

# **Justice Unbalanced: A Civil Court Mystery**

**Investigating the factors contributing to the damage awarded in civil cases**

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## **Introduction**

Civil court is a place where parties in dispute can settle their differences. However, there has been public outcry with regard to the variability and inconsistency in the amount of damage awarded in civil court cases. While some plaintiffs received large amount of money as compensation, others received little to none, despite all the hassle. This was particularly infuriating to some because in principle, everybody should be equal in front of the law. Therefore, we want to investigate in this report the reasons behind unequal damage awards using data from the Civil Justice Survey of State Courts in 2001. Particularly, we will address the following questions of interest:

- Is there a relationship between the amount of damage awarded and the amount demanded by the plaintiff?
- Are other factors such as whether the trial was more recent, if the defendant was a corporation, or an increased number in plaintiffs predictive of the amount awarded?
- How did cases with bodily injuries alter the relationship between damage awarded and requested?

## **Methods**

### **Data**

The U.S. department of justice bureau of justice statistics conducted a systemic examination of civil trials in the nation's 75 most popular counties in 2001. The data was collected via a two stage stratified sample (details in Inter-University Consortium for Political and Social Research Codebook). This 2010 data contains 1836 civil court cases from the sample.

### **Measures**

For each of the civil court cases, we collected the total amount of damages awarded to and requested by the plaintiff, the number of days that the trials lasted, whether bodily injury was part of the claim, whether the defendant was a corporation, or the government, the time period of the cases, the type of claims that was made by the plaintiff, the total number of plaintiffs and the total number of defendants. A total of 661 cases in our data set ended with no awarded damage. Therefore, we added an additional indicator variable on whether the case ended with a damage reward, and created a subset of the data that contained only cases that were rewarded damage. We aimed to develop two different models on the respective data sets in order to model the probability of being awarded damage, and the amount awarded from the relevant cases.

## Statistically Analysis

A multivariate logistic regression model and a multivariate linear model were fit on the each of the datasets. In order to capture the relationship between the probability of a case being awarded with any damage value, we fitted the logistic regression on the dataset with additional indicator variable. In particular, we wanted to find out the specific variables that are predictive of the probability that plaintiffs were awarded damage from the civil cases. On the other hand, we modeled the multivariate linear model on the subset of data containing only awarded cases. This model allowed us to infer the relationships between the amount awarded to the plaintiff and the other measures available. With each model, we preformed residual diagnostics and variable transformation to access and improve model fitness. We used partial F-test to evaluate whether to include the interaction terms in our models.

## Results

Of all the cases in our dataset, 36% of the plaintiff were not awarded with any damages. In terms of the type of defendants, it appears that approximately half of them are corporations, and only 5% of the cases involves government as defendants. About 55.5% of the cases involved one defendant. The Year variable appears to be normally distributed with a left skew and a right cutoff, possibly caused by data collection (fewer cases in the most recent year collected). We want to look into the possible relationship between year and response variables to see if regrouping is a possibility. Around 42% of the plaintiffs received have bodily injury as part of the claim, and we can see that 78.5% of the cases had only one plaintiff.

In relation to the probability of being awarded any damage from the cases, only 29% of the non-injured plaintiffs were awarded whereas 46% of the plaintiffs with injury claims were awarded. When the defendant was a corporation, 32% of the cases were awarded with damages, but this number is 40% in non-corporation defendants. In terms of years, the portion of cases that were awarded between 1999-2001 was similar, whereas the portion prior to 1999 the rates were higher. Therefore, we decided regrouped year during modeling.

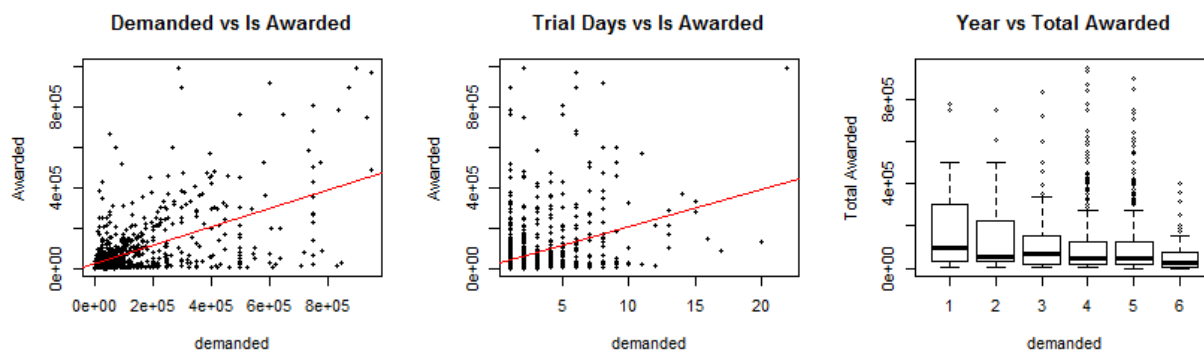


Figure 1: Damage demanded, Trial days appears to be positively correlated with damage awarded

Figure 1 showcases the relationship between the amount awarded and amount requested in civil cases that ended up with plaintiff being compensated monetarily. It was difficult to observe the difference in the amount rewarded in relation to whether the defendant was corporation and the number of plaintiffs.

## Logistic Regression

Our initial logistic regression model used the indicator variable of whether the case ended with any awarded damage as the response variable, and the rest of variates as predictors. We also included the interaction term between demanded damage and Injury Claims. We re-categorized Years into a binary variable, with zero indicating before 1999 and one indicating after 1999. After several versions fitting, re-categorizing the year variable, and performing diagnostics, we selected our best fitted model, as displayed in table 1.

	AOR	CI lb	CI ub %	Pval
Intercept	2.142	1.262	3.636	0.005
Trial Days	1.035	1.001	1.072	0.046
Is.Corporate	1.087	0.863	1.368	0.479
Is.Gov't	0.569	0.359	0.898	0.016
Is.after.1999	1.719	1.336	2.21	<0.001
premises liability claims	0.663	0.442	0.993	0.046
malpractice claims	0.272	0.165	0.439	<0.001
fraud claims	0.423	0.234	0.77	0.005
rental claims	0.637	0.333	1.236	0.177
other claims	0.654	0.416	1.028	0.066
Two Plaintiffs	0.966	0.737	1.27	0.803
Three or more Plaintiffs	1.886	1.148	3.205	0.015
Two Defendant	1.299	1.024	1.651	0.032
Three or more Defendants	1.08	0.786	1.489	0.638
Injury Claims	0.387	0.251	0.596	<0.001
Damage Demanded	1	1	1	0.103
Injury:Demanded	1	1	1	0.185

**Table 1:** Multivariate Logistic Regression results for estimating probability of awarded damage.

We could interpret the final result in terms of adjusted odds ratio. To answer our research questions, we first looked at relationship between the odds of being awarded damage and whether the defendant was a corporation. In this model, we did not have enough evidence to suggest that the adjusted odds were different when defendant is a corporation. We concluded that the relationship between the adjusted odds of being awarded damage and the amount of damage requested was not statistically significant. We did not have enough evidence to conclude that the relationship between the odds of being awarded damage and the amount demanded could be altered by whether the case involves bodily injuries. In cases with three or more plaintiffs, however, were associated with higher odds on average of being awarded damage (AOR = 1.982). Contrary to what we see in the EDA, our model suggested that between 1999 - 2001, the adjusted odds of a plaintiff being awarded damage was higher when compared to the cases before 1999 (AOR = 1.385). Note that when the defendant is the government, the odds of the plaintiff receiving any damage was decreased when comparing to the cases where

the defendant is not the government (AOR = 0.546). Of all the claim types, motor vehicle cases had the highest odds of awarding damage to plaintiff because the AOR of all other claim types are less than 1, and claims of malpractice has the lowest odds for damage award (AOR = 0.254).

## Linear Regression

Our initial linear regression model used the amount awarded as the predictor variable and the rest of the variables as predictors, and included the interaction term between demanded and injury claims. During diagnostics, our initial model violated the linear model assumption, especially in constant variance. Therefore, we log-transformed the response variable, Trial Days, and Damage demanded. The transformed model satisfies the assumptions well and thus we choose it as our final model. Displayed in table 2.

	AOR	CI lb	CI ub %	Pval
Intercept	2.159	1.291	3.027	<0.001
log(Trial Days)	0.426	0.308	0.543	<0.001
Is.Corporate	0.121	-0.054	0.295	0.175
Is.Gov't	0.271	-0.153	0.695	0.21
Pre-1997 (Ref)				
1997	-0.385	-0.944	0.174	0.177
1998	-0.164	-0.639	0.31	0.496
1999	-0.109	-0.533	0.316	0.616
2000	-0.312	-0.737	0.114	0.151
2001	-0.219	-0.732	0.294	0.403
Motor Claims (Ref)				
premises liability claims	0.608	0.239	0.977	0.001
malpractice claims	0.775	0.286	1.264	0.002
fraud claims	0.679	0.187	1.17	0.007
rental claims	0.646	0.126	1.165	0.015
other claims	0.674	0.287	1.061	0.001
One Plaintiff (Ref)				
Two Plaintiffs	-0.171	-0.389	0.047	0.123
Three or more Plaintiffs	0.266	-0.064	0.597	0.114
One Defendant				
Two Defendant	0.084	-0.093	0.261	0.351
Three or more Defendants	0.013	-0.232	0.257	0.919
Injury Claims	1.873	0.83	2.915	<0.001
log(Damage Demanded)	0.685	0.627	0.744	<0.001
Injury:log(Demanded)	-0.197	-0.279	-0.115	<0.001

**Table 2:** Multivariate Linear Regression results for estimating amount of awarded damage.

This model was built on cases that were awarded damage. Because our linear model was built with the log-transformed amount of damages awarded and requested, we could interpret the coefficients in terms of ratio. An increase in 1% of demanded damage from the plaintiffs were, on average, associated with an 0.68% increase in awarded damages when no bodily injuries were involved in the case. However, the same 1% increase in demanded damage in cases with bodily injury claims were on average only associated with 0.49% in awarded damage. Nevertheless, cases with bodily injury claims on average were awarded 5.33 times amount in damage than the cases without such claims, holding all other variables constant. We did not have enough evidence to suggest that there was a relationship between the amount awarded

and whether the case occurred in recent years. We also conclude that the relationship between the awarded damage amount and whether the defendant was a corporation was statistically insignificant. Additionally, our model did not have evidence that there was a relationship between the number of plaintiffs and the amount of damage awarded. Note that an increase in 1% of trial length was on average associated with an 0.425% increase in money awarded, and that all the other claim types other than motor vehicle claims received less in damage award.

## **Discussion**

Overall, to address our initial hypothesis, we concluded that a more “recent” trial and cases with three or more plaintiffs are predictive of a higher probability that damages were awarded, controlling for all other covariates. We did not have enough evidence to support that the relationship exists with the other variables that we have proposed. In terms of the amount awarded, we concluded that there existed a relationship between the damage requested and the damage awarded, and whether the case involved a bodily injury claim alters this relationship. For cases with bodily injury claims, the amount demanded had a weaker effect on the total damages. We did not find any statistically significant relationships between the other hypothesized variables and the amount rewarded.

We could use additional information or data to solidify the validity of our models. With the limited amount of information, it was difficult for us to access any potential causal relationship between the predictor variables and its covariates. Thus, our inference results are by no means “predictive”, but only provides possible leads to the real reasons behind the scene. Future analysis could gather more additional information with regard to the high claims cases, and determine if they are truly outliers of the data.