American University Law Review

Volume 67 | Issue 4 Article 2

2018

The Landscape of Modern Patent Appeals

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Keywords
Compendium, USPTO, Court of Appeals for Veterans Claims

ARTICLES

THE LANDSCAPE OF MODERN PATENT APPEALS

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Quantitative studies of the U.S. Court of Appeals for the Federal Circuit's patent law decisions are almost more numerous than the judicial decisions they examine. Each study painstakingly collects basic data about the decisions—case name, appeal number, judges, precedential status—before adding its own set of unique observations. This process is redundant, labor-intensive, and makes cross-study comparisons difficult, if not impossible. This Article and the accompanying database aim to eliminate these inefficiencies and provide a mechanism for meaningful cross-study comparisons.

This Article describes the Compendium of Federal Circuit Decisions *("*Compendium*"), a database created to both standardize and analyze decisions of the Federal Circuit. The* Compendium *contains an array of data on all documents released on the Federal Circuit's website relating to cases that originated in a federal district court or the U.S. Patent and Trademark Office (USPTO)—essentially all opinions since 2004 and all Rule 36 affirmances since 2007, along with numerous orders and other documents.*

This Article draws upon the Compendium *to examine key metrics of the*

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Federal Circuit's decisions in appeals arising from the district courts and USPTO over the past decade, updating previous work by scholars who studied similar populations during earlier time periods and providing new insights into the Federal Circuit's performance. The data reveal, among other things, an increase in the number of precedential opinions in appeals arising from the USPTO, a general increase in the quantity—but not necessarily the frequency*—with which the Federal Circuit invokes Rule 36, and a return to general agreement among the judges following a period of substantial disuniformity. These metrics point to, on the surface at least, a Federal Circuit that is functioning smoothly in the post-America Invents Act world, while also hinting at areas for further study.*

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INTRODUCTION

Statistics about the U.S. Court of Appeals for the Federal Circuit are plentiful. Reliable, transparent, and clear statistics are not.[1] This Article and its accompanying database aim to change the status quo by providing

1. *See generally* Jason Rantanen, *Empirical Analyses of Judicial Opinions: Methodology, Metrics, and the Federal Circuit*, 49 CONN. L. REV. 227 (2016) (describing the problems and limitations inherent in existing studies of the Federal Circuit).

a high quality, publicly accessible, and user-friendly source for quantitative data about the Federal Circuit. Drawing upon this powerful database, named the *Compendium of Federal Circuit Decisions*[2] ("*Compendium*"), this Article provides key metrics to help answer questions about how the Federal Circuit is responding in the post-America Invents Act[3] world of patent law.

The *Compendium* was created to solve two problems plaguing empirical studies of the Federal Circuit. First, almost every study of Federal Circuit decisions painstakingly recreates a basic set of data—case name, appeal number, judges, precedential status—before adding its own set of unique observations.[4] This process is redundant and labor-intensive, taking time and resources away from the actual focus of the study.[5] Second, variations in data sources and nomenclature among researchers make it challenging, and sometimes impossible, to conduct cross-study comparisons.[6] While researchers often desire to reproduce each other's results or combine their data sets with previous ones to produce more complex analyses, the fact that researchers collect data from different sources and record it in different ways makes it difficult for subsequent researchers to perform these tasks.[7]

The *Compendium* addresses these issues by providing a high-quality, well-documented data set together with a standardized data recordation framework. That data set includes information about every document released on the Federal Circuit's website—most notably, opinions and Federal Circuit Rule 36 affirmances. Information about each document is recorded in a series of searchable fields, and data can be easily

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2. *Federal Circuit Decisions Database*, U. IOWA, https://fedcircuit.shinyapps.io/federalcompendium (last visited May 9, 2018) [hereinafter *Compendium*]. For discussion of the methodology and coding for the *Compendium*, see The Fed. Circuit Data Project, *The Compendium of Federal Circuit Decisions*, U. IOWA, https://empirical.law.uiowa.edu/compendium-federal-circuit-decisions (last visited May 9, 2018), and the remainder of this Article.

3. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified in scattered sections of 35 U.S.C.).

4. *See* Jason Rantanen, *Empirical Analyses of Judicial Opinions: Methodology, Metrics, and the Federal Circuit*, 49 CONN. L. REV. 227, 230–32, 283–87 app. A (2016) (describing the numerous empirical studies of the Federal Circuit and concluding with an appendix of over eighty such studies).

5. *See id.* at 281–82 (suggesting ways to improve methodological studies of judicial opinions to assist future scholars and researchers, such as creating coding manuals detailing coding options and data collection methods).

6. *See id.* at 231–33 (describing the lack of inter-study analyses in the field and exploring the difficulty in cross-study comparisons of one metric, reversal rates).

7. *See id.* at 259–62 (discussing the various sources and methodology researchers use to collect and present data on the Federal Circuit).

exported for further analysis. In an effort to maximize transparency and encourage collaboration, this data set is available for future researchers to draw upon and, ideally, contribute to. In addition, the *Compendium* is designed to simplify access and analysis for researchers who are not themselves involved in an empirical project but who wish to reference quantitative data about the Federal Circuit in a more robust way than through a query in a commercial database.[8] Consistent with principles of ethical legal research, its design is fully transparent.[9]

In addition to describing the *Compendium*, this Article draws upon its contents to make several important observations about the Federal Circuit's current decisions in appeals from district courts and the U.S. Patent and Trademark Office (USPTO). In particular, while online news articles have provided some quantitative analyses of the Federal Circuit,[10] this study offers the critical infrastructure lacking in the popular legal press: it publicly discloses the entire set of data underlying the observations, provides a detailed methodology for data collection and analysis, and rigorously examines the makeup of Federal Circuit decisions.

Analysis of the data reveals several important findings. Since the passage of the 2011 America Invents Act, the number of Federal Circuit decisions in appeals from the USPTO has exploded, even as the number of decisions in appeals from district courts has remained relatively steady.[11] As the number of Federal Circuit decisions in appeals arising from the USPTO has grown, so too has the number of precedential opinions.[12] At the same time, however, the Federal

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8. *See id.* at 245, 251–52 (detailing research issues arising from the design of commercial databases as primarily practice tools for lawyers rather than databases designed for empirical research).

9. *See* William Baude et al., *Making Doctrinal Work More Rigorous: Lessons from Systematic Reviews*, 84 U. CHI. L. REV. 37, 37–38 (2017) (discussing the need for legal scholars to be transparent in how they collect and analyze samples when conducting a systematic review); Robin Feldman et al., *Open Letter on Ethical Norms in Intellectual Property Scholarship*, 29 HARV. J.L. & TECH. 339, 345–48 (2016) (encouraging the articulation of ethical norms in legal scholarship such as the disclosure of data).

10. *See, e.g.*, Cristina Violante, *Law360's Federal Circuit Snapshot: By the Numbers*, LAW360 (Mar. 1, 2017, 12:07 PM), https://www.law360.com/articles/894751/law360-s-federal-circuit-snapshot-by-the-numbers (finding that the number of patent cases in the Federal Circuit has increased in recent years with more appeals coming from the Patent Trial and Appeal Board (PTAB)).

11. *Id.*

12. Jason Rantanen, *Data on Federal Circuit Appeals and Decisions*, PATENTLY-O (June 2, 2016) [hereinafter *Data on Federal Circuit Appeals and Decisions*], https://patentlyo.com/patent/2016/06/circuit-appeals-decisions.html.

Circuit has not resolved all of these new appeals through precedential opinions: the lion's share of resolutions continue to be through nonprecedential opinions and affirmances under Rule 36.[13] In other words, as other scholars note,[14] the Federal Circuit is resolving more cases with Rule 36 affirmances than ever before. Importantly, however, the *rate* at which the court is employing Rule 36 affirmances has fluctuated within relatively limited bounds over the last decade.

Another aspect of the Federal Circuit's decisions that the *Compendium* reveals is that, contrary to the trend of substantial disagreement among judges in the early 2010s,[15] Federal Circuit judges are now coming to unanimous agreement in precedential opinions more often and writing dissenting and concurring opinions less often.[16] This is a dramatic departure from a period when the average rate of precedential opinions including dissents exceeded the average rate of precedential opinions in which all the judges agreed.[17]

Analysis of individual judges' decisions reveals several notable patterns. While all active judges participate in about the same number of Rule 36 summary affirmances, there is substantial variation in the number of precedential opinions authored by each judge.[18] And when it comes to precedential opinions, certain judges are notable for the high frequency of unanimous (i.e., joined by both of the other members

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13. *See id.* (charting the number of precedential opinions, nonprecedential opinions, and Rule 36 affirmances in appeals from the USPTO from 2008 to 2016); *see also infra* notes 145–47 and accompanying text (describing the Federal Circuit practice of using summary affirmances under Rule 36).

14. Dennis Crouch, *Wrongly Affirmed Without Opinion*, 52 WAKE FOREST L. REV. 561, 569–70 (2017) (noting that the rise of USPTO appeals to the Federal Circuit has correlated with an increase in the percentage of Rule 36 judgments); Paul R. Gugliuzza & Mark A. Lemley, *Can a Court Change the Law by Saying Nothing?*, 71 VAND. L. REV. (forthcoming 2018) (manuscript at 20–22), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3015459 (illustrating the connection between passage of the America Invents Act with the rise in cases from the USPTO and resulting increase in Rule 36 affirmances).

15. *See* Jason Rantanen & Lee Petherbridge, *Disuniformity*, 66 FLA. L. REV. 2007, 2019–21 (2014) [hereinafter *Disuniformity*] (reporting an extraordinary period of disagreement among Federal Circuit judges and noting a drop of 20% in the rate of unanimous precedential opinions between 2004 and 2013).

16. *See infra* Figure 16.

17. *Disuniformity*, *supra* note 15, at 2021 (interpreting data revealing that during one period 43% of Federal Circuit precedential opinions involved a dissent while only 37% of precedential opinions were unanimous).

18. *See infra* Figures 15, 18.

of the panel) opinions they author,[19] while others—particularly Judge Timothy B. Dyk—are typified by writing precedential opinions joined by only one other member of the panel.[20]

The remainder of this Article proceeds as follows. Part I provides background on the Federal Circuit and previous empirical studies of the court. Part II describes the data source, collection process, and data framework for the *Compendium*. Part III presents descriptive statistics drawn from the *Compendium*, including numbers of Rule 36 summary affirmances over time and the extent of agreement among judges on the court. Finally, Part IV draws some conclusions from these observations and offers some directions for future work.

I. BACKGROUND

This Part provides a brief introduction to the Federal Circuit and highlights a few of its aspects applicable to the *Compendium*.

A. The U.S. Court of Appeals for the Federal Circuit

The Federal Circuit is the Article III court tasked with hearing appeals in disputes involving certain types of substantive legal issues, including those related to patents.[21] At full capacity, there are twelve "active" judges on the court.[22] There may also be—and currently are—additional judges who have taken "senior" status. Judges in senior status typically work about a quarter of the caseload of an "active" judge.[23] Occasionally, other judges will sit by designation.[24] Because the Federal Circuit's appellate jurisdiction is defined by subject matter

19. *See infra* Figure 16.

20. *See infra* Figure 16.

21. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, § 127, 96 Stat. 25, 37 (codified at 28 U.S.C. § 1295) (establishing the U.S. Court of Appeals for the Federal Circuit and its jurisdiction).

22. *See* 28 U.S.C. § 44 (2012) (prescribing the number of judges in each circuit court of appeals).

23. *See* § 371 (stating the requirements for senior status as involving about a quarter of the caseload of an "active" judge).

24. *See* § 292(a) (authorizing the designation of district judges to sit on courts of appeals when "the business of that court so requires"); *see also* U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT, VISITING JUDGES (2016), http://www.cafc.uscourts.gov/sites/default/files/judicial-reports/vjchartforwebsite2006-2015.pdf (providing a list of all fifty-six judges who have sat by designation on the Federal Circuit from September 2006 to November 2015).

rather than the geographical origins of an appeal,[25] the Federal Circuit may decide cases arising from federal courts from California to New York, Texas to Minnesota—provided that the appeals fall within the court's subject matter jurisdiction. Practice before the court is governed by the Federal Rules of Appellate Procedure, as supplemented and modified by the Federal Circuit Rules of Practice.[26]

The court hears appeals on a variety of subjects, including money claims against the government, trade issues, and appeals from the Court of Appeals for Veterans Claims and Merit Systems Protection Board.[27] Researchers studying patent law are principally interested in appeals involving patent issues.[28] These appeals primarily arise from the district courts and USPTO, although a few arise from the International Trade Commission and an even smaller number from the Court of Federal Claims.[29]

Nearly all appeals to the Federal Circuit that arise from the district courts involve a dispute relating to a patent—typically a patent infringement suit based on 35 U.S.C. § 271.[30] The *Compendium*

25. *See* 28 U.S.C. § 1295 (setting out the exclusive jurisdiction of the Federal Circuit over cases from specific subject matter fields as opposed to cases arising in a particular geographic region).

26. *See* U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, FEDERAL CIRCUIT RULES OF PRACTICE 7 (2017), http://www.cafc.uscourts.gov/sites/default/files/rules-of-practice/MASTERFederalCircuitRulesOfPractice-10.2.2017.pdf.

27. *See id.* (enumerating the sources from which an appeal before the Federal Circuit may derive).

28. *See id.* (granting the Federal Circuit jurisdiction in a number areas of intellectual property including over appeals from decisions of the PTAB, the Under Secretary of Commerce for Intellectual Property, the Director of the USPTO, and the Trademark Trial and Appeal Board (TTAB)); Paul R. Gugliuzza, *The Federal Circuit as a Federal Court*, 54 WM. & MARY L. REV. 1791, 1791 (2013) (discussing broadly the Federal Circuit's jurisdiction over patent appeals).

29. *See* U.S. COURT OF APPEALS FOR FED. CIRCUIT, APPEALS FILED, BY CATEGORY: FY 2017 (2018), http://www.cafc.uscourts.gov/sites/default/files/the-court/statistics/FY_17_Filings_by_Category.pdf (reporting that 63% of appeals before the Federal Circuit involved intellectual property law). At present, documents from appeals arising from the International Trade Commission and the Court of Federal Claims are not included in the *Compendium*, nor are documents from appeals arising from tribunals that are unlikely to present issues of patent law, including the Merit Systems Protection Board and Court of Appeals for Veterans Claims.

30. *Compare* U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, APPEALS FILED IN MAJOR ORIGINS, http://www.cafc.uscourts.gov/sites/default/files/the-court/statistics/Hist_Caseld_by_Major_Origin_10-year.pdf (charting the total number of appeals arising before the Federal Circuit from district courts), *with* U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, FILINGS OF PATENT INFRINGEMENT APPEALS FROM THE U.S. DISTRICT COURTS, http://www.cafc.uscourts.gov/sites/default/files/the-court/statistics/Patent

currently does not distinguish between appeals arising from the district courts that involve patents and those that do not.

Appeals from the USPTO come in two major flavors: patents and trademarks.[31] Prior to September 16, 2012, appeals involving patent issues at the USPTO arose from the Board of Patent Appeals and Interferences (BPAI); since then, those appeals arise from the Patent Trial and Appeal Board (PTAB).[32] Appeals involving trademarks arise from the Trademark Trial and Appeal Board (TTAB).[33] As discussed in Part III, the number of Federal Circuit decisions involving trademark appeals from the USPTO remained under twenty per year, even as the number of decisions involving patents grew from about twenty in 2008 to nearly 200 in 2016.[34]

Once at the Federal Circuit, appeals are assigned to a panel of three judges.[35] These judges read the briefs and preside over oral arguments.[36] After oral arguments, the panel of judges confers.[37] They affirm some appeals at this stage through application of Federal Circuit Rule 36.[38] These "Rule 36s" involve just one outcome: an affirmance of the lower tribunal.[39]

_filings_historical.pdf (charting the number of annual appeals from district courts involving patent infringement).

31. Technically, these are patents or patent applications and trademark registrations or trademark registration applications, but for readability these will be referred to as "patents" and "trademarks" unless more detail is necessary. *See* 28 U.S.C. § 1295(a)(4)(A)–(B) (providing the Federal Circuit with exclusive jurisdiction over appeals from the PTAB and TTAB respectively).

32. *See* § 1295(a)(4)(A); Dennis Crouch, *P-T-A-B: Patent Trial and Appeal Board*, PATENTLY-O (Sept. 15, 2012), https://patentlyo.com/patent/2012/09/p-t-a-b-patent-trial-and-appeal-board.html (announcing the transition from the Board of Patent Appeals and Interferences (BPAI) to the PTAB and including Chief Judge James D. Smith's remarks on the functioning of the new Board); Dennis Crouch, *Pending Appeals Not Impacted by BPAI->PTAB Transformation*, PATENTLY-O (Sept. 16, 2012), https://patentlyo.com/patent/2012/09/pending-appeals-not-impacted-by-bpai-ptab-transformation.html (noting that the America Invents Act required the name change).

33. § 1295(a)(4)(B).

34. *See infra* Section III.B.

35. For the internal operating procedures (IOPs) followed by the court and summarized in these paragraphs, see U.S. COURT OF APPEALS FOR THE FED. CIRCUIT: INTERNAL OPERATING PROCEDURES 6, 11 (2016) [hereinafter INTERNAL OPERATING PROCEDURES], http://www.cafc.uscourts.gov/sites/default/files/rules-of-practice/IOPs/IOPsMaster2.pdf.

36. *Id.* at 5, 12.

37. *Id.* at 18.

38. *See* FED. CIR. R. 36 (allowing the court to "enter a judgment of affirmance without opinion" under certain enumerated circumstances and when an opinion would provide no precedential value).

39. *Id.* (stipulating that the outcome of a Rule 36 judgment is an affirmance).

A Rule 36 affirmance requires agreement among all the judges on the panel, and the decision is not attributed to any single judge or group of judges.[40] Instead, the panel acts "per curiam," or in unanimous agreement.[41]

If the panel does not affirm through Rule 36, the most senior judge in the majority will assign a judge to write the opinion of the court.[42] Typically, the other members of the panel will join the court's opinion; sometimes one or even both other judges will choose to write separately.[43] Although separate opinions are usually a dissent or a concurrence, judges occasionally write other categories of opinions.[44] The judges may also designate an opinion as "precedential," making it binding precedent on future panels of the court.[45] If the judges do not designate an opinion as precedential, it remains nonprecedential, a status that limits its legal influence.[46]

Appeals may also be resolved by orders of the court or settlement by the parties.[47] Because these results are not typically published to the Federal Circuit's website, they are not included in the *Compendium*.

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40. INTERNAL OPERATING PROCEDURES, *supra* note 35, at 25 ("An election to utilize a Rule 36 judgment shall be unanimous among the judges of a panel.").

41. *Id.* at 19.

42. *Id.* at 4, 18.

43. For an example of a case from the Federal Circuit in which three different opinions were issued—the majority, one concurring, and one dissenting in part—see *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1311, 1322, 1329 (Fed. Cir. 2016).

44. Examples are "Additional Views" or "Dubitante" ("doubting"). *See* Jason J. Czarnezki, *The Dubitante Opinion*, 39 AKRON L. REV. 1, 1–2 (2006) (noting that while most judicial opinions are designated as the majority, concurrences, or dissents, the dubitante opinion is occasionally used to express doubt and reservations). These are extremely rare—the *Compendium* lists only three "Dubitante" and five "Additional Views" since 2004. *See, e.g.*, Inpro II Licensing, S.A.R.L. v. T-Mobile USA, Inc., 450 F.3d 1350, 1358 (Fed. Cir. 2006) (Newman, J., additional views) (expressing concern in an additional views opinion regarding the court's decision denying review of all the presented claims).

45. The Federal Circuit's IOPs explain the circumstances in which an opinion is designated as precedential:

> An election to issue a precedential opinion shall be by a majority of the panel, except that, when the decision includes a dissenting opinion, the dissenting judge may elect to have the entire opinion issued as precedential notwithstanding the majority's vote. These election rights may be made at any time before issuance of an opinion.

INTERNAL OPERATING PROCEDURES, *supra* note 35, at 25.

46. *See* FED. CIR. R. 32.1(b), (d) (stating that a nonprecedential opinion does not significantly add to the body of law and provides only "guidance or persuasive reasoning" to future courts). *But see* FED. CIR. R. 32.1(c) (allowing parties to cite to nonprecedential opinions issued after January 1, 2007).

47. *See* FED. CIR. R. 33 (requiring parties participate in settlement discussions on appeal).

On occasion, the court may sit in panels of more than three judges or as a court en banc.[48] When the court issues an opinion en banc, that opinion has especially strong controlling weight and may only be overturned by the court again sitting en banc or by the U.S. Supreme Court.

Many scholars have written on the role of the Federal Circuit in patent law, and there are entire treatises devoted to the court.[49] Leading descriptive work on the Federal Circuit includes Rochelle Cooper Dreyfuss's classic *The Federal Circuit: A Case Study in Specialized Courts*[50] and more recent articles;[51] Paul R. Gugliuzza's *The Federal Circuit as a Federal Court*;[52] Judge Pauline Newman's *The Federal Circuit: Judicial Stability or Judicial Activism?*[53] and *Origins of the Federal Circuit: The Role of Industry*;[54] Laura G. Pedraza-Fariña's *Understanding the Federal Circuit: An Expert Community Approach*;[55] and Ryan Vacca's extensive literature review, *The Federal Circuit as an Institution*.[56]

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48. FED. R. APP. P. 35 (allowing en banc consideration for "question[s] of exceptional importance" or "to secure or maintain uniformity of the court's decisions").

49. *See generally* ROBERT L. HARMON ET AL., PATENTS AND THE FEDERAL CIRCUIT (13th ed. 2017) (discussing the jurisprudence of the Federal Circuit).

50. Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 3–5 (1989) (taking an in-depth look at the first five years of the Federal Circuit with a focus on procedural issues and its unique specialization in patent law).

51. *See* Rochelle Cooper Dreyfuss, *The Federal Circuit as an Institution: What Ought We to Expect*, 43 LOY. L.A. L. REV. 827, 829–31 (2010) (arguing that the Federal Circuit should pursue the reinterpretation of patent law to adapt to massive technological developments since its inception); Rochelle Cooper Dreyfuss, *In Search of Institutional Identity: The Federal Circuit Comes of Age*, 23 BERKELEY TECH. L.J. 787, 789–92 (2008) (addressing the critiques of the Federal Circuit and analyzing various proposals for improvement); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Continuing Experiment in Specialization*, 54 CASE W. RES. L. REV. 769, 769, 772–73 (2004) (examining the Federal Circuit on its twentieth anniversary by reviewing frequently articulated criticisms and exploring areas of improvement).

52. Gugliuzza, *supra* note 28, at 1795 (questioning the Federal Circuit's influence in shaping and potentially stunting the development of patent law).

53. Pauline Newman, *The Federal Circuit: Judicial Stability or Judicial Activism?*, 42 AM. U. L. REV. 683, 688–89 (1993) (recognizing the importance of the Federal Circuit deciding cases based on law rather than policy).

54. Pauline Newman, *Origins of the Federal Circuit: The Role of Industry*, 11 FED. CIR. B.J. 541, 541 (2002) (reviewing the catalysts of the creation of the Federal Circuit).

55. Laura G. Pedraza-Fariña, *Understanding the Federal Circuit: An Expert Community Approach*, 30 BERKELEY TECH. L.J. 89, 89 (2015) (acknowledging the controversies surrounding Federal Circuit decision making and suggesting that court behavior is a "product of four distinct but interrelated expert community features: (1) epistemic control, (2) codification, (3) typecasting, and (4) inability to self-coordinate").

56. Ryan G. Vacca, *The Federal Circuit as an Institution*, *in* RESEARCH HANDBOOK ON THE ECONOMICS OF INTELLECTUAL PROPERTY LAW (Peter S. Menell et al. eds.,

B. Empirical Studies of the Federal Circuit

Given the array of theories about the role and function of the Federal Circuit, it is unsurprising that legal researchers and commentators have sought to assess or support those theories with empirical data about the court's decisions. Empirical studies of the Federal Circuit number in the dozens and take every shape and form imaginable, from glossy fliers[57] to detailed and methodical law review articles[58] to blog posts.[59] Ryan Vacca's *The Federal Circuit as an Institution* is an excellent place to begin a foray into this area, as it provides an overview of every empirical study of the court through 2016.[60]

A problem with these studies, however, is that they are not easy to compare. This is not just because they examine different attributes of the court's decision making, but also because they frequently measure the same thing using different systems of measurement.[61] Just as a Mars probe was once lost when one engineering group used English units of measurement while another used metric,[62] so too are problems presented by these varying ways of recording data about Federal Circuit decisions.

One example of this problem is discussed in a recent article

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forthcoming 2018) (manuscript at 1) (discussing throughout the chapter the development of the Federal Circuit and its distinguishing qualities that have molded it into a critical institution).

57. *See, e.g.*, LEX MACHINA, INEQUITABLE CONDUCT: 2005–2010 (2011), https://lexmachina.com/wp-content/uploads/2011/01/Inequitable-Conduct-Study.pdf; PWC, 2017 PATENT LITIGATION STUDY: CHANGE ON THE HORIZON? (2017), https://www.pwc.com/us/en/forensic-services/publications/assets/2017-patent-litigation-study.pdf.

58. *See, e.g.*, Lee Petherbridge & R. Polk Wagner, *The Federal Circuit and Patentability: An Empirical Assessment of the Law of Obviousness*, 85 TEX. L. REV. 2051, 2054–55 (2007) (studying the Federal Circuit's application of the doctrine of obviousness in patent law empirically and suggesting that "current commentary may overstate the concerns with the Federal Circuit's approach"); R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1111–12 (2004) (concluding that the Federal Circuit's oscillation between two methodological approaches in deciding cases and the results derived therefrom created "increasingly polarized" jurisprudence).

59. *See, e.g.*, *Data on Federal Circuit Appeals and Decisions*, *supra* note 12 (tracking the trends of patent appeals decisions in the Federal Circuit).

60. *See generally* Vacca, *supra* note 56 (providing a comprehensive overview of all empirical studies of the Federal Circuit through 2016).

61. *See* Rantanen, *supra* note 4, at 260–61 (comparing studies that report the Federal Circuit's reversal rate on an aggregate basis versus those that report the reversal rate on an annual basis).

62. *See* Robin Lloyd, *Metric Mishap Caused Loss of NASA Orbiter*, CNN (Sept. 30, 1999, 4:21 PM), https://edition.cnn.com/TECH/space/9909/30/mars.metric.02.

examining the rate at which the Federal Circuit reverses district courts.[63] As that analysis demonstrates, the definition of the term "reversal" alone can affect rates by as much as 10%.[64] Other components of study design can also affect the observed reversal rate.[65] Difficulties with cross-study comparisons are not limited to reversal rates; virtually every empirical study of the Federal Circuit uses its own nomenclature, field descriptions, and data collection methodology.[66] Worse, sometimes these details are not provided in the study or accompanying documentation, ratcheting up the difficulty of understanding or comparing the study results.

Another problem with existing empirical studies is that they frequently rely on commercial databases that are designed to assist lawyers in conducting traditional legal research, not for empiricists seeking to maximize replicability and transparency.[67] The contents of these databases change over time, as do their interfaces.[68] Contractual limitations may also restrict what may be done with those databases.[69] The *Compendium* aims to reduce these barriers by providing a consistent and reliable source for empirical studies of the Federal Circuit using a standardized nomenclature and open access dataset.

II. METHODOLOGY

This Part describes the source of the *Compendium*'s data, the methodology used in its collection, and how the information it

63. *See* Rantanen, *supra* note 4, at 233.

64. *Id.* at 275.

65. *Id.* at 259–75 (including studies that examine per-opinion basis versus per-issue basis, the varying sources of data, and the differing data collection and filtering methodologies).

66. *Id.* at 251–54 (discussing, for example, how defining a record unit as per "patent case" can avoid the challenges of defining an individual analysis, but the court may address multiple distinct issues for a given patent).

67. *See id.* at 245 (explaining that one limitation to databases such as Lexis and Westlaw is their limited number of non-precedential opinions prior to 2001).

68. *Id.* at 251–52; *see also* Michael Hannon, *A Closer Look at Unpublished Opinions in the United States Courts of Appeals*, 3 J. APP. PRAC. & PROCESS 199, 201 n.13 (2001) (discussing the limited number of unpublished cases available on Westlaw and Lexis).

69. *See* Rantanen, *supra* note 4, at 251–52; *see also Westlaw® Subscriber Agreement*, WESTLAW, https://lawschool.westlaw.com//marketing//display/mi/75 (last visited May 9, 2018) (prohibiting the storage or usage of downloaded data unless expressly permitted or quoted in work product); *Terms & Conditions for Use of the LexisNexis Services*, LEXISNEXIS, http://www.lexisnexis.com/terms/supplemental.aspx (last visited May 9, 2018) (forbidding users from publishing, broadcasting, or selling information obtained on Lexis for commercial purposes).

contains was recorded.

A. Data Source and Collection

1. The source of the decisions used to create the Compendium

The *Compendium* draws from the Federal Circuit's own platform for releasing its decisions.[70] Using the Federal Circuit itself as a data source offers many advantages over other data sets, such as the U.S. Patent Quarterly, the Federal Judicial Center, Westlaw, or Lexis.[71] First, written decisions are published in their entirety on the website, rather than being condensed.[72] This allows researchers to extract a substantial amount of information about the decisions, including dissents, concurrences, and their respective authors. Second, the website includes both precedential and nonprecedential decisions, thus providing an extensive collection of materials.[73] Third, the decisions collected from the Federal Circuit's website are in the public domain,[74] and, unlike commercial databases, usage of the data is not restricted by contract. Fourth, constructing a database based on records collected from the Federal Circuit allows it to be designed especially for use by academic researchers and other scholars of the Federal Circuit. Consequently, the *Compendium* is structured to maximize reproducibility, transparency, and the types of information most useful to scholars of the Federal Circuit.

There are some important limitations on the *Compendium* that flow from its data source. In particular, any data set is only as good as its

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70. *See* THE FED. CIRCUIT DATA PROJECT, CODEBOOK FOR THE COMPENDIUM OF FEDERAL CIRCUIT DECISIONS 1 (2017), [hereinafter *COMPENDIUM* CODEBOOK], https://empirical.law.uiowa.edu/sites/empirical.law.uiowa.edu/files/wysiwyg_uploads/codebook_for_the_compendium_of_federal_circuit_decisions_-_2017-09-26.pdf (describing the coding methodology for the *Compendium* and noting that the information is derived from the Federal Circuit's database); *see also Opinions & Orders*, U.S. CT. APPEALS FOR FED. CIR., http://www.cafc.uscourts.gov/opinions-orders (last visited May 9, 2018) (Federal Circuit decision database).

71. For disadvantages of these sources, see Lee Petherbridge & Jason Rantanen, *Infringement*, *in* RESEARCH HANDBOOK ON THE ECONOMICS OF INTELLECTUAL PROPERTY LAW 7, 18 n.10 (Peter S. Menell et al. eds., 2017) (explaining that the U.S. Patent Quarterly is an incomplete resource because it does not include Rule 36 affirmances or nonprecedential opinions); Rantanen, *supra* note 4, at 245–50 (critiquing the limits of third-party services as a data source for empirical research).

72. *See Opinions & Orders*, *supra* note 70.

73. *See id.*

74. *See* 17 U.S.C. § 105 (2012) (stating that U.S. government works are not subject to copyright protection).

source data. Any conscious policy or inadvertent action that results in documents not being released on the court's website means that those documents are not included in the *Compendium*. Only three instances of this occurring are known to date. The first is that although there are precedential and nonprecedential written opinions in the *Compendium* prior to 2007, there are no Rule 36 affirmances prior to 2007. The second known data source limitation is that the Federal Circuit released a large number of orders on its website from 2010 to 2013, stopped doing so around 2013, and currently publishes only a handful of orders each year.[75] This limitation is considered of relatively minimal importance, at least for this Article, as it focuses on opinions and Rule 36 affirmances. However, it is something to take into account for future studies drawing upon the *Compendium*. The third is the smallest but potentially most concerning: during the data verification process, the research team discovered that there was a period of time, September 2012 to March 2013, from which it appears that opinions and Rule 36 affirmances are missing from the court's website. The gap consists of eighty-nine precedential opinions, nonprecedential opinions, and Rule 36 affirmances that are not available on the court's website. Fortuitously, the seventy documents in appeals arising from the district courts were collected in 2013 as part of another project and are included in the database.[76] In addition, information about the nineteen decisions in appeals arising from the USPTO was collected from other sources and added to the *Compendium*.[77]

Another limitation doesn't relate directly to the completeness of the data source but does relate to its contents. Occasionally, the Federal Circuit might issue an opinion in an appeal only to later withdraw it and issue a new one following a party's request for rehearing. The court may also change an opinion from nonprecedential status to

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75. A court "order" is a written order issued by a court that requires or permits a certain action. *See Order*, BLACK'S LAW DICTIONARY (10th ed. 2014). It is distinct from an "opinion," which is "[a] court's written statement explaining its decision in a given case," *Opinion*, BLACK'S LAW DICTIONARY, *supra*, and a "decision," which is "[a] judicial or agency determination after consideration of the facts and the law," *Decision*, BLACK'S LAW DICTIONARY, *supra*. Appellate "opinions" resolve controversies, and thus constitute "decisions." The Federal Circuit's decisions on the merits are written in opinions. Internal Operating Procedures, *supra* note 35, at 19. The court issues decisions on motions, petitions, and applications through orders. *Id.*

76. We have also contacted the webmaster of the Federal Circuit's website to let the court know about the missing documents.

77. *See infra* Section II.C (describing these decisions in more detail). These decisions are included in the statistics presented here.

precedential status after the initial opinion issued. These events are relatively rare. To the extent these documents were available on the court's website during a collection period, they were collected and included in the *Compendium*. In addition, a variety of deduplication methods were used to identify these situations and flag the earlier version as a duplicate.[78]

Finally, because the *Compendium* is a database of "slip" opinions and orders released on the Federal Circuit's website, the documents do not constitute the "official" versions published in the Federal Reporter. That said, there are rarely major changes to an opinion once it is released and, when there are, those changes are accompanied by a new opinion.[79] The *Compendium* includes both original and revised opinions provided that they were available on the court's website during a data collection period.

2. *Assembly of the* Compendium

The *Compendium* was constructed from documents released on the "Opinions & Orders" page of the Federal Circuit's website. Each record in the *Compendium* represents a single document posted to that page.[80] For example, record 10196 in the *Compendium* is the Federal Circuit's en banc opinion in *Phillips v. AWH Corp.*[81] Because a record corresponds to a single document, an opinion or other form of decision that resolves multiple appeals consolidated by the court is treated as a single record.[82]

In order to collect only documents in appeals arising from the district courts and USPTO, either "DCT" or "PATO" was selected from

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78. Duplicates identified through these methods were not removed from the database; instead, they were flagged as duplicates and a note made of the reason.

79. This observation is based on the author's review of the contents of the Federal Circuit's website. Minor changes are made via errata, which are included in the *Compendium* provided that they were published on the court's website. A possible avenue for future investigation is the nature of changes to the court's opinions.

80. *See Opinions & Orders*, *supra* note 70 (allowing users to filter their search by selecting from the following drop-down menus: "Origin," "Type," and "Date Range").

81. 415 F.3d 1303 (Fed. Cir. 2005); *see also Appendix A*; *Compendium*, *supra* note 2 (search "10196").

82. Examples of document with multiple appeal numbers include record 15623, which is an opinion resolving appeal numbers 2016-1678 and 2016-1679 in *Novartis Ag v. Noven Pharmaceuticals Inc.*, 853 F.3d 1289 (Fed. Cir. 2017), and record 15508, which is an opinion resolving appeal numbers 2015-1977, 2015-1986, and 2015-1987 in *Medtronic, Inc. v. Robert Bosch Healthcare*, 839 F.3d 1382 (Fed. Cir. 2016). *See Compendium*, *supra* note 2 (search "15623"; "15508").

the "Origin" field on the Federal Circuit's "Opinions & Orders" page. Opinions were then downloaded by hand.

Each record contains multiple discrete pieces of information—or "fields"—that relate to the document. During the collection process, coders recorded basic information—including the court of origin, the case name, and the appeal number—about the document provided on the Federal Circuit's website through a copy-and-paste process so as to minimize coder error.[83] For record 10196, the "Case Name" was recorded as "PHILLIPS V. AWH CORPORATION, ET AL.," the "Origin" as "DCT" (indicating that the appeal originated in the district courts), and the "Appeal Number" as "2003-1269." Additional information about the document was collected from the document itself. For example, in record 10196 the "Document Type" field was coded as "Opinion," and "En Banc" was recorded as "Yes."

Due to the ongoing nature of this project, data were collected on multiple occasions. An early set of the data was used in *Disuniformity*, a 2013 study of the rate of unanimity and dissents in Federal Circuit decisions arising from the district courts.[84] Additional data were collected over the period 2013 to 2017. Due to the potential for error and variation in this collection process, it was subjected to an extensive verification process in 2017.[85]

As of the end of 2017, there were 1477 records in the *Compendium* arising from the USPTO and 4397 records in the *Compendium* arising from the district courts, excluding duplicates.[86]

B. Fields

The following attributes are recorded for each document: (1) date; (2) appeal number; (3) origin; (4) case name; (5) precedential status; (6) document type; (7) en banc status; (8) judges; (9) opinion type (majority, dissent, etc.); (10) authorship; (11) URL; (12) notes; and

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83. *See Appendix A*; *see also Compendium*, *supra* note 2 (search "10196").

84. *See Disuniformity*, *supra* note 15, at 2042 (finding a dramatic increase in judicial disagreement over the past several years and evidence of a substantial decrease in the doctrinal uniformity in patent law).

85. *See infra* Section II.C. (detailing the data verification process including the steps involved and findings).

86. A duplicate is defined as a record that is identical to another record, including the contents of the underlying document, or a document that replaced a previous document on the court's website. *See infra* Section II.B.4. Including duplicates, there are 4441 documents in appeals arising from the district courts and 1502 in appeals arising from the USPTO.

(13) duplicate status.[87] The information for the first five categories was collected directly from the website, while research assistants manually coded information for the subsequent categories based on information contained in the document itself. In addition, each record automatically received a unique record ID to make it easier to track and compare the data. Recent work on the data set includes the classification of appeals by the specific tribunal of origin, such as the PTAB or TTAB, and the coding of outcomes.

Data were initially recorded in Microsoft Excel spreadsheets. However, in the spring of 2017, the existing spreadsheets were combined and converted into a format accessible through a user-friendly application.[88] The new application includes a mechanism to quickly filter data based on field selection and permits exportation of filtered data to a .csv file for further analysis in a program such as Stata or Excel. It also allows a user to view all of the fields for a given record at one time. Working with a large spreadsheet in Excel—nearly 6000 records, each with dozens of fields—can be both time consuming and computer-power taxing, and the new application greatly simplifies interaction with the data.

To allow for even easier use of the data, access to the application is available via a website, accessible through https://empirical.law.uiowa.edu.[89] This version of the application allows users to filter, sort, and export the data in a version readable by Excel and other programs. For security and stability reasons, the web-accessible version of the application is read-only and does not permit editing of the database itself.

Appendix A has a full sample record that lists the variables and format of an example opinion, *Phillips v. AWH*.[90] With the standardized set of fields and formatting, future researchers will be able to easily compare results using a single reference point.

Below is a summary of each field coded on the *Compendium*. The

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87. *See Compendium*, *supra* note 2.

88. SQLite database accessed through an application to view and edit the database in RStudio®. This process involved providing the Excel spreadsheets to a statistics consulting class supervised by Dr. Rhonda DeCook. The assigned team of students created a database and coded an application in Shiny—an application framework for RStudio®—that allows for a variety of database manipulations. *See Shiny from RStudio*, RSTUDIO, http://shiny.rstudio.com (last visited May 9, 2018). Thanks again to Rhonda DeCook, Alexander M. Zajicheck, and Tyler W. Olson for their assistance with this project. The source files are available on request.

89. The Fed. Circuit Data Project, *supra* note 2. Thanks to Louis Constantinou and Rhonda DeCook for their substantial assistance in website development.

90. *Infra* Appendix A.

Compendium itself also has an accompanying Codebook that provides further details about each field and addresses particular issues that arose during the coding process.[91]

1. Case name

The case name is copied directly from the Federal Circuit website with no further abbreviation of parties or titles. This helps eliminate errors in coding from one person to the next and therefore keeps the record consistent. Whereas one researcher may keep "international" in the case name and another may abbreviate to "int'l," the methodology used in the *Compendium* lets the Federal Circuit make that decision. The case names also include the bracketed text found on the Federal Circuit's website, such as "[OPINION]" or "[ORDER]." This further eliminates error as the case name in the database matches the primary source for the data.

2. Case date

The date is also directly copied from the Federal Circuit website. This is the date the opinion was published in ISO 8601 form, or year-month-day.[92] While the format may not be the traditional way dates are recorded in the United States, ISO 8601 is the worldwide standard for "naming" dates and is the most frequent method for date recording in computer programming.[93] It is also the form used on the Federal Circuit's website.[94] Therefore, copying directly from the Federal Circuit not only eliminates potential human error from format changing, but also allows computer-savvy researchers to directly input and code the output into their own databases.

3. Origin

The origin of the case is recorded directly from the Federal Circuit website and is identified by the Federal Circuit's identification of the origin as either "DCT" or "PATO." This field was subjected to additional human verification, and a few rare errors in the Federal Circuit's classification were corrected at that time.

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91. *COMPENDIUM* CODEBOOK, *supra* note 70, at 1–9.

92. *Date and Time Format—ISO 8601*, INT'L ORG. STANDARDIZATION, https://www.iso.org/iso-8601-date-and-time-format.html (last visited May 9, 2018) (showing that ISO 8601 formats dates as (Year-Month-Day)).

93. *Id.*

94. *See Opinions & Orders*, *supra* note 70.

4. Duplicate

Records that are identified as duplicates are flagged with "Yes" in the duplicate field. A document is considered a duplicate if a record was inadvertently added to the database more than once or if it is a document that the Federal Circuit initially issued and then replaced.[95] In these situations, the earlier record is marked as the duplicate.

5. Precedential status

The precedential status is recorded as either "Nonprecedential" or "Precedential," drawing directly from the Federal Circuit's website subject to review by a human coder.[96]

6. Document type

The document type was determined by examining the bracketed text in the case name, discussed above, and checking that information against information from within the document itself. Possible document types are "Order," "Opinion," "Errata," "Rule 36," "No file," and "Other."[97] Note that while the earliest opinion released on the Federal Circuit's website—and thus the earliest released on the *Compendium*—is October 13, 2004, the earliest Rule 36 affirmance is July 11, 2007.[98] The Federal Circuit did, however, affirm appeals prior to that date using Rule 36.[99] Consequently, while there were Rule 36 affirmances between 2004 and 2007, they are not contained in the data set. "No file" indicates that the record entry on the Federal Circuit's website did not have a document associated with it and the document type could not be otherwise determined from context.[100]

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95. Examples include Records 10653 and 10676. *See Compendium*, *supra* note 2 (search "10653"; "10676").

96. Note that in the *Disuniformity* data set this field was called "Type." *Disuniformity*, *supra* note 15, at 2043 app. A. The field name was changed to make its contents clearer in the application. However, currently data exports continue to refer to this field as "Type."

97. *See supra* notes 38–42 and accompanying text (discussing Rule 36 affirmances); *supra* note 75 (distinguishing between an "opinion" and an "order").

98. *See Opinions & Orders*, *supra* note 70 (finding *Vaizburd v. United States*, 384 F.3d 1278 (Fed. Cir. 2004), to be the earliest opinion on the website, dated October 1, 2004); *Compendium*, *supra* note 2 (select "Document Type: Rule 36") (showing the earliest Rule 36 affirmance in the *Compendium* to be *Venture Industries Corp. v. Autoliv ASP*, 227 F. App'x 923 (Fed. Cir. 2007), dated July 11, 2007).

99. *See* Rantanen, *supra* note 4, at 248 (detailing that Westlaw has Rule 36 summary affirmances beginning in 1989, the year the rule was adopted).

100. *See Compendium*, *supra* note 2 (select "Document Type: No File").

7. En banc

En banc status is recorded for some Orders and for all documents identified as either "Opinion" or "Rule 36." The field is coded as "Yes," "No," or "Partial" based on information that is extracted from the document. Occasionally, the Federal Circuit will issue an opinion that is en banc only in part.[101] The *Compendium* accounts for these opinions by coding the field as "Partial." As of the end of 2017, there were twenty-six opinions coded as "Yes" or "Partial" in the "En Banc" field.[102]

8. Judge 1, Judge 2, and Judge 3

The last names of the first three judges on each panel are recorded in the fields "Judge 1," "Judge 2," and "Judge 3." These names are found at the beginning of the Federal Circuit document.[103] Typically, there are only three judges assigned to an appellate panel, and the order in which the document lists the judges is the order in which the fields were populated. The Federal Circuit publishes judges' names in uppercase font but the *Compendium* codes them in title case for readability. In the rare instances where more than three judges were on the panel, only the names of the first three listed judges appear in the *Compendium*. For opinions by the court sitting en banc, "Judge 1" is coded as "En Banc."

9. Opinion 1

"Opinion 1" captures the agreement among the panel members for the prevailing outcome in a decision. The document was coded as "Unanimous" when all members of the panel completely joined in the prevailing opinion, while "Majority" was recorded if the prevailing opinion was not unanimous.

10. Opinion 2 and Opinion 3

"Opinion 2" and "Opinion 3" provide information on additional opinions written by judges on the panel who did not fully agree with the prevailing opinion. Common examples are "Dissenting" and "Concurring." There is no entry in these fields if there are no additional opinions, such as in instances when the prevailing opinion was unanimous.

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101. *See, e.g.*, *Compendium*, *supra* note 2 (search "10439") (displaying *DSU Medical Corporation v. JMS Co.*, 471 F.3d 1293 (Fed. Cir. 2006), as an example of a partial en banc opinion).

102. *Compendium*, *supra* note 2 (select "Document Type: Opinion"; "En Banc: Yes; Partial").

103. *E.g.*, Amgen Inc. v. Sandoz Inc., 877 F.3d 1315, 1319 (Fed. Cir. 2017) (listing the judges on page three of the original Federal Circuit opinion).

11. Opinion 1 Author

"Opinion 1 Author" contains the last name of the judge who authored the prevailing opinion. In the case of a per curiam opinion, this field is coded as "Per Curiam."

12. Opinion 2 Author and Opinion 3 Author

The remaining opinion author fields are for the authors of additional opinions in the document, typically dissents and concurrences.

13. Notes

The "Notes" field indicates anything particularly unusual about the document and identifies the corresponding record for a duplicate. It also describes resolutions of particular issues that arose during coding.

14. Tribunal of Origin

A recent addition to the *Compendium* is information about the specific tribunal from where the appeal originated. The purpose of this field is to provide more specificity than just "DCT" or "PATO." Currently, the *Compendium* contains only data on the "Tribunal of Origin" for appeals arising from the USPTO. This information is coded as "BPAI," "PTAB," or "TTAB."

C. Data Verification

Because multiple researchers collected the documents used in the *Compendium* at multiple times over the span of several years, the data underwent additional verification in 2017. Verification involved re-collecting all of the information on the Federal Circuit's website and comparing it to an export of relevant fields from the *Compendium* to determine whether any records were missing or duplicated. That process revealed some minor inconsistencies with the Federal Circuit's current website, mainly consisting of formatting issues. A small number of new documents were added and others flagged as duplicates. The biggest issue identified through this verification process was the discovery that about seventy decisions in appeals arising from the district courts from September 1, 2012, through April 1, 2013, were no longer on the Federal Circuit's website. These decisions are included in the *Compendium*. A follow-up comparison of the results of a Lexis search to the *Compendium* for this period revealed an additional nineteen missing decisions arising from the USPTO

from that time period.[104] A list of the specific missing decisions was sent to the court's webmaster.

In addition, fifty records from each year—over 10% of the database—were re-collected and coded by a single research assistant and compared to the corresponding record in the database.[105] Due to the issue identified above, data from the period September 1, 2012, through April 1, 2013, were not included in this analysis. This review revealed a generally high degree of agreement among coders. However, it also revealed a handful of systematic data cleanup tasks that were necessary (for example, the "Opinion 2" field for some records had been coded with "Dissent" while others were coded as "Dissenting"). Another verification review and inter-coder agreement assessment was subsequently conducted. Analysis of this comparison indicated extremely high agreement, particularly when two systematic coding differences were addressed. The results of this analysis are contained in Appendix K.

Another verification step compared counts of a particular type of document—Rule 36 affirmances—to the counts obtained from a commercial database.[106] The results of this comparison align very closely.[107]

Finally, note that while no collection of data is perfect, data can have

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104. Documents were identified using the search "Appeal /s "United States Patent and Trademark Office"" and then manually compared to the *Compendium*. The differences consisted of four Rule 36 affirmances and nine opinions in 2012, and three Rule 36 affirmances and three opinions in 2013.

105. Cohen's kappas were also calculated for the data set for the period 2004 to 2013 in connection with *Disuniformity*. Those numbers are similarly high. *See Disuniformity*, *supra* note 15, at 2043 app. A.

106. The following procedure was used: counts were obtained from the *Compendium* on a yearly basis for Rule 36 affirmances in appeals arising from both the district courts and USPTO. Searches were then run on Lexis on a yearly basis for documents from the Federal Circuit using the search strings "Affirmed. See Fed. Cir. R. 36" & (Appeal /s "United States Patent and Trademark Office") and "Affirmed. See Fed. Cir. R. 36" & (Appeal /s "United States District Court"). The results from a sample year were compared in order to identify possible reasons for the slight variations in counts; this indicated that the difference was due to slight variations produced by the Lexis search methodology. For example, *Bose Corp. v. SDI Techs., Inc.*, 670 F. App'x 717 (Fed. Cir. 2016), appeared in the *Compendium* but not in the Lexis search. In this case, it was because the Lexis document indicated that the appeal was from the "Patent and Trade-mark Office" rather than the "Patent and Trademark Office." Another example is *Schmirler v. Kappos*, 477 F. App'x 741 (Fed. Cir. 2012), which appeared in the list of Lexis search results for the USPTO search but is actually an appeal arising from a district court. Given this analysis, no comprehensive comparison with Lexis output is planned.

107. *See infra* Appendix B.

greater or lesser amounts of uncertainty. In general, the data set currently contained in the *Compendium* is highly objective and has been subjected to extensive verification. That said, there is always room for improvement. As one example, not all appeals to the Federal Circuit that arise from the district courts are conventional patent infringement cases.[108] A future project involves distinguishing patent cases from other types of cases arising from the district courts. A major goal of the *Compendium* is continued improvement to the database while ensuring that all future use of the database is reverse-compatible with past uses in order to maximize the ability of researchers to conduct inter-study comparisons.

III. DESCRIPTIVE STATISTICS

This Part draws upon the *Compendium* to provide metrics on the documents released by the Federal Circuit on its website and the decisions it has issued. The numbers used in these figures can be found in the appendices.

A. Types of Documents

The following graphs show the breakdown of types of documents in the *Compendium* by year. As noted above in Part II, there are no Rule 36 affirmances in the database prior to August 2007.[109] This is not because there were no such affirmances—there were.[110] However, those decisions were not released on the court's website.

108. *See supra* note 30 (comparing the total number of district court appeals to the number of appeals in patent infringement cases).

109. *See supra* Part II (noting the Rule 36 affirmances are not in the database prior to August 2007 because the Federal Circuit's website does not publish any Rule 36 affirmances prior to August 2007).

110. *See supra* note 97–99 and accompanying text.

Figure 1: Types of Documents in Appeals Arising from the District Courts (2004–2017)[111]

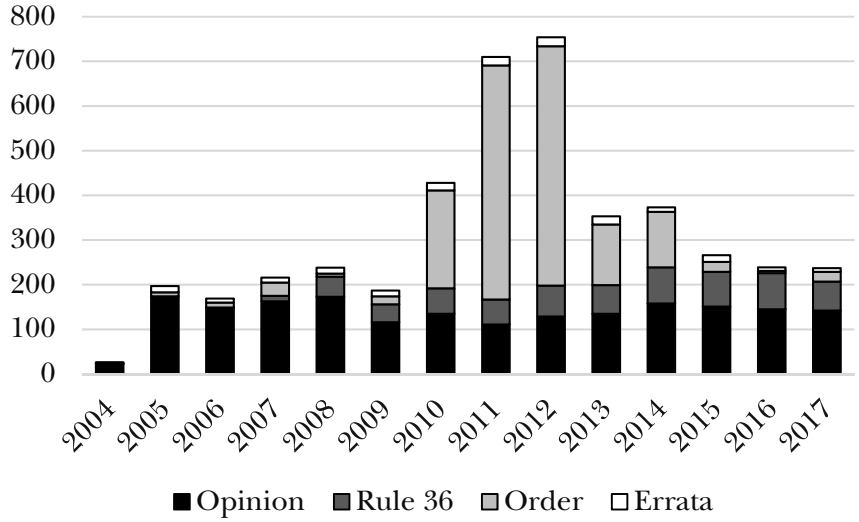
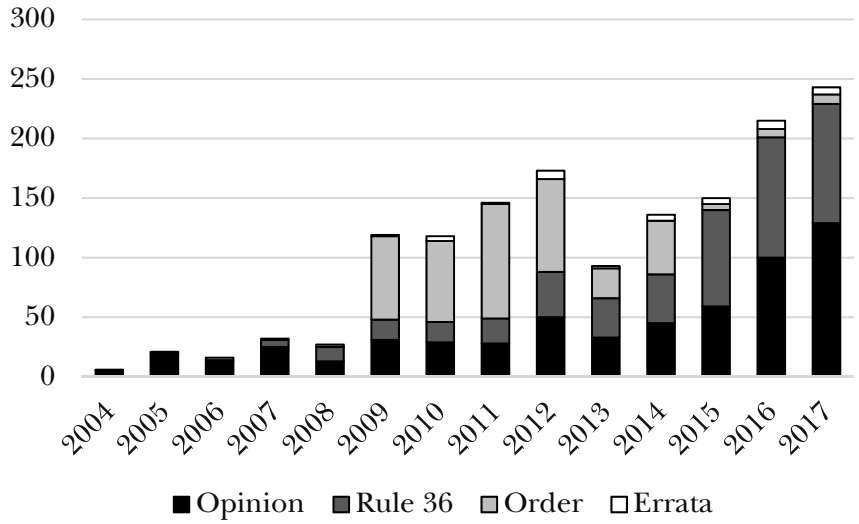


Figure 2: Types of Documents in Appeals Arising from the USPTO (2004–2017)[112]



111. *See infra* Appendix L. As of March 2018, there are six documents classified as "No File" and two documents classified as "Other" in the *Compendium*. These documents are not reflected in the chart.

112. *See infra* Appendix M.

Many of the documents recorded in the *Compendium* are opinions and Rule 36 affirmances. However, Figures 1 and 2 also show that between 2009 and 2014, the Federal Circuit released a large number of orders on its website. That number declined in 2013 and dropped even more precipitously in 2015. This is a data availability issue rather than a reflection of the actual number of orders issued by the court. In other words, during the period 2009 to 2014, the Federal Circuit apparently decided to release its orders via its website but then ceased doing so in 2014 except in certain instances. As of 2017, very few orders are released on the Federal Circuit's website.[113] The court also releases a small number of errata each year. These typically involve minor edits to a previously issued document.

B. Decisions by Court of Origin

This Section focuses on those documents that are the primary subject of legal scrutiny: appellate decisions reviewing a lower tribunal's determination.[114] "Decisions" in the *Compendium* consist of documents classified as opinions—both precedential and nonprecedential—and affirmances under Rule 36, which are necessarily nonprecedential.[115] Because each record in the *Compendium* corresponds to an individual document issued by the Federal Circuit, decisions that resolve multiple appeals that the Federal Circuit consolidated into a single proceeding are treated as a single decision.

Figure 3 shows the number of decisions arising from the district courts and USPTO.[116] As a reminder, the Federal Circuit hears appeals arising from other agencies as well—most significantly, the Merit Systems Protection Board and Court of Appeals for Veterans Claims, which—though not included in the data set—together comprise

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113. *Opinions & Orders*, *supra* note 70 (displaying opinions and orders through January 1, 2017).

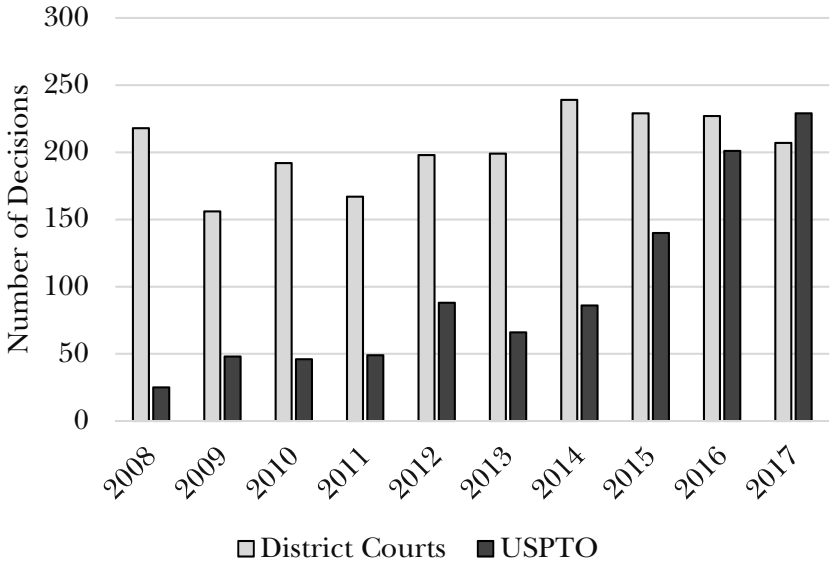
114. Note that typically decisions involving a writ of mandamus (an extraordinary remedy sought to compel an official action) are made through orders and thus are not included in these figures.

115. *See* FED. CIR. R. 36 (establishing that "the court may enter a judgment of affirmance without opinion . . . when it determines that [certain] conditions exist and an opinion would have no precedential value"); *see also* INTERNAL OPERATING PROCEDURES, *supra* note 35, at 20 ("Rule 36 judgments shall not be employed as binding precedent by this court, except in relation to a claim of res judicata, collateral estoppel, or law of the case, and shall carry notice to the nonprecedential effect.").

116. *See infra* Figure 3. Data from 2004 are not shown because the *Compendium* includes only partial data for that year. In addition, keep in mind that summary affirmances under Rule 36 do not begin appearing in the *Compendium* until August 2007.

approximately 20% of the court's docket.[117]

Figure 3: Decisions by Tribunal of Origin (Jan. 1, 2008–Dec. 31, 2017)[118]



117. *See* U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, APPEALS FILED, BY CATEGORY: FY 2016 (2017), http://www.cafc.uscourts.gov/sites/default/files/the-court/statistics/FY16_Caseload_by_Category.pdf. Note that, until recently, the Merit Systems Protection Board and the Court of Appeals for Veterans Claims appeals made up an even more substantial portion (about 33%) of the court's docket. *See* U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, APPEALS FILED, BY CATEGORY: FY 2010 (2011), http://www.cafc.uscourts.gov/sites/default/files/the-court/Caseload_by_Category_Appeals_Filed_2010.pdf.

118. *See infra* Appendix C, Appendix D (compiling and comparing Federal Circuit decisions arising from district courts and the USPTO).

Figure 3 is striking, if not surprising. As numerous commentators have observed,[119] the number of decisions in appeals arising from the district courts has remained relatively constant for the past several years, while the number of decisions in appeals arising from the USPTO has risen sharply.[120] Indeed, in 2017 the number of decisions in appeals arising from the USPTO exceeded those in appeals arising from the district courts—a first since the creation of the Federal Circuit.[121]

Not all of the appeals from the USPTO involve patent issues, however.[122] Figure 4 shows the breakdown of decisions arising from the BPAI and PTAB (patents) versus those arising from the TTAB (trademarks).[123] While the number of decisions arising from the TTAB has ranged from five to nineteen over the ten-year period, the number of decisions arising from the two patent-related USPTO tribunals grew from eighteen in 2008 to over 200 in 2017.[124] In 2017, 93% of the Federal Circuit's decisions in appeals arising from the USPTO involved an appeal from the PTAB.[125]

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119. *See, e.g.*, Evan J. Wallach & Jonathan J. Darrow, *Federal Circuit Review of USPTO Inter Partes Review Decisions, by the Numbers: How the AIA Has Impacted the Caseload of the Federal Circuit*, 98 J. PAT. & TRADEMARK OFF. SOC'Y 105, 113 (2016) (noting that more appeals originate from the USPTO than from other tribunals over which the Federal Circuit has appellate jurisdiction); Vin Gurrieri, *Fed. Circ. Can Handle Crush of PTAB Appeals*, LAW360 (Mar. 8, 2016, 10:21 PM), https://www.law360.com/articles/767352/fed-circ-can-handle-crush-of-ptab-appeals (attributing the increase in patent opinions issued by the Federal Circuit in 2016 to appeals originating from the USPTO); Jason Rantanen, *The Federal Circuit and Appeals from the Patent Office*, PATENTLY-O (Dec. 4, 2016), https://patentlyo.com/patent/2016/12/federal-circuit-appeals.html [hereinafter *Appeals from the Patent Office*] (illustrating the increase in appeals from the USPTO docketed at the Federal Circuit).

120. *Appeals from the Patent Office*, *supra* note 119 (highlighting the sharp increase in appeals from the USPTO and the relative consistency in appeals from district courts between 2013 and 2016).

121. *See supra* Figure 3.

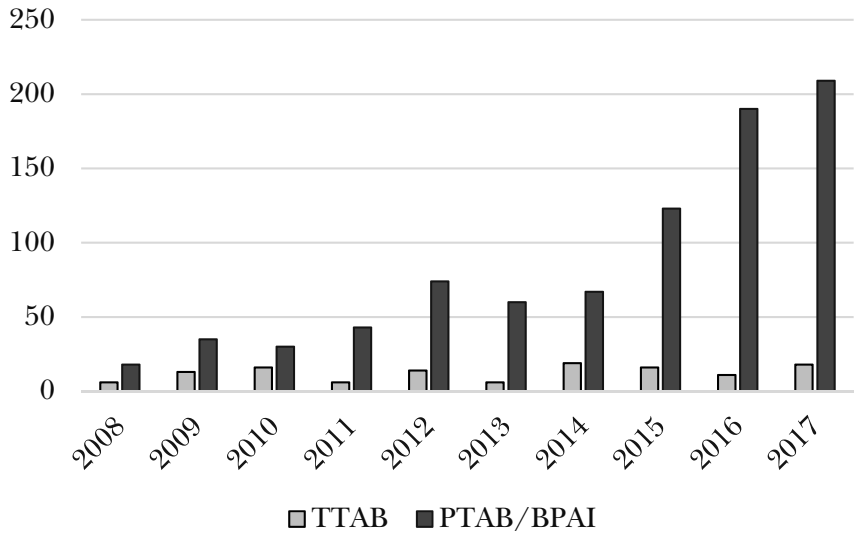
122. *See supra* note 31 and accompanying text (clarifying that trademark appeals also arise from the USPTO).

123. *See infra* Figure 4.

124. *See infra* Figure 4.

125. *See infra* Figure 4.

Figure 4: Federal Circuit Decisions by USPTO Tribunal of Origin (Jan. 1, 2008–Dec. 31, 2017)[126]



Because TTAB appeals make up only an extremely small—and diminishing—portion of the total Federal Circuit decisions in appeals from the USPTO, the remainder of this Article does not parse out those decisions from those from the BPAI and PTAB. However, the *Compendium* allows for such analyses to be easily conducted.

C. The Federal Circuit's Precedential Opinions

One measure of a court's performance might be the rate at which it issues precedential opinions. After all, if the law obtains its shape from precedent, then the court's production of those opinions is an important aspect of how well it is doing.

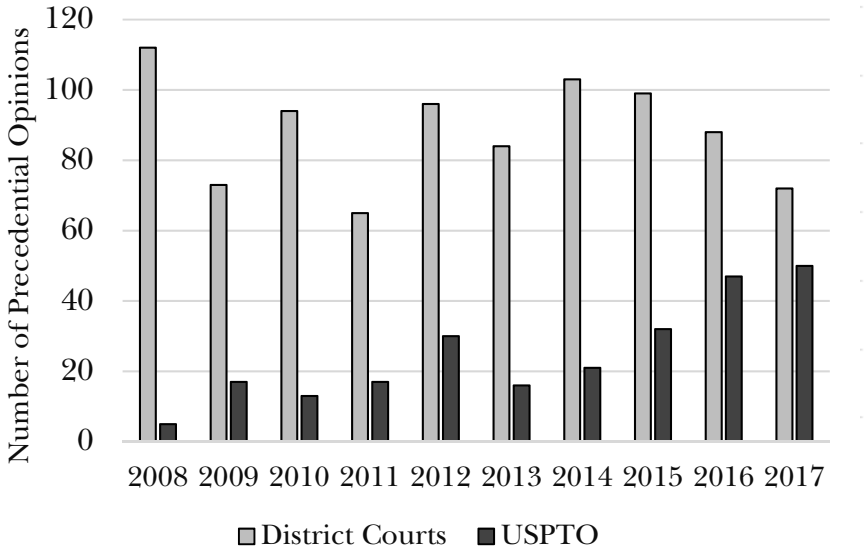
Viewed in these terms, the Federal Circuit continues to produce precedential opinions at a high rate. Figure 5 shows that the Federal Circuit has ramped up its issuance of precedential opinions in recent years[127]—particularly in appeals arising from the USPTO, perhaps the area where the law currently needs the most clarification and

126. *See infra* Appendix E (comparing Federal Circuit decisions arising from the TTAB with those arising from patent-related USPTO tribunals over the same ten-year period to highlight the relative consistency in the number of trademark decisions and the sharp increase in patent decisions).

127. *See infra* Figure 5.

interpretation given the sweeping changes created by the 2011 America Invents Act.[128] As Figure 5 shows, a greater and greater portion of the court's precedential opinions in patent cases stem from appeals from the USPTO, even as the court continues to issue many precedential opinions in appeals arising from the district courts.

Figure 5: Precedential Opinions by Tribunal of Origin (Jan. 1, 2008–Dec. 31, 2017)[129]



D. The Other Decisions: Nonprecedential Opinions and Rule 36 Affirmances

The precedential opinions depicted in Figure 5 do not make up all the court's decisions in appeals. To the contrary, a substantial—and

128. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, 284 (2011) (codified in scattered sections of 35 U.S.C.) (stating as its purpose "[t]o amend title 35, United States Code, to provide for patent reform"); *see also* Lee Petherbridge & Jason Rantanen, *Toward a System of Invention Registration: The Leahy-Smith America Invents Act*, 110 MICH. L. REV. FIRST IMPRESSIONS 24, 24 (2011); Eric P. Vandenburg, *America Invents Act: How It Affects Small Businesses*, 50 IDAHO L. REV. 201, 201–02 (2013) (characterizing the transition of "America's patent system from 'first-to-invent' (FTI) to 'first-to-file' (FTF)" as "the most significant change to the Patent Act since 1952").

129. *See infra* Appendix C, Appendix D (analyzing data on precedential opinions issued by the Federal Circuit in appeals arising from both the districts courts and the USPTO between 2007 and 2017).

growing—number of the court's decisions consist of nonprecedential opinions and Rule 36 affirmances.[130] This set of the court's decisions matters for at least three reasons. First, if the Federal Circuit is issuing more nonprecedential opinions relative to precedential opinions, it may not be "keeping up" with the need for judicial interpretation and clarification of the law. In other words, disputes are happening faster than the court can erect signposts. Second, if the Federal Circuit is issuing a higher proportion of its decisions as Rule 36 affirmances, that may mean that the Federal Circuit's overall affirmance rate is increasing, something that might have profound effects for discussions on deference, especially informal deference.[131] Third, the use of Rule 36 affirmances may mask substantive patterns in the court's decision making.[132]

1. The district courts

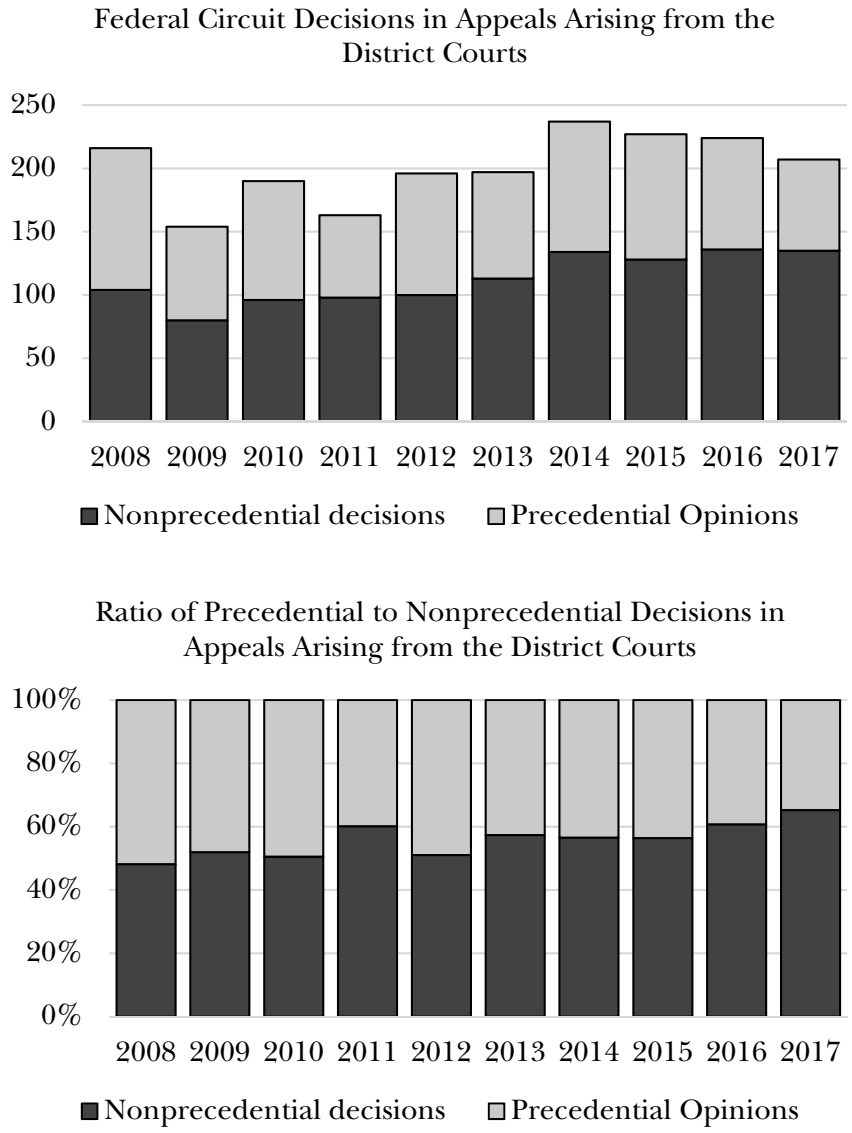
Figure 6 shows the distribution of precedential and nonprecedential decisions in appeals arising from the district courts from January 2008 to December 2017. Nonprecedential decisions include affirmances under Rule 36.

130. *See infra Figure 6* (presenting the total number of nonprecedential and precedential opinions issued by the Federal Circuit in appeals arising from district courts between 2008 and 2017 and emphasizing the increase in nonprecedential opinions at the expense of precedential opinions).

131. *See* J. Jonas Anderson & Peter S. Menell, *Informal Deference: A Historical, Empirical, and Normative Analysis of Patent Claim Construction*, 108 NW. U. L. REV. 1, 55, 61 (2014) (emphasizing that the increase in Rule 36 affirmances of claim construction cases from 18.7% in 2005 to 30.2% in the time since "supports a shift toward informal deference").

132. *See, e.g.*, Gugliuzza & Lemley, *supra* note 14, (manuscript at 38) (hypothesizing that "judges who are more likely to vote to uphold validity are also more likely to cast invalidity votes in 'hidden' decisions under Rule 36 as opposed to written opinions"); Rantanen, *supra* note 4, at 242–43 (summarizing the effects of not counting Rule 36 affirmances).

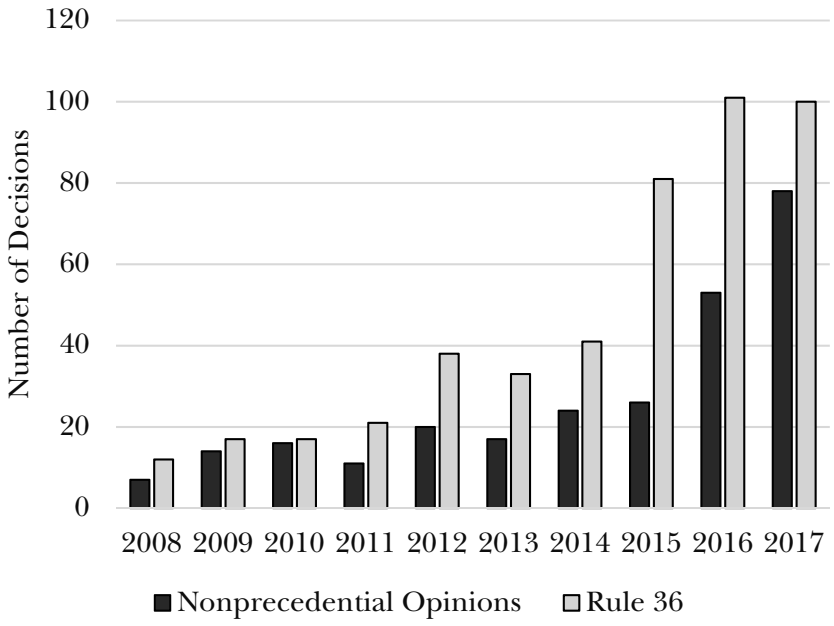
Figure 6: Precedential vs. Nonprecedential Decisions in Appeals Arising from the District Courts[133]



133. *See infra* Appendix C (cataloguing the precedential and nonprecedential decisions issued by the Federal Circuit in appeals arising from district courts each year between 2008 and 2017).

As the charts in Figure 6 illustrate, while the number of precedential opinions has fluctuated but otherwise remained relatively constant, the Federal Circuit is resolving more appeals in cases arising from the district courts through nonprecedential opinions and Rule 36 affirmances. The result is that nonprecedential decisions make up a greater portion of decisions in appeals arising from the district courts: 48% in 2008 as compared to 65% in 2017. Put another way, the Federal Circuit is resolving more appeals in cases arising from the district courts through nonprecedential mechanisms than precedential mechanisms.

Figure 7: Type of Nonprecedential Decisions in Appeals Arising from the District Courts (Jan. 1, 2008–Dec. 31, 2017)[134]



134. *See infra* Appendix C (isolating the number of Rule 36 affirmances issued by the Federal Circuit in appeals arising from district courts between 2008 and 2017 from other nonprecedential opinions issued in appeals from district courts over the same period).

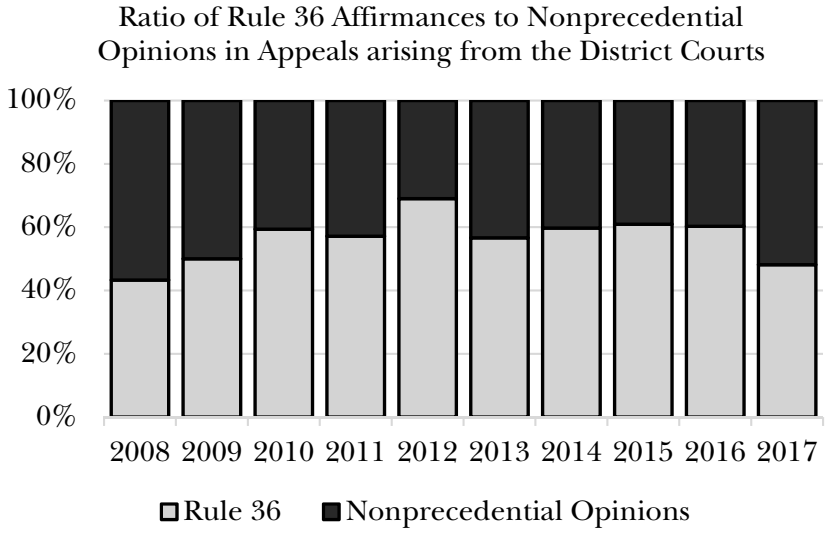
Growth of nonprecedential decisions has involved increasing numbers of both nonprecedential opinions and Rule 36 affirmances. Whereas in 2009 there were forty nonprecedential opinions and forty Rule 36 affirmances, in 2016 there were substantially more of both, with fifty-four nonprecedential opinions and eighty-two Rule 36 affirmances.[135]

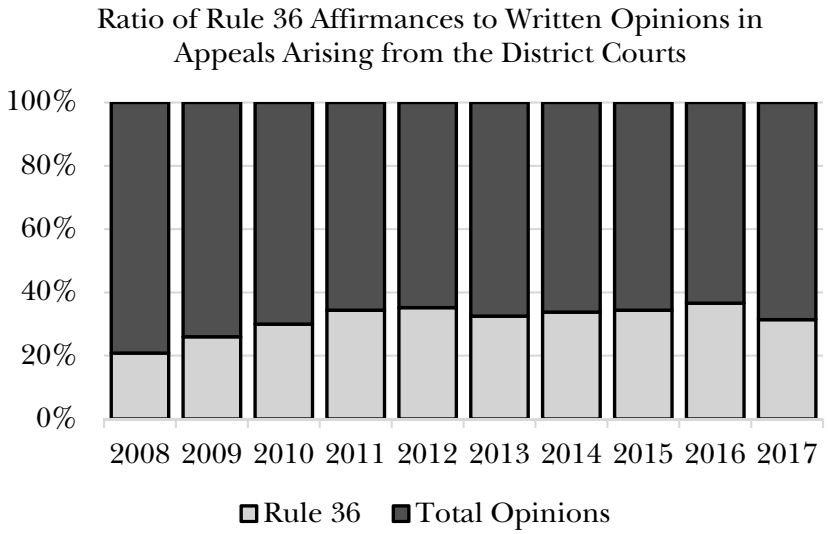
That said, the charts in Figure 8 show that the *ratio* of summary affirmances to written opinions and nonprecedential opinions has not exhibited a continuously upward trend, at least since 2010.[136] In both 2010 and 2016, approximately 60% of all nonprecedential decisions were Rule 36 affirmances; only 2012 (69%) and 2017 (48%) differed by more than a few percentage points.

135. *See supra* Figure 7.

136. For nonprecedential decisions, the percentage has hovered around 60% Rule 36 affirmances since 2010, excluding 2012 (69%) and 2017 (47%). *See infra* Appendix B.

Figure 8: Ratio of Rule 36 Affirmances in Appeals Arising from the District Courts[137]





137. *See infra* Appendix C (evaluating all opinions issued by the Federal Circuit in appeals arising from district courts from 2008 to 2017 to determine the ratio of Rule

2. The USPTO

The data presented in Section III.B show a dramatic growth in the number of Federal Circuit decisions in appeals arising from the USPTO.[138] What procedural mechanism has the Federal Circuit used to resolve those appeals?

Figure 9 shows that just as the number of precedential opinions in appeals arising from the USPTO has grown over the past few years, so too has the number of nonprecedential decisions. In 2009, there were seventeen precedential opinions and thirty-one nonprecedential decisions; in 2016, there were forty-seven precedential opinions and 154 nonprecedential decisions.[139] As a portion of all appeals arising from the USPTO, the percentage of appeals resolved through nonprecedential decisions grew from 65% in 2009 to 77% in 2016.[140] In other words, while the Federal Circuit is issuing an increased number of precedential opinions in appeals arising from the USPTO, it continues to issue more nonprecedential decisions overall.

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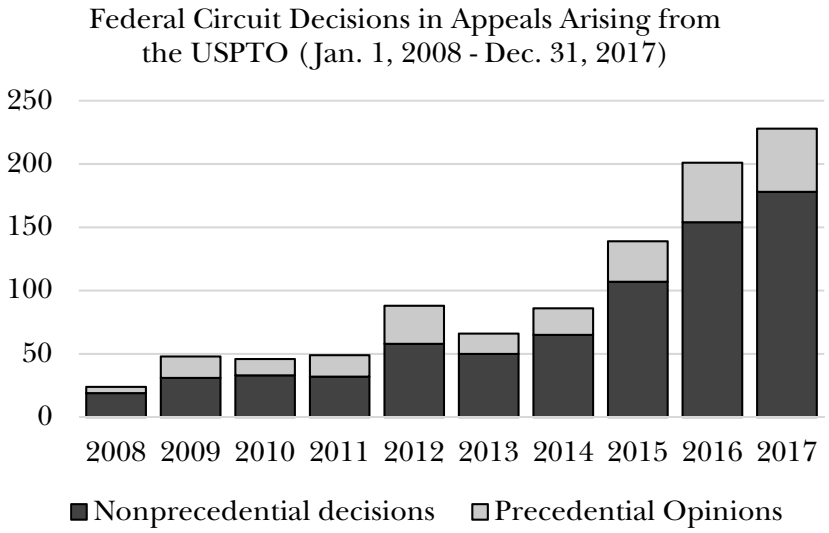
36 affirmances to other nonprecedential opinions issued and to ascertain the ratio of Rule 36 affirmances to written opinions).

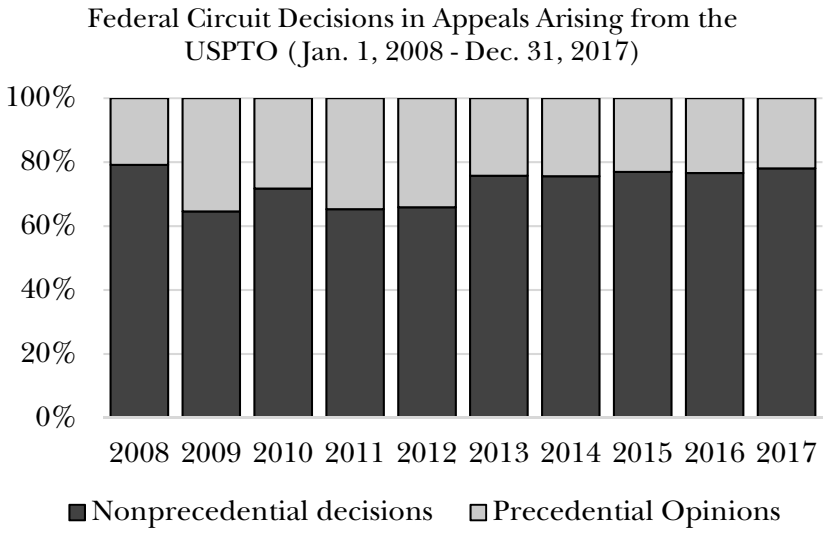
138. *See supra* Figures 3, 4 (showing a clear increase in Federal Circuit decisions arising from the USPTO between 2008 and 2017).

139. *See infra* Figure 9; *infra* Appendix D.

140. *See infra* Figure 9; *infra* Appendix D.

Figure 9: Precedential and Nonprecedential Decisions in Appeals Arising from the USPTO[141]

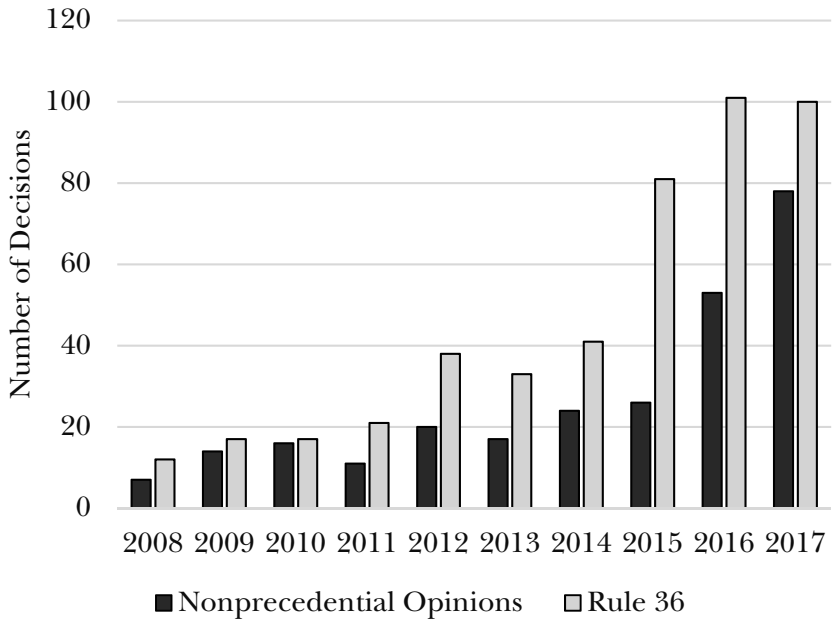




141. *See infra* Appendix D (compiling all decisions issued by the Federal Circuit in appeals arising from the USPTO from 2008 to 2017 and separating the decisions into precedential and nonprecedential opinions).

The growth in nonprecedential decisions has been accompanied by more Rule 36 affirmances. Figure 10 shows the types of nonprecedential decisions in appeals arising from the USPTO. The increase in the lighter bar—the Rule 36 affirmances—is readily apparent.

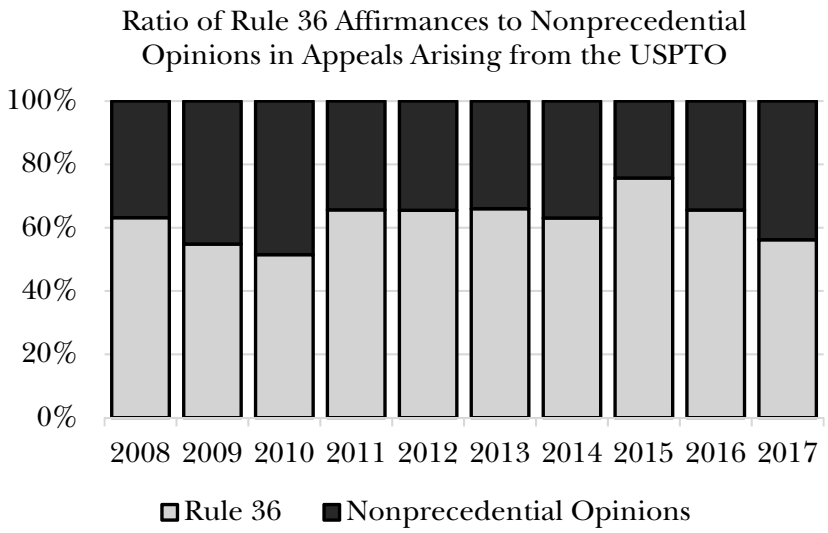
Figure 10: Types of Nonprecedential Decisions in Appeals Arising from the USPTO (Jan. 1, 2008–Dec. 31, 2017)[142]

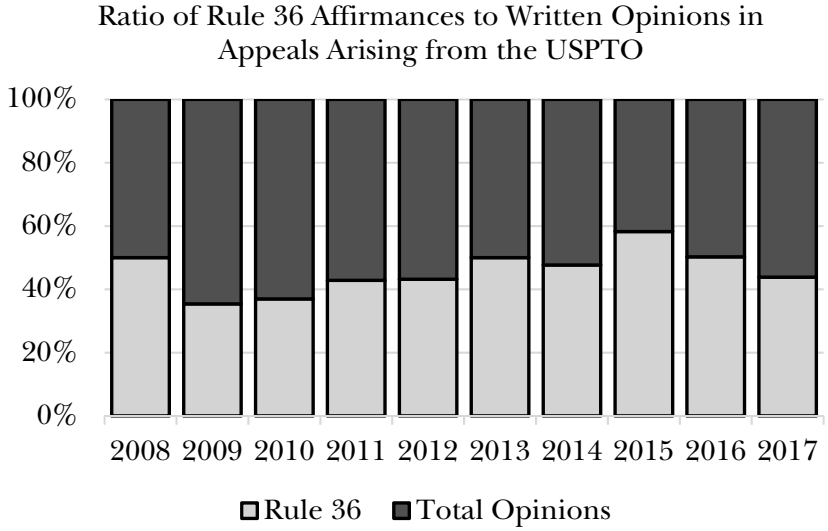


The sheer number of Rule 36 affirmances might lead one to think that the makeup of those decisions is changing—that perhaps the court is resolving appeals through Rule 36 affirmances at a higher rate. But since the court is resolving more appeals from the USPTO generally, perhaps the increase is just reflective of the increase in input. Figure 11 shows the ratio of Rule 36 affirmances both to nonprecedential opinions specifically and to all opinions generally.

142. *See infra* Appendix D (categorizing the decisions issued by the Federal Circuit in appeals arising from the USPTO between 2008 and 2017 to compare the number of Rule 36 affirmances issued with the number of nonprecedential opinions handed down over the same period).

Figure 11: Ratio of Rule 36 Affirmances to Opinions[143]





143. *See infra* Appendix D (grouping together Rule 36 affirmances, nonprecedential opinions, and total written opinions issued by the Federal Circuit in appeals arising from the USPTO from 2008 to 2017 and comparing the annual totals of each).

The overall trend of these figures is far from clear. Certainly, however, they do not suggest a continuing trend of the court's increasing frequency of Rule 36 usage.[144] Indeed, although recent narratives have focused on an increase in the court's usage of Rule 36 affirmances, Figure 11 indicates that the *frequency* at which the court used Rule 36 affirmances has dropped over the last two years. One might speculate that perhaps this is due to the lack of suitability of the appeals themselves to the Rule 36 mechanism,[145] but it could also be due to recent criticism of the court's use of Rule 36 affirmances—particularly that of Dennis Crouch, who released a draft of his article *Wrongly Affirmed Without Opinion* on the Patently-O weblog on February 2, 2017, in which he challenged the validity of using the Rule 36 mechanism in appeals arising from the USPTO.[146] The *Compendium* reveals that from that date through the end of 2017, only 42% (88/210) of decisions in appeals arising from the USPTO have involved a Rule 36 affirmance. Together with the data from the district court appeals, this evidence suggests that the Federal Circuit's use of Rule 36 affirmances continues to be worth close analysis.[147]

E. Degree of Unanimity in Precedential Federal Circuit Opinions

The data recorded in the *Compendium* also contains information about the nature of the court's decision—in particular, whether the panel was unanimous in its opinion and whether there was a dissent or other additional writing by one of the panel members. This information provides

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144. Keep in mind that until recently, there were relatively few decisions in appeals arising from the USPTO, thus limiting the value of these graphs for those earlier years.

145. *See* FED. CIR. R. 36 (stipulating that the Federal Circuit "may enter a judgment of affirmance without opinion, citing this rule, when it determines" that one of five specific conditions exist "and an opinion would have no precedential value"); *see also* Jeremy Bock, *Restructuring the Federal Circuit*, 3 N.Y.U. J. INTELL. PROP. & ENT. L. 197, 238 (2014) (clarifying that "an election to issue a Rule 36 judgment requires panel unanimity").

146. *See* Dennis Crouch, *The Statute Bars Affirmances Without Opinion*, PATENTLY-O (Feb. 2, 2017), https://patentlyo.com/patent/2017/02/statute-affirmances-opinion.html (arguing that "Rule 36 Judgments Without Opinion are (almost by definition) not opinions and thus do not satisfy the opinion requirement" of either the Patent Act or the Lanham Act); *see also* Crouch, *supra* note 14, at 562 (concluding that the Federal Circuit's use of Rule 36 judgments "violates federal statutory law"). Between February 2, 2017, when Professor Crouch first released a draft of his Rule 36 study, and the end of 2018, only 40% of the decisions arising from the USPTO have involved a Rule 36 affirmance.

147. Indeed, at least one study on the subject is already complete. *See* Gugliuzza & Lemley, *supra* note 14 (manuscript at 2–3) (investigating how the Federal Circuit has applied its test for patentable subject matter by analyzing "precedential opinions, non-precedential opinions, and, crucially, affirmances without opinion under Federal Rule 36").

a way to examine the degree of agreement among the judges on the court.

1. Appeals arising from the district courts

The early 2010s were marked by extraordinary disagreement among Federal Circuit judges in appeals arising from the district courts.[148] The disagreements were so apparent that they prompted an empirical study examining the lack of uniformity and offering possible reasons for its existence.[149]

Since that study, however, the formal disagreement among Federal Circuit judges in precedential opinions has fallen, with the judges finding common ground more and more often.[150] The judges—who used to reach unanimous decisions in fewer than 60% of precedential opinions—now agree at a much higher rate.[151] In fact, of the seventy-two precedential opinions in appeals arising from the district courts that the Federal Circuit issued in 2017, only eleven were not been unanimous—an 85% unanimity rate.[152] Figure 12 shows the number of opinions in appeals arising from the district courts that were unanimous (excluding en banc decisions, which involve the court sitting as a whole).

148. *Disuniformity*, *supra* note 15, at 2019 fig.1 (illustrating the downtrend in Federal Circuit decisional unanimity between 2010 and 2013).

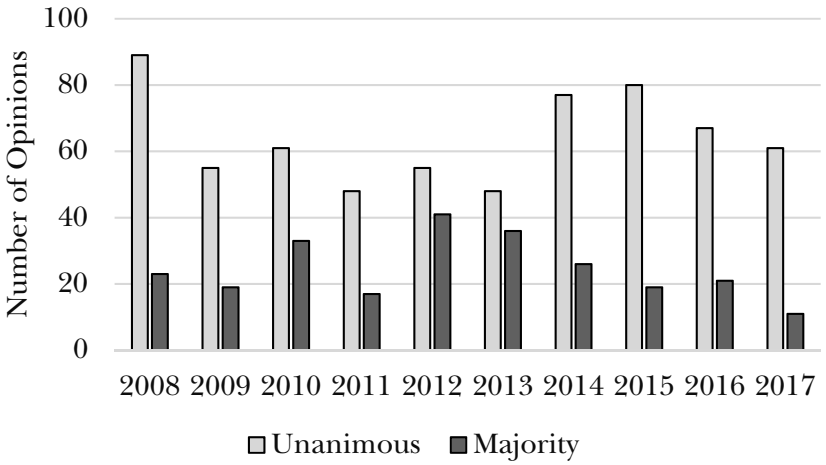
149. *See id.* at 2007 (measuring "open decisional disagreement between Federal Circuit judges" and attributing a decrease in decisional uniformity to the disruptive influence of the Supreme Court and "personnel changes at the Federal Circuit").

150. *See infra* Figure 12 (highlighting the sustained shift toward unanimous precedential opinions and accompanying trend downward in majority decisions from 2013 to the present).

151. Opinions of the court sitting en banc are not included; as discussed in Section III.D, there are only a handful of such decisions and they almost always involve some alternate viewpoints by members of the court. *See supra* Section III.D; *see also Disuniformity*, *supra* note 15, at 2021 (drawing attention to "an astonishing 37% unanimity rate for precedential opinions" in a rolling analysis in the early 2010s).

152. *See infra* Figure 12.

Figure 12: Agreement Among Panel in Precedential Opinions in Appeals Arising from the District Courts (Jan. 1, 2007–Dec. 31, 2017)[153]



2. Appeals arising from the USPTO

Because there were relatively few precedential opinions in appeals arising from the USPTO until recently, there were inherently fewer opportunities for dissent in those decisions.[154] Indeed, during the early portions of the data set, there were relatively few dissents in precedential opinions arising from the USPTO. As the number of decisions in appeals arising from the USPTO has increased, however, so too have the dissents.[155] Over the past three years—2015, 2016, and 2017—twenty-seven precedential opinions in appeals arising from the USPTO contained a dissent.[156]

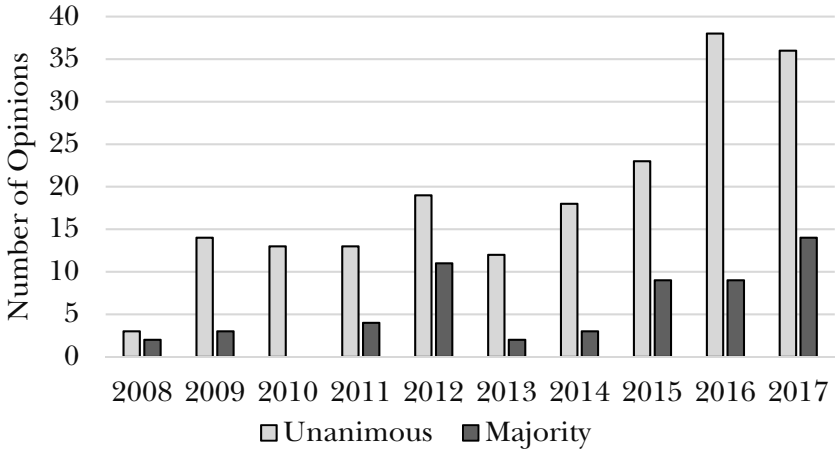
153. *See infra* Appendix F (cataloging the number of opinions in appeals arising from the district courts that were unanimous, excluding en banc decisions that involve the court sitting as a whole).

154. *See supra* note 140 and accompanying text.

155. *See infra* Figure 13 (showcasing the clear uptick in dissents in precedential opinions issued by the Federal Circuit from appeals arising from the USPTO between 2014 and 2017); Appendix G.

156. *See infra* Appendix G.

Figure 13: Agreement in Precedential Opinions in Appeals Arising from USPTO (Jan. 1, 2007–Dec. 31, 2017)[157]

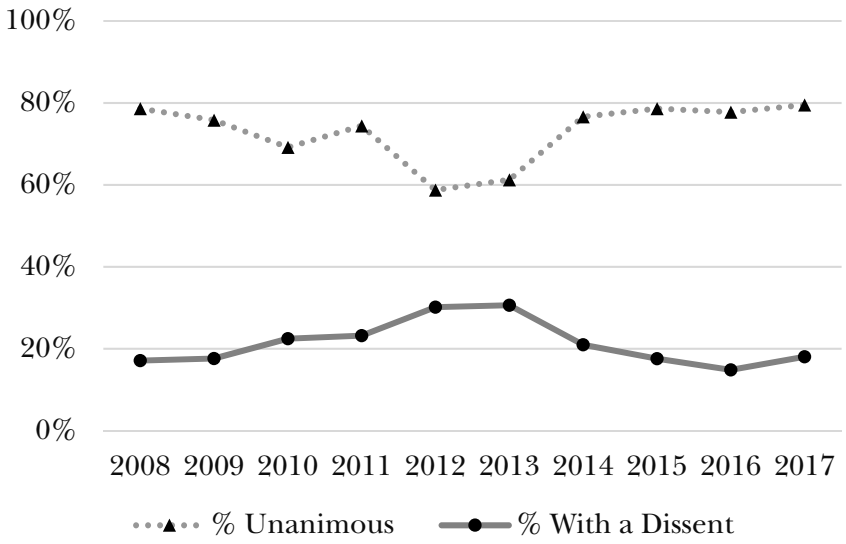


3. Dissents in patent appeals generally

Despite the increasing number of dissents in appeals arising from the USPTO, the below figure illustrates the decline of disagreement in the court's precedential opinions arising from appeals of district court and USPTO decisions considered as a whole.

157. *See infra* Appendix G (aggregating precedential opinions issued annually by the Federal Circuit in appeals from the USPTO from 2008 to 2017 and separating unanimous decisions from decisions in which at least one judge dissented).

Figure 14: Rates of Agreement Among Panel Members in Appeals Arising from the USPTO and District Courts Collectively[158]*p*



The goal of this Article is to report, not to speculate. Nevertheless, some possible explanations for why the judges are agreeing more and dissenting less come to mind. One possible hypothesis is that there is simply far more work to be done.[159] Federal Circuit judges may just not have the time anymore to express separate opinions.[160] Another possible reason is the Supreme Court's consistently high degree of review of the court's decisions, which often reverses the Federal Circuit, requiring it to "do over" the issue.[161] Federal Circuit judges may want to clearly signal those decisions that they think that the Supreme Court ought to review; one way to do this would be to only dissent in cases in which the dissenting judge feels especially strongly that the majority got it wrong—i.e., don't "cry wolf." A third possible reason is a change in culture at the Federal Circuit, one that could

158. *See infra* Appendix F; Appendix G.

159. *See Federal Judicial Caseload Statistics 2017*, U.S. CTS., http://www.uscourts.gov/statistics-reports/federal-judicial-caseload-statistics-2017 (last visited May 9, 2018) (showing that total filings in the Federal Circuit have increased 45% since 2013).

160. *See Disuniformity*, *supra* note 15, at 2021 (describing research supporting this hypothesis but questioning its consistency with the data available at the time).

161. *See* Roy E. Hofer, *Supreme Court Reversal Rates: Evaluating the Federal Courts of Appeals*, LANDSLIDE, Jan./Feb. 2010, at 8, 9–10 (noting a 92.3% Supreme Court reversal rate for Federal Circuit appeals in patent cases).

relate to both preceding shifts. In the face of the increased number of decisions needing to be made, criticism by people outside the court, and the continued review by the Supreme Court, perhaps the judges are coalescing as a unit and presenting a unified outward face. This would suggest that litigant attempts to win an advantage by focusing on divisions within the court are unlikely to be successful. This may be particularly likely given the relatively low number of new faces on the court in recent years and the change of leadership at the Court.[162] Between 2010 and 2013, there were six new appointees to the court; since 2013, there has been only one.[163]

F. Decisions by Individual Judges

A final metric of interest relates to the actions of individual judges on the court based on the parameters just discussed. Figure 15 shows the number of written precedential and non-precedential opinions authored by Federal Circuit judges between January 1, 2014, and December 31, 2017.[164] Over that time period, Judge Alan Lourie wrote the most opinions—ninety-two—followed by Judge Sharon Prost at eighty-four.[165] Considering authorship of precedential opinions, there is a wide degree of variation: at the high end is Judge Dyk, who wrote fifty-two precedential opinions during the four-year span; at the low

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162. In May 2014, Judge Randall Rader resigned as Chief Judge. *See* Joe Mullin, *Top US Patent Judge Resigns Following "Ethical Breach*," ARS TECHNICA (June 16, 2014, 10:12 PM), https://arstechnica.com/tech-policy/2014/06/top-us-patent-judge-resigns-following-ethical-breach. Judge Sharon Prost took over as Chief Judge later that month. *See* Dennis Crouch, *A Warm Welcome to Chief Judge Prost*, PATENTLY-O (May 23, 2014), https://patentlyo.com/patent/2014/05/welcome-chief-prost.html. Apart from Judge Prost's succession to Chief Judge and the appointment of Judge Kara Farnandez Stoll to the bench after Judge Rader's resignation, the last few years have been remarkably consistent in terms of judicial identity. *Compare* Don W. Martens, *Filling the Vacancies on the Federal Circuit*, LANDSLIDE, Mar./Apr. 2010, at 1, 1 (describing the potential for a "major turnover of judges" on the Federal Circuit in 2010), *with Judges*, U.S. CT. APPEALS FOR FED. CIR., http://www.cafc.uscourts.gov/judges (last visited May 9, 2018) (showing that the Federal Circuit has consisted of the same twelve judges since July 7, 2015).

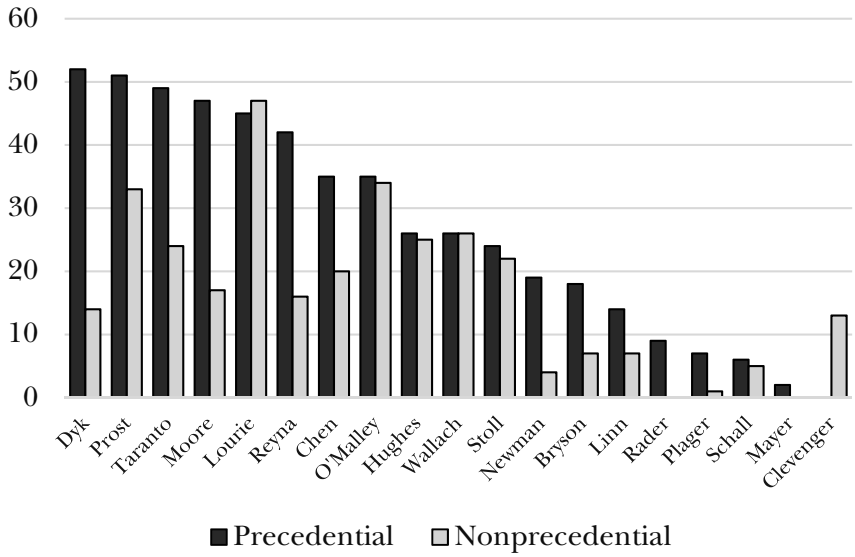
163. Judges Kathleen O'Malley, Jimmie Reyna, Evan Wallach, Richard Taranto, Raymond Chen, and Todd Hughes joined the court between 2010 and 2013. *Judges*, *supra* note 162. Judge Stoll joined the court in 2015. *Id.*

164. *See infra* Figure 15. These statistics are limited to opinions for the court and thus do not count concurring or dissenting opinions authored by the judge.

165. *See infra* Appendix H (collecting and categorizing the written precedential and nonprecedential opinions written by each judge on the Federal Circuit between 2014 and 2017).

end among active judges is Judge Newman, who wrote nineteen. The judges on the right side of Figure 15 are judges who had senior status for the entire time period, with the exception of Judge Randall Rader.[166] Excluding Judge Kara Farnandez Stoll, who joined the court in mid-2015,[167] the average number of precedential opinions among the active judges was thirty-nine.[168]

Figure 15: Precedential and Nonprecedential Opinions Authored by Federal Circuit Judges in Appeals from District Courts and the USPTO (2014–2017)[169]

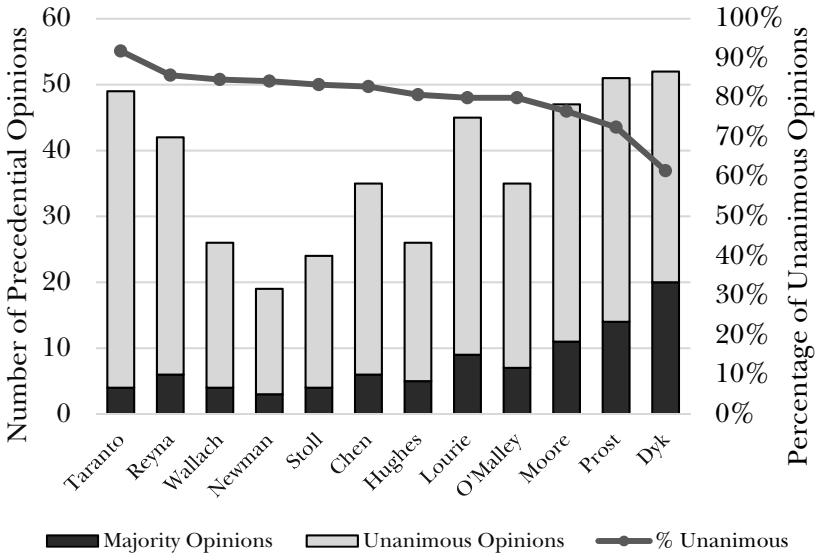


Of the twelve active judges, Judge Richard Taranto had the most success at obtaining unanimity in the precedential opinions he authored.[170] Ninety percent—or forty-five out of forty-nine—of Judge Taranto's precedential opinions garnered the unanimous support of the other two panel members.[171] Conversely, Judge Dyk's opinions frequently carried the day but often were joined by only one other

166. As noted above, Judge Rader resigned from the court in 2014. *See supra* note 162.
167. *See supra* note 163 and accompanying text.
168. *See infra* Appendix H.
169. *See infra* Appendix H (assigning the precedential and nonprecedential decisions issued by the Federal Circuit between 2014 and 2017 to the judge responsible for authoring each opinion).
170. *See supra* Figure 15.
171. *See supra* Figure 15.

member of the panel. Only 60%—or thirty-two out of fifty-two—of Judge Dyk's precedential opinions were unanimous.[172]

Figure 16: Majority and Unanimous Precedential Opinions Authored by Federal Circuit Judges in Appeals Arising from the District Courts and USPTO (2014–2017)[173]



Judge Newman's lower number of precedential opinions may be due to her numerous dissents.[174] Figure 17 shows the number of dissents in precedential opinions in appeals from the district courts and USPTO since 2014.[175] As this figure shows, Judge Newman wrote dissenting opinions more than four times as often as Judge Dyk, the next highest dissenter.[176]

172. *See supra* Figure 15.

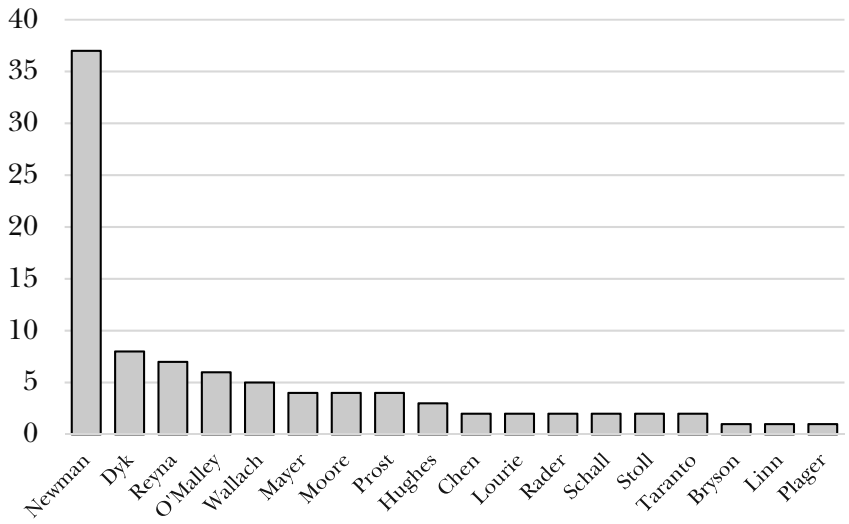
173. *See infra* Appendix I (examining judge authorship of unanimous and majority opinions between 2014 and 2017 to calculate the propensity of each active judge to elicit a dissent from the other sitting judges).

174. *See* Daryl Lim, *I Dissent: The Federal Circuit's "Great Dissenter," Her Influence on the Patent Dialogue, and Why It Matters*, 19 VAND. J. ENT. & TECH. L. 873, 900 (2017) (noting that Judge Newman has penned "more dissents than any Federal Circuit judge, past or present").

175. *See infra* Figure 17.

176. *See infra* Figure 17 (demonstrating that whereas Judge Dyk authored eight dissents between 2014 and 2017, Judge Newman wrote thirty-seven).

Figure 17: Dissents in Precedential Opinions (2014–2017)[177]

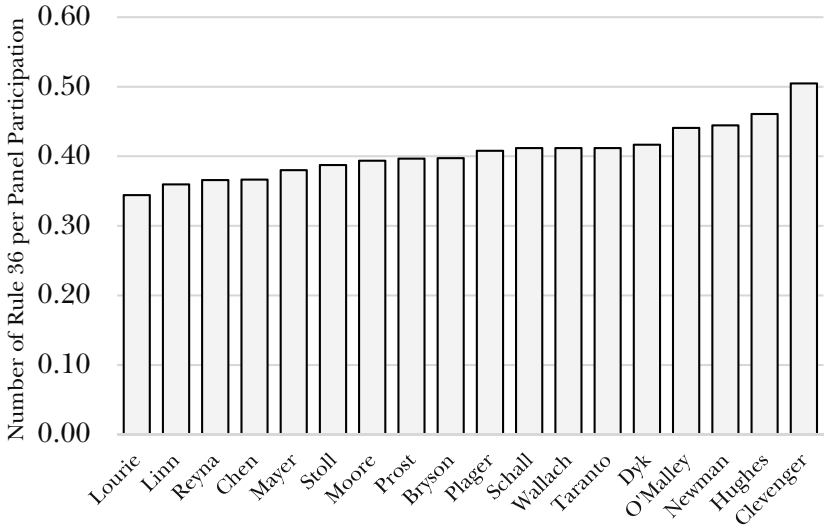


What about Rule 36 affirmances? Figure 18 depicts each judge's ratio of Rule 36 affirmances to participation on a panel that rendered a decision in an appeal arising from the District Court or USPTO.[178] None of the ratios are serious outliers, other than possibly Judge Raymond Clevenger at the high end.

177. *See infra* Appendix H (attributing to each active judge the dissents he or she authored in precedential opinions issued by the Federal Circuit between 2014 and 2017).

178. Figure 18 excludes Judge Rader, who participated in only forty-one panels during this time period.

Figure 18: Ratio of Rule 36 to Panel Participation in Appeals Arising from the District Courts and USPTO (2014–2017)[179]



CONCLUSION

The above data suggest a Federal Circuit hard at work deciding cases and issuing opinions. While commentators, academics, and policymakers frequently criticize the court for its decisions,[180] it is unquestionably fulfilling its primary mandate: deciding appeals and issuing precedential opinions that parties can rely on in the future. The data suggest a court with its nose to the grindstone, focused on getting its job done during a period of skyrocketing demands and limited resources.

The data are, of course, incomplete. For one thing, this type of descriptive statistical overview only provides the bare bones of the court's decisions. It says nothing about the types of issues the court reviews, the importance of individual cases, or even the procedural posture in which the appeal arrives at the court. Nor does it address

179. *See infra* Appendix J (comparing the instances where each active judge participated in a panel that issued a Rule 36 affirmance in all appeals arising from the district courts and the USPTO from 2014 to 2017).

180. *See, e.g.*, Crouch, *supra* note 14, at 562 (contending that the Federal Circuit's decision to use no-opinion judgments through Rule 36 affirmances "runs contrary to the law"); Rantanen, *supra* note 4, at 229 (detailing how "[n]early every written decision the Federal Circuit issues involving patents is pounced on, dissected, and criticized within hours of release").

causality. For example, Figures 7 to 10 indicate that the Federal Circuit's use of Rule 36 affirmances has declined recently. *Why* that is so is a subject for future work. To the extent that additional data are observable and recordable, it will be added to the *Compendium* over time. There are a million questions to ask about the court's decisions, and the *Compendium* can provide some answers.

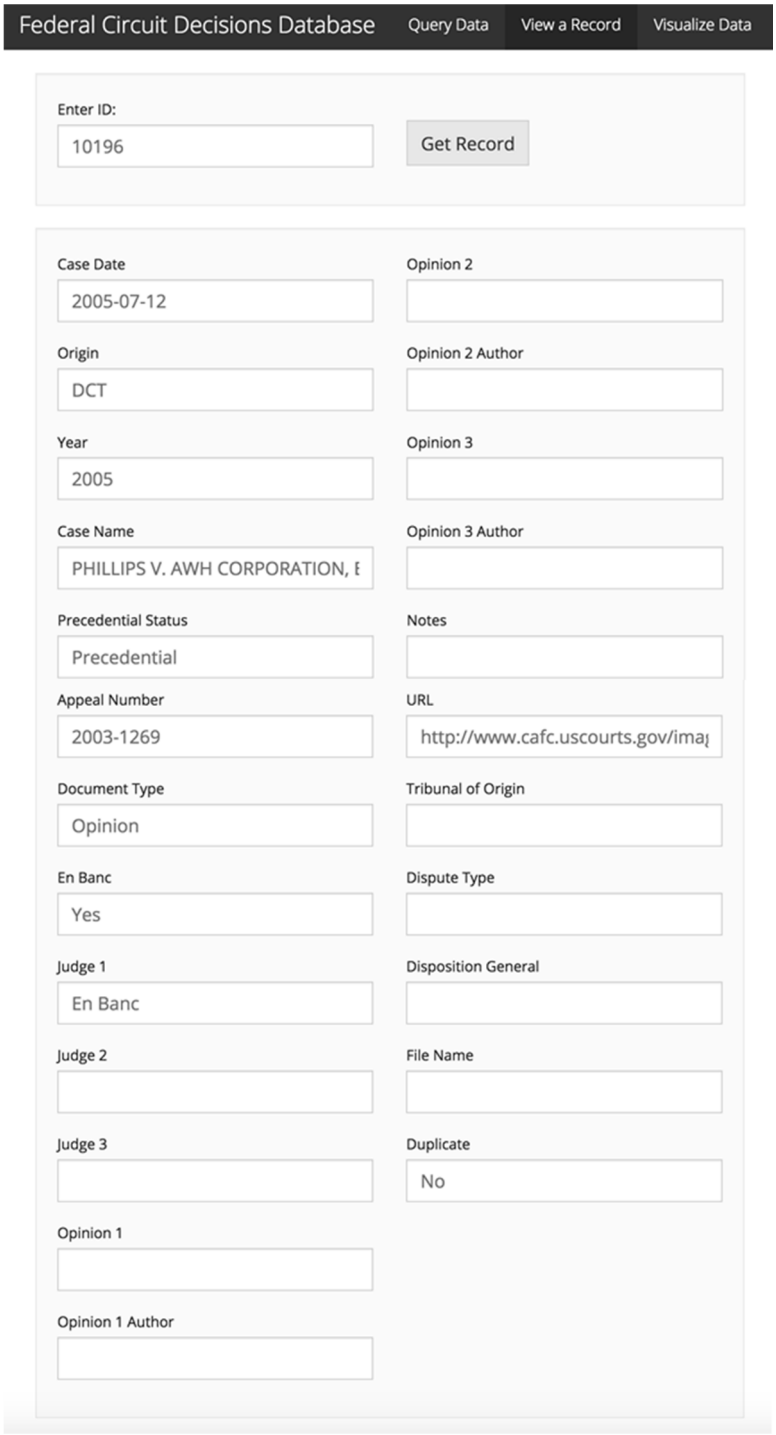
More importantly, however, commentators, academics, and policymakers should never lose sight of the fact that quantitative data about a court's decisions only provide one lens to view a court's jurisprudence. Individual decisions may have outsized importance relative to their cohort, and nothing substitutes for understanding the context and nuance of a decision or for reading an opinion itself rather than reading *about* the opinion.[181] Big-picture empirical analyses are an important tool, but they are not the only tool.

With this in mind, the *Compendium* provides a platform for further explorations of the Federal Circuit's decisions that are limited only by the creativity of future researchers. There has already been work in this direction. For example, the *Compendium* will soon contain information about the specific lower tribunal from which the appeal arose (such as the PTAB or TTAB), the general disposition of the Federal Circuit (such as affirmed, reversed, or vacated), and the issues involved in the appeal (such as novelty or nonobviousness). This information will provide yet another way to think about the decisions of the Federal Circuit.

181. *See, e.g.*, Harry T. Edwards & Michael A. Livermore, *Pitfalls of Empirical Studies that Attempt to Understand the Factors Affecting Appellate Decisionmaking*, 58 DUKE L.J. 1895, 1899 (2009) (describing problems with empirical studies of judicial decisions); *see also* Rantanen, *supra* note 4, at 281 (admitting that while empirical studies of judicial opinions have value, "it is critical that key methodological decisions be explained and identified").

APPENDICES

Appendix A: Sample Record



Appendix B: Data Verification Against Commercial Database

Rule 36				
	District Court		PATO	
	Compendium	Lexis	*Compendium*	Lexis
2008	45	44	12	10
2009	40	40	17	20
2010	57	56	17	17
2011	56	57	21	21
2012	69	69	38	40
2013	64	65	33	33
2014	80	80	41	42
2015	78	78	81	81
2016	82	81	101	99

Appendix C: Types of Decisions in Appeals from the District Courts

Year	Precedential Opinions	Nonprec. Opinions	Rule 36	Total Opinions	Total Decisions	Nonprec. Decisions
2008	112	59	45	171	216	104
2009	7	40	40	114	154	80
2010	93	39	57	133	190	96
2011	65	42	56	107	163	98
2012	96	31	69	127	196	100
2013	84	49	64	133	197	113
2014	103	54	80	157	237	134
2015	99	50	78	149	227	128
2016	88	54	82	142	223	136
2017	72	70	65	142	207	135

Appendix D: Types of Decisions in Appeals from the USPTO

Year	Precedential Opinions	Nonprec. Opinions	Rule 36	Total Opinions	Total Decisions	Nonprec. Decisions
2008	5	7	12	12	24	19
2009	17	14	17	31	48	31
2010	13	16	17	29	46	33
2011	17	11	21	28	49	32
2012	30	20	38	50	88	58
2013	16	17	33	33	66	50
2014	21	24	41	45	86	65
2015	32	26	81	58	139	107
2016	47	53	101	100	201	154
2017	50	78	100	128	228	178

Appendix E: Tribunal of Origin for Appeals from the USPTO

	TTAB	PTAB/BPAI
2008	6	18
2009	13	35
2010	16	30
2011	6	43
2012	14	74
2013	6	60
2014	19	67
2015	16	123
2016	11	190
2017	18	209

Appendix F: Agreement in Precedential Opinions in Appeals from the District Courts

	Unanimous	Non-unanimous	Opinions with a Dissent	% Unanimous
2008	89	23	19	79%
2009	55	19	14	75%
2010	61	33	24	66%
2011	48	17	15	74%
2012	55	41	30	58%
2013	48	36	28	57%
2014	77	26	23	75%
2015	80	19	15	81%
2016	67	21	13	76%
2017	61	11	10	85%

Appendix G: Agreement in Precedential Opinions in Appeals from the USPTO

	Unanimous	Majority	Dissent	% Unanimous
2008	3	2	1	60%
2009	14	3	2	82%
2010	13	0	0	100%
2011	13	4	4	76%
2012	19	11	8	61%
2013	12	2	2	86%
2014	18	3	3	86%
2015	23	9	8	72%
2016	38	9	7	81%
2017	36	14	12	72%

Appendix H: Authorship, 2014–2017

Author	Nonprec. Opinions	Precedential Opinions	Total	% Precedential	Dissents in Precedential Opinions
Dyk	14	52	66	79%	8
Prost	33	51	84	61%	4
Taranto	24	49	73	67%	2
Moore	17	47	64	73%	4
Lourie	47	45	92	49%	2
Reyna	16	42	58	72%	7
Chen	20	35	55	64%	2
O'Malley	34	35	69	51%	6
Hughes	25	26	51	51%	3
Wallach	26	26	52	50%	5
Stoll	22	24	46	52%	2
Newman	4	19	23	83%	37
Bryson	7	18	25	72%	1
Linn	7	14	21	67%	1
Rader	0	9	9	100%	2
Plager	1	7	8	88%	0
Schall	5	6	11	55%	2
Mayer	0	2	2	100%	4
Clevenger	13	0	13	0%	0

Appendix I: Unanimity of Authorship, 2014–2017

Author	Majority Opinions	Unanimous Opinions	Total	% Unanimous
Taranto	4	45	4	92%
Reyna	6	36	42	86%
Wallach	4	22	26	85%
Newman	3	16	19	84%
Stoll	4	20	24	83%
Chen	6	29	35	83%
Hughes	5	21	26	81%
Lourie	9	36	45	80%
O'Malley	7	28	35	80%
Moore	11	36	47	77%
Prost	14	37	51	73%
Dyk	20	32	52	62%

Appendix J: Panel Membership, 2014–2017

Judge Name	Total Rule 36 Panels	Total Panels	Ratio
Rader	10	41	0.24
Lourie	117	340	0.34
Linn	32	89	0.36
Reyna	120	328	0.37
Chen	118	322	0.37
Mayer	38	100	0.38
Stoll	74	191	0.39
Moore	126	320	0.39
Prost	161	406	0.40
Bryson	60	151	0.40
Plager	31	76	0.41
Schall	35	85	0.41
Wallach	152	369	0.41
Taranto	145	352	0.41
Dyk	140	336	0.42
O'Malley	134	304	0.44
Newman	136	306	0.44
Hughes	165	358	0.46
Clevenger	52	103	0.50

Appendix K: Verification Agreement

For All Documents:

Field	Percentage Agreement
Case Date	100% (not independently coded)
Year	99%
Origin	99%
Case Name	100% (not independently coded)
Appeal Number	100% (not independently coded)
Precedential Status	99%
Doc Type	97%

For Decisions Only:

Field	Percentage agreement
Precedential Status	99%
Doc Type	98%
En Banc	97%
Judge 1	97%
Judge 2	97%
Judge 3	97%
Opinion 1	97%[182]
Opinion 1 Author	97%[183]
Opinion 2	97%
Opinion 2 Author	98%
Opinion 3	99%
Opinion 3 Author	99%

182. Agreement is reported for a comparison conducted after blank entries for this field in records for Rule 36 affirmances were changed to "Unanimous" in the *Compendium*.

183. Agreement is reported for a comparison conducted after "Anonymous" entries for this field in records for Rule 36 affirmances were changed to "Per Curiam" in the *Compendium*.

For Decisions in Appeals from the USPTO Only:

Field	Percentage agreement
Tribunal of Origin	99%

Appendix L: Documents in Compendium *in Appeals Arising from the District Courts, 2004–2017*

Year	Errata	Motion Panel Order	No File	Opinion	Order	Other	Rule 36	Total
2004	0	0	0	22	1	0	0	23
2005	14	0	0	174	9	0	0	197
2006	9	0	0	149	11	0	0	169
2007	11	0	1	163	30	1	12	218
2008	13	0	5	173	7	0	45	243
2009	13	0	0	116	18	0	40	187
2010	17	0	0	135	219	0	57	428
2011	19	0	0	111	524	0	56	710
2012	20	0	0	129	536	1	69	755
2013	18	0	0	135	136	0	64	353
2014	10	1	0	158	123	0	81	373
2015	15	0	0	151	22	0	78	266
2016	8	0	0	145	5	0	81	239

Appendix M: Documents in Compendium *in Appeals Arising from the USPTO, 2004–2017*

Year	Errata	Motion Panel Order	Opinion	Order	Rule 36	Total
2004	0	0	5	0	0	5
2005	1	0	20	0	0	21
2006	2	0	14	0	0	16
2007	1	0	25	0	6	32
2008	0	0	13	2	12	27
2009	1	0	31	70	17	119
2010	4	0	29	68	17	118
2011	1	0	28	96	21	146
2012	7	0	50	78	38	173
2013	2	0	33	25	33	93
2014	5	0	45	45	41	136
2015	5	0	59	5	81	150
2016	7	0	100	7	101	215
2017	6	1	129	8	100	244