

MARKMAN EIGHT YEARS LATER: IS CLAIM CONSTRUCTION
MORE PREDICTABLE?

by
Kimberly A. Moore*

This Article revisits the growing criticism surrounding the lack of guidance and predictability in claim construction cases after the Markman decision. Specifically, the Article investigates the Federal Circuit’s reversal rate on these cases, as a high reversal rate evidences confusion among the lower courts. In Part II, the author reviews existing empirical studies on the Federal Circuit’s reversal rate in claim construction cases, arguing that many of these studies are misleading. Part III clarifies what data must be considered to adequately determine the Federal Circuit’s reversal rate of appealed claim construction cases. In Part IV, the author concludes that her new analysis of the reversal rate supports the growing criticism that Markman has created confusion, not guidance, in claim construction cases, and the confusion is getting worse.

I.	INTRODUCTION.....	231
II.	EMPIRICAL STUDIES OF CLAIM CONSTRUCTION.....	233
	A. <i>Result-Based Studies: What is the Reversal Rate?</i>	234
	B. <i>Methodology-Based Studies</i>	238
III.	THE EMPIRICAL STUDY.....	239
	A. <i>Reversal Rates</i>	239
	B. <i>Who Wins—Patentee or Infringer?</i>	240
	C. <i>Means-Plus-Function Terms</i>	242
	D. <i>Claim Construction By the Federal Circuit Judges</i>	243
IV.	THE REVERSAL RATE IS GETTING WORSE NOT BETTER.....	245

I. INTRODUCTION

There is concern among the bench and bar that the Federal Circuit’s de novo review of district court claim construction decisions¹ and lack of guidance have caused considerable unpredictability.²

* Professor of Law, George Mason University School of Law. I am grateful to Banner & Witcoff, Howrey Simon Arnold & White, Kenyon & Kenyon, and Morgan, Lewis & Bockius for generously sponsoring this research. I can be contacted at kamoore@gmu.edu with any comments. I am also grateful to the George Mason Center for Law and Economics for continued financial support. Finally, thanks are due to participants at the Tenth Annual Lewis & Clark Business Law Forum for helpful comments, as well as to Scott Thomas, Andrew Sommer, and Joshua Liu for research assistance. © 2004 Kimberly A. Moore.

There's a real sense of fatalism among the patent trial bar, shared by the district court judges, that no matter how careful we are in trying to apply what the court says about *Markman*, there's a high likelihood that on review, the [Federal Circuit] will change the construction of the claims.³

Such concern prompted two prominent practitioners to coin the term “judicial hyperactivity” to describe how the Federal Circuit usurps the province

¹ *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1451 (Fed. Cir. 1998) (determining that the Federal Circuit shall review district court claim construction decisions de novo).

² *See, e.g., SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337 (Fed. Cir. 2001) (Dyk, J., concurring) (“[O]ur decisions provide inadequate guidance as to when it is appropriate to look to the specification to narrow the claim by interpretation and when it is not appropriate to do so. Until we provide better guidance, I fear that the lower courts and litigants will remain confused.”); William C. Rooklidge & Matthew F. Weil, *Judicial Hyperactivity: The Federal Circuit's Discomfort with its Appellate Role*, 15 BERKELEY TECH. L.J. 725, 729–30 (2000) (criticizing the Federal Circuit's claim construction as appellate fact finding which encourages protracted litigation); Mark T. Banner, *Keeping Current with the Chair*, IPL NEWSLETTER, Summer 2003, at 1, 15 (attributing the high Federal Circuit reversal rate to a “morass of confused and contradictory claim construction canons”); William F. Lee & Anita K. Krug, *Still Adjusting to Markman: A Prescription for the Timing of Claim Construction Hearings*, 13 HARV. J.L. & TECH. 55, 67 (1999) (“Although, according to the Federal Circuit and the Supreme Court, *Markman* should have ushered in greater uniformity, predictability, and certainty in patent litigation, many believe that the holding has had the opposite effect. This is largely because Federal Circuit review of claim interpretation is de novo.”); Michael O'Shea, *A Changing Role for the Markman Hearing: In Light of Festo IX, Markman Hearings Could Become M-F-G Hearings Which Are Longer, More Complex and Ripe for Appeal*, 37 CREIGHTON L. REV. 843, 843 (2004) (noting three problems in the post-*Markman* world: “(1) a high reversal rate of claim construction decisions by the Court of Appeals for the Federal Circuit results in uncertainty even after trial, (2) litigating patents continues to be expensive, and (3) court resources are routinely wasted by empanelling juries only to re-try the same case in the future”); Victoria Slind-Flor, *Formerly Obscure Court is in Spotlight: Importance of New Technology Makes its Decisions Big News*, NAT'L L.J., Apr. 30, 2001, at B9, B12 (noting that the reversal rates on claim construction issues “has so enraged the bench that one federal judge—Samuel Kent of Galveston, Texas—has dismissed the appeals court as ‘little green men wearing propeller hats who don't know Tuesday from Philadelphia’”); George J. Awad & George A. Frank, *Federal Circuit Construction Project: Hard Hats Required*, LEGAL INTELLIGENCER, Aug. 25, 2004, at 5 (stating that “[w]hat is certain is that uncertainty reigns supreme in trying to prognosticate how the CAFC will resolve [the issues in *Phillips*]”); Erik Paul Belt, *Federal Circuit Stresses Ordinary Meaning: In Recent Cases, The Court Has Limited the Narrowing of Claims, Often Benefiting Patent Owners*, NAT'L L.J., Sept. 22, 2003 at S1, S14 (stating that “many feel that *Markman* has not yet led to the hoped-for certainty in claim construction”); Anthony R. Zeuli & Rachel Clark Hugley, *Avoiding Patent Claim Construction Errors: Determining the Ordinary and Customary Meaning Before Reading the Written Description*, FED. LAW., June 2004, at 29, 30 (stating that “[i]t comes as little surprise that some trial judges have grown apathetic to the process, and that nearly all litigants unhappy with the outcome of their cases will appeal and include a claim construction issue”); Victoria Slind-Flor, *Judges Receive Mixed Reviews on Handling of Patent Claims*, N.Y.L.J., March 14, 2002, at 1 (“By most accounts, the *Markman* decision has added uncertainty, costs and delay to a system that already had plenty of all three.”) [hereinafter Slind-Flor, *Judges Receive Mixed Reviews*].

³ Victoria Slind-Flor, *Markman Precedent Holds Up Patents: Ruling Intended to Add Predictability and Speed Fails to Do So*, NAT'L L.J., Jan. 15, 2001, at A1, A12 (quoting Bradford P. Lyerla, patent litigator) (alteration in original).

of the district court in, among other areas, claim construction.⁴ The problem is so pernicious that the court itself has taken yet another claim construction case,⁵ *Phillips*,⁶ en banc in order to establish some ground rules for the claim construction process. In the *Phillips* case, the court invited briefing on fourteen separate questions regarding the types of sources to be consulted in construing claims and the deference to be given to the district court.⁷

It is always useful to quantify any problem. Just how unpredictable is the claim construction process? Existing empirical studies have asserted that the Federal Circuit reverses 25% to 50% of district court claim construction decisions. Practitioners then choose whichever number suits their cause. This is irresponsible empiricism. The Federal Circuit's claim construction reversal rate is not a judgment call. There is a right answer to the question: How often does the Federal Circuit determine that the district court got the claim construction wrong? The reversal rate (rate at which the Federal Circuit determined the claim construction was wrong) for appealed claim terms from 1996, after *Markman* was decided,⁸ through 2003 is 34.5%.⁹

In Part II, this Article reviews existing empirical studies on the claim construction process and discusses the shortcomings of these studies. In Part III, the Article presents updated and additional empirical findings on the Federal Circuit's reversal rates of appealed claim construction decisions. Part IV analyzes these results and concludes that criticism over the lack of guidance and unpredictability caused by the current claim construction process is warranted. The problem is getting worse, not better.

II. EMPIRICAL STUDIES OF CLAIM CONSTRUCTION

There are two categories of empirical studies of claim construction that have been performed: result-based and methodology-based. The result-based

⁴ Rooklidge & Weil, *supra* note 2, at 727. Rooklidge and Weil distinguish judicial activism from judicial hyperactivity, as follows:

Unlike critics who level the charge of 'judicial activism' when they believe that a court has improperly usurped the policy-making role of the legislature, we are concerned with what happens when an intermediate appellate court usurps elements of the decision-making process that are supposed to be the province of the lower courts, administrative bodies, or even litigants.

Id.; see also *Control Resources, Inc. v. Delta Elecs., Inc.*, 133 F. Supp. 2d 121, 123–24 (D. Mass. 2001) ("Disappointed litigants and commentators alike have criticized the court for fact-finding and other forms of hyperactive judging. Increasingly, the bar is expressing concern over the court's decision-making procedures and its apparent willingness to take over the roles of patent examiner, advocate and trier of fact.").

⁵ The previous en banc claim construction decisions were *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996), and *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998).

⁶ *Phillips v. AWH Corp.*, 376 F.3d 1382 (Fed. Cir. 2004).

⁷ *Id.* at 1383. Although the court has seven numbered questions, with subparts in most of them, there are in actuality fourteen questions the court is inviting the parties and amici to address.

⁸ *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

⁹ See *infra* Part III.A.

studies, like this one, focus on outcome data to determine, among other things, how bad the problem is. The methodology-based studies focus on the process itself to explain why the problem is so bad. Both are useful in judging the process.

A. *Result-Based Studies: What is the Reversal Rate?*

It is undoubtedly frustrating to have several studies which purport to present the Federal Circuit's reversal rate of district court claim construction. The existing literature asserts a reversal rate ranging from 25% to 50%, depending on the study cited. The other empirical literature on this subject suffers from several serious flaws. The most substantial of which is the failure to review the Federal Circuit's Rule 36 summary affirmances.¹⁰

When the Federal Circuit resolves an appeal, it can issue a precedential opinion, a non-precedential opinion, or a summary affirmance. Precedential opinions are opinions in which the court can either affirm or reverse the district court judgment, and these opinions are published and create citable precedent on the issues of law to which they pertain. Non-precedential opinions are law of the case in which they are issued, but do not create citable precedent.¹¹ These opinions can also either affirm or reverse the district court judgment. The court may also resolve a case by a Rule 36 summary affirmance.¹² This is an affirmance of the district court without opinion. These affirmances leave intact and affirm the judgment of the district court (and any claim construction determinations by the district court which were appealed). A case is not summarily affirmed because it is unimportant and should not be considered.¹³ It is summarily affirmed because the district court got it right, and there is no new law that needs to be explained, defined, clarified or established.¹⁴ There are no

¹⁰ Only this study and its predecessor include all Rule 36 cases. See Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 8–10 (2001).

¹¹ Fed. Cir. R. 47.6(b).

Nonprecedential Opinion or Order. An opinion or order which is designated as not to be cited as precedent is one determined by the panel issuing it as not adding significantly to the body of law. Any opinion or order so designated must not be employed or cited as precedent. This rule does not preclude assertion of claim preclusion, issue preclusion, judicial estoppel, law of the case, or the like based on a decision of the court designated as nonprecedential.

Id.; see also Penelope Pether, *Inequitable Injunctions: The Scandal of Private Judging in the U.S. Courts*, 56 STAN. L. REV. 1435, 1442–44 (2004) (explaining the origin, purpose and current state of unpublished, non-precedential decisions); Dean A. Morande, *Publication Plans in the United States Courts of Appeals: The Unattainable Paradigm*, 31 FLA. ST. U. L. REV. 751 (2004); Richard B. Cappalli, *The Common Law's Case Against Non-Precedential Opinions*, 76 S. CAL. L. REV. 755 (2003).

¹² Fed. Cir. R. 36.

¹³ One commentator suggested that it was acceptable to omit the Rule 36 affirmances because these were “quickies.” Slind-Flor, *Judges Receive Mixed Reviews*, *supra*, note 2, at 7.

¹⁴ Entering judgment without opinion under this rule is proper when:

[A]ny of the following conditions exist and an opinion would have no precedential value: (a) the judgment, decision, or order of the trial court appealed from is based on

summary reversals. Whenever the Federal Circuit reverses, it issues an opinion explaining how and why the district court was wrong.

The Federal Circuit resolves claim construction appeals by all three means (precedential opinion, non-precedential opinion and Rule 36 summary affirmance). Obviously, eliminating a large group of non-randomly selected cases would affect the results. Studies that did not consider the Rule 36 summary affirmances eliminated a large group of affirmances from their dataset. This skewed their results and they report a significantly higher reversal rate than actually exists. All of the other early claim construction studies (the Chu Study (44% reversal rate),¹⁵ the Bender Study (40% reversal rate),¹⁶ and the Zidel Study (41.5% reversal rate)¹⁷) omitted Rule 36 cases from their claim

findings that are not clearly erroneous; (b) the evidence supporting the jury's verdict is sufficient; (c) the record supports summary judgment, directed verdict, or judgment on the pleadings; (d) the decision of an administrative agency warrants affirmance under the standard of review in the statute authorizing the petition for review; or (e) a judgment or decision has been entered without an error of law.

Fed. Cir. R. 36.

¹⁵ Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1104 (2001) (finding that the Federal Circuit overturned 44% of the 179 district court claim constructions that were appealed between January 1, 1998 and April 30, 2000). The Chu Study appears at first blush to have included Rule 36 summary affirmances, and in fact it did for overall reversal rates, but *not* for the claim construction calculations. Chu states "because this methodological definition requires that claim constructions explicitly appear in the court's opinions, cases implicitly construing claims and summary affirmances would be excluded from the subset of cases where the court has 'reviewed' claim constructions." *Id.* at 1094. "[T]his study first examined the Federal Circuit's reversal rate of lower court judgments by analyzing the court's written opinions. . . ." *Id.* at 1097. "Using the 396 cases with available written opinions, this study ascertained the number of cases per month in which the court changed at least one claim interpretation. . . ." *Id.* at 1100-01. Chu explains that his approach "excludes all 106 summary affirmances because the methodology's focus on express claim construction requires the availability of a written opinion." *Id.* at 1100 n.121. I am uncertain what methodology Chu refers to or the justification for excluding Rule 36 decisions which affirm claim construction, other than the difficulty attendant the identification and empirical collection of these cases. Although Chu does not perform any analysis of the 106 actual Rule 36 cases, not even a sample of them to ascertain the frequency with which they address claim construction, he does "attempt[] to estimate the effect of summary affirmances on the rate of claim construction changes and claim interpretation-based reversals." *Id.* at 1101 n.121 (referring to an estimation in Appendix A). While Chu's reversal rate of 44% does not include any summary affirmances, he does include a table in the appendix showing the results if no summary affirmances are included and the results if all summary affirmances are assumed to be claim construction cases. My criticism of the Chu study is limited to its omission of summary affirmances from issue specific reversal rate statistics. The study is otherwise well done and provides interesting insights on appeals of other patent issues and of patent cases generally.

¹⁶ 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, 207 (2001) (finding that the Federal Circuit reversed 40% of the 160 claim constructions appealed in from *Markman* through 2000).

¹⁷ 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, 741-42 (2003) (finding that the Federal Circuit reversed 39 of the 94 claim construction decisions in 2001).

construction reversal rate determinations.¹⁸ Although the studies were generally clear about what they considered,¹⁹ and some even pointed out that they did not include Rule 36 summary affirmances,²⁰ they generally did not explain the consequences of this omission. Without the Rule 36 summary affirmances, these reversal rates are inaccurate—they are artificially high. It is common sense that if one excludes a bunch of affirmances, it will appear as though the court reverses more often than it does.

The empirical studies, other than this one, omitted the Rule 36 summary affirmances because they are simply too difficult to include. Since the summary affirmances simply indicate that the case was affirmed, there is no easy way of determining what issues were involved in the appeal. The information cannot be obtained from a quick search on Westlaw or Lexis, but instead requires resort to the briefs filed with the Federal Circuit. Unless one obtains the original appellate briefs that were filed, and painstakingly reviews each one, one cannot determine whether a summary affirmance is an affirmance of a district court claim construction or an affirmance of some other unrelated issue. Obtaining the actual briefs is both time consuming and expensive. This study did just that; it reviewed every Rule 36 summary affirmance during the period of interest to ascertain whether the appeal involved claim construction. If so, it was included.

To understand the magnitude of the error in data collection and its impact, consider this study. Of the 1100 claim construction terms appealed in this study, 15.5% (170) were resolved by Rule 36 summary affirmance, 34.7% (328) were resolved via non-precedential opinion of the court, and 49.8% (548) were resolved via precedential opinion of the court. The resultant reversal rate of 34.5% considered all of these cases. If the Rule 36 summary affirmances are left out, the reversal rate becomes 40.8%.

None of the studies which omitted the Rule 36 cases explain how profound the impact on the results would likely be despite the fact that the significance was intuitively obvious. When one eliminates affirmances, one finds a higher reversal rate. Moreover, it is sensible to assume that a large number of Rule 36 cases would likely involve claim construction, because the construction of any individual claim term does not have significant impact beyond the parties. The meaning of a particular claim term does not have precedential value beyond the

¹⁸ There have been other studies attempting to quantify the reversal rates such as one by the American Bar Association Section on Intellectual Property, which surveyed its members to ascertain frequency of reversal (using just six cases where the surveys were returned (five of which were reversals)). See *American Bar Association Section of Intellectual Property Law 1999 Markman Survey*, IPL NEWSLETTER, Spring 2000, at 14–15; see also W. Thad Adams, III & J. Derel Monteith, Jr., *The Continuing Saga of Federal Circuit Patent Claim Construction Jurisprudence: Extrinsic Evidence and Other Stories*, 8 FED. CIR. B.J. 83 (1999) (finding that the Federal Circuit reversed 35% of all claim construction decisions appealed in 1998 and part of 1999 (34 cases)).

¹⁹ In fact, the Bender and Zidel studies list all of the cases considered in very long footnotes and appendices. Bender, *supra* note 16, at 204–07 nn.215–16; Zidel, *supra* note 17, app. A.

²⁰ The Chu study says “this study did not include Rule 36 summary affirmances in the dataset of Figure A-1.” Chu, *supra* note 15, at 1097 n.112.

patent at issue. In short, claim construction cases seem likely candidates for Rule 36 affirmance—that is, when the district court gets the construction right. However, the data show that claim construction appeals are actually less likely to be affirmed via Rule 36 than other patent appeals. As mentioned above, 15.5% of all the claim construction appeals were summarily affirmed. Another study found that among the 502 patent appeals to the Federal Circuit resolved between January 1, 1998 and April 30, 2000, 106 were summarily affirmed—21.1%.²¹ This result suggests that claim construction cases are, thus far, less likely to be the subject of a Rule 36 summary affirmance despite the intuition that these sorts of cases would be the least likely to have precedential value. This is likely correlated to the ultimate finding of this study; namely, that claim construction reversals have gotten worse over time, not better. Since the Federal Circuit is reversing more claim construction decisions in recent years,²² there are fewer Rule 36 summary affirmances.

The first assertion regarding claim construction reversal rates came directly from one of the Federal Circuit judges and appeared in a concurrence to the en banc decision in *Cybor Corp.*²³ This, of course, gives the number the imprimatur of accuracy. In this decision, Judge Rader states as follows:

[O]ne study shows that the plenary standard of review has produced reversal, in whole or in part, of almost 40% of all claim constructions since *Markman I*. A reversal rate in this range reverses more than the work of numerous trial courts; it also reverses the benefits of *Markman I*. In fact, this reversal rate, hovering near 50%, is the worst possible. Even a rate that was much higher would provide greater certainty.²⁴

Interestingly the Judge cites the reversal rate as “almost 40%” then says that 40% is “hovering near 50%.” With this empirical slight of hand, claim construction reversal is raised from the actual finding of the study, 38.3%, to 50%, and quoted by people accordingly.²⁵ Although we have no idea from the opinion who conducted the study, the opinion does explain:

This figure is based on a survey of every patent decision rendered by the Court of Appeals for the Federal Circuit between 5 April 1995 (the date *Markman I* was decided) and 24 November 1997. A total of 246 patent cases, originating in the Board of Patent Appeals and Interferences (BPAI), the district courts, and the Court of Federal Claims, were evaluated. Of the 246 cases, 141 cases expressly reviewed claim construction issues. Among these 141 decisions, this court reversed, in whole or in part, 54 or 38.3% of all claim constructions. With respect to

²¹ *Id.* at 1099.

²² *See infra* Part III.

²³ *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1473 (Fed. Cir. 1998) (Rader, J., concurring).

²⁴ *Id.* at 1476.

²⁵ Zeuli & Hugley, *supra* note 2, at 29 (“The reversal rate of patent claim constructions is nearing 50 percent. Many believe the process is flawed, the results too unpredictable, and the procedures too costly.”).

the district court and Court of Federal Claims cases, the rate of reversal of claim constructions is 47 out of 126 or 37.3%.²⁶

This explanation does not clarify whether the empiricist considered all Federal Circuit cases: Rule 36, non-precedential, and precedential. It is also unclear when a case is considered “reversed.” Are cases only included if they result in an actual reversal of the district court judgment, or are they included whenever the Federal Circuit determines that the district court wrongly construed claim construction? It is possible that the district court could get claim construction wrong but the case would still be affirmed. For example, suppose the district court construed two terms favorably for the infringer, each of which results in a finding of non-infringement. The Federal Circuit may determine that the district court construed one of the terms wrongly but still affirm the judgment of non-infringement based on the other term.

In comparing all of these empirical studies, one must be mindful not only of the shortcomings of some of the empirical collection but also of exactly what the study means by “reversal rate.” There are three possibilities. First, reversal rate can be the rate at which the Federal Circuit determined that the district court claim construction was wrong (even if it did not actually result in reversal of the judgment) on a term-by-term basis. In many appeals, more than one construed term was appealed, so statistics can be reported on a term-by-term basis or on a case-by-case basis. In this study, the Federal Circuit determined that the district court wrongly interpreted 34.5% of all claim terms that were appealed. Second, the reversal rate could be the number of cases in which one or more claim term was erroneously construed. In this study, that reversal rate would be 37.5%. Finally, the reversal rate could be only the cases in which a claim construction error actually resulted in reversal of the appealed judgment. In this study, 29.7% of the cases were reversed or vacated and remanded because of erroneous claim construction. Obviously, the definition of “reversal rate” could impact the percentage by 5% (29.7%–37.5%).

B. Methodology-Based Studies

Few empirical studies examine the methodology behind Federal Circuit decision-making on any issue. There are two such studies on the issue of claim construction. A study by Wagner and Petherbridge found that the Federal Circuit is divided between two methodological approaches to claim construction: procedural and holistic.²⁷ Additionally, the study found evidence of panel dependence in claim construction decision-making.²⁸ The most recent empirical study, by Miller and Hilsenteger, analyzes the Federal Circuit’s use of dictionaries in defining claim terms.²⁹ This study will undoubtedly be useful to the court in resolving the en banc *Phillips* case on this very point.

²⁶ *Cybor Corp.*, 138 F.3d at 1476 n.4.

²⁷ R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1111 (2004).

²⁸ *Id.* at 1112.

²⁹ Joseph Scott Miller & James A. Hilsenteger, *The Proven Key: Roles and Rules for Dictionaries and the Patents Office and the Courts*, 54 AM. U. L. REV. (forthcoming May

III. THE EMPIRICAL STUDY

In this study, I update and expand my earlier empirical project described in *Are District Court Judges Equipped to Resolve Patent Cases?*³⁰ This original database now contains all precedential, non-precedential, and Rule 36 (summary affirmances) decisions of the Federal Circuit on claim construction from the Supreme Court's *Markman* decision (1996) through 2003.³¹ This dataset contains 1100 appealed claim construction terms from 651 separate cases.

A. *Reversal Rates*

After a de novo appeal, the Federal Circuit held that 34.5% of the terms were wrongly construed by the district court. In the 651 cases, the Federal Circuit held at least one term was wrongly construed in 37.5% of the cases. In the cases in which one or more term was wrongly construed, the erroneous claim construction required the Federal Circuit to reverse or vacate the district court's judgment in 29.7% of the cases.

2005) (manuscript on file with author, *available at* <http://ssrn.com/abstract=577262> (empirically demonstrating that the “caprice with which judges currently may choose dictionaries effectively eliminates whatever neutrality and predictability gains the turn to dictionaries can offer” and recommending that the patentee be required to list dictionary selections for defining claim terms in the patent application itself) (quoting from abstract).

³⁰ Moore, *supra* note 10. See this earlier Article for a detailed description of the data collection process and the acknowledged shortcomings of the dataset.

³¹ I conducted a search on Westlaw using the query “patent & claim /s interp! or constru!” Each case retrieved was examined to determine whether the district court judge's claim construction was being appealed to the Federal Circuit. I also collected the data on all Rule 36 summary affirmances that occurred during this same time period in order to ascertain whether the issue affirmed was claim construction. Pursuant to Rule 36 of the Federal Circuit Rules of Procedure, the court can summarily affirm without opinion a district court judgment. There were 276 Rule 36 affirmances during the time period of this study. After obtaining the appeal briefs in these cases (two cases could not be located by the Federal Circuit), I discovered that 104 cases did appeal district court claim constructions. There were 170 claim terms appealed in these 104 cases.

B. *Who Wins—Patentee or Infringer?*

The Federal Circuit has long been criticized as a pro-patentee forum.³² Analyzing the claim construction data according to infringer and patentee wins may shed some light on this critique. Among the claim construction terms appealed to the Federal Circuit, 76% were won by the infringer at the district court level. This probably confirms popular perceptions that district courts are increasingly granting summary judgment of non-infringement following claim construction because it is the only way to get appellate review of claim construction at an early stage in the proceedings.³³ In fact, in another study, I found that 86% of all summary judgments granted in all patent cases terminated from 1999–2000 were summary judgments of non-infringement. There could be another possible explanation: namely, that patentees who lose on claim construction are more likely to appeal than infringers who lose. Hence, the pool of appealed cases is not random or representative of district court decisions, but rather appeal is more likely whenever the patentee loses. There are asymmetric stakes in most patent litigations.³⁴ The patentee has more to lose than the infringer because, if the claims are construed narrowly, the patentee will not be able to assert them against other potential infringers. These asymmetric stakes make appeal by the patentee more likely, which would skew the pool of appealed cases.

Regardless of the pool of district court decision-making, appellate review statistics can provide insight into the patentee/infringer debate. While the infringer won 76% of the appealed claim constructions from the district court,

³² See Mark D. Janis, *Reforming Patent Validity Litigation: The “Dubious Preponderance”*, 19 BERKELEY TECH. L.J. 923, 928 (2004) (stating that “[t]he perception that the Federal Circuit enhanced the effect of the presumption of validity coincides with the generally received wisdom that the Federal Circuit adopted a pro-patent bias early in its tenure”); Hon. Richard Linn, *The Future Role of the United States Court of Appeals for the Federal Circuit Now That It Has Turned 21*, 53 AM. U. L. REV. 731, 733 (2004) (stating that the belief that the CAFC was a pro-patent court “may have been justified” citing to “[c]omparative statistics from the years just before and just after the court’s establishment”); William M. Landes & Richard A. Posner, *An Empirical Analysis of the Patent Court*, 71 U. CHI. L. REV. 111, 112 (2004) (asserting that “[a]s expected, the Federal Circuit has turned out to be a pro-patent court in comparison to the average of the regional courts that it displaced in the patent domain”); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 335 (2003) (arguing that, as predicted, the CAFC would become a pro-patent court due, at least in part, to special interest groups including “the patent bar and its clients”, who “would exert themselves to influence” judicial selection for the court); John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 251 (1998) (concluding that findings of patent validity have been significantly higher since the establishment of the Federal Circuit). *But cf.* Glynn S. Lunney, Jr., *Patent Law, the Federal Circuit, and the Supreme Court: A Quiet Revolution*, 11 SUP. CT. ECON. REV. 1, 3 (2004) (stating that “[d]espite the Federal Circuit’s pro-patent holder reputation, this summary reveals that claims of patent infringement are no more likely to succeed since the Federal Circuit’s advent”).

³³ See Wagner & Petherbridge, *supra* note 27, at 1119 n.47 (observing that “[m]any district court judges, however, simply enter summary judgment for one of the parties after construing the claims, creating a de facto interlocutory appeal”).

³⁴ Kimberly A. Moore, *Judges, Juries & Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 377 (2000).

after appellate review, the claim construction only favored the infringer in 58% of the cases. This may lead some to conclude that the Federal Circuit is in fact pro-patentee, because they reverse a higher number of infringer wins. The fact that their claim constructions favor the infringer 58% of the time with de novo review suggests that the court, if anything, favors the infringer. However, there is, of course, a selection effect story to tell. Normally, the party with more at stake would only try stronger cases because a loss would harm them more.³⁵ However, the appeal is a different matter altogether. In this case, there already exists a negative claim construction determination that harms the patentee not just in this action, but with all other possible infringers. The determination harms their ability to secure licensing revenue and their chances at litigation. In addition, appeals have low transaction costs as compared to trials. Since patentees have more at stake in patent cases, and with claim construction in particular, and since the appeal costs little, it makes sense that they would actually appeal even weaker cases. With the de novo review, patentees have little to lose.³⁶ This might explain why on appeal claim construction decisions favor infringers slightly more than patentees. Hence, while the Federal Circuit finds in favor of patentees more often than the district court judges looking at the same terms, the overall rate of 58% in favor of infringers belies claims that the Federal Circuit is pro-patentee. Table 1 indicates that the Federal Circuit is just as likely to reverse a claim construction appeal which was won by the infringer at the district court level as one won by the patentee.

Who Won At District Court	Federal Circuit Claim Construction Reversal Rate
Patentee Won	32.3%
Infringer Won	33.2%

³⁵ George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984) (explaining the effect of asymmetric stakes on trial rates).

³⁶ Even if the review was more deferential, there would likely be a “Hail Mary” appeal by the patentee in these circumstances.

C. *Means-Plus-Function Terms*

Construing means-plus-function claim terms is even more difficult.³⁷ The patentee has the option of using function rather than structural claim language. If the patentee chooses to use a means-plus-function term, then the court looks to the specification to identify the structure that corresponds to the claimed means.³⁸ According to the Federal Circuit, means-plus-function infringement analysis requires several steps. First, the judge must determine whether a claim term even employs means-plus-function language.³⁹ Second, the judge must identify the function.⁴⁰ Third, the judge must identify the corresponding structure from the patent's specification.⁴¹ Finally, the factfinder must determine whether the accused device has the same or equivalent structure. The first three steps are all part of the claim construction analysis and must therefore be performed by the district court judge.

The overall rate of district court errors on means-plus-function terms according to appellate review is 39.3%. In 39% of the term appeals, the district

³⁷ See *Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d 1009, 1018 (Fed. Cir. 1998) (Plager, J. concurring) (stating that with respect to the application of the doctrine of equivalents to means-plus-function claims that the “law in this area [is] confused and confusing”); Eva M. Ogielska, Note, *IMS Technology, Inc. v. Haas Automation, Inc. & Kemco Sales, Inc. v. Control Papers Co.*, 16 BERKELEY TECH. L.J. 71 (2001) (noting that “[t]he difficulties of claim interpretation are particularly apparent in the judicial construction of means-plus-function claims”); Yoncha Lynn Kundupoglu, *The Law of Means-Plus-Function Language (Part I of II)*, 28 AIPLA Q.J. 39, 43 (2000) (observing that the “[i]nterpretation of means-plus-function limitations has been complicated by the competing [policy-based] roles played by claims”); Rudolph P. Hofmann, Jr. & Edward P. Heller, III, *The Rosetta Stone for the Doctrines of Means-Plus-Function Patent Claims*, RUTGERS COMPUTER AND TECH. L.J. 227, 240 (1997) (noting that “uncertainty as to the construction of a means-plus-function limitation . . . makes difficult the assessment of likely outcomes of patent infringement litigation”); Lawrence Kass, Comment, *Computer Software Patentability and the Role of Means-Plus-Function Format in Computer Software Claims*, 15 PACE L. REV. 787, 850 (1995) (stating that the construction of means-plus-function claims “has bred confusion and controversy, particularly with regard to computer program and mathematical algorithm inventions”); Chris Ullsperger, *Lessons in Claim Construction from the Federal Circuit; Reading, Writing, and Reversal*, INTELL. PROP. TODAY, Sept. 1, 2002, at 14 (concluding from review of patent related claims in 2001 that “complicated issues such as the construction of ‘means-plus-function’ claims remain especially resistant to resolution at the district court level”).

³⁸ 35 U.S.C. § 112 (2000).

³⁹ See KIMBERLY A. MOORE ET AL., *PATENT LITIGATION & STRATEGY* 321–24 (2d ed. 2003) (explaining that while the rule of thumb is that if a claim uses the word “means” it invokes § 112, para. 6, there are several exceptions); cf. *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004) (“The task of determining whether the limitation in question should be regarded as a means-plus-function limitation, like all claim construction issues, is a question of law for the court, even though it is a question on which evidence from experts may be relevant.”).

⁴⁰ *Gemstar-TV Guide Int’l, Inc. v. Int’l Trade Comm’n*, 383 F.3d 1352, 1361 (Fed. Cir. 2004) (“In construing a means-plus-function claim limitation, the recited function within that limitation must first be identified.”).

⁴¹ *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1334 (Fed. Cir. 2004) (“The next step in construing a means-plus-function claim limitation is to look to the specification and identify the corresponding structure for that function.”).

court failed to correctly perform one of the three steps described above. If means-plus-function language appeals are removed from the study, the Federal Circuit determined that the district court claim construction was wrong in 33.4% of the terms. Hence, the overall reversal rate for non-means-plus-function terms is lower than that for means-plus-function terms. It seems that district court judges do struggle slightly more with means-plus-function terms.

Breaking down the errors helps to find where the problems arise. Means-plus-function language was at issue in 191 of the appealed claim terms. In 162 terms, both the Federal Circuit and the district court agreed that the term was a means-plus-function term. In 25 terms, the district court held that a term employed means-plus-function language, but the Federal Circuit disagreed. Finally, in four instances, the district court held that a term did not employ means-plus-function language, but the Federal Circuit disagreed. Hence in 15.2% of the means-plus-function term appeals, the district court wrongly assessed whether means-plus-function language even applied.

Isolating just the cases where both the Federal Circuit and the district court identified the term as employing means-plus-function language (162 cases), the reversal rate was only 30.9%. It appears from this that district courts struggle more with the question of whether a term employs § 112, para. 6 means-plus-function language than they do with claim construction generally. This may support adoption of a black letter application standard; namely, if the term uses the word “means,” it is a means-plus-function term, but if it does not use the term “means,” it does not employ § 112, para. 6.⁴²

D. Claim Construction By the Federal Circuit Judges

The Federal Circuit consists of twelve active judges and four senior judges. Five of the active judges were appointed after *Markman* was decided⁴³ and three after *Cybor Corp.*⁴⁴ There are twenty Federal Circuit judges that have participated in claim construction decisions during the eight years of this study. Twelve of the judges have participated in more than 100 claim construction decisions. As Table 2 shows, in the 1100 claim constructions that were appealed, there were only 36 dissents. Hence, while the Federal Circuit disagreed with the district court judges as to the proper claim constructions in

⁴² MOORE ET AL., *supra* note 39, at 321–24 (suggesting a black letter rule); cf. Michael T. Hopkins, *When a Lack of Equivalence Can Still Be Equivalent—Litigating Infringement of Means-Plus-Function Claims*, 40 IDEA 581, 586 (2000) (noting that despite “seemingly rational and straightforward exceptions to the general means-plus-functions rules” there is an “inherent difficulty surrounding the application” of the rules); Mark D. Janis, *Who’s Afraid of Functional Claims? Reforming the Patent Law’s § 112, ¶ 6*, *Jurisprudence*, 15 SANTA CLARA COMPUTER & HIGH TECH. L.J. 231, 236 (1998) (arguing that § 112, para. 6 should be eliminated because of “the sudden emergence of a vexing and Byzantine threshold scheme for determining whether an arguably functional expression in fact qualifies as a ‘means plus function’ expression”).

⁴³ Judges Bryson, Gajarsa, Linn, Dyk, and Prost are all new to the court. Judge Bryson was actually appointed before the *Markman* decision issued but after the appeal was initiated, and he therefore did not participate in the decision.

⁴⁴ Judges Dyk, Linn and Prost were appointed after *Cybor Corp.*

34.5% of the appeals, they only disagreed amongst themselves in 3% of the appeals.

Judge	# of Cases	# Terms Construed	Majority	# of Terms Opinion Authored	Dissents
Archer	53	83	83	14	0
Bryson	150	256	255	79	1
Clevenger	170	280	277	85	3
Cowen	7	10	10	0	0
Dyk	83	139	138	37	1
Friedman	42	73	71	0	2
Gajarsa	147	239	236	55	3
Linn	73	147	146	61	1
Lourie	163	269	268	106	1
Mayer	149	249	245	10	4
Michel	158	288	285	86	3
Newman	171	263	257	59	6
Nies	2	2	2	1	0
Plager	84	143	143	24	0
Prost	40	71	71	13	0
Rader	190	341	335	138	6
Rich	59	95	95	39	0
Schall	159	278	273	54	5
Skelton	15	23	23	0	0
Smith	16	24	24	0	0

Table 3, below, details the outcomes by judge. There is significant variation in likelihood of reversal by judge. As the table details, affirmance rates by judge vary from 50% to 90%. There also appears to be considerable variation in patentee win rates by judge. Of course, this may be a function of the population of appealed cases. As noted earlier, more pro-infringer claim constructions are appealed.

Interestingly, Judge Newman, who has previously been shown to have a high patent holder win rate on the issue of validity,⁴⁵ has a low patentee win rate on the issue of claim construction. Reconciling these findings may suggest that Judge Newman is pro-patent but not necessarily pro-patentee.

⁴⁵ John R. Allison & Mark A. Lemley, *How Federal Circuit Judges Vote in Patent Validity Cases*, 10 FED. CIR. B.J. 435, 446 (2001).

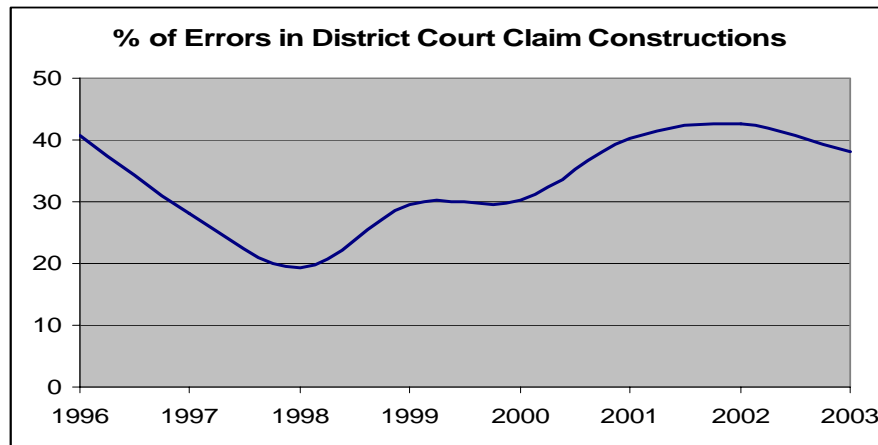
Table 3 – Substantive Outcomes Among Federal Circuit Judges of Claim Construction Appeals				
Judge	# of Claim Terms Construed	% of Terms District Court Construed Correctly	% of Cases District Court Construed <u>All</u> Terms Correctly	% of Terms Patentee Wins
Archer	83	73%	72%	37%
Bryson	256	62%	59%	38%
Clevenger	280	72%	66%	44%
Cowen	10	90%	86%	20%
Dyk	139	55%	48%	52%
Friedman	73	58%	50%	42%
Gajarsa	239	67%	65%	38%
Linn	147	50%	51%	54%
Lourie	268	65%	59%	38%
Mayer	249	68%	63%	45%
Michel	288	68%	67%	40%
Newman	263	70%	68%	39%
Nies	2	50%	50%	50%
Plager	143	67%	67%	30%
Prost	71	69%	68%	35%
Rader	341	64%	58%	47%
Rich	95	59%	58%	41%
Schall	278	63%	60%	43%
Skelton	23	83%	80%	17%
Smith	24	79%	81%	38%

While it might seem that judges with a technical background themselves might be more inclined to substitute their own claim construction for that of the district court judge, the data does not support this assumption. It is a common misconception that all the Federal Circuit judges were first engineers or scientists. In fact, only four of the twenty judges in this study had some sort of scientific background (Judges Gajarsa, Linn, Lourie, and Newman). A simple linear regression comparing the likelihood of reversal rates of judges with a technical background versus nontechnically trained Federal Circuit judges defies this prediction. In short, technical judges are not more likely to reverse than nontechnical judges. Moreover, there is not a greater likelihood that the opinion will be authored by a technically trained judge when the claim construction is reversed ($p=0.073$). However, judges with technical backgrounds are more likely to dissent in claim construction cases ($p=0.000$).

IV. THE REVERSAL RATE IS GETTING WORSE NOT BETTER

It seemed logical that the reversal rate would be highest shortly after *Markman* was decided because at that time claim construction was new to district court judges. Many held the belief that over time, with the evolution of

precedent and clear canons of claim construction to guide the district courts, the reversal rate would go down.⁴⁶ In short, if the Federal Circuit provides adequate guidance, the district court judges should get better at construing claims. As the figure below shows, the claim construction reversal rate did decline after *Markman* but rose again after *Cybor Corp.* This is not surprising, given that in *Cybor Corp.* the court resolved a dispute regarding how much deference ought to be given to district court claim constructions, concluding that a de novo standard of review ought to apply. The continued rise in reversal rates five years after the *Cybor Corp.* decision suggests that the district court judges are not able to resolve claim construction issues as the Federal Circuit judges would like.



The high reversal rate could be due to the fact that district court judges lack technical training and repeat exposure to claim construction. But this seems unlikely, given that the Federal Circuit judges themselves generally lack technical training in the particular issues being appealed. As previously discussed, only four of the judges have technical backgrounds. In addition, a chemistry background is only useful in chemistry cases but would not provide that judge a background for electrical engineering, mechanical engineering or even biotech cases.

While the Federal Circuit judges undoubtedly construe more claim terms than a given district court judge, the claim construction inquiry depends entirely on what information is presented in the specification and what the ordinary and customary meaning of the term would be to one of skill in the art—clearly a factual inquiry that will vary with each patent. In short, construing claim terms in a given patent does not make construing claim terms in a different patent any easier.

With judicial claim construction now nearing its adolescence (eight years from the Supreme Court's *Markman* and ten years from the Federal Circuit's

⁴⁶ Moore, *supra* note 10, at 29; Chu, *supra* note 15, at 1097 (“Over time, claim construction should thus become more predictable and consistent, thereby reducing reversible errors in claim construction.”).

Markman), there should be more predictability. The reversal rate ought to be going down, not up. The fault, at this point, undoubtedly lies with the Federal Circuit itself. The court is not providing sufficient guidance on claim construction. There have not evolved any clear canons of claim construction to aid district court judges, and in fact the Federal Circuit judges seem to disagree among themselves regarding the tools available for claim construction.

The court seems to realize that the internal conflict warrants en banc scrutiny, and hopefully the *Phillips* decision will provide the clarity that has yet to emerge from eight to ten years of claim construction. Again, only time will tell.