A Detailed Study of Court Decisions on Admissibility of Intellectual Property Damages Experts

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Abstract

Damages experts' opinions in intellectual property litigation are routinely challenged for failing to reach standards set forth in the Supreme Court's 1993 Daubert *decision. Our study is the first of its kind, in performing a systematic and in-depth review of court decisions, including an analysis of the substantive reasons for challenge. We studied more than 400* Daubert *orders covering nearly 1,300 decisions over a six-year period from 2015 through 2020.*

Patent cases make up a significant majority of our dataset. Overall, we find an exclusion rate of 24%. While plaintiff experts are challenged more frequently than defendant experts, their exclusion rates are not significantly different. However, the type of analysis challenged appears to matter—in particular, lost profits analyses are excluded at lower rates than other types of analyses, and experts described as offering legal opinions are excluded at higher rates. Exclusion rates vary by district, with the Northern District of California (NDCA) having higher exclusion rates and the Eastern District of Texas (EDTX) having lower exclusion rates than the rest of the country. We study the impact of the Supreme Court's Heartland *decision on exclusion rates, which has reduced a plaintiff's ability to engage in "venue shopping." Overall, rates of exclusion in EDTX and Delaware declined following the decision, with a moderate increase in exclusion rates in NDCA.*

Finally, we find substantial disparities in exclusion rates among judges. Among the top ten judges ranked by number of decisions, five have relatively "low" exclusion rates of less than 15% and four have relatively "high" exclusion rates greater than 30%. Variations such as these, along with differences by jurisdiction, raise questions about courts' consistency in application of the Daubert *standard— questions that are left for future researchers and policymakers to address.*

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I.   Expert Admissibility Standards Background[2]

The primary cases relating to expert witness testimony admissibility are the U.S. Supreme Court opinions in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[3]

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[2]   This section borrows from Deepa Sundararaman, *Intellectual Property Expert Damages Admissibility*, *in* CLEVE B. TYLER & GREGORY SMITH, ASSETS AND FINANCES: CALCULATING INTELLECTUAL PROPERTY DAMAGES app. A (2022–2023 ed. 2022).

[3]   Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579 (1993).

and *Kumho Tire Co. Ltd. v. Carmichael*.[4] In *Daubert*, the Supreme Court concluded that "under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable."[5] More specifically, the Court stated that, in acting as a gatekeeper:

> [T]he trial judge must determine at the outset . . . whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.[6]

In *Kumho Tire*, the Court clarified that the standards set forth in the Federal Rules of Evidence (FRE) and in *Daubert* apply to more than just the admissibility of "scientific knowledge," extending the rules to all expert testimony, including economic, finance, and accounting issues.[7] In fact, FRE Rule 702, titled "Testimony by Expert Witnesses" and cited prominently in *Daubert*, was subsequently revised to reflect the *Daubert* and *Kumho Tire* decisions more closely. Following this revision, Rule 702 reads in its entirety as follows:

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if: (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based upon sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.[8]

While the factors laid out in *Daubert* are helpful, the Court has made it clear that an inquiry into expert testimony admissibility is "a flexible one" and should be "tied to the facts" of a case.[9] The Court has said that "the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable."[10] Accordingly, once a district court has made a decision regarding the admissibility of expert testimony, reversal requires a showing of "abuse of discretion" by the district court.[11] The combination of this heightened standard of review at the appellate level and the leeway that the trial judge has in determining the admission of expert testimony means that the

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4   Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999).
5   *Daubert*, 509 U.S. at 589.
6   *Id.* at 592–93.
7   *Kumho Tire*, 526 U.S. at 147–49.
8   Fed. R. Evid. 702. Note that a proposed (at the time of this writing) change to FRE 702 seeks to clarify that the preponderance of evidence standard applies to expert testimony admissibility. *See, e.g.*, Timothy E. Burroughs, *Changes to Rule 702 Cement Judge's Role as Gatekeeper for Expert Testimony*, THE NAT'L L. REV. (May 4, 2022), https://www.natlawreview.com /article/changes-to-rule-702-cement-judge-s-role-gatekeeper-expert-testimony.
9   *Kumho Tire*, 526 U.S. at 150.
10 *Id.* at 148.
11 General Elec. Co. v. Joiner, 522 U.S. 136 (1997).

outcomes of challenges to expert testimony in district courts have important consequences.

II.   Prior Studies

Prior studies of *Daubert* challenges and decisions provide relatively "high-level" assessments of admissibility decisions since *Daubert*. The annual summary compiled by PwC, which includes 3,342 challenges of financial experts spanning the years from 2000 to 2021, is a widely cited study regarding assessment of admissibility.[12] In 2022, the PwC study reported that 33% of challenges regarding financial experts result in at least partial exclusion. The most common high-level rationale cited for exclusion was reliability (52%), followed by relevance (36%), and then qualification (12%).[13]

Further, over the twenty-two years studied by PwC, intellectual property (IP) damages experts who were challenged were found to have been excluded or partially excluded at a rate of 47%, among the highest of any type of case in which financial experts are involved. Researchers Rich Franciosa and Michael Herrigel investigated exclusion rates for IP experts who were challenged based on the comparability of licenses across 266 cases (from January 2015 to September 2021) and reported exclusion at a rate of 31%.[14] With exclusion rates like these, a careful study of the reasons why IP experts are challenged and excluded is warranted.

III.   Data Collection and Methodology

We identified court rulings regarding *Daubert* challenges of IP experts by conducting searches of federal court rulings that included the terms "Daubert" and "damages" as well as indicators that the case was related to IP during the period from January 2015 to December 2020.[15] Rulings from that initial search were reviewed for relevance (pertaining to a challenge of a damages expert's opinion in an IP case), and those that were found to be relevant were reviewed in detail.[16] A list of eighteen key fields recorded for each court ruling is described below in Table 1.

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[12]   Daubert *Challenges to Financial Experts, A Yearly Study of Trends and Outcomes (2000-2021)*, PwC (2022) [hereinafter *PWC Report*], https://www.pwc.com/us/en/services/consulting/deals/assets/daubert-study-2022.pdf.

[13]   The rationales for exclusion are not mutually exclusive.

[14]   Rich Franciosa & Michael Herrigel, *The Comparability Challenges Patent Damages Experts Face*, LAW360 (Nov. 10, 2021), https://www.law360.com/articles/1439349/the-comparability-challenges-patent-damages-experts-face.

[15]   Specifically, searches were conducted in Lexis in "All Federal Cases" for court rulings that included either the term "patent," "copyright," "trademark," or "trade secret," and included both the terms "Daubert" and "damages" over the period 2015–2020. We tested the use of the term "FRE 702" (for the Federal Rules of Evidence 702) instead of "Daubert" but found that this search term did not result in any appreciable increase in IP cases related to expert admissibility.

[16]   We did not include motions in limine unless a *Daubert* ruling was subsumed within such a ruling. We include decisions by federal magistrates and district court judges.

Table 1
Variables Recorded from Court Rulings
on IP Damages Expert Admissibility

Plaintiff	Name of the plaintiff in the matter
Defendant	Name of the defendant in the matter
IP Type	Type of IP matter
Damages Type	Type of damages calculation shorthand
Expert Challenged	Which side was challenged in the matter
Judge Name	Standardized name of the judge
Expert Name	Standardized name of the challenged expert
Case No.	Case number assigned by the court
Lexis	Organization in the Lexis system
Court Level	Level of the court when challenged
District	Standardized district names
Division	Standardized division within the district (if applicable)
Decided	Date of the decision
Filed	Date the decision was filed
Decision	Decision on admissibility
First Level Category	Highest level of reason for exclusion (Tier 1)
Second Level Category	Second most specific level of reason for exclusion (if applicable) (Tier 2)
Third Level Category	Most specific level of reason for exclusion (if applicable) (Tier 3)

For the purposes of our study, we adopt the following terms:

- "Ruling" refers to the document that contains a court's finding.

- "Expert-order" refers to the portions of a court ruling that address the admissibility of a specific IP damages expert. This distinction is useful because a court ruling might contain multiple expert-orders, given that challenges might be addressed for multiple experts within the same court ruling (e.g., both the plaintiff expert and defendant expert).

- "Decision" refers to a court's findings related to a specific type of challenge described in an expert-order. An expert-order typically contains multiple decisions for an expert separately addressing multiple challenges related to that expert's opinion.

We developed three tiers of categories for characterizing decisions.[17] Tier 1 consists of seven potential values to represent high-level descriptions of decision types: (1) Qualifications and Relevance, (2) Royalty Base, (3) Royalty Rate, (4)

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[17] The authors began this process by both reading court rulings and separately categorizing decisions. We would meet and discuss decision categorizations until consensus was reached regarding a reasonable categorization of a decision. In certain instances, at the start of this process, the discussions led to a modification of the categories themselves. This process continued over the course of many months. Once a level of consistency was reached for categorization, the remaining rulings were assigned to one of the authors and reviewed, and the decisions were categorized. If unusual or uncertain decisions were encountered, then those orders were flagged for the coauthor to read and categorize as well. In these circumstances, discussion ensued until consensus was reached on an appropriate categorization.

Lost Profits, (5) Inappropriate Daubert Challenge, (6) Disgorgement, and (7) Impairment of Business (Lost Business Value).

Tier 2 is designed to provide more specificity about a decision and contains thirty-nine separate potential values, which are contingent on the Tier 1 value. For example, if the value of Tier 1 is "Royalty Rate," then the potential values for Tier 2 are: (1) NIA,[18] (2) Licenses,[19] (3) Apportionment,[20] (4) Hypothetical Negotiation Setup,[21] (5) Methodology, (6) Georgia-Pacific Factor Analysis,[22] (7) FRAND,[23] or (8) Bargaining.[24]

Tier 3 allows for further detail regarding a decision and contains sixty-four separate potential values, which are contingent on the value selected for Tier 2. For example, if the value of Tier 1 is "Royalty Rate" and the value of Tier 2 is "Licenses," then the potential values for Tier 3 are: (1) Comparability, (2) Date of License/Book of Wisdom, (3) Reliance on Expert, (4) Reliance on Fact Witness, (5) Evidence, or (6) Methodology.

All told, there are 112 unique combinations to describe a decision across the three tiers, and there are 47 unique combinations across the first and second tier. If no appropriate lower-tier value exists for a specific decision, then that field is left blank. A description of these tiers and their relations to one another is shown in Appendix A, which provides the 47 unique combinations, the decision counts, and the exclusion rates across each combination.

Our analysis is based on language contained in *Daubert* rulings and, therefore, is contingent on how judges describe the challenges included in *Daubert* motions filed by the parties. So, for example, if a judge groups several licenses together in arriving at a decision to exclude or not exclude an expert's opinion, that is counted as one decision. If a judge conducts a separate analysis for each of three different licenses in a ruling, that is counted as three different decisions, even if the ultimate

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[18] "NIA" stands for non-infringing alternative.

[19] This category relates to what is known as the "Market Approach," whereby licenses that are technically and economically comparable may be used to inform a royalty rate that would be agreed upon in a hypothetical negotiation.

[20] This category relates to the process by which estimated value is apportioned to the technology described in the patents-in-suit versus other factors contributing to value.

[21] This category relates to appropriately characterizing the hypothetical negotiation, including whether the expert assumed the appropriate parties at the negotiation and the date of the hypothetical negotiation.

[22] The *Georgia-Pacific* Factor Analysis refers to the use of fifteen factors described by the Second Circuit in *Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers, Inc.* for evaluating a reasonable royalty, which tend to be cited by IP damages experts when estimating a reasonable royalty. 446 F.2d 295, 297 (2d Cir. 1971).

[23] "FRAND" stands for fair, reasonable, and non-discriminatory and refers to a commitment made by members of a standard-setting organization regarding the general terms under which they commit to licensing standard-essential patents they own. A FRAND commitment by a plaintiff in a patent litigation regarding any of the patents-in-suit has implications for reasonable royalty analyses.

[24] Bargaining refers to an analysis of how the parties in a hypothetical negotiation might choose to split the recognized value of the use of the technology between the two parties at the negotiation.

outcome in each decision is the same for the expert opinion (excluded or not excluded). In short, the database is constructed based on our analysis and description of the analyses performed and described by the judge in each ruling.[25]

The court rulings included in our study are necessarily limited to written rulings. Judges may issue oral *Daubert* orders that are not memorialized in a written opinion. Written rulings may not be representative of the full population of all *Daubert* orders; selection bias may exist since judges determine when they issue a written opinion. Based on our experience, judges are more likely to issue written rulings when an expert's opinion is excluded (at least in part), compared to circumstances in which a judge admits an expert entirely without exclusion.[26] Other factors may play a role. Judges may be more likely to issue written rulings in cases viewed as higher-profile, for instance.[27]

IV. Overall Results

A. Exclusion Rates by Year for Plaintiff and Defendant Experts

The dataset contains 305 court rulings from federal judges and magistrates over the 2015 to 2020 period, which encompass 403 separate expert-orders. These expert-orders contain 1,294 separate decisions regarding challenges to the admissibility of IP damages expert opinions. Table 2 provides an overview of the counts of decisions, expert-orders, and decisions per expert-order by year and by expert type (plaintiff or defendant).

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[25] Rulings tend to summarize the positions adopted by the parties in arguing for and against the *Daubert* motion. We encountered instances in which a judge describes a motion as bringing a particular type of challenge while summarizing a party's legal position but then characterizes the challenge differently in his or her analysis of the motion and subsequent ruling. In those cases, we rely on the judge's description contained in the analysis as opposed to the judge's description of the motion characterizing a party's legal position.

[26] At this time, the authors are unaware of a means by which this potential bias might be further assessed.

[27] Another factor might relate to the workload of a judge. A judge facing many motions in a case (or across all cases) may be more inclined to issue an oral order than a written order.

Table 2
Count of Decisions and Expert-Orders by Year and Expert Type[28]

Year	Decisions			Expert-Orders			Decisions per Expert-Order		
	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
2015	156	70	226	43	21	64	3.6	3.3	3.5
2016	116	58	174	38	29	67	3.1	2.0	2.6
2017	178	55	233	58	19	77	3.1	2.9	3.0
2018	141	45	186	41	13	54	3.4	3.5	3.4
2019	175	68	243	54	21	75	3.2	3.2	3.2
2020	157	75	232	44	22	66	3.6	3.4	3.5
Total	**923**	**371**	**1,294**	**278**	**125**	**403**	**3.3**	**3.0**	**3.2**

We identified sixty-seven admissibility orders per year on average, containing 216 decisions annually. Decisions related to plaintiff experts are more numerous—about 2.5 times more than observed for defendant experts. This pattern is consistent with our professional experience, where plaintiff experts are more likely to be challenged than defendant experts (who may only offer opinions on a rebuttal basis rather than providing affirmative opinions).

Judges tend to reach about 3.2 decisions per order, with slightly more for plaintiff experts (3.3) than for defendant experts (3.0). So, despite the fact that plaintiff experts are challenged more frequently than defendant experts, when a challenge does occur, the average number of discrete issues challenged in an expert-order is similar between plaintiff and defendant experts.

Table 3, below, shows that the overall exclusion rate across the data is 24%. This means that, for any specific challenge addressed by a judge in a written ruling, we find that nearly a quarter of these challenges are successful. Importantly, just because a particular challenge is successful does not necessarily mean (and in most cases does not mean) that the expert cannot testify at all. Instead, it generally means the expert is precluded from offering an opinion related to that aspect of their analysis that was successfully challenged. However, other parts of the opinion—potentially even the expert's overall opinion—might still be admissible.

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[28] This excludes the following types of decisions in which a determination of exclusion is not reached: Decision Deferred, Carried, Deferred, Moot, Reserve Ruling, Reserved, Dismissed, and Terminated. The year is based on a decision date or filing date if the decision date is missing.

Table 3

Annual Decision Exclusion Rates

Year	Decisions			Excluded Decisions			% Decisions Excluded		
	Plaintiff	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**
2015	156	70	226	39	14	53	25%	20%	23%
2016	116	58	174	29	17	46	25%	29%	26%
2017	178	55	233	48	12	60	27%	22%	26%
2018	141	45	186	31	8	39	22%	18%	21%
2019	175	68	243	41	24	65	23%	35%	27%
2020	157	75	232	31	17	48	20%	23%	21%
Total	**923**	**371**	**1,294**	**219**	**92**	**311**	**24%**	**25%**	**24%**

The exclusion percentage is nearly the same for both plaintiff and defendant experts and has been relatively stable over time. We find no statistically significant difference in the probability of exclusion by expert role.[29] In addition, we find no statistical evidence that exclusion rates vary over time.[30]

B. Exclusion Rates by Type of IP

Table 4 shows the exclusion rates by type of IP. Interestingly, exclusion rates for plaintiff experts (24%) and defendant experts (25%) are nearly the same overall. Also, exclusion rates for challenges related to non-patent forms of IP are similar to the exclusion rates for patents. However, the exclusion rates for defendant experts are higher for non-patent forms of IP, a difference that is statistically significant.[31] This may run counter to expectations; however, the number of decisions regarding defendant experts is substantially fewer than for plaintiff experts.

Table 4

Exclusion Rates by IP Type and Expert Type

IP Type	Decisions			Excluded Decisions			Percent Excluded		
	Plaintiff	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**
Patent	669	288	957	172	67	239	26%	23%	25%
Trade Secret	129	31	160	24	9	33	19%	29%	21%
Copyright	78	37	115	16	11	27	21%	30%	23%
Trademark	47	15	62	7	5	12	15%	33%	19%
Overall	**923**	**371**	**1,294**	**219**	**92**	**311**	**24%**	**25%**	**24%**

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[29]   *See infra* Appendix B. In Appendix B, we provide a regression analysis (called a probit model) that provides statistical tests for whether certain attributes associated with a decision are more (or less) likely to be associated with exclusion, holding other factors constant.

[30]   *See infra* Appendix B.

[31]   *Id.*

The number of patent decisions in the data is disproportionately large compared to the number of cases for other IP types. For the same six-year period as the *Daubert* decision data, patent infringement cases filed in the U.S. district courts account for 37% of all IP cases, with trademark and copyright cases accounting for 26% and 38%, respectively.[32] However, most of the court decisions in our data relate to patent infringement matters (74%), followed by trade secrets (12%), copyright (9%), and trademark (5%).

This difference could be explained by several factors, including that patent infringement cases tend to have a higher quantum of damages at stake than other types of IP. The differences might also be explained if non-patent orders tend to be oral while patent orders tend to be written.

C.   Exclusion Rates—in Part and in Entirety

We also studied whether expert-orders included at least one decision excluding an expert opinion. That is, how frequently are experts that are challenged excluded for at least one reason? We find that 46% of experts are excluded in part or in whole in IP cases, as shown in Table 5.[33] This is consistent with the PwC study, which found that IP experts who were challenged were excluded in part or in whole 47% of the time from 2000 to 2021.[34]

Table 5
Experts Excluded in Part or in Whole

Year	Expert-Orders			Excluded in Part or Whole			Percent Excluded in Part or Whole		
	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
2015	43	21	64	21	11	32	49%	52%	50%
2016	38	29	67	20	13	33	53%	45%	49%
2017	58	19	77	29	8	37	50%	42%	48%
2018	41	13	54	14	5	19	34%	38%	35%
2019	54	21	75	24	16	40	44%	76%	53%
2020	44	22	66	17	8	25	39%	36%	38%
Total	**278**	**125**	**403**	**125**	**61**	**186**	**45%**	**49%**	**46%**

However, while the percentage excluded in part or in whole was nearly one-half (46%), the percentage of experts who were challenged and excluded entirely (all challenges against an expert in a case were successful) was far smaller (17%). Table 6 shows these results.

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32   U.S. COURTS, TABLE 4.7 U.S. DISTRICT COURTS–COPYRIGHT, PATENT AND TRADEMARK CASES FILES DURING THE 12-MONTH PERIODS ENDING JUNE 30, 1990, AND SEPTEMBER 30, 1995 THROUGH 2020, https://www.uscourts.gov/sites/default/files/data_tables/jff_4.7_0930.2020.pdf.

33   Exclusion "in part" means than at least one decision is reached by the judge to exclude an expert's opinion for a given order.

34   *PWC Report*, *supra* note 12.

Table 6
Total Orders for Expert Admissibility and
Experts Excluded for All Challenges Brought

Year	Expert-Orders			Excluded in Entirety			Percent Excluded in Entirety		
	Plaintiff	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**
2015	43	21	64	7	2	9	16%	10%	14%
2016	38	29	67	6	6	12	16%	21%	18%
2017	58	19	77	12	4	16	21%	21%	21%
2018	41	13	54	2	2	4	5%	15%	7%
2019	54	21	75	10	5	15	19%	24%	20%
2020	44	22	66	8	3	11	18%	14%	17%
Total	**278**	**125**	**403**	**45**	**22**	**67**	**16%**	**18%**	**17%**

When we describe that an expert has been excluded "in entirety," this means that the moving party was successful in excluding the expert across all challenges brought in that case against an expert. But this does not necessarily mean that all of the expert's opinions are excluded because the expert's unchallenged opinions might still be presentable at trial.

V.   Exclusions by District, Judge, and Expert

A.   Exclusion Rates by District

Table 7, below, shows the number and percentage of exclusions by federal district for the ten districts with the most *Daubert* decisions.[35] Just three districts comprise about 50% of all IP *Daubert* decisions in the country: the Eastern District of Texas (EDTX), the District of Delaware, and the Northern District of California (NDCA). This distribution may not come as a surprise to practitioners who routinely see cases in these districts.

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[35]   However, there are some interesting patterns when the decisions are compared to IP cases filed by district. When considering IP case filings in 2020, only five of the top ten districts by number of *Daubert* decisions (as shown in Table 7) appear in the top ten districts by IP cases filed. Northern Illinois, Western Texas, New Jersey, and Southern Florida are examples of districts that see many IP cases but relatively few *Daubert* decisions. It could be the case that judges in those districts issue more oral court rulings, or there may be a higher number of non-patent cases filed for which we see fewer *Daubert* decisions. Interestingly, the district nicknamed the "Rocket Docket," the Eastern District of Virginia, is home to 4% of all civil cases filed but just 1% of IP cases filed nationally. Similarly, the Eastern District of Virginia ranks low in the number of *Daubert* court rulings made and is not in the top ten in Table 7.

Table 7
Decisions and Percentage Excluded by District, 2015–2020

District	Decisions					Excluded Decisions			Percent Excluded		
	Plaintiff	Defendant	Total	Percent of Total	Cumulative Percentage	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
Eastern Texas	199	57	256	20%	20%	27	13	40	14%	23%	16%
Delaware	131	76	207	16%	36%	44	16	60	34%	21%	29%
Northern California	136	51	187	14%	50%	51	14	65	38%	27%	35%
Central California	44	17	61	5%	55%	19	4	23	43%	24%	38%
Southern New York	27	24	51	4%	59%	7	12	19	26%	50%	37%
Western Wisconsin	37	14	51	4%	63%	5	2	7	14%	14%	14%
Southern California	33	12	45	3%	66%	5	2	7	15%	17%	16%
Minnesota	23	5	28	2%	68%	2	1	3	9%	20%	11%
Southern Texas	24	3	27	2%	71%	1	-	1	4%	0%	4%
Western Pennsylvania	21	5	26	2%	73%	5	1	6	24%	20%	23%
Top 10 Total	**675**	**264**	**939**	**73%**		**166**	**65**	**231**	**25%**	**25%**	**25%**
All Other Districts	**248**	**107**	**355**	**27%**	**100%**	**53**	**27**	**80**	**21%**	**25%**	**23%**

Our data confirms what many experts and counsel have observed in practice: EDTX excludes expert opinions somewhat less frequently than average and tends to allow the fact-finder to determine the appropriate weight to be afforded to expert testimony. EDTX has a 16% exclusion rate over this six-year period compared to the 24% average overall—a difference that is statistically significant.[36] NDCA has a reputation for being stricter, and our data again supports that reputation with an exclusion rate of 35% overall—a difference that is also statistically significant.[37] Delaware is considered more "middle of the road," and the overall exclusion rate in the district is closer to the overall average (29%), again supporting the general reputation. The Central District of California (CDCA) and the Southern District of New York (SDNY) tend to have exclusion rates similar to that of NDCA, which are statistically significantly higher than average.[38] Districts that are similar to EDTX in the top ten include Western Wisconsin, Southern California, and Minnesota.

Another issue beyond overall exclusion rates is how districts treat plaintiff experts relative to defendant experts.[39] One means of addressing this question is to consider the ratio of the exclusion rates of plaintiff experts to defendant experts. So, if a district had a 30% exclusion rate for plaintiff experts and a 15% exclusion rate for defendant experts, the ratio would be 2.0 and would indicate a relatively higher exclusion rate for plaintiff experts. If a district had a 20% exclusion rate for plaintiff experts and a 30% exclusion rate for defendant experts, this ratio would be 0.67 and

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[36]   *See infra* Appendix B.

[37]   *Id.*

[38]   *Id.*

[39]   *See, e.g.*, Maurius Meland, *Eastern District of Texas: A Plaintiff's Best Bet*, LAW360 (Dec. 9, 2005), https://www.law360.com/articles/4738/eastern-district-of-texas-a-plaintiff-s-best-bet; *see also* David Mroz, *After TC Heartland, Patent Owners Should Consider the Nuanced Standards in Other Districts Before Deciding Where to File*, FINNEGAN (July/Aug. 2017), https://www.finnegan.com/en/insights/articles/after-tc-heartland-patent-owners-should-consider-the-nuanced-standards-in-other-districts-before-deciding-where-to-file.html.

would indicate relatively fewer exclusions of plaintiff experts relative to defendant experts.

Figure 8, below, is a scatter plot of overall exclusion rates (of all expert types) against the ratio of exclusion rates for plaintiff experts to defendant experts.[40]

Figure 8
Scatterplot of Exclusion Rates vs.
Ratio of Plaintiff to Defendant Exclusion Rates,
Top Ten Districts
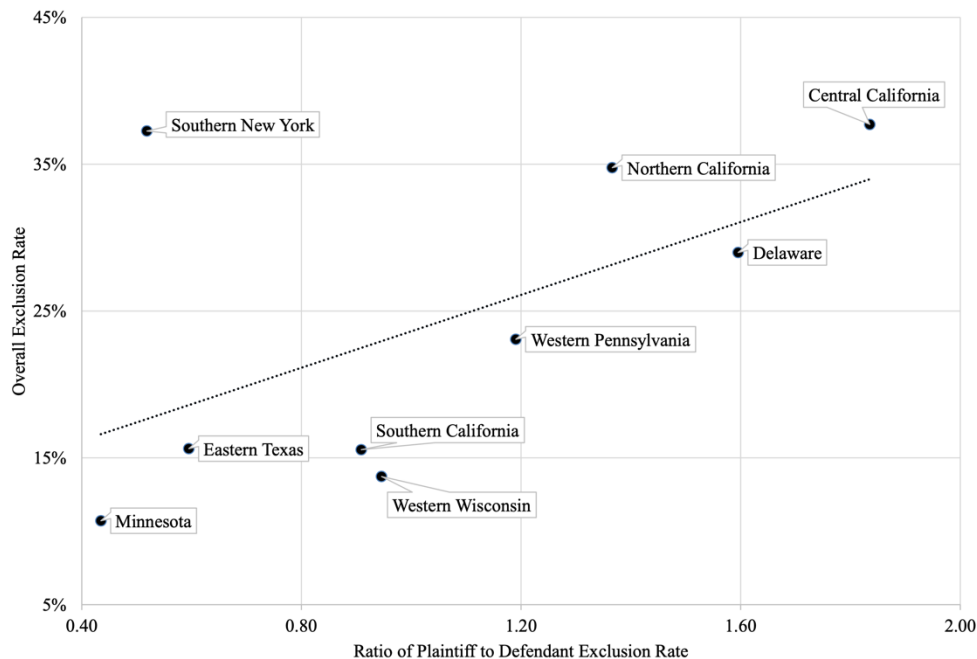
Figure 8 shows a positive relationship between overall exclusion rates and relative exclusion rates for plaintiff experts compared with defendant experts. The figure includes a trend line showing the overall relationship, which has a correlation of 0.58. The districts having lower exclusion rates overall tend to have relatively fewer exclusions of plaintiff experts than defendant experts (e.g., Minnesota and EDTX). The districts that have higher exclusion rates overall also tend to have higher exclusion rates for plaintiff experts relative to defendant experts (e.g., CDCA, NDCA, and Delaware). One outlier here is SDNY, which has relatively high exclusion rates overall (37%) but actually has a higher exclusion rate for defendant experts (50%) than for plaintiff experts (26%).

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40 Southern Texas is excluded from this analysis since judges in this district did not exclude any defendant experts in our sample, so a ratio cannot be computed.

Keep in mind that we only observe the outcomes of a process where attorneys, experts, and judges have all made certain choices, and those choices could affect the outcomes we observe. This can have implications on what we observe (an issue economists refer to as endogeneity). For example, attorneys might hire a certain expert to testify in EDTX but might not hire that same expert to testify in NDCA. To the extent that judges are applying standards for admissibility differently across districts, our observed numbers would tend to understate the true differences in the application of *Daubert* across districts.

B. Expert Admissibility and the Supreme Court's *Heartland* Decision

In 2017, the Supreme Court issued its ruling in *Heartland*, which addressed jurisdiction.[41] In particular, a unanimous court overturned the Federal Circuit and ruled that "a domestic corporation 'resides' only in its State of incorporation."[42] The practical impact of this ruling (it was thought) would be that cases would be more likely to be adjudicated outside EDTX.[43] This impact is apparent in data from the years after *Heartland*.[44] For example, in 2020, EDTX ranked just number ten in number of IP cases filed.[45]

Our data allows us to assess whether we see differences in patterns before and after this ruling. The before and after durations are roughly 40% and 60%, respectively. Table 9, below, shows the exclusion rates for experts in the top ten districts before and after the *Heartland* decision.

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[41] *See* TC Heartland LLC v. Kraft Foods Grp. Brands LLC, 581 U.S. 258, 261 (2017).

[42] *Id.*

[43] *See* Jess Krochtengel, *Patent Venue Ruling Will Force Texas Firms to Branch Out*, Law360 (May 22, 2017), https://www.law360.com/articles/926787 ("The decision means fewer new patent cases will be filed in the Eastern District [of Texas], and that many of the thousands of pending cases in the district will be transferred out or dismissed. Though the ruling won't come close to drying up patent litigation in the Lone Star State, a diminished patent docket in Texas is expected to cause some heartache for intellectual property groups at Texas firms that focus heavily on litigation in the Eastern District.").

[44] *See, e.g.*, Rachel C. Hughey & Ian G. McFarland, *Venue Decisions and Trends Post*-TC Heartland, The Federal Lawyer 56, 58–59 (Nov./Dec. 2019), https://www.fedbar.org/wp-content/uploads/2019/12/6-Feature.pdf.

[45] U.S. Courts, Table C-3—U.S. District Courts–Civil Federal Judicial Caseload Statistics (Mar. 31, 2020), https://www.uscourts.gov/statistics/table/c-3/federal-judicial-caseload-statistics/2020/03/31.

Table 9
Exclusion Rates for Experts Before and After *Heartland*,
Top Ten Districts

Top 10 District	Pre-*Heartland*			Post-*Heartland*		
	Total Decisions	Total Excluded Decisions	Exclusion Rate	Total Decisions	Total Excluded Decisions	Exclusion Rate
Eastern Texas	100	24	24.0%	156	16	10.3%
Delaware	50	20	40.0%	157	40	25.5%
Northern California	100	27	27.0%	87	38	43.7%
Central California	9	2	22.2%	52	21	40.4%
Southern New York	22	7	31.8%	29	12	41.4%
Western Wisconsin	29	2	6.9%	22	5	22.7%
Southern California	19	1	5.3%	26	6	23.1%
Minnesota	19	0	0%	9	3	33.3%
Southern Texas	2	0	0%	25	1	4.0%
Western Pennsylvania	13	3	23.1%	13	2	15.4%
Non-Top 10 District	**149**	**37**	**24.8%**	**206**	**43**	**20.9%**
Total	**512**	**123**	**24.0%**	**782**	**187**	**23.9%**

We see sizable shifts in exclusion rates for a number of districts following *Heartland*. Some additional focus on EDTX is warranted given the concerns at the time about the concentration of cases brought in EDTX. Figures 10 and 11, below, set forth exclusion rates before and after the *Heartland* decision in EDTX (Figure 10) and in all other districts (Figure 11).

Figure 10
Exclusion Rate by Expert Type in EDTX
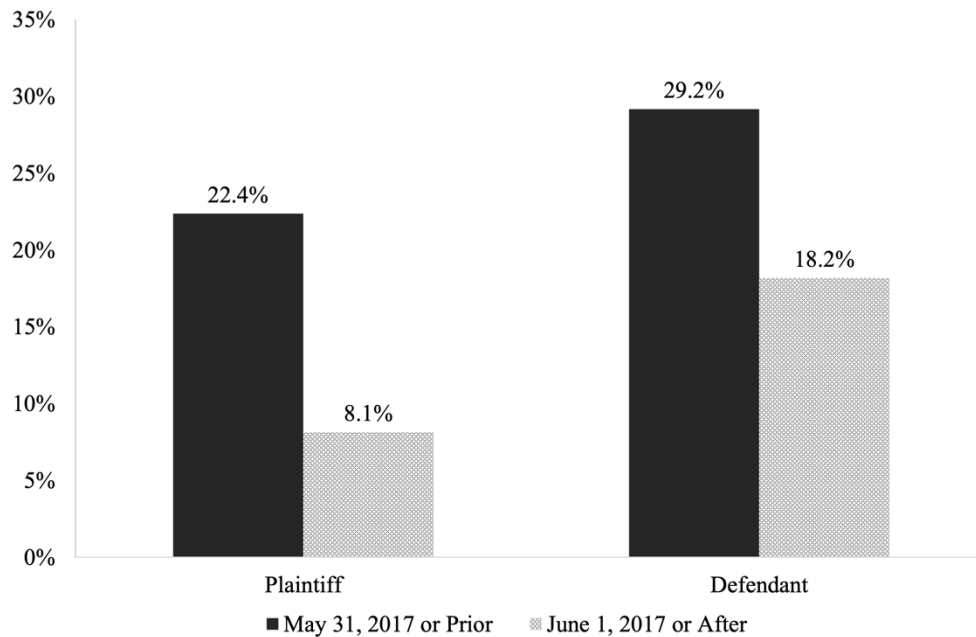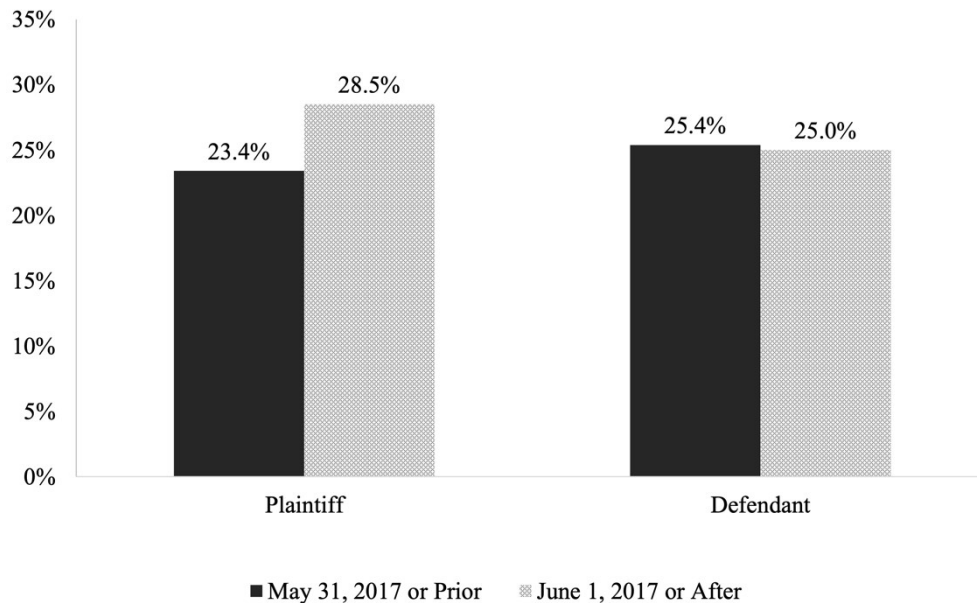Before and After *Heartland*

Bar chart legend: ■ May 31, 2017 or Prior   ▨ June 1, 2017 or After

Plaintiff: 22.4% (May 31, 2017 or Prior), 8.1% (June 1, 2017 or After)
Defendant: 29.2% (May 31, 2017 or Prior), 18.2% (June 1, 2017 or After)

Figure 11
Exclusion Rate by Expert Type Not in EDTX
Before and After *Heartland*

■ May 31, 2017 or Prior　　　▨ June 1, 2017 or After

Our data shows a decline in exclusion rates in EDTX following the *Heartland* decision, especially for plaintiff experts. Exclusion rates are just 10% in EDTX following *Heartland*. This is contrary to the trend observed in other courts, where exclusion rates have generally increased moderately to 27% in the later period as compared to 24% in the earlier period. In fact, this decline is so large that it explains the entirety of the differences observed between EDTX and the rest of the country over the entire six-year period. Our regression analysis confirms a statistically significant decline in exclusion rates for plaintiff experts in EDTX following the *Heartland* decision.[46]

The reasons for this shift in exclusion rates in EDTX following the *Heartland* decision are unclear. One theory might be that judges were incentivized to change their behavior in EDTX following *Heartland*. Another explanation, which we think is more likely, is that the *Heartland* decision removed some degree of jurisdiction shopping by plaintiffs, such that the inherent tendencies (greater latitude in allowing experts' opinions to stand up to the weight of their testimony) became more apparent with the more random assignment of cases across districts following the decision. This question is worthy of investigation by future researchers.

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[46]　*See infra* Appendix B.

C.   Exclusions by Judge

We have also studied exclusions by judge. We observe that a large number of decisions are concentrated in a relatively small number of judges. The top two judges alone account for 20% of written admissibility decisions regarding IP damages experts. The top five judges account for more than 30% of these decisions, the top ten account for more than 40% of these decisions, and the top twenty account for 53% of these decisions. In 2020, 621 of 677 authorized judges in district courts were considered active.[47] In addition, there were 555 full-time magistrate judges in the district courts. Thus, by any account, certain judges have specialized in presiding over IP cases.

Our data shows substantial differences when studying exclusion rates by judge. Figure 12, below, shows the exclusion rates for the judges making the most IP damages expert *Daubert* decisions, with the judge issuing the greatest number of decisions (137) labeled as "1" and the judge issuing the tenth-most decisions (19) labeled as "10."

Figure 12
Exclusion Rates by
Top Ten Judges

Judge Rank by Count of Decisions

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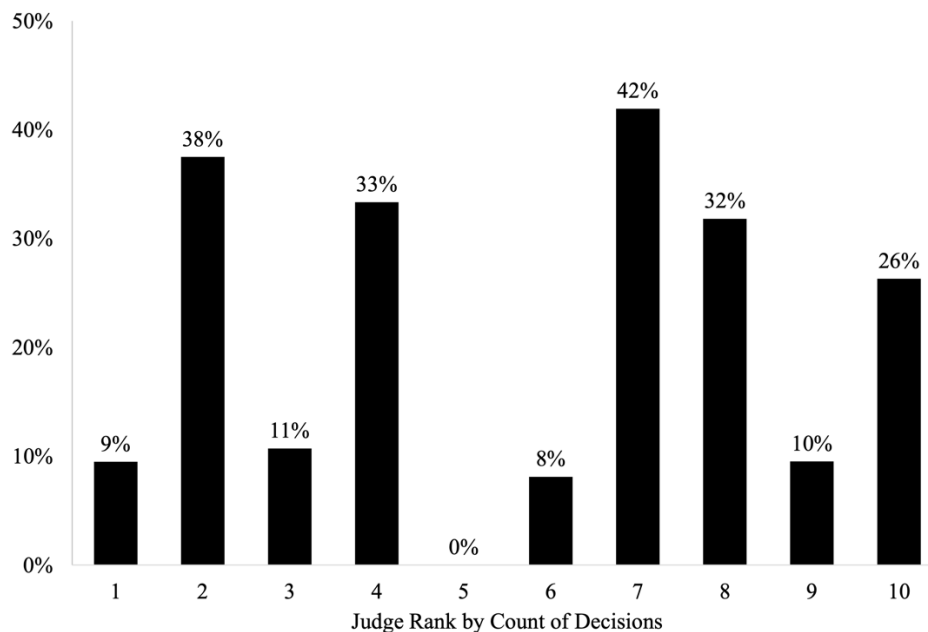
47   U.S. Courts, Table 1.1 Total Judicial Officers–U.S. Courts of Appeals, District Courts, and Bankruptcy Courts During the 12-Month Periods Ending June 30, 1990 and September 30, 1995 Through 2020, https://www.uscourts.gov/sites/default/files/data_tables/jff_1.1_0930.2020.pdf.

Our analysis indicates that the ten judges with the most decisions (again, representing 40% of the observations) generally can be categorized in one of two camps—having a "high" or "low" expert admissibility rate, relative to the overall exclusion rate of 24%. Five of the judges excluded opinions at rates ranging from 0% to 11% of challenges decided. Four judges excluded opinions at rates ranging from 32% to 42% of challenges decided. No judges in the top ten excluded opinions at rates ranging from 12% to 25%. Only one judge (number ten at 26%) was close to the overall mean exclusion rate in the data of 24%.

Also of note is that a specific judge's rate of expert admissibility might not necessarily align with other judges in the same district. Among the top ten judges with the most decisions, the judges with the highest exclusion rate of 42% and the lowest exclusion rate of 0% are both in EDTX, where the overall exclusion rate was 16%. The difference is even more pronounced in NDCA, home to seven of the top twenty judges, where exclusion rates by judge vary from 8% to 77%.

Individual cases are very fact specific, and outcomes are driven by how cases evolve in conjunction with case-specific facts. Nevertheless, the analysis above raises questions about whether district courts acting as gatekeepers are applying the standards set forth in *Daubert* by the Supreme Court in a sufficiently consistent manner across the country and among judges. If standards are not sufficiently consistent, what steps might be taken to encourage more consistent gatekeeping decisions? A discussion of that question, while important, is beyond the scope of this paper.[48]

Regardless of issues related to consistency, the data indicates that familiarity with particular judges' decision-making processes with regard to admissibility of experts can be important for practitioners.

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[48] A proposed change in the Federal Rules of Evidence seeks greater consistency in *Daubert* decisions. The proposed change to FRE 702 seeks to clarify that the preponderance of evidence standard applies to expert testimony admissibility. *See, e.g.*, Burroughs, *supra* note 8.

D.   Exclusions by Expert

Our data allows us to study exclusions by expert as well. We have 221 unique experts in our data. The number of decisions is less concentrated at the top among experts than judges. Figure 13, below, shows exclusions for the twenty experts with the most decisions.

Table 13
Exclusion Rates for the
Twenty Experts with the Most Decisions

	Decisions					Excluded Decisions			Percent Excluded		
	Plaintiff	Defendant	Total	% Whole	Cum. %	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
Expert 1	23	11	34	3%	3%	2	4	6	9%	36%	18%
Expert 2	4	29	33	3%	5%	2	8	10	50%	28%	30%
Expert 3	26	3	29	2%	7%	5	-	5	19%	0%	17%
Expert 4	29	-	29	2%	10%	10	-	10	34%	N/A	34%
Expert 5	10	16	26	2%	12%	1	2	3	10%	13%	12%
Expert 6	23	-	23	2%	13%	5	-	5	22%	N/A	22%
Expert 7	17	4	21	2%	15%	2	2	4	12%	50%	19%
Expert 8	20	-	20	2%	17%	7	-	7	35%	N/A	35%
Expert 9	18	-	18	1%	18%	2	-	2	11%	N/A	11%
Expert 10	16	2	18	1%	19%	2	-	2	13%	0%	11%
Expert 11	14	3	17	1%	21%	4	-	4	29%	0%	24%
Expert 12	16	1	17	1%	22%	-	-	-	0%	0%	0%
Expert 13	-	16	16	1%	23%	-	5	5	N/A	31%	31%
Expert 14	3	13	16	1%	24%	2	2	4	67%	15%	25%
Expert 15	8	8	16	1%	26%	2	-	2	25%	0%	13%
Expert 16	16	-	16	1%	27%	1	-	1	6%	N/A	6%
Expert 17	10	5	15	1%	28%	8	1	9	80%	20%	60%
Expert 18	14	-	14	1%	29%	8	-	8	57%	N/A	57%
Expert 19	14	-	14	1%	30%	5	-	5	36%	N/A	36%
Expert 20	10	3	13	1%	31%	4	1	5	40%	33%	38%
Top-20 Experts Total	**291**	**114**	**405**	**31%**		**72**	**25**	**97**	**25%**	**22%**	**24%**
All Other Experts	**632**	**257**	**889**	**69%**	**100%**	**147**	**67**	**214**	**23%**	**26%**	**24%**

The top twenty experts comprise 31% of the total decisions in the data, with each expert's total decisions ranging from thirteen to thirty-four in this group. The rate of exclusion for the twenty experts with the most decisions (24%) is the same as experts with fewer decisions (24%).

Focusing on the differences in exclusion rates across these experts shows some interesting patterns. Figure 14, below, shows exclusion rates for the top twenty experts sorted from largest to smallest.

Figure 14
Exclusion Rates for Top Twenty Experts
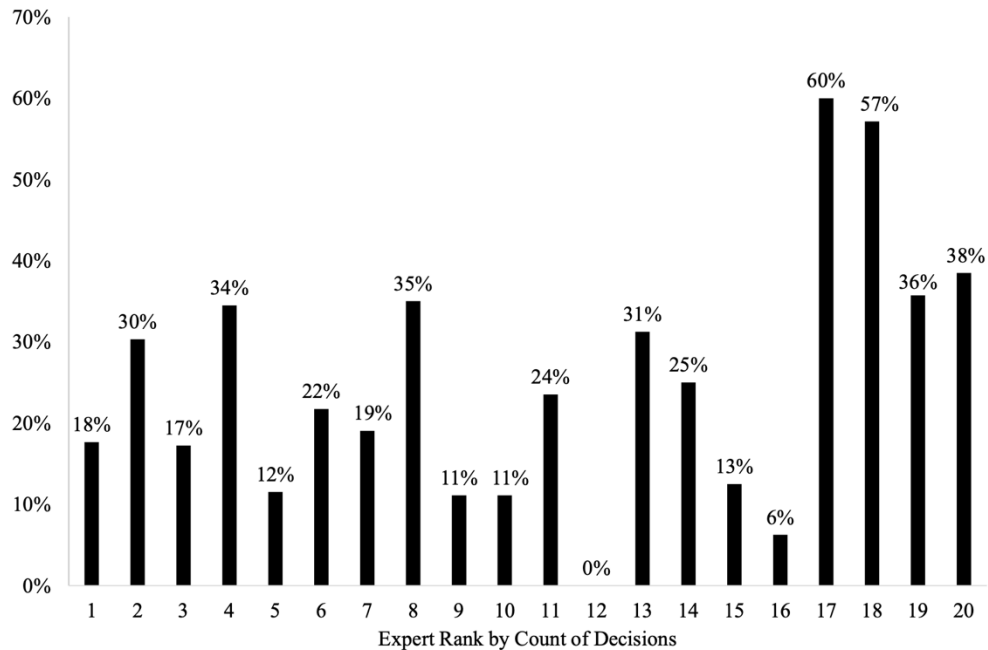
Only one expert in the top twenty had zero exclusions during this six-year period. Six experts had exclusion rates under 15%. However, five experts had 35% or more of the challenges against them succeed, including two experts in the top twenty where more than one-half of the challenges against them succeeded. These six experts had forty-four exclusions between them—about 14% of all exclusions in the full dataset.

Again, there are issues of endogeneity here, and assessing expert "quality" based on exclusion percentages is difficult. It may be that the "toughest" cases (e.g., lack of comparable licenses or ways to independently assess technology value) are those that also have higher risks of exclusion, which also may be cases where the "best" experts (in the eyes of the parties) are hired.

E.   Exclusions by Gender

Our data further allows us to evaluate whether exclusion rates vary according to the gender of the judge or expert. In our experience, we have not observed circumstances that would suggest differences in admissibility rates based on gender (either for judges or experts). So, we pursued this analysis with no prior expectations about what we might observe on the basis of gender. Table 15, below, shows decisions broken down by the gender of the judge and expert.

Table 15
Exclusions by Gender of Judge and Expert

Judge Gender	Expert Gender	Decisions			Excluded Decisions			Percent Excluded		
		Plaintiff	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**	**Plaintiff**	**Defendant**	**Total**
M	M	582	204	786	139	46	185	24%	23%	24%
F	M	237	90	327	51	28	79	22%	31%	24%
M	F	69	57	126	20	10	30	29%	18%	24%
F	F	35	20	55	9	8	17	26%	40%	31%

Perhaps the biggest takeaway from this data is that most decisions are rendered by male judges (70%) and that most decisions involve experts who are male (87%). We note that five of the top twenty experts described in the prior section are female and six of the top twenty judges are female, more or less in line with the percentages for all decisions above.

We observe similar exclusion rates for all permutations of gender, though somewhat higher exclusion rates for challenges that involve both a female judge and expert. However, there are just fifty-five observations for this scenario, the lowest of the four groups. We find no statistically different results for exclusion rates based on the gender of judges or experts.[49]

VI. Exclusions by Categories

A. Exclusion Rates by Tier 1 Category

We categorized challenges by type using three tiers, as described above, with Tier 2 categorizations contingent of the category identified for Tier 1 and with Tier 3 categories contingent on the values identified for Tier 2 for each observation. Each successive tier provides more detailed information on the substantive reasons for each challenge. One advantage of this tiered approach is that we can aggregate types of challenges in several ways—in what we describe as a "watershed" analysis. Table 16, below, summarizes the data by Tier 1 categorizations.[50]

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[49]   *See infra* Appendix B.

[50]   Unjust enrichment and disgorgement analyses are grouped together since the analysis of damages for disgorgement and under a theory of unjust enrichment are essentially the same. However, we understand there are differences between disgorgement and unjust enrichment under the law. *See generally* R.B. Grantham & C.E.F. Rickett, *Disgorgement for Unjust Enrichment?*, 62 CAMBRIDGE L. J. 159 (2003).

Table 16

Exclusion Rates by Damages Approach in Challenge

Watershed Damages Approach Category	Decisions			Excluded Decisions			Percent Excluded		
	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
Reasonable Royalty	582	253	835	148	62	210	25%	25%	25%
Lost Profits	178	48	226	24	7	31	13%	15%	14%
Unjust Enrichment	54	20	74	13	5	18	24%	25%	24%
Scope/Basis for Damages, Incl. Legal Opinion	42	20	62	16	11	27	38%	55%	44%
Relevance	35	13	48	11	3	14	31%	23%	29%
Qualifications	13	14	27	-	4	4	0%	29%	15%
Impairment of Business	10	-	10	7	-	7	70%	N/A	70%
N/A	9	3	12	-	-	-	0%	0%	0%
Total	**923**	**371**	**1,294**	**219**	**92**	**311**	**24%**	**25%**	**24%**

Reasonable royalty approaches alone account for 64% of the total challenges, and lost profits account for another 17%. Reasonable royalty challenges succeeded 25% of the time, similar to the overall average. In our experience, lost profits damages are sought less frequently than reasonable royalty damages. However, at least for admissibility purposes, the exclusion rate of experts is statistically significantly lower for lost profits calculations (14%) than other damages approaches.

One potential explanation for these results is that the ability of a plaintiff to pursue a lost profits damages claim is guided by the relatively structured approach set forth by the *Panduit* factors.[51] This results in fewer ways in which lost profits analyses can be challenged on a methodological basis. Another plausible explanation is that the methodology for computation of lost profits is relatively less subjective compared to the methodology applied to reasonable royalties.

Additional themes emerge from the table. We observe high exclusion rates (43%) related to challenges dealing with the scope of an expert's opinion, including offering legal opinions, indicating these challenges are associated with a statistically significantly greater likelihood of exclusion.[52] Not surprisingly, economic and financial experts offering opinions that fall under the purview of the court generally are not well received by judges.

Challenges related to relevance were also successful at a high rate (35%), though this type of challenge is not associated with a statistically significantly greater chance of exclusion. Regardless, a higher risk of exclusion would not be surprising for this category. If an expert has opinions that are not relevant to the decisions before the fact finder, the judge is likely to exclude those opinions. These sorts of exclusions do not go directly to the quality of the work or the reliability of the methods but are part of *Daubert* just the same.

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[51] *See* Deepa Sundararaman, *Intellectual Property Expert Damages Admissibility*, *in* CLEVE B. TYLER AND GREGORY SMITH, ASSETS AND FINANCES: CALCULATING INTELLECTUAL PROPERTY DAMAGES app. A:12 (2022–2023 ed. 2022).

[52] *See infra* Appendix B.

While comprising a small fraction of overall challenges, those that were based strictly on qualifications did not succeed often (just 15%), but this type of challenge is not statistically associated with a lower risk of exclusion. We found no examples of a plaintiff expert that was excluded for qualifications alone. Again, lower rates of exclusion for this type of challenge are not surprising as *Daubert* focuses not on the qualifications of the expert but instead on the methods used by that expert and the application of those methods to the facts of a case. That focus leaves less room for challenges based on qualifications. And, of course, the parties in litigation seek to hire experts that are at least minimally qualified (and usually much more than minimally qualified) as it is in their interest to do so.

B. Exclusion Rates by Challenge Type

Our tiered approach allows us to classify challenges based on the overall type of challenge—whether the challenge could be classified as a challenge to the methodology, use of evidence, assumptions made, or reliance on another expert. Table 17, below, summarizes these results.

Table 17
Exclusion Rates by Challenge Type

Watershed Challenge Type Catgory Breakdown	Decisions			Excluded Decisions			Percent Excluded		
	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
Methodology	360	135	495	105	29	134	29%	21%	27%
Evidence	171	85	256	29	19	48	17%	22%	19%
Assumptions	73	25	98	15	4	19	21%	16%	19%
Reliance on Expert	34	15	49	7	3	10	21%	20%	20%
N/A	285	111	396	63	37	100	22%	33%	25%
Total	**923**	**371**	**1,294**	**219**	**92**	**311**	**24%**	**25%**	**24%**

Most challenges were classified as pertaining to methodology, with an overall exclusion rate of 27% and with somewhat higher exclusions for plaintiff experts than defendant experts. By coincidence, the exclusion rates for challenges based on evidence and assumptions are both 19%, while reliance on other experts is 20%. Within these categories, there was a somewhat higher exclusion rate for challenges pertaining to methodology for plaintiff experts (29%) than for defendant experts (21%).

Challenges related to relying on other experts tend to relate to other *Daubert* challenges. So, for example, a technical expert might offer an opinion about non-infringing alternatives and face a *Daubert* challenge for that opinion. The damages expert might also face a challenge based on his or her reliance on a technical expert's challenged opinion. Such challenges have little to do with the quality of a damages expert's work; rather, they depend nearly entirely on the ruling with regard to the other expert relied upon. However, there can still be issues if a damages expert *indicates* that they relied on another expert, but that expert did not express the opinion that the damages expert claims they did—in those circumstances, that reliance likely would be faulty.

C.   Exclusion Rates by Type of Challenge in Patent Cases

With reasonable royalty damages, we conducted further analysis and categorized decisions based on the specific type of analysis employed. We were able to group about one-half of the challenges related to a reasonable royalty analysis into five analytical categories:

- Market Approach: analysis in which potentially comparable licenses are used as a benchmark;

- *Georgia-Pacific* (GP) Analysis: related to how the *Georgia-Pacific* factors are employed and/or a hypothetical negotiation is conducted;

- Apportionment: related to how value specific to the technology is isolated from other factors, including other technologies incorporated into the allegedly infringing products;

- Income or Cost Approaches: related to either an analysis of how profits are impacted by use of the technology compared to when the technology is not used (income approach) or analyzing the cost of using a non-infringing alternative (cost approach); and

- Royalty Base: issues related to the royalty base (not related to apportionment).

Table 18, below, shows these results by the above types of analyses.

Table 18
Exclusion Rates by Reasonable Royalty Analysis Type

Watershed Reasonable Royalty Analysis Type Category	Decisions			Excluded Decisions			Percent Excluded		
	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total	Plaintiff	Defendant	Total
Market Approach/Licenses	109	81	190	33	23	56	30%	28%	29%
GP Analysis	121	63	184	24	17	41	20%	27%	22%
Apportionment	144	32	176	47	5	52	33%	16%	30%
Income/Cost Approach	47	10	57	11	-	11	23%	0%	19%
Base Issues (non-Apportionment)	38	4	42	11	1	12	29%	25%	29%
N/A	464	181	645	93	46	139	20%	25%	22%
Total	923	371	1,294	219	92	311	24%	25%	24%

Each category deserves some discussion. Market approaches tend to lead to somewhat higher exclusion rates overall (29%) compared to the overall total (24%), with no meaningful difference between plaintiff and defendant experts. Exclusions in this analytical type tend to relate to the comparability of licenses—i.e., whether licenses are technically and economically comparable to a license contemplated in a hypothetical negotiation.

Figure 19, below, shows the ratio of plaintiff to defendant expert decisions (on the left) and ratio of plaintiff to defendant excluded decisions (on the right). If the height of a bar on the right is higher than the bar of the same color on the left, then

plaintiff experts are excluded at a greater rate than defendant experts for that type of challenge. A lower bar on the right shows the opposite relationship.

Figure 19
Ratio of Plaintiff to Defendant Challenges
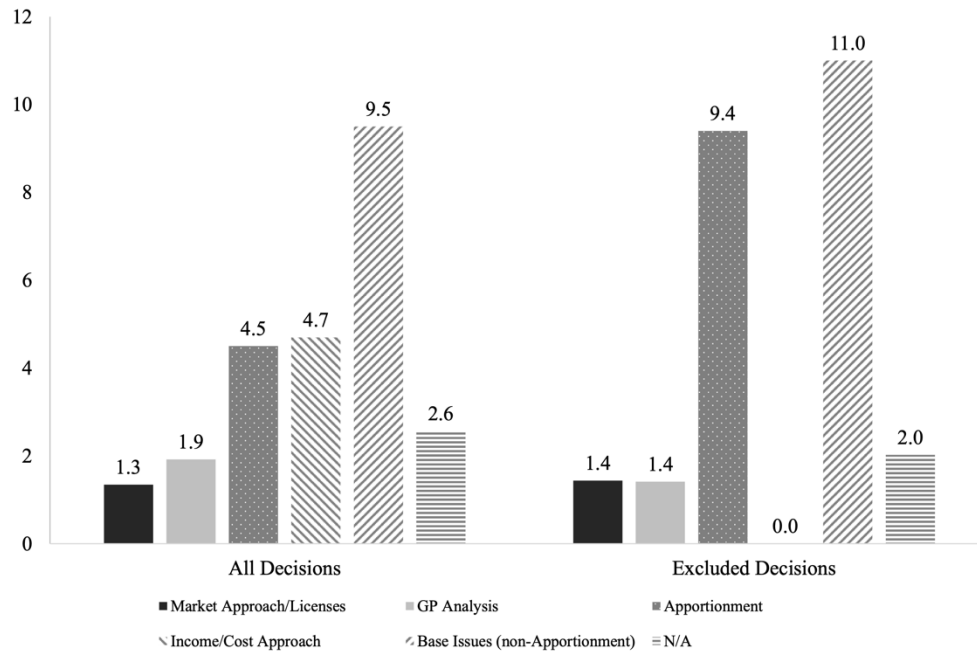
The category "GP Analysis" tends to relate to how the *Georgia-Pacific* factors are employed, but it also includes issues related to the hypothetical negotiation itself, such as the date of the first infringement (and thus date of the hypothetical negotiation), the parties at the table, and any adjustment related to bargaining positions. Interestingly, the exclusion rate for defendant experts is higher than for plaintiff experts for this category.

Apportionment is a step in the analytical process that has led to more exclusions on the plaintiff side than any other (47 exclusions). The exclusion rate related to apportionment for plaintiff experts (33%) is more than double what we find for defendant experts (16%). Conceptually, this makes sense because plaintiff experts often are accused of not sufficiently apportioning, thereby including in their analyses technologies beyond those at issue in the case.

Income or cost approaches have somewhat lower exclusion rates and are challenged in many fewer cases than other approaches. In fact, we found no exclusions for defendant experts specifically with regard to the use of an income or cost approach.

Issues related to the royalty base show higher rates of exclusion (29%) relative to the average (24%); however, the number of challenges specifically related to the base (and not otherwise related to apportionment) is small.

VII. Discussion and Concluding Thoughts

No other researchers, to our knowledge, have attempted to categorize written expert admissibility decisions by judges based on the specific characteristics of challenges. Challenges of IP damages experts represent a potentially fruitful area of study, especially given the continued importance of expert damages opinions in IP cases and the frequency of challenges to these opinions.

Our results indicate that the venue can matter—as indicated by our findings with regard to the Supreme Court's decision in *Heartland*, which showed a sizable reduction in expert exclusion rates in EDTX and Delaware following that decision. Importantly, such a finding does not necessarily indicate a change in behavior by judges but may simply reveal underlying tendencies that had been present all along.

We also find substantial variability in exclusion rates across judges. These differences may reflect different types of cases that tend to appear before certain judges, though these differences also might reflect different stances toward application of the *Daubert* standard across courts. Anticipated changes in the Federal Rules of Evidence are designed to encourage more consistency in the application of *Daubert*, though whether that occurs in practice will only be revealed in time. Regardless, we believe our findings regarding these differences warrant more in-depth analysis into potential differences in the application of *Daubert* across federal courts.

Finally, the types of challenges are related to exclusion rates—such as our finding of lower rates of exclusion for lost profits analyses. However, the most important drivers of admissibility in any case are the specific analyses conducted by the expert and the specific challenges brought against that expert.

Appendix A: Decision Types Across Tiers

First Level Tier	Second Level Tier	Category Code	Plaintiff Decisions	Defendant Decisions	Total Decisions	Plaintiff Exclusions	Defendant Exclusions	Total Exclusions	% Plaintiff Exclusion	% Defendant Exclusion	% Total Exclusion
N/A	N/A	0.0	1	1	2	0	0	0	0%	0%	0%
Quals_And_Relevance	N/A	1.0	3	1	4	0	0	0	0%	0%	0%
Quals_And_Relevance	Qualifications	1.1	13	14	27	0	4	4	0%	29%	15%
Quals_And_Relevance	Non-Damages Opinions (e.g., Legal)	1.2	18	13	31	7	6	13	39%	46%	42%
Quals_And_Relevance	Damages Period	1.3	8	0	8	1	0	1	13%		13%
Quals_And_Relevance	Future_Damages	1.4	6	0	6	1	0	1	17%		17%
Quals_And_Relevance	Duplicative	1.5	3	2	5	1	0	1	33%	0%	20%
Quals_And_Relevance	Legal basis for damages	1.6	19	6	25	6	5	11	32%	83%	44%
Quals_And_Relevance	Relevance - rely on other experts	1.7	7	3	10	3	0	3	43%	0%	30%
Quals_And_Relevance	Relevance	1.8	11	8	19	5	3	8	45%	38%	42%
Quals_And_Relevance	Scope of Damages	1.9	5	1	6	3	0	3	60%	0%	50%
Royalty_Base	N/A	2.0	0	0	0	0	0	0			
Royalty_Base	EMVR	2.1	35	1	36	15	0	15	43%	0%	42%
Royalty_Base	Inappropriate Base	2.2	31	3	34	8	1	9	26%	33%	26%
Royalty_Base	US_Sales	2.3	6	1	7	3	0	3	50%	0%	43%
Royalty_Base	Apportionment / SSPPU	2.4	24	11	35	10	1	11	42%	9%	31%
Royalty_Base	Reliance on other expert	2.5	1	0	1	0	0	0	0%		0%
Royalty_Rate	N/A	3.0	11	4	15	0	3	3	0%	75%	20%
Royalty_Rate	NIA	3.1	11	23	34	0	5	5	0%	22%	15%
Royalty_Rate	Licenses	3.2	109	81	190	33	23	56	30%	28%	29%
Royalty_Rate	Apportionment	3.3	85	21	106	22	5	27	26%	24%	25%
Royalty_Rate	HN_setup	3.4	25	10	35	5	3	8	20%	30%	23%
Royalty_Rate	Methodology	3.5	158	67	225	33	13	46	21%	19%	20%
Royalty_Rate	GP_Factor_Analysis	3.6	71	24	95	15	6	21	21%	25%	22%
Royalty_Rate	FRAND	3.7	1	2	3	0	0	0	0%	0%	0%
Royalty_Rate	Bargaining	3.8	14	5	19	4	2	6	29%	40%	32%

Appendix A: Decision Types Across Tiers (continued)

First Level Tier	Second Level Tier	Category Code	Plaintiff Decisions	Defendant Decisions	Total Decisions	Plaintiff Exclusions	Defendant Exclusions	Total Exclusions	% Plaintiff Exclusion	% Defendant Exclusion	% Total Exclusion
Lost_Profits	N/A	4.0	2	5	7	1	0	1	50%	0%	14%
Lost_Profits	Demand for patented products	4.1	10	7	17	3	3	6	30%	43%	35%
Lost_Profits	Future_Damages	4.10	0	0	0	0	0	0			
Lost_Profits	Reliance on Fact Witnesses/Evidence	4.11	10	1	11	2	0	2	20%	0%	18%
Lost_Profits	Price Erosion	4.12	5	0	5	1	0	1	20%		20%
Lost_Profits	NIA	4.2	24	10	34	1	1	2	4%	10%	6%
Lost_Profits	Capacity	4.3	8	2	10	0	0	0	0%	0%	0%
Lost_Profits	Calculation	4.4	82	10	92	10	2	12	12%	20%	13%
Lost_Profits	Apportionment	4.5	2	2	4	0	0	0	0%	0%	0%
Lost_Profits	Panduit factors - incorrect application	4.6	2	0	2	1	0	1	50%		50%
Lost_Profits	Convoyed sales	4.7	6	2	8	3	1	4	50%	50%	50%
Lost_Profits	Causation	4.8	20	5	25	2	0	2	10%	0%	8%
Lost_Profits	Assumptions	4.9	7	4	11	0	0	0	0%	0%	0%
Inappropriate Daubert challenge	N/A	5.0	5	1	6	0	0	0	0%	0%	0%
Disgorgement	N/A	6.0	7	1	8	2	1	3	29%	100%	38%
Disgorgement	Evidence	6.1	11	6	17	3	0	3	27%	0%	18%
Disgorgement	Costs	6.2	2	5	7	0	2	2	0%	40%	29%
Disgorgement	Taxes	6.3	0	1	1	0	1	1		100%	100%
Disgorgement	Methodology	6.4	25	6	31	4	1	5	16%	17%	16%
Disgorgement	Assumptions	6.5	9	1	10	4	0	4	44%	0%	40%
Impairment of Business (Lost business value)	N/A	7.0	10	0	10	7	0	7	70%	0%	70%
Total:			923	371	1294	219	92	311	24%	25%	24%

Appendix B: Probit Regression Model of IP Damages Expert Admissibility Decisions

A regression analysis is a widely-used statistical technique that quantifies empirical relationships between one variable and one or more other variables. A regression model has two variable types: dependent variables and independent (or explanatory) variables. Independent variables are included in a model to explain variation in the values of the dependent variable.

The use of a regression analysis results in coefficients for each independent variable included in the model. These coefficients represent the estimated relationship between the independent variables and dependent variables in a well-specified model. In a two-variable setting, the technique is akin to statistically fitting a line through a scatterplot of data, with the coefficient of the independent variable representing the slope of that line. In this way, a regression analysis allows a researcher to assess the incremental impact of each independent variable on the dependent variable.

Once a regression analysis has been performed, the results allow for a set of independent (or explanatory) variables to predict values for the dependent variable. The residuals of a regression analysis are the portion of the dependent variable not explained by the regression equation for each observation. In fact, regression analyses solve for the coefficients in the regression equation such that the sum of the squared residuals is as small as possible.[53]

Here, we use a probit model to study the likelihood of exclusion based on observed characteristics of the order. In a probit model, the dependent variable is an "indicator variable" (also referred to as a "dummy variable"). An indicator variable takes on the value of "1" if something is true about an observation and a value of "0" if something is not true about an observation. Here, we specify a regression in which the dependent variable is an indicator variable with regard to exclusion—taking on a value of 1 if the judge's decision was exclusion and a value of 0 if the judge's decision was to admit the opinion. Hence, the generated coefficients of the independent variables are restricted such that the input of independent variables will predict a probability of exclusion for a particular decision restricted to being between 0 and 1.

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[53] The most common form of regression analysis is termed "OLS," which stands for Ordinary Least Squares, which describes the technique of minimizing the square of the residuals in a regression analysis.

Table 20, below, shows the results of our probit model where the independent variables are key factors discussed above and discussed more specifically below. In a probit model, the coefficients can be translated into the changes in probability based on the standard normal probability density function evaluated at specified values for all other variables.[54] Importantly, coefficients indicate correlations and do not prove causation.

Table 20
Results of Probit Model: Where Dependent Variable Is an
Indicator Variable of Expert Exclusion

Daubert Exclusion (Probit Model)		
Defendant	-0.0869	(0.111)
Non-Patent	-0.486***	(0.160)
Defendant × Non-Patent	0.520**	(0.253)
Year (vs. 2015)		
2016	0.365**	(0.153)
2017	0.288**	(0.145)
2018	0.0620	(0.154)
2019	0.265*	(0.146)
2020	-0.00866	(0.147)
Top 10 District (vs. Non-Top 10)		
Central California	0.341*	(0.190)
Delaware	0.0555	(0.141)
Eastern Texas	-0.436***	(0.142)
Minnesota	-0.597*	(0.334)
Northern California	0.317**	(0.130)
Southern California	-0.472*	(0.258)
Southern New York	0.373*	(0.217)
Southern Texas	-0.682	(0.469)
Western Pennsylvania	-0.259	(0.305)
Western Wisconsin	-0.629**	(0.265)
Gender Effects (vs. Male Judge/Expert)		
Female Judge	0.0619	(0.115)
Female Expert	-0.0651	(0.142)
Female Judge × Female Expert	-0.117	(0.254)

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[54] DAMODAR N. GUJARATI & DAWN C. PORTER, BASIC ECONOMETRICS 569–70 (5th ed., McGraw-Hill Irwin 2009).

Table 20 (continued)
Results of Probit Model: Where Dependent Variable Is an
Indicator Variable of Expert Exclusion

Reasonable Royalty Type (vs. N/A)

Impairment of Business × Plaintiff	1.801***	(0.452)
Lost Profits × Defendant	-0.508**	(0.247)
Lost Profits × Plaintiff	-0.365**	(0.144)
Qualifications × Defendant	-0.156	(0.391)
Relevance × Defendant	-0.0421	(0.398)
Relevance × Plaintiff	0.343	(0.244)
Scope/Basis for Damages, Incl. Legal Opinion × Defendant	0.710**	(0.319)
Scope/Basis for Damages, Incl. Legal Opinion × Plaintiff	0.480**	(0.224)
Unjust Enrichment × Defendant	-0.143	(0.355)
Unjust Enrichment × Plaintiff	0.318	(0.246)
Constant	-0.725***	(0.137)
Observations	1277	
Pseudo-R^2	0.076	
χ^2	108.109***	

Standard errors in parentheses. 17 observations were dropped due to perfect prediction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The regression results confirm some of the relationships observed in the summary tables above but refute other potential relationships. First, the overall regression is statistically significant. However, the overall explanatory power is small, which is not surprising considering that each and every decision made by a judge about an expert's decision will be driven mostly by the specific facts and circumstances of the case and analysis performed.

We find no statistically significant differences in exclusion rates across types of IP. We also find no difference between exclusion rates for plaintiff experts and defendant experts, consistent with our summary tables.

We do find differences across districts. In particular, exclusion rates are statistically significantly greater in Northern California, Central California, and Southern New York. Western Wisconsin is statistically significantly lower than average. Interestingly, neither EDTX nor Delaware are significantly different than the rest of the country.

However, there is a wrinkle for EDTX. Recall that we observed differences in EDTX before and after the *Heartland* decision by the Supreme Court in 2017. In Table 21, below, we modify the base model to include an interaction variable in the regression analysis that identifies whether the exclusion rate changes in EDTX

following *Heartland*.[55] The EDTX is a district that may have been impacted following the *Heartland* decision. This is the interaction term "EDTX x Post-*Heartland*" in Table 21.[56] We include similar interaction terms for Delaware and NDCA as well.

The coefficient for this interaction term is negative and statistically significant, indicating that an expert in EDTX following the *Heartland* decision was less likely to be excluded, all else equal. Thus, given that the overall coefficient on EDTX is not significant, this indicates that the differences observed between EDTX and the average exclusion rates in the remainder of the country are driven largely by the implications of *Heartland* on exclusion rates in EDTX. We also find that experts are less likely to be excluded in Delaware following *Heartland*.

Table 21
Probit Model: Difference-in-Differences Test for
EDTX Exclusion Rate Post-*Heartland*

Daubert Exclusion (Probit Model)		
Defendant	-0.0819	(0.112)
Non-Patent	-0.439***	(0.161)
Defendant × Non-Patent	0.461*	(0.254)
Year (vs. 2015)		
2016	0.159	(0.161)
2017	0.0278	(0.191)
2018	-0.274	(0.257)
2019	-0.0320	(0.252)
2020	-0.364	(0.257)
Top 10 District (vs. Non-Top 10)		
Central California	0.322*	(0.193)
Delaware	0.465**	(0.228)
Eastern Texas	-0.0713	(0.196)
Minnesota	-0.504	(0.339)
Northern California	0.108	(0.182)
Southern California	-0.397	(0.263)
Southern New York	0.339	(0.217)
Southern Texas	-0.712	(0.469)
Western Pennsylvania	-0.231	(0.303)
Western Wisconsin	-0.652**	(0.267)

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[55] An "interaction" variable (sometimes referred to as an interaction term) is when two other variables are multiplied together and that multiplied value is included as an independent variable in the regression. Often, an interaction term is the multiple of two indicator variables.

[56] By including the variables "EDTX," "Post-*Heartland*," and an interaction term "EDTX – Post-*Heartland*," we are performing a difference-in-differences study to examine whether exclusion rates in the treatment group (EDTX) change following the *Heartland* decision compared with a control group (non-EDTX districts).

Table 21 (continued)
Probit Model: Difference-in-Differences Test for
EDTX Exclusion Rate Post-*Heartland*

Heartland Effects (vs. Non-State/Pre-Heartland)		
Post-Heartland	0.327	(0.223)
Post-Heartland × Delaware	-0.552**	(0.256)
Post-Heartland × Eastern Texas	-0.599**	(0.240)
Post-Heartland × Northern California	0.404*	(0.238)
Gender Effects (vs. Male Judge/Expert)		
Female Judge	0.0493	(0.115)
Female Expert	-0.00170	(0.144)
Female Judge × Female Expert	-0.0643	(0.255)
Reasonable Royalty Type (vs. N/A)		
Impairment of Business × Plaintiff	1.793***	(0.453)
Lost Profits × Defendant	-0.587**	(0.253)
Lost Profits × Plaintiff	-0.342**	(0.145)
Qualifications × Defendant	-0.140	(0.389)
Relevance × Defendant	0.0203	(0.399)
Relevance × Plaintiff	0.324	(0.244)
Scope/Basis for Damages, Incl. Legal Opinion × Defendant	0.667**	(0.320)
Scope/Basis for Damages, Incl. Legal Opinion × Plaintiff	0.485**	(0.227)
Unjust Enrichment × Defendant	-0.218	(0.358)
Unjust Enrichment × Plaintiff	0.271	(0.247)
Constant	-0.700***	(0.147)
Observations	1277	
Pseudo R^2	0.087	
χ^2	123.814***	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We also included certain high-level characteristics of decisions to test for significant differences in exclusion rates. We find that experts challenged for analyses related to the impairment of business (which includes disgorgement analyses) were excluded at a significantly higher rate. Also, consistent with our summary tables, experts facing challenges related to lost profits analyses were statistically significantly (at 5% p-value) less likely to be excluded. We also included whether a challenge related to apportionment issues, as this type of challenge appears to be more likely to succeed, but we do not find that apportionment challenges are statistically significantly more likely to result in exclusion when controlling for other factors.

Finally, we included indicator variables to indicate the combinations of gender for experts and judges. However, we find no statistically different exclusion rates

for female experts or for decisions by female judges compared with decisions by male judges for male experts.