The Plaintiff's Role in Enforcing a Court Ruling:

Evidence from a Labor Court in Mexico[*]

(Preliminary)

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Abstract

We analyze the outcomes of 128 cases from a labor court in Mexico in which a judge awarded money to a plaintiff who claimed to have been fired by a firm without cause. The judgment was enforced in only 44% of the cases. A plaintiff may try to enforce a judgment by petitioning the court to seize the firm's assets when the firm refuses to pay. Half of the enforced judgments required at least one seizure attempt. We estimate the parameters of post judgment games in which the worker does not know if a seizure attempt would ultimately succeed and show that these models explain the data well. We then simulate the effects of a policy that reduces worker costs of a seizure attempt. We find that this policy would increase the probability of enforcement, either by increasing the probability that the worker attempts an asset seizure or by inducing firms to pay voluntarily to avoid such seizure attempts. However, reducing worker costs of seizure attempts can only have a modest effect on enforcement probabilities because seizure attempts are often unsuccessful.

JEL Classifications: J65, K31, and K41

Introduction

There is a large literature that focuses on the effects of labor laws. Labor laws are found to have important effects on employment levels as well as on the flows of workers to and from firms. This literature has informed a debate on how to structure labor laws so that they provide social insurance to workers without unduly interfering with the ability of firms to operate efficiently.

An analysis of labor laws, although informative, will likely yield an incomplete picture of the true state of labor regulation. Labor laws will have an effect on the decisions of firms and workers only to the extent that these laws are enforced by the courts. In order to understand the *de facto* rather than the *de jure* regulatory environment, it is therefore crucial to understand the enforcement process.

In this paper, we study directly the enforcement of labor laws using data from a labor court in Mexico. In particular, we analyze 128 cases in which a worker was awarded compensation by a judge as a result of an unjust dismissal. As in Kaplan and Sadka (2008), we find that more than half of these judgments are not enforced. The novelty of the current paper, however, is that we are able to observe worker attempts to seize firm assets in the case that the firm tries to avoid payment. The ability to observe worker attempts to seize assets allows us to estimate the parameters of post judgment games in which the firm has to decide whether it should try to avoid payment and the worker has to decide if she should try to force payment. We show that the models fit the data quite well.

In addition to replicating what we see in the data, the structural parameters of the models are quite interesting in their own right. We find that the worker pays a cost of approximately 50% of the judgment amount in order to engage in a seizure attempt. Furthermore, a seizure attempt may be unsuccessful. A firm that is forced to pay a judgment following a seizure attempt also pays a cost of approximately 50% of the judgment amount in addition to the judgment amount itself. We then show through simulations that a policy that reduced worker costs of seizure attempts would result in a modest increase in the percentage of judgments that are enforced. The impact of this cost decrease is limited due to the fact that a high percentage of firms are estimated to be able to thwart seizure attempts, possibly due to not having tangible assets or because they have moved or exited the market.

The outline of the rest of the paper is as follows. In section 1, we briefly review the related literature. In section 2, we provide the legal and institutional background necessary to understand our analyses. In section 3, we propose a model and explore its solutions and their empirical implications. We also present the likelihood function that will be the basis for the estimation of the model's parameters. In section 4, we describe the data used in the paper. In section 5, we present our main empirical results, which will include structural estimates of the parameters of the model. In section 6, we discuss the interpretation of our results and present an alternative model that makes the same equilibrium predictions as our first model. In section 7, we present

the results of a simulation of a policy that reduces worker costs of a seizure attempt by one third. Although our two estimated models generate different predictions of the effect of this policy change, they do provide useful bounds on the true effect. In section 8, we offer some concluding comments.

1. Related Literature

This paper is most related to our earlier paper, Kaplan and Sadka (2008), which found that more than half of judgments were unenforced. Judgments in favor of workers who had worked for many years prior to dismissal, which we conjectured to be the cases in which the workers had been awarded the most, were more likely to be enforced.

The current paper extends our earlier results in at least two important ways. The first extension is that we collected additional variables that are crucial to the analysis of the enforcement of judgments. We collected data on the number of times the worker tried to seize firm assets to force payment, as well as data on the size of the judgment awarded by the judge. A direct measurement of the judgment amount is a significant improvement over using worker-reported tenure as a proxy.

The second extension builds on the first and is the main contribution of the paper. By gathering more information on the enforcement process, we are able to estimate the structural parameters of post judgment games in which the firm has to decide whether to try to avoid payment and the worker has to decide whether to try to force payment. The parameters of these models provide estimates of the costs of the enforcement process and allow us to simulate the effects of potential policy reforms.

Our estimates confirm the conjecture in Kaplan and Sadka (2008) that a worker must invest a lot of effort in order to enforce a judgment, and that workers only choose to invest this effort when the size of the award is large enough to justify the effort. Firms often do not pay an award unless the worker essentially forces the firm to do so with an attempt to seize the firm's assets.

Our paper is also related to a strand of the law and economics literature that analyzes the differences between *de facto* and *de jure* regulatory environments. Many papers show that analyses of written laws give an incomplete picture of the true regulatory environment. That is, the manner in which laws or regulations are applied must be incorporated into a complete analysis of the legal or regulatory environment.

Along these lines, Lerner and Schoar (2005) find that private equity investments have higher valuations and returns in countries with good enforcement mechanisms. Djankov, et. al. (2008a) show that the development of debt markets is highly correlated with the efficiency of debt contract enforcement. Djankov et. al. (2008b), La Porta et. al. (2006), and Safavian and Sharma

(2007) all show that both *de jure* legal rules and the quality of enforcement affect economic outcomes.

Papers that analyze the interaction between labor-market laws and their enforcement are particularly related to our paper since we are analyzing data from a labor court. Dávila (1997), for example, finds that in Mexico around 30% of workers who consider themselves unjustly dismissed do not go to court, mainly because of high uncertainty about outcomes and the long duration of the processes and that more than two-thirds of those who actually initiate legal actions end up settling out of court for a rather low fraction of what the law dictates. Our finding in the present paper that the value to the worker of a given judge's award is less than one fourth of that award makes Dávila's results seem quite understandable.

Almeida and Carneiro (2009) analyze the effects of enforcement on the labor market. They examine the effects of differential enforcement across municipalities of Brazilian national labor regulations and find that stricter enforcement of labor regulation constrains firm size and leads to higher unemployment. Montes Rojas and Santamaría (2007) present survey evidence suggesting that having to go through the labor courts in a firing dispute increases firms' labor adjustment costs.

Several papers suggest that rigid labor laws will distort labor markets only to the extent that they are enforced. Maloney (2001), for example, finds that several Latin America countries, including Mexico, do not appear to have distorted labor markets despite the fact that they have rigid labor laws. Caballero, et. al. (2006), Haltiwanger, et. al. (2006), and Micco and Pagés (2007) all find that the negative effects of labor-market regulation are particularly strong in countries where the regulations are likely to be enforced.

To illustrate how our paper contributes to the above literature, consider the results in Caballero et. al. (2006) who find that

> "Moving from the 20th to the 80th percentile in job security, in countries with strong rule of law, cuts the annual speed of adjustment to shocks by a third while shaving off about one percent from annual productivity growth. The same movement has negligible effects in countries with weak rule of law."

Among the countries used in the Caballero et. al. (2006) study, Mexico has among the most rigid labor laws. Mexico is also, however, categorized as a weak rule-of-law country based on the results of Kaufmann et al. (1999).

What does it mean to have a weak rule of law? Our results show that, for more than half of the cases in which the worker was awarded money from a judge, the judgment was simply not enforced. And for judgments that are enforced, plaintiffs frequently incur considerable costs even after they have won at trial. Many potential plaintiffs may be deterred from initiating lawsuits by

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these enforcement difficulties. It is therefore quite understandable that, in countries like Mexico with a weak rule of law, the details of the labor code might have little impact on the *de facto* regulatory environment.

2. Legal and Institutional Background

Mexican labor law is highly protective of workers. The law regulates hours and working conditions, health risks, fringe benefits, and firing. According to the Doing Business 2010 report, Mexico is tied for 5th through 15th of 183 countries in terms of being the most difficult place to dismiss workers. Mexico is also tied for 66th through 69th in terms of having the highest severance payments.[1]

In this paper we analyze firing lawsuits, so we will focus on the laws related to termination of employment contracts. Under Mexican law, firing is classified as either justified or unjustified. In order for firing a worker to be justified under the law, the worker must have engaged in wrongful behavior such as deliberately destroying the firm's machinery or materials, physically attacking a supervisor, showing up to work under the influence of alcohol or drugs, or being absent from work repeatedly without justification. Remarkably, firing a worker for low productivity or laying off a worker during downturns is not considered to be justified.[2]

In order to fire a worker, a firm must notify the worker in writing, stating the cause for firing the worker. Given that firms must state one of the causes specified in the labor code, they often fabricate causes for firing a worker who is simply unproductive, and this often results in a lawsuit in which the worker claims the dismissal was not justified. When sued by a worker, the firm is considered to carry the burden of proof in relation to the cause of firing.

Kaplan and Sadka (2008) and Kaplan et. al. (2008) provide more information on how the severance payment is determined if the firing is deemed to be unjustified. For this paper, it is more important to focus on the mechanisms through which labor law is enforced.

The labor courts are called *Juntas de Conciliación y Arbitraje*. They are administrative courts that belong to the executive branch of government at both the federal and state levels. Federal labor courts resolve disputes in a number of industries listed in the labor code. These industries are generally comprised of large firms and have high degrees of unionization. All other labor

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[1] These data can be obtained from http://www.doingbusiness.org. See Botero et. al. (2004) for details on the measurement of labor regulations.

[2] The discussion of Mexican labor law in this section is based on the *Ley Federal del Trabajo* (LFT), Title II, Chapter IV, as well as on the *Reglamento Interior de la Junta Federal de Conciliación y Arbitraje* (Internal Regulations of the Federal Labor Board).

disputes fall under local jurisdiction, so all states have at least one local junta, and large states will often have several tribunals with jurisdiction defined by the geographical location of the dispute. Federal and state level courts apply the same federal labor code.

The labor tribunals are intended to serve both mediation and adjudication functions. The law mandates that they hold at least one conciliation hearing before proceeding to a court judgment. If the conciliation hearing concludes without a settlement, another hearing similar to a trial is held. Evidence such as expert testimony, depositions, and other documents is submitted to the judge during this hearing. After the conclusion of this hearing, the judge produces a draft ruling on matters of fact as well as matters of law and submits it to the labor board, consisting of the judge, a lay magistrate who represents firms, and a lay magistrate who represents workers. In order for the proposed draft to become a valid ruling, at least one of the magistrates must vote along with the judge in favor of the decision. Once due notification has taken place, the firm has 72 hours to send payment to the tribunal.

If the firm does not pay within 72 hours, another hearing must be scheduled in which the judge should order a court actuary to appraise the firm's assets, seize a sufficient number of assets to pay the judgment the firm owes, and proceed to a sale of these assets, after which the court pays the judgment amount to the worker directly.[3] These procedures are called *intentos de embargo*, or attempts to seize the firm's assets. The firm can simply pay the judgment at this point instead of having assets sold or simply given to the worker. Often, however, assets are in fact seized. As part of the seizure attempt, the worker can request that the cost she incurred in pursuing collection be added to the amount the firm must pay.[4]

These asset seizure attempts are akin to putting the firm through bankruptcy and therefore can be very costly, especially because the firm may block proper notification, move its place of business, or hide its assets.[5] Often a seizure attempt will fail because the court was unable to gain access to the firm's assets or was unable to locate a legal representative of the firm. Each seizure attempt requires a hearing before the judge.

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[3] This procedure is governed by Title 15 of the LFT, Articles 939-975.

[4] Article 944 of the LFT states that all expenses incurred for the purpose of enforcing a judgment are to be paid by the party that did not pay the judgment in a timely fashion. No separate procedure is required for soliciting this increase in the amount the firm must pay; the worker requests these costs be added to the judgment at the time she requests that a seizure attempt be made.

[5] Among other aspects of the process, seizure involves removing goods, titles, and notes of credit from the firm's place of business and holding them either at the court (for liquid assets) or assigning them to a trustee who administers the asset (e.g. pursues collecting debts owed to the firm). This trustee is appointed by the worker. See Articles 956, 957, 958, and 960 of the LFT for details.

The procedures for enforcing a judge's ruling in a labor court are quite similar to the procedures for enforcing a ruling in a commercial court. For this reason, the results from the Doing Business 2010 report on contract enforcement are informative in our case. Although the hypothetical case considered in the Doing Business report is a commercial sale dispute (not an unjust dismissal suit), the enforcement of the judge's ruling does involve the seizure and auction of the defendant's assets, which is exactly the enforcement mechanism that plays a central role in our paper.

According to the Doing Business 2010 report, courts in Mexico are reasonably efficient. Mexican courts are ranked 46th out of 183 countries in terms of overall court efficiency. However, Mexico is ranked 123rd in terms of time to enforce the decision once the court has ruled. It therefore appears that the enforcement of a judge's ruling, which is the focus of our paper, is an area in which Mexican courts are particularly inefficient.[6]

3. Model

Consider the following game represented by its extensive form:
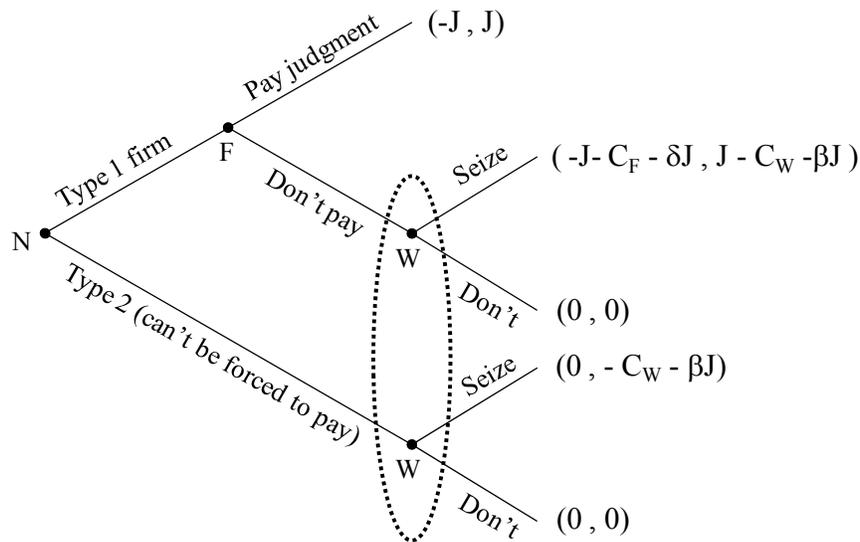
Before the game starts, a judge awards the worker (W) a judgment amount J. The game starts with nature (N) choosing whether a firm (F) will be of type 1 or type 2. A type 1 firm can be forced to pay the judgment if the worker incurs the cost to enforce the judgment. A type 2 firm cannot be forced to pay. A type 2 firm may be a firm that is planning to relocate or a firm that is planning on liquidating all assets so that an eventual attempt to seize assets will fail.

We assume that nature chooses a type 1 firm with probability P, and that this probability is known to the worker. A type 1 firm chooses to either pay voluntarily or not to pay voluntarily, while a firm of type 2 never pays the judgment (voluntarily or otherwise). The worker observes whether the firm has paid voluntarily or not, but cannot observe firm type.

If the firm pays voluntarily, the game ends with the firm receiving -J and the worker receiving J. If the firm does not pay voluntarily, the worker can either attempt to seize the firm's assets or not attempt to seize the firm's assets. The choice not to try to seize firm assets is equivalent to giving up—if the worker chooses not to try to seize the firm's assets, the game ends with a zero payoff for both players.

If the worker chooses to attempt to seize the firm's assets and the firm is of type 1, then the firm is forced to pay. In addition to the judgment amount, the firm will pay two other costs: a fixed cost of having its assets seized, C_F, and a variable cost that depends on the judgment amount, δJ. Hence the firm's payoff in this case will be $-J - C_F - \delta J$. The worker recovers the judgment amount J, but pays a fixed cost of asset seizure, C_W, and a variable cost that depends on the judgment amount, βJ. Therefore the worker's payoff in this case is $J - C_W - \beta J$.

If the worker chooses to attempt to seize the firm's assets and the firm is of type 2, the seizure is unsuccessful, so the firm pays no cost and receives a final payoff of 0. The worker must pay the same fixed and variable costs of the seizure attempt, but does not recover any portion of the judgment, so that her payoff is $-C_W - \beta J$.

Some discussion of the interpretation of this game and its payoffs may now be in order. In our data, the worker engaged in at least one attempt to seize firm assets in 56 of 128 cases (44%). In 28 of the 56 cases (50%) in which the worker attempted to seize firm's assets, the worker was unable to collect the award. This high rate of failed seizure attempts is evidence that workers do not know ex ante if they will be able to force the firm to pay the judgment. For this reason, we assume that the worker does not know the firm's type when deciding whether to try to seize assets or not.

How can we interpret the different "types" of firms? Although no firm in this model is keen on paying the judgment amount to the worker, a "type 1" firm can be made to pay if the worker pursues the enforcement process to the point of seizing its assets. A "type 2" firm, on the other hand, never pays judgments. As we mentioned earlier, a firm that is planning on liquidating its assets or planning on relocating may be able to thwart a seizure attempt rather easily. Indeed we observe cases in which the worker petitions the court to seize assets and the court cannot find the firm. We also observe cases in which the court seizes a bank account only to find later that the

account no longer has funds. We assume firm type is exogenous in this and the other models we present later in the paper.[7]

The two fixed costs of seizure attempts capture the formal aspect of seizure attempts. On the worker's side, each seizure attempt requires a petition to be filed at the court, and this cost is unrelated to the size of the judgment the worker is attempting to enforce. On the firm's side, once a type 1 firm's assets are successfully seized, the firm must send a legal representative to the court not only to deliver the judgment amount to the worker through the court, but also to petition the recovery of the firm's assets once the worker has been paid.

The variable components of seizure costs account for the fact that as the judgment amount is larger, seizures are likely to be more costly. For the firm, the larger the judgment amount, the more assets the worker takes in a successful seizure attempt, with greater disruption of the firm's business. For the worker, the logistics of seizing, holding, and administering either a larger number of assets or more valuable assets is also likely to be greater. In addition, since judgment amount depends on the worker's wages, a larger judgment may indicate the worker received higher wages, so that her opportunity cost of the time she must invest in seizure attempts is greater.

The fact that we estimate that a seizure attempt is more costly (both for the worker and the firm) when the judgment amount is higher may also be a result of a simplification in our modeling of the process. Our model supposes that there can only be one seizure attempt. In reality, multiple seizure attempts are not uncommon. The first attempt to seize the firm's assets will typically not involve the police, so this attempt can be more easily thwarted by the firm. Second seizure attempts often involve police presence and forced entry into the firm's premises. Since the probability of a second seizure attempt is higher for higher judgment amounts (see appendix figure A.1), the fact that our estimated cost of a seizure attempt is higher for large judgment amounts may be picking up the costs of additional seizure attempts not considered in our structural model.

To find the possible perfect Bayesian solutions to this game, we start by analyzing the decision of the worker on whether or not to seize the firm's assets, and work backwards to the type 1 firm's decision to pay the judgment or not. The following two propositions narrow down the types of possible equilibria.

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[7] Note that this is an important assumption especially if one wants to measure the effects of labor law on firm behavior. In a world where restrictive labor laws can be avoided by firms more easily when they are smaller, less formal, and have fewer assets, firms may choose levels of investment and scales of production that would be inefficient in the presence of less restrictive labor laws.

Proposition 1: There is no equilibrium in which the worker chooses to attempt to seize assets with probability 1.

Proof: Suppose an equilibrium exists in which the worker always chooses to seize the firm's assets. In this equilibrium, the payoff to a type 1 firm that chooses not to pay is $-C_F -J(1+ \delta)$, while its payoff when it chooses to pay before the seizure decision is -J. Hence, a type 1 firm would always choose to pay. This means that in the worker's information set, faced with a firm that did not pay, the worker will assign probability zero to the firm being type 1, and probability 1 to the firm being type 2. Since a seizure will therefore not be successful and the worker will bear its cost, she chooses not to seize the firm's assets, which contradicts our initial assumption.

Proposition 2: There is no equilibrium in which a type 1 firm chooses to pay voluntarily with probability 1.

Proof: Suppose an equilibrium exists in which a type 1 firm chooses to pay voluntarily with probability 1. Again, this would imply that the probability assigned to a type 2 firm in the worker's information set is 1. This means that when the worker is faced with non-payment, the worker will choose not to seize the firm's assets. Knowing this, a type 1 firm would strictly prefer not to pay the judgment. This contradicts the initial assumption that a type 1 firm always pays the judgment before the worker's seizure decision.

So far we know there is no equilibrium in which a type 1 firm always pays voluntarily. We also know that there is no equilibrium in which the worker always chooses to seize the firm's assets. We can therefore say that, in equilibrium, the firm will either play a mixed strategy or the firm will choose not to pay voluntarily with probability equal to one.

Note that if the worker chooses with probability equal to one not to try to seize assets, then the type 1 firm strictly prefers not to pay voluntarily, so that the firm cannot play a randomizing strategy in equilibrium. So if an equilibrium exists in which the worker always chooses not to seize assets, it must be the case that the type 1 firm always chooses not to pay voluntarily. The probability of facing a type 1 or 2 firm in the worker's information set would therefore be P and (1-P), respectively. Now we can find the payoff to the worker given either action. Comparing these two payoffs shows that the worker will strictly prefer not to seize assets when

$$J < C_W/(P-\beta). \tag{1}$$

So when (1) is satisfied, there is a unique equilibrium in which the type 1 firm does not pay and the worker does not seize the firm's assets. In this equilibrium we will never observe the worker

receiving compensation after a judgment in her favor. For any set of parameters (P, C_W, β) there will be a judgment amount low enough so that no seizures or enforcement take place.[8]

To see that this equilibrium is unique, note first that (1) guarantees that even if all type 1 firms refuse to pay voluntarily, the worker strictly prefers not to seize the firm's assets. No equilibrium in which some type 1 firms pay before the seizure attempt can exist when (1) is satisfied, because as fewer type 1 firms are choosing not to pay, the likelihood of a non-paying firm being type 1 is even lower, and the worker's preference for not seizing the firm's assets will only be strengthened. So type 1 firms' best response will always be to not pay the judgment.

This leaves the possible equilibrium in which both players randomize. When $J > C_W/(P-\beta)$, there can be no equilibrium in which the type 1 firm never pays voluntarily.[9] We have also established that there can be no equilibrium in which the type 1 firm always pays voluntarily. Hence, the only possible equilibrium is one in which the type 1 firm randomizes. And in this equilibrium the worker must also be randomizing, because a pure strategy used by the worker implies that the type 1 firm will strictly prefer one of its pure strategies. Therefore, the mixed strategy equilibrium we discuss in what follows will be unique when $J > C_W/(P-\beta)$.

To describe this mixed strategy equilibrium, assume that the worker attempts to seize firm assets with probability γ. In order for the type 2 firm to be indifferent between its two possible actions, it must be the case that

$$\gamma^* = J/[J(1+\delta)+C_F].$$

Notice that, assuming that $C_F > 0$, γ^* is increasing in J. That is, the worker is more likely to attempt to seize the firm's assets when the judgment amount is larger. To anticipate results, our structural estimation will estimate that C_F is positive and statistically significantly different from zero. Reduced form logit estimates also confirm that seizure attempts are more likely when the judgment amount is high.

We now analyze the firm's strategy. Suppose that the type 1 firm chooses not to pay voluntarily with probability σ. This means that in the worker's information set, the likelihood that a firm who has not paid voluntarily is a type 1 firm is now $P\sigma/[P\sigma+(1-P)]$. Therefore, for the worker to be indifferent in equilibrium between attempting to seize assets or not, it must be the case that

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[8] When expression (1) holds with equality, equilibrium can exist in which the type 1 firm does not pay voluntarily with probability equal to one and the worker chooses any pure or mixed strategy such that the type 1 firm prefers not to pay voluntarily. As discussed below, the worker's likelihood of seizing the firm's assets would have to be strictly less than $J/[J(1+\delta)+C_F]$.

[9] If the type 2 firm never pays voluntarily, then given $J > C_W/(P-\beta)$, the worker will strictly prefer to seize the firm's assets. In this situation the type 1 firm would strictly prefer to play to pay voluntarily.

$$\sigma^* = \left(\frac{1-P}{P}\right)\left(\frac{C_W + \beta J}{-C_W - \beta J + J}\right)$$

There are two important characteristics of the firm's equilibrium strategy to note. First, a reduction in the worker's costs will result in the firm paying voluntarily with a higher probability. This feature will play an important role in our policy experiment in section 6.

Second, if $C_W = 0$, the firm's probability of paying voluntarily will be independent of the judgment amount J. Indeed we will not estimate C_W to be statistically different from zero. Furthermore, reduced form logit estimates cannot reject the null hypothesis that the probability that the firm pays voluntarily is unrelated to the judgment amount.

In the empirical section we show that our model can replicate the main features of our data set quite well. We are able to estimate the parameters of the model because we can easily write down the likelihood of any observation in our data set as a function of the parameters of the model and data we observe. If $J < C_W/(P-\beta)$, for example, then the only possible outcome is that the firm does not pay voluntarily and the worker does not attempt to seize the firm's assets.[10]

If $J > C_W/(P-\beta)$, there are four possible outcomes. The outcomes are:

1. The firm pays the judgment amount voluntarily before any attempt at seizure takes place. In our model this occurs with probability $P(1-\sigma^*)$.
2. The firm does not pay the judgment amount, but the worker makes no seizure attempt. The probability of this outcome is given by $(1-P + P\sigma^*)(1-\gamma^*)$, the probability of the firm not paying up front multiplied by the probability of the worker choosing not to attempt a seizure.
3. The firm does not pay the judgment up front, and the worker engages in a seizure attempt which is successful. Note that this can only happen when a type 1 firm chooses not to pay up front and the worker chooses to seize its assets. Hence this outcome takes place with probability $P\sigma^*\gamma^*$.
4. The firm does not pay the judgment up front, and the worker engages in a seizure attempt which is unsuccessful. The firm must now be of type 2, so that the probability of this outcome is $(1-P)\gamma^*$.

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[10] Only one observation falls into this category according to our estimates. For the observation with the lowest judgment amount, our parameter estimates imply that the firm would choose with probability equal to one not to pay and that the worker would choose with probability equal to one not to seize assets.

The maximum likelihood technique will estimate the parameters of the model in order to maximize the sum of the logs of the likelihood functions for each individual observation.

4. Data

We have assembled a data set comprised of all lawsuits filed in the *Junta Local de Conciliación y Arbitraje del Estado de México, Valle de Cuautitlán-Texcoco*, during 2002. This tribunal is located in an industrial region in the northern part of the Mexico City metropolitan area. The court is comprised of four sub courts. Workers file their cases at a central location and then are assigned to one of the four sub courts with the goal of having approximately the same workload across sub courts.

There were 2,596 unjust dismissal cases filed in 2002. Only 338 of these cases received a ruling from a judge, with the rest of the cases being either settled or dropped.

We further restrict our analysis to cases that were not appealed. This restriction drops the number of observations to 317. We also exclude cases in which the judge did not award anything to the worker, since in these cases there is no judgment to enforce. This restriction reduces the number of observations to 168. Finally, we only analyze cases in which there was only one plaintiff, since these cases more closely match our theoretical model. This final restriction brings our final sample to 128 cases. We present the descriptive statistics for these 128 cases in table 1.

Descriptive Statistics

	N	mean	std	min	max
dummy for award collected	128	0.44	0.50	0	1
firm pays voluntarily	128	0.22	0.42	0	1
number of seizure attempts	128	0.61	0.83	0	4
dummy for at least one seizure attempt	128	0.44	0.50	0	1
amount awarded to the worker (in pesos)	128	72,389	185,403	133	1,417,753
amount asked for by worker (in pesos)	128	1,299,979	10,175,812	11,161	115,000,000
dummy for female worker	128	0.38	0.49	0	1

Table 1

The first thing to note from table 1 is that only 44% of judgments are enforced. Since appealed cases were excluded from the analysis, these unenforced judgments represent cases in which the firm simply did not pay. These results are very similar to those from Kaplan and Sadka (2008) from the same court but using data from 2000 and 2001.

Another interesting feature from table 1 is that the firm paid "voluntarily" in only 22% of the cases. We say that a firm pays voluntarily if the firm pays prior to the worker attempting to seize its assets. A seizure attempt was necessary in half of the cases in which the worker collected the award.

Note also that the average number of seizure attempts per case is 0.61. At least one seizure attempt was made in 44% of the cases. Recall that a seizure attempt only occurs after the firm has been notified that there is a judgment against it and has not paid. Furthermore, each seizure attempt requires a special hearing before the judge. Plaintiffs often decide not to undertake these costly enforcement procedures.

5. Empirical Results

We now turn to the main results of the paper. We begin with some reduced form models that will present some of the important correlations in the data set and will make the estimates of the structural parameters more transparent.

Recall that the probability that a worker attempts to seize firm assets, conditional on the firm not paying the judgment voluntarily, is $\gamma^* = J/[J(1+\delta)+C_F]$. Recall further that the probability that the worker attempts to seize assets is increasing in the judgment amount J as long as the firm's fixed cost of a seizure attempt C_F is positive. Table 2 presents logit estimates of the probability that the worker attempts to seize firm assets at least once. Table 2 indeed reveals that seizure attempts are more likely for larger awards, which can be interpreted as reduced form evidence that C_F is positive.

Logit Models of the Probability of a Seizure Attempt

all cases (N = 128)

log of amount awarded to worker	0.35 ***	0.34 ***	-0.37	-0.27
	(0.12)	(0.12)	(0.95)	(0.98)
square of log of amount awarded to worker			0.04	0.03
			(0.05)	(0.05)
controls for subcourt and gender of worker	no	yes	no	yes
p value from test of joint significance of judgment amount variables	0.003	0.007	0.011	0.021

excluding cases in which the firm paid voluntarily (N = 100)

log of amount awarded to worker	0.40 ***	0.38 ***	0.02	0.19
	(0.13)	(0.14)	(1.04)	(1.07)
square of log of amount awarded to worker			0.02	0.01
			(0.06)	(0.06)
controls for subcourt and gender of worker	no	yes	no	yes
p value from test of joint significance of judgment	0.002	0.006	0.010	0.023

Notes: A firm is said to pay voluntarily if it pays the judgment without a seizure attempt. See text for details.

Table 2

The top panel of table 2 presents models in which all 128 cases are considered. The bottom panel eliminates cases in which the firm paid voluntarily. Column 1 presents models in which the only independent variable is the log of the judgment amount. Column 2 adds additional controls for the sub court to which the case was assigned and the gender of the worker. Columns 3 and 4 are analogous to columns 1 and 2 except the square of the log of the judgment amount is concluded as an additional control.

The first two columns show a positive statistically significant correlation between the probability of a seizure attempt and the judgment amount. Although neither of the judgment amount variables yield significant coefficients in columns 3 and 4, the variables are jointly statistically significant. Based on these results, it should not be surprising that the structural estimate of the C_F will be positive and statistically significantly different from zero.

Now recall that the probability that the firm does not pay the judgment amount voluntarily is

$$\sigma^* = \left(\frac{1-p}{p}\right)\left(\frac{C_W + \beta J}{-C_W - \beta J + J}\right).$$ Recall further that if the worker's fixed cost of a seizure attempt

C_W is zero, the probability that the firm pays voluntarily does not depend on the judgment amount J. Table 3 presents logit models of the probability that the firm pays voluntarily in order to investigate this issue.

Logit Models of the Probability that the Firm Pays Voluntarily

log of amount awarded to worker	-0.02	-0.01	1.83	2.18
	(0.12)	(0.13)	(1.32)	(1.42)
square of log of amount awarded to worker			-0.10	-0.12
			(0.07)	(0.07)
controls for subcourt and gender of worker	no	yes	no	yes
p value from test of joint significance of judgment	0.85	0.91	0.37	0.30

Notes: N=128. A firm is said to pay voluntarily if it pays the judgment without a seizure attempt. See text for details.

Table 3

The format of table 3 is similar to that of table 2. The two key independent variables are once again the log of the judgment amount and the square of the log of the judgment amount. The important result is that the judgment-amount variables are neither individually nor jointly statistically significant. Based on these results, it should not be surprising that the structural estimate of the C_W will not be statistically significantly different from zero.

We now turn to the structural estimation of the model. This is done by choosing the model's parameters to maximize the log likelihood function presented in the theoretical section of the paper. Table 4 presents these results.

Estimated Parameters from the Model

Parameter	Description	Estimate
P	proportion of firms that can be forced to pay	0.6 ***
C_W	worker's fixed cost of a seizure attempt	31
β	derivative of worker's cost with respect to J	0.5 ***
C_F	firm's fixed cost of a seizure attempt	2,062 ***
δ	derivative of firm's cost with respect to J	0.5 ***

Notes: N=128. We use the notation of *** to denote significance at the 0.01 level. Similarly ** denotes significance at the 0.05 level and * denotes significance at the 0.10 level. Significance levels are determined using likelihood ratio tests. See text for details

Table 4

What do these results imply? The estimates tell us that only 60% of firms could be forced to pay their judgments, even if workers always engaged in seizure attempts. The coefficient of 0.5 for β tells us that a worker incurs a cost of 50% of the judgment amount if she decides to attempt to seize the firm's assets in order to force payment. Similarly, The coefficient of 0.5 for δ tells us that a firm that is forced to pay a judgment through a seizure attempt must pay a penalty equal to 50% of the judgment amount in addition to the judgment amount itself and in addition to the firm's fixed cost of a seizure attempt.

The worker's fixed cost C_W of attempting to seize the firm's assets is estimated to be only 31 pesos (about 3 dollars), and is not statistically significantly different from zero. This result was to be expected because a large value for this parameter would imply that the firm's probability of paying the judgment voluntarily should be increasing in the judgment amount J, which is not supported by the logit models presented in table 3.

The firm's fixed cost C_F of a seizure of its assets is estimated to be 2,062 pesos and is statistically significantly different from zero. This result was also to be expected because a value of zero for this parameter would imply that the worker's probability of attempting to seize the firm's assets to force payment should be independent of the judgment amount J, which is not supported by the logit models presented in table 2.

We now discuss how well the estimated model fits the data. Figure 1 compares a lowess regression of the probability of a seizure attempt against the log of the judgment amount. Figure 1 also plots the same probability using the estimated parameters from the model. The vertical lines represent the 5th and 95th percentiles of the log of the judgment amount. Apart from the tails in which the lowess regression is likely to be inaccurate, the model's predictions compare quite well with the data.
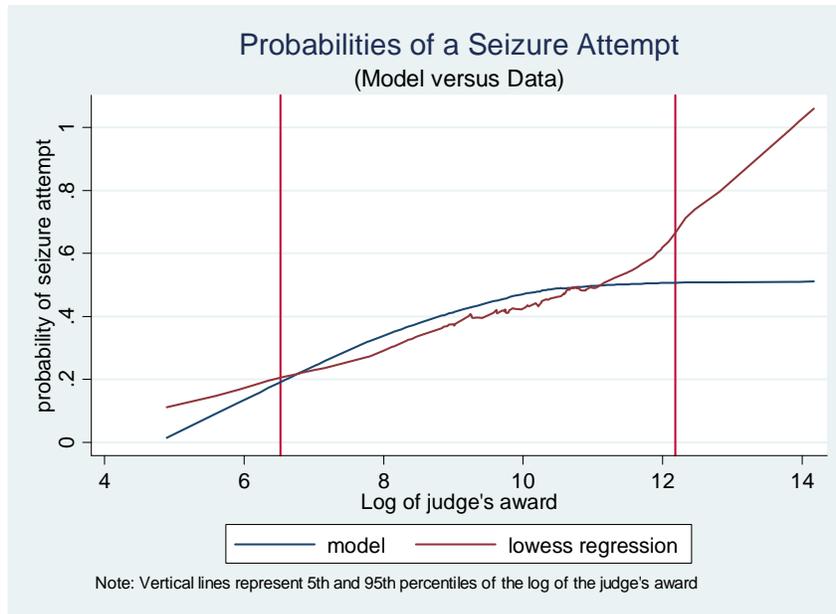
Figure 1

Figure 2 is analogous to figure 1 except figure 1 examines the probability that the award is collected, that is, the probability that the judgment is enforced. Once again, the model's predictions compare quite favorably with the data.
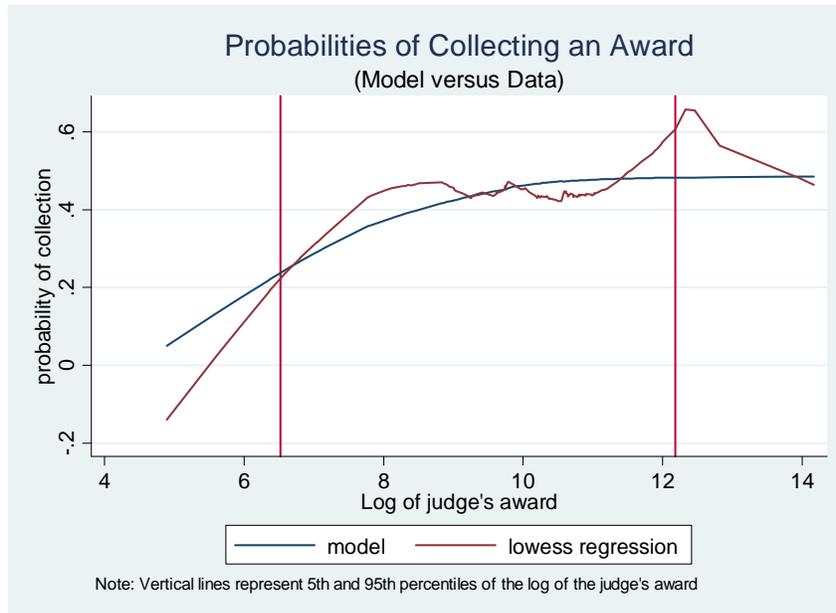

Figure 2

As a final check of the model's performance, figure 3 presents a lowess regression of the probability that the firm pays voluntarily against the log of the judgment amount. The model's predictions and the data appears to be less closely aligned than in figures 1 and 2, although the

model still appears to perform reasonably well. Based on the results of table 3 which found no statistically significant relation between the size of the judgment and the probability that the firm pays voluntarily, it may not be worthwhile to try to improve the match between the model's predictions and the data.
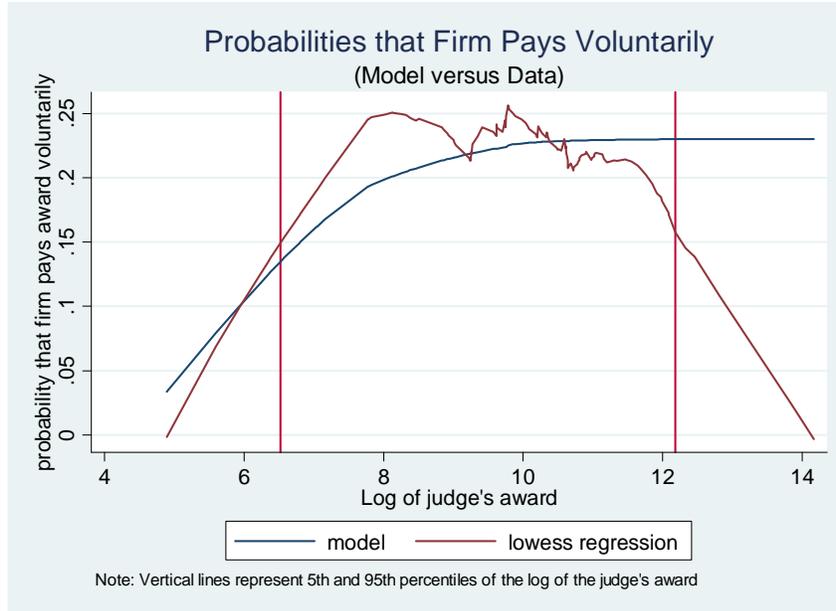
Figure 3

The probability that the firm pays voluntarily has an important interpretation in our model. Conditional on the firm not paying the judgment voluntarily, the worker receives an expected payoff of zero. This is because in equilibrium the worker that is faced with non-payment of a positive judgment must be indifferent between attempting seizure and not attempting seizure, and in the latter case she receives a payment of 0. This means that the probability that the firm pays voluntarily is equal to the ex-ante expected value of the award as a percentage of the amount stated by the judge in that award. Figure 3 shows that this ex-ante value is always less than one fourth of the judgment amount.

Recall that we cannot reject the hypothesis that the worker's fixed cost of a seizure attempt (C_W) is zero. A value of zero for this fixed cost implies that a worker will be indifferent between attempting to seize assets or not if a type 1 firm pays voluntarily with probability equal to $\left(\frac{1-P}{P}\right)\left(\frac{\beta}{1-\beta}\right)$, which is independent of the judgment amount. When we impose the restriction that $C_W = 0$, we find the parameter values presented in table 5.

Estimated Parameters from the Restricted Model

Parameter	Description	Estimate
P	proportion of firms that can be forced to pay	0.6 ***
β	derivative of worker's cost with respect to J	0.5 ***
C_F	firm's fixed cost of a seizure attempt	2,487 ***
δ	derivative of firm's cost with respect to J	0.5 ***

Notes: N=128. We use the notation of *** to denote significance at the 0.01 level. Similarly
** denotes significance at the 0.05 level and * denotes significance at the 0.10 level.
Significance levels are determined using likelihood ratio tests. See text for details.

Table 5

Figures 4-6 are the analogs of figures 1-3, but generated using the estimates of the restricted model presented in table 5. The only noticeable difference between the fits of the unrestricted and restricted models is that the restricted model generates a constant probability that the firm pays the judgment voluntarily, as seen in figure 6.
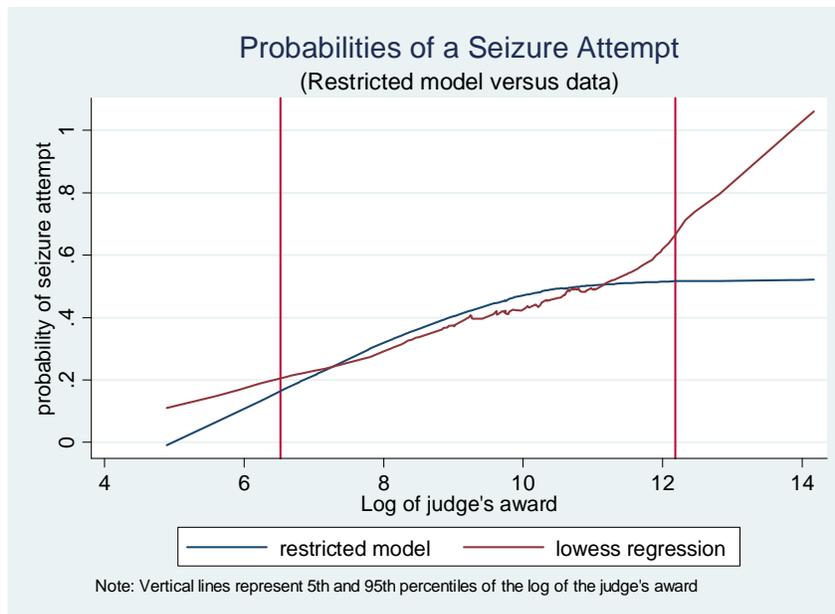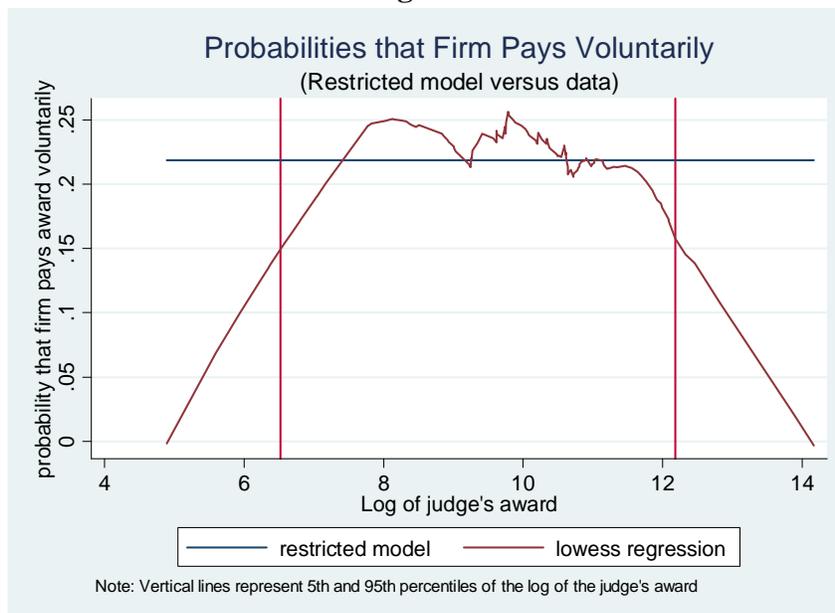

Figure 4
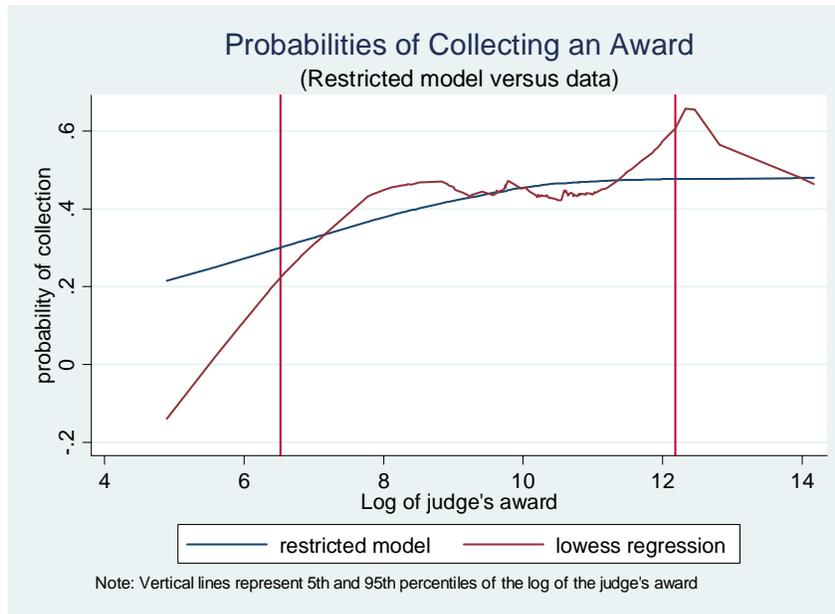
Figure 5

Figure 6

We will focus the rest of this paper on the restricted model for several reasons. First, our inability to reject the hypothesis that C_W equals zero is further supported by the fact that we find no evidence that the probability that the firm pays voluntarily is correlated with judgment size in reduced form logits (table 3). Second, assuming that C_W equals zero implies that the worker's reaction function does not depend on the judgment amount, which makes the model easier to represent graphically. We will present a graphical analysis of our results in the next section. Finally, we will present an alternative specification in which workers have different costs of

seizure attempts, which yields equilibrium predictions that are identical to those of the model presented above when C_W equals zero.

6. Interpretation of Our Results and an Alternative Model

We begin this section by presenting a graphical analysis of our model, assuming that the worker's fixed cost of a seizure attempt (C_W) equals zero. Figure 7 presents the best response correspondences for a worker and for a type 1 firm.
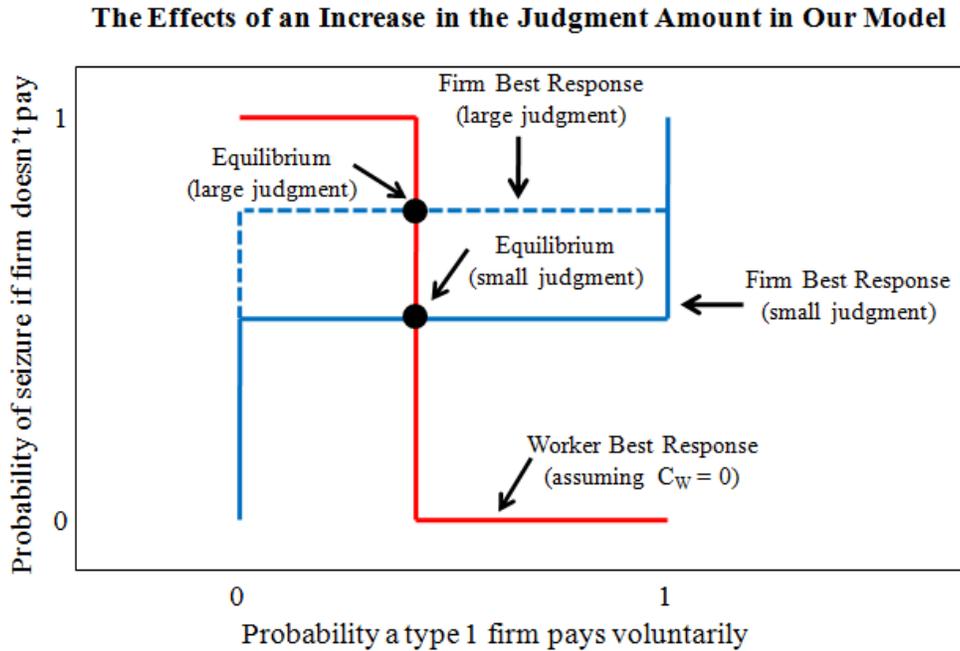

The Effects of an Increase in the Judgment Amount in Our Model

Figure 7

We begin by analyzing the model from the perspective of the worker. When the probability that a type 1 firm pays voluntarily is low enough, the worker would set the probability of a seizure attempt equal to one. When the probability that a type 1 firm pays voluntarily is high enough, the worker would set the probability of a seizure attempt equal to zero. There is one probability that the type 1 firm pays voluntarily that will make the worker indifferent between attempting to seize assets or not, and this critical probability does not depend on the judgment amount. In equilibrium, type 1 firms must be choosing the probability of voluntary payment that makes the worker indifferent between attempting to seize assets or not.

We now analyze the model from the perspective of the firm. For any judgment amount, there is only one probability that the worker attempts to seize assets that will make the firm indifferent between paying voluntarily or not. In equilibrium, workers must choose the probability of

attempting to seize assets that makes the type 1 firm indifferent between paying the judgment voluntarily or not.

How does the equilibrium change when the judgment amount increases? Note first that the worker's best response correspondence is unaffected by the judgment amount as long as C_W equals zero. The type 1 firm, however, now finds not paying the judgment to be more attractive. The only way to bring the type 1 firm back to indifference between paying voluntarily or not is by the worker increasing the probability of a seizure attempt.

There are several potential criticisms of the model we are estimating. One criticism is that workers all have the same costs of seizure attempts and that type 1 firms all have the same costs of seizure attempts. To address these concerns, we first present in figure 8 a hypothetical model in which heterogeneity of costs of seizures for type 1 firms is introduced.
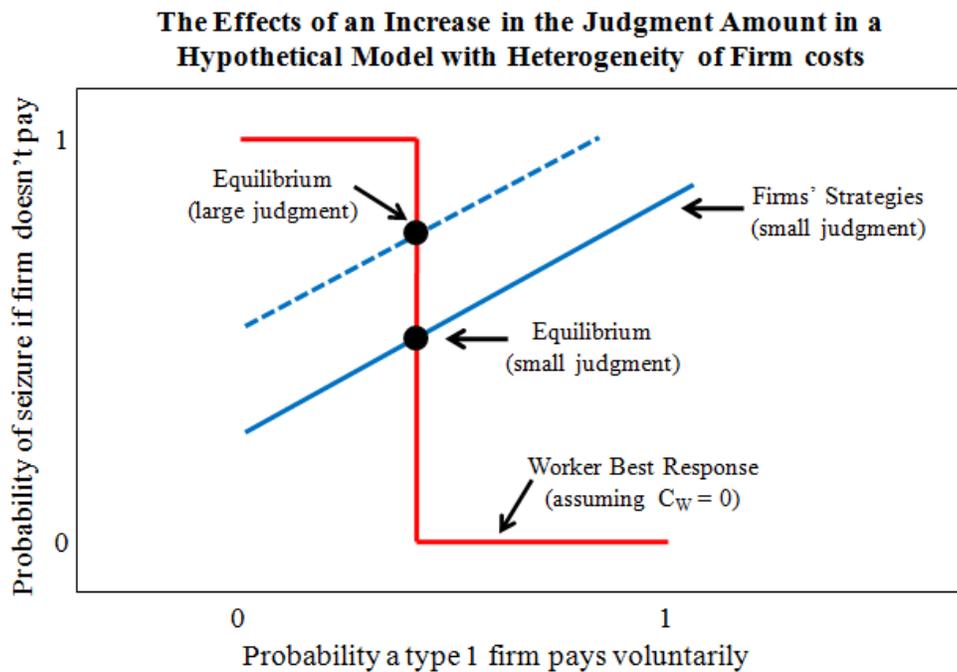
The Effects of an Increase in the Judgment Amount in a
Hypothetical Model with Heterogeneity of Firm costs

Figure 8

A model like the hypothetical one sketched above would imply that firms above some cost threshold strictly prefer paying the judgment voluntarily, while firms below some cost threshold strictly prefer not paying the judgment voluntarily. Our estimation procedure, however, does not take into account what happens outside of equilibrium. To the extent that the hypothetical model presented above would deliver the same equilibrium predictions as the one we estimate, the two models would be indistinguishable empirically. Furthermore, the costs of the marginal firm (the one indifferent between paying voluntarily or not) would be identical to those we estimated in our model. In this sense, one can say that our estimates apply to the marginal firm and the

22

marginal worker. The simplest way to achieve this is by estimating a model in which all firms and all workers are marginal.[11]

To further illustrate this point, figure 9 presents yet another model. In this model, firm behavior is completely inelastic, that is, the probability that the type 1 firm pays the judgment voluntarily does not depend on the probability that the worker attempts to seize assets. Workers now have heterogeneous costs of engaging in a seizure attempt.

The Effects of an Increase in the Judgment Amount in a Hypothetical Model with Inelastic Firm Behavior and Heterogeneous Worker Costs
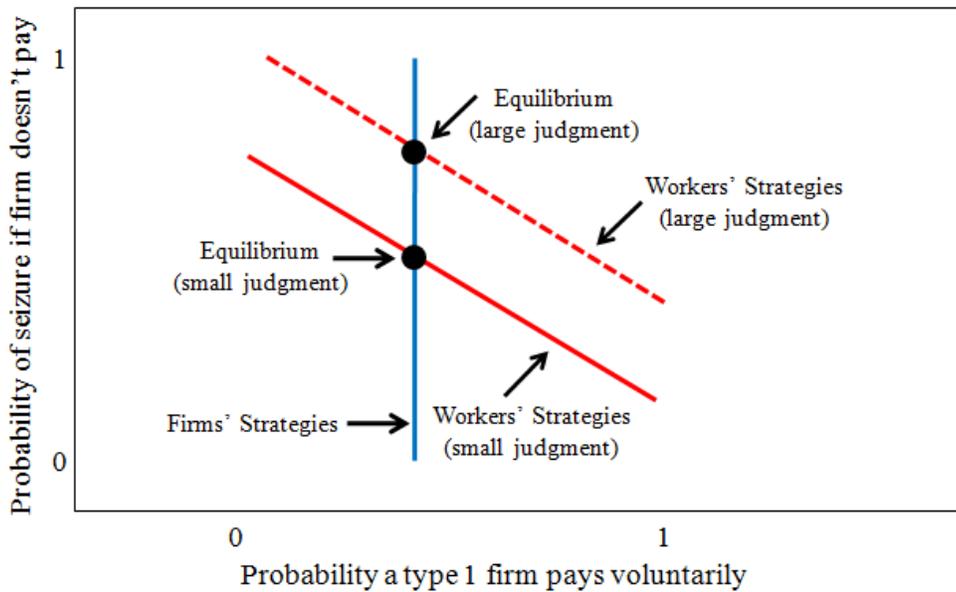
Figure 9

How can our model be modified to deliver the type of model presented in figure 9? Suppose that a fraction σ of firms have no costs of a seizure attempt and a fraction $1- \sigma$ have infinite costs of a seizure attempt. Suppose further that a worker's cost of a seizure attempt is drawn from a uniform distribution with a lower bound equal to zero and an upper bound equal to $\underline{C} + \theta J$.

In this alternative model, the probability that the firm pays voluntarily is $P(1- \sigma)$. Conditional on the firm not paying voluntarily, the probability the worker is facing a type 1 firm (one that can be

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[11] It is easy to write down a model like the one sketched in figure 8. Suppose a firm's cost of a seizure attempt is drawn from a uniform distribution with a lower bound of zero and an upper bound equal to $\underline{C_F} + \Psi J$. Maximum likelihood estimation of this model yields exactly the same equilibrium predictions as the model estimated in table 5 with $\underline{C_F}$ = 3,880 and Ψ=0.78.

forced to pay after a seizure attempt) is Pσ/ [Pσ+(1-P)]. A worker will therefore attempt to seize firm assets if her costs are below this probability multiplied by the judgment amount, which occurs with probability $\frac{P\sigma J}{(P\sigma+1-P)(\underline{C}+\theta J)}$. The likelihood function can therefore be expressed in the following manner:

1. The firm pays voluntarily with probability $P(1 - \sigma)$.

2. The firm does not pay voluntarily and the worker does not attempt to seize assets with probability $(P\sigma + 1 - P)\left(1 - \frac{P\sigma J}{(P\sigma+1-P)(\underline{C}+\theta J)}\right)$.

3. The firm does not pay voluntarily and the worker engages in a seizure attempt which is successful with probability $P\sigma\left(\frac{P\sigma J}{(P\sigma+1-P)(\underline{C}+\theta J)}\right)$.

4. The firm does not pay voluntarily and the worker engages in a seizure attempt which is successful with probability $(1 - P)\left(\frac{P\sigma J}{(P\sigma+1-P)(\underline{C}+\theta J)}\right)$.

There are several important differences between the model presented above and our previous model. First, our previous model assumed that firm behavior was infinitely elastic, that is, a small change in worker behavior would lead either to the type 1 firm never paying voluntarily or always paying voluntarily. The model presented above, however, assumes infinitely inelastic behavior by firms. Second, the model estimated above adds heterogeneity to the costs of workers, which weakens the assumption of completely elastic behavior by workers.

Despite these differences, the above model is observationally equivalent to our previously estimated model, assuming that C_W from the previous model is equal to zero. In particular, table 6 presents the estimated parameters from the above model that deliver predictions that are identical to those of the model estimated in table 5.

Estimated Parameters from the Restricted Model

Parameter	Description	Estimate
P	proportion of firms that can be forced to pay (type 1 firms)	0.6 ***
σ	proportion of type 1 firms with no costs of seizure attempt	0.6 ***
$\underline{C}$	upper bound of worker's cost distribution when J=0	1,244 ***
δ	derivative of upper bound of worker's cost with respect to J	0.8 ***

Notes: N=128. We use the notation of *** to denote significance at the 0.01 level. Similarly ** denotes significance at the 0.05 level and * denotes significance at the 0.10 level. Significance levels are determined using likelihood ratio tests. See text for details.

Table 6

How do these results compare with the results of the model estimated in table 5? The costs of a seizure attempt for the marginal worker are exactly the same in both models, namely one half of the judgment amount. In the model estimated in table 5, we (arbitrarily) assumed that all workers were identical.

In the model estimated in table 6, we (arbitrarily) assumed a uniform distribution from which worker costs were drawn. Given this assumption, we can say that the average seizure cost for those workers who attempt seizures is one fourth of the judgment amount. We can also say that the average cost of a seizure attempt for all workers (including those who do not try to seize assets, approaches 0.37 times the judgment amount as the judgment amount gets large. This figure is even higher for low judgments.

The basic message from the estimates in table 5, namely that worker costs of seizure attempts are quite high, continues to be true in our alternative model. A cost equal to one fourth of the judgment amount is extremely high, particularly given the fact that the seizure attempt will only succeed with probability 50%.

7. Simulating the Effects of Reducing Worker Costs of Seizure Attempts

The models that we estimated in tables 5 and 6 generate the same predictions for equilibrium outcomes. They also give broadly the same implications for worker costs of seizure attempts, namely that they are quite costly and will only succeed half of the time.

The purpose of this section, however, is to simulate the effects of a policy that reduced worker costs by one third. We will show that the two models generate substantially different predictions of the effects of such a cost reduction, but they do provide useful bounds on the true effect. We begin by considering the effects of reducing worker costs in the model presented in table 5, which we present in figure 10.

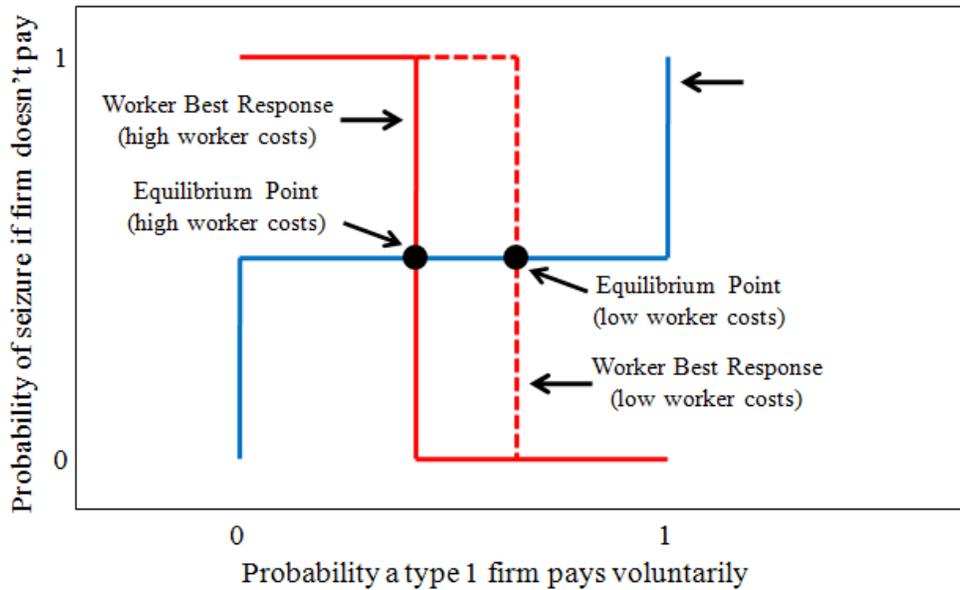## The Effects of a Decrease in Worker Costs in Our First Model

Figure 10

As depicted in figure 10, a reduction in worker costs will shift the workers' best response correspondence to the right. Since firm behavior is entirely elastic (any change in worker behavior will result in type 1 firms either always or never paying voluntarily), the only effect of the reduction in worker costs is to increase the probability that the firm pays the judgment voluntarily. Conditional on the firm not paying the judgment, the probability that the worker will attempt to seize firm assets will not change as a result of the workers' costs being reduced.

It is also worth noting that an estimate of the effect of reducing workers' costs on the probability that the firm pays voluntarily obtained from estimating this model would be an upper bound on the true effect. We begin by noting that it is straightforward to calculate the new indifference point for the marginal worker.

The current marginal worker has a cost of a seizure equal to half of the judgment amount, which corresponds to a 50% probability that the seizure attempt will be successful. A reduction of one third of this cost would make the marginal worker's new cost equal to one third. In order to keep this worker indifferent between attempting a seizure attempt or not, the increase in the type 1 firm's probability of paying voluntarily would have to be such that the new probability that a seizure attempt is successful would also be one third.

Heterogeneity of firm costs would result in an upward sloping response function. Heterogeneity of worker costs would result in a downward sloping response function. Given these two sources of heterogeneity, the same shift of the workers' response function would result in a smaller

increase the probability that the firm pays voluntarily than what we will estimate using the model from table 5.

Using the model estimated in table 5, a reduction of one third of worker costs would increase the probability that a firm pays the judgment voluntarily from about 22% to about 28%. Figure 11 shows the effect of this cost reduction on the probability that the worker collects, which are relatively modest.
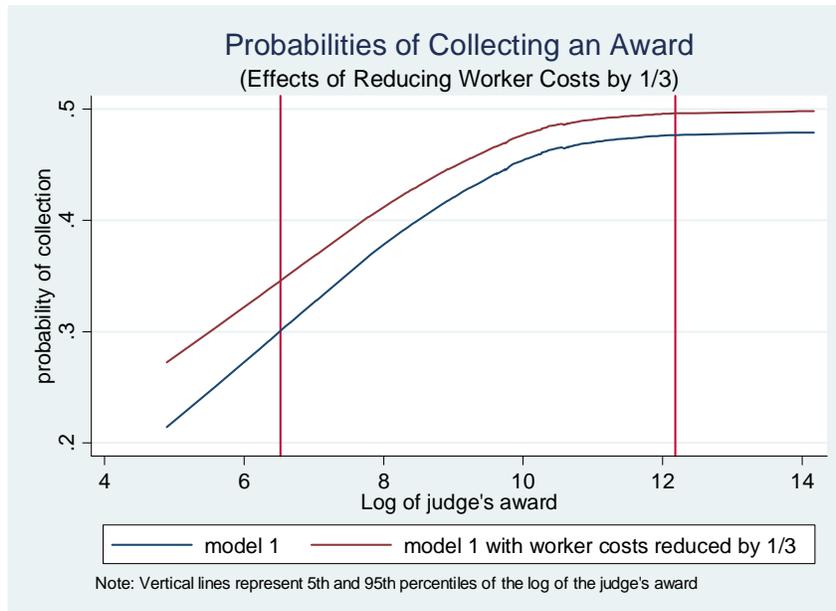

Figure 11

We now turn to the same experiment using the model estimated in table 6. In this model, firm behavior is assumed to be infinitely inelastic, implying that the probability that the firm pays voluntarily will not change when worker costs of a seizure attempt are reduced. Conditional on the firm not paying voluntarily, however, the probability that the worker will attempt to seize assets will increase. The effect is depicted in figure 12.

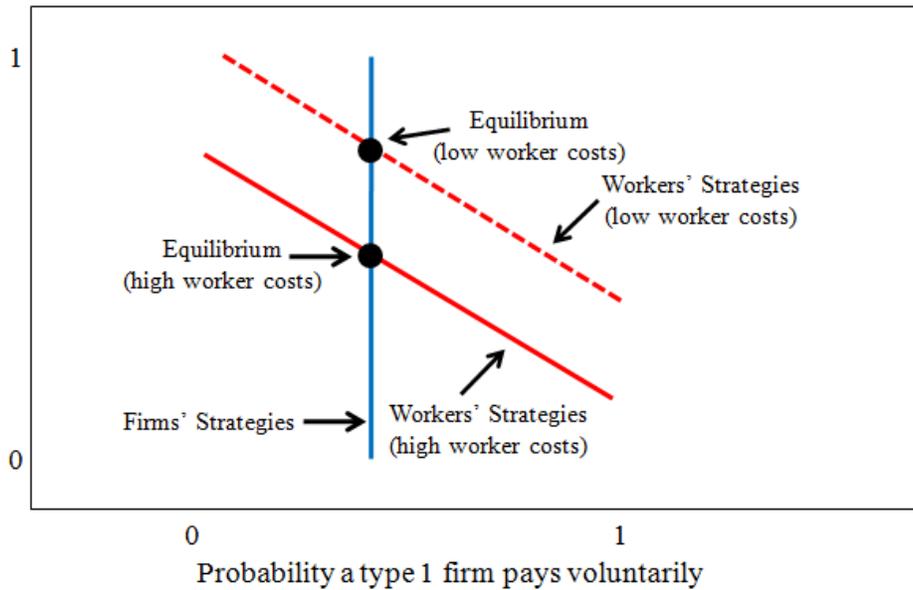**The Effects of a Decrease in Worker Costs
in Our Second Model**

Figure 12

As we discussed earlier in this section, the magnitude of the rightward shift of the worker response function is fairly straightforward to calculate. The extent to which this rightward shift translates into an increase in the probability that the worker attempts to seize assets depends on the slope of this curve, which in turn depends on the distribution from which worker costs are drawn.

In the case of our policy experiment of a one third reduction of worker costs, the probability of a seizure attempt conditional on the firm not paying is close to one for higher judgment amounts. In this sense the magnitude of the effects from our simulation are upper bounds on the true effects. Figure 13 presents the effects of the cost reduction on the (unconditional) probabilities of seizure attempts and figure 14 presents the effects of the cost reduction on the probabilities that the worker collects the award.
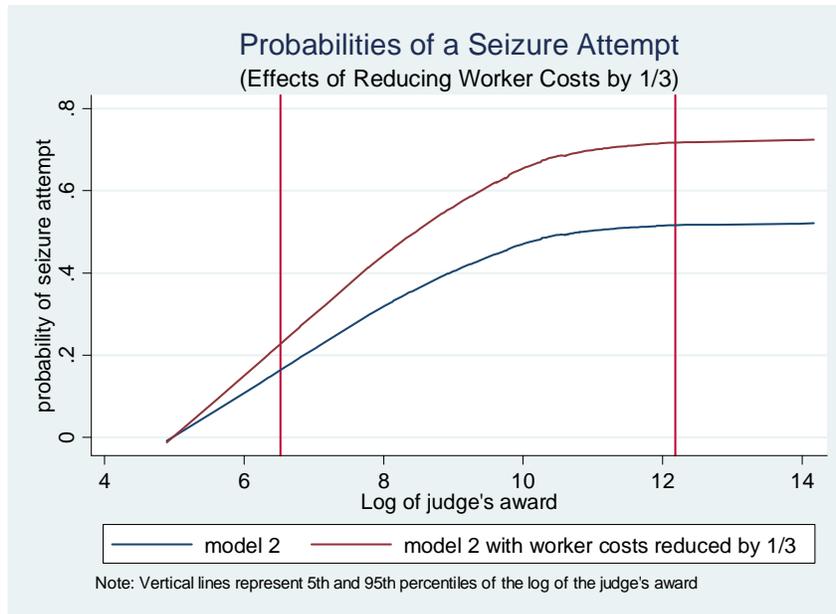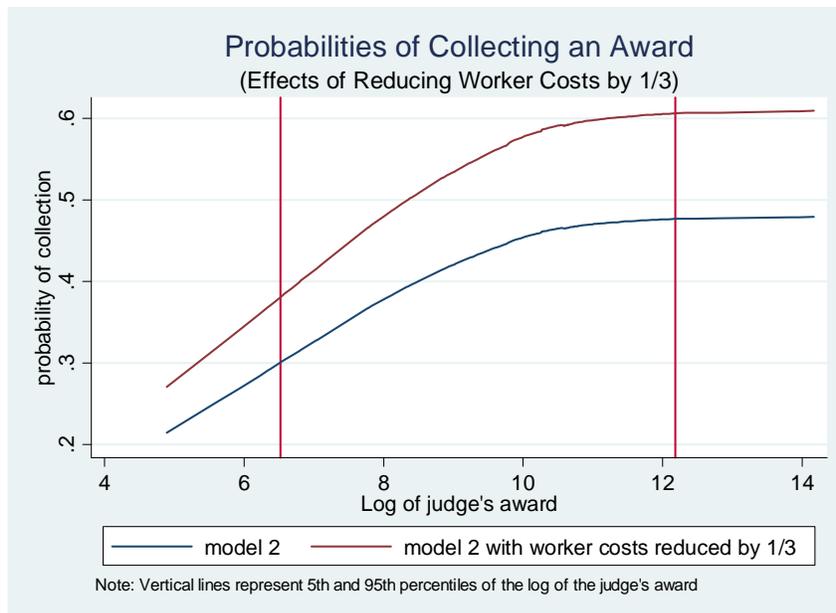
Figure 13

Figure 14

Note from figure 14 that, for the larger judgment amounts, the probability that the judgment is enforced approaches 60%. This is as high an enforcement rate as could be obtained by reducing worker costs due to the fact that we estimate that almost 40% of firms cannot be forced to pay as a result of seizure attempts. It is not clear, however, whether an effective policy response exists to address this problem. If firms avoid payment by going out of business, for example, it is not clear how they could be forced to pay.

8. Conclusions

Despite the fact that the manner in which the law is enforced can be as important as the law itself, little is known about problems that may arise in the enforcement process. In order to analyze the obstacles to enforcement of law, we study the results of individual cases in Mexico in which a judge has ruled that a worker was fired without just cause. The judge's ruling was only enforced 44% of the time.

The predictions of our estimated models match quite well with the data. Furthermore, the models yield several interesting conclusions. One important conclusion is that seizure attempts are quite costly. The cost to the marginal worker of attempting to seize firm assets is approximately 50% of the judgment amount. Should the seizure attempt be successful, the cost to the marginal firm is also approximately 50% of the judgment amount.

We use our estimated models to conduct experiments on the effect of reducing workers' costs of attempting to seize firm assets. The effects of this cost reduction are modest in magnitude and are ultimately constrained by the fact that nearly 40% of firms are estimated to be able to thwart attempts to seize their assets.

This finding highlights an important problem with the policy of protecting workers who lose their jobs by mandating high severance payments. Such a policy requires collection from firms that may go bankrupt or may have very few tangible assets, which means that workers who lose their jobs will often be left with no compensation at all. Although an unemployment insurance program may be difficult to implement in countries like Mexico with large informal markets, one advantage of an unemployment insurance program is that the enforceability problems analyzed in this paper could be avoided. The safety net provided to workers who lose their jobs would therefore be more secure.

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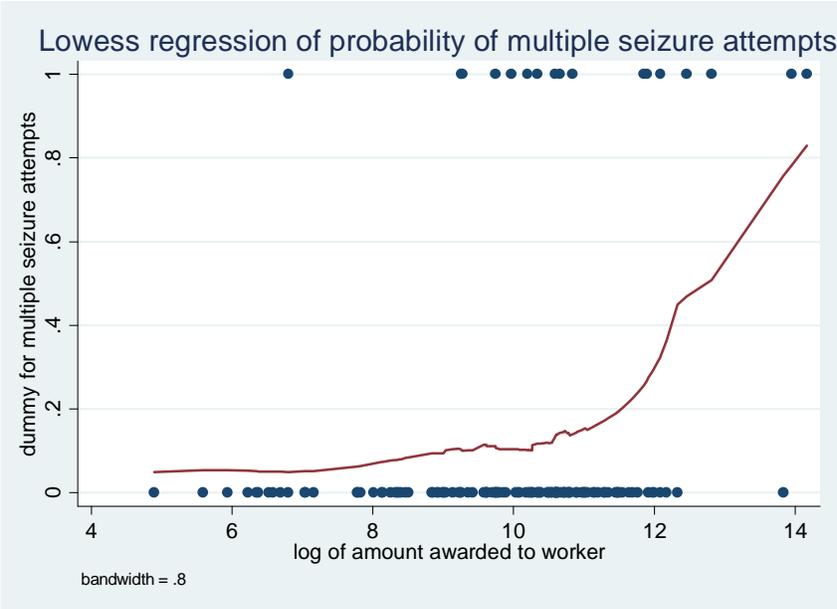
Appendix: Additional Figures

Lowess regression of probability of multiple seizure attempts

Figure A.1