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Prosecutor and lawyers in plea bargaining with complete information

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Abstract

In criminal law, when a conflict is solved by plea bargaining, the negotiation is mainly made between the prosecutor and the lawyer. Adopting a complete information framework about his type (selfish or altruistic), this paper compares two lawyer payment systems: flat fees and hourly-wage fees. We identify the system of fees in which the sentence is the lowest. We first show that under flat fees the prosecutor provides less effort when he faces an altruistic lawyer. Second, we show that under some conditions an altruistic lawyer may accept a higher sentence than a selfish lawyer.

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1 Introduction

In the United States, more than 95% of all criminal cases are solved by plea bargaining. This process consists in reducing the defendant's sentence if he recognize his guiltiness. After the common law countries, civil law countries (Italy, Poland, France) have applied this widely discussed process (see Alschuler, (1968), (1975), (1976), Schulhofer (1988)) with same objectives as American plea bargaining, mainly decreasing legal costs.

Focusing on criminal law¹, the economic theory of plea bargaining usually considers that the prosecutor offers a contract to the defendant, who accepts or rejects it². However, in plea bargaining the relationship is mainly between the prosecutor and the lawyer. This paper thus analyzes plea bargaining by focusing on the prosecutor and lawyer relationship, considering different degrees of lawyer's altruism. Moreover, the system of fees in plea bargaining is a crucial element determining the final outcome. We thus compare flat fee and hourly wage, when the level of lawyer's altruism known by the prosecutor.

In the next section, we analyze plea bargaining as a two step game. We analyze the impact of the fee system on the sentence, first when the case goes to court, and then when it is concluded by plea bargaining. So, this paper allows to compare the systems of payment and their impact on the sentence against the defendant.

2 Plea bargaining as a two-stage game

We consider a two-stage game between the prosecutor and the lawyer. We assume that the lawyer may be more or less altruistic. The degree of altruism of lawyer i is assumed to be public knowledge, which may be explained by reputation. In the first stage, the prosecutor offers a reduced sentence \bar{q}_i , as a take-it-or-leave-it offer, to the lawyer so that his client accepts to plea guilty³. The game ends if the offer is accepted. In the second stage, if the offer is refused, the case goes to court. At this point, both players choose how much time to spent on the case⁴. e_i and a are thus the number of worked hours by the lawyer and prosecutor, respectively, which result in expected sentence $q(e_i, a)$. The game is solved by backward induction, invoking the concept of subgame perfect Nash equilibria.

2.1 The lawyer

The lawyer is endowed with available time \bar{e} . If the case goes to court, the lawyer chooses the number of hours to spend on the case, e_i , to maximize his expected payoff, which is a weighted sum of his net private payoff and the final sentence⁵.

¹In civil law, the literature mainly explores the agency problems in settlement between the lawyer and his client (Miller (1987), Gravelle and Waterson (1993, Gilson and Mnookin (1997), Hay (1997)). The agency issue between the two parties may arise because of diverging interests coming from the fee system.

²For a survey see Ancelot and Doriat-Duban (2008).

³We implicitly assume that the lawyer is able to influence the client's decision (Gravelle and Waterson (1993)).

⁴We assume here that time spent on the case can be perfectly monitored by the defendant. We avoid thus the potentially interesting case of moral hazard between the lawyer and his client.

⁵The following expected payoff function is equivalent to the more conventional weighted payoffs: $\alpha_i(\Omega(e_i) - ce_i) - (1 - \alpha_i)\lambda_i q(e_i, a)$, with $\alpha_i \in (0, 1]$ and $\lambda_i = \frac{\alpha_i}{1 - \alpha_i}$. $\alpha_i = 1$ ($\alpha_i = 0$) corresponds to a fully selfish (altruistic) lawyer. This specification brings similar but more straightforward analytical results.

$$\max_{e_i} \Pi_i = \lambda_i(\Omega(e_i) - ce_i) - q(e_i, a) \quad (1)$$

The lawyer may be more or less altruistic. A more altruistic (equivalently less selfish) lawyer acts with a perspective of professional ethic, that is in the best interest of his client, i.e. to reduce the most the sentence. A more selfish lawyer thus puts more weight on his net private payoff. A smaller λ_i thus describes a more altruistic lawyer.

The lawyer's private payoff $\Omega(e_i)$ may either be hourly wage or flat fee. In the case of hourly-wage system, we have: $\Omega(e_i) = we_i$, with w being the hourly wage. Conversely, in the flat-fee system, the lawyer receives a flat sum, whatever the time spent on the case: $\Omega(e_i) = \bar{w}$. c is the unit cost of a worked hour.

$q(e_i, a)$ is the expected sentence received by the client and depends on both time spent by the attorney and the prosecutor. We take the standard assumption that more time spent on the case by the lawyer decreases the expected sentence, at a decreasing rate: $\frac{\partial q(e_i, a)}{\partial e_i} < 0$, $\frac{\partial^2 q(e_i, a)}{\partial e_i^2} > 0$.

2.2 The prosecutor

The prosecutor chooses the number of hours spent on the case, to maximize the severity of the expected sentence with respect to the cost of a worked hour. This assumption is consistent with the literature that specifies conviction maximization as an objective function of the prosecutor (Ramseyer and Rasmusen (1999)). Furthermore, one part of the economic analysis of plea bargaining considers this assumption as fair (Grossman and Katz (1983), Reinganum (1988), Baker and Mezzetti (2001)). In the American system, this assumption is even more justified by the fact that the prosecutor acts in a re-election perspective. In fact, the electorate and politician tends to evaluate the prosecutor's quality by the severity of sentences obtained (Garoupa and Stephen (2008)).

If the case goes to court, the prosecutor chooses to spend a hours on the case, in order to maximize his expected payoff⁶:

$$\max_a I = q(e_i, a) - ka \quad (2)$$

Time spent on the case increases the penalty at a decreasing rate: $\frac{\partial q(e_i, a)}{\partial a} > 0$, $\frac{\partial^2 q(e_i, a)}{\partial a^2} < 0$. k is the prosecutor's unit cost of a worked hour.

Note here that if the case goes to court, the final sentence depends on both levels of worked hours: $q(e_i, a)$. A crucial question here is the impact of the lawyer's effort on the prosecutor's effort marginal effect and *vice versa*. Both players have opposite objectives about the final sentence. It is thus likely that a player's effort decreases the other player marginal productivity: $\frac{\partial^2 q(e_i, a)}{\partial a \partial e_i} < 0$. We will thus keep this assumption for the remaining of the paper.

⁶Maximizing expected sentence means that the prosecutor aims at maximizing the probability of conviction and/or the sentence if the defendant is convicted.

2.3 Going to court

If the reduced sentence offered by the prosecutor is refused, the case goes to court. In this case, both the prosecutor and the lawyer choose their optimal level of worked hours.

The lawyer's first order condition gives its optimal working time level. e_i^* is implicitly defined by:

$$\lambda_i \left(\frac{\partial \Omega(e_i^*)}{\partial e_i} - c \right) = \frac{\partial q(e_i^*, a)}{\partial e_i} \quad (3)$$

Hourly-wage system: If the lawyer is paid proportionally to the provided hours level, equation (3) gives: $\lambda_i(w - c) = \frac{\partial q(e_i^*, a)}{\partial e_i}$. Since additional spent time reduces the expected sentence ($\frac{\partial q(e_i, a)}{\partial e_i} < 0$), this condition is not met as long as $w > c$, which is the most likely case. Under an hourly-wage system, the lawyer optimization thus leads to a corner solution, in which the lawyer spend all his available time on the case, whatever his type.

Flat-fees system: If the lawyer receives a flat fee, equation (3) gives: $\lambda_i c = -\frac{\partial q(e_i^*, a)}{\partial e_i}$. A selfish lawyer thus puts extra weight on its private net payoff, while an altruistic lawyer puts more weight on the sentence.

Proposition 1:

- *In a hourly-wage framework, so long as the hourly wage exceeds the lawyer's hourly cost, the lawyer spends all his available time on the case, whatever his degrees of altruism : $e_i^* = \bar{e}$, $\forall i$.*
- *In a flat-fee framework, a more altruistic lawyer spends more time on a case than a less altruistic one: $\frac{\partial e_i^*}{\partial \lambda_i} < 0$.*

Proof: from the implicit function theorem: $\frac{\partial e_i^*}{\partial \lambda_i} = \frac{-c}{\frac{\partial^2 q(e_i, a)}{\partial e_i^2}} < 0$.

Similarly, the prosecutor maximizes equation (2). The first-order condition implicitly gives the prosecutor equilibrium worked hours:

$$\frac{\partial q(e_i, a^*)}{\partial a} = k \quad (4)$$

Relying on the assumptions above ($\frac{\partial^2 q(e_i, a)}{\partial a^2} < 0$, $\frac{\partial^2 q(e_i, a)}{\partial e_i^2} < 0$ and $\frac{\partial q(e_i, a)}{\partial a \partial e_i} < 0$), we can conclude from equation (3) and (4) that a prosecutor spends more time on a case if the lawyer is paid through hourly wage than with a fixed-fee mechanism: $a^*(e_i) > a^*(\bar{e})$, $\forall i$. Moreover, in the case of a flat-fee payment, the prosecutor spends less time if he is confronted to a more altruistic lawyer: $\frac{\partial a^*(e_i)}{\partial \lambda_i} > 0$, $\forall i$. This results comes from the prosecutor's trade off between the expected sentence and his cost of worked hours. Indeed, the expected sentence meets the marginal cost earlier if the lawyers works longer.

Proposition 2:

- When going to court, the defendant can expect a larger sentence if his lawyer is paid through a flat-fee mechanism than if he receives an hourly-wage: $q(\bar{e}, a^*(\bar{e})) < q(e_i^*, a^*(e_i^*))$, $\forall i$.
- Moreover, if the lawyer receives a flat fee, the sentence is smaller if the lawyer is more altruistic: $\frac{\partial q(e_i^*, a^*(e_i^*))}{\partial \lambda_i} > 0$.

Proof: from the implicit function theorem: $\frac{\partial a^*(e_i^*)}{\partial \lambda_i} = \frac{\partial a^*(e_i^*)}{\partial e_i} \frac{\partial e_i^*}{\partial \lambda_i} = -\frac{\partial q(e_i^*, a^*(e_i^*)) / \partial a}{\partial q(e_i^*, a^*(e_i^*)) / \partial e_i} \frac{\partial e_i^*}{\partial \lambda_i} > 0$.
 Moreover, as shown before, $\frac{\partial e_i^*}{\partial \lambda_i} < 0$. Since $\frac{\partial q(e_i, a)}{\partial a} > 0$ and $\frac{\partial q(e_i, a)}{\partial e_i} < 0$, it follows that $\frac{\partial q(e_i^*, a^*(e_i^*))}{\partial \lambda_i} > 0$.

Our results thus gives the intuition that, when the case is solved by trial, a two-speed justice is developed: defendants (and often poorer) with flat-fee lawyers can expect a larger sentence than with hourly-wage lawyers.

2.4 Take-it-or-leave-it offer

The prosecutor may offer a reduced sentence \bar{q}_i to the defendant if he decides to plea guilty. We consider that the defendant is relatively ignorant, which implies that the lawyer is able to influence his decision to conclude a arrangement. Thus we implicitly consider that the lawyer has sufficient bargaining power to persuade his client to accept any offer. If the defendant accepts the offer, the prosecutor and the lawyer save the time they would spend if the case goes to court. Moreover, the lawyer gets a private payoff of $\Omega(0)$. Remember that the lawyer's type is public knowledge because of the lawyers reputation.

2.4.1 Participation constraints

In order to have any interest in the plea bargaining process, both players need to get at least the expected payoff they would get if the game would have gone to court.

Prosecutor Participation Constraint: The prosecutor's participation constraint is:

$$\bar{q}_i \geq q(a^*(e_i^*), e_i^*) - ka^*(e_i^*) \equiv \bar{q}_{pi} \tag{5}$$

Thus he will never offer a reduced sentence below \bar{q}_{pi} to the lawyer. The prosecutor has a smaller participation constraint when he is confronted to an more altruistic lawyer if his cost of one worked hour is sufficiently small:

$$\frac{\partial \bar{q}_{pi}}{\partial \lambda_i} = \left(\frac{\partial q(e_i^*, a^*(e_i^*))}{\partial a} - k \right) \frac{\partial a^*(e_i^*)}{\partial \lambda_i} + \frac{\partial q(e_i^*, a^*(e_i^*))}{\partial e_i} \frac{\partial e_i^*}{\partial \lambda_i} > 0 \tag{6}$$

Lawyer Participation Constraint: The participation constraint of a type i lawyer is:

$$\bar{q}_i \leq \lambda_i(\Omega(0) - \Omega(e_i^*) + ce_i^*) + q(a^*(e_i^*), e_i^*) \equiv \bar{q}_{li} \quad (7)$$

The lawyer only accepts the prosecutor's offer if it is smaller than \bar{q}_{li} . Considering hourly wage, the lawyer loses the whole income he would have had if the game has gone to court: $\Omega(0) = 0$. In this context, a more altruistic lawyer thus accepts a worse offer (larger \bar{q}_{li}) than a more selfish lawyer. Indeed, the lawyer loses his wage if the reduced sentence is accepted, and a selfish lawyer puts more weight on his private payoff. Selfishness thus creates an incentive to refuse an offer in order to go to court and receive a larger private payoff.

Considering flat-fee: $\Omega(0) = \bar{w}$. Thus a lawyer paid through a flat-fee system accepts a worse offer (larger \bar{q}_{li}) than a lawyer with an hourly-wage system. Indeed, in this case, the lawyer reduces his level of effort without reducing his wage.

Proposition 3:

- *In an hourly-wage system, a more altruistic lawyer accepts a worse offer than a less altruistic one: $\frac{\partial \bar{q}_{li}}{\partial \lambda_i} = (-w + c)\bar{e} < 0$.*
- *In a flat-fee framework, a more selfish lawyer accepts a worse offer than a more altruistic lawyer if the marginal productivity of a worked hour is large or if the cost a worked hour is small: $\frac{\partial \bar{q}_{li}}{\partial \lambda_i} = c(e_i^* + \lambda_i) + \frac{\partial q(e_i^*, a^*(e_i^*))}{\partial e_i} + \frac{\partial q(e_i^*, a^*(e_i^*))}{\partial a} \frac{\partial a^*(e_i^*)}{\partial e_i} > 0$.*

The system of fee is also crucial in the plea bargaining stage. The flat-fee system plays as an incentive for the lawyer to accept a worst offer than under an hourly-wage framework. This statement is particularly relevant when considering that poorer defendants are usually represented by lawyers paid under a flat-fee framework.

2.4.2 Surplus from plea bargaining:

Overall the plea bargaining may be implemented if $\bar{q}_{li} \geq \bar{q}_{pi}$, which implies:

$$\lambda_i \geq \frac{ka}{\Omega(e_i) - ce_i - \Omega(0)} \equiv \lambda^w \quad (8)$$

Proposition 4:

- *Under a flat-fee framework, the surplus of a plea bargaining is always positive: $\lambda^w = \frac{-ka}{ce_i} < 0$.*
- *Under an hourly-wage system, the surplus of a plea bargaining is larger if the lawyer is more altruistic, if the prosecutor's cost is large or if the lawyer's cost is small.*

As long as equation (8) is satisfied, and since we consider a take-it-or-leave-it framework, the prosecutor offers a reduced sentence that binds the lawyer's participation constraint. Therefore the lawyer does not get any extra payoff from the plea bargaining. The prosecutor thus gets the whole surplus S from the plea bargaining, that depends on the payment framework:

$$S = \begin{cases} ka(\bar{e}) - \lambda_i(w - c)\bar{e} & \text{if hourly - wage payment} \\ ka^*(e_i^*) + \lambda_i ce_i^* & \text{if flat - fee payment} \end{cases} \quad (9)$$

Proposition 5:

- *An hourly-wage framework implies a smaller prosecutor surplus than a flat-fee system framework.*
- *Considering a hourly-wage system (flat-fee system) framework, a more selfish lawyer decreases (increases) the prosecutor surplus.*

Indeed, in the flat-fee framework, the plea bargaining allows the lawyer to save time, which increases its payoff. This effect is increasing in selfishness. Conversely, in the hourly-wage system, the plea bargaining deprives the lawyer from the positive private net payoff he would get if the game goes to court.

3 Conclusion

Focusing on the prosecutor-lawyer relationship, this paper identifies the effect of the lawyer selfishness and of the fee system (flat fee and hourly wage) on the sentence in a plea bargaining process. If the game goes to court, the defendant can expect a smaller sentence if his lawyer is more altruistic or if he receive an hourly wage. However, if he receives an hourly wage, a more altruistic lawyer accepts a worse offer. In the case of a flat-fee system, a plea bargaining may always be implemented. The lawyer always tend to accept the prosecutor's offer, whatever his type.

Overall, our results provides evidence of a two-speed justice: lawyers of poorer defendants tends to receive flat fees, while richer defendant are more able to employ business lawyers (with hourly-wage payment). It follows that poorer defendants can expect larger sentences on court, and to some extend worse plea bargaining offers. Conversely, prosecutors tend to experience smaller surplus when confronted to a hourly-waged lawyer.

A crucial assumption in this paper is the complete information framework. Ancelet and Delacote (2009) relax this assumption, by imposing uncertainty on the lawyer's type. This extension allows to add adverse selection considerations, since the prosecutor's effort is determined by the lawyer's type. The plea bargaining process may in this case becomes a screening tool for the prosecutor to infer the lawyer type.

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