supra* note 50; *see also* Kimberly A. Moore, *Xenophobia in American Courts*, 97 NW. U. L. REV. 1497, 1506–09 (2003) (describing the patent case data used in this study).

120. Allison et al., *supra* note 50; *see also* Hall, *supra* note 85.

121. Allison et al., *supra* note 50. The data was compiled by Allison & Lemley. *See* Allison & Lemley, *supra* note 17.

122. Allison et al., *supra* note 50, at 438.

123. *Id.*

124. Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 67–68.

125. *Id.* In fact, they interpret the 5% of cases that go to trial as indicating that “post-filing settlement rates are high (about 95%)”—a figure that is widely quoted. *Id.* *See also* Jean O. Lanjouw & Mark Schankerman, *Enforcing Intellectual Property Rights* (Nat’l Bureau of Econ. Research, Working Paper No. 8656, 2001), available at <http://papers.nber.org/papers/w8656.pdf> (explaining in more detail the formulation of their data and analysis).

126. *See supra* Part II.B.

can also explain whether a case that has been filed goes to trial.<sup>127</sup> However, none of the variables on the nature of the patent or the parties<sup>128</sup> are significant in explaining which cases are adjudicated through a trial and which settle.<sup>129</sup> 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.<sup>130</sup> 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 conclusions.

Other studies focus on the types of rulings arrived at through a trial, evaluating the performance of the courts in deciding patent cases through the type of decision delivered at trials. In a series of studies,<sup>131</sup> 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.<sup>132</sup> 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 68% of jury trials but in only 51% of bench trials.<sup>133</sup> Likewise, she finds that juries are more likely to rule that the patent is valid (by a margin of 71% to 64%) and that it was infringed (by a margin of 71% to 59%).<sup>134</sup> These results are reflected in the statistics she reports for requests for jury trials. Jury trials are requested in 78% of all patent cases,<sup>135</sup> but 74% of patent holders request a jury while only 43% of alleged infringers do so.<sup>136</sup> These results support the view that the two sides are aware of these kinds of results.<sup>137</sup> In other 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 venue.<sup>138</sup> While she finds that

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127. Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 67–68.

128. *Id.*

129. *Id.*

130. *Id.* at 69.

131. Moore, *Forum Shopping*, *supra* note 79; Moore, *Judges, Juries*, *supra* note 79. Kimberly A. Moore, *Jury Demands: Who's Asking*, 17 BERKELEY TECH. L.J. 847 (2002).

132. Moore, *Forum Shopping*, *supra* note 79; Moore, *Judges, Juries*, *supra* note 79.

133. Moore, *Judges, Juries*, *supra* note 79, at 386 (noting the deviation in jury trials from the “50% rule” in jury trials).

134. *Id.* at 390.

135. *See* Moore, *supra* note 131, at 855.

136. *See id.* at 859.

137. *Id.* at 859.

138. Moore, *Forum Shopping*, *supra* note 79.

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.<sup>139</sup>

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 Lemley<sup>140</sup> focus solely on rulings of invalidity in patent cases, using written rulings reported in *U.S. Patents Quarterly*.<sup>141</sup> They find that they cannot reject the hypothesis that half of these rulings find the patent wholly or partially invalid.<sup>142</sup>

Finally, some recent work analyzes the propensity to settle a case or pursue a judgment either through pre-trial adjudication or a ruling rendered at trial. Somaya, using AO data from 1983 to 1993 supplemented by PTO data,<sup>143</sup> investigates whether the asymmetric stakes argument can be used to explain the decision to settle patent litigation.<sup>144</sup> He formulates two classes of hypotheses. The first concerns settlements that can be explained by the asymmetric or “strategic” stakes of the parties in the patent at issue. Some patents will have great value to the patentee because they have yet to exploit the research (measured by the young of the patent). In other cases, the patent at issue may be in a technical area that the defendant values more highly than the plaintiff (measured by the number of times the alleged infringer’s patents cite the patent at issue).<sup>145</sup> The second class of hypotheses concerns the possibility of mutual holdup—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.<sup>146</sup>

Somaya examines whether the cases were resolved through a judgment<sup>147</sup> and whether they progressed at least through the summary judgment phase before settling<sup>148</sup> and finds some evidence to support the

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139. *See id.* at 914.

140. Allison & Lemley, *supra* note 47, at 205–07.

141. Allison & Lemley, *supra* note 47; *see also* USPQ (BNA), *supra* note 80.

142. Allison & Lemley, *supra* note 47, 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.

143. Somaya, *Duration*, *supra* note 79 (exploring the source of the data).

144. Somaya, *Strategic Determinants*, *supra* note 79, at 19–20 (explaining the asymmetric information and strategic stakes hypotheses).

145. *Id.*

146. *See id.* at 20–21.

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

148. Somaya, *Strategic Determinants*, *supra* note 79, at 27.

strategic stakes hypotheses<sup>149</sup> but little to support mutual holdup.<sup>150</sup> In a related work,<sup>151</sup> 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; the time to a settlement increases with the number of times the same patent has been involved in litigation.<sup>152</sup>

Thus, we have learned much about the nature of patent litigation from the empirical work in this area. We know that an 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.<sup>153</sup> 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 it being litigated.<sup>154</sup> And finally, we know that firms seem to act strategically in patent litigation: they are less likely to settle if they have a number of patents in the same area, or if the patent is involved in multiple suits and they want to establish an aggressive reputation.<sup>155</sup>

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.<sup>156</sup> Some work has been done incorporating pre-trial adjudication, but the data used has deficiencies which may misclassify many adjudicated cases,<sup>157</sup> and the period covered does not reflect current patent law and procedure. Moreover, to date, attempts to measure the cost

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149. *Id.* at 33–34 (admitting that some asymmetric information arguments could explain the same results).

150. *Id.* at 34–35.

151. Somaya, *Duration*, *supra* note 79.

152. *Id.* at 28–29.

153. See Lerner, *supra* note 97.

154. See Lanjouw & Schankerman, *Small Firms*, *supra* note 79; see also Allison et al., *supra* note 50.

155. See Lanjouw & Schankerman, *Patent Litigation*, *supra* note 79; Lanjouw & Schankerman, *Small Firms*, *supra* note 79; Moore, *Forum Shopping*, *supra* note 79; Moore, *Judges, Juries*, *supra* note 79.

156. For an exception, see Somaya, *Strategic Determinants*, *supra* note 79 (making use of whether cases settle in the pre-summary judgment phase or proceed to motions on summary judgment as well as whether cases settle).

157. 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.

of patent litigation can only use the duration of the case as a proxy,<sup>158</sup> and one 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.

### III. CLASSIFYING CASE OUTCOMES: HOW MANY CASES ARE ADJUDICATED ON THE MERITS?

The principal 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,<sup>159</sup> 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 judgment 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.<sup>160</sup> Our results are consistent with such a figure.<sup>161</sup> However, this fact has come to be interpreted as meaning that “95% of all cases settle.”<sup>162</sup> The conventional wisdom on this point ignores the fact that many cases are resolved through procedural terminations.<sup>163</sup> But, as we will show, 8% of cases are terminated through final rulings on a motion for summary judgment, with the remainder

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158. See Somaya, *Duration*, *supra* note 79.

159. See *infra* Part III.A.

160. See Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 48.

161. See *infra* Part III.C.

162. See Hall, *supra* note 14, at 8; Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 48.

163. See Gillian K. Hadfield, *Where Have All the Trials Gone? Settlements, Nontrial Adjudications, and Statistical Artifacts in the Changing Disposition of Federal Civil Cases*, 1 J. EMPIRICAL LEGAL STUD. 705, 706–08 (2004).

[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.*

disposed of through some form of non-merit disposition.<sup>164</sup> 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.<sup>165</sup> 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.<sup>166</sup> 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”;<sup>167</sup> there is still cause for concern that the transaction costs associated with patent cases inhibit the courts’ ability to weed out improvidently granted patents.

#### A. *The Data*

The first step in our analysis was to construct the data set. 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)<sup>168</sup> allowed us to examine the history of each case in greater detail than is possible with a large data set. In particular, it allowed us not only to exploit publicly available data on U.S. court cases,<sup>169</sup> 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.

Our 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, 1997, and 2000 met these criteria. Cases litigated in these years were covered by the most recent developments in

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164. See *infra* Part III.C.

165. See *infra* Part III.D.

166. See *infra* Part III.C.

167. See *infra* Part IV.

168. See *infra* Table 1.

169. See Federal Judicial Center, *supra* note 83.

patent law. For example, we found that only twenty-three of the cases filed in 1995 had terminated before the *Markman* decision.<sup>170</sup> We also found that only a very few cases from these years had not terminated; only one patent case from 1995<sup>171</sup> and twelve cases from 1997<sup>172</sup> 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, sixty-two (or 2.5% of the original data) had yet to terminate as of this writing.<sup>173</sup> 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,<sup>174</sup> 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 Courts.<sup>175</sup> The AO data includes a coding system for all court cases that identifies the type of case<sup>176</sup> and allowed us to extract all patent cases.<sup>177</sup>

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

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

172. *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. Paracclipse, 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). One case included among the ongoing cases from 1997, *Rackman v. Microsoft Corp.*, No. 97-0003 (E.D.N.Y. filed Jan. 2, 1997), had terminated as of June 30, 2006.

173. As of June 30, 2006, seven of these cases were reported as terminated in the online docket reports. Thus, fifty-five cases were still listed as “ongoing” even as of that date—a sufficient number to influence the analysis of case terminations.

174. See *infra* Part IV.A.

175. See Federal Judicial Center, *supra* note 83.

176. See Federal Judicial Center, *supra* note 83; Federal Court Cases: Integrated Data Base, 2003 14–16 (Dec. 2004), <http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/04026.xml> (follow “Download” hyperlink (requires authorization)) (explaining in the project documentation the various codes and that patent cases are given a “Nature of Suit” (NOS) code of “830”).

177. 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 79, 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.



In each year we eliminated cases which were coded as a patent case but were some other type of litigation—usually a trademark or copyright case—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 <sup>178</sup>	(168)	(183)	(195)
Dockets not available	(17)	(24)	(14)
Transfers and Consolidations	(153)	(164)	(186)
Number of Cases used for analysis	1369	1756	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 online docket reports available through the PACER system.<sup>179</sup> These reports allowed us to collect additional information on how cases were administered, how they were resolved, and what kind of remedies were applied.

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.<sup>180</sup> We choose, on the other hand, to examine cases filed in three years and observe these cohorts over time. We believe that this allows us to better analyze the factors which determine the length of patent litigation.

Other authors 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.<sup>181</sup> We disagree with both

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

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

180. See, e.g., Moore, *Forum Shopping*, *supra* note 79, at 892.

181. See, e.g., Somaya, *Duration*, *supra* note 79, at 9.

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 suits' histories, 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. 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-old 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; legal and procedural consistency 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.<sup>182</sup> One source of differing views regarding the strength of the case is uncertainty regarding the way the court will handle the case, especially the way it will evaluate the property right associated with a patent.<sup>183</sup> For example, 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, consequently, 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

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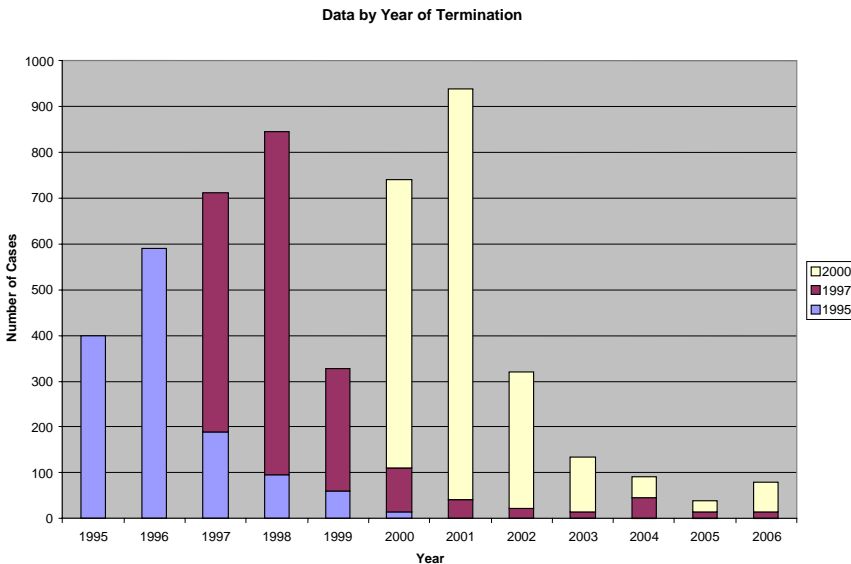
182. For a discussion of the role of uncertainty in the propensity to go to trial, see Lanjouw & Lerner, *supra* note 78, at 4.

183. *Id.*

maximum number of cases to be resolved while simultaneously keeping the incentives created by courtroom procedure consistent.

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 reasonably good picture of recently terminated cases.

FIGURE 1: CASES BY YEAR OF TERMINATION



*B. Methodology for Classifying Case Outcomes*

Once the data set 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 the 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 role 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 classify 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. If there are any discrepancies between our classifications and those of the AO (*e.g.*, we called it a verdict and the AO called it a settlement), the docket was re-examined to determine whether this “red flag” was the result of our error.

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%.<sup>184</sup> But this figure ignores the fact that many cases are resolved through other pre-trial terminations.<sup>185</sup> Moreover, we will show that 6%–9% of cases are terminated through final rulings granting a motion for summary judgment.<sup>186</sup> Perhaps more importantly, while there are very few rulings of patent invalidity, they tended to occur in cases that terminated 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.<sup>187</sup> 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.”<sup>188</sup> There is still cause for significant concern that the high transaction costs associated with patent litigation create incentives for parties to settle and inhibit the ability of the courts to rule on the validity and infringement of patent rights.

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184. Hall et al., *supra* note 14, at 8; Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 48.

185. Hadfield makes a strong case against assuming that any case that does not reach trial is automatically a settlement. Hadfield, *supra* note 163 and accompanying text.

186. See *infra* Tables 4, 5, and 6.

187. See *infra* Tables 4, 5, and 6.

188. See *infra* Part IV.

Classifying the manner in which cases are resolved is a surprisingly difficult task. The Administrative Office of the District Courts requires that each case be classified according to a “case disposition” variable.<sup>189</sup> 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 allows 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—they can also be classified in the “other judgment” category, as could a consent judgment, which is more likely to be a settlement.<sup>190</sup>

TABLE 2: AO CASE DISPOSITION CODES<sup>191</sup>

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

189. 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* Hadfield, *supra* note 163, at 712.

190. 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.”

191. *See* Federal Judicial Center, *supra* note 83, at 22

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

To overcome this problem, we compared the AO codes with information obtained from the online 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. For example, 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. Also recorded was 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 recorded.<sup>192</sup> But, in particular, the reading of the dockets focused on whether there was an *explicit* reference to a settlement, 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.<sup>193</sup>

192. 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.

193. 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

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 reexamined to determine the correct classification when necessary.<sup>194</sup>

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. For instance, 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 a 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.<sup>195</sup> Note that only grants of summary judgment which completely resolved the case were treated as final rulings on the merits. Denials of summary judgment, even though they may also be seen, at some level, to be an adjudication on the merits of the case, were not treated as final rulings on the merits.

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.<sup>196</sup> Consent

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are not classified as “settlements.”

194. 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.

195. 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.

196. 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 were called a settlement by us but not by the AO 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.

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, and consent judgments were all considered probable settlements. Voluntary dismissals were classified as non-merit dispositions or probable settlements depending on whether they occurred before or after the complaint was answered, respectively. An alternative view would hold that nearly all voluntary dismissals are in fact very early settlements, so all voluntary dismissals should be classified as probable settlements. However, we preferred not to force this assumption. If we had done so, it would be impossible for a reader disagreeing with our position to disaggregate the two types of voluntary dismissals. Under the rationale we have employed, any reader believing that all voluntary dismissals are probable settlements is free to adjust the number of settlements upward.

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.

TABLE 3: KEY TO CASE RESOLUTION CODES

<p><b>Dismissed without prejudice:</b> Terminated with this category; could not be assigned to any other category.</p> <p><b>Lack of Jurisdiction:</b> Case was dismissed because court found it did not have jurisdiction; usually personal jurisdiction, especially in declaratory judgment cases.</p> <p><b>Dismissal due to Want of Prosecution:</b> Explicitly identified by the AO or in the docket.</p> <p><b>Default Judgments:</b> Explicitly identified by the AO. In some cases classified as "other judgment" by the AO but explicit reference in the docket.</p> <p><b>Identified Settlements:</b> 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</p>
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resolved through some form of judgment other than a consent judgment were re-classified in a category referring to the appropriate form of judgment.

**Consent judgments:** Explicitly identified by the AO or the docket without reference to a settlement. Not associated with any other form of judgment.

**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.<sup>197</sup>

**Agreed Dismissal:** Explicitly identified in the docket.

**Stipulated Dismissals:** Explicitly identified by AO or the docket without reference to a settlement.

**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.

**Judgment on Jury Trial:** Liability decided through a jury verdict. If a final judgment was also issued, still classified as jury trial.

**Judgment on Bench Trial:** Liability decided through a bench trial.<sup>198</sup>

**Judgment as a Matter of Law:** Jury verdict, but change in ruling by a directed verdict.

**Dismissals with Prejudice:** Case dismissed with prejudice with no reference to a settlement or any other form of judgment.

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 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. Among 1997 cases there were

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197. Here we also followed Hadfield's view that voluntary dismissals may reflect a settlement if they are with prejudice. Hadfield, *supra* note 163, at 717.

198. 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 714–15.

137 such cases.<sup>199</sup> All but a handful of such cases were coded by the AO as a consent judgment, voluntary dismissal, other dismissal, or a statistical closing.<sup>200</sup> Meanwhile, in the 1995 data there were 304 cases and, in the 1997 data, 372 cases, in which the AO, even after reexamination, reported a settlement and the docket did not.<sup>201</sup> In all of these cases, the docket reported a stipulated dismissal, consent judgment, voluntary dismissal, or an undesignated dismissal.<sup>202</sup> 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.<sup>203</sup> These results imply that after our correction, the two indicators of settlements, the docket and the AO's codes, were consistent.<sup>204</sup>

We believe that the system described above provides a clearer and more complete picture for a study that focuses on determining how cases are actually resolved than previous studies that have relied on the categories provided by the AO.<sup>205</sup> We are able to assign cases to the most

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199. 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 "stayed pending bankruptcy"; eight "other" judgments; and 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; and one statistical closing.

200. See *supra* note 199.

201. In 1995, twenty-three of these cases terminated with consent judgments, 176 with stipulated dismissals, nine with voluntary dismissals, and eighty-seven with general dismissals; in nine cases the docket did not give enough information. In 1997, thirty-two cases terminated with consent judgments, 239 with stipulated dismissals, thirteen with voluntary dismissals, and eighty-four with general dismissals; in four cases the docket did not give enough information.

202. See *supra* note 201.

203. For 1995, six cases were coded by the AO as terminating in a "motion before trial" and one in a jury trial where our reading of the docket found that the cases had actually settled. For 1997 there was one settled case which was coded by the AO as a "motion before trial." Finally for 2000 there were seven settled cases that were coded by the AO as a "motion before trial" and one as a jury verdict.

204. 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 reopen the case. There are a small number of cases (about a dozen) which were reopened after a lapse of a year or more because one party was not operating in accordance with the settlement agreement. See Hadfield, *supra* note 163.

205. Some researchers might solve this problem by using only the most precise AO categories—settlements, trials, and rulings on pre-trial motions—and ignoring consent judgments or other categories that are somewhat ambiguous. We found very few cases which the AO assigned to the trial or pre-trial motion categories that were actually settled. However, many rulings would be lost using

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 motion,” which can include both dismissals with and without prejudice and grants of summary judgments.<sup>206</sup>

*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.<sup>207</sup> Seven to eight percent of the cases in our cohorts terminated in grants of summary judgment.<sup>208</sup> Slightly fewer cases terminated in a trial. As a consequence, about 15% of all cases—16% of the cases filed in 1995, 13% of the cases filed in 1997, and 11% of the cases in filed in 2000—terminated with a court decision, i.e., terminated through some sort of court ruling on the merits.<sup>209</sup> However, previous authors have stated that “settlement rates [in patent litigation] are high [about 95%].”<sup>210</sup> 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

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this approach, since many cases actually terminating on a pre-trial motion are classified in the ambiguous categories. Thus, this alternate procedure could be used for statistically analyzing the marginal effects of the parties’ or patents’ characteristics on patent case outcomes. However, losing so many rulings will have an impact on the accuracy of such estimates and the size of standard errors associated with them. Moreover, 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.

206. *E.g.*, Moore, *Judges, Juries*, *supra* note 79, at 384 n.79 (“[I]n 1998, 24% of 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 a trial.”).

207. 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 ongoing 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.

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

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

210. Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 48; *see also* Hall, *supra* note 14, at 8. Lanjouw and Schankerman were not able to obtain statistically significant results explaining the propensity to go to trial. Lanjouw & Schankerman, *Small Firms*, *supra* note 79. Including additional forms of adjudication, as Somaya did, may lead to more significant results, although including all adjudicated cases as we do here should reduce standard errors still further.

are adjudicated to a final resolution on the merits than has been previously suggested in the literature.<sup>211</sup>

Nonetheless, we still find that the vast majority of cases settle. For cases filed in any of the three years, nearly half of all cases are definitively settlements.<sup>212</sup> Moreover, we have included in the second column of each table several entries for “probable settlements.”<sup>213</sup> 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.<sup>214</sup> A stipulated or agreed dismissal is also often an indication that the parties have reached some form of agreement. A voluntary dismissal occurring after the complaint is answered can denote that the case has settled as well.<sup>215</sup> If these cases are included, approximately two-thirds of all patent cases terminate in a settlement.<sup>216</sup> 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.<sup>217</sup>

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211. Lanjouw & Schankerman, *Small Firms*, *supra* note 79, at 48.

212. Table 4 (47% of the 1995 cases definitively settle); Table 5 (46% of the 1997 cases definitively settle); Table 6 (47% of the 2000 cases definitively settle).

213. Table 4 (18% of the 1995 cases are classified as “probable” settlements); Table 5 (20% of the 1997 cases are probable settlements); Table 6 (21% of the 2000 cases are probable settlements).

214. These agreements are easily identified as settlements because they nearly always state that both parties are to pay their own costs, although sometimes an explicit 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.

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

216. Table 4 (47% of 1995 cases definitively 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); Table 6 (47% of 2000 cases definitively settle and 68% of cases definitively or probably settle).

217. We also find support for Hadfield’s contention that it cannot be assumed that cases that are not adjudicated necessarily terminate with a settlement. Hadfield, *supra* note 163, at 717. Around 5% of the cases in each year terminated in some form of non-action: a dismissal without prejudice, dismissal for lack of jurisdiction, or want of prosecution. There were also a small number of default judgments.

TABLE 4: OUTCOMES, 1995<sup>218</sup>

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	644	47%	Summary Judgments	115	8%
Lack of Jurisdiction	9	1%	Consent Judgments	114	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 <sup>219</sup>	0	0%
Voluntary Dismissals (complaint not answered)	171	13%	Voluntary Dismissals (answered complaint)	65	5%	Dismissals with Prejudice	15	1%
						Arbitration	1	0%
Subtotals <sup>220</sup>	242	18%		889	65%		210	16%
Other Dismissals							22	
Total of Outcomes							1363	
Ongoing							1	
Unidentified							5	
Total							1369	

TABLE 5: OUTCOMES, 1997<sup>221</sup>

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	800	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%

218. 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.

219. Directed Verdict.

220. Percentages may not total due to rounding.

221. 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.

Default Judgments	28	1%	Agreed Dismissals	0	0%	Judgment as a Matter of Law <sup>222</sup>	8	0%
Voluntary Dismissals (complaint not answered)	221	13%	Voluntary Dismissals (answered complaint)	126	7%	Dismissals with Prejudice	24	1%
						Arbitration	1	0%
Subtotals <sup>223</sup>	355	20%		1141	66%		225	13%
Other Dismissals							15	
Total of Outcomes							1736	
Ongoing							12	
Unidentified							8	
Total							1756	

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	928	47%	Summary Judgments	129	7%
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	22	1%
Default Judgments	31	2%	Agreed Dismissals	0	0%	Judgment as a Matter of Law <sup>224</sup>	5	0%
Voluntary Dismissals (complaint not answered)	241	12%	Voluntary Dismissals (answered complaint)	39	2%	Dismissals with Prejudice	23	2%
						Arbitration	1	0
Subtotals <sup>225</sup>	401	20%		1340	68%		224	11%
Other Dismissals							7	
Total of Outcomes							1972	
Ongoing							62	
Unidentified							47	
Total							2081	

222. Directed Verdict.

223. Percentages may not total due to rounding.

224. Directed Verdict.

225. Percentages may not total due to rounding.

#### *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 was also small. 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-two (or 6.0%) in cases from 1995; 103 (or 5.9%) in cases from 1997, and ninety-one (or 4.4%) among cases from 2000.<sup>226</sup> However, since a settlement is usually accompanied by some form of licensing agreement,<sup>227</sup> the patentee has, at least to some extent, preserved and/or protected her patent rights.

TABLE 7: RULINGS OF INFRINGEMENT

	1995		1997		2000		Total	
	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent
Summary Judgment	22	26.8%	29	28.2%	11	12.1%	62	22.6%
Jury or Bench Trial	54	65.9%	44	42.7%	47	51.6%	145	52.9%
Default Judgment	6	7.3%	28	27.1%	33	36.2%	67	24.5%
Total	82	100%	103	100%	91	100%	274	100%
Percent of All Cases	6.0%		5.9%		4.4%		5.3%	

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

226. There were 84 such cases out of 1369 cases in the 1995 cohort, 103 out of 1756 in the 1997 cohort, and 90 out of 2081 in the 2000 cohort.

227. 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.

cases and forty-eight (2.3%) of the 2000 cases.<sup>228</sup> 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.<sup>229</sup>

TABLE 8: RULINGS OF INVALIDITY

	1995		1997		2000		Total	
	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent
Summary Judgment	21	72.4%	36	85.3%	41	85%	96	81.4%
Jury or Bench Trial	8	27.6%	5	14.6%	7	15%	22	18.6%
Total	29	100%	41	100%	48	100%	118	100%
Percent of All Cases	2.1%		2.3%		2.3%		2.3%	

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.<sup>230</sup> It seems 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, rather than 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.

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228. One claim or more was ruled invalid in 29 out of 1369 cases in the 1995 cohort, 41 out of 1756 in the 1997 cohort, and 48 out of 2081 in the 2000 cohort.

229. Allison and Lemley, using final written decisions on validity, find only 299 patents litigated in 239 cases between 1989 and 1996—an average of just over forty-two patents a year. Allison & Lemley, *supra* note 47, at 194. Because approximately half were ruled invalid, this would mean approximately twenty-one rulings of invalidity a year. *Id.* at 205–07. Moreover, the authors argue that the number of invalidity rulings should be increasing, so our findings of twenty-eight rulings of invalidity in 1995 and forty-one in 1997 seem reasonable. *Id.*

230. 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.



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-four out of the eighty-two 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 twenty-eight were as result of a summary judgment. Among the 2000 cases, forty-seven of the ninety-one rulings of infringement occurred in a trial while eleven were the result of a summary judgment. Thus, across the three cohorts, 145 out of the 277 rulings of infringement—approximately 53%—occurred at trial.<sup>231</sup> 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; twenty-one were the result of a successful summary judgment motion, which may or may not have terminated the case.<sup>232</sup> 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.<sup>233</sup> And among the 2000 cases, seven of the forty-eight rulings of invalidity occurred in a trial while thirty-one were as the result of a motion for summary judgment.<sup>234</sup> 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

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231. The remaining 44% occurred through default judgments.

232. Six of the rulings of invalidity occurred in a trial while thirty-nine were the result of a motion for summary judgment.

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

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

in patent cases.<sup>235</sup> In short, termination at an early procedural stage does not necessarily mean that the case has been resolved “cheaply.”

### *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), fifty-four non-settled cases from 1997 (of which twenty-three were jury verdicts) and thirty non-settled cases from 2000 (of which nineteen were jury verdicts).<sup>236</sup> The average amount awarded in these cases was \$7.4 million, \$3.3 million, and \$2.1 million, respectively.<sup>237</sup> 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.<sup>238</sup> 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 million each in southern Iowa.<sup>239</sup> From 1997, one case in Connecticut with a consent judgment cited damages of \$1 million.<sup>240</sup> Among all cases filed in 2000, fourteen cases awarded damages in excess of \$1 million,<sup>241</sup> one of which was a case in the Eastern District of Virginia in which \$2 million was awarded and another was a case in the

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235. See *infra* Part IV.D.

236. Table 9.

237. Table 9.

238. Table 9.

239. *Chiuminatta 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 Jan. 16, 1996).

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

241. *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. v. VDO N. Am. L.L.C.*, No. 00-432 (D. Del. Apr. 25, 2000); *BBA Nonwovens v. Superior Nonwovens*, No. 00-2764 (D. S.C. Sept. 6, 2000); *IP Global, Ltd. v. Thomson Consumer*, 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 Commc'ns v. Zi Corp.*, No. 00-989 (N.D. Cal. Mar. 21, 2000); *DSU Med. Corp. v. JMS Co., Inc.*, No. 00-1826 (N.D. Cal. May 22, 2000); *O2 Micro Int'l Ltd. v. Monolithic Power Sys., Inc.*, No. 00-4071 (N.D. Cal. Nov. 3, 2000); *Int'l Rectifier v. IXYS Corp.*, No. 00-6756 (C.D. Cal. June 22, 2000); *Suntiger Inc. v. Ronald Anson*, No. 00-6875 (C.D. Cal. June 26, 2000); *Laser Tech. 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).

Central District of California in which \$4.9 million was awarded in settlement agreements.<sup>242</sup>

TABLE 9: DAMAGES

Damages Awarded		1995	1997	2000
Number of Cases with Monetary Awards				
	Jury Verdicts	29	23	19
	Other Rulings	13	31	11
	Consent Judgments and Settlements <sup>243</sup>	14	23	33
	Total	56	77	63
Average Award Size (in millions)		7.4	3.3	2.1

Permanent injunctions are more common, though they seem to play a different role in the process. As shown in Table 10, 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.<sup>244</sup> 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.

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

243. In these cases, a monetary payment was explicitly noted as part of the consent judgment or settlement in the case docket.

244. Over the three years, 42 of the 220 cases terminating through a trial granted a permanent injunction, while 17 out of the 382 cases terminating on a final ruling through summary judgment granted a permanent injunction.

TABLE 10: 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%	4	2%	10	3%
Definitive Settlement	43	36%	60	47%	67	41%	170	42%
Consent Judgment	43	38%	38	29%	65	42%	146	36%
Default Judgment	1	1%	9	7%	13	8%	23	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 70% of all patent cases settle.<sup>245</sup>

Economic theory suggests that settlements are a mechanism used by the parties to avoid the high litigation costs of patent cases.<sup>246</sup> 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.<sup>247</sup> However, they will not include in their calculus the public benefits in reduced research costs or the cheaper production of goods that may occur when a wrongly granted patent is ruled invalid.<sup>248</sup> Thus, if 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

245. See *supra* Part III.C.

246. See Lanjouw & Lerner, *supra* note 78; see also Yeazell, *supra* note 45.

247. See Lanjouw & Lerner, *supra* note 78; see also Yeazell, *supra* note 45.

248. See Gross & Syverud, *supra* note 44; see also Landsman, *supra* note 54.

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.<sup>249</sup> However, while it has a strong intuitive appeal, this measure 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; it is less obvious what constitutes “a lot” of documents than what constitutes 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.

#### *A. Level of Expenditure: All Cases*

Table 11 reports 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.<sup>250</sup> Among the cases filed in 1997, the average number of days to termination was 466,

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249. See Somaya, *Duration*, *supra* note 79.

250. Table 11.

while the median number of days was 299.<sup>251</sup> For cases filed in 2000, the mean and median of duration were 443 and 295 days respectively.<sup>252</sup> Thus, in all three years, 50% of cases were resolved within ten months.<sup>253</sup> However, as shown in Figure 2, there are a small number of cases with exceedingly long durations. In particular, as the 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.<sup>254</sup>

TABLE 11: TIME TO RESOLUTION: ALL CASES

	1995		1997		2000 <sup>255</sup>	
	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	73	5	86	5	110	5
8 Quarters	37	3	64	4	80	4
More Than 8 Quarters	238	17	325	19	362	17
Total	1369	100	1756	100	2081	100
Average Number of Days	418		466		443	
Median Number of Days	298		299		295	

251. Table 11.

252. Table 11.

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

254. See Figure 2.

255. Case durations for 2000 are calculated using the assumption that the sixty-two ongoing cases terminate on February 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.

FIGURE 2: DURATION OF PATENT CASES

FIGURE 2A.

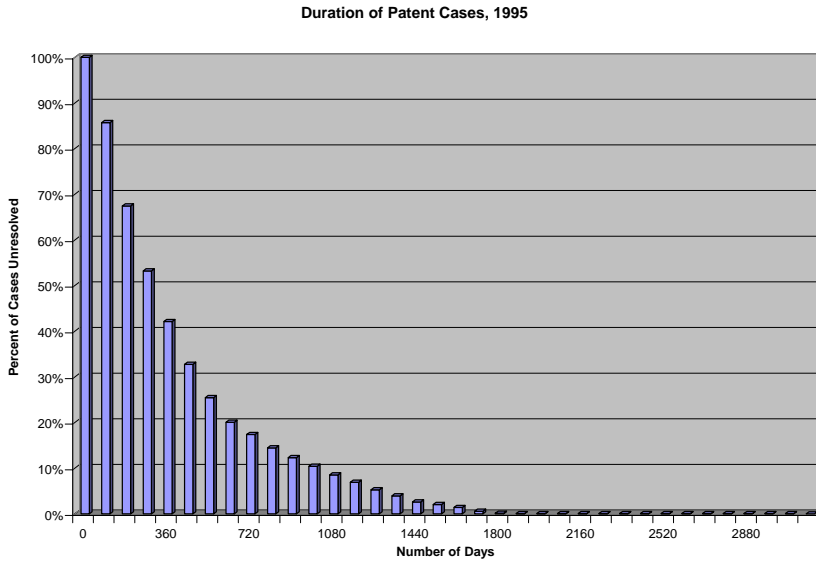


FIGURE 2B.

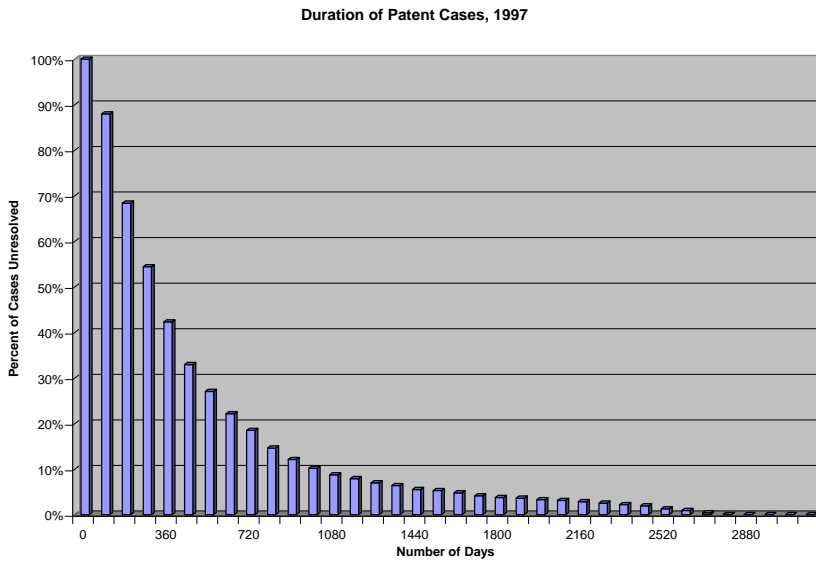
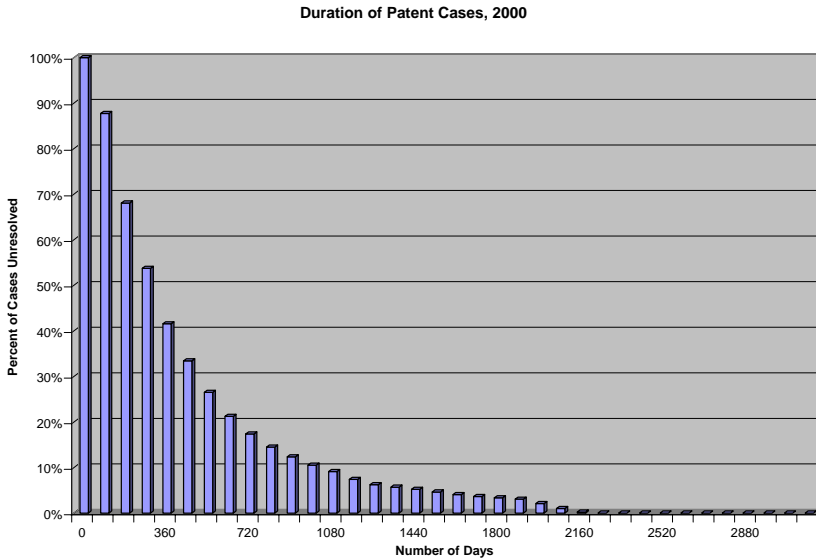


FIGURE 2C.



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 12, the average number of documents filed was approximately sixty-five while the median was approximately twenty-four across all three years.<sup>256</sup> Figure 3 demonstrates that, as with the time to termination, the number of

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256. See Table 12.



documents filed in cases has a long trail of cases with numerous documents.<sup>257</sup> 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 12.

TABLE 12: NUMBER OF DOCUMENTS FILED: ALL CASES

	1995		1997		2000 <sup>258</sup>	
	Number <sup>259</sup>	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	

257. The maximum number of documents was 1042 in 1995 and 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.

258. The tallies of documents for 2000 are calculated using the number of documents filed for the sixty-two ongoing cases as of February 15, 2006. The same caveat as for case durations applies.

259. Number of documents was not available for four cases in Nevada in 1995 and 1997 due to the format of the online docket reports.

FIGURE 3: NUMBER OF DOCUMENTS FILED

FIGURE 3A.

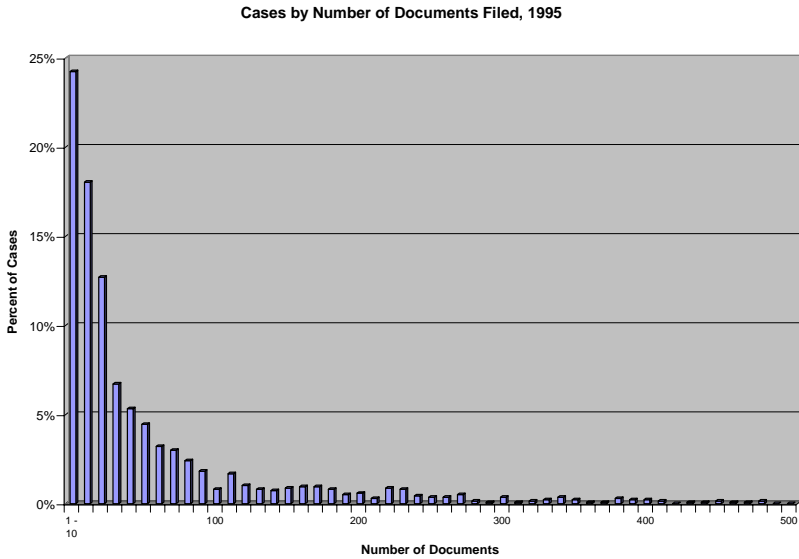


FIGURE 3B.

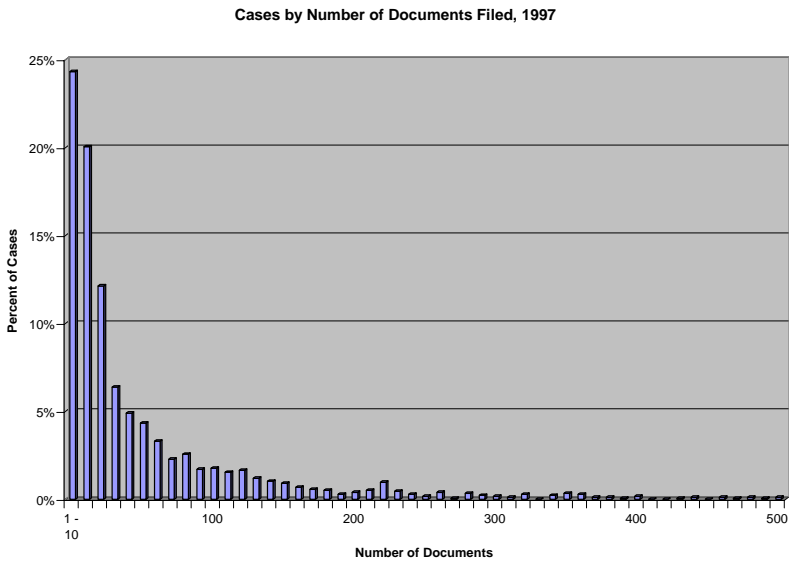
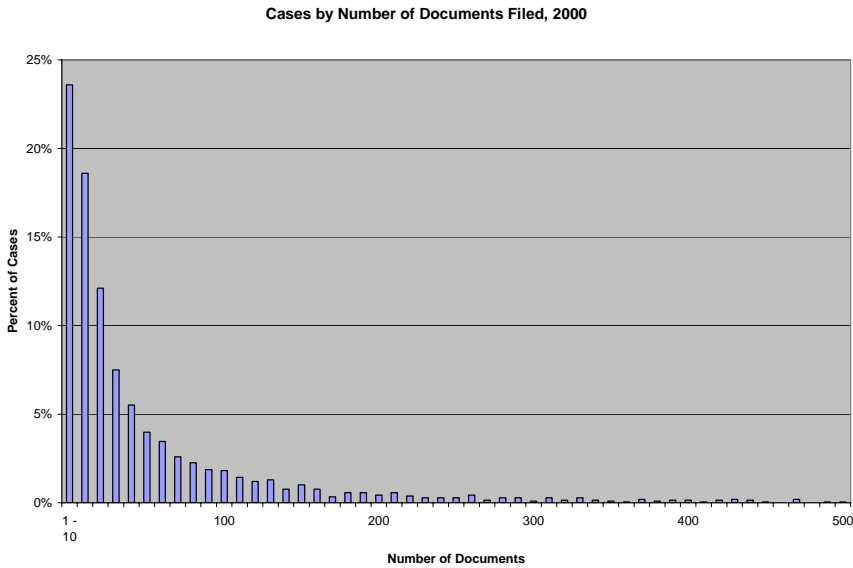


FIGURE 3C.



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.<sup>260</sup> In the 2000 cohort, a summary judgment motion was filed in 490, or 24%, of all cases.<sup>261</sup> The significance of this measure will be seen later when we examine the characteristics of cases terminating with various outcomes.<sup>262</sup>

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

261. There were 2081 cases in the 2000 cohort. Summary judgment motions were filed in 490 of these cases.

262. 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 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.

*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 13 and 14 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 merits<sup>263</sup> 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 679 for 1995, 867 for 1997, and 780 for 2000; the averages among settlements were 421, 439, and 392, respectively.<sup>264</sup> Thus, the number of days to termination was 30–50% higher in cases terminating in rulings than in those that settled over the three years.<sup>265</sup>

TABLE 13: DISTRIBUTION OF NUMBER OF DAYS TO TERMINATION BY TYPE OF OUTCOME

	1995						1997						2000 <sup>266</sup>					
	Mean	Percentiles					Mean	Percentiles					Mean	Percentiles				
		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
Rulings	679	166	318	564	1002	1358	867	217	414	685	1001	2110	780	213	399	658	1067	1636
Settlement	421	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

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

264. 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 was 643 and 798, respectively.

265. Statistically, we can reject the hypothesis that the average number of days to termination is equal in the two groups of cases against the alternative that cases with rulings on the average take longer at the 1% level of significance.

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

FIGURE 4: DURATION OF CASES TERMINATED WITH SETTLEMENTS OR PROBABLE SETTLEMENTS

FIGURE 4A.

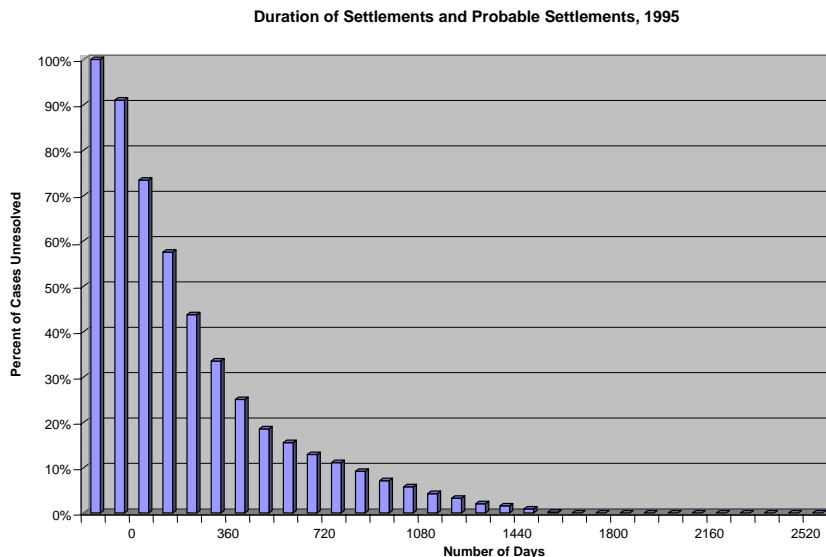


FIGURE 4B.

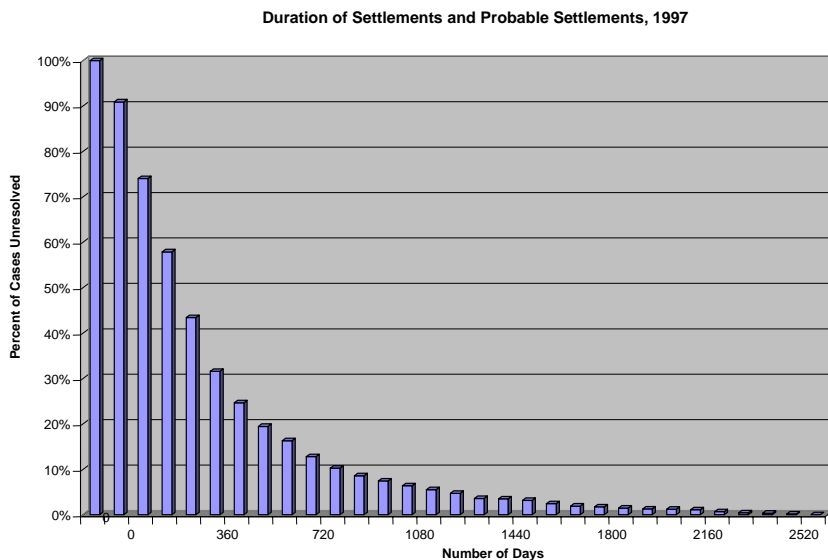


FIGURE 4C.

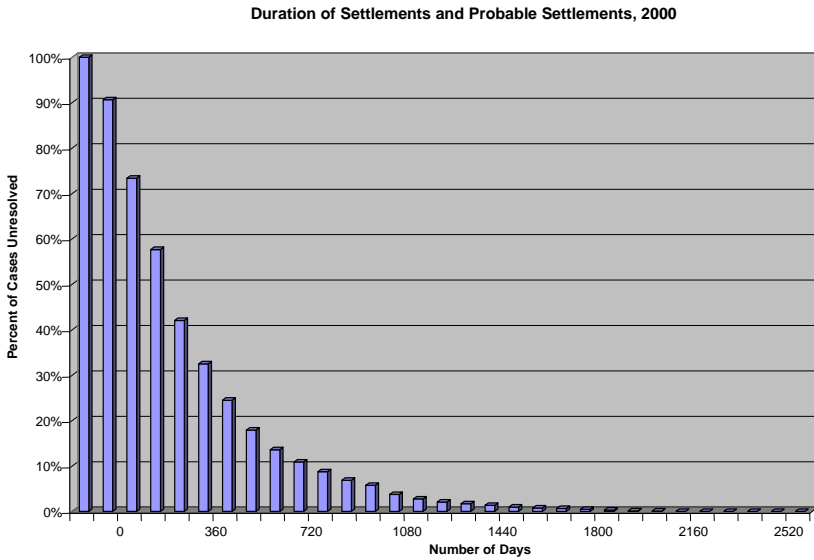


FIGURE 5: DURATION OF CASES TERMINATING IN RULINGS

FIGURE 5A.

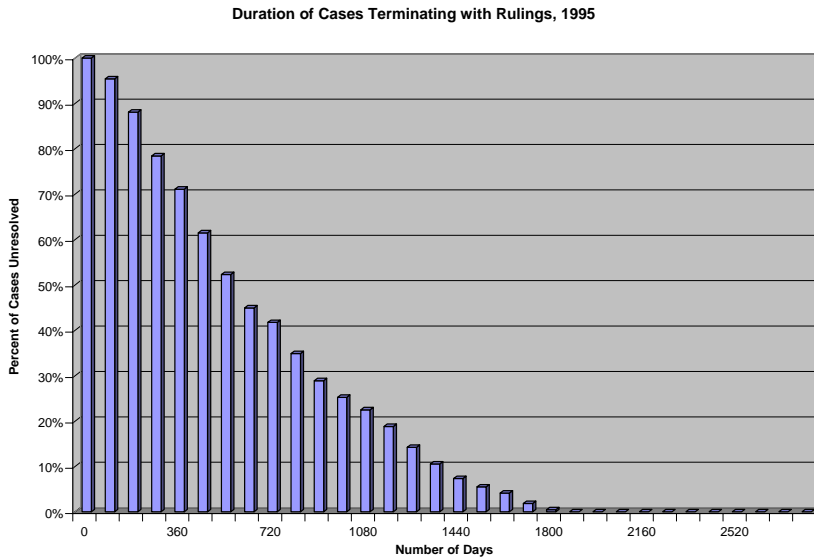


FIGURE 5B.

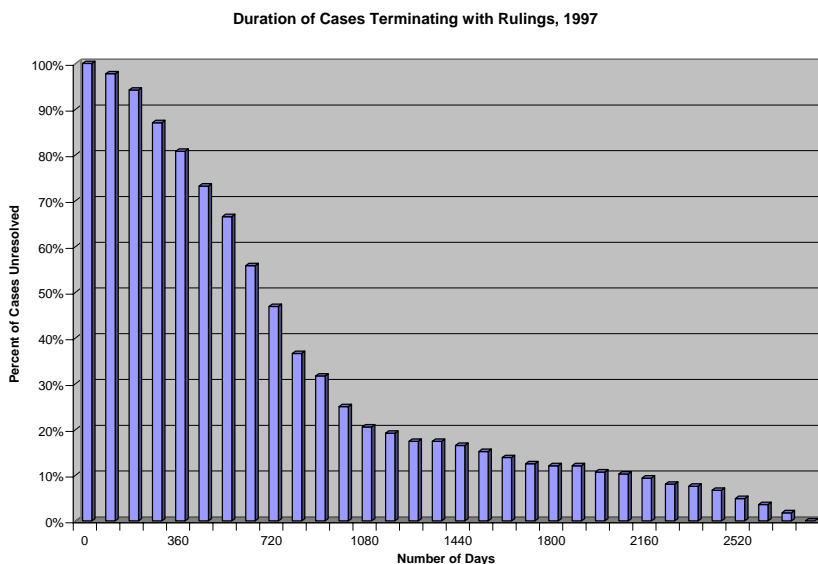
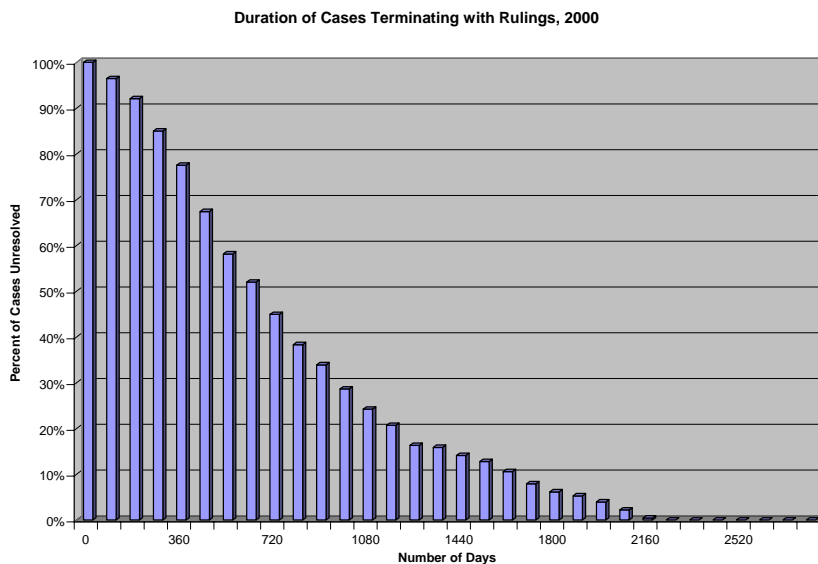


FIGURE 5C.



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, 184 for 1997, and 214 for 2000; for settlements, it was 56, 55 and 49, respectively.<sup>267</sup> Thus, over three times as many documents were filed in the average case terminating in a ruling than in the average case that settled.<sup>268</sup> As demonstrated in Figures 8, 11 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;<sup>269</sup> cases terminating in rulings also seem to involve a greater number of filed documents.<sup>270</sup>

TABLE 14: DISTRIBUTION OF NUMBER OF DOCUMENTS FILED BY TYPE OF OUTCOME

	1995						1997						2000 <sup>271</sup>					
	Mean	Percentiles					Mean	Percentiles					Mean	Percentiles				
		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>		10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
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

267. The total number of documents across cases with rulings was 38,106 in 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.

268. In 1995, 174 documents in cases with rulings versus 56 in cases which settled; in 1997, 184 in cases with rulings versus 55 in cases which settled.

269. 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.

270. Again, the hypothesis that the average number of documents is equal in the two types of cases against the alternative that on average more documents are filed in cases terminating with rulings is rejected at the 1% level of significance.

271. Again, these results are preliminary pending resolution of the ongoing cases from 2000.



FIGURE 6: DOCUMENTS FILED IN 1995 CASES WHICH SETTLED OR PROBABLY SETTLED

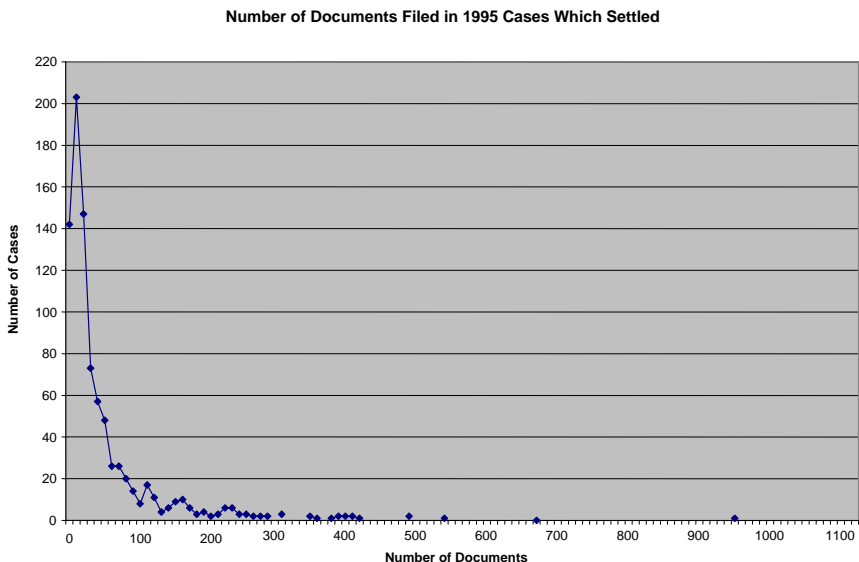


FIGURE 7: DOCUMENTS FILED IN 1995 CASES TERMINATED WITH RULINGS

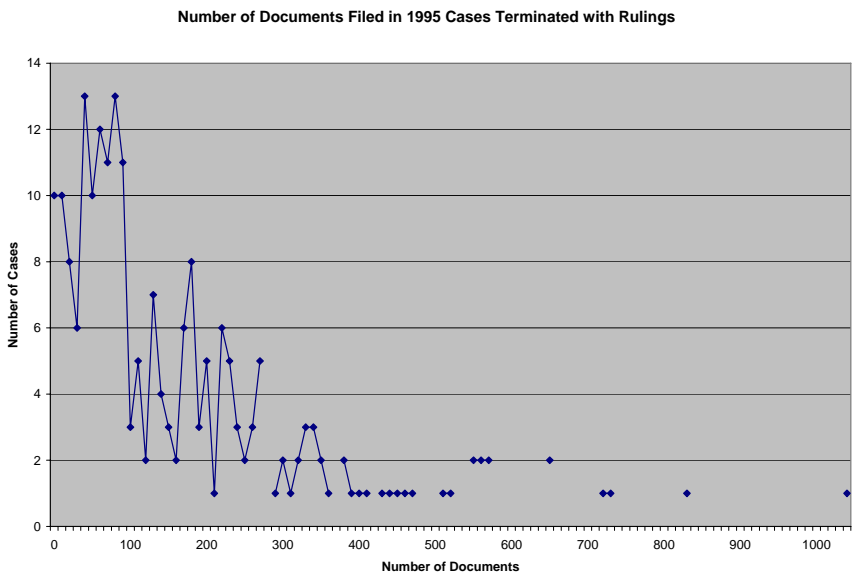


FIGURE 8: NUMBER OF DOCUMENTS FILED BY TYPE OF OUTCOME, 1995

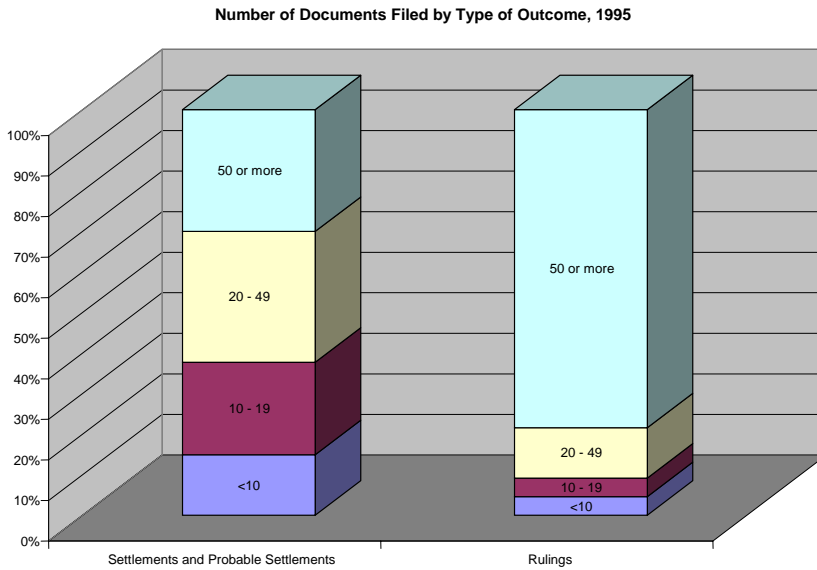


FIGURE 9: DOCUMENTS FILED IN 1997 CASES WHICH SETTLED OR PROBABLY SETTLED

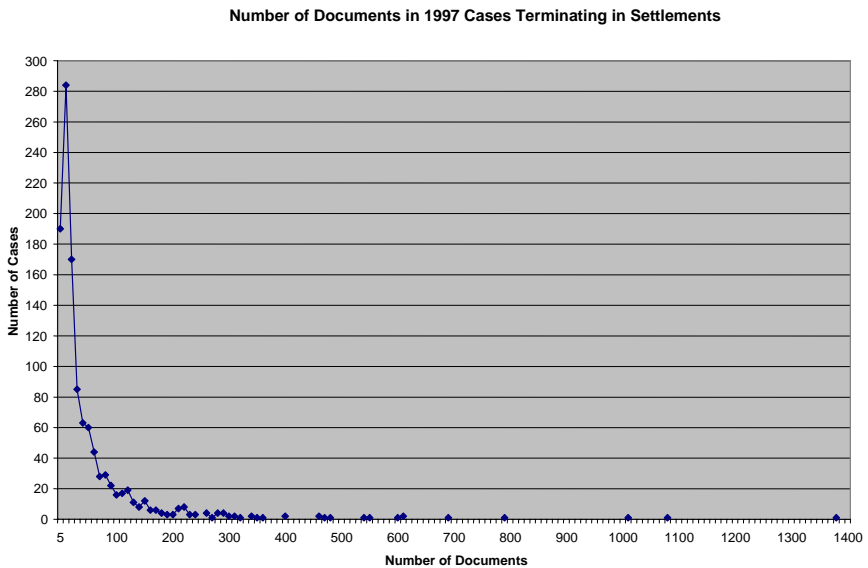


FIGURE 10: DOCUMENTS FILED IN 1997 CASES TERMINATED WITH RULINGS

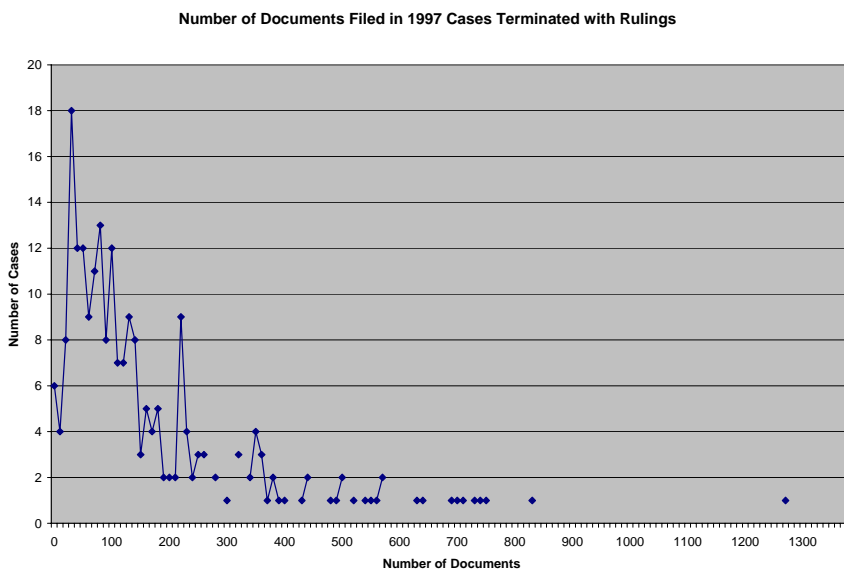


FIGURE 11: NUMBER OF DOCUMENTS FILED BY TYPE OF OUTCOME, 1997

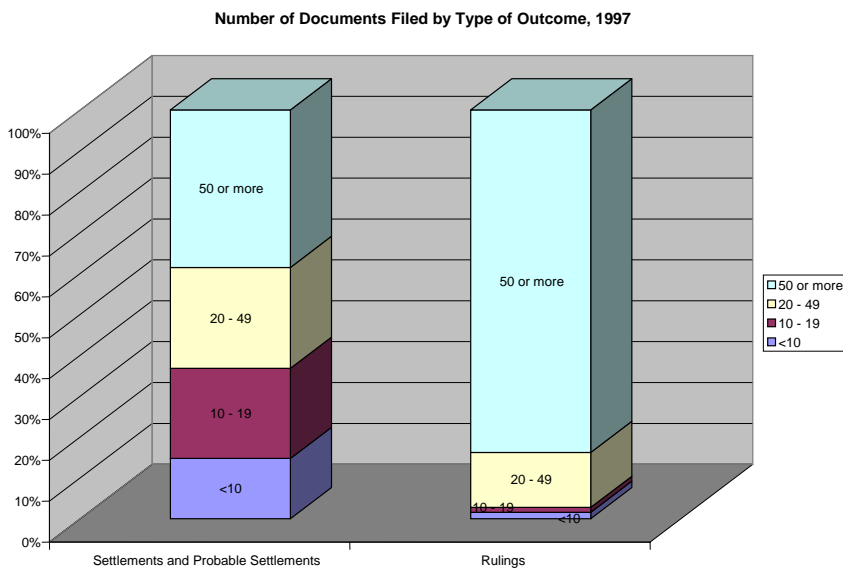


FIGURE 12: DOCUMENTS FILED IN 2000 CASES WHICH SETTLED OR PROBABLY SETTLED

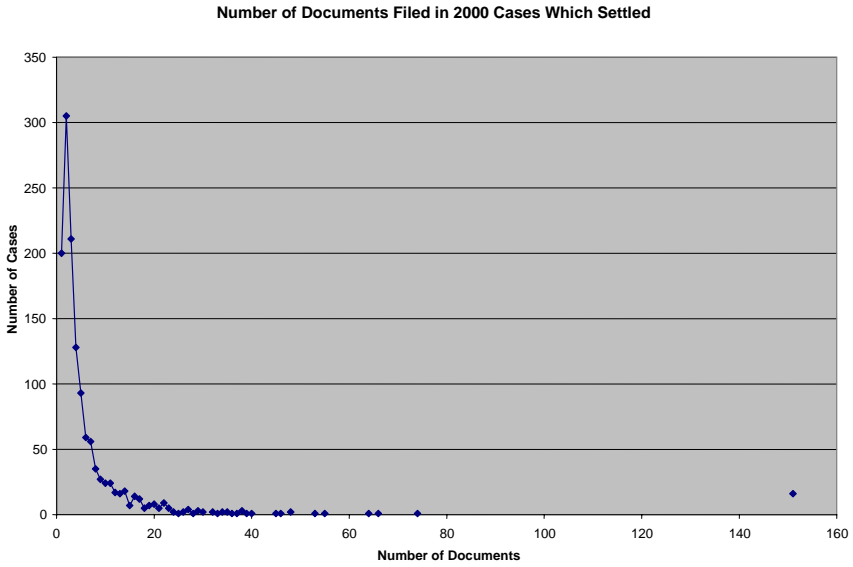


FIGURE 13: NUMBER OF DOCUMENTS IN 2000 CASES TERMINATED WITH RULINGS

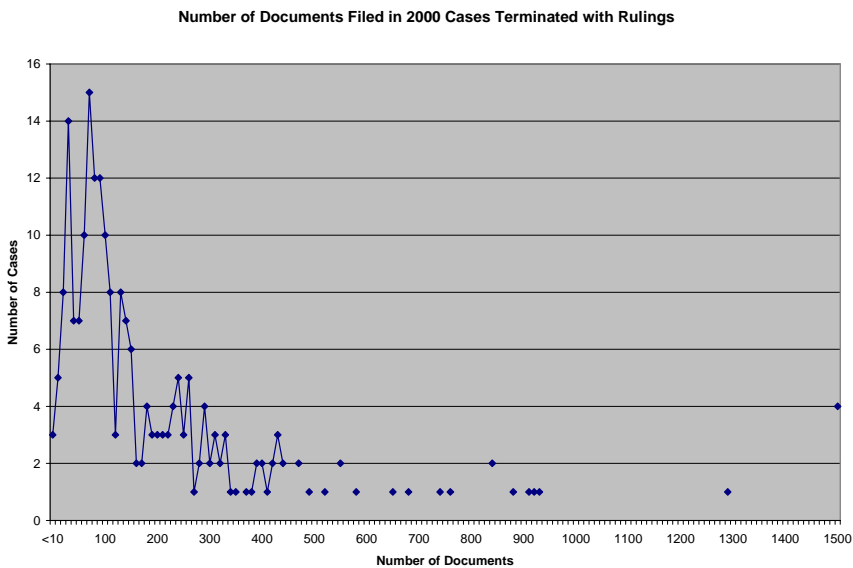
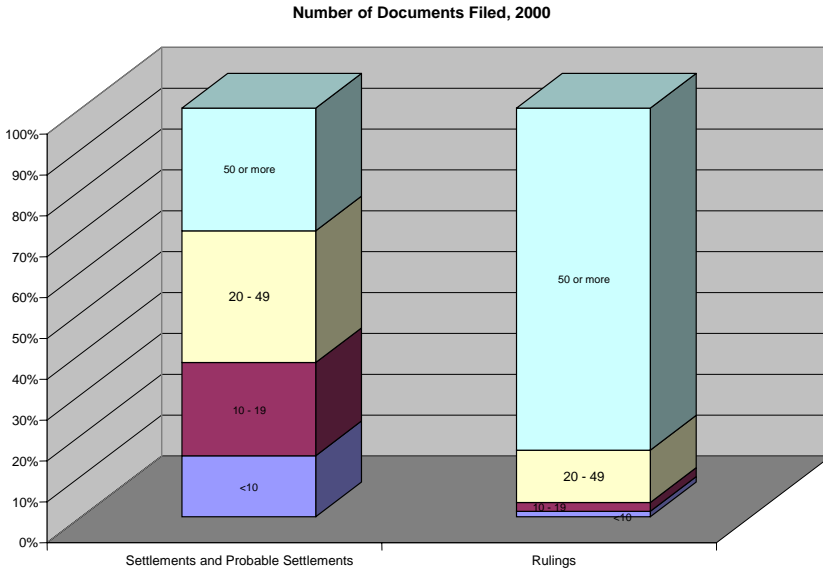


FIGURE 14: NUMBER OF DOCUMENTS FILED BY TYPE OF OUTCOME, 2000



It should be noted that the distribution of both number of days and number of documents is quite similar for the settlement and probable settlement categories. To some extent, this result is due to our choice to classify voluntary dismissals occurring before the complaint is answered as non-merit dispositions rather than very early probable settlements. For example, if these cases were classified as probable settlements, the average number of days in that category would fall to 372 in 1999, 391 in 1997, and 266 in 2000, and the average number of documents to 46 in 1995, 48 in 1997, and 45 in 2000. But if this classification is accepted, our results would *overestimate* the resources expended on settled cases. As a consequence, the disparity between resource expenditure on settled cases versus those terminating through a judgment may be even greater than we present in this analysis.

Given the “long tails” associated with expenditure on patent cases, Tables 13 and 14 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.<sup>272</sup> In fact, the median case terminating in a ruling from 1997 would have fallen at the ninety-sixth 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 display similar trends.

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?<sup>273</sup> 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.<sup>274</sup> 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.<sup>275</sup> For the 2000 cases, summary judgment motions were filed in 18% of the settled cases and 20% of the probable settlements.<sup>276</sup> 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.

### 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.<sup>277</sup> As shown in Table 15, 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

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

273. “[S]ettlement at an early stage, before a pretrial 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 pretrial motion.” Hadfield, *supra* note 163, at 708.

274. In 1997, the average number of documents in cases ending in a trial was 276, and in cases ending through summary judgments, 169. The medians were 224 and 105, respectively. *See infra* Table 15.

275. The average length of cases terminating through a trial was 873 days in 1995 and 951 days in 1997. The medians were 862 and 776, respectively. *See infra* Table 15.

276. *See infra* Table 15.

277. *See Gross & Syverud, supra* note 44, at 320.

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.<sup>278</sup> 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.<sup>279</sup> 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.<sup>280</sup> In 1997, the average number filed in cases with a trial was only about 60% greater, and the median was about twice as great.<sup>281</sup>

TABLE 15: EXPENDITURE ON CASES WITH RULINGS BY TYPE OF RULING

	Number of Days						Number of Documents					
	1995		1997		2000 <sup>282</sup>		1995		1997		2000 <sup>283</sup>	
	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	1127	1037	282	233	276	224	339	295

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 15, the average duration of a case terminating through a trial grew by about 9% between the 1995 and 1997 cohorts. The median length actually

278. 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. *See infra* Table 15.

279. 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. *See infra* Table 15.

280. In 1995, on 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. *See infra* Table 15.

281. In 1997, the average number of documents in cases ending in a trial was 276, and in cases ending through summary judgments, 169. The median number for tried cases was 224, and for cases ending in a summary judgment, 105. *See infra* Table 15.

282. *See supra* note 266.

283. *See supra* note 266.

decreased.<sup>284</sup> However, the average duration of cases terminating with summary judgments from 1997 was nearly 60% more than that of 1995, increasing from 567 to 900 days.<sup>285</sup> The median duration among summary judgment cases increased by nearly 50% from 445 to 651 days.<sup>286</sup> A similar result can be seen in Table 15 among the number of documents filed, which showed very little change among cases terminating in trials between 1995 and 1997. However, the median number of documents among cases terminating through a summary judgment also increased by about 40%.<sup>287</sup> Whichever measure of expenditure is used, the overall cost of a trial seems to be growing at a relatively slow rate, while that of a summary judgment is increasing rapidly and was only somewhat less costly than a trial in 1997. These results can also be seen in 2000 in Figures 5c and 12. These diagrams demonstrate somewhat of a shift toward 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 is 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;<sup>288</sup> 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 the 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

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284. The average length of cases terminating through trial was 873 days in 1995 and 951 days in 1997. The medians were 862 and 776, respectively. *See supra* Table 15.

285. *See supra* Table 15.

286. *See supra* Table 15.

287. The average number of documents in cases terminating through trials dropped 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 79 to 105. *See supra* Table 15.

288. *See supra* Tables 4 and 5 (123 cases (9%) resolved through summary judgment in the 1995 cohort and 133 cases (8%) resolved through summary judgment in the 1997 cohort).



*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 15–19 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.<sup>289</sup> But for 1997, the majority of such cases terminated through a pre-trial final ruling.<sup>290</sup> The results are similar when expenditure is measured by the number of documents displayed in Figures 20 and 21. In 1997, among cases terminating through a final ruling in which more than 100 documents were filed, 60% terminated in the pre-trial stage.<sup>291</sup>

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 the most expensive cases from the 2000 cohort are unresolved, and the preliminary data from that year provides weaker support for the existence of the trend observed between the 1995 and 1997 cohorts. The ratio of expenditure on trial terminations to that of summary judgment terminations in cases from 2000 is less than or equal to the ratio among the 1995 cases for both measures of expenditure. A full understanding of expenditures on cases cannot be calculated until the remaining sixty-odd cases are resolved. However, the 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 high level of expenditure. In other words, expenditures in patent cases may not be as closely related to the initiation of a trial as is commonly thought.

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

290. 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.

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

### FIGURE 15: DURATION OF CASES TERMINATING WITH SUMMARY JUDGMENT

FIGURE 15A.

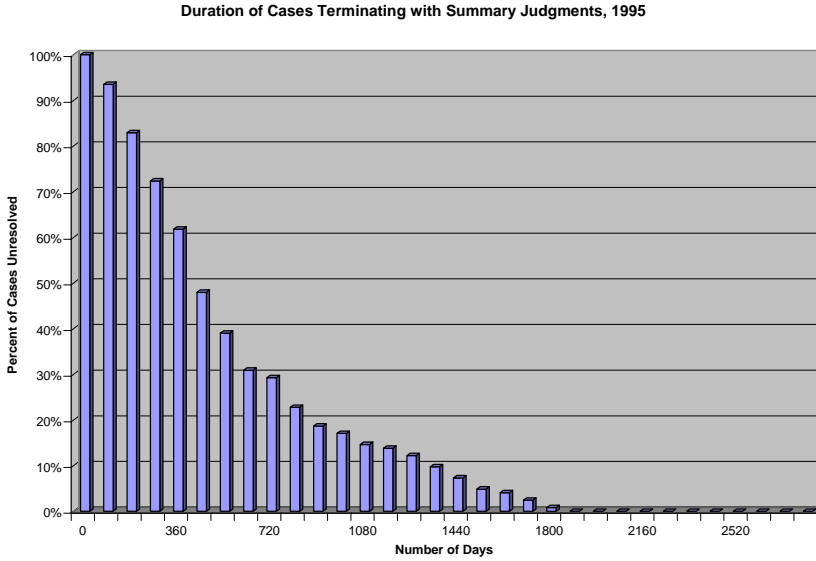


FIGURE 15B.

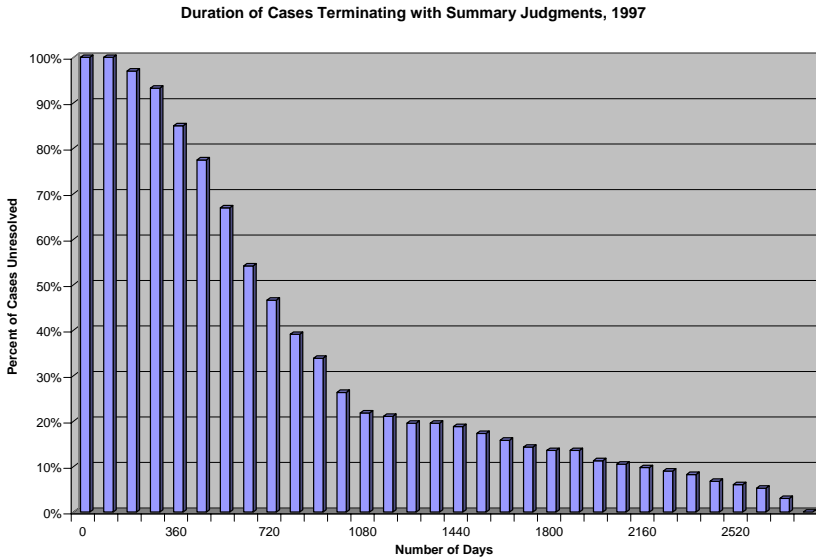


FIGURE 15C.

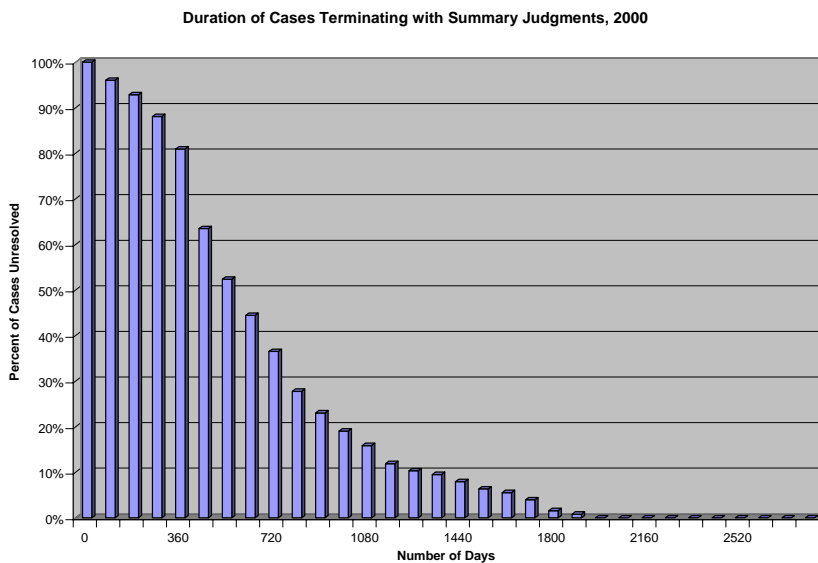


FIGURE 16: DURATION OF CASES TERMINATING THROUGH TRIALS

FIGURE 16A.

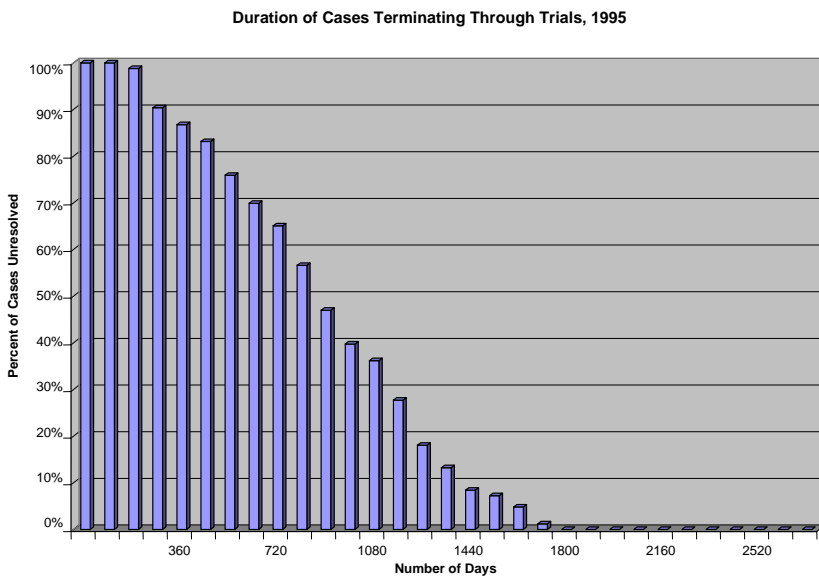


FIGURE 16B.

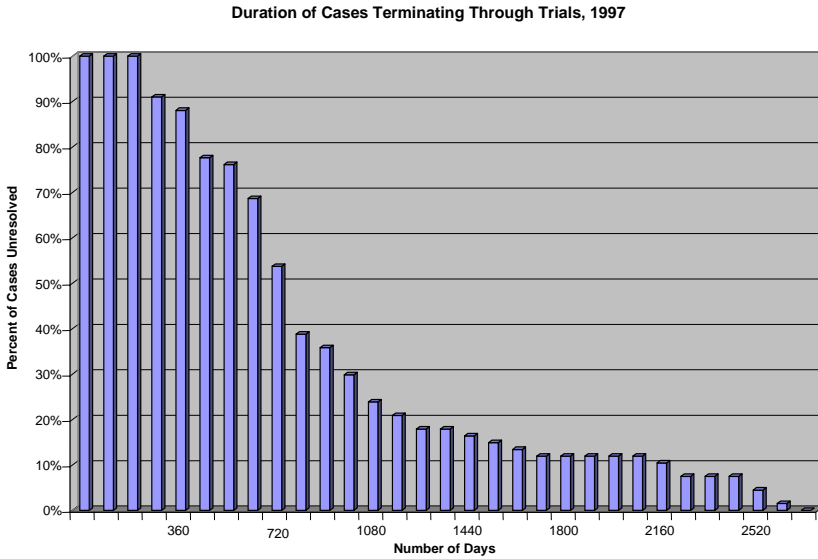


FIGURE 16C.

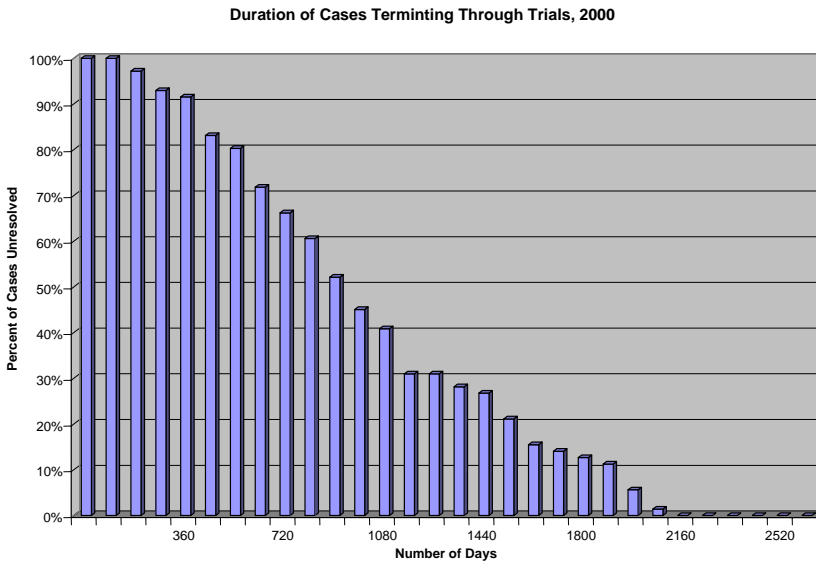


FIGURE 17: DURATION OF CASES WITH RULINGS, 1995

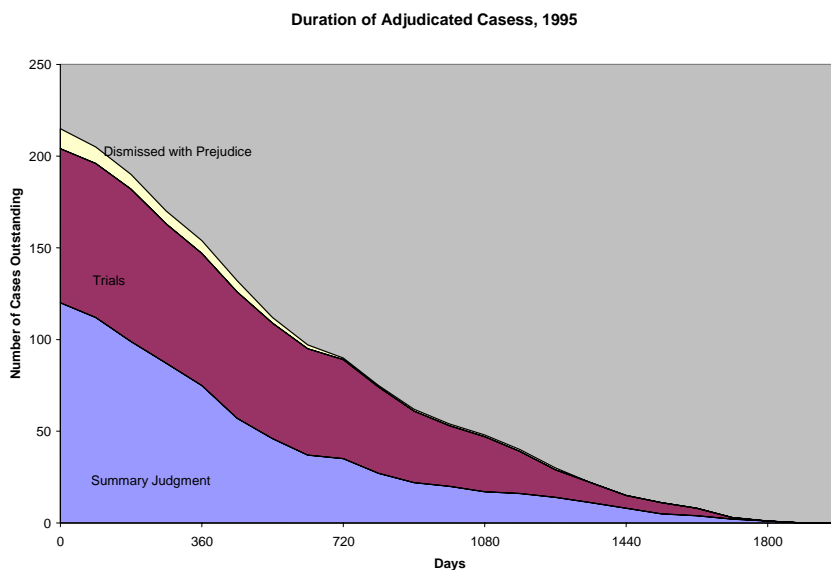


FIGURE 18: DURATION OF CASES WITH RULINGS, 1997

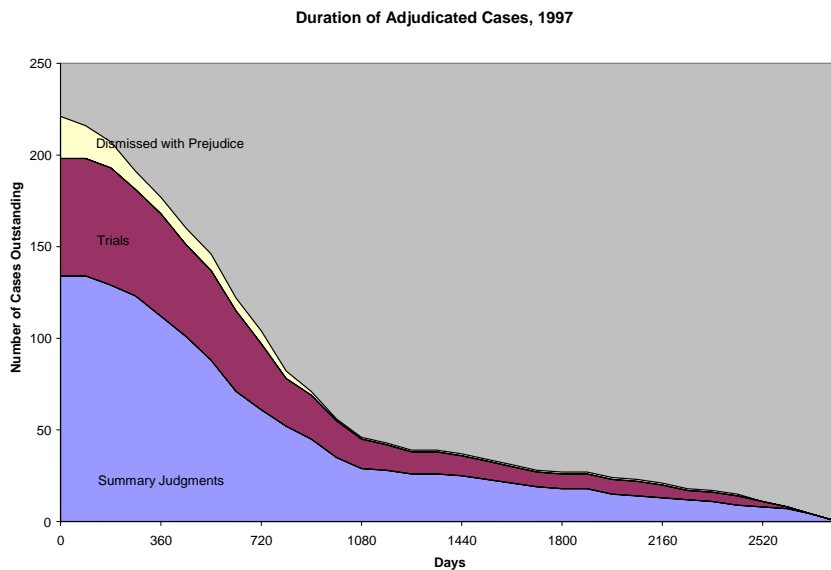


FIGURE 19: DURATION OF CASES WITH RULINGS, 2000

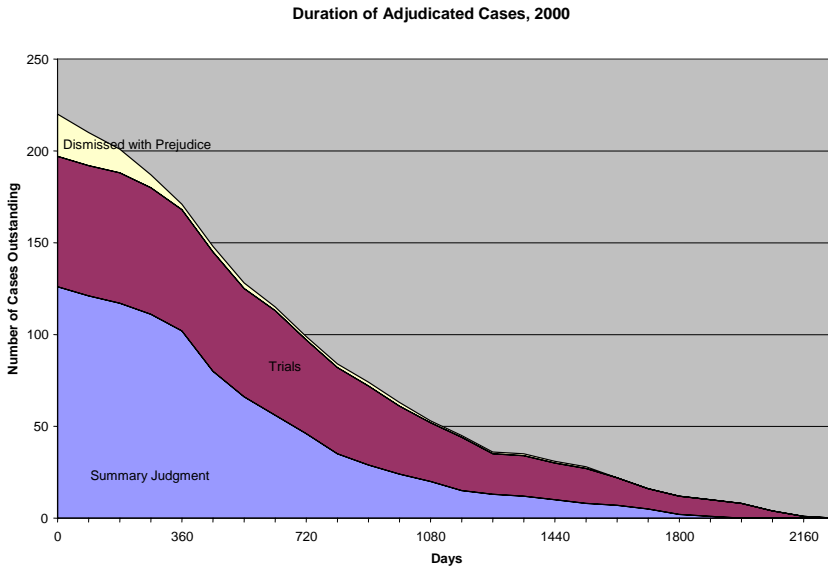


FIGURE 20: DOCUMENTS FILED IN CASES TERMINATING WITH SUMMARY JUDGMENTS

FIGURE 20A.

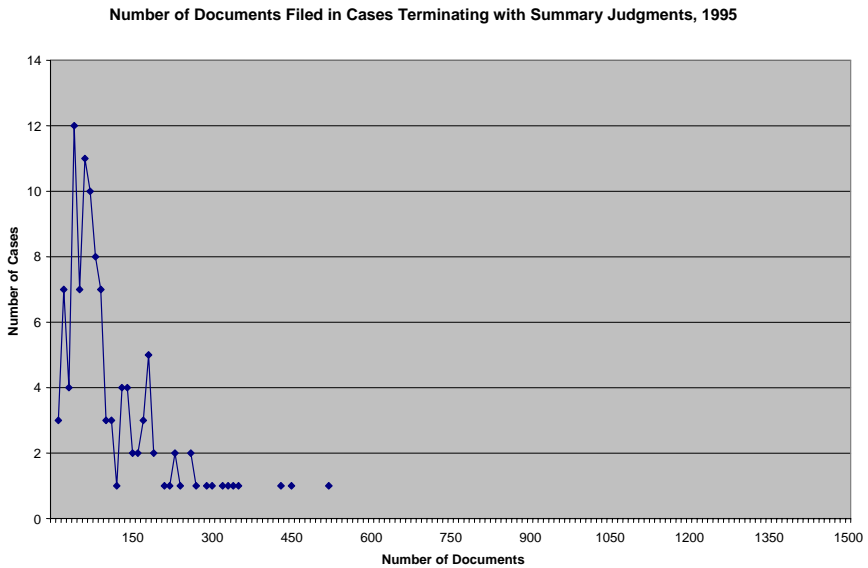


FIGURE 20B.

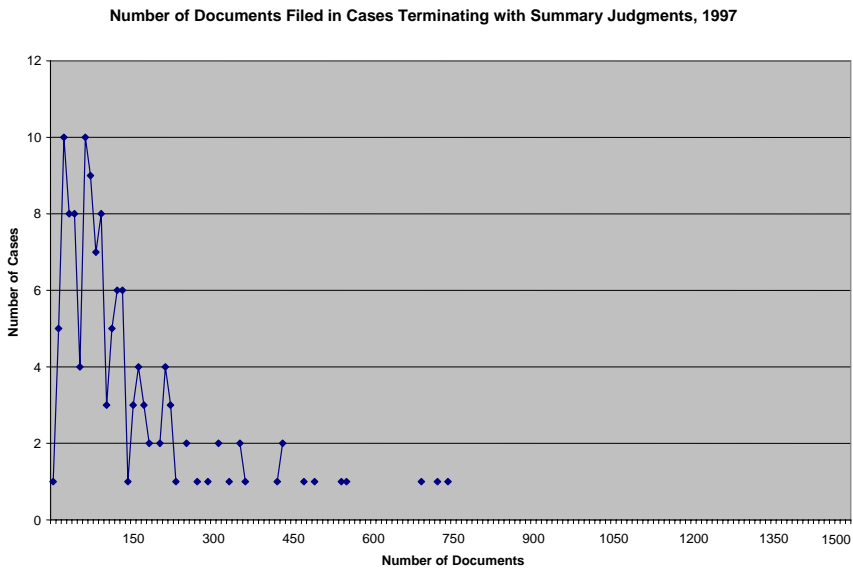


FIGURE 20C.

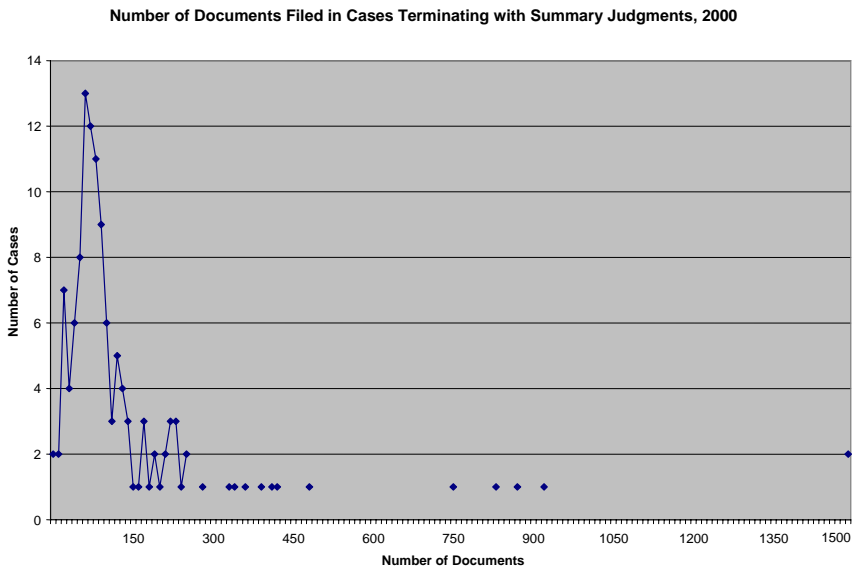


FIGURE 21: DOCUMENTS FILED IN CASES TERMINATING THROUGH TRIALS

FIGURE 21A.

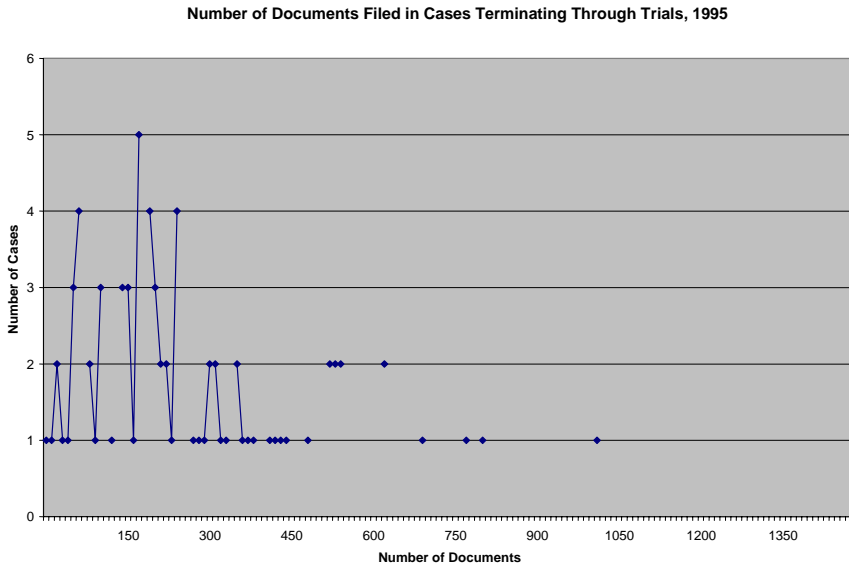


FIGURE 21B.

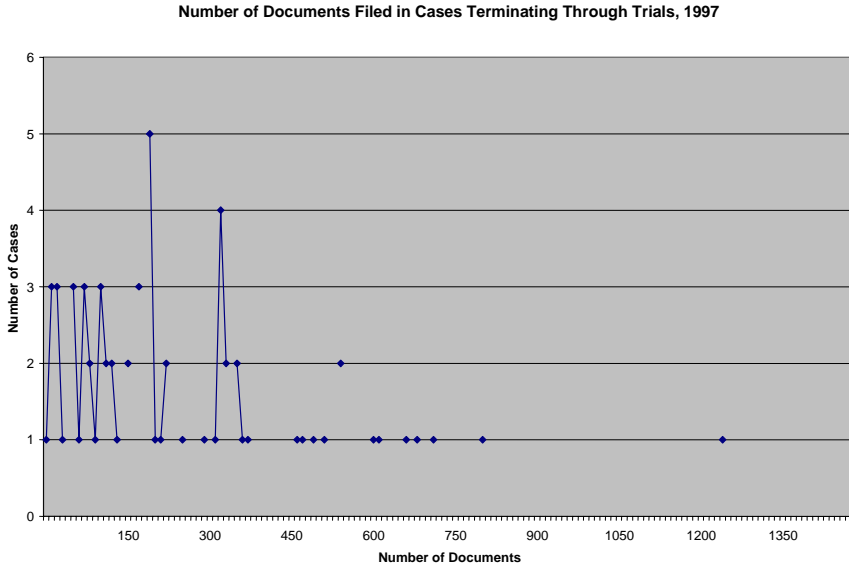
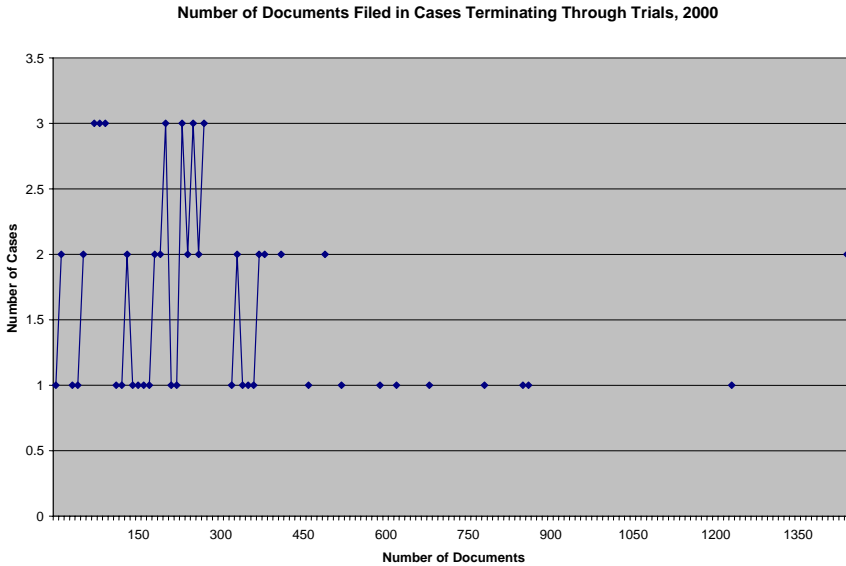




FIGURE 21C.



#### *D. Invalidation Rulings: The Cost of Revoking an Improvidently Granted Patent*

We can no longer make the argument 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 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.<sup>292</sup> 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.<sup>293</sup>

292. See *supra* Part III.D.

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

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).<sup>294</sup> For 1997, the average number of days to termination in such cases was 853 (median 612), and the average number of documents was 225 (median 121).<sup>295</sup> 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).<sup>296</sup> 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.<sup>297</sup>

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 on invalidity involves extensive 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.

## 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

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294. The total number of days for 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.

295. The total number of days for 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.

296. The total number of days for rulings of invalidity was 41,952 in 2000, while the total number of documents filed was 10,608; the number of rulings of invalidity was forty-eight.

297. 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.

cases) through to settlement or adjudication on the merits. The focus of this effort is on keeping track of a number of variables so that one can 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 efforts in empirical litigation scholarship that can actually estimate this amount; most other papers rely exclusively on the imprecise categorization performed by the Administrative Office of the 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%<sup>298</sup>), another significant percentage of cases, about 6%–9%, are resolved on the merits through summary judgment.<sup>299</sup>

Consequently, summary judgments are important in patent cases for determining patent validity and infringement. The summary judgments related to patent validity occur earlier in the litigation than 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 rulings based on invalidity in particular, are expensive.

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 after *Markman* placed on construing the claims before

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298. See *supra* Tables 4, 5, and 6.

299. See *supra* Tables 4, 5, and 6.

addressing infringement or invalidity 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 the 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, i.e., about twelve to fifteen 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 by 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 mechanisms that complement the courts.