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Pre-Markman Reversal Rates

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PRE-*MARKMAN* REVERSAL RATES

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The decisions in Markman v. Westview Instruments *by the U.S. Court of Appeals for the Federal Circuit and the Supreme Court shifted the responsibility for construing claims from jury to judge, and the Federal Circuit's decision in* Cybor Corp. v. FAS Technologies, Inc., *adopted a de novo standard of review on appeal. These decisions were motivated in part to bring stability, predictability, and transparency to the claim construction process. The Federal Circuit's reversal rate, which has hovered between 20 and 45 percent, has prompted calls for significant changes. These proposals are premised on the notion that the claim construction reversal rate is unduly high because of fundamental features of the appellate review process, such as the standard of review, the scope of judicial authority over claim interpretation, and the canons of claim interpretation. This Article, which is part of a symposium on "The Federal Circuit as an Institution," provides data from all Federal Circuit opinions from 1991 through 2008 to determine whether changes in the procedure for construing and reviewing claims has changed the reversal rate.*

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INTRODUCTION

The Federal Circuit's ostensibly high reversal rate of claim construction decisions by the district courts has been well documented and widely publicized. Academics have intensively studied the claim construction reversal rate, both anecdotally and empirically. District court judges openly complain about it. Even the Federal Circuit itself has noted the criticism over the perceived high reversal rate.

The Federal Circuit's reversal rate—which has hovered between 20 and 45 percent—has driven calls for several significant changes, including providing interlocutory review of claim construction decisions and shifting from a de novo standard of review to a deferential one. These proposals are premised on the notion that the claim construction reversal rate is unduly high because of fundamental features of the appellate review process, such as the standard of review, the scope of judicial authority over claim interpretation, and the canons of claim interpretation.

Many of these factors can be traced to both the Federal Circuit's[1] and the Supreme Court's[2] decision in *Markman v. Westview Instruments*, which placed all of the responsibility for construing claims with judges,[3] and the Federal Circuit's decision in *Cybor Corp. v. FAS Technologies, Inc.*,[4] which adopted a de novo standard of review on appeal.[5] These decisions were motivated in part to bring stability, predictability, and transparency to the claim construction process.[6]

But were these objectives achieved? In particular, how does the current reversal rate compare with the rate before *Markman* and *Cybor*? Examining the pre-*Markman* and pre-*Cybor* cases provides an important natural experiment to determine whether changes in the procedure for construing and reviewing claims changed the reversal rate. Relying upon data from all Federal Circuit opinions from 1991

1. 52 F.3d 967 (Fed. Cir. 1995) (en banc).
2. 517 U.S. 370 (1996).
3. *Id.* at 391.
4. 138 F.3d 1448 (Fed. Cir. 1998) (en banc).
5. *Id.* at 1456.
6. *See Markman*, 517 U.S. at 390–91; *Cybor*, F.3d at 1455.

through 2008—which includes cases from several years before *Markman* and *Cybor*—this Article reports the reversal rate before and after *Markman* and *Cybor*. It also discusses the reversal rate for appeals decided under the deferential standard of review used in the mid-1990s.

This Article is a contribution to the *Loyola of Los Angeles Law Review*'s symposium "The Federal Circuit as an Institution." It is part of a larger project evaluating the success of *Markman* and provides descriptive information about reversal rates.

This Article proceeds in several parts. Part I explains the background law and procedure involving patent claim construction. In so doing, the Article describes the important shift from jury to judge that occurred via *Markman*. The current role of claim construction in patent litigation is also described. Additionally, Part I explains the controversy surrounding the level of deference—currently none—that the Federal Circuit gives claim constructions by district court judges. Part II explains the empirical study that underlies the data presented here and elaborates on the methodology employed. Part III describes the empirical results, reporting the reversal rates before and after *Markman*, as well as the rates under the two standards of appellate review. Part IV discusses the significance of the findings. Part V provides some brief remarks about selection effects theory in the context of patent litigation.

I. BACKGROUND

Claim construction is the process of interpreting the scope of a patent. This part first sets forth the basics of claim construction. It then traces the evolution of the law of claim construction during the 1990s, including the reallocation in *Markman* of responsibility from the jury to the judge and the confirmation in *Cybor* that claim construction is reviewed de novo.

A. The Law of Claim Construction

Every patent must contain at least one claim.[7] The claims set forth the outer boundaries of the patentee's right to exclude others

7. 35 U.S.C. § 112 (2006).

from certain activities such as manufacturing products.[8] The claims are written in a technical manner and must comply with detailed formatting and structural rules.[9] In addition, the claims must describe an invention that satisfies the patentability requirements, including that the claimed invention is novel and nonobvious.[10]

Typically, inventors, their patent attorneys, and the U.S. Patent and Trademark Office (USPTO) carefully consider the language of claims.[11] The USPTO often finds claims unpatentable based on any number of grounds: because they are indefinite, because they do not sufficiently set forth the patent's boundaries, because they are anticipated or obvious in light of the prior art, or because they are unsupported by the patent's disclosure.[12] In many instances, the patent applicant alters the claim language in an attempt to obtain allowance of the patent.[13]

Patent claim construction is the process of interpreting what the words and terms in an issued patent claim mean. Claim construction occurs in a variety of contexts, such as when the USPTO is considering whether to allow the claims.[14] It also occurs in patent litigation in the federal district courts, the International Trade Commission,[15] and the Court of Federal Claims.[16] This Article

8. *See id.* § 271; Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. 719, 731 (2009) ("[C]laiming communicates the set to the public to encourage efficient investment in the invention, by requiring licensing or abstinence from the set's embodiments and by permitting free use of embodiments not in the set.").

9. PATENT & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 608.01 (8th ed., rev. July 2008) [hereinafter MPEP].

10. *See* 35 U.S.C. §§ 101–103.

11. Lee Petherbridge, *Positive Examination*, 46 IDEA 173, 186 (2006) (arguing that the USPTO should focus even more on expressly defining claim scope). Former Chief Judge Giles Rich once stated, "[T]he name of the game is the claim." Giles S. Rich, *Extent of Protection and Interpretation of Claims—American Perspectives*, 21 INT'L REV. INDUS. PROP. & COPYRIGHT L. 497, 499 (1990) (emphasis omitted). *See generally* ROBERT C. FABER, LANDIS ON MECHANICS OF PATENT CLAIM DRAFTING (5th ed. 2008) (discussing claim drafting).

12. *See* Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 183–84 (2007).

13. *See, e.g.*, *In re* Hyatt, 211 F.3d 1367, 1372–73 (Fed. Cir. 2000). Alternatively, applicants can argue that the claim is patentable as presented. *See* MPEP, *supra* note 9, § 707.07(f).

14. Risch, *supra* note 12, at 182–84.

15. For an interesting discussion of why litigants may choose to bring suit in the International Trade Commission, see Colleen V. Chien, *Patently Protectionist? An Empirical Analysis of Patent Cases at the International Trade Commission*, 50 WM. & MARY L. REV. 63 (2008) (analyzing patent disputes filed in the International Trade Commission and district courts).

focuses exclusively on patent claim construction in litigation in the district courts, where the bulk of patent litigation occurs.[17]

Patent litigation is an adversarial process in which a patentee accuses another of infringing a patent.[18] To prevail, the patentee must prove infringement and defeat any defenses raised by the accused infringer, including invalidity and unenforceability.[19] The process for proving infringement is simple, at least in theory. The first step is to construe the patent claim at issue in order to determine its scope.[20] The second step is to compare the properly construed patent claim with the accused device or method.[21] If each and every element recited in the patent claim is literally or equivalently found in the accused device or method, there is infringement.[22]

Because claim construction is the necessary first step in the patent infringement analysis,[23] it is an issue in almost all patent

16. The Court of Federal Claims hears patent infringement suits brought against the U.S. government. 28 U.S.C. § 1498 (2006).

17. The interpretation used by the USPTO is arguably different from the interpretation used in litigation. The USPTO's broadest-reasonable-interpretation standard allows it to truly test the reach of the claims vis-à-vis the prior art. Furthermore, during pendency at the USPTO, there generally is little or no prosecution history to rely upon, so that the tool of claim construction frequently used by the district courts in litigation is unavailable. *See* MPEP, *supra* note 9, § 2111; *see also* Dawn-Marie Bey & Christopher A. Cotropia, *The Unreasonableness of the Patent Office's "Broadest Reasonable Interpretation" Standard*, 37 AIPLA Q.J. 285 (2009); Risch, *supra* note 12, 182–84.

18. Most suits are brought by the patentee, but some are brought as declaratory judgment actions by an accused infringer. *See* 28 U.S.C. § 2201. The largest share of patent litigation involves large corporations as both plaintiffs and defendants. *See* Gwendolyn G. Ball & Jay P. Kesan, Transaction Costs and Trolls: Strategic Behavior by Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation (Univ. Ill. Law & Econs. Research Paper No. LE09-005, 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337166; Colleen V. Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C. L. REV. 1571, 1603 (2009).

19. Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time Is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175, 189 (2001).

20. General Mills, Inc. v. Hunt-Wesson, Inc., 103 F.3d 978, 981 (Fed. Cir. 1997).

21. *Id.*

22. A patentee can prove infringement either literally or under the doctrine of equivalents. If an accused device or method does not literally contain a required element, infringement may still be found if the accused device or method contains an equivalent. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608–09 (1950).

23. State Contracting & Eng'g Corp. v. Condotte Am., Inc., 346 F.3d 1057, 1067 (Fed. Cir. 2003) ("[W]e have held that a claim 'must be construed before determining its validity, just as it is first construed before deciding infringement.'" (quoting Markman v. Westview Instruments, Inc., 52 F.3d 967, 997 n.7 (Fed. Cir. 1995) (en banc))).

lawsuits.[24] Not only is claim construction an issue, but the parties almost always dispute the proper interpretation of the patent claims.[25] In fact, there are often disputes as to the meaning of numerous claim terms.[26] And these claim construction disputes are frequently dispositive of the issue of infringement.[27] In other words, once the claims have been interpreted, it is often apparent whether the device or method infringes. Claim construction is also a necessary step in evaluating several defenses to patent infringement. For example, claim construction must be considered in determining whether the claim is invalid as anticipated or obvious in light of the prior art.[28]

While it may at first blush seem simple to interpret patent claims, it is anything but.[29] The words used in the patent are often susceptible to several different meanings.[30] To assist in claim construction, the Federal Circuit and its predecessor courts have articulated the claim construction doctrine in the form of various canons of construction. These canons are used to decide how to define terms in the patent claim.[31]

Perhaps the most basic canon of claim construction is that claim terms are to be given their ordinary and customary meaning as understood by a person in the field of technology at the time the invention was made.[32] Yet another canon, known as the doctrine of claim differentiation, states that two separate claims in a single

24. Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1751 (2009).

25. *Id.* (stating that "there is essentially *always* a dispute over the meaning of the patent claims"); *see also* PETER S. MENELL, LYNN H. PASAHOW, JAMES POOLEY & MATTHEW D. POWERS, PATENT CASE MANAGEMENT JUDICIAL GUIDE 5-3 (2009), http://www.fjc.gov/library/fjc_catalog.nsf/autoframepage!openform&url=/library/fjc_catalog.nsf/DPublication!openform&parentunid=C80239D6A4DD70D7852575F4005B23CD ("The construction of patent claims plays a critical role in nearly every patent case.").

26. Burk & Lemley, *supra* note 24, at 1744.

27. *See* Markman v. Westview Instruments, Inc., 52 F.3d 967, 989 (Fed. Cir. 1995) (Mayer, J., concurring) (stating that "to decide what the claims mean is nearly always to decide the case").

28. *State Contracting & Eng'g Corp.*, 346 F.3d at 1067 (stating that claims must be construed before evaluating validity).

29. EDWARD D. MANZO, CLAIM CONSTRUCTION IN THE FEDERAL CIRCUIT § 1.2 (2009).

30. Tun-Jen Chiang, *Fixing Patent Boundaries*, 108 MICH. L. REV. 523, 525 (2010) (discussing the vagueness of the boundaries of patent claims).

31. *See* Timothy R. Holbrook, *Substantive Versus Process-Based Formalism in Claim Construction*, 9 LEWIS & CLARK L. REV. 123, 144–46 (2005).

32. *Id.* at 145.

patent should not be interpreted as having identical scope.[33] Another canon, that a claim should be construed to preserve its validity, urges that claims not be interpreted so broadly that they would be obvious or anticipated in light of the prior art.[34] Patentees are also permitted to be their own lexicographers.[35] This means that patentees can define words in any manner they desire, even if the definition is contrary to how people in the field understand the words.[36]

The application of these canons often leads to multiple possible constructions of a given term in a patent. The judge must consider all of the canons in the context of the patent and use her best judgment to decide which construction is correct.

An intracircuit split arose over the claim construction doctrine in the early 2000s. Some of the Federal Circuit judges believed that claim construction should be accomplished by first resorting to the dictionary.[37] Other judges felt that this approach was incorrect and contended that claim construction should focus on "intrinsic evidence," namely, the claims, specification, and prosecution history.[38] After several years of disagreement, the Federal Circuit attempted to clarify the claim construction doctrine in *Phillips v. AWH Corp.* by rejecting the dictionary approach.[39] But while most Federal Circuit judges nominally agreed upon the same general methodology in *Phillips*, in that case and cases since then, there has been notable disagreement over how to actually construe a specific claim's disputed terms in a given case.[40] In other words, different Federal Circuit judges will read the same patent specification and claim, yet will often arrive at opposite conclusions from district court

33. *See* D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574 (Fed. Cir. 1985).

34. Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 911 (Fed. Cir. 2004).

35. *See* MyMail, Ltd. v. Am. Online, Inc., 476 F.3d 1372, 1376 (Fed. Cir. 2007); K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1364 (Fed. Cir. 1999) ("As we have repeatedly said, a patentee can be his own lexicographer provided the patentee's definition, to the extent it differs from the conventional definition, is clearly set forth in the specification." (internal citations omitted)).

36. *See MyMail, Ltd.*, 476 F.3d at 1376.

37. Tex. Digital Sys. v. Telegenix, 308 F.3d 1193, 1202 (Fed. Cir. 2002).

38. *Id.* at 1203.

39. Phillips v. AWH Corp., 415 F.3d 1303, 1328 (Fed. Cir. 2005) (en banc).

40. *Id.* at 1332–33; *see also* R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding?: An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1111 (2004) (noting two distinct methods for construing claims used by Federal Circuit judges).

judges and one another as to the claim's meaning.[41] In general, there has been little evidence that *Phillips* had a "significant impact on the stability and predictability of the Federal Circuit's claim construction jurisprudence."[42]

B. Markman I *and* Markman II

Claim construction in patent cases in the early 1990s was conducted with the same canons of construction used today. However, in many cases tried in the early 1990s, the jury construed patent claims.[43] When a jury was demanded and a case reached trial, the jury was allowed to hear all of the evidence and determine claim construction and infringement claims. Basically, the parties presented their proposed claim constructions and the evidence of whether the accused device met the claim limitations. The judge then instructed the jury as to the canons of construction and applicable law. The jury thereafter deliberated and determined who won. In these cases, the role of the judge was limited to posttrial relief such as deciding motions for judgment as a matter of law.

The responsibility for claim construction was reallocated to the judge as a result of a pair of decisions involving a patent held by Herbert Markman. Markman was the named inventor of United States Reissue Patent No. 33,054 (the "'054 patent"), which was directed to an inventory control system for use in dry-cleaning stores.[44] Markman's system was "capable of monitoring and reporting upon the status, location and throughput of inventory in an establishment."[45] The invention purportedly provided for monitoring "the progress of articles through the laundry and drycleaning system" and permitted the inventory to be "reconcile[d] at any point in the sequence" of sorting, cleaning, and unsorting clothing.[46]

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41. Wagner & Petherbridge, *supra* note 40, at 1111–12.

42. R. Polk Wagner & Lee Petherbridge, Did *Phillips* Change Anything?: Empirical Analysis of the Federal Circuit's Claim Construction Jurisprudence 26 (Mar. 30, 2008) (unpublished manuscript), *available at* http://www.chicagoip.com/wagner.pdf.

43. Jeffrey Peabody, *Under Construction: Towards a More Deferential Standard of Review in Claim Construction Cases*, 17 FED. CIR. B.J. 505, 506 (2008) ("Prior to 1995, claim construction issues were typically decided by the jury.").

44. Markman v. Westview Instruments, Inc., 52 F.3d 967, 971 (Fed. Cir. 1995) (en banc).

45. *Id.*

46. *Id.*

In 1991, Markman and his licensee brought suit against Westview Instruments and another accused infringer.[47] A key disputed term in Markman's patent was "inventory."[48] Markman contended that "inventory" covered transaction totals or dollars.[49] Westview countered that "inventory" meant "articles of clothing."[50] The case proceeded to a jury trial on the issue of infringement. The court instructed the jury to determine the meaning of the claim "using the relevant patent documents including the specifications, the drawings and the file histories."[51] The court also instructed the jury to determine whether Westview's device was an infringement.[52] After deliberating, the jury found that Westview infringed the '054 patent.[53] Subsequent to the jury verdict, the trial court granted Westview's motion for judgment as a matter of law.[54] The court stated that claim construction was a matter of law for the judge, not the jury, to decide.[55] In so doing, the court adopted Westview's construction of the term "inventory" and held that it did not infringe.[56]

Markman appealed the judgment and argued that the trial court erred in granting the judgment as a matter of law.[57] Specifically, Markman contended that it was proper for the jury to interpret the meaning of terms of a patent.[58] In late 1993, after the appeal was argued before a panel, the Federal Circuit, sua sponte, ordered an en banc rehearing of the case.[59] On April 5, 1995, the Federal Circuit issued its ruling in *Markman v. Westview Instruments, Inc.* (*Markman I*).[60]

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47. *Id.* at 972.
48. *Id.* at 972–73.
49. *Id.* at 974.
50. *Id.*
51. *Id.* at 973.
52. *Id.*
53. *Id.*
54. *Id.*
55. *Id.*
56. *Id.*
57. *Id.*
58. *Id.* at 973–74.
59. *Id.* at 970 n.1.
60. *Id.* at 967.

In *Markman I*, a majority of the Federal Circuit judges shifted the responsibility for claim construction away from the jury and to the judge as a matter of law reserved exclusively for the court.[61] The majority stated that there were two lines of cases in Federal Circuit claim construction precedent.[62] The first line stated that "claim construction may have underlying factual inquiries that must be submitted to a jury."[63] The second line held that claim construction "is strictly a question of law for the court."[64] The Federal Circuit found that the first line—asserting that there was a factual component in claim construction—did not have a firm basis in Federal Circuit precedent.[65] Moreover, the majority argued that Supreme Court precedent firmly held that claim construction was a matter of law exclusively for the court.[66] Separately, issues of fairness and the patent statutory scheme required that competitors be able to reasonably ascertain the scope of the patentee's exclusive rights.[67] Finally, the court held that the construction of all written documents, including patents in particular, is reserved for the court.[68] Based on these considerations, the *Markman I* majority adopted a clear rule that claim construction is a matter of law to be determined by the court.[69] Further, since construction is a matter of law, the Federal Circuit held that lower court decisions are to be "reviewed *de novo* on appeal."[70]

Arguing that the decision had seized power reserved for the jury, three judges declined to join the Federal Circuit majority opinion. Judges Mayer and Rader concurred in the judgment, while Judge Newman dissented.[71] According to Judge Mayer, the majority opinion "usurp[ed] a major part of the functions of both trial judge and jury in patent cases, obliterating the traditional, defined

61. *See id.* at 979.
62. *See id.* at 976–77.
63. *Id.* at 976.
64. *Id.* at 977.
65. *Id.* at 976–77.
66. *Id.* at 977–78.
67. *Id.* at 978.
68. *See id.*
69. *Id.* at 979.
70. *Id.*
71. *Id.* at 989, 998–99 (Mayer, J. and Rader, J., concurring; Newman, J., dissenting).

differences between the roles of judge and jury, and trial and appellate courts."[72] The majority's holding, he argued, violated the Seventh Amendment.[73]

Judge Mayer concurred that claim construction as a whole should be reviewed de novo.[74] However, Judge Mayer argued that "any facts found in the course of interpreting the claims must be subject to the same standard by which we review any other factual determinations: for clear error in facts found by a court; for substantial evidence to support a jury's verdict."[75] He asserted that the majority's reading of the lines of claim construction cases in the Federal Circuit and at the Supreme Court was incorrect.[76]

In her dissent, Judge Newman argued that the majority was wrong to affirm because the decision violated the Seventh Amendment's right to a jury trial.[77] She also argued that the majority had misconstrued the applicable Federal Circuit and Supreme Court precedents on claim construction.[78]

The Supreme Court granted certiorari and subsequently affirmed the Federal Circuit's decision in *Markman v. Westview Instruments, Inc. (Markman II)*.[79] Justice Souter, writing for a unanimous court, confirmed that claim construction is "exclusively within the province of the court."[80] His opinion focused on the Seventh Amendment concern raised by the Federal Circuit concurrences and dissent. After acknowledging that patent infringement cases must be tried by a jury, Justice Souter analyzed whether the "substance of the common-law right of trial by jury" was implicated by claim construction.[81]

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72. *Id.* at 992 (Mayer, J., concurring).

73. *Id.* The Seventh Amendment states:

> In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

U.S. CONST. amend. VII.

74. *See Markman*, 52 F.3d at 991 (Mayer, J., concurring).

75. *Id.*

76. *See id.* at 989–90, 993–95.

77. *Id.* at 1000 (Newman, J., dissenting).

78. *See id.* at 999, 1002.

79. 517 U.S. 370, 391 (1996).

80. *Id.* at 372.

81. *Id.* at 377 (internal citation omitted).

The Supreme Court precedent roughly considered issues of fact to be for the jury and issues of law to be for the judge.[82] However, Justice Souter did not place claim construction within either category. Instead, he called it "a mongrel practice."[83] After determining that no Supreme Court precedent decided the issue, he elected to "consider both the relative interpretive skills of judges and juries and the statutory policies that ought to be furthered by the allocation."[84] He found that judges are more likely to properly construe a written instrument.[85] For these reasons, the Supreme Court found that claim construction is an issue for the judge.[86]

However, the Supreme Court was silent on the standard of appellate review. It did not opine whether the standard of review was de novo, as the Federal Circuit held in *Markman I.* Hence, the standard of review issue was not entirely settled. *Markman I* held that claim construction was to be reviewed de novo, but *Markman II* was silent on this point. A majority of Federal Circuit claim construction opinions issued in the years immediately following *Markman II* found that claim construction was to be reviewed de novo.[87] Nonetheless, a minority of opinions concluded that there was a factual component to claim construction, and those facts were reviewed with deference.[88]

C. Cybor *and Confirmation of De Novo Appellate Review*

In 1998, the Federal Circuit considered the appropriate level of review en banc in *Cybor Corp. v. FAS Technologies, Inc.* The majority, after reciting the Supreme Court's analysis in *Markman II*,

82. *See id.* at 384 n.10.

83. *Id.* at 378.

84. *Id.* at 384.

85. *Id.* at 388.

86. *Id.* at 390.

87. Cybor Corp. v. FAS Techs., Inc. 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc) (citing Serrano v. Telular Corp., 111 F.3d 1578 (Fed. Cir. 1997); Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1218 (Fed. Cir. 1996); General Am. Transp. v. Cryo-Trans, Inc., 93 F.3d 766, 769 (Fed. Cir. 1996); Insituform Techs., Inc. v. Cat Contracting, Inc., 99 F.3d 1098, 1105 (Fed. Cir. 1996)).

88. *Cybor*, 138 F.3d at 1454 (citing Eastman Kodak Co. v. Goodyear Tire & Rubber Co., 114 F.3d 1547, 1555–56 (Fed. Cir. 1997); *Serrano*, 111 F.3d at 1586 (Mayer, J., concurring); Metaullics Sys. Co. v. Cooper, 100 F.3d 938, 939 (Fed. Cir. 1996); Wiener v. NEC Elecs. Inc., 102 F.3d 534, 539 (Fed. Cir. 1996)).

held that claim construction is purely a matter of law and is to be reviewed by the Federal Circuit de novo.[89] It also stated that the Supreme Court's description of claim construction as a "mongrel practice" was merely a "prefatory comment" and did not support the position that claim construction has underlying factual questions.[90]

Judges Plager, Bryson, and Mayer concurred in the judgment, each writing separately.[91] While agreeing that claim construction should be reviewed de novo, Judge Plager indicated that informal deference should be provided.[92] Indeed, his concurrence noted that "common sense dictates that the trial judge's view will carry weight."[93] Judge Bryson wrote a second concurrence underscoring that he would provide weight to the district court's claim construction, notwithstanding the de novo review standard.[94]

Judge Mayer also penned a concurrence, joined by Judge Newman.[95] He argued that the Supreme Court in *Markman II* could have easily affirmed the de novo standard of *Markman I*.[96] However, the Supreme Court chose not to do so.[97] And in choosing not to, the Supreme Court discussed claim construction as a practice that was not clearly either pure law or pure fact.[98] Noting that the Court called it a "mongrel practice,"[99] Judge Mayer argued that in some cases "there are factual determinations that are more than just incident to claim construction."[100] In these cases, he argued, some formal deference should be provided to the factual findings of the district court judge.[101]

89. *Cybor*, 138 F.3d at 1451.
90. *Id.* at 1455.
91. *Id.* at 1462–63.
92. *Id.* at 1462.
93. *Id.*
94. *Id.* at 1463.
95. *Id.* (Newman, J., joining Mayer, J., concurring).
96. *Id.* at 1464.
97. *Id.*
98. *Id.*
99. *Id.* at 1464 n.1.
100. *Id.* at 1464.
101. *Id.* at 1465.

Judge Rader also dissented in part, arguing that *Markman I* required numerous deviations from normal litigation procedure.[102] These deviations included a "[b]ias toward summary judgment[]," shifting claim construction theories before trial, and the risk of multiple trials if the Federal Circuit reversed a district court's claim construction.[103] Judge Rader argued that de novo appellate review of claim construction undercuts the benefits of having judges construe claims.[104] He provided his own statistics supporting a high reversal rate for claim constructions.[105] More specifically, Judge Rader noted that from *Markman I* until *Cybor*, the Federal Circuit had expressly reviewed 141 claim construction decisions and reversed "in whole or in part" 38.3 percent of them.[106] Limiting the analysis to claim constructions from the district courts or the Court of Federal Claims, Judge Rader cited a reversal rate of 37.3 percent.[107] According to Judge Rader, a reversal rate of that magnitude undermined *Markman I*'s goals of predictability and certainty.[108]

Judge Newman wrote a separate opinion with additional views—in which Judge Mayer joined—arguing that the way the Federal Circuit implemented de novo review was problematic.[109] First, Judge Newman noted that the Federal Circuit had not accepted interlocutory review of district court judges' claim construction orders.[110] Thus, in order to reach an appealable judgment, a district court must enter final judgment on infringement and all defenses or rule on a preliminary injunction. Reaching an appealable judgment is expensive, even after a *Markman* ruling.[111] Judge Newman also criticized the "unexpectedly creative" claim constructions adopted by

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102. *Id.* at 1474 n.2 (Rader, J., dissenting).

103. *Id.*

104. *Id.* at 1476.

105. *Id.*

106. *Id.* at 1476 n.4.

107. *Id.*

108. *See id.* at 1476.

109. *Id.* at 1478–79 (Mayer, J. joining Newman, J., additional views).

110. *Id.* at 1479. It should be noted that in the years since *Cybor*, the Federal Circuit has almost never accepted an interlocutory review of a claim construction order. *See, e.g.*, V. Ajay Singh, *Interlocutory Appeals in Patent Cases Under 28 U.S.C. § 1292(c)(2): Are They Still Justified and Are They Implemented Correctly?*, 55 DUKE L.J. 179, 196 (2005) ("[T]he Federal Circuit has thus far refused to hear permissive appeals related to claim construction.").

111. *See infra* note 170 and accompanying text.

some Federal Circuit panels.[112] According to Judge Newman, these claim constructions create unpredictability for litigants and add "a sporting element" to the Federal Circuit.[113]

The standard of review relating to claim construction has been vigorously debated since *Cybor*. There are numerous academic criticisms of de novo appellate review of claim construction.[114] Furthermore, on several occasions Congress has proposed mandating interlocutory review of claim construction orders.[115]

The Federal Circuit may itself revisit the de novo standard of review. In fact, the Federal Circuit requested briefing on the issue during its en banc consideration of *Phillips v. AWH Corp.* in 2004.[116] However, in the majority opinion in *Phillips*, the court declined to address the issue "at this time."[117] In 2006, several judges on the Federal Circuit expressed a willingness to revisit *Cybor* and de novo review of district court judges' claim constructions.[118] The case, *Amgen Inc. v. Hoechst Marion Roussel, Inc.*,[119] involved an important claim construction dispute in the context of generic drug litigation.[120] Although the Federal Circuit denied a request for rehearing en banc,[121] several judges dissented from the denial, and all of the judges

112. *Cybor Corp.*, 138 F.3d at 1479.

113. *Id.*

114. *See, e.g.*, Thomas Chen, *Patent Claim Construction: An Appeal for* Chevron *Deference*, 94 VA. L. REV. 1165 (2008); David Krinsky, *The Supreme Court, Stare Decisis, and the Role of Appellate Deference in Patent Claim Construction Appeals*, 66 MD. L. REV. 194 (2006); Lauren Maida, *Patent Claim Construction: It's Not a Pure Matter of Law, So Why Isn't the Federal Circuit Giving the District Courts the Deference They Deserve?*, 30 CARDOZO L. REV. 1773 (2009); Peabody, *supra* note 43.

115. *See* H.R. 2795, 109th Cong. (2005) (enacted); S. 3818, 109th Cong. (2006); H.R. 1908, 110th Cong. (2007); S. 3600, 110th Cong. (2008).

116. Phillips v. AWH Corp., 376 F.3d 1382, 1383 (Fed. Cir. 2004) (per curiam). The court stated:

> Consistent with the Supreme Court's decision in Markman v. Westview Instruments, Inc., . . . and our *en banc* decision in Cybor Corp. v. FAS Technologies, Inc., . . . is it appropriate for this court to accord any deference to any aspect of trial court claim construction rulings? If so, on what aspects, in what circumstances, and to what extent?

Id.

117. Phillips v. AWH Corp., 415 F.3d 1303, 1328 (Fed. Cir. 2005) (en banc). Judges Mayer and Newman dissented in part, stating that the court should overrule *Cybor*. *See id.* at 1330–31 (Newman, J., joining Mayer, J., dissenting).

118. *See* Amgen Inc. v. Hoechst Marion Roussel, Inc., 457 F.3d 1293, 1301 (Fed. Cir. 2006).

119. 457 F.3d 1293 (Fed. Cir. 2006).

120. *Id.* at 1296.

121. Amgen Inc. v. Hoechst Marion Roussel, Inc., 469 F.3d 1039, 1040 (Fed. Cir. 2006).

who wrote separately indicated that they would eliminate or at least revise the de novo standard.[122]

II. STUDY DESIGN AND METHODOLOGY

This Article relies upon a database of all published and unpublished Federal Circuit claim construction decisions from 1991 through 2008. This section briefly describes the development and scope of the database.

A few previous articles have used the core database used here,[123] but the database has now been extended to include opinions from January 1, 1991, to December 31, 2008. It contains all Federal Circuit opinions resolving a disputed issue of claim construction arising from district court litigation during that time period. The database includes precedential and nonprecedential opinions, as well as appeals resolved without a written opinion. Because a detailed

122. Judges Michel and Rader dissented, arguing that de novo review of claim construction had caused four problems: (1) a consistently high reversal rate; (2) a lack of predictability; (3) the loss of the district court judges' "comparative advantage" gained because they hear all of the evidence; and (4) an overloading of the Federal Circuit's docket with appeals about minor claim construction issues. *Id.* at 1040 (Michel, J., and Rader, J., dissenting). Judge Newman separately dissented and criticized the claim construction methodology used by the original Federal Circuit panel. *Id.* at 1041 (Newman, J., dissenting). She also stated that science-and-technology-based facts in patent cases should receive the same standard of appellate review as other science-and-technology-based cases under *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579 (1993). *Amgen*, 469 F.3d at 1041, 1043. Judge Rader dissented, explicitly urging that the Federal Circuit provide deference to factual components of a trial court's claim construction. *Id.* at 1044 (Rader, J., dissenting). Judge Moore also dissented and suggested that the Federal Circuit reconsider the de novo review standard. *Id.* at 1046 (Moore, J., dissenting). Judges Gajarsa, Dyk, and Linn concurred in the denial of en banc review but noted that their joining in a denial should not be viewed as their unqualified agreement with *Cybor*. Rather, they wrote, *Amgen* was not the appropriate case for en banc review of this issue. *Id.* at 1045 (Gajarsa, J., Dyk, J., and Linn, J., concurring). Judge Lourie also concurred in the denial of en banc review, despite agreeing that the panel had incorrectly interpreted the patent claim at issue. He stated that the case did not satisfy the requirements for en banc review. *Id.* at 1043 (Lourie, J., concurring). More recently, district court judge Ronald Clark sitting on the Federal Circuit by designation, echoed concerns about the de novo standard of review of claim construction. Trading Tech. Intern., Inc. v. eSpeed, Inc., 595 F.3d 1340, 1363 (Fed. Cir. 2010) (Clark J., concurring) ("[T]he current de novo standard of review for claim construction may result in unintended consequences of discouraging settlement, encouraging appeals, and in some cases, multiplying the proceedings.").

123. *See, e.g.*, David L. Schwartz, *Courting Specialization: An Empirical Study of Claim Construction Comparing Patent Litigation Before Federal District Courts and the International Trade Commission*, 50 WM. & MARY L. REV. 1699, 1703 (2009) (relying on a database from 1996–2008) [hereinafter Schwartz, *Courting Specialization*]; David L. Schwartz, *Practice Makes Perfect?: An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 238 (2008) (relying on a database from 1996–2007) [hereinafter Schwartz, *Practice Makes Perfect*].

explanation of how the original data set was derived is available elsewhere,[124] it is not repeated here. The same general process was undertaken to expand the data set.

However, there are two items worth mentioning about the patent cases decided by the Federal Circuit before the Supreme Court's decision in *Markman II*. First, juries construed the claims in some cases. To account for this, the data set recorded whether a judge or jury construed the claims for pre-*Markman II* decisions. After *Markman II*, nearly all of the substantive Federal Circuit opinions on claim construction have been appeals from claim constructions by judges.[125] Thus, the judge-jury distinction is not important after *Markman II*.

Second, a fair number of appeals of patent claim construction cases from the pre-*Markman I* period were decided by summary affirmance.[126] Specifically, Federal Circuit Rule 36 ("Rule 36") permits the court to resolve an appeal without a written opinion.[127] If the Federal Circuit decides a case via summary affirmance, the entire Federal Circuit resolution consists of the word *affirmed*. Because there is no written opinion, it is not immediately clear which issues were appealed. For these cases, there are a number of techniques available to determine whether claim construction was appealed. These techniques include reviewing the appellate briefs (if available), discussing the appeal with one of the attorneys involved, analyzing reported district court decisions in the case, and reviewing the district court docket. If the issue of the district court's claim construction was raised on appeal, the case was considered relevant to the database. Otherwise, the case was eliminated as irrelevant.[128]

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124. For a thorough discussion of the selection, coding, and reliability of the data set, see Schwartz, *Practice Makes Perfect*, *supra* note 123, at 269–74. The same general process was undertaken to expand the data set.

125. A very few cases were tried to juries before *Markman I* but not decided on appeal until after *Markman II*. For example, in *B. Braun Medical, Inc. v. Abbott Laboratories*, the entire case was submitted to a jury in 1994, but the case was not decided by the Federal Circuit until 1997. 124 F.3d 1419, 1422 (Fed. Cir. 1997). Almost all other jury claim constructions had been settled or resolved by *Markman II*.

126. *See* David L. Schwartz, *Explaining the Demise of the Doctrine of Equivalents*, BERKELEY TECH. L.J. (forthcoming 2011).

127. FED. CIR. R. 36.

128. There are two Rule 36 cases for which there is insufficient information to determine whether claim construction was at issue on appeal; one is from 1991, and the other is from 1993.

As discussed further in Part III.A *infra*, it is important to recognize that because of the significant difficulty in locating Rule 36 opinions, most studies of claim construction reversal rates omit these opinions from their data sets, artificially raising their reported reversal rates.[129]

III. EMPIRICAL RESULTS

This part sets forth the empirical results of the present study, reporting the reversal rate before and after *Markman* and *Cybor*. Before doing so, it recounts the results of prior empirical research into the post-*Markman* reversal rate.

*A. Prior Empirical Literature on the Post-*Markman *Reversal Rate*

The claim construction reversal rate has been extensively studied by scholars.[130] Nearly all of the previous studies begin their analysis on or after the date of the Supreme Court's *Markman II* decision in 1996.[131] There do not appear to be any empirical studies of the claim construction reversal rate before the Federal Circuit's *Markman I* decision in 1995.[132]

See Layh v. Cronk, 1993 WL 113716 (Fed. Cir. 1993); Four Seasons Solar Prods. Corp. v. Cal. Solariums, Inc., 1991 WL 185048 (Fed. Cir. 1991). These cases were not included in the study.

129. Kimberly Moore's pair of empirical articles on claim construction reversal rates includes Rule 36 decisions. *See* Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 8–10 (2001) [hereinafter Moore, *Are District Court Judges Equipped*]; Kimberly A. Moore, Markman *Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231, 234–38 (2005) [hereinafter Moore, Markman *Eight Years Later*].

130. These are discussed in Richard S. Gruner's article *How High Is Too High?: Reflections on the Sources and Meaning of Claim Construction Reversal Rates at the Federal Circuit*, 43 LOY. L.A. L. REV. 981, 994–1001 (2010).

131. *See, e.g.*, Bender, *supra* note 19, at 203–08; Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1078, 1092 (2007); Moore, *Are District Court Judges Equipped*, *supra* note 129, at 8–9; Moore, Markman *Eight Years Later*, *supra* note 129, at 239; Michael Saunders, *A Survey of Post-*Phillips *Claim Construction Cases*, 22 BERKELEY TECH. L.J. 215, 235 (2007). Several of the studies begin with *Markman I*. *See* Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance from the Federal Circuit*, 33 SETON HALL L. REV. 711 (2003).

132. In a speech, Judge Randall Rader apparently indicated that he had reviewed over one hundred Federal Circuit decisions before *Markman I* and found that there was a 39 percent reversal rate. Robert C. Weiss, Armand F. Ayazi & Kate Hertel, Markman *Practice, Procedure and Tactics*, *in* PATENT LITIGATION 2000, at 134 (PLI Patents, Copyrights, Trademarks, & Literary Prop. Course Handbook Series No. 619, 2000). I was unable to locate any other article describing these results in more detail.

In general, the Federal Circuit reverses a seemingly high number of district court claim construction decisions. A previous study using a subset of the data used in the present study found that from 1996 through 2007, 29.7 percent of appeals from district courts involving claim construction were reversed, vacated, and/or remanded in such a way that vacated the judgment.[133] In addition to this 29.7 percent, in another 8.3 percent of cases, the court found a claim construction error by the district court but nonetheless affirmed the decision.[134] District court judges with larger and smaller patent dockets were reversed at approximately the same rate.[135] Surprisingly, the administrative judges at the International Trade Commission did not perform significantly better. From 1996 through 2008, 31 percent of appeals from the International Trade Commission involving claim construction were reversed, vacated, and/or remanded.[136] It does not appear that more experience with patent cases reduces the reversal rate. Previous studies suggest several possible—and not mutually exclusive—explanations for the seemingly intractable reversal rate: (1) trial judges (including federal district court judges and the administrative law judges of the International Trade Commission) cannot master claim construction, especially without a technical background; (2) the Federal Circuit's claim construction caselaw is poorly articulated; and (3) claim construction is often inherently indeterminate because of the difficulty of using words to describe complex technological inventions.[137]

District court judges have voiced concerns about the claim construction reversal rate. For example, District Court Judge Patti Saris noted that the claim construction reversal rate has demoralized some district court judges.[138] Indeed, District Court Judge Marsha J.

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133. Schwartz, *Practice Makes Perfect*, *supra* note 123, at 249.

134. *Id.* at 248–49. For the federal appellate courts, the overall reversal rate was under 13 percent for civil nonprisoner appeals in 2007. *See* ADMIN. OFFICE OF THE U.S. COURTS, 2007 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 113 tbl.B-5 (2008), *available at* http://www.uscourts.gov/judbus2007/appendices/B05Sep07.pdf (listing appellate reversal rates for the fiscal year ending September 30, 2007).

135. Schwartz, *Practice Makes Perfect*, *supra* note 123, at 255–56.

136. Schwartz, *Courting Specialization*, *supra* note 123, at 1716 tbl.II.

137. *Id.* at 1704; Schwartz, *Practice Makes Perfect*, *supra* note 123, at 267.

138. Kathleen M. O'Malley, Patti Saris & Ronald H. Whyte, *A Panel Discussion: Claim Construction from the Perspective of the District Judge*, 54 CASE W. RES. L. REV. 671, 682 (2004).

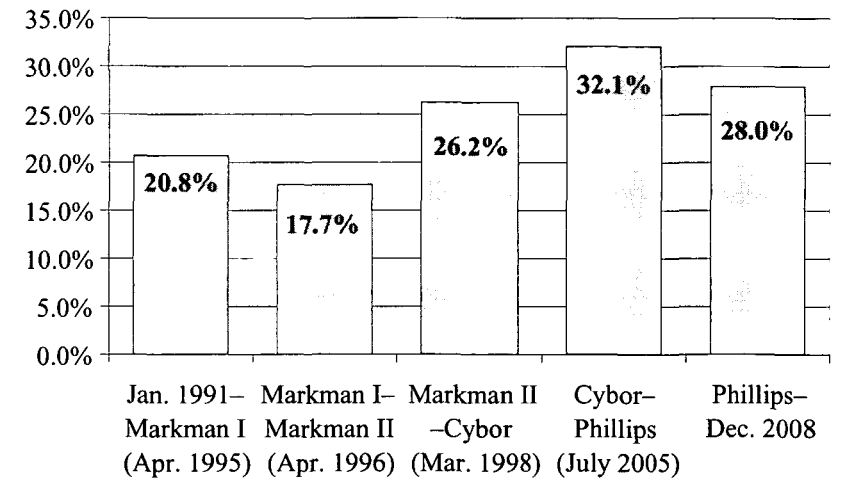
Pechman seemed to be demoralized when she said, "You get reversed 37 percent of [the] time; you might as well throw darts."[139] Even judges on the Federal Circuit have acknowledged that district court judges complain about the claim construction reversal rate.[140]

B. Data on Claim Construction Before Markman

Relying on the data set described in Part II, I calculated the claim construction reversal rate before *Markman I*.[141] The reversal rates for various periods are set forth in figure A.[142]

FIGURE A

CLAIM CONSTRUCTION REVERSAL RATE BY TIME PERIOD



139. Anandashankar Mazumdar, *Federal District Courts Need Experts That Are Good "Teachers," Judges Tell Bar*, 70 PAT. TRADEMARK & COPYRIGHT J. (BNA) 536 (Sept. 16, 2005).

140. *See* Amgen Inc. v. Hoechst Marion Roussel, Inc., 469 F.3d 1039, 1040 (Fed. Cir. 2006) (noting the problem in claim construction of "a steadily high reversal rate"); Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 1381 (Fed. Cir. 2005) (Rader J., dissenting) (noting that the Federal Circuit "often hears criticism from district court judges that its reversal rate on claim construction issues far exceeds that of other circuit courts").

141. *See supra* Part II.

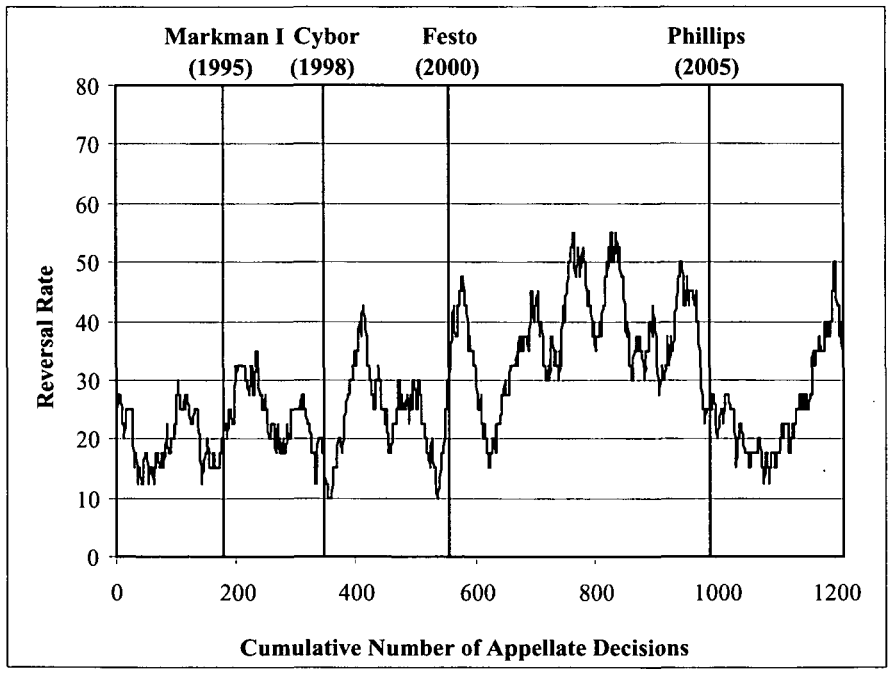
142. As mentioned in the Introduction, descriptive information is provided in this Article. Additional and more robust analysis of the data will be presented in a future article.

As shown in figure A, the rate between January 1991 and *Markman I* was 20.8 percent, that between *Markman I* and *Markman II* was 17.7 percent, that between *Markman II* and *Cybor* was 26.2 percent, that between *Cybor* and *Phillips* was 32.1 percent, and that between *Phillips* and the end of December 2008 was 28.0 percent.[143] In terms of raw percentages, the reversal rates were higher for the periods after *Markman I* and *Markman II* than before.

The claim construction reversal rate is perhaps more easily viewed in a line graph. As shown in figure B, the reversal rate varies from one year to the next, and there has not been a downward trend over time.[144]

FIGURE B

CLAIM CONSTRUCTION REVERSAL RATE
1991–2008



143. The reversal rates illustrated in figure A represent the entire population of district court appeals during each given time period. The number of observations for each period is 159, 62, 107, 644, and 318, respectively.

144. Figure B presents a forty-observation trailing moving average of the reversal rate. A trailing moving average is a rolling arithmetic average, in this case of the previous forty observations. Significant decisions are marked by vertical lines.

From 1991 through 2008, 28.5 percent of appeals from district courts involving claim construction were reversed, vacated, or remanded.[145] In another 6.6 percent of the cases, the Federal Circuit found a claim construction error by the district court but nonetheless affirmed.[146] Of note, the reversal rate for 2008 was 37.5 percent.[147]

As discussed in Part V, the shift after *Markman I* to judicial claim construction may influence the types of cases brought on appeal. In other words, the shift of claim construction to the judge may affect which lawsuits reach the stage of appellate resolution and which are settled or dropped. With that concern set aside for a moment, the overall reversal rate clearly increased after *Markman II*.[148]

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145. The rate from *Markman II* through 2007 was almost the same, 29.7 percent. Schwartz, *Practice Makes Perfect*, *supra* note 123, at 249.

146. Each summary affirmance/Rule 36 decision is an affirmance (the district court's ruling is affirmed), and consequently the claim construction did not require the case to be reversed, vacated, and/or remanded. However, the calculation of cases with a claim construction error is more difficult. It is impossible to ascertain the Federal Circuit's view on the disputed claim construction for many summary affirmances. In appeals in which a party alleges that the district court erred on multiple grounds, it is impossible to ascertain upon which ground(s) the Federal Circuit affirmed. Because there is no written opinion, it is possible that the Federal Circuit elected to affirm the opinion on a basis not related to claim construction and would have revised the claim construction if the Federal Circuit wrote a written opinion. As there is no indication in the record that the Federal Circuit found a claim construction error, these cases were not tabulated as cases with an error. Separately, as a point of reference for reversal rates, an extremely thorough study of 2008 decisions from the U.S. Courts of Appeals found a 25.52 percent reversal rate for cases involving de novo review. Corey Rayburn Yung, *Flexing Judicial Muscle: An Empirical Study of Judicial Activism in the Federal Courts*, 105 NW. U. L. REV. (forthcoming 2011) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1434742. Professor Yung's study did not include summary affirmances. To provide a more apples-to-apples comparison with Professor Yung's study, Professor Yung graciously provided me with the civil de novo reversal rate for 2008 using his study's search terms. Across all of the regional circuits, the reversal rate was 26.6 percent. I conducted an analogous search incorporating Professor Yung's search query for claim construction cases in the Federal Circuit. I used Professor Yung's method for content analysis and his coding methodology. With that method, the claim construction reversal rate was 48.5 percent, almost double the rate of the regional circuit courts on civil de novo–reviewed issues.

147. This figure comes from my data set and is based upon all appeals, including summary affirmances.

148. This result is statistically significant. The following hypotheses can be rejected with confidence (p=0.003): there is no difference in the proportion of appeals affirmed before *Markman* and between *Markman* and *Cybor*; there is no difference in the proportion of appeals affirmed before *Markman* and between *Cybor* and *Festo*; there is no difference in the proportion of appeals affirmed before *Markman* and between *Festo* and *Phillips*; and there is no difference in the proportion of appeals affirmed before *Markman* and after *Phillips*.

Table 1 breaks out the pre-*Markman I* reversal rate based upon the procedural posture of the district court case being reversed.

TABLE 1

PRE-*MARKMAN I* REVERSAL RATES BY PROCEDURAL DISPOSITION

Procedural Posture	Reversal Rate (%)	Number of Appellate Decisions[149]
Preliminary Injunction	16.7%	12
Summary Judgment	19.0%	58
Jury Trial	27.0%	37
Bench Trial	20.5%	44

The number of observations is quite low for the category of preliminary injunction (12) and somewhat low for the category of jury trial (37).[150] For that reason, I did not perform a statistical analysis of the differences.[151] In raw numbers, the reversal rate after trial by jury is about 8 percent higher than the reversal rate on summary judgment.

After *Cybor*, the Federal Circuit reviewed all claim construction opinions without any deference to the district court's findings.[152] Before *Cybor*, the Federal Circuit was not always clear as to the

149. In addition to the results set forth in table 1, there were three appellate decisions which involved other procedural postures (two appeals from contempt proceedings, and one from a hearing before a Special Master), and three other appellate decisions for which the procedural posture could not be ascertained.

150. There were also two appeals from contempt hearings and a handful of cases in which the procedural posture from the district court could not be obtained. *Those appeals are not reported in table 1.*

151. Because the numbers represent the entire population, the differences represent the absolute and actual disparities for this time frame.

152. Bey & Cotropia, *supra* note 17, at 290 ("Since its decision in Cybor Corp. v. FAS Technologies, Inc., the Federal Circuit has upheld the de novo standard of review for district court interpretations of issued claims.")

standard of review it employed. In twenty-two opinions from 1991 until 1998, the Federal Circuit expressly stated it was reviewing claim construction under a "clearly erroneous" standard of review.[153] In twenty of these opinions (90.9 percent), the Federal Circuit affirmed the district court's claim construction. Because there are fewer than twenty-five opinions reviewed under a deferential standard, not much can be said about them empirically. Furthermore, the twenty-two opinions were not randomly generated; the Federal Circuit judges on those panels may have been predisposed to affirm. Interestingly, there are numerous cases in the same 1991–1998 time period that do not explicitly identify the standard of review for claim construction.[154] These pre-*Cybor* cases omit any mention of whether review was de novo or at least somewhat deferential. It is impossible to ascertain from content analysis of the opinions themselves what standard the court applied.

153. The following twenty-two cases were reviewed under a deferential standard of review: Eastman Kodak Co. v. Goodyear Tire & Rubber Co., 114 F.3d 1547 (Fed. Cir. 1997); Wiener v. NEC Elecs., 102 F.3d 543 (Fed Cir. 1996); King Instruments Corp. v. Perego, 65 F.3d 941 (Fed. Cir. 1995); Salt Lake Brine Shrimp v. Sanders Brine Shrimp Co., 1995 U.S. App. LEXIS 14255 (Fed. Cir. 1995); Tielemen Food Equip. v. Stork Gamco, 56 F.3d 1373 (Fed. Cir. 1995); Comair Rotron, Inc. v. Matsushita Elec. Corp. of Am., 1994 U.S. App. Lexis 18325 (Fed. Cir. 1994); Genentech, Inc. v. Wellcome Found., 29 F.3d 1555 (Fed. Cir. 1994); Gaska Tape, Inc. v. Pres-On Prods., Inc., 1993 U.S. App. LEXIS 10912 (Fed. Cir. 1993); Miles Lab., Inc. v. Shandon, Inc., 997 F.2d 870 (Fed. Cir. 1993); Morton Int'l v. Cardinal Chem. Co., 5 F.3d 1464 (Fed. Cir. 1993); FMT Corp, Inc. v. Nissei ASB Co., 1993 U.S. App. LEXIS 19895 (Fed. Cir. 1993); Altech Controls Corp. v. PLT Controls, Inc., 1993 U.S. App. LEXIS 12927 (Fed. Cir. 1993); Drexelbrook Controls, Inc. v. Endress + Hauser, Inc., 1993 U.S. App. LEXIS 1915 (Fed. Cir. 1993); Tex. Instruments Inc. v. Cypress Semiconductor Corp., 1993 U.S. App. Lexis 19639 (Fed. Cir. 1993); Charles Greiner & Co., Inc. v. Mari-Med Mfg., Inc., 962 F.2d 1031 (Fed. Cir. 1992); *In re* Hayes Microcomputer Prods., Inc. Patent Litigation, 982 F.2d 1527 (Fed. Cir. 1992); Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559 (Fed. Cir. 1992); Gencor Indus. v. Standard Havens Prods., 953 F.2d 1360 (Fed. Cir. 1991); Tol-O-Matic, Inc. v. Proma Produkt-Und Mktg. Gesellschaft, 945 F.2d 1546 (Fed. Cir. 1991); Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565 (Fed. Cir. 1991); Uniroyal, Inc. v. Rudkin-Wiley Corp., 939 F.2d 1540 (Fed. Cir. 1991); Siemens-Elema AB v. Puritan-Bennett Corp., 1991 U.S. App. LEXIS 1204 (Fed. Cir. 1991).

154. *See, e.g.*, Shatterproof Glass Corp. v. PPG Indus., 1995 U.S. App. LEXIS 227 (Fed. Cir. 1995); Lantech, Inc. v. Keip Mach. Co., 32 F.3d 542 (Fed. Cir. 1994); Rogers Living Trust v. Baxter Int'l Inc., 1994 U.S. App. LEXIS 28122 (Fed. Cir. 1994); Int'l Visual Corp. v. Crown Metal Mfg., 991 F.2d 768 (Fed. Cir. 1993); Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039 (Fed. Cir. 1993); Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555 (Fed. Cir. 1992); Ernster v. Ralston Purina Co., 1992 U.S. App. LEXIS 26507 (Fed. Cir. 1992); Amgen, Inc. v. Chugai Pharm. Co., 927 F.2d 1200 (Fed. Cir. 1991); Laitram Corp. v. NEC Corp., 952 F.2d 1357 (Fed. Cir. 1991).

IV. IMPLICATIONS

This Article reports new data on the Federal Circuit reversal rate from just before the Federal Circuit's decision in *Markman* through the end of 2008. The pre-*Markman* reversal rate was lower in absolute terms than the current claim construction reversal rate. Further empirical analysis is required, which should include regressions for various control variables. Until that analysis is complete, there are several possible explanations for this difference.

Before delving too far into the implications, note that caution should be used in comparison of the reversal rates before and after *Markman*. Studying the time period surrounding a major change such as *Markman* presents difficulties. For example, the types of cases that survived until an appellate decision may have changed across this period. When claim construction was performed by a jury, more accused infringers may have settled instead of risking a jury ruling.[155] After *Markman*, it appears that accused infringers in similar cases could more freely litigate claim construction before a judge. As more courts began utilizing a completely separate claim construction hearing, the number of litigants willing to proceed through claim construction may have increased.[156] In essence, this limitation is a selection effects concern, although slightly different from the 50 percent "closest case" hypothesis, which is discussed in more detail in Part V. For these reasons, the types of cases that resulted in a Federal Circuit decision may be different before and after *Markman*.

As for implications of the present study, some may assert that the reason for a lower reversal rate for claim constructions before *Markman I* is obvious. Juries decided claim construction in a black box manner, and the Federal Circuit did not have a concrete claim construction to review on appeal. Consequently, the argument goes, the Federal Circuit had little choice but to affirm because of the lack of a written claim construction record. However, the appellate briefs in the pre-*Markman* jury cases belie this view. Those briefs presented issues for appeal that directly challenged claim construction by stating that particular claim terms were either

155. *See* Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 389, 395 (2000).

156. *See* Chu, *supra* note 131, at 1083.

missing from or present in the accused device, arguing for reversal on that basis. The appellate briefing in these early cases made the same arguments based on the canons of claim construction that are present in modern-day claim construction appeals. Additionally, claim construction issues were raised as central issues in the older appeals, not as peripheral or throw-in issues. Thus, the black box nature of some pre-*Markman* decisions alone does not explain the results.

Furthermore, as shown in table I, the pre-*Markman* reversal rate for appeals from jury trials was about 8 percent higher than the reversal rate for appeals from summary judgment and bench trials. The Federal Circuit in some instances officially extended deference to bench and jury trial determinations on extrinsic evidence used in claim construction.[157] If jury trials inherently result in fewer reversals, then the jury trial reversal rate should be lower than both the summary judgment and bench trial rates.[158] But it is not. The pre-*Markman* reversal rate from jury trials is in line with the average reversal rate for all claim construction appeals over the past seventeen years.

A second implication worth noting is that shifting claim construction authority from the jury to the judge may have resulted in different case selection effects. As previously noted, the theory is that different cases reached an appealable judgment once a jury was removed from claim construction. The requirement to litigate through a jury trial undoubtedly encouraged some lawsuits to settle. It may have been that only the closest and fiercest disputes reached appellate resolution before *Markman I*. After *Markman*, and especially after the rise of separate *Markman* hearings, litigants were free to pursue a case through claim construction and still settle before trial. Moreover, the district court itself could resolve easier cases via summary judgment after claim construction. However, if judicial claim construction permits more appeals of easier cases, we should expect the post-*Markman* reversal rate to be lower.

157. *See* Brian Michael Martin, *Federal Circuit Limits Jury's Role in Patent Trials*, 77 J. PAT. & TRADEMARK OFF. SOC'Y 641, 642–43 (1995).

158. As discussed in Part V, *infra*, the selection effects theory may predict that the summary judgment reversal rate is lower than the trial reversal rate. The pre-*Markman* data are consistent with this prediction.

Third, it could be that the claim construction reversal rate is constant because of litigation selection effects. Some law-and-economics approaches suggest that the reversal rate should be relatively constant over time because litigants will always settle all but the closest cases.[159] The fluctuations in the reversal rate over time shown in figure B undercut this explanation. The reversal rate has varied by over 100 percent, with it being as low as below 20 percent and as high as over 40 percent in a given year. To be fair, the reversal rate before *Markman I* is not dramatically lower than that immediately after *Markman*. It also fluctuated, although not as much as the post-*Markman* reversal rate. Furthermore, the time period before *Markman* considered in the present study is only about four-and-a-half years, while the period after *Markman* is almost fifteen years. A study including a longer period before *Markman* may be beneficial.

Some may argue that these fluctuations are the result of changes in the types of patents, in the parties to patent litigation, or in the nature of patent litigation. For example, it is believed that suits by nonpracticing entities increased in the late 1990s and early 2000s.[160] The complexity of patents and patent claims may have increased.[161] Perhaps related to this change in complexity, the quantity of patent litigation involving software and business method patents also increased during the time period of the study.[162] Furthermore, lawyers and law firms willing to handle patent cases on a contingency basis increased during roughly the same time period.[163] These causes cannot be definitively ruled out at this point. Then again, the reversal rate fluctuated both up and down, and these fluctuations do not seem to correlate with such changes. The increase in business method and software patents likely occurred in the early to mid-2000s. The increase in the reversal rate predates these developments.

159. *See* Gruner, *supra* note 130, at 985, 1050–51, 1052.

160. *See* Jennifer Kahaulelio Gregory, Comment, *The Troll Next Door*, 6 J. MARSHALL REV. INTELL. PROP. L. 292, 295 (2007).

161. John R. Allison & Mark A. Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, 79 (2002).

162. *Id.* at 88 n.35.

163. Paul Lansing, Michael Fricke & Suzanne Davis, *The Ethics of Contingent Fees in Legal Service Businesses*, 33 J. LEGAL PROF. 301, 311 (2009).

Fourth, it could be that the claim construction reversal rate for similarly situated cases increased after *Markman*. Claim construction is frequently raised on appeal, and its reversal rate is higher than that for most other issues in patent law.[164] If this is true, it is possible that patent law has *not* become more predictable by removing responsibility for claim construction from the jury. Of course, a confounding factor is the de novo standard of review for all claim construction appeals. Furthermore, claim construction is but one piece in patent law, and the reversal rate does not explain the entire picture. Yet, it provides one measure of predictability.

V. THOUGHTS ON SELECTION EFFECTS IN PATENT LITIGATION

In this part, I briefly present several observations about the selection effects theory as it relates to patent litigation. These remarks are not limited to the pre-*Markman* period and are meant to supplement the articles in this symposium issue by Professors Ted Sichelman and Richard Gruner, which also address potential selection effects.

Some law-and-economics literature, including Professor Gruner's article, suggests that the appealed cases should always be the closest cases.[165] One theory is that settlement means that the parties overlapped in their expectations of success on the merits. According to this theory, the parties will settle all but the closest cases at some stage, whether before a lawsuit is brought, before a trial court ruling, or before an appellate court ruling. Because claim construction is a central issue in a majority of appeals decisions on the merits, such an approach suggests that claim construction appeals should be resolved with a 50 percent reversal rate. Deviations from

164. Ted Sichelman, *The Myths of (Un)Certainty at the Federal Circuit*, 43 LOY. L.A. L. REV. 1161, 1172–73 (2010).

165. Gruner, *supra* note 130, at 1008–09; Moore, *Are District Court Judges Equipped*, *supra* note 129, at 10; George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 16–17 (1984). Other empirical studies have reported plaintiff win rates in patent jury trials at nearly 70 percent, contrary to what one would expect using the limiting case of the Priest/Klein economic theory. Moore, *Judges, Juries, and Patent Cases*, *supra* note 155, at 385–86; *see also* Alan C. Marco, *The Selection Effects (and Lack Thereof) in Patent Litigation: Evidence from Trials*, 4 TOPICS ECON. ANALYSIS & POL'Y 1, 34–35, 42 (2004) (reporting that there does not appear to be a selection bias tending to produce a 50 percent patent infringement win rate but that there does appear to be a selection bias toward 50 percent in the validity win rate).

this rate may result from a variety of factors, including (1) asymmetric stakes, costs, and risk profiles; (2) agency costs; (3) endowment effects; and (4) other complicating factors.[166] There are reasons to doubt that this selection effects approach completely explains the reversal rate, given the complexities of real-world patent litigation.

Selection effects should be considered at the three stages previously mentioned: before a lawsuit has been filed, during pendency at the trial court, and on appeal. Turning to the first stage, it is practically impossible to evaluate the disputes that never resulted in lawsuits. Presumably, those cases include some easier disputes and ones in which the amounts in controversy made litigation untenable. For a brief moment, I will skip an analysis of selection effects between the time of the filing of a lawsuit and the entry of an appealable judgment in the district court. With respect to appellate outcomes in civil litigation in general, there is little if any evidence that the 50 percent theory holds, regardless of the win rate at the trial court.[167] The annual civil reversal rate in the federal appellate court system is nowhere near 50 percent for any federal appellate court.[168]

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166. *See, e.g.*, Kevin M. Clermont, *Litigation Realities Redux*, 84 NOTRE DAME L. REV. 1919, 1951–56 (2009) [hereinafter Clermont, *Redux*]; Kevin M. Clermont & Theodore Eisenberg, *Litigation Realities*, 88 CORNELL L. REV. 119, 137–40 (2002) [hereinafter Clermont & Eisenberg, *Litigation Realities*]; Daniel Kessler, Thomas Meites & Geoffrey Miller, *Explaining Deviations from the Fifty-Percent Rule: A Multimodal Approach to the Selection of Cases for Litigation*, 25 J. LEGAL STUD. 233, 237, 242–48 (1996).

167. *See, e.g.*, Clermont & Eisenberg, *Litigation Realities*, *supra* note 166, at 151.

168. *See* ADMIN. OFFICE OF THE U.S. COURTS, 2008 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 111–14 tbl.B-5 (2009), *available at* http://www.uscourts.gov/judbus2008/appendices/B05Sep08.pdf (listing appellate reversal rates by circuit for the fiscal year ending September 30, 2008); *see also* ADMIN. OFFICE OF THE U.S. COURTS, 2007 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 113–16 tbl.B-5 (2008), *available at* http://www.uscourts.gov/judbus2007/appendices/B05Sep07.pdf (listing appellate reversal rates by circuit for the fiscal year ending September 30, 2007); ADMIN. OFFICE OF THE U.S. COURTS, 2006 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 130–33 tbl.B-5 (2007), *available at* http://www.uscourts.gov/judbus2006/appendices/b5.pdf (listing appellate reversal rates by circuit for the fiscal year ending September 30, 2006); ADMIN. OFFICE OF THE U.S. COURTS, 2005 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 126–29 tbl.B-5 (2006), *available at* http://www.uscourts.gov/judbus2005/appendices/b5.pdf (listing appellate reversal rates by circuit for the fiscal year ending September 30, 2005); ADMIN. OFFICE OF THE U.S. COURTS, 2004 ANNUAL REPORT OF THE DIRECTOR: JUDICIAL BUSINESS OF THE UNITED STATES COURTS 100–03 tbl.B-5 (2005), *available at* http://www.uscourts.gov/judbus2004/appendices/b5.pdf (listing appellate reversal rates by circuit for the fiscal year ending September 30, 2004).

Furthermore, once a final, appealable judgment has been entered, most cases involving claim construction disputes are appealed.[169] The cost of appeal is low compared with the amount in dispute and the cost of litigating in the district court. The average cost of litigating a high-value patent infringement claim through the close of discovery is greater than $6 million.[170] Rational litigants do not spend that sort of money on legal fees without the potential for a significant monetary recovery or a valuable injunction. Typical appeals cost at least an order of magnitude less than trial court litigation.[171] An appellate reversal of claim construction normally flips the result by the trial court.[172] For example, a different claim construction usually reverses a jury verdict of infringement[173] or vacates a grant of summary judgment of noninfringement.[174] An appeal of a final

169. Data on appeal rates in general are difficult to obtain. In contrast to reversal rates, appeal rates cannot be gleaned merely from reviewing written opinions. The district court dockets themselves must be reviewed. From these dockets, one must determine whether the case was in condition for an appeal, typically requiring the entry of final judgment. Even if summary judgment of noninfringement has been granted, the judgment is not necessarily appealable. *See, e.g.*, Int'l Elec. Tech. Corp. v. Hughes Aircraft Co., 476 F.3d 1329, 1331 (Fed. Cir. 2007) (dismissing appeal of summary judgment of noninfringement for lack of jurisdiction because the district court's judgment was not final). Before a judgment is final, either all of the claims and counterclaims must be resolved or the district court must make a determination under Federal Rule of Civil Procedure 54(b). In short, it is difficult to ascertain which cases are appealable, a critical component in calculating appeal rates. The existing appeal rates data are sparse and of unknown reliability. The data support a patent appeal rate much above the average for all civil litigation but less than 100 percent. *Compare* Thomas H. Cohen, When Is the Verdict or Judgment Final? An Examination of Post-Trial Activity in Civil Litigation 10 (July 10, 2009) (unpublished manuscript), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1432567 (reporting an 18 percent appeal rate after civil trials in state courts in 1995), *with* REBECCA N. EYRE, JOE S. CECIL & ERIC TOPOR, PATENT CLAIM CONSTRUCTION: A SURVEY OF FEDERAL DISTRICT COURT JUDGES 23 (2008), http://ftp.resource.org/courts.gov/fjc/patclaim.pdf (reporting that 71 percent of patent cases resolved by summary judgment or jury trial were appealed), *and* Mary A. Woodford, Vice President, Cornerstone Research, Presentation to Ropes & Gray LLP, Preliminary Analysis of IPLC Data: Patent Infringement Cases 33–39 (June 2009) (reporting approximately 50 percent of all patent cases are appealed).

170. AIPLA, REPORT OF THE ECONOMIC SURVEY I–129 (2009). This figure does not include the substantial nonmonetary costs of patent litigation. *See* Matthew Sag & Kurt Rohde, *Patent Reform and Differential Impact*, 8 MINN. J.L. SCI. & TECH. 1, 29–30 (2007).

171. Moore, *Are District Court Judges Equipped*, *supra* note 129, at 10 ("[A]ppeal transaction costs are relatively low compared to the trial costs.").

172. *See* Schwartz, *Practice Makes Perfect*, *supra* note 123, at 249 tbl.4 (reporting that in 80 percent of the cases with claim construction errors, the case was reversed, vacated, or remanded).

173. *See, e.g.*, Exxon Chem. Patents, Inc. v. Lubrizol Corp., 64 F.3d 1553, 1555 (Fed. Cir. 1995) (reversing an award over $100,000,000 due to erroneous claim construction).

174. *See, e.g.*, Symantech Corp. v. Computer Assoc. Int'l, Inc., 522 F.3d 1279 (Fed. Cir. 2008).

judgment is the norm because of the combination of (1) the low cost of appeal; (2) the high dollar amount in dispute; and (3) the potential for a reversal of fortune in the event the Federal Circuit reverses (and the well-known high claim construction reversal rate).[175] If litigants rationally settled patent disputes, we would expect to see a large number of settlements after a notice of appeal has been filed, especially after appellate briefing and oral argument.[176] At that point, the issues in dispute have been narrowed, and the parties should be able to more accurately predict outcomes. However, while hard data are not presently available, the anecdotal evidence suggests that there are almost no settlements during this time period in patent cases.[177]

Second, turning back to proceedings before the trial court, there is debate within the academy regarding the correctness of this particular sort of law-and-economics theory.[178] The most basic formulation of the selection effects theory—the 50 percent hypothesis—does not hold in many areas of law,[179] including in patent litigation.[180] But there is ongoing empirical debate about the correctness of a modified selection effects theory to take into account differential stakes, parties' misperceptions, and other information asymmetries.[181] The parties in patent cases have different stakes depending upon the issue. For example, in many cases, a patentee is harmed more by a finding of invalidity than by one of noninfringement. This is because an invalid patent cannot be asserted

175. While the data on appeal rates are sparse, the appeal rate does not appear to be near 100 percent. Perhaps delays in entering a final, appealable judgment encourage parties to settle. Further investigation into appeal rates is warranted.

176. *See* Gruner, *supra* note 130, at 1034–35, 1042.

177. *See* Schwartz, *Practice Makes Perfect*, *supra* note 123, at 243–44 n.127.

178. *See* Moore, *supra* note 155, at 376 n.51.

179. *See* Theodore Eisenberg, *Testing the Selection Effect: A New Theoretical Framework with Empirical Tests*, 19 J. LEGAL STUD. 337, 339–40 (1990) (concluding that the refined Priest/Klein hypothesis "can be rejected as a description of all civil litigation" but that it may accurately describe products liability litigation).

180. *See* Scott Woloson, Patent Verdicts from 1-1-05 to 1-11-2010, http://www.patstats.org/Verdicts%20to_10_2_09.xls (reporting a 75 percent patentee win rate at trial from 2005 until 2009).

181. *See* Clermont, *Redux*, *supra* note 166, at 1966; Peter Siegelman & Joel Waldfogel, *Toward a Taxonomy of Disputes: New Evidence Through the Prism of the Priest/Klein Model*, 28 J. LEGAL STUD. 101, 130 (1999) ("Our conclusions are mixed. While our three-parameter version of the Priest/Klein model fits the pattern of independent evidence for three or four of the case types, the estimates it yields are not consistent for the other two . . . .").

against anyone, while a noninfringed patent can be asserted against other products and other parties.[182] Thus, patentees may settle more often to avoid rulings on invalidity than on noninfringement, especially for patents of questionable validity. Furthermore, in many cases, an injunction harms the infringer more than it benefits the patentee.[183] These differences and others are hard to model and are deviations from the limiting instance of the case selection theory.

Settlement is often difficult to achieve during the pendency of patent cases in district court.[184] For example, there are uncertainties related to patent damages. It is not uncommon for the parties' trial damages positions to vary by one and sometimes even two orders of magnitude. On the other hand, there are often huge transaction costs, including attorneys' fees, involved in litigating a patent dispute. The large transaction costs alone may make settlement possible, even when the amount in dispute is in the millions of dollars. While many patent cases settle, I am skeptical that a great percentage of patent disputes settle because the parties overlap in their expectations on claim construction.

Third, the existing empirical evidence about selection bias in claim construction appeals does not support a strong effect. Specifically, the appeal rate of district court judges who were reversed substantially more often (and less often) than average were roughly in line with the appeal rate of all district court judges.[185] A selection effects theory predicts that parties appeal more often from opinions from inaccurate judges and settle more often from opinions from accurate judges.[186] The empirical evidence to date, while somewhat scant, undercuts this proposition. Some may argue that

182. Collateral estoppel applies to a finding of invalidity. *See* Kaiser Indus. Corp. v. Jones & Laughlin Steel Corp., 515 F.2d 964, 987 (1975). But it does not apply to a finding of noninfringement. Alan Devlin, *The Stochastic Relationship Between Patents & Antitrust*, 5 J. COMPETITION L. & ECON. 75, 92 (2009).

183. *See* Moore, *supra* note 155, at 378 n.62.

184. David C. Berry, *Harnessing the "Sport of Kings": Using Pre-Dispute Arbitration Agreements to Control Discovery in Patent Disputes*, 9 T.M. COOLEY J. PRAC. & CLINICAL L. 1, 3 (2006) ("[T]he stakes in patent litigation often involve competitor access to the marketplace (sometimes with international ramifications) rather than simply payment of damages, making it more difficult for patentees and their competitors to reach a financial compromise in order to settle disputes early in the litigation process.").

185. *See* Schwartz, *Practice Makes Perfect*, *supra* note 123, at 282–84.

186. *See* Gruner, *supra* note 130, at 1009–10.

litigants do not have data on which district court judges are "better" or "worse" at claim construction and therefore make their best estimate before attempting to settle. However, there are reasons to be skeptical that litigants, especially in the busy patent districts, do not know which judges are better or worse at construing claims, especially after the judge construes the claims in their case. The truth may be that unsuccessful patent litigants always believe that an error was made in their case, even if the claim construction was performed by the most accurate judge. Thus, the rational-actor assumption in the selection effects theory may not completely hold true in real-world patent litigation.

Fourth, as Professor Ted Sichelman notes in another article in this issue, relative to other appealed patent law issues, claim construction reversal rates are among the highest.[187] If selection effects are driving appeals, then one would expect all issues that can be appealed to the Federal Circuit to have similarly high reversal rates. However, it is only claim construction and a few other doctrines—several of which are related to claim construction, such as indefiniteness—that top the charts.[188] The doctrines with a greater than average reversal rate are not only those reviewed de novo but also those typically reviewed with deference, such as damages (including both reasonable royalties and lost profits). And litigants are acutely aware of the claim construction reversal rate. Consequently, litigants frequently select claim construction as an issue on appeal, as long as they can make a plausible argument.[189] This frequency should increase the number of weak claim construction appeals relative to other patent law issues on appeal, and these weak appeals should result largely in affirmances. Thus,

187. Sichelman, *supra* note 164, at 1177 figs.2–3.

188. *Id.* at 1174–75. Indefiniteness is really another form of a claim construction dispute. An indefiniteness dispute typically involves the patentee arguing for one construction of a claim term and the accused infringer arguing that no construction is possible. In my coding, I included these disputes as claim construction disputes. Consequently, the claim construction reversal rates I report include most or all of the indefiniteness cases Sichelman separately reports.

189. Lee Petherbridge, *The Claim Construction Effect*, 15 MICH. TELECOMM. TECH L. REV. 215, 252 n. 95 (2008) ("[A]s the issue became more visibly contentious, parties likely featured claim construction more often in appeals."); *cf.* Brian Z. Tamanaha, *Devising Rule of Law Baselines: The Next Step in Quantitative Studies of Judging* (Feb. 4, 2010) (Duke Law Journal—Online Edition; Washington U. School of Law Paper No. 10-02-02), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1547981 (reporting that in the average federal appellate case (i.e., nonpatent), only 10–15 percent involve hard or uncertain issues).

the true differences in reversal rates may be even higher than shown by Sichelman's article.

While there are grounds to be doubtful that selection effects are the primary cause of the seemingly high claim construction reversal rate, selection effects cannot be dismissed out of hand. A large body of theoretical literature is based upon rational litigant behavior with respect to settlement. Like disputes in all areas of civil litigation, most patent disputes settle before final judgment in a district court.[190] To be fair, at least some settlements are likely because the parties overlap in their expectations of results on claim construction. Further empirical research into this topic is sorely needed.

CONCLUSION

This Article presents new evidence on the claim construction reversal rate before *Markman*. The data show that the reversal rate was somewhat lower before *Markman*. There are several possible explanations for the difference, including the shift of claim construction responsibility from the jury to the judge, which resulted in different case selection effects on appeal. According to this explanation, the *Markman* revolution had modest effects that only seem larger on appeal. Alternatively, the higher reversal rate may have been caused by *Markman*. Because of the variety of explanations and relative paucity of data, further research is warranted on whether claim construction has become less predictable since *Markman*. Evaluating this question requires more data and more sophisticated empirical models that control for potential explanatory variables. Until such definitive analysis is available, the best understanding is that the claim construction reversal rate is unduly high and has generally been increasing in the last fifteen years.

190. Jay P. Kesan & Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Examination of the Adjudication and Settlement of Patent Disputes*, 84 WASH. U. L. REV. 237, 272 (2006).