Courts, Contracts, and Interference*

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Abstract

This paper shows that the possibility of interference in court proceedings, or more generally jamming other agents' messages, has significant consequences for the form of optimal contracts and the flexibility of decisions that can be made inside firms. Our approach offers a new view of authority, basing it on the ability of parties to have their say in court. Interference gives authority a role in worlds where it is traditionally absent in contract theory, like simple employment relationships without relation specific investments.

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1 Introduction

A recurrent question raised in response to the incomplete contracting literature is why mechanisms like authority and ownership should be used in place of "message games." In many economic environments, particularly those in which contracting parties have symmetric information, message games would be more efficient. At the same time, many researchers acknowledge the empirical dubiousness of such message games.

Avoiding the unpleasant territory between theoretical unfoundedness and empirical irrelevance calls for an account of what limits the set of feasible mechanisms. Recently, some authors have begun to focus on the role of the court as enforcer of contracts and to ask how limitations on this form of enforcement might in turn generate limits to contracting.

Court enforcement has several possible sources of imperfection. First, it is voluntary: if both parties to a contract decide not to call on the court, or if they decide afterward to ignore the court's decision (Anderlini et al., 2001), the contract isn't enforced. In other words commitment to the contract is limited by renegotiation.

Second, the court itself may have a commitment problem: judges and juries may be corruptible, subject to bribes or threats by the parties in dispute (Bond, 2001). While doubtless an important issue, especially in developing countries, it strains credulity that, for instance, corruptible judges are at bottom the source of the widespread use of such "incomplete contracts" as the employment relation.

Third, there may be limits to the amount of information the court can extract. This is certainly plausible when the contracting parties have asymmetric information. But as we suggested, in the symmetric information environments that are the favorite haunt of incomplete contracting models, it is often "easy" to extract the common information with message games (e.g. Maskin, 2001).

In Legros-Newman (1999), we develop a theory of *interference* in mechanism design based on a kind of imperfection in the technology of communication. We depart from standard mechanism design theory by admitting the possibility that an agent might jam messages sent by other agents and for agents to attempt to secure (at a cost) their communication channels from such jamming.

It is natural to think of a court proceeding as a mechanism: an exchange of messages takes place in the form of testimony by experts and witnesses along

with various pieces of "hard" evidence; these are aggregated into a decision by the judge (or jury) and an allocation is implemented. We think of this aggregation process as subject to manipulation: rhetorical ploys, outright forgery, ambiguous evidence and cognitive limitations all contribute to the possibility of interference.[1] The quality of one's lawyer, as well as the resources spent on record keeping, are likely to have considerable influence on what the judge "hears."

In this paper, we illustrate this theory in a very simple contracting environment. The parties to a contract can influence the court proceeding not only by what they announce (as in standard mechanism design) but by influencing the message the judge receives from their opponent. We think of this as depending on the quality of one's lawyer, which is determined by an endogenous investment: if he is good, and your opponent's is bad, then your message will be heard, and your opponent's message will be unheard.

This simple model yields a number of insights. When good lawyers are expensive or when the conflicts of interest are small, first-best contracting will be achieved. Otherwise, optimal contracts assume forms that fall short of the first best. They may be "flat," with less variation in production decisions than the first best would require. In addition, the model gives a new interpretation to the idea of *authority*: one party may invest in good lawyers, so that only his voice is heard, and decisions then follow his interests. In our example, the one who invests is the one whose interests are more consonant with total welfare, and the decision made is the same as the first-best. This view of authority is distinct, though complementary to the standard ones which identify it with the right to decide (Grossman-Hart, 1986) or being better informed (Aghion-Tirole, 1997).

A feature of this approach is that we introduce an imperfection in the technology of communication, but otherwise maintain the usual commitment assumptions of static mechanism design. Moreover, authority arises even in environments that are simpler than the usual ones in which it is studied. In particular authority may play a role in organizations even if there is no hold up problem, relationship specific investments, sequential decisions, or renegotiation.

[1] For a discussion of some aspects of the "technology" of debate, see Glazer and Rubinstein (2001).

2 A Model

Consider the following simple problem of decision-making in a firm. The value of the firm is a function of the worker's (observable) action and of a state of the world that is known to the worker and to the employer but not to outside parties. The initial "contract" specifies a wage w paid to the worker and a list of actions that might be required from the worker; this list should be interpreted as the set of state contingent decisions.[2] If decision $a \in \mathbb{R}_+$ is chosen in state θ, payoffs are

$$\begin{aligned} V(a,\theta) &= y - w - \frac{a^2}{2} + \alpha\theta a \text{ for the employer} \\ U(a) &= w - \beta a \text{ for the worker.} \end{aligned}$$

Assuming no wealth effects, the problem for the employer and the worker is to find state contingent decisions that maximize the total expected surplus. To simplify again, assume that the state can take one of two values, $\theta \in \{0,1\}$, with $\Pr(\theta = 0) = 1 - \pi$. The first best decision in state θ maximizes $V(a,\theta) + U(a)$ for each θ; simple computations lead to

$$\begin{aligned} a^{FB}(0) &= 0,\ a^{FB}(1) = \alpha - \beta \\ W^{FB} &= y + \pi\frac{(a-\beta)^2}{2}. \end{aligned} \tag{1}$$

Two different approaches to this problem lead to the conclusion that the first-best allocation can be implemented. In the *mechanism design* approach each player is asked to reveal the state of the world. If their messages agree, the first-best decision corresponding to the state they announce is imposed by the center or court. If they disagree, then a severe punishment is imposed. Under this scheme, it is a Nash equilibrium to truthfully reveal the state, and the first-best allocation results (we ignore the problem of multiplicity of equilibria in this paper).

In the *incomplete contract* approach, one focuses on instruments such as authority. Note that the employer prefers $a^{FB}(0)$ to $a^{FB}(1)$ in state $\theta = 0$, and

[2] For simplicity, we assume that it is not possible to write monetary contracts as a function of the action. Allowing such contracts would not eliminate the fundamental conflict of interest between the two parties, and the issues we discuss here would remain.

prefers $a^{FB}(1)$ to $a^{FB}(0)$ in state $\theta = 1$.[3] Hence a contract which limits action choices to $\{a^{FB}(0), a^{FB}(1)\}$ and gives the employer "authority" to choose between them will replicate the first best decision rule. The worker, on the other hand, has the same preferences over these actions as the employer in state $\theta = 0$ but has the reverse preference in state $\theta = 1$. Hence, the worker would like to disobey the employer in state $\theta = 1$ and do $a^{FB}(0)$ instead of $a^{FB}(1)$.

How does authority avoid such disobedience? One possibility is to write in the contract that "if the employer tells the worker to do d but the worker decides to do $d' \neq d$, then the worker has to pay a penalty." Such a clause requires that the order given by the employer to the worker is verifiable in court, e.g., that the employer keeps track of his orders. Generally, whether or not the employer has collected evidence (hard or soft), his authority relies on his ability to convince the court to compel the worker to obey his orders.[4] If this is the case, the worker will obey because he does not expect a better outcome by going to court.

Indeed, one could simply let the judge ask the employer what he told the worker to do and enforce this order. As long as the employer can communicate perfectly with the judge, such a decision rule can enforce any outcome the employer desires. The employer has authority, not because this authority is "given" by the contract but because the employer has "voice" in court *and* that the judge will go along with what he says in court.

But in fact court proceedings are not perfect. Communication between the judge (and/or the jury) and the parties is subject to noise, misinterpretation, and interference. The quality of each side's lawyer may affect the outcome as much as the facts of the case. Moreover, the law itself can make it difficult for some parties to have effective voice in courts (e.g., by putting the burden of proof on one party). In short, justice does not just happen, it is manufactured, and the technology with which it is done is an imperfect one.

This point applies with equal force whatever the approach one takes to thinking about contracting. It will impose limits to what can be accomplished via the design of mechanisms. But it also increases the cost of enforcing authority, and it may provide natural restrictions on its scope.

[3] $V(a, 1)$ is maximized at $a = \alpha$, below which (in particular, at $a^{FB}(1)$) it is increasing.
[4] We assume that there is no direct cost of going to court.

2.1 Interference

We introduce an imperfection in court proceedings by allowing each party's lawyer to "jam" the message that is sent by the other party's lawyer to the judge.[5] Lawyers come in two varieties: good and bad. A bad lawyer can always be interfered with, either by a bad lawyer or by a good lawyer. A good lawyer cannot be interfered with. "Good" refers to the ability to give an argument that cannot be nullified by a counter-argument. Bad lawyers come for free in this world; good lawyers cost $c \geq 0$. This model resembles the form of court proceedings in "common law" countries wherein advocates compete for the judge's (or jury's) attention.[6]

Formally, each lawyer can send an argument and a counter-argument Let m_P be the argument and n_P be the counter-argument sent by the lawyer of the employer; let m_A be the counter-argument and n_A the argument of the lawyer of the worker. If both lawyers are good, the judge will hear their arguments, i.e., will hear (m_P, n_A); if the employer's lawyer is good while the worker's lawyer is bad, the judge will hear (m_P, n_P). Hence, the benefit of having a good lawyer when the other lawyer is bad is that one can effectively be the only one to communicate with the judge. Note that if both lawyers are bad, the judge will hear the counter-arguments only, i.e., (m_A, n_P); this case is similar to the case where both lawyers are good: each lawyer has effectively a way to transmit a message to the judge.

This is similar to the standard mechanism design approach: each lawyer can send arguments to the judge, m for the employer's lawyer and n for the worker's lawyer. With a perfect communication technology, the judge would hear (m, n) and, knowing that the two parties have common information, mechanism design tells us that it is simple for a judge to extract this common information.[7] In our case, each lawyer can try to interfere, to replace the message of the other lawyer by his own; whether or not this interference succeeds is a function of the quality of the other lawyer.

This interference technology could be interpreted literally: legal procedures

[5] See Legros-Newman (1999) for a general analysis of such interference.

[6] For the benefits of an advocacy regime see Dewatripont-Tirole (1999).

[7] Typically, the judge can threaten to enforce a "bad" outcome for both parties if they do not agree on the state of the world. However, there may be other equilibria which don't implement this outcome; we ignore this issue here.

often allow the judge to "strike" from the record some arguments if the other party has valid objections; evidence might be tampered with by the other party, either physically (forgery) or by having outside experts re-interpreting the meaning of the evidence. More broadly, though, the interference technology also captures the "bounded rationality" of the judge: hearing the rhetorical arguments of both parties' lawyers, the judge makes up his mind about the meaning of the message of each lawyer, perhaps forgetting in the process the sequence of messages sent by each party.

While neither the entrepreneur nor the worker wants to be interfered with in court, this comes at a cost, and unless the stakes built into the contract and the anticipation of the court outcome are important enough, they may decide not to invest in good quality lawyers. Since there is an interplay between contract stakes and incentives to invest, we make this an integral part of the model.

The natural model that should be considered is one where the decision to go to court is endogenous; doing so weakens the commitment to play the court mechanism. However, with private investments in lawyers, a number of issues involving signalling one's investment arise that distract from the issue of interference per se.

Thus to remain as close to the standard framework as possible, and to focus on what interference alone implies for limitations on mechanisms, we assume here that the worker and the entrepreneur go to court automatically.[8]

2.2 A Revelation Principle

The timing of the model is as follows.

1. Each party decides – privately – to invest at cost c in good quality lawyers (the ex-ante nature of the investment means these lawyers are on retainer) or in organizational structures that will facilitate the presentation of persuasive evidence once in court.

2. The state θ is realized.

3. Parties go to court and play the mechanism $(M, N, g : M \times N \to \mathbb{R}_+ \cup \{bad\})$, where "*bad*" is a decision that the court can impose on the parties and

[8] If there were no possibility of interfence and court itself is costless, then the outcome is the same whether or not the parties are commited to go to court.

that bring each of them a payoff of zero, M is the set of messages of the entrepreneur's lawyer and N is the set of messages of the worker's lawyer.

An equilibrium in pure strategies is then *an investment strategy* $I_i \in \{0, c\}$ at the first stage and a *message sending strategy* $\sigma_i(\theta, I_i) = (m_i, n_i)$ in court, where (θ, I_i) is the information set of agent i. As explained before, each lawyer will send two messages: an argument (m_P for the entrepreneur, n_A for the worker) and will try to interfere with the other lawyer's argument by sending a counter-argument (n_P for the entrepreneur, m_A for the worker). The messages eventually received by the judge depend on the initial investments. Precisely, if the entrepreneur sends (m_P, n_P) and the worker sends (m_A, n_A), the judge receives

$$\begin{aligned}
&(m_P, n_p) \text{ if } I_P = c,\ I_A = 0\\
&(m_P, n_A) \text{ if } I_P = c,\ I_A = c\\
&(m_A, n_A) \text{ if } I_P = 0,\ I_A = c\\
&(m_A, n_p) \text{ if } I_P = 0,\ I_A = 0.
\end{aligned}$$

We show in Legros-Newman (1999) that it is possible to appeal to a revelation principle in order to characterize the set of equilibrium allocations. Since with interference, the judge may confound the sources of the messages m and n, the direct revelation mechanism asks each lawyer to send a message (θ, i) where θ is the state and $i \in \{P, A\}$ is the identity of the party's lawyer and specifies an outcome $h((\theta, i), (\phi, j)) \in \mathbb{R}_+ \cup \{bad\}$. The revelation principle is then: consider a mechanism $(M, N, g : M \times N \to \mathbb{R}_+ \cup \{bad\})$ together with equilibrium investments (I_P, I_A) and equilibrium message sending strategies $(\sigma_P(\theta, I_P), \sigma_A(\theta, I_A))$; there is a direct revelation game

$$\left(\{0,1\} \times \{P, A\}, \{0,1\} \times \{P, A\}, h : (\{0,1\} \times \{P, A\})^2 \to \mathbb{R}_+ \cup \{bad\}\right)$$

such that (I_P, I_A) are equilibrium investment levels and both P and A use equilibrium message sending strategies that reveal the state and their identity, i.e., $\sigma_i(\theta, I_i) = ((\theta, i), (\theta, i))$ for $i = P, A$, that generates the same equilibrium allocations as in the initial mechanism.

3 The First-Best

In the first best, no party should invest in good quality lawyer. Our revelation principle implies that in state θ, P will make argument (θ, P) and a counter-argument (θ, P), A will make argument (θ, A) and a counter-argument (θ, A) and moreover neither P nor A wants to invest in a good quality lawyer and then send other messages..

Assume first that neither P nor A invests and that each lawyer is truthful (in our sense). The judge will hear the counter-argument (θ, P) of P and the counter-argument (θ, A) of A. The outcome will then be $h((\theta, A), (\theta, P))$. Since we must have the first best decisions we need

$$\begin{aligned} h((0, A), (0, P)) &= 0 \\ h((1, A), (1, P)) &= \alpha - \beta. \end{aligned} \tag{2}$$

The easiest way to insure incentive compatibility is to have

$$h((\theta, i), (\phi, j)) = bad \text{ whenever } \theta \neq \phi, \text{ or } ij \neq AP. \tag{3}$$

For then, as long as w and $y - w$ are large enough (which we will assume from now on), deviating from equilibrium messages generates a payoff of zero. Because P's preferences are consonant with the first best, he has no reason to invest in a good lawyer. This is not the case for A however. Assume that A spends c for a good lawyer. The judge will hear the argument and counter-arguments of A, and A can select the decision $a = 0$ in any state of the world by using the argument $(0, P)$ an the counter-argument $(0, A)$ (note that he lies twice: in his argument since $(0, P) \neq (\theta, A)$ and in his counterargument since $(0, A) \neq (1, A)$ in the high state). By doing so, he saves on effort and his ex-ante utility is

$$w - c.$$

If A does not invest in a good lawyer, his ex-ante utility is

$$w - \pi\beta(\alpha - \beta).$$

Therefore,

Proposition 1 *The first best is implementable if and only if* $c \geq \pi\beta(\alpha - \beta)$.

This is quite sensible; interfering is not worth the expense when the stakes in the contract are smaller than the cost of investment, that is

- when high quality lawyers are expensive.
- when the expected marginal cost of effort $\pi\beta$ is small.
- when the conflict of interests (as measured by $\alpha - \beta$) is small.

4 Second Best and Authority

4.1 Which allocations are consistent with $q = (0, 0)$ when $c < \pi\beta(\alpha - \beta)$?

From the previous result, it is necessary to distort the allocation from the first best. We show that it is in fact sometimes optimal to distort both decisions: A will exert higher effort than in the first best in the low state and a lower effort than in the first best in the high state. As before, consider the judge decision given by (3) and by

$$\begin{aligned} h((0,P),(0,A)) &= a \\ h((1,P),(1,A)) &= b. \end{aligned} \tag{4}$$

Without loss of generality, let $a \leq b$. As long as $a \leq b$ and $b \leq \alpha$, P does not want to invest in high quality lawyers (since his preferences are consonant with $a \leq b$). A however would prefer to have a in the high state. He can do so by investing in a high quality lawyer and give an argument $(0, P)$ and a counter-argument $(0, A)$. His expected utility is then

$$w - \beta a - c$$

while by having a bad lawyer his expected utility is

$$w - (1 - \pi)\beta a - \pi\beta b.$$

Incentive compatibility therefore requires

$$b - a \leq \frac{c}{\pi\beta}. \tag{5}$$

Note that since by assumption $c < \pi\beta(\alpha - \beta)$, $b - a < \alpha - \beta$. The variation in actions in between the two states is strictly bounded above by the first best variation. Total welfare is

$$W(a,b) = y - (1-\pi)\left[\frac{a^2}{2} + \beta a\right] - \pi\left[\frac{b^2}{2} - (\alpha - \beta)b\right]. \tag{6}$$

Note that W_b is negative for $b > \alpha - \beta$ and that $W_a < 0$. It follows that $b \leq \alpha - \beta$ and that a should be as small as possible. It follows that the constraint (5) binds and that $a = b - \frac{c}{\pi\beta}$. Substituting this value in W and maximizing with respect to b (ignoring the constraints $b \leq \alpha - \beta$, $a \geq 0$) yields

$$b^* = \pi\alpha - \beta + \frac{1-\pi}{\pi}\frac{c}{\beta}. \tag{7}$$

The right hand side is indeed less than $\alpha - \beta$, therefore this is the solution to the constrained problem if

$$a^* = \pi\alpha - \beta - \frac{c}{\beta}. \tag{8}$$

is non-negative. Hence, if $c \geq \beta(\pi\alpha - \beta)$, the optimal solution is $a^* = 0, b^* = \frac{c}{\pi\beta}$ and only the high state decision is distorted, but if $c < \beta(\pi\alpha - \beta)$, the solution is given by (8)-(7) and both the low state and the high state decisions are distorted. Thus when good lawyers are cheap, they may nevertheless be avoided by making the contract sufficiently "flat." Whether this is optimal remains to be addressed.

5 One Sided-Investment by the Employer May Be Optimal

Assume now that P invest in a high quality lawyer while A does not. We show that the first best decision is achieved, but at cost c. If there is truth-telling, in state θ the judge should hear the argument of P, (θ, P) and his counter-argument (θ, P) and choose

$$\begin{aligned} h((0,P),(0,P)) &= 0 \\ h((1,P),(1,P)) &= \alpha - \beta. \end{aligned}$$

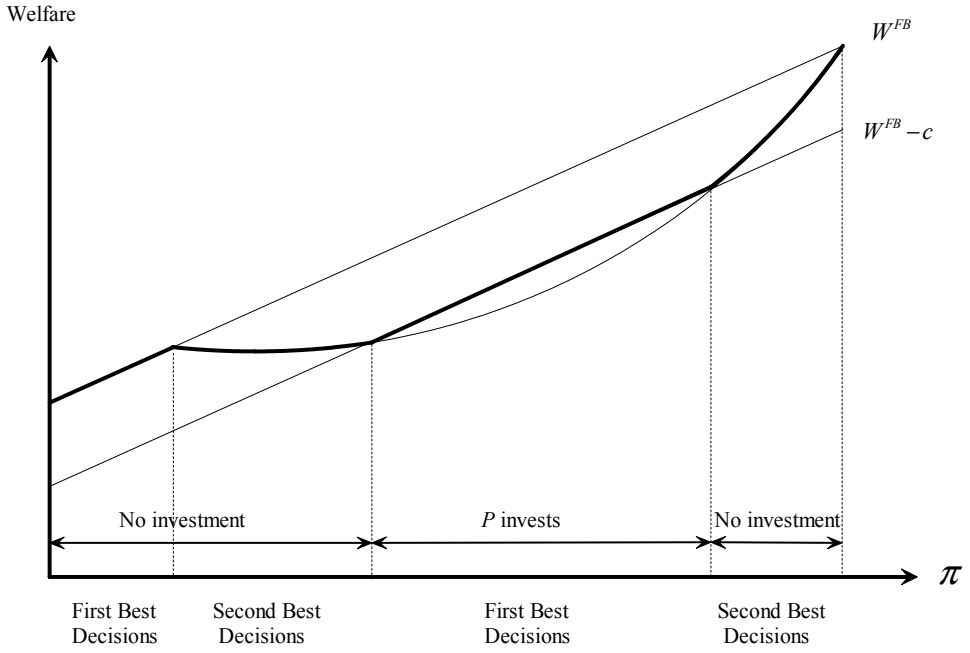
Assume as before that

$$h((\theta,i),(\phi,j)) = bad \text{ whenever } \theta \neq \phi, \text{ or } ij \neq PP. \tag{9}$$

If A deviates to investing in a good lawyer, his argument will be heard by the judge (his counter-argument will not however since P has a good lawyer). Since P is truthful, the judge will hear $((\theta, P), (\phi, i))$ in state θ, where (ϕ, i) is the argument of A. By interfering A can have his argument (ϕ, i) heard, but by (9), the best argument that A can make is (θ, P) in order to avoid *bad* and getting 0. Hence, A cannot improve on the previous outcome by investing. The total ex-ante welfare is $W^* - c$. For certain values of the parameters (e.g. c small, π moderately large), this will exceed the welfare achieved by the second-best contract described above.

Suppose that the worker is the only one to invest. Since the worker now controls the messages that the judge receives, he will send messages that induce the lowest decision in the range of h. Hence the equilibrium decision is a constant; but this is not optimal since by simply writing a contract with a constant decision the employer and the employee can save c.

We identify this arrangement in which the employer invests and the worker does not with giving the employer authority: not only are his preferred decisions implemented, but it is he who is "believed" in court: he has the good lawyer and the employee dare not gainsay him. A summary of what contracts are optimal over the parameter space is provided in the figure below.



What about mixed strategies in investment? It is possible to show that having the worker invest with some probability is never optimal.[9] However, there could be welfare gains when P invests with a probability less than one. A full analysis of this possibility is somewhat intricate, and we defer it to future work.

6 Conclusion

This example shows that the possibility of interference in court proceedings, or more generally jamming other agents' messages, has significant consequences for the form of optimal contracts and the flexibility of decisions that can be made inside firms. We believe that our approach brings a fresh look to the question of authority. Authority is here based on the ability of parties to have their say in court. It is therefore of a different nature than previous approaches to authority that were based on ownership of assets (Grossman and Hart 1986), or on the ability to take informed decisions (Aghion and Tirole 1997). Interference gives authority a role in worlds where it is traditionally absent in contract theory, like simple employment relationships where parties tend to have symmetric information and where there are no significant relation specific investments.

Often, these views of authority are complementary. For instance, ownership of assets might confer authority if the courts are biased in favor of property owners, if owners can afford better lawyers, etc. Particularly in environments with wealth effects and/or credit constraints, the latter possibility suggests there should be a positive correlation between wealth and authority. Similarly, better informed agents might be better at giving convincing arguments or evidence in court proceedings.

The legal system itself will also affect the allocation of authority. For example, shifting the burden of proof can be modelled by changes in the efficacy of a given investment in lawyers; this will typically result in changes to the firms's contractual structure.

[9] Conditional on P investing with probability q, incentive compatibility for A implies a condition like in (**??**).Having A invest does not weaken the incentive problem for P but introduce additional constraints. In more general situations of conflicts – for instance when P has (and A has not) consonant preferences with the first best in some states and when A has (and P has not) consonant preferences with the first best in other states – it can be welfare enhancing to have both parties make the investment. See Legros-Newman (1999) for an exemple.

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