

## The Survival of U.S. Patent Damages on Appeal: An Empirical Study of Award Size and Affirmance Rates

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### Executive Summary

This study investigates the survival of large patent damages awards on appeal to the U.S. Court of Appeals for the Federal Circuit (CAFC). Drawing on a novel database of district court jury verdicts between 2010 and 2025, the research assesses how often damages survive appellate review and whether award size affects affirmance rates.

### Key Findings

- Low overall survival: Only about one-third of damages awards survive intact on appeal once pending and settled cases are excluded.
- Award size is decisive: Larger verdicts are disproportionately overturned, reduced, or vacated.
  - Upheld awards average \$103M, while non-upheld awards average \$ 267 million.
  - Median damages are similar (~\$35–40M), showing that mega-verdicts skew the averages.
- Cliff effect at high values:
  - Awards above \$100M are rarely upheld.
  - Awards above \$500M are never upheld.
- Biotech vs. non-biotech: Non-biotech cases show a stronger negative correlation between award size and survival, with statistical significance.

### Implications

- For policymakers: The data suggest that very large damages awards, while headline-grabbing, are illusory. They rarely survive appellate scrutiny and may distort perceptions of patent enforcement.
- For litigants: The fragility of large verdicts may play a key role in informing the litigation and settlement strategies of patent litigants of different sizes.
- For the courts: The findings highlight the appellate system's active role in overturning the majority of lower court decisions, which adds to the duration and expense of patent litigation.

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## Conclusion

Patent damages awards are most vulnerable at the upper end of the spectrum. Billion-dollar verdicts consistently collapse on appeal, and damages exceeding \$500M have no survival record in the modern era. The relationship between award size and appellate survival is robust, providing a better understanding of the real outcomes of patent litigation as empirical input for policy debates on patent enforcement.

## 1. Research Design

This study investigates the survival rate of patent damages awards in the United States when appealed to the Court of Appeals for the Federal Circuit (CAFC), with particular focus on the relationship between the size of the award and the likelihood of it being upheld. The research is motivated by the need to understand better the extent to which large jury damages awards in patent litigation translate into actual recoveries for patent holders. Prior scholarship and anecdotal evidence suggest that unusually large awards are more vulnerable to being overturned, reduced, or vacated on appeal.<sup>2</sup>

The analysis centers on three key variables: (1) the size of the damages awarded by juries in U.S. district courts, (2) the outcome of subsequent appeals at the CAFC, and (3) a classification of the award's ultimate disposition—whether it was upheld, not upheld, settled, or remains pending. For this study, an award is considered “upheld” if the CAFC affirmed the damages or remanded the case for enhanced damages. In contrast, awards overturned on judgment as a matter of law (JMOL) by district courts, or reversed or vacated on appeal, are categorized as “not upheld.”

The research adopts a primarily quantitative approach, using statistical tests and regression models to explore correlations between award size and appellate outcomes. However, certain aspects of the dataset required qualitative interpretation, particularly in cases where appellate decisions were mixed—affirmed in part, reversed in part, or vacated in part. In such instances, the classification depended on the practical impact on the damages award.

To construct the dataset, a comprehensive CAFC Patent Damages Appeal Database was developed, encompassing all cases between 2010 and 2025 in which U.S. district courts awarded damages in excess of \$10 million and where the case was subsequently appealed to the CAFC. Data was collected from district court and CAFC records, supplemented by credible news reports that provided insight into settlement actions.

The final dataset was analyzed to identify statistical trends and outliers while accounting for the qualitative nuances of appellate review. This mixed-methods design enables a rigorous assessment of whether the size of jury damages awards is systematically related

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<sup>2</sup> Heiden, Bowman, and Matthew Rappaport. "How Weak Are Strong Patents: Patent Holdout and Small (er) Technology Firms." *Berkeley Tech. LJ* 38 (2023): 349.

to appellate outcomes. It ultimately sheds light on the extent to which headline-grabbing patent verdicts translate into sustainable victories for patent holders.

## 2. Preliminary Research Results

### Survival rate of Jury Damage Awards from US District Court

A CAFC Patent Damages Appeal Database (2010–2025) was created, including cases with a US district court damage award of greater than \$10 million (233 cases) that were subsequently appealed to the CAFC, producing 142 cases. The coding for appellate outcome (i.e. upheld, not upheld, pending, or settled) yielded the results shown in table 1 below. Removing pending cases produced a total of 110 cases with an upheld rate of 28%<sup>3</sup> (see table 2), and eliminating settled cases produced a total of 82 with an upheld rate of 38% (see table 3).

Outcome	Cases	%
Upheld	31	22%
Not Upheld	51	36%
Pending	32	23%
Settled	28	20%
Total	142	100%

Table 1. Outcome statistics of the total sample

Outcome	Cases	%
Upheld	31	28%
Not Upheld	51	46%
Settled	28	25%
Total	110	100%

Table 2. Outcome statistics minus pending CAFC decisions

Outcome	Cases	%
Upheld	31	38%
Not Upheld	51	62%
Total	82	100%

Table 3. Outcome statistics based on cases with CAFC decisions

### Relationship Between Damages Award and Appeal Success Rate Overview

Using the CAFC Patent Damages Appeal Database (2010–2025), we analyzed whether the size of a patent infringement damage award is linked to the success of an appeal at the Federal Circuit (CAFC). Here, “success” is defined from the patent holder’s perspective of the original trial decision (i.e. the appeal is “successful” if the CAFC upholds the original damages decision, meaning the original decision stands). Conversely, if the CAFC does not

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<sup>3</sup> All available information on settlements showed an agreement for a lower amount than the jury damage award as expected. Thus, both settlements and cases that were not upheld at the CAFC resulted patent holders’ inability to recover the damages awarded by the US district court.

uphold the original damages award in full, the appeal can be considered “unsuccessful,” meaning the verdict was reversed/vacated, or modified. In simpler terms, we are examining how often large vs. small damages awards survive on appeal. Key steps in our analysis included computing the overall upheld rate, comparing damages distributions for upheld vs. overturned cases, and assessing correlation (both numerically and via visual trends) between award amount and appeal outcome.

The subset of 82 cases (see table 3), containing information on patent damages awards appealed to final verdict at the CAFC between 2010 and 2025, were used for this comparative analysis. Table 4 below provides an overview of the descriptive statistics of the total sample (82 cases) and non-biotech sample (73 cases) that reached an appellate decision.

	Total Sample			Non-Biotech Sample		
	All Decisions	Upheld	Not Upheld	All Decisions	Upheld	Not Upheld
Sample size	82	31	51	73	23	50
Mean Damages	204.7	102.7	266.8	204.3	40.1	279.8
Medium Damages	37.5	34.7	39.6	30.9	26.7	39.0
Std. Dev.	460.9	141.5	567.2	486.9	34.8	573.8
Min Damages	10.1	10.7	10.1	10.1	10.7	10.1
Max Damages	2540	532.9	2540	2540	146	2540

Table 4. Descriptive statistics for CAFC decisions with and without biotech cases. All damages are in \$ million.

The descriptive statistics include the following key insights:

- Upheld awards are generally much smaller – averaging approximately \$103 and ~\$40M vs. \$267M and \$280M for the not upheld cases, respectively, across the total sample and the non-biotech sample.
- The median values are relatively close in both the total sample (~\$35–40M) and non-biotech sample (\$26.7M vs. \$39.0M), suggesting the difference is mainly driven by the very large awards being struck down.
- The largest upheld cases were (~\$533M) and (\$146M), while damages over \$1B were never upheld.

Table 5 provides an overview of the upheld rate across three damage award intervals and the subset of cases. The results show a similar upheld rate below \$100 million in damages (42% vs. 40%), but a significant difference for awards exceeding \$100 million (30% vs. 10%). In both cases, the upheld rate for damage awards above \$500 million is zero.

Outcome	<\$100M	>\$100M	>\$500M
Total	42%	30%	0%
w/o biotech	40%	10%	0%

Table 5. Upheld rate for CAFC decisions with and without biotech cases.

Figure 2 below shows the plot of the probability of an upheld outcome vs. the damage award on a log scale. The orange line is the logistic regression fit showing a decline curve where the probability of upholding drops notably as damages grow. The **blue points** represent actual upheld (1) and not upheld (0) outcomes, and the **red X's** denote awards above \$500M — every single one is *not upheld*. The **dashed line** at the \$500M threshold marks the sharp drop to zero. The visual makes the gradual downward slope for most cases and the absolute cliff at \$500M+ very clear.

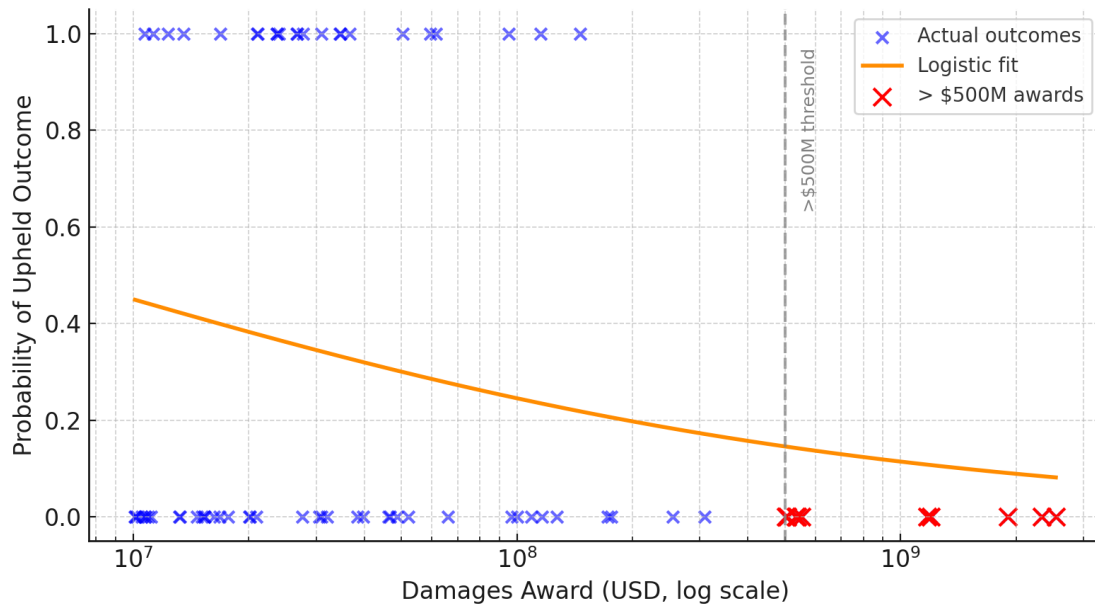


Figure 2. Probability of Appeal Being Upheld vs. Damages Size in the non-biotech dataset.

In the non-biotech dataset, the negative correlation between award size and uphold probability is stronger ( $r \approx -0.230$  vs.  $-0.202$ ) and more statistically meaningful ( $p \approx 0.050$  vs.  $0.068$ ) than the total sample. The sharp drop-off to a 0% uphold rate above \$500M remains absolute, showing a clear “ceiling effect” for extreme verdicts.

For the logistic regression, the non-botech dataset indicates a stronger downward slope ( $-0.923$  vs.  $-0.303$ ), a higher significance level ( $p \approx 0.063$  vs.  $0.417$ ), and a higher Pseudo  $R^2$  ( $0.046$  vs.  $0.006$ ).