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A Study of How Different Incentive Systems Can Impact Criminal Defense

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A Study of How Different Incentive Systems can Impact Criminal Defense

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Doctor of Philosophy
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by
Benjamin Schwall
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Accepted by:
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Abstract

This dissertation examines how different payment methods affect the behavior of criminal defense attorneys. In particular, I study the impact of switching from an hourly rate to a flat fee affects attorney behaviors across several measures. In my first paper, I begin by looking at how the switch affects the number of hours being reported. I identify the casual effect of switching from an hourly wage to a flat fee by exploiting a policy change that the South Carolina Commission on Indigent Defense instituted for private attorneys who handle indigent defense cases. I find that defense attorneys report 48% less hours when they are paid a flat fee compared to an hourly wage. Additionally, I look at how the attorney's in-court behavior changes. In-court behavior is a better measure of effort because in-court hours are observable by other members of the court. I find that attorneys are 25% less likely to go to court under the flat fee system; then, conditional on them going to court, they reduce the number of hours in court by about 30%.

Next, I study how the change in payment methods affect the outcomes of criminal cases. Theoretically, neither payment method provides an incentive for the attorney to protect the client's interests. Thus, it is empirical question as to which method does a better job at protecting the client's interests. I construct a new data set on court outcomes using information on the South Carolina county web pages. The outcomes that I focus on are the sentence length that the defendant receives, the probability of the case being resolved with a guilty outcome, and the probability that the case is resolved at a lesser included charge. Although not statistically significant, I find that defendants receive a sentence length that is, on average, about 3 months shorter under the flat fee system compared to the hourly rate. This represents about a 10% reduction in sentence length. On the other hand, there does not seem to be a difference between the two systems in the probability of being found guilty or in the probability that the case is resolved at a lesser included charge.

My second paper looks at how the payment method could affect the plea bargaining process.

I develop a model where the defense attorney is an imperfect agent of the defendant. This model shows that, holding all else constant, defense attorneys are willing to accept a plea with a longer sentence length for the defendant when they are paid a flat fee compared to an hourly rate. I also show that introducing an incentive where effort in the current case affects the probability of receiving future cases may offset the payment method effect. I then empirically test the model by taking advantage of a policy change by the state of South Carolina. Using a difference-in-difference model, I find that the sentence length is not statistically different when paying the attorney an hourly rate and paying him a flat fee where effort in this case affects the probability of receiving future cases.

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Chapter 1

Getting What You Paid For: How Payment Methods Affect Attorneys' Behaviors

1   Introduction

The attorney-client relationship is a classic example of the principal-agent problem in which the agent must complete multiple tasks on behalf of the principal.[1] For a criminal defense attorney, the main tasks are resolving the case and protecting the client's interests. The principal must devise a payment system that aligns the agent's interests with his own interests. Within the criminal defense context, the most common payment systems either pays the attorney an hourly wage for time spent on the case or a flat fee to complete the case. Both methods present different trade-offs that the attorney might try to exploit because of an information advantage that she has over the client in regards to what tasks she should complete.[2] With an hourly wage, the attorney might be slow to resolve the case in order to increase her hours. Because of the information advantage, she might complete tasks that fail to improve her client's case. On the other hand, paying an attorney a flat fee might result in the attorney focusing her effort on resolving the case but she might fail

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[1]Holmstrom and Milgrom (1991), discuss how payment systems can affect the agent's behavior when the task has multiple facets.

[2]This problem is discussed in the civil context in Polinsky and Rubinfeld (2003)

to protect the client's interests. Thus, she might not pursue a potentially beneficial task because it is too costly to her. Since neither payment system provides a direct incentive for the attorney to protect the client's interests, an important step is to understand how the payment systems affect attorney behavior.

Using an exogenous change in payment systems, I establish a causal relationship between payment system and attorney behavior. I take advantage of a change in policy for the South Carolina indigent defense system that switched from paying non-staff attorneys an hourly rate to a flat fee per case. This policy change allows me to study how an attorney's behavior differs between the two systems. First, I look at how the change affects the amount of time the attorney spends on a case. Using a simple difference model, I estimate how the total number of hours reported change and find a decrease of 48% of hours reported when the attorney is paid a flat fee. Additionally, I look at how the in-court hours change because in-court hours are observable, and therefore more difficult to just inflate. Using a log-hurdle model, I find that flat fee attorneys are 28% less likely to go to court and then, conditional on going to court, they spend 30% less time in court.

Second, I study whether the change of payment systems affects the outcomes of criminal cases. An attorney being paid an hourly rate will spend more time on the case than when she is paid a flat fee. However, effort per hour may not be the same between the two systems and so more hours may not lead to more effort. Additionally, the hourly attorney might pursue tasks that do not necessarily protect the client's interest but merely increase the billable hours. Since it is unclear which payment system protects the client's interests better, there is an important empirical question as to whether the outcome depends on the attorney's payment method. In order to study the effect of the change on outcomes, I constructed a new data set for criminal cases in South Carolina using information from the courts' web pages. The outcomes I study are the sentence lengths that defendants receive, the rate at which they plea guilty, and the probability that case is resolved at a lesser included charge. I estimate a difference-in-difference model and find that there is no statistical difference between the two systems for any of the outcomes. These results supports the idea that compensating the attorney for her time does not protect the client's interests any better than paying the attorney a flat fee.

This paper contributes to a larger empirical literature that has focused on how payment systems can affect worker productivity. LAZEAR (2000) was the first to study empirically how high-powered incentives can increase a firm's production. He found that a firm's productivity increased

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by 22% due to the incentive effect when it switched from an hourly rate to piece-rate system.[3] The incentive effect is the basic idea that people increase their output when they are paid based on some output measure. Other papers have studied the incentive effect and have found an increase in output (Paarsch and Shearer, 2000; Shearer, 2004; Bandiera et al., 2005). However, the previous literature has studied a change in output when quality was easy to measure. Within the criminal defense context, quality is difficult to define, yet alone measure. It is difficult to construct the counterfactual of how the case would have turned out if the attorney had behaved differently. Thus, this paper is one of the first papers to study how quality is affected when output increases.

This paper also contributes to a growing literature on indigent defense. The previous literature has mainly focused on how the different types[4] of attorneys perform relative to one another (Roach, 2014; Hartley et al., 2010; Huang et al., 2010; Iyengar, 2007). This paper differs from those papers in that it studies how payment methods affects attorney behavior. The paper closest to mine is Fenn et al. (2007) who looked at a change within the English legal system. The English system switched from paying attorneys an hourly rate to paying them a flat fee based on a multi-tiered system. Their paper focused on how the new payment system caused the attorney to change their behavior in regards to what tasks they completed. They found that attorneys reduced the amount of time they spent preparing, advocating, and waiting in court. However, the paper did not address how outcomes were affected by the change in payment systems. I am able to test whether the change of payment systems affected how the case was adjudicated.

Finally, this paper contributes to the literature that focuses on attorney-client principal-agent problem. This literature has mainly focused on the conflict-of-interest problem within the civil law context (Dana and Spier, 1993; ?). The main focus is on how hourly wages and contingency fees do not fully align the attorney's interests with the clients' interests. To the best of my knowledge, this is the first paper to look at whether the payment method affects this conflict of interest problem within the context of the criminal defense. Since I look at are indigent defense cases where the rate is not determined by the market, the payment method could have a larger effect on the conflict of interest problem.

The rest of the paper proceeds as follows: Section 2 provides some background on indigent

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[3]Lazear found a total change of 44% but noted that half of the change in production is the result of the selection effect. The selection effect is the idea that more productive workers will seek employment where they are paid based on output. I find suggestive evidence of a selection effect but I do not test it directly.

[4]By attorney types, I mean public defenders, assigned counsel, and private attorneys.

defense systems. Section 3 discusses the details of the South Carolina indigent defense system both before and after the change. Section 4 outlines the basic theory. Section 5 provides the analysis of how hours change along with describing the empirical methodology and results. Section 6 discusses how outcomes vary between the two systems. Section 7 offers some concluding remarks.

2   Background of Indigent Defense

In the landmark case of *Gideon v. Wainwright*[5], the United States Supreme Court ruled that state governments are required to provide defense counsel to defendants in felony cases who are unable to afford it on their own. The Court later expanded this rule to defendants who may face imprisonment in *Argersinger v. Hamlin*[6]. The result has been that counties across the United States have combined to spend more than $4.4 billion a year to represent more than four million indigent defendants (Stevens et al., 2010). While the *Gideon* decision made the provision of counsel mandatory for indigent defendants, it offered no guidance as to how the states should provide it. Thus, a state is left to decide for itself what is the most effective way to provide the service. It must balance the trade-off between the cost of providing the service to all indigent defendants and ensuring that the service meets the requirement of effective counsel.

Indigent defense systems vary greatly from state to state, and even from county to county within some states, in how they provide the service. There are three main methods of providing indigent defense: 1) Public Defender's Office, 2) assigned counsel, and 3) contract attorneys. Some jurisdictions use a combination of the three methods to handle the caseload of indigent defendants. The first step involves the defendant signaling to the court that he is unable to afford an attorney. The jurisdiction then uses some assignment mechanism to determine which attorney is assigned to the case. When the jurisdiction uses a public defender system, the case is assigned to the office. Then the Office determines how to distribute cases to individual attorneys. Attorneys within the public defender system are government employees and are paid a salary. Public defenders only work on cases assigned to them within the Public Defender's Office and are usually prohibited from taking any private cases. Thus, every case they work on is an indigent defense case. The individual attorney is responsible for the case but typically has to answer to a supervisor within the system.

Assigned counsel and contract attorneys both share the feature that these attorneys have a

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[5] *Gideon v. Wainwright*, 372 U.S. 335 (1963).
[6] *Argersinger v. Hamlin*, 407 U.S. 25 (1972).

private practice. These attorneys have their own legal practice and then supplement their caseloads by accepting indigent defense cases. Thus, their caseload is a mixture of indigent defense and private cases. While the exact mechanism may vary among jurisdictions, the assigned counsel system involves cases being assigned to attorneys who have previously agreed to take such cases. Some jurisdictions require all attorneys to participate while others require the attorney to select onto the list. On the other hand, the contract attorney system signs an agreement with either a firm or attorney to handle cases for some fee. In some jurisdictions, the fee will be set based on the number of cases the attorney handles while other jurisdictions pay a fee for a set time period.[7] The contract usually states what cases will be handled by the attorney. In both systems, attorneys are responsible for the disposition of the case with no oversight other than the ethical board.[8]

Even if the jurisdiction uses the public defender system, it still generally employs private attorneys to handle, at minimum, conflict of interest cases.[9] Conflict of interest cases occur when one crime is committed by multiple defendants and at least two qualify as indigent defendants. One attorney may not be allowed to represent all of the defendants because the advice the attorney gives to one client may be prejudicial to another client. Thus, the State will employ attorneys from the private sector to handle such cases. Apart from what system to use, the State must decide how it will compensate the attorneys. Some states choose to pay the attorneys an hourly rate, often subject to some cap, while others pay a flat fee per case. This paper focuses on how the compensation methods affect attorney performance.

3 South Carolina Indigent Defense Systems

This section explains the details of the South Carolina indigent defense system. South Carolina primarily uses a public defender system and only hires private attorneys when it has a conflict of interest case. Originally, the State employed private attorneys within an assigned counsel system and paid them an hourly rate.[10] In November of 2012, the South Carolina Commission on Indigent Defense[11] (SCCID or Commission) switched to a contract system that paid the attorney a

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[7]Some jurisdictions utilize an auction to determine which firm handles the cases. Other jurisdictions hire individual attorneys to handle cases as needed.

[8]There is some implicit oversight if the firm must reapply for a new contract each year.

[9]Large metropolitan areas typically employ the private bar for overflow cases. Overflow cases occur when the public defenders have reached the maximum caseload allowed and new cases still need representation.

[10]The system is known as Rule 608 because Court Rule 608 governed the system.

[11]On November 2, 2012, the Supreme Court of South Carolina issued an amended administrative order that gave power to change how indigent defenses cases are assigned to private attorneys.

flat fee per case worked. The remainder of this section describes the major differences between the two systems.

3.1 Pay Structure

Under the old system (hourly system), the appointed attorney was paid an hourly wage that depended on the type of case.[12] The rates were predetermined based on whether the case was classified as a capital or non-capital offense. When the attorney submitted her hours, the Commission would review them to make sure that the numbers were reasonable. Thus, there was an upper bound for how much attorneys could inflate their hours.

Under the new system system (flat fee), attorneys are paid \$900 per case, which is equivalent to the average payout per case under the hourly system plus about \$100. The same rate is paid regardless of whether the case is settled with a ten-minute phone call or has a lengthy trial. The Public Defenders' Office tries to balance the workload of attorney between felonies and misdemeanors, because felony cases require more time, on average than misdemeanor cases. The idea is that if the attorney receives a balance workload, then she should be willing to work more hours on a felony case because the next case should be a misdemeanor case. Attorneys must still submit their hours under the flat fee system for administrative purposes; however, they are not rigorously checked for accuracy like under the hourly system.

3.2 Who is Participating

The Commission changed who was eligible to receive cases by switching from an assigned counsel system to a contract system. Under the hourly rate system, every attorney in the State who was not part of an exempted class was required to register to participate in the indigent defense system. The attorney's only choice was whether they would receive civil cases or criminal cases. When the Commission switched to the flat fee system, it also changed to a contract system. Attorneys now must be hired by the Commission after submitting an application in order to be eligible to receive indigent defense cases. Thus, the contract attorneys represent a subset of attorneys who received cases under the hourly rate system.[13]

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[12]The wage was either \$40 or \$50 for out-of-court work and either \$60 or \$75 for in-court work.

[13]The only exception would be if the Commission hired attorneys who joined the State bar after the change.

3.3 Case Assignment Mechanism

The hourly system used a random assignment mechanism. Attorneys submitted their names to be on either the criminal or civil list within the county that they practiced. When the court needed outside counsel, it would select the next name on the list. The only exception was if the attorney did not have enough experience to handle a capital case. Furthermore, the court had no recourse against an attorney who under-performed. Since attorneys are required to be on the list by State law, the court could not prevent them from being assigned cases.

The flat fee system gave more control to the local Public Defender's Office.[14] The local office now has the power to determine how to assign conflict cases to the private attorneys. The most common mechanism is a random assignment of cases but the Public Defender generally tries to balance the case load for a particular attorneys between felony and misdemeanor cases. The Commission also has the ability to remove the attorney from the list for under-performance either by firing her or failing to renew her contract the next year.

4 Theory

In a world of perfect information, the payment system would have no effect on attorney activity. Lazear (1986) points out that if "effort level is observed perfectly and contemporaneously...[p]aying the appropriate hourly wage would provide exactly the right incentive." With perfect information, the State would know what actions the attorney should undertake, observe effort, and be able to provide the right incentives either through an hourly rate or a flat fee. However, reality is that asymmetric information exists in favor of the attorney. The attorney possesses the relevant information about the case and is in the best position to determine how she should proceed with the case. Furthermore, the cost of observing the attorney's effort is high for the State because the attorney works out of her private office.

Since attorney effort is not observable, the Commission must choose a "second-best" payment method that attempts to align the attorney's interest with its own. The State's interest should be to provide the best representation it can, given its budget constraint. The standard "pay-for-performance" model (**?**) predicts that if the agent is compensated based on output, then the agent

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[14]The contract system had a greater affect on civil case assignment. However, the main focus is on the impact of criminal cases and so those changes are not noted.

will spend less time per unit of output. When quality is difficult to monitor, the agent will increase his output per unit of time at the expense of quality. Thus, when an attorney is paid a flat fee, Lazear's model predicts that the attorney will spend less time on the case and quality is expected to decrease. Quality is likely to suffer, because quality is difficult to define, let alone measure within the context of criminal defense.

Alternatively, hours could be thought of as the output that the State is trying to control. The logic is that if the attorney is putting more time on the case then she is more likely to meeting the adequate representation standard. The problem with this logic is that the State must assume that quality per unit of time is consistent for the attorney. Holmstrom and Milgrom (1991) multi-task theory predicts that workers focus their efforts on activities for which they are being directly compensated and shirk on other activities that are unobservable. When attorneys are being paid an hourly wage, their compensation is related solely to the number of hours that they report. So with the hourly wage, attorneys should increase their production but it is likely to come at the expense of quality of the hour. This is because hours are not observable by the State, and no clear benchmark can be set by the State for production per unit of time.[15] The easiest illustration of this problem is an attorney inflating her hours (stating that a task took longer than it actually did) which shows hours increasing but the quality of the inflated hours are zero, as they do not benefit the client.

Lastly, neither of the two payment methods provide a direct incentive for the attorney to protect the client's interests. As a result, the increase in production of both hours and cases should result in a reduction of quality. Thus, the theory is ambiguous as to which payment method provides better protection of the client's interests. Therefore, I empirically test to see if there is a difference in outcomes. The outcomes that represent the client's interests are sentence lengths, guilty pleas, and whether the case was resolved at a lesser charge. The empirical test show whether there is a relative difference between paying an attorney a flat fee versus an hourly wage. Another factor that could affect results, in favor of the flat fee attorneys, is that attorneys now have a contract with the Commission as oppose to having cases randomly assigned to them. Thus, current performance can impact the probability of getting cases in the future. This could offset the incentive effect.

The three hypothesis I test are: (1) attorneys report less hours when paid a flat fee as compared to when they are paid an hourly wage; (2) whether attorneys were just inflating their

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[15]For Lazear's example, the company could mandate that a worker install at least one windshield per hour if it wanted to do so.

hours by testing whether their in-court behavior is unchanged; and (3) I test whether the two systems produce different outcomes in terms of sentence lengths, plea rates, and resolving the case at a lower charge.

5 Impact on Hours Reported

The South Carolina Commission on Indigent Defense (Commission) provided data connected to the analysis of hours reported. The Commission is the government agency that is tasked with providing legal services for indigent defendants. As part of its course of business, it collected information on hours that attorneys reported along with information concerning the case. The data set includes cases from October 2006 to November 2014 and includes more than 20,000 criminal cases. It provides information on the number of hours spent on the case broken down between in-court and out-of-court hours, how many charges the case involved, the specific charges, the county it was litigated in, an attorney identifier that allows me to track attorneys across cases, and an indicator of which payment system the case used. One issue that I need to address is whether the attorneys are reporting hours in a meaningful way under the flat fee system. The concern is that the attorneys are just writing down one hour in order to get paid (they have to report something) and that these hours are not related to the number of hours worked. I take a conservative approach and drop all of these cases.[16]

Table 1.1 presents summary statistics for the hourly data. The table splits the data into cases handled under the hourly wage system and the flat fee system. The mean number of hours reported decreases by about 56% under the flat fee system. This effect is slightly larger for out-of-court hours compared to in-court hours. This is also true despite the mean number of charges per case being slightly higher for flat fee cases. One reason for the reduction might be that the attorneys hired under the flat fee system spent less time on cases under the hourly system than those who were not hired. Table 1.2 presents the same statistics except the observations are limited to attorneys who participated under both regimes. It is true that these attorneys have a lower mean under the hourly system compared to attorneys who never worked under the flat fee system.[17] This provides some evidence of a selection effect. The reduction in the mean number of hours reported is still

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[16]Most of the cases were handled by a small group of attorneys who always reported one hour. I performed the regression analysis with these cases included and the results have the same sign, but are much greater in magnitude.

[17]The difference is statistically significant at the 10% level.

around 50%. Thus, there is a significant incentive effect in how attorneys behave.

This reduction could be also be the results of a change in the types of cases that the attorneys receive under the two systems. Table 1.3 shows the breakdown of case assignments based on the severity of the charge for the two cases. I would expect that attorneys would spend more time, on average, on cases where the defendant faces a longer possible prison sentence.[18] The biggest change in case-composition is that the hourly system featured a larger number of the lowest possible misdemeanor charge. Thus, I would expect the reduction in the mean number of hours reported to be larger if the case-composition was held constant. The regression analysis will control for differences in case-composition. However, there is a clear difference in the means between the two systems that cannot be explained by the selection effect or the case-composition.

5.1   Empirical Strategy and Results

The identification strategy is to look at the difference in hours between cases that are part of the hourly system and cases that are part of the flat fee system while controlling for differences in case characteristics, the specific attorney, and which county the case was adjudicated in. I use a simple difference model where a dummy variable indicates which payment system the attorney faced for the case. The model is specified as follows:

$$\log(Hours_{ijck} = \beta_0 + \beta_1 ContractCase_i + \beta_2 Charges_i + \gamma_j + \delta_c + \alpha_k + \epsilon_{ijck}, \qquad (1.1)$$

where the unit of observation is case i, with a charge j, in county c, and attorney k ; $ContractCase_i$ is a dummy variable equal to 1 if the case was a flat-fee case and equal to 0 if the case was an hourly case, $Charges_i$ is the number of charges the case had, γ_j are the charge level fixed effects, δ_c are county fixed effects, and α_k are attorney effects. For case-type fixed effects, my main specification uses a dummy variable for the severity of the case. As a robustness check, I alter the crime fixed effects to be based on the CDR code (narrowest classification), categories of the crime, and the class of the crime (Felony/Misdemeanor which is the broadest classification).

The main results can be found in Table 1.4. The first four columns focus on how the different fixed effects affect the results, while column 5 is the main specification. The coefficient of interest is β_1 which is negative and statistically significant. The interpretation for β_1 is that holding all else

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[18]This fact is confirmed in Table A1 in the appendix.

constant, an attorney being paid a flat fee compared to an hourly rate reduces the total number of hours reported for a case by about 48%, on average.[19]

One concern with these results could be that the cases that require more hours in the flat fee system have not had enough time to be completed. Attorneys only have to report hours once the case has been completed and there is only a two year window for contract cases to have been completed. Thus, the mean number of hours for contract cases might be smaller because the longer cases have not been completed yet. There are two ways to address this issue: 1) I limit my sample to one year before and one year after the change;[20] and 2) I run a median regression. Both methods should limit the effect of potentially missing the observations from the right tail. Tables 1.5 presents the results when limiting the time (Column 1) and presents the results for the median regression (Column 2). In both cases, the results are similar to the main results reported here.[21] Thus, the difference is not being driven by high-hour cases that have not been completed due to a lack of time.

5.2 Were Attorneys Just Lying Before?

While the results clearly show that attorneys are reporting fewer total hours, the question remains whether this is a change in attorney effort rather than just a change in reporting habits. The hourly system provides an incentive for attorneys to inflate their hours while the flat fee system does not. Thus, I would expect reported hours to be less under the flat fee system even if the attorneys are exerting the same effort. In order to better understand what the reduction in hours might mean, I look at how the change in incentives affects in-court hours.

In-court hours are a better measure of attorney effort because they are observable which makes them more difficult to inflate. Additionally, in-court hours represent time in front of the judge when the attorney could be arguing the case. When estimating the effect for in-court hours, I use a lognormal Hurdle Model. This is because almost 35%[22] of cases after the change do not go to court. I use a probit model to estimate the decision as to whether the attorney decides to go to court, then I use OLS, with the log of in-court hours as the dependent variable, to estimate the effect on in-court work conditional on going to court. The results can be found in Table 1.6. The

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[19]The percent change is calculated by $\exp^{\beta_1} - 1 * 100$.

[20]A better test would be look at cases that were open for the same amount of time, say a year. However, that information was not included in this data set.

[21]When limiting the data, I find the decrease to be about 33%. For the median regression results, I find the reduction to be about 41%.

[22]This is compared to about 19% of cases did not go to court under the hourly rate system.

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first column displays the results of the probit model while the second column displays the results of the truncated normal regression. The marginal effect of the case being a flat-fee case instead of an hourly case is that attorney are about 25% less likely to go to court; then conditional on going to court, they reduce the number of hours reported by about 34% on average.

This result is consistent with the concept that attorneys are changing their effort. First, the attorneys are less likely to go to court when they are paid a flat fee. Generally speaking, attorneys go to court to either argue the facts of the case or to argue applicable case law. This finding would suggest that attorneys are focusing their effort on resolving the case rather than arguing about various issues. Second, the results show that the attorneys who do go to court spend less time in court when paid a flat fee. Since these hours are observable, this finding supports the idea that attorneys work less when paid a flat fee.

6   Effects on Outcomes

I collected the outcome data from the various county court web pages. This study looks at the first 10 counties, alphabetically, of South Carolina's 46 counties. These 10 counties represent about 23% of the population and about 25% of the crime in the state.[23] I have information on cases where the defendant was arrested between January 1, 2012, and December 31, 2013. The web page provides information about the defendant's race, gender, year of birth, and the name of the defense attorney. It also includes information about the case such as the arrest date, disposition date, disposition method, the final charge, the original charge, sentencing information, and some information about documents that were filed. This information is all reported at the charge-level and so I collapse the information by disposition date for the defendant to look at case outcomes.

Another way to evaluate the attorney's effort is to look at how case outcomes are affected. If outcomes are being negatively impacted, then that would support the hypothesis that attorneys are exerting less effort. However, if there is no impact on outcomes, then it could be that attorneys are just changing their reporting habits or it could that they are changing their efforts in areas that does not impact outcomes. If outcomes for some reason are improving, then something other than the change in payment methods must be driving the results. I focus on sentence length as the main outcome measure of interest because, from the defendant's perspective, it is the most important

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[23]Crime   information   taken   from   South   Carolina   Law   Enforcement   Division   webpage: http://www.sled.sc.gov/SCCrimeBooks.aspx?MenuID=CrimeReporting

one. I also look at how the plea rate changes and whether the defendant pleas to a lesser charge as separate outcomes. If the attorney who is paid a flat fee is simply trying to resolve the case as quickly as possibly, then I would these two measures to also be affected.[24]

Table 1.7 breaks down the summary statistics concerning for case outcomes by public defenders and private attorneys for the time periods before and after the law change. Public defenders are staff attorneys who are paid a salary; thus, they should not be affected by the change in incentives and serve as a control group. The unconditional sentence length, in months decreases from 31 months to 26.4 months for private attorneys. This change is significant at the 5% level. For public defenders, the mean sentence length drops from 24.4 months to 22.8 months, but this change is not statistically significant. Just looking at sentence length, attorneys being paid a flat fee are performing better from the defendant's perspective. There is a similar change if I look at sentence length conditional on the defendant receiving one. Thus, it would not appear that the change is being driven by the attorney doing a better job of getting the defendant no jail time. For both groups, the defendant's guilty plea rate increases in the second time period while the defendant's case is resolved at a lower charge less often. If I consider only the private attorneys, these changes would be consistent with the flat fee attorney putting in less effort. However, the guilty plea rates and lower charges do not explain why sentence lengths, on average, are shorter under the flat fee system.

6.1 Empirical Strategy and Results

To strengthen the analysis, I run several regressions to control for different charges and defendant characteristics. The identification strategy in the outcome analysis is similar to the strategy used in the hourly analysis. I use a difference-in-difference framework to estimate the impact that the change in payment method. The three outcomes that I look at are: sentence length (in months), the probability of pleading guilty, and the probability of resolving the case at a lower charge. For sentence lengths, I estimate a tobit model because sentence lengths are greater than equal to zero. If the defendant did not receive a sentence, then sentence length is zero. For both the probability of pleading guilty and the probability of resolving the case at a lower charge, I estimate a probit model. The dependent variable is equal to 1 if the defendant plead guilty, zero

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[24]This requires the assumption that the prosecutor does not alter her behavior because of the change in incentives for the defense attorney.

otherwise. Similarly, the dependent variable is equal to 1 if the case was resolved at a lower charge, zero otherwise.

My basic model can be written as the following:

$$Outcome_{ijkc} = \beta_0 + \beta_1 Private_j + \beta_2 Period2_j + \beta_3 Private * Period2_j$$
$$+ \beta_4 Charges_j + X_i + \gamma_k + \delta_c + \epsilon_{ijkc}, \tag{1.2}$$

where Outcome is for case j in county c with a highest charge of k; $Private$ is a dummy variable equal to one if the case was handled by a private attorney, zero otherwise; $Period2$ indicates that the case originated in 2013, zero otherwise; X_i is a vector of defendant characteristics$(age, age^2, race, gender)$; γ_k is charge level fixed effects; and $delta_c$ is county level fixed effects.

While I am able to observe whether the defense attorney is a public defender or a private attorney, I cannot identify when the private attorney is being paid by the state or by her client because the case is part of her private practice. The SCCID web page reports that about 80-85% of all criminal cases are handled through the public defender's office.[25] Since such a large percentage of cases are public defender cases, I treat all private cases as being affected by the incentive change. Since this is over-inclusive, the results may be noisy and most likely suffer from attenuation bias. Therefore, my results may find a smaller impact in how outcomes are affected and the standard errors may be inflated.

Table 1.8 presents the main regression results for a couple of different specifications. The first column presents the results for sentence length from a Tobit model. The Tobit model is more appropriate than OLS since there are no sentence lengths less than zero. The coefficient of interest is β_3 which is -2.830. However, the coefficient is not statistically significant. Another measure of attorney effort would be the plea rates and whether the defendant plead to the highest charge. If the defendant is more likely to plea guilty or is less likely to get the charge reduced, these results would support that attorneys are exerting less effort in a meaningful way. If there is no change, then the attorney's reduction in hours represents either a change in a reporting behavior or the change in effort affects tasks that do not ultimately determine the case's outcome. I estimate a Probit model for both the guilty plea rate and whether the charge was reduced for the defendant. Column 3 in Table 1.8 reports the coefficients from the probit model for the guilty plea rate and column 4 for the probability of a charge reduction. However, I am concerned with the marginal effect of attorneys

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[25]See www.sccid.sc.gov/about-us/overview.

being paid a flat fee compared to an hourly wage. These results are presented in Table 1.9. Again, the effect is not statistically significant.

6.2 Discussion of Outcome Results

The coefficient of interest is negative in all specifications and using different methods, but the coefficient is not statistically significant. This results suggest that there is no difference in performance in regards to protecting the client's interests between the two payment systems. Thus, the "quality" of representation does not depend on the payment method of the attorney. The negative sign on sentence length could be a product of the selection effect that the accompanied the change in payment systems. The Commission could be selecting attorneys who, on average, do a better job of securing shorter sentences when they switched to paying the attorneys a flat fee. This result would also be consistent with the notion that attorneys are performing better under the flat fee system because current performance affects the probability of getting cases in the future. These results, combined with the hourly results, would also be consistent with Laffont and Tirole's proposition that making an agent a residual claimant on a contract will prevent artificial inflation of unobservable inputs (Laffont and Tirole, 1993).

A concern with flat fee payment systems is that attorneys are incentivize to plead guilty as quickly as possible in order to maximize their profits (Bibas, 2004). However, I do not find a significant effect when I look at the marginal effect of the flat fee system. If anything, the sign is counterintuitive as it suggests defendants with attorneys who are paid a flat fee are less likely to plead guilty. Also, their case is more likely to be resolved at a lesser charge, although the difference is not statistically significant. Overall, these results suggest that an attorney's performance does not depend on the payment method.

7 Conclusion

This paper looks at how attorneys within the South Carolina Indigent Defense System responded to a change in incentives. The attorneys used to be paid an hourly rate but now receive a flat fee for each case. The result is that attorneys report working about 48% less hours when controlling for case type, individual attorneys, and the county in which the case was filed. When studying the impact of the incentive change on in-court hours, I find that attorneys are about 28%

less likely to go to court and then reduce their in-court hours by about 30%, on average. Since in-court hours are observable and harder to inflate, these results suggest that attorneys are changing their effort when paid a flat fee.

I also study how the change in incentives affects attorney performance by looking at how case outcomes are affected. The main outcome that I study is sentence length. This is because it is the most important outcome from the defendant's perspective. I also look at the guilty plea rates and whether the defendant receives a reduction in charges because if the attorney is putting in less effort, there is a predictable effect on those two measures. Across all specifications, there is no statistical difference between how attorneys perform based on the payment systems. This supports the idea that quality is independent of the payment methods. The hourly results combined with the outcome results support Laffont and Tirole's proposition (Laffont and Tirole, 1993) that making agents residual claimants to any surplus on the contract will prevent artificial inflation of unobservable inputs.

Table 1.1: Summary statistics by Attorney Type

Variable	Hourly System		Flat Fee	
	Mean	Std. Dev.	Mean	Std. Dev.
Total Hours	19.44	45.67	8.50	12.10
Out of Court	17.67	42.80	7.65	10.01
In Court	1.76	5.90	0.85	3.52
In Court Ratio	0.103	0.15036	0.070	0.118
Charges	2.21	2.31	2.31	2.46
N	19032		1242	

Table 1.2: Summary statistics by Attorney Type-Same Attorneys

Variable	Hourly System		Flat Fee	
	Mean	Std. Dev.	Mean	Std. Dev.
Total Hours	17.17	28.32	8.50	12.10
Out of Court	15.79	25.18	7.65	10.01
In Court	1.39	4.66	0.85	3.52
In Court Ratio	0.083	0.135	0.070	0.118
Charges	2.31	2.30	2.31	2.46
N	5514		1242	

Table 1.3: Breakdown of Criminal Case Type by Fee Structure

	Hourly	Percent	Flat Fee	Percent
Felony U	901	6.47	149	6.00
Felony A	1770	12.72	421	16.97
Felony B	140	1.01	46	1.85
Felony C	609	4.38	60	2.42
Felony D	1951	14.02	388	15.64
Felony E	2190	15.74	482	19.43
Felony F	2226	16.00	470	18.94
Misdemeanor A	665	4.78	130	5.24
Misdemeanor B	45	0.32	21	0.85
Misdemeanor C	353	2.54	75	3.02
Misdemeanor U	3066	22.03	239	9.63
Total	13916	100.00	2481	100.00

Table 1.4: Main Results

	(1)	(2)	(3)	(4)	(5)
Criminal					
Charges	0.0730***	0.0552***	0.0596***	0.0615***	0.0617***
	(0.00580)	(0.00559)	(0.00510)	(0.00509)	(0.00507)
Contract Case	-0.736***	-0.797***	-0.795***	-0.633***	-0.658***
	(0.103)	(0.106)	(0.111)	(0.0997)	(0.103)
N	19894	14946	14945	14946	14945
Charge FE	N	Y	Y	Y	Y
County FE	N	N	Y	N	Y
Attorney FE	N	N	N	Y	Y

Standard errors are reported in parentheses and clustered by attorney.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.5: Robustness

	(1)	(2)
	Limited	Median
charges	0.0589***	0.0531***
	(0.00821)	(0.00699)
contract_case	-0.405***	-0.532***
	(0.0626)	(0.0476)
Type FE	Y	Y
County FE	Y	Y
Attorney FE	Y	Y
N	4759	5612

Clustered Standard errors in parentheses. Median regression standard errors were bootstrapped.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.6: In-Court Results

	ProbCrim	Criminal
Charges	0.0194***	0.0332***
	(0.00233)	(0.00451)
Contract Case	-0.248***	-0.342***
	(0.0336)	(0.0672)
Type FE	Y	Y
County FE	Y	Y
Attorney FE	Y	Y
N	13698	10952

Column (1) presents marginal effects for the probit estimation.

Standard errors are calculated using the delta method for column (1).

Standard errors for column (2) are clustered by attorney.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.7: Case Characteristics

Variable	Public Defenders			Private		
	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Case Length (Days)	1966	343	237.67	1359	384	251
Sentence (Month)	1966	24.4	51.1	1359	31.0	64.3
Charge-Severity	1966	5.62	2.34	1359	5.83	2.58
Black Defendant	1966	0.585	0.493	1359	0.475	0.500
Age	1952	32.7	11.5	1344	32.0	11.4
Male	1952	0.810	0.392	1343	0.848	0.359
Sentence Length if > 0	1198	40.0	60.5	775	54.5	77.3
Guilty Pleas	1966	0.658	0.475	1359	0.639	0.480
Lower Charge	1966	0.491	0.500	1359	0.531	0.499
Period 2						
Case Length (Days)	3033	299	201	1949	362	210
Sentence (Month)	3033	22.8	42.7	1949	26.4	50.8
Charge-Severity	3033	5.29	2.25	1949	5.41	2.54
Black Defendant	3033	0.560	0.496	1949	0.457	0.498
Age	3005	33.4	11.5	1928	32.6	11.4
Male	3007	0.817	0.387	1924	0.835	0.372
Sentence Length if > 0	1896	36.5	49.2	1124	45.8	59.9
Guilty Pleas	3033	0.712	0.453	1949	0.679	0.467
Lower Charge	3033	0.435	0.496	1949	0.465	0.499

Table 1.8: Court Outcomes-Main

	(1)	(2)	(3)
	Tobit	PleaRate	LowCharge
private	-0.663	-0.129**	0.0517
	(2.829)	(0.0481)	(0.0483)
Period2	0.881	0.113**	0.00583
	(1.913)	(0.0394)	(0.0395)
PrivatePeriod2	-2.830	-0.0433	-0.0178
	(3.395)	(0.0622)	(0.0615)
black	3.246*	0.0233	0.0373
	(1.630)	(0.0330)	(0.0325)
Other	-1.348	0.0165	0.0329
	(3.293)	(0.0664)	(0.0669)
age	0.0178	0.00265	-0.00190
	(0.0622)	(0.00136)	(0.00134)
gender	8.988***	0.127**	0.0599
	(1.764)	(0.0401)	(0.0400)
ncharges	4.602***	0.0486***	-0.0102
	(0.684)	(0.0126)	(0.00916)
N	8200	8200	8200

Robust Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.9: Difference-in-Difference Effect

	(1) Tobit	(2) PleaRate	(3) LowCharge
PrivatePeriod2	-2.830	-0.0121	0.0199
	(3.395)	(0.0196)	(.0180)

Chapter 2

Plea Bargaining with an Imperfect Agent

1 Introduction

Plea-bargaining is a prominent element of the American criminal justice system. According to the Bureau of Justice Statistics, 94% of all felony convictions were the result of a guilty plea by the defendant.[1] The literature has focused on three aspects of the plea-bargaining process: how plea-bargaining can conserve resources (Landes, 1971; Adelstein, 1978); how prosecutors can use plea bargaining as a tool to create a semi-separating equilibrium (Grossman and Katz, 1983; Baker and Mezzetti, 2001); and how rules could be created to limit prosecutorial discretion (Reinganum, 1988; Bar-Gill and Gazal Ayal, 2006; Daughety and Reinganum, 2015). In these models, the plea bargaining game involves only the prosecutor and the defendant. Thus, they implicitly treat the defense attorney as a perfect agent for the defendant and ignore how the defense attorney could influence the process. While the literature has recognized the role of attorneys in civil settlements,[2] there has been little focus on how the criminal defense attorney and the incentives she faces factor into the plea bargaining process.

In this paper, I provide a theoretical model of the effects that the defense attorney's incentives on sentence lengths during the plea-bargaining process. I then test the implications of my

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[1] Bureau of Justice Statistics, https://www.bjs.gov/index.cfm?ty=tp&tid=23
[2] For example, see Dana and Spier (1993); Polinsky and Rubinfeld (2003).

theoretically model using a new data set that contains sentencing information from cases in South Carolina. In November of 2013, the state decided to switch how it paid the private attorneys who handled indigent defense cases. The basic theoretical model shows that, holding all else constant, defense attorneys are willing to accept a plea with a longer sentence length for the defendant when paid a flat fee compared to when paid an hourly rate. This difference is a function of two things: first, the defense attorney will exert more effort when paid an hourly rate, lowering the probability that the prosecutor will win at trial. Second, the prosecutor will have to offer a shorter sentence in order to induce the hourly rate attorney to settle at a particular time and forfeit the opportunity to earn additional wages.

In South Carolina, the State changed both the payment method and how cases were assigned to the attorneys. I address this change in my model by introducing an incentive where the probability of receiving future cases depends on effort in the current case. When this incentive is included for flat fee attorneys and not hourly rate attorneys, the predicted effect of hourly fees on sentence length is ambiguous. The result will depend on whether this incentive induces more effort compared to the attorney being paid an hourly wage.

Thus, I empirically test the effect of the change in the incentives that South Carolina implicated. Using a difference-in-difference model, I find that the average sentence length is not statistically different between the two systems for plea bargaining cases. This result is consistent with the model's prediction that the payment method effect can be offset by connecting future employment status with effort exerting in this case. However, the result seems to depend on whether the attorney receives a reduction in the severity of the charge (for example, if the defendant was charged with a felony class A, he may plead guilty to felony class B which has a lower maximum sentence). When there is a reduction in the severity of the charge, the defendant receives a longer sentence length when paid a flat fee than an hourly rate. When there is not a reduction, the defendant receives a shorter sentence length when a paid a flat fee compared to an hourly rate.

This research contributes to the literature that has focused on how the defense attorney's incentives can impact the plea bargaining process. Garoupa and Stephen (2008) discuss how the defense attorney and the incentives he faces can affect the validity of the plea bargaining system. Specifically, they explain how agency costs could distort the outcomes of the plea bargaining process. (Stephen et al., 2008) study how switching to a fixed fees system affecting the timing of settlements in the Scottish criminal justice system. They found that cases were more likely to make it past the

first stage and settle at the second stage. The authors explained that a plea of not guilty at the initial stage is a requirement in order for the attorney's fees to be paid by the state. This paper contributes to this literature by developing a theoretical model that shows how incentives affect the sentence length that the defendant receives and by empirically testing the model's implications.

The paper continues as follows: section 2 develops the model and states the testable hypothesis derived from the model. Section 3 describes the data and provides summary statistics. Section 4 explains the empirical strategy and provides the results. Section 5 offers some concluding remarks.

2   Model

The plea-bargaining game features two players: the prosecutor and the defense attorney who is one of two types: paid a flat fee, f, or paid hourly, h. While the defendant legally has the power to make decisions in regards to his case, I assume that the defense attorney has enough influence to convince the defendant to follow his advice. I assume that the prosecutor knows whether the defense attorney is being paid a flat fee or an hourly wage.[3] The prosecutor is trying to maximize the sentence that the defendant receives. The defense attorney is trying to maximize his utility which is a function of the defendant's outcome and his profit, subject to a budget constraint.[4]

The timing of the game goes as follows: at time zero, the prosecutor receives the case and he values it at x. This x is determined by the severity of the charge. Also, at this time zero there is an initial probability of that the prosecutor will win the case at trial, α. For symmetry, the defendant values the case at $-x$. At time one, the prosecutor makes an offer of q to the defense attorney, where $q \in [0, x]$. An offer of $q = 0$ is equivalent to the case being dismissed and the defense attorney must accept it.[5] Upon receiving the offer, the defense attorney can either reject the offer or accept it. If the attorney accepts the offer, the game ends and the players receive their payoffs. For simplicity, I assume that the attorney puts forth no effort when he accepts the offer.[6] If the attorney rejects the offer, then the case goes to trial and the defense attorney expends effort in order to prepare for

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[3]In my data, this is a reasonable assumption because the State controls the payment method and decides to change it for all cases.

[4]Gravelle and Waterson (1993), in the civil context, recognize that the lawyer's responsiveness to incentives will depend on the relative weight in their utility function of their financial interests and their client's interests.

[5]Even though a perfectly selfish attorney might want to reject this offer, he is ethically obligated to take the offer to his client and follow his client's decision.

[6]This can be thought of normalizing all cases to consider the defense attorney's decision once he has an offer.

it and litigate the case in court. With some probability θ_i, the defendant will be found guilty and with probability $1 - \theta_i$ he will be acquitted. I assume θ_i is a function of attorney effort and initial probability of winning the case, such that $\theta(e_i, \alpha)$.[7] In particular, the probability of the prosecutor winning decreases at a decreasing rate with the defense attorney's effort.

Figure 2.1 presents the game with payoffs for each stage. I am concerned with how the prosecutor will change the offer to the defense attorney based on the attorney's type. For the prosecutor, he will make an offer q such that $q \geq \theta_i x$. For the defense attorney, he will accept an offer if

$$-\lambda q + (1 - \lambda)(W_i(0)) \geq -\lambda \theta_i x + (1 - \lambda)(W_i(e_i^*) - C(e_i^*)), \tag{2.1}$$

where $\lambda \in [0, 1]$ represents how much the defense attorney cares about his client's interests. If $\lambda = 1$, then the attorney would be a perfect agent and $\lambda = 0$ would mean the attorney only cares about his financial interests. The term $W_i(e)$ represents the attorney's wage and is equal to a flat fee for type f and is a function of the attorney's effort for the hourly type.[8] The term $C_i(e)$ represents the attorney's opportunity cost of expending effort. I assume that the attorney faces the same cost function regardless of the type and that this function is increasing on effort at an increasing rate. The defense attorney chooses e^* to maximize his expected returns from trial, namely

$$-\lambda \theta_i(\alpha, e_i)x + (1 - \lambda)(W_i(e_i) - C(e_i)). \tag{2.2}$$

This means that the prosecutor will need to offer the following deal to each type:

$$q_f = \frac{\lambda \theta_f x + C(e_f^*)(1 - \lambda)}{\lambda} \tag{2.3}$$

$$q_h = \frac{\lambda \theta_h x - (1 - \lambda)(W_h(e_h^*) - C(e_h^*))}{\lambda} \tag{2.4}$$

The intuition behind each offer is that the prosecutor has to adjust the offer based on the expected probability that the defendant will lose at trial and the difference in profits that the defense attorney will get between settling and going to trial. Using the two equations, it can be shown that the

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[7]For my model, I only focus on defense attorney effort in order to simplify the analysis as including the prosecutor's effort should only increase the magnitude of the difference.

[8]In my data set, the attorney is paid an hourly rate related to whether the work in done in-court or out-of-court.

difference in offers is:

$$q_f - q_h = \frac{(1 - \lambda)[W_h(e_h^*) - C(e_h^*) + C(e_f^*)] - \lambda x(\theta_h - \theta_f)}{\lambda} \qquad (2.5)$$

2.1 Implications

The implications from equation 2.5 are as follows: first, if the attorney is a perfect agent ($\lambda = 1$) then there should be no difference in the offer.[9] However, if the attorney is not a perfect agent, then the prosecutor will make different offers based on the attorney type. Second, the prosecutor should offer a longer sentence to an attorney paid a flat fee compared to one paid an hourly wage, holding all else constant. This is because the second term of equation 2.5 will be negative due to the fact that $e_h^* > e_f^*$,[10] and θ is decreasing with e. The intuition for this result is that the prosecutor will offer a lower sentence to the defendant represented by an hourly attorney because he faces a lower likelihood of winning due to the increase effort by the defense attorney. Third, even if the attorney puts in the same effort under both payment systems, the defendant would still receive a longer sentence length under the flat fee system because the prosecutor has to discount his offer to the hourly rate attorney to compensate for the foregone wages.

The sign of the first term depends on whether the defense attorney earns rents under the hourly system. When the rents are non-negative,[11] then the sign of first term will be positive and the whole equation will be positive. This would mean that when the attorney is paid a flat fee, the prosecutor will offer a longer sentence length than when the attorney is paid an hourly rate.

When the defense attorney makes negative profit under the hourly system, then the sign of the equation becomes ambiguous. There are two ways that entire result will be positive: (1) $W_h(e_h^*) + C(e_f^*) > C(e_h^*)$; and (2) $\lambda x(\theta_h - \theta_f) > (1 - \lambda)[W_h(e_h^*) - C(e_h^*) + C(e_f^*)]$. I know that $C(e_h^*) > C(e_f^*)$ which means the first condition is not guaranteed to be met. If the defense attorney is willing to take a loss, then either he values the defendant's interests more than his financial gains or he faces a high opportunity cost. When he values the defendant's interests more than his own financial interests, then the defense attorney will be less responsive to change in payment

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[9]This is because both attorney types would be choosing e^* to minimize the prosecutor's probability of winning. Thus, both types should choose the same effort level which affect θ the same way, assuming α is held constant.

[10]This result comes from the fact that $W_f'(e) = 0$, while $W_h'(e)$ is a positive number.

[11]Given that this is the attorney's profession, I would expect that the attorney would earn non-negative profits more often than not. However, this does not need to be true for every case.

methods.[12] It could be the case that the attorney faces a high fixed cost or that the marginal cost of effort is always higher than the wage that the attorney receives. Since the attorney faces the same opportunity cost function for each system, the high fixed costs will cancel out between the two systems when taking the difference of the costs of the two systems. In the latter case, the defense attorney should exert similar effort under the two systems since costs are increasing at an increasing rate; thus, the main benefit from effort would be reducing the prosecutor's probability of winning. Thus, the defense attorney will exert similar effort between the two systems, which means $C(e_f^*)$ will balance out $C(e_h^*)$. This makes it likely that the first term is positive which means the overall sign would be positive since the second term is still positive. Finally, there should be few cases where the attorney is willing to take a loss. This is because the attorney operates a private practice and could afford a loss leader to sustain her reputation or to gain future business.

2.2 Model Adjusted for Probability of Future Cases

One way of trying to offset this payment method effect is to introduce an additional incentive where effort in the current case affects the probability of receiving a case in the future. The change in South Carolina policy incorporates both aspects: it switched from paying the attorney an hourly rate to a flat fee and it switched from a random case assignment to a contract system. So attorneys who are paid the flat fee must apply to the Commission and be selected from the pool applicants by the Public Defender's office in order to receive cases. This contract lasts for one year and then the attorneys must reapply to the Commission. Thus, the attorney's performance in his current cases should affect the probability that he is rehired and receives more cases in the future. In contrast, the hourly system used random assignment and so there was no systematic relationship between effort today [13] and receiving more cases in the future. This would change the defense attorney's pay-off to:

$$-\lambda\theta_i x + (1-\lambda)[W_i(e_i) - C(e_i) + B_i(e_i)] \tag{2.6}$$

where the additional $B_i(e_i)$ represents how effort affects the probability of receiving future cases. Since under the hourly system cases were assigned randomly, $\frac{\partial B_h}{\partial e} = 0$. For flat fee attorneys, effort should affect whether the attorney is rehired. This could show up in one of two ways: first,

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[12]The best example is if $\lambda = 1$, then he is completely unresponsive to the change.
[13]The attorney must meet some minimum threshold of exerting enough effort that ethical charges are unlikely to be brought against the attorney.

effort could directly affect the probability that the attorney is rehired, represented mathematically as $\frac{\partial B_f}{\partial e}$ is positive, and $\frac{\partial^2 B_f}{\partial e^2}$ is negative. The intuition is that the more effort the attorney exerts the more impressed the Commission is with the attorney, making it more likely he will get future cases. However, the marginal return of effort is decreasing. The other way the State could use the new incentive is by setting a minimum level of effort, e_{min}, that the attorney must reach on each case or he risks not receiving cases in the future. This would be similar to Lazear's idea of having a minimum output requirement when paying an hourly wage ?. The attorneys must exert enough effort that the State does not wish to terminate the attorney's contract.[14]

This change has no effect for the hourly attorney as $B_h(e_h) = 0$ for all e not at the threshold level. However, the prosecutor must change his offer to the flat fee attorney to account for the benefit of the attorney's effort and how it affects the probability of acquiring future cases. The new offer can be written as:

$$q_f = \frac{\lambda \theta_f x - (1 - \lambda)[B_f(e_f^*) - C(e_f^*)]}{\lambda}. \tag{2.7}$$

This means the that the difference in the offers is now:

$$q_f - q_h = \frac{\lambda x(\theta_f - \theta_h) - (1 - \lambda)[B_f(e_f^*) - C(e_f^*) - (W_h(e_h^*) - C(e_h^*))]}{\lambda}. \tag{2.8}$$

The sign of this equation is now ambiguous and depends on a couple of things: (1) whether $e_f^* > e_h^*$ and (2) whether $B_f(e_f^*) - C(e_f^*) > W_h(e_h^*) - C(e_h^*)$. Presumably, an attorney under the flat fee should exert more effort with this additional incentive of to make sure that he will receive more cases in the future.[15] Thus, $e_f^* > e_h^*$ depends on whether $\frac{\partial B_f}{\partial e} > \frac{\partial W_h}{\partial e}$, and it is not obvious which one should be greater. The magnitude of the partial derivative, $\frac{\partial B_f}{\partial e}$, will depend on both the value of future earnings and how much effort affects the probability of receiving future cases. If, instead, the State is setting a minimum amount of effort that an attorney must exert per case, then it depends on whether this minimum is greater than the effort that the attorney exerts under the hourly system. If $e_f^* > e_h^*$, then the $\theta_f < \theta_h$ since the probability of the prosecutor winning decreases with effort by the defense attorney. Thus, the first term of equation 2.8 would be negative.

The second term depends upon whether the defense attorney is earning larger rents under the hourly system or under the flat fee system. When the rents are larger for the attorney under

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[14]To the extent that the market is competitive for these cases, then more effort should help ensure that the attorney is rehired the next year.

[15]This does not need to be the case if the State sets e_{min} which is less than his original choice of effort, e_f^*.

the flat fee system compared to the hourly rate, then the second term is positive. This means that the prosecutor will have to reduce the sentence length when the attorney is paid a flat fee compared to an hourly rate. When the rents are larger for the attorney under the hourly system compared to the flat fee system, then second term is negative. This means that the prosecutor can offer a higher sentence length to the attorney under the flat fee system compared to the hourly rate system. It is unclear which system should lead to higher rents on a per case basis. Thus, the ultimate sign of equation 2.8 is ambiguous.

2.3   Testable Hypothesis

In summary, the model predicts that sentence lengths will increase when the attorney is paid a flat fee with no additional incentive connecting effort to obtaining future cases. When that incentive is included, the effect becomes ambiguous. Given that South Carolina switched to a flat fee and added the additional incentive in 2012, I can test the following hypothesis: the change in incentives has no effect on the sentence length that the defendant receives from plea bargaining. There are three possible outcomes:

(1) Defendants receive longer sentence lengths under the flat fee system. This result would be consistent with the first model and suggest that the additional incentive does not completely offset the effect of the change in payment methods.

(2) Defendants receive shorter sentence lengths under the flat fee system. This result would suggest that the additional incentive is stronger than the effect of the change in payment methods.

(3) Defendants receive the same sentence lengths under the flat fee system. This result would suggest that either the additional incentive balances the effect of the change in payment methods or that the attorney does not respond to incentives.

The main reason why the additional incentive may not offset the effect of the change in payment methods is that the State is unable to perfectly observe effort by the attorneys. Since these attorneys are private practitioners, they perform most of their tasks in their offices making their effort unobservable by the State. Thus, the attorney may complete tasks that are observable in order to improve the probability that they get rehired, even though there is no substantial change in the outcome. For example, they may try to convince the prosecutor to reduce the severity of the

charge without negotiating for a different sentence length.

3 Data

3.1 Description

In 2013[16], South Carolina switched payment methods for private attorneys handling indigent defense cases. I collected my data by accessing information available on the South Carolina county web pages. I focused on cases where the defendant was arrested between January 1, 2012, and December 31, 2013, one year before and after the change in the payment scheme. I have information on the defendants' race, gender, and age. I know what the defendant was initially charged with, what charge the case was resolved at, how it was resolved, and what the punishment was for a guilty conviction. I also know which defense attorney represented the defendant in the case. I collected data for 10 of the 46 counties in South Carolina which represent 23% of the population and 25% of the crime.[17] Additionally, I focus my analysis on cases where the initial charge was at the felony level.

The State implemented its policy change that switched from paying the private attorneys, who are handling indigent defense cases, an hourly rate to paying a flat fee per case.[18] Additionally, the State instituted a contract system to go along the flat fee. This replaced a system that required participation by attorneys and then assigned cases randomly to the attorneys. The contract system requires attorneys to apply to the State and be selected in order to receive indigent defense cases. They also must reapply every year; thus, attorney effort in the present case affects whether the attorney will be rehired in the future.[19] This decision by the State is beneficial in identifying the casual relationship between the different incentives and sentence lengths for two reasons: first, this is arguably an exogenous change in the payment method as the attorneys themselves must accept the change for all cases assigned to them by the State. Additionally, prosecutors could act strategically since they were aware of the change.

Additionally, I have information for cases that were handled by staff public defenders. These

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[16]The change was announced in November of 2012 and took effect in 2013.

[17]Crime information taken from South Carolina Law Enforcement Division webpage: http://www.sled.sc.gov/SCCrimeBooks.aspx?MenuID=CrimeReporting.

[18]For a full description of the change, see Schwall (2017).

[19]Attorneys can also be fired under the contract system whereas the hourly system had a mandatory participation requirement. Since it was mandatory for all attorneys under state law, the State could not remove them from the list of attorneys receiving cases.

attorneys are not affected by the law change as they receive salary. Thus, their cases serve as a control group. Any change in the outcomes that affect the public defenders should also affect private attorneys in the same manner but not vice versa.

One limitation of my data is that, for private attorneys, I cannot distinguish between cases that part of the attorney's private practice or assigned to him by the State, that is, I cannot specifically identify the cases that are subjected to the change in payment methods. However, The South Carolina Commission on Indigent Defense web page reports that about 80-85% of all criminal cases are handled through the public defender's office.[20] Since such a large percentage of cases are public defender cases, I treat all of the private cases as being affected by the incentive change. Since this is over-inclusive, the results may be noisy and most likely suffer from attenuation bias. Therefore, my results may find a smaller impact in how outcomes are affected and the standard errors may be inflated.

3.2   Summary Statistics

Figure 2.2 shows the distribution of sentence length measured in months by time period. Period 1 is when private attorneys were paid an hourly rate; whereas Period 2 is when private attorneys were paid a flat fee. Since there is a long right tail for the distribution for both cases, I take the natural log of sentence length. Additionally, my sample focuses on cases where the original charge was a felony and when the defendant received a sentence that was non-zero.[21] Thus, I am able to take the natural log for all of the observations without a transformation.

Table 2.1 presents the summary statistics concerning the various case characteristics. The table is split two ways: between public defenders (first 3 columns) and private attorneys; and between period one (top portion) and period two.[22] First, the log of sentence length does increase for both sets of attorneys in period two compared to period one. The difference in means is statistically significant for public defenders between period one and period two, but not for the private attorneys. Second, the defendant's characteristics (age, race, and gender) are not statistically different between period one and period two, for each group.[23] Third, the change in sentence length is occurring despite the

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[20]See www.sccid.sc.gov/about-us/overview.

[21]There was only a handful of cases where the defendant was charged with a felony, plead guilty, and received a punishment with sentence length of zero. These observations were excluded.

[22]Period one is when the private attorneys are being paid an hourly wage while period two is when they are being paid a flat fee.

[23]There may be a difference across attorney types, but that is not the focus of this analysis.

fact that the severity of the charge is decreasing (the difference is statistically significant for both groups). Defendants face a shorter maximum sentence for less severe charges. Additionally, the case is less likely to be resolved at a lesser charge. This would be consistent with longer sentence lengths. Thus, it is unclear what factor is driving the results.

4   Identification Strategy and Estimation

I use a difference-in-difference framework to estimate the casual relationship between the incentive methods and sentence length. The identification strategy is that any changes that affect the system outside of the different incentives should affect the public defenders and private attorneys equally. My empirical model can be written as the following:

$$\log(Sentence_{ijkc}) = \beta_0 + \beta_1 Private_j + \beta_2 Period2_j + \beta_3 Private * Period2_j \\ + \beta_4 Charges_j + X_j + \gamma_k + \delta_c + \epsilon_{ijkc},$$

(2.9)

where the sentence length is for case j in county c facing charge k. $Private$ indicates that the case was handled by a private attorney and $Period2$ indicates that the case originated after the law change, X_j is a vector of defendant characteristics, γ_k is charge level fixed effects for the highest charge the defendant faced, and $delta_c$ is county level fixed effects.

Table 2.2 presents the main set of results. The coefficient on $Private\_Period2$ captures the effect of the change in incentives on sentence length. Column 1 presents the baseline estimates, notice that the coefficient of interest is small, positive and statistically insignificant. This result is consistent with the hypothesis that the effect from the additional incentive of effort today on the probability of receiving future cases offsets the effect of the change in payment methods.[24]

Since multiple charges could affect the plea bargaining process in a way not captured by my model, I look at cases in which the defendant only faced one charge. These results are presented in Column 2 of Table 2.2. The coefficient of interest increases in magnitude but remains positive and statistically insignificant. However, the coefficient represents a 12% increase in sentence length for the defendant, holding all else constant, which would be economically significant.

Lastly, I look at what happens, separately, in cases where there is a reduction in the severity

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[24]I estimate similar regressions as Table 2.2 but in levels instead of logs. See Appendix for results. For model used in column 1, the coefficient has the same sign, is small, and statistically insignificant. For the second and third model, the sign is negative, but the magnitudes are small and statistically insignificant.

of the charge and where there is no reduction in the severity of the charge (Columns 3 and 4 of Table 2.2). In both cases, the coefficient of interest is not statistically significant, but the effect is about an 11% change in sentence length, holding all else constant. When the attorney obtains a reduction in charge severity, the defendant receives a longer sentence length when the attorney is paid a flat fee compared to an hourly wage. The effect is the opposite when there is no reduction, meaning the sentence length is shorter for the defendant with a flat fee attorney. This is an interesting result and may highlight the fact that effort is difficult to monitor; thus, attorneys focus on tasks that suggest they are exerting effort in order to secure more cases in the future. For example, the attorney may simply try to reduce the severity of charge and accept a longer sentence length because he can say to the State that he worked to get the charge reduced.

5 Conclusion

This paper illustrates how an attorney's payment method can affect the outcome in a plea-bargaining case. I develop a model where the defense attorney is not a perfect agent for the defendant. The model shows that an attorney who is paid a flat fee will accept a plea bargain where the defendant receives a longer sentence than if that same attorney was paid an hourly rate, holding all else constant. One way that this effect can be offset is by making the prospect of receiving more cases in the future contingent on effort in this case. My model then predicts an ambiguous relationship between an attorney being paid an hourly rate with effort not affecting the probability of receiving future cases and an attorney being paid a flat fee with effort affecting the probability of receiving future cases.

Using South Carolina data from 2012-2013, I study how switching from an hourly system with random assignment to a flat fee system where each attorney has a contract that must be renewed every year affects the sentence length in a plea bargaining case. My baseline model suggests that there is no statistical difference in sentence length between the two systems. This result is consistent with a scenario where the effect connecting performance in cases and receiving future cases offsets the effect of the change in payment methods. Furthermore, there is an interesting difference between when the attorney obtains a reduction in the severity of the charge and when there is no reduction. Although neither coefficient is statistically significant, the coefficients are similar in magnitude but the signs are opposite each other. This might suggest that attorneys are concerned with the appearance of

exerting effort more than the ultimate outcome of the case.

Table 2.1: Case Characteristics

Variable	Public Defenders			Private		
	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Log Length	1044	2.24	2.12	670	2.57	2.22
Case Length (Days)	1044	334.3	226.2	670	375.0	234.2
Black Defendant	1044	0.572	0.495	670	0.501	0.500
Age	1044	33.0	11.5	670	31.8	11.2
Male	1044	0.828	0.378	670	0.845	0.362
Charge-Severity	1044	6.20	1.82	670	6.57	2.05
Lower Charge	1044	0.495	0.500	670	0.539	0.499
Period2						
Log Length	1607	2.42	1.97	964	2.71	2.00
Case Length (Days)	1607	283.8	190.8	964	349.6	202.0
Black Defendant	1607	0.559	0.497	964	0.470	0.499
Age	1607	33.7	11.6	964	32.8	11.2
Male	1607	0.843	0.364	964	0.838	0.369
Charge-Severity	1607	6.02	1.80	964	6.17	1.96
Lower Charge	1607	0.436	0.496	964	0.456	0.498

Table 2.2: Main Results

	(1)	(2)	(3)	(4)
private	0.148	0.0927	0.159	0.324*
	(0.164)	(0.270)	(0.109)	(0.139)
Period2	0.168	0.205	0.125*	0.0769
	(0.0797)	(0.136)	(0.0428)	(0.0884)
Private_Period2	0.0204	0.122	0.117	-0.112
	(0.113)	(0.219)	(0.0779)	(0.157)
black	-0.0318	0.0529	0.0960	-0.0666
	(0.0488)	(0.0569)	(0.0701)	(0.0495)
Other	-0.358**	-0.206	-0.384**	-0.355
	(0.109)	(0.112)	(0.112)	(0.189)
ncharges	0.0299		0.0898	-0.0756***
	(0.0417)		(0.0450)	(0.0154)
gender	0.477**	0.550**	0.649***	0.270**
	(0.113)	(0.143)	(0.0932)	(0.0735)
age	0.0197	0.0286	0.0299	-0.0155
	(0.0125)	(0.0156)	(0.0154)	(0.0140)
age2	-0.000330	-0.000462	-0.000518	0.0000538
	(0.000159)	(0.000220)	(0.000231)	(0.000162)
Charge FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	4284	2491	2018	2266

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 2.1: Diagram of Game

Case with initial value x
and probability of
prosecutor winning, α

Prosecutor makes offer, q

Defense Attorney
Accepts

Defense Attorney
Rejects

$(q, -\lambda q + (1- \lambda)W_i (0))$

$(\theta x, -\lambda \theta x + (1- \lambda)(W_i (e_i^*) - C(e_i^*)))$
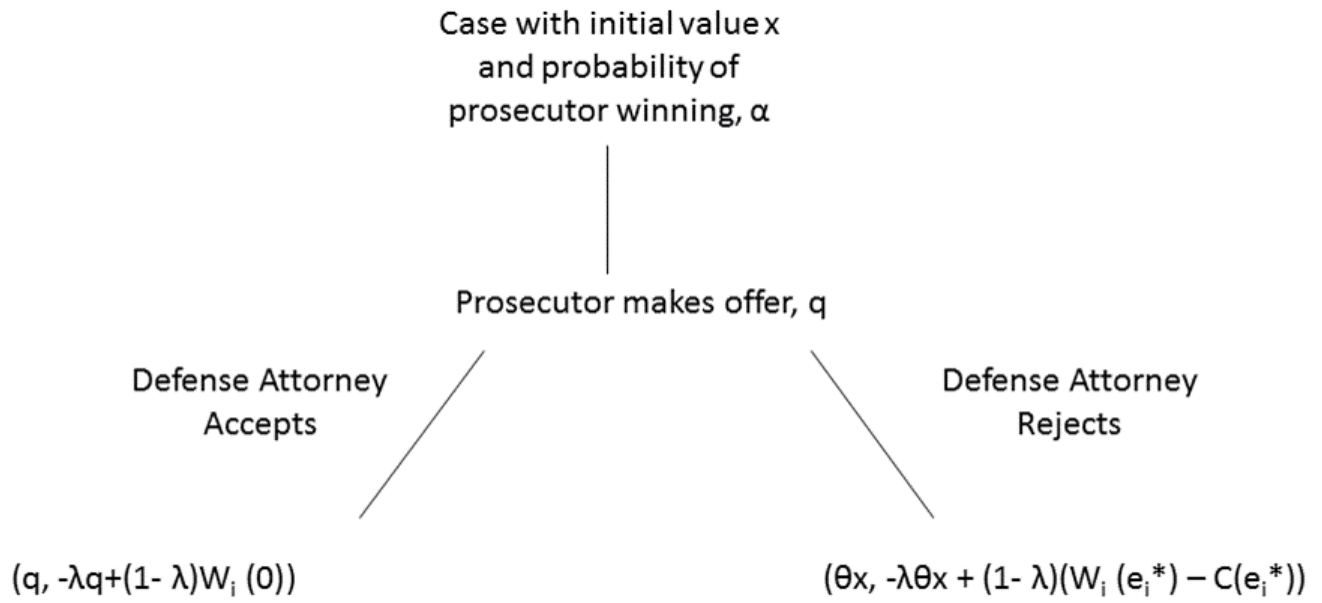
Figure 2.2: Distribution of Sentence by Type

Graphs by Label
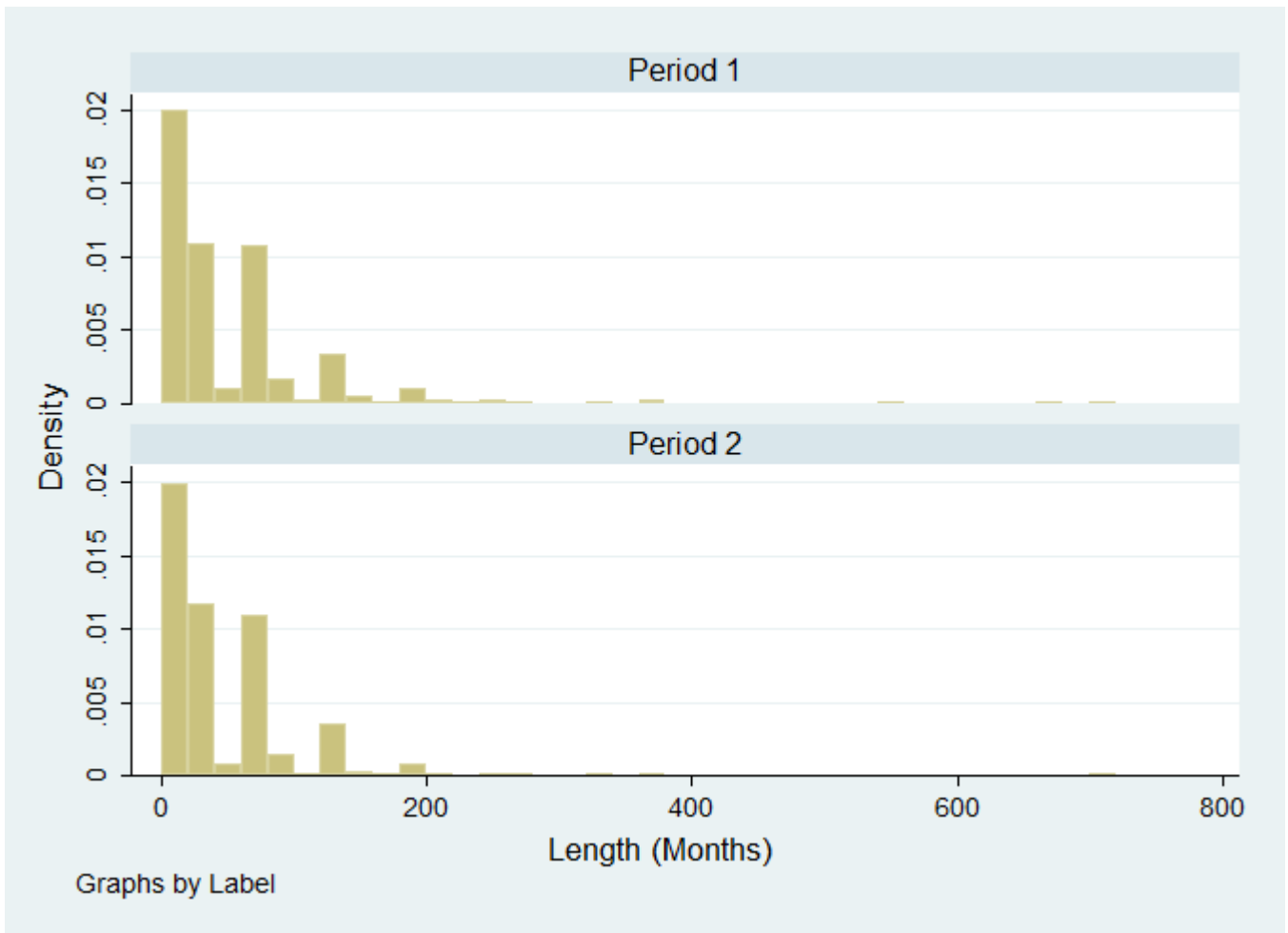
Appendices

Appendix A

Inverse Propensity Score Weighing Estimation

An alternative estimate strategy would be to use an inverse propensity score weighing method. This would help address the issue that the results may be driven by the observations where the defendant receives a sentence length of 0 months. This can occur for two reasons: 1) the defendant received only a fine or a time served for a guilty plea;[25] or 2) the case was dismissed by either the prosecutor or the judge. One method to account for these differences is to use a inverse propensity score weighing (IPW). IPW weights the observations in different groups such that the reweighted samples resemble each other in terms of the distribution of the covariates.

The probability of being paid a flat fee ($E(Law2|X_i)$, the "propensity score") if first estimated by a logistic regression of "flat fee" on covariates X: gender, race, age, number of charges, charging offense, and county. This essentially corrects for any difference in case assignment between the two periods. Then estimates of average differences between flat fee and hourly attorneys are produced via weighted regression of sentence length, where the weights are inverse functions of the propensity score.

In Column 1 of Table A2, I estimate the overall average difference in sentence length between the two attorney types conditional on X. This provides an "average treatment effect" (ATE)which provides the difference between the mean sentence lengths if every defendant was assumed to have an attorney paid a flat fee and the mean sentence length if they had an attorney paid who received an hourly wage. The "average treatment effect on the treated" (ATET) represents the estimated effect of being paid flat fee on flat fee sentences, and is estimated by comparing the observed flat fee sentence to a reweighted hourly sentence (Column 2). After the reweighting, the hourly cases endowments of covariates are similar to those of the flat fee cases, so the reweighted hourly mean can be interpreted as a counterfactual mean if flat fee cases were treated like hourly cases.

As Table A2 shows, the overall average difference (ATE) is -2.565 months, or a 8.61% decrease for attorneys paid a flat fee. The ATET is very similar, especially in percentage terms (8.633% decrease). However, these estimates are not statistically significant. Although none of the coefficients, they are all similar in magnitude and suggest that the defendants represented by flat fee attorneys receive approximately a 2.5 month reduction, on average, compared to when they have

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[25]For a discussion on a debate of how to treat a sentence length of 0, see Starr (2015), footnote 9.

attorneys who are paid an hourly wage, holding all else constant.

A.2

Additional Tables and Figures

Table A1: Average Hours by Case Type and Fee Structure

	Hourly		Flat Fee	
	Mean	Std Dev.	Mean	Std Dev.
Felony U	55.04	112.58	13.37	17.94
Felony A	34.82	73.99	13.87	21.26
Felony B	21.08	23.83	8.54	11.81
Felony C	26.94	88.68	9.70	9.17
Felony D	17.57	26.63	7.29	7.94
Felony E	16.33	19.48	8.54	11.16
Felony F	16.03	24.17	7.14	10.26
Misdemeanor A	11.40	10.95	6.49	6.39
Misdemeanor B	9.19	9.08	5.57	3.63
Misdemeanor C	10.33	9.61	4.44	3.17
Misdemeanor U	12.82	17.44	5.77	4.44

Table A2: IPW Results

	(1) ATE	(2) ATET
main		
Period2	-2.565	-2.493
	(1.883)	(1.792)
POmean		
Period2	29.80***	28.87***
	(1.547)	(1.562)
N	3252	3252
R^2		

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure A1: Distribution of Log Hours for Different Systems but the Same Attorney
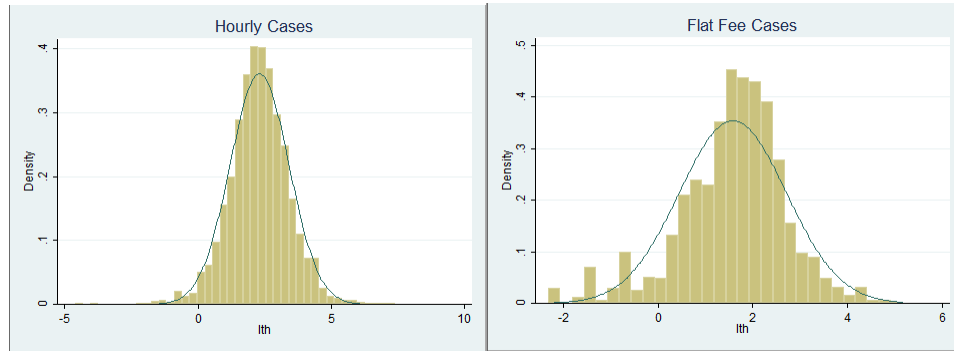
Appendix B

Regression Results in Levels

Table B1: Main Regressions in Levels

	(1)	(2)	(3)	(4)
private	5.180*	7.719**	5.705**	6.748
	(2.006)	(2.369)	(1.272)	(3.074)
Period2	-0.230	1.566	-0.168	-0.336
	(1.478)	(1.606)	(2.161)	(2.127)
Private_Period2	0.305	-1.137	-0.0453	-0.612
	(2.202)	(2.783)	(3.181)	(3.027)
black	-0.462	1.022	1.759	-1.933
	(1.297)	(1.578)	(0.999)	(1.491)
Other	-1.288	3.180	2.474	-4.744
	(2.819)	(2.530)	(3.434)	(5.389)
ncharges	3.917***		4.237***	2.733*
	(0.708)		(0.624)	(0.965)
gender	6.372***	5.134**	7.929***	4.908
	(1.207)	(1.103)	(1.088)	(2.256)
age	0.560	0.398	0.958	-0.344
	(0.408)	(0.412)	(0.431)	(0.673)
age2	-0.00869	-0.00751	-0.0148*	0.00240
	(0.00494)	(0.00516)	(0.00636)	(0.00785)
Charge FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	4284	2491	2018	2266

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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