Decision Rules and Information Provision: Monitoring vs Manipulation*

Elisabetta Iossa† *and Giuliana Palumbo*‡

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Abstract

The paper focuses on the organization of institutions designed to resolve disputes between two parties, when contracts are incomplete and decision makers have vested preferences. It shows that the choice of how much discretional power to grant to the decision maker and who provides the information are intrinsically related. Direct involvement of the interested parties in the supply of information enhances monitoring of the decision maker. Thus, it is desirable when the latter is granted high discretion. Conversely, when the decision maker has limited discretional power, information provision is better assigned to agents with no direct stake. The analysis helps to rationalize some organizational arrangements that are commonly observed in the context of judicial and antitrust decision-making.

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†Brunel University, Department of Economics and Finance, Uxbridge Middlesex UB8 3PH, UK. E-mail: Elisabetta.Iossa@brunel.ac.uk.

‡Getulio Vargas Foundation and European University Institute. EPGE, Getulio Vargas Foundation, Praia de Botafogo, 190 22253 900 Rio de Janeiro, RJ, Brazil. E-mail:giuliana@fgv.br

1 Introduction

Judicial systems, quasi-judicial institutions, such as industrial tribunals, regulatory and antitrust authorities are some of the institutions through which modern states administer the disputes that arise between their members. In all such institutions the decision process consists of a first stage where the information is acquired and a second one where a decision is made. Efficiency results from the extent to which the information produced enables to evaluate the available alternatives and by how the actual decision reflects this information.

The paper studies the internal organization of these institutions in a world where contracts are incomplete, decision makers have vested preferences and monetary incentive schemes are not sufficient to discipline them. The focus of the analysis is the relationship between the design of decision rules and the delegation of information provision. The former relates to the degree of discretion that is granted to the decision maker; the latter defines whether information provision is better assigned to the parties directly interested in the decision or to an investigator (generally an agent internal to the organization) with no immediate stake.

Although a rich literature exists on both these topics, each of them has been treated in isolation. On the issue of information provision for decision-making, different authors have analyzed the costs and benefits of relying on agents with dissonant objectives. Lipman and Seppi (1995) and Milgrom and Roberts (1986) have noticed that competition between two perfectly informed parties elicits all relevant information, even if the parties conceal information that is damaging to their interests. Shin (1998) has shown that relying on the interested parties is preferred even under conditions of imperfect information. Dewatripont and Tirole (1999) have considered a setting with moral hazard and argued that information-gathering is less expensive with two competing agents than with a non-partisan agent. In a similar setting, Palumbo (2002) has emphasized that competition between opposing interests induces efficient mutual monitoring. All these papers, however, assume that the decision maker is a disinterested party. Thus, they do not deal with issues related to the design of decision rules: the optimal rule simply consists in delegating full discretion to the benevolent decision maker. Another strand of the literature has focused on the delegation of decision-making to an agent with superior information but vested preferences. This literature has stressed the desirability of imposing limits on the decision maker's discretion in order to prevent opportunistic behaviors (see for example Holmstrom 1984, Brennan and Buchanan 1985 and Armstrong 1994);

to address time inconsistency problems (see, among many others, Kidland and Prescott 1977); or to reduce capture by interests groups in regulatory contexts (see for example Laffont and Tirole 1990, 1991).[1] In all these contributions the process by which the information is created is treated as exogenous. Our approach, by looking at the relationship between the adjudicative and investigative stages represents an attempt to bridge these two strands of literature.

We consider a setting where a decision maker - on behalf of a principal - must resolve a dispute between two parties. The decision maker relies on information supplied either by the parties themselves or by an investigator with no immediate stake. After a decision is made, the interested parties can appeal to seek for correction.

The contracting problem faced by the principal is threefold. A contract specifies the amount of discretional power to grant to the decision maker (decision rule), who is in charge of information provision (the interested parties or the investigator), and the conditions under which the interested parties are allowed to exercise their right to appeal.

The key feature of the model is that contracts are incomplete and therefore comprehensive decision rules are technologically infeasible. Contract incompleteness arises because either some information is difficult to describe and foresee ex ante or it is prohibitively costly to specify the decision to be taken in every conceivable eventuality. The principal can make up for this incompleteness in two ways. He can leave the decision maker full discretion to decide in all circumstances that are left out from the initial contract or he can set a rule that defines ex ante the decision to be taken whenever an uncover circumstance arises. We shall refer to the first regime as *Rules* and to the second as *Discretion*. Discretion is attractive because ex post the decision maker can better assess which decision is most desirable. The cost of discretion is related to the fact that the decision maker cannot be fully trusted to implement the principal's goals. What may prevent the decision maker from abusing his authority is the monitoring activity exercised by the interested parties through their right to appeal.

We show that the direct involvement of the interested parties in the supply of information contributes to enhance their monitoring role. The reason is that the parties have an inherent incentive to retain information that is damaging to their cause and diametrically opposed goals. Since

[1] On the other hand, Cowen *et al.* (2000) have emphasized that discretion may enhance credibility by enabling the discovery of the decision makers' preferences over time. Their set up is however quite different from the one considered here.

concealment by one side always works to the detriment of the other side, each party has strong incentives to find hard evidence of wrongdoing against her interest. In this process a decision maker who abused his authority may end up being caught. Thus, parties' reciprocal monitoring helps to keep non-benevolent decision makers on their toes.[2]

Further, we argue that the positive correlation between the parties' manipulation of information and their monitoring incentives implies that the choice of the decision rule (*Rules* versus *Discretion*) and the delegation of information provision (to the interested parties or the investigator) are inherently interlinked. Under *Discretion*, ex post monitoring is especially valuable, for the principal is more vulnerable to opportunistic behavior by the decision maker. Thus, he wishes to encourage ex post monitoring by delegating information provision to the interested parties (control from below). Under *Rules*, ex post monitoring is less valuable, for the principal monitors the decision maker ex ante (control from above). This increases the desirability to delegate information provision to a more impartial investigator that ensures less manipulation of information.

Finally, we compare different organizational arrangements and provide conditions under which either is optimal.

Our approach sheds lights on a number of issues related to institution design and helps rationalize some organizational arrangements that are commonly observed in the context of court and antitrust decision making. The Civil Law and the Common Law systems mainly differ for the degree to which they insist on adherence to predetermined standards, with the Civil Law system being more inclined to standards than the Common Law. Consistent with our results, we observe that where a Civil Law system is adopted, the proof-taking task is assigned to an impartial investigator who is supposed to make the case for both causes. On the contrary, where a Common Law system prevails, evidence is adduced bilaterally (prosecutor and defense attorney) through direct and cross-examination. The same type of matching is observed in antitrust proceedings. The European competition law tends to rely more on predetermined and fixed rules (*per se rules*) whereas in the

[2] This result can be seen as complementary to the one in Dewatripont and Tirole (1999). There two organizational arrangements are compared. In the first, agents are *made* advocates of specific causes. In the second, there is a single nonpartisan agent. In this setting, they argue (on this aspect their analysis is kept largely informed) that advocates have higher incentives to monitor than nonpartisan agents and this is good for the integrity of decision making. Instead we consider the case where the advocates (our Parties) are always the one who monitor and compare their monitoring incentives when they themselves provide the information and when such information is provided by the nonpartisan agent (our investigator).

US, antitrust authorities enjoy much more discretion (*rules of reason*). In line with our analysis, in Europe the investigation is mainly carried out by the Commission itself with limited intervention of the interested subjects. By contrast, in the US, the Parties involved have a great control of the proceeding and the fact-finding.

The paper is organized as follows. Section 2 describes the model. Section 3 looks at the behavior of the parties and the investigator at the information disclosure stage. Section 4 studies the decision rules. In particular, section 4.1 discusses the case where the initial contract imposes restrictions on the decision maker's authority (*Rules*), whereas section 4.2 focuses on the case where the decision maker is given discretional power (*Discretion*). Section 4.3 compares these two different settings. Section 5 discusses our main assumptions while section 6 applies our results to shed some lights on issues related to the organization of legal systems and antitrust proceedings. Section 7 concludes.

2 The Model

Suppose a principal (Congress) delegates to a decision maker (antitrust authority, judge) the task of deciding in a dispute between two parties, a and b (merging firms and their rivals, prosecutor and defendant). Throughout we shall refer to them as Parties. The decision maker's action set is $d \in \{A, B, 0\}$. Decisions A and B are to be interpreted as favoring parties a and b, respectively. Depending on the context, 0 can be interpreted as either the status quo, or an intermediate decision or a more lenient sentence.

The socially optimal decision depends on the realization of a state of nature $\theta \in \{A, B\}$ and is given by $d = \theta$. We assume that θ is non observable (neither ex ante nor ex post) but it is common knowledge that the distribution over its values is characterized by $\Pr(\theta = A) = \frac{1}{2}$. The principal can choose between two procedures to elicit information about the true state of nature. In the first, labelled *Parties*, the supply of information to the decision maker is assigned to parties a and b. In the second, labelled *Investigator* the same task is delegated to an investigator with no immediate stake. After a decision is made, the Parties can appeal and seek for correction.

The sequence of events is as follows. At stage 0 (contractual stage) the principal designs the contract. A contract specifies the decision rule (*Rules* versus *Discretion*), the allocation of the information provision (*Parties* or *Investigator*) and regulates the appeal procedure. At stage 1 (pre-decision

stage) information is disclosed to the decision maker. At stage 2 (decision stage) the decision maker makes a decision conditional on the information received and the decision rule. At stage 3 (appeal stage) the Parties decide whether to appeal.

The Principal

The principal's objective is to minimize the expected loss of taking an erroneous decision under some cost constraint. The precise objective function of the principal will be defined as we proceed with the analysis. For the moment it suffices to say that the loss in state $\theta \in \{A, B\}$ when decision $d \in \{A, B, 0\}$ is made is given by

$$l_\theta^d = \begin{cases} 0 & \text{if } d = \theta \\ l^0 > 0 & \text{if } d = 0 \\ (1+\delta)l^0 & \text{if } d \neq \theta, 0 \end{cases} \tag{1}$$

We let $\delta > 1$, which implies that ex ante the principal prefers $d = 0$ to a randomly chosen $d = A, B$.

The Decision Makers

Decision makers do not respond to monetary incentives, receive a constant wage equal to their reservation wage of zero and can be of two types: "congruent" or "incongruent". Congruent decision makers always act in the principal's interest; incongruent decision makers receive a private benefit V when $d \neq \{\theta, 0\}$. Incongruence may be due to a different view of social welfare, to corruption or political or ideological positions. Decision makers' types and benefits are unobservable and unverifiable by third parties. The fraction of incongruent decision makers is common knowledge and denoted by α, with $\alpha < 1$. For each decisional stage (stage 2 and 3) a decision maker extracted from the above population is appointed.[3]

The Parties

Parties' preferred outcomes are independent of the state of nature and common knowledge: Party a always prefers decision A to 0 and 0 to B whereas party b always prefers decision B to 0 and 0 to A. For each party $i = a, b$ and each decision $d \in \{A, B, 0\}$ the utilities are private benefits;

[3] This characterization of the preferences and benefits is one way to capture the potential conflict of interests between the principal and the decision-maker. This specification is chosen so as to simplify the analysis, and has no impact on its insights.

they are symmetric and given as follows

$$U_i^d = \begin{cases} (1+\lambda)U^0 & \text{if } i = d \\ U^0 > 0 & \text{if } d = 0 \\ 0 & \text{if } i \neq d \end{cases} \tag{2}$$

with $\lambda > 0$.

The Investigator

Like the decision makers, the investigator does not respond to monetary incentives and receives a constant wage equal to his reservation wage of zero. To simplify, in most of the paper we shall assume that the investigator is not driven by private interests and is always congruent. In Section 5 we check the robustness of our results to the case where the investigator is incongruent with positive probability. As we shall see, the key assumption is that the investigator is, on average, less biased than the Parties.

The information structure

The potential benefit of granting discretion to the decision makers stems from their superior ability in determining which decision is most desirable. There are two reasons for this. The first is that ex-post information may become available that was not known to the principal ex ante. This is the standard argument of the incomplete contract approach where some contingencies are left out of the contract because of the principal's inability to anticipate and/or describe all future information. The allocation of the right to decide in the uncover contingencies to (congruent) decision makers allows the use of the non-anticipated information. The second reason relates to the fact that the decision makers are experts with high ability to process the information; thus they are able to draw better inference from the information that becomes available than the other players.

To capture the benefits from discretion in a simple way we model the information collection as the observation of a signal $h \in \{\overline{\theta}, \underline{\theta}\}$, where $\overline{\theta} \in \{\overline{A}, \overline{B}\}$ and $\underline{\theta} \in \{\underline{A}, \underline{B}\}$. If $\theta = A$, $h = \overline{A}$ with probability μ and $h = \underline{A}$ with probability $1 - \mu$. If $\theta = B$, $h = \overline{B}$ with probability μ and $h = \underline{B}$ with probability $1 - \mu$.

$\overline{\theta}$ is contractible information, that is, information that can be described ex ante and embodied in the initial contract at no cost. Moreover, it is perfectly informative for all players. Thus, conditional on $\overline{\theta}$ being revealed, discretion has no value. Instead, $\underline{\theta}$ is information that is either ambiguous or not anticipated so that enforceable contingent contracts based on it cannot be written. Moreover, ex post only the decision makers have the ability to

process this information and to draw correct inference. Thus, $pr(\theta = A \mid \underline{A}) = pr(\theta = B \mid \underline{B}) = 1$ for the decision makers and $pr(\theta = A \mid \underline{\theta}) = pr(\theta = B \mid \underline{\theta}) = \frac{1}{2}$, $\underline{\theta} \in \{\underline{A}, \underline{B}\}$ for all other players. $\underline{\theta}$ captures the value of discretion. It is worth stressing that the information structure described above is just one way (though the most convenient one for the purposes of the paper) to capture the benefits of discretion. As discussed in Section 5, our results are robust to less asymmetric distributions of the abilities to draw inference.

The amount of information collection is the same when the Parties are in charge and when the investigator is in charge. This assumption is meant to avoid the bias that could be generated by the Parties being two. We formalize this by assuming that the investigator observes two simultaneous and independent realizations of h. Instead, the Parties observe one realization each.

The signal(s) h is privately owned by who is in charge of information provision (a, b, investigator) and it is hard evidence.[4] That is, it can be substantiated if transmitted but partially concealed. Let $\widehat{h} \in \{\overline{\theta}, \underline{\theta}\}$ denote the report. We assume that if $h = \overline{\theta}$ is observed, either the truth ($\widehat{h} = \overline{\theta}$) can be reported or some of his information can be concealed, in which case $\widehat{h} = \underline{\theta}$. By contrast a player who observes $h = \underline{\theta}$ can only report $\widehat{h} = \underline{\theta}$.

The decision rule

The contractual design problem faced by the principal can be illustrated as follows. Since $\overline{\theta}$ is contractible and perfectly informative, contingent on this information being reported, the first-best decision can always be enforced. The optimal contract will thus always require the decision maker to abide by the following rule[5]

$$d = \theta \qquad \text{if} \qquad \widehat{h} = \overline{\theta} \tag{3}$$

Conversely, since $\underline{\theta}$ cannot be made part of an enforceable contract, when $\widehat{h} \neq \overline{\theta}$, the principal has two alternatives. He can establish ex ante the decision to be taken whenever $\widehat{h} \neq \overline{\theta}$. In this case, referred to as *Rules*, the

[4] This is innocuous, we could as well assume that Parties always observe a signal each, while the investigator observes h only when he is in charge. See Section 5.

[5] With some abuse of notation, the expression "if $\widehat{h} = \overline{\theta}$" is here used to mean "if at least one of the reports is $\widehat{h} = \overline{\theta}$". Thus, when the parties are in charge it sufficies that $\widehat{h} = \overline{\theta}$ for either a or b. Similarly, when the investigator is in charge it suffices that $\widehat{h} = \overline{\theta}$ for at least one realization of h. Similarly, in (4) the expression "if $\widehat{h} \neq \overline{\theta}$" is used to mean "if none of the reports is $\widehat{h} = \overline{\theta}$".

optimal contract is (from (1) and $\delta > 1$)

$$d = 0 \qquad \text{if} \qquad \widehat{h} \neq \overline{\theta} \tag{4}$$

Alternatively, the principal can empower the decision maker with the right to decide in all situations where $\widehat{h} \neq \overline{\theta}$. We shall refer to this case as *Discretion*.

Appeal

Appeal costs $C < (1+\delta)l^0$ to the principal. The right to appeal is optimally restricted to those situations where the appealing party can provide verifiable evidence that an inefficient decision was made in the first stage. Indeed, under the assumption that all decision makers have the same ability and are drawn from the same population, if no evidence of wrongdoing is provided, the expected outcome of the appeal game is the same as that of the first period game. Thus, systematic appeals only add an extra cost C. Note also that under this rule frivolous appeals never occur.

Evidence of incorrect decisions can be gathered, at private cost H, by the Parties through a new information acquisition process. We assume that there exists a positive correlation between the information available at the appeal stage and the information that was available in the first stage and, for simplicity, we let this correlation be perfect. Thus at the appeal stage only information that was concealed in the previous stage (if any) can be discovered. Moreover, we assume that manipulation is discovered with probability 1. If the appeal is granted and the initial decision is reversed, the decision maker suffers a reputation loss $R \geq 0$. We assume that this is bounded above by an exogenously given number $\overline{R}$.

Two remarks on the role of the appeal in this set up are in order. By ruling out the possibility of errors in decision making we are abstracting from the fact that appeals may help correct such errors. Moreover, by assuming that the appealing decision maker is on average as incongruent as the first decision maker, we are assuming away that the former may serve as monitor for the latter. We shall return on this in Section 5 and show that both assumptions are without any loss of insights.

3 Information disclosure

In this section we investigate the behavior of the Parties and the investigator at the disclosure stage. We proceed by assuming that detected manipulation is not punished. Then, in Section 4.2 we show that this is indeed optimal.

Given our specification of preferences, the investigator truthfully reveals his information. Thus, with probability $1-(1-\mu)^2$ the decision maker receives contractible information that perfectly reveals the true state ($\overline{\theta}$), with probability $(1-\mu)^2$ he receives non-contractible information ($\underline{\theta}$). On the contrary, the Parties have an inherent incentive to disclose only evidence that is favorable to their cause. Their behavior for the case of $\theta = A$ is summarized in Table 1.

Probabilities	Information		Reports	
	a	b	a	b
μ^2	$\overline{\text{A}}$	$\overline{\text{A}}$	$\overline{\text{A}}$	$\underline{\text{A}}$
$\mu(1-\mu)$	$\underline{\text{A}}$	$\overline{\text{A}}$	$\underline{\text{A}}$	$\underline{\text{A}}$
$\mu(1-\mu)$	$\overline{\text{A}}$	$\underline{\text{A}}$	$\overline{\text{A}}$	$\underline{\text{A}}$
$(1-\mu)^2$	$\underline{\text{A}}$	$\underline{\text{A}}$	$\underline{\text{A}}$	$\underline{\text{A}}$

Table 1

Thus, under *Parties*, non-contractible information ($\underline{\theta}$) is reported with higher probability ($1-\mu$ rather than $(1-\mu)^2$).

Note that the different behavior of the investigator and of the Parties implies that the latter are aware that no evidence of wrongdoing can ever be found when information provision is delegated to the former. Thus, delegation of information provision to the Parties is a necessary condition for an appeal to be triggered.[6]

4 The decision rules

4.1 Rules

In this section we investigate the desirability to delegate information provision to the Parties or to the investigator when the initial contract leaves no discretion to the decision maker *(Rules)*. Our results are summarized in the next proposition.

Proposition 1 *Under Rules delegating information acquisition to the investigator is always preferred.*

[6] This result is clearly an artefact of the assumption that the investigator never conceals information and is therefore not to be stressed. See, however, Section 5 for a discussion.

The intuition behind this result lies in the fact that under *Rules* the principal protects himself against opportunistic behavior from the decision maker by restricting his scope of authority (control from above). To the extent that the decision maker's hands are tied, ex-post monitoring has limited value (nil in our simplified setting) and the outcome of the decision-making process is mainly determined by the efficiency of the information provision process. Hence, relying on a more impartial investigator is preferable.

To see this more formally, first suppose that information provision is assigned to the investigator. From Section 3, with probability $1-(1-\mu)^2$ the report is $\widehat{h}=\overline{\theta}$ and $d=\theta$. Instead, with probability $(1-\mu)^2$ the report is $\widehat{h}=\underline{\theta}$ and an inefficient decision ($d=0$) occurs.[7] In both cases, there is no scope for appeal. Thus the expected loss to the principal under *Rules-Investigator* is

$$L^{RI}=(1-\mu)^2 l^0 \tag{5}$$

Now suppose that the Parties supply the information. From Table 1, under *Rules-Parties*, the expected loss if there is no appeal is $(1-\mu)l^0$. Clearly, this is larger than L^{RI}. Allowing for the appeal does not affect our result. The best the appeal can do is to permit each Party to discover the manipulation of his opponent. This yields a loss of $(1-\mu)^2 l^0$ plus the expected cost of appeal which is greater than L^{RI}.

4.2 Discretion

We now consider the optimal structure of information provision when the initial contract grants discretion to the decision maker. Clearly, when the decision maker is congruent, relying on the investigator is always optimal. However, as we shall see, this is not necessarily the case when the decision maker has vested preferences.

Suppose that the information is provided by the investigator. From Section 3, with probability $1-(1-\mu)^2$ the investigator reports $\widehat{h}=\overline{\theta}$ and $d=\theta$. With probability $(1-\mu)^2$ he reports $\widehat{h}=\underline{\theta}$. When confronted with this report, an incongruent decision maker chooses $d\neq\{\theta,0\}$. This is because he correctly anticipates that the Parties will never be able to find hard evidence of wrongdoing. It follows that the expected loss to the principal under *Discretion-Investigator* is

$$L^{DI}=(1-\mu)^2\alpha(1+\delta)l^0 \tag{6}$$

[7] Note that contract enforceability implies that deviations from (3) and (4) never occur.

Now suppose that the provision of information is delegated to the Parties and consider the Parties' incentives to incur H in order to seek evidence of manipulation from the other side. Since the model is perfectly symmetric we can focus on one party only, say a. Let y denote the probability that Party a searches for Party b's manipulation and let x denote the probability that an incongruent decision maker takes his preferred decision $(d \neq \theta, 0)$ when the report is $\widehat{h} = \underline{\theta}$.[8] As shown in the Appendix, when $d = B$, Party a's expected utility is

$$\frac{\mu\alpha x}{\mu\alpha x + \frac{1}{2}(1-\mu)}(1+\lambda)U^0 - H \tag{7}$$

when he incurs H and zero otherwise. Similarly, an incongruent decision maker enjoys an expected payoff of

$$-y\mu R + y(1-\mu)V + (1-y)V \tag{8}$$

when he acts opportunistically $(d \neq \theta, 0)$ and zero otherwise. Suppose that $x = 1$. From (7) the cost H is too large to induce party a to search for manipulation if

$$H > H_0 \equiv \frac{\mu\alpha}{\mu\alpha + \frac{1}{2}(1-\mu)}(1+\lambda)U^0 \tag{9}$$

When equation (9) holds, the appeal is never triggered ($y^* = 0$) and the incongruent decision maker always takes his preferred decision ($x^* = 1$). When equation (9) does not hold, the Parties would always search if the decision maker always acted opportunistically and therefore the decision maker would never do so. On the other hand, the decision maker would always act opportunistically if the Parties did never search. Thus, the equilibrium must be in mixed strategies where the probability that the Parties search is (from equation 7)

$$x^* = \frac{\frac{1}{2}(1-\mu)H}{\mu\alpha[(1+\lambda)U^0 - H]} \tag{10}$$

The probability of the decision maker acting opportunistically is (from equation 8)

$$y^* = \frac{V}{\mu(V+R)} \tag{11}$$

We assume $R > \frac{1-\mu}{\mu}V$ to ensure that $y^* > 0$.

[8] Given $R \geq 0$ a congruent decision maker always prefers $d = \theta$.

Equations (10) and (11) provide the interesting insight that delegating information provision to parties with conflicting goals enhances monitoring over the decision maker (control from below). Since concealment of information by one side always works to the detriment of the other side, each party has incentive to discover possible manipulations in the opponent's reports. In this process an incongruent decision maker may end up being caught. Thus, Parties' reciprocal monitoring is the channel through which the decision maker is disciplined. The result is summarized in the next proposition.

Proposition 2 *Under Discretion, delegation of information provision to the Parties enhances monitoring over the decision maker.*

Proposition 2 contains a crucial idea of our analysis, namely that manipulation and monitoring are the two sides of the same coin, where more manipulation leads to more monitoring. This also underlies the intuition for the following Corollary.

Corollary 1 *Punishments for detected manipulation are never optimal.*

Our analysis predicts that the delegation of information provision to the Parties is valuable, but also costly. On the one hand, an incongruent decision maker has more opportunities to abuse his discretional power, since $h = \underline{\theta}$ is reported more often. On the other hand, he has less incentives to do so. In what follows we compare these costs and benefits and give condition for the optimality of relying on the Parties to supply information.

The expected loss under *Discretion-Parties* is

$$L^{DP} = (1-\mu)^2 \alpha x^*(1+\delta)l^0 + \mu(1-\mu)[\alpha x^*(1-y^*)(1+\delta)l^0 + \alpha x^* y^* C] \quad (12)$$

The first term of the right-hand side of (12) is the loss when both parties observe $h = \underline{\theta}$ (no manipulation) and therefore there is no appeal. Compared to its counterpart in L^{DI}, it shows the benefit of monitoring: the probability of an inefficient decision is lower. The second term is the loss when the report is $\widehat{h} = \underline{\theta}$ but either party a or b concealed information. With probability y^* the appeal is triggered and the optimal decision is achieved. With probability $1 - y^*$ the appeal is not triggered and therefore an inefficient decision occurs whenever the decision maker is incongruent.[9] This represents the cost of manipulation. Substituting for (10) and (11) into (12) and comparing the resulting expression with (6) yields as follows.

[9] Note that L^{DP} is lower than C, where C would be the loss if the principal did not delegate the appeal decision to the parties but specified ex ante that appeal occurs with probability 1.

Proposition 3 *Under Discretion, delegating information acquisition to the Parties is optimal if* $H < H_1 \equiv \frac{\mu\alpha}{\frac{1}{2}+\mu\alpha}(1+\lambda)U^0$, *where* $H_1 < H_0$.

A decrease in the monitoring cost has two effects. First, it increases reciprocal monitoring from the Parties, thereby reducing the loss associated with the manipulation of information. Second, it lowers the decision maker's incentive to act opportunistically. For sufficiently small H, the loss of manipulation is more than off-set by the benefits of control and relying on the Parties is optimal.

4.3 Rules versus Discretion

We now compare the optimal combinations of decision rules and information provision and show that either can be optimal depending on the values of the parameters. For conciseness, we restrict attention to the case where $\delta > \frac{1-\alpha}{\alpha}$ which implies $L^{RI} < L^{DI}$. That is, in the absence of monitoring, imposing restrictions on the scope of authority conferred to the decision maker is more desirable than leaving him discretion. Under this assumption, the relevant comparison is the one between RI and DP. The results are summarized in the following proposition.

Proposition 4 *DP dominates RI when $(1+\lambda)U^0$ is high or H is low. RI dominates DP when δ is large.*

Proof. Notice that $L^{DP} < L^{RNA}$ if $H < H_2 \equiv \frac{2\mu}{(1+\delta)+2\mu}(1+\lambda)U^0$, with $H_2 < H_1$. ■

When the Parties' stakes are high or the monitoring costs are low the beneficial role played by the Parties' monitoring activity can correct for both their manipulations of information and for the decision maker abuse of discretion, so as to render discretion optimal. However, when the loss of control is large, more rigid rules should be preferred.

5 Extensions

Because of the difficulty in building a model that fully accounts for all stages of the decision-making process (i.e. information revelation, decision-making and monitoring) our insights have been generated using a highly stylized set up. A discussion of our main assumptions follows.

Incongruent investigator

The assumption that the investigator has congruent preferences is clearly an oversimplification. If the principal could select agents whose preferences coincide with his own the contractual problem would be trivial. To test the robustness of our results to more realistic assumption on the investigator's preferences, we now assume that he has probability γ of being incongruent. Under *Investigator* manipulation is less likely than under *Parties* if[10]

$$\gamma\left(2\mu-1\right)<\left(1-\mu\right) \tag{13}$$

Suppose that $d=B$ and consider the expected payoff of Party a from looking for evidence of wrongdoing

$$\frac{\mu\gamma\alpha x\left(2\mu-1\right)}{\mu\gamma\alpha x\left(2\mu-1\right)+\frac{1}{2}(1-\mu)^{2}}(1+\lambda)U^{0}-H$$

It is easy to show that the above expression is lower than (7) when condition (13) holds. Hence, ex post monitoring is still lower under *Investigator*, for the Parties have less incentive to search for evidence of wrongdoing. This suggests that our results hold provided that total manipulation under *Investigator* is on average less than under *Parties*. This assumption seems reasonable. It is hard to imagine an investigator with higher stakes than the parties directly affected by the decision. The above reasoning also shows that the assumption that the investigator is a different player than the decision maker is also without loss of generality.

Appeal

We have assumed that the appeal is decided by a single decision maker who is drawn from the same population as the decision maker in stage 2. Often, appeals are decided by juries and the process is structured so as to reduce the possibility of bad decision-making. In our set up this would be equivalent to assuming that the appeal decision maker is less incongruent than the one in stage 2. Let $\phi\in[0,\alpha)$ denote the probability that the appeal decision maker is incongruent and $C(\phi)$ the social cost of appeal, where $C_{\phi}<0$ (a larger jury ensures a lower bias but it is more costly). In this setting, if systematic exogenous appeals are never optimal, which holds when $(\alpha-\phi)(1+\delta)l^{0}>C(\phi)$, hard evidence of wrongdoing is still necessary for an appeal to be granted. Then, it is still true that manipulation enhances

[10] An incongruent investigator conceals information whenever $h=\overline{\theta}$ for at least one realization of the signal. Thus, under *Investigator* manipulation occurs with probability $\gamma(1-(1-\mu)^{2})=\gamma\mu\left(2\mu-1\right)$. Instead, under *Parties* manipulation occurs with probability $\mu\left(1-\mu\right)$.

Parties' monitoring, by increasing their ex post beliefs of seeing the decision reversed.

Similar reasoning shows that disregarding errors in decision making and hence the possibility that appeals work as devices to correct such errors is a mere simplification.

We have put an upper bound on the loss suffered by the decision maker after a reversal, interpreting it as a pure reputation loss. In our setting this is not optimal, since reversals occur only when the decision maker intentionally pursued his private interests at the expense of the principal. Hence, imposing a very harsh punishment to the decision maker would be sufficient to avoid opportunistic behavior. In practice, however, wrong decisions might occur for a number of other reasons: lack of information, incompetence, errors, and so forth. In all these cases, imposing harsh penalties would paralyze the decision process and prevent decisions from being taken, which is the main reason why we do not observe them in practice. Our assumption should then be interpreted as capturing this fact.

Information structure

The mixed strategy equilibrium in Subsection 4.2 was derived under the assumptions that the Parties learn nothing from the non-contractible signal while the decision maker makes perfect inference. It should be apparent at this point that assuming that the Parties are able to extract some information from the non-contractible signal would not affect our main insights. The key to our results is that the decision maker is not able to predict the behavior of the Parties so that fear of monitoring induces him to act less opportunistically. Thus, our results would also be qualitatively unchanged if the Parties and the decision maker observed different imperfect signals (with the same level of precision) on the state θ.[11] Note that with imperfect signals appeal could also occur under *Discretion-Investigator* and *Rules*.

The assumption that *either* the Parties *or* the neutral investigator possess the information is also not crucial. We could as well assumed that the Parties always learn h (one realization each), but *when in charge* the neutral agent has access to this information. Indeed, all is needed for our results to hold is that the possibility of information manipulation increases the Parties' incentives to appeal.

[11] A pure strategy equilibrium would emerge if we assumed that the non contractible signal were perfectly informative and both the parties and the decision maker were able to draw correct inference. In this case the Parties would learn the type of the decision maker from his behavior and the first-best would be achieved.

6 Applications

Comparative legal and judicial systems

Legal systems contain the body of rules that allocates authority within the judiciary and defines the procedures judges are to follow. The two most widely adopted legal systems are those of Civil Law and Common Law. The former is typically observed in European continental countries, whereas the latter is more widespread in the Anglo-Saxon world. Underlying the Civil Law system is the great importance given to the "certainty of decision-making", which is guaranteed by a systematic organization of the law into a code whose provisions the courts should administer without power of amendment. The code is viewed as to supply a solution for any legal problem that may arise; official discretion is seen as negative and harmful. On the contrary, in the Common Law system, much more importance is put on the task of taking the decision most appropriate to the specific circumstances of each case.

Judicial systems on the other hand, regulate the process of acquisition and disclosure of evidence at trial. The two most widely adopted procedures are the adversarial and the inquisitorial types. In the latter, the trial is conceived as an official inquest conducted by a single investigator who is supposed to be impartial and to look for evidence both against and in favor of the accused. Instead, in the adversarial procedure the proceeding is dominated by the two Parties - prosecutor and defense attorney- and evidence is adduced bilaterally through direct and cross-examination. It is of interest that the same combination of legal and judicial system is observed in nearly all the countries. In particular, Civil Law systems are generally associated with inquisitorial procedures whereas Common Law systems are often combined with adversarial procedures. The paper provides a theoretical justification for this stylized fact.

Antitrust proceedings

The insights generated by our analysis appear to be relevant also in the context of antitrust regulation. The problem of designing efficient proceedings for the enforcement of antitrust policies has been central among politicians and economists in recent years. At the core of the debate lies the inherent tension between flexibility and certainty in competition law. Certainty is necessary to maintain some degree of predictability of outcomes and help the firms to anticipate that a particular conduct or agreement does or does not violate antitrust laws. Flexibility is important to reflect changes in economic thinking and in market conditions, two aspects that are par-

ticularly relevant for competition laws where the legal analysis is combined with an economic-based approach. In antitrust laws, the only way to ensure certainty is to have *per se rules.* A *per se rule* requires that a particular practice or agreements always be treated in the same way, regardless of who engaged in the conduct and regardless of the effects of the conduct. Flexibility on the other hand can be achieved adopting *rules of reason.* The classical definition of the *rule of reason* was given by the Supreme Court in 1919:

> The court must ordinarily consider the facts peculiar to the business to which the restraint is applied, its condition before and after the restraint was imposed, the nature of the restraint and its effects, actual and probable. The history of the restraint, the evil believed to exist, the reason for adopting the particular remedy and the purpose or end sought to be achieved are all relevant facts.

Rules of reasons are very widespread in the US where jurists more easily accept the greater uncertainty resulting from the inclusion of economics in antitrust law. *Per se rules* instead are prevalent in the European law, where the legislators' concern is much more on ensuring legal certainty. Consistent with our results, in the US antitrust proceedings are heavily dominated by the Parties, which are responsible for presenting the evidence whereas in Europe most of the investigation is done by the Commission, with the Parties playing a more limited role.

7 Concluding Remarks

We have focused on the organization design of public institutions devoted to resolve disputes between two Parties, when a possibly opportunistic decision maker relies on information supplied by other players. Under the assumption that contracts are incomplete, we have investigated the contractual design problem faced by a principal who has to choose a decision rule and allocate information provision.

The paper has yielded a number of general insights, which can be summarized as follows. First, under Parties, information manipulation improves monitoring. The larger the amount of manipulation at the information provision stage, the higher the Parties' incentives to challenge the decision made and to ask for correction, which helps to keep the decisions maker on his toes. Involving the Parties in the provision of information, ensures greater

control from below. Further, how the principal weighs monitoring and manipulation depends on the extent of the discretionary power given to the decision maker. High discretion calls for monitoring; thus information provision by the interested Parties tends to be preferred. Low discretion renders monitoring less relevant and calls for a more impartial information collector. Finally, as contract incompleteness becomes more pervasive, discretion becomes both more valuable and more risky. Therefore, it should be preferred only if the interest Parties' stakes are sufficiently high relative to their monitoring costs.

We have ruled out monetary incentives and assumed that the agents are only driven by their private benefits. This assumption can be motivated on the ground that monetary contingent payments are not observed in practice, at least not in the applications discussed above. Indeed, judges and antitrust regulators are usually given job life positions and fixed salaries in order to preserve their independence. One may argue though that monetary incentives could be used to motivate the investigator to exert some monitoring. For example, the principal could promise him a compensation conditional on the decision being reversed in appeal. However, this would induce the investigator to distort the information in the first place.

We have also abstracted from moral hazard consideration, by taking the agents' effort to search for information as given. We believe that extending our analysis in this direction, by taking a more internal organization view point, would be an interesting topic for future research.

8 Appendix

Derivation of equation (9). Since party a never incurs H if she has observed $h = \overline{\theta}$ and/or party b has disclosed either $\widehat{h} = \underline{B}$ or $\widehat{h} = \overline{B}$ we only need to consider the case where $h = \underline{\theta}$ for party a and $\widehat{h} = \underline{A}$ for party b. Moreover, since party a has no interest to see the decision reversed if $d = A$, we can confine attention to the case where $d = B$. If party a does not incur H or if she does but there was no manipulation, then $d = B$ is implemented. On the contrary, if party a incurs H and discovers manipulation from party b, she can appeal and ask for correction of the proposed decision. Therefore, party a's expected pay-off is

$$\Pr(h = \overline{A} \;/\; \widehat{h} = \underline{A},\ d = B)(1+\lambda)U^0 - H = \frac{\mu\alpha x}{\mu\alpha x + \frac{1}{2}(1-\mu)}(1+\lambda)U^0 - H \tag{14}$$

where $\Pr(h = \overline{A} \;/\; \widehat{h} = \underline{A},\, d = B)$ is the probability that party b observed $h = \overline{A}$, given that she reported $\widehat{h} = \underline{A}$ and that the decision was $d = B$. ■

Proof of Proposition 3. Note that $H < \frac{\mu\alpha}{\frac{1}{2}+\mu\alpha}[(1+\lambda)U^0 - K]$ implies that condition (9) does not hold. Hence, the equilibrium strategies of the appeal game under *Discretion-Parties* are given by (11) and (10) and expression (12) yields

$$L^{DP} = (1-\mu)^2\alpha x^*(1+\delta)l^0 + \mu(1-\mu)[\alpha x^*(1-y^*)(1+\delta)l^0 + \alpha x^* y^* C] = \frac{\frac{1}{2}\alpha(1-\mu)^2 H}{\mu\alpha[(1+\lambda)U^0 - H]}\{(1-\mu)(1+\delta)l^0 + \mu[(1-y^*)(1+\delta)l^0 + y^* C]\}$$

Recalling that $C < (1+\delta)l^0$, from (6), a sufficient condition for $L^{DP} < L^{DNA}$ is

$$\frac{\frac{1}{2}H}{\mu\alpha[(1+\lambda)U^0 - H]} < 1$$

Trivial calculations prove the result. ■

Proof of Corollary 1. Suppose that a punishment P is imposed to a party that is caught manipulating her information and let $\beta(P) \leq 1$ denote the associated probability of manipulation. Then, from (7), the expected payoff from appealing becomes

$$\frac{\beta\alpha x\mu}{\beta\alpha x\mu + \frac{1}{2}(1-\mu)}(1+\lambda)U - H$$

which implies, $x^* = \frac{HF}{\beta\alpha\mu[(1+\lambda)U - H]}$,with $\frac{\partial x^*}{\partial\beta} = -\frac{x^*}{\beta} < 0$: the higher the probability of manipulation, the higher the monitoring and the lower the probability of cheating. It is easily shown that the expected loss under *Discretion-Parties*, as given by

$$L^{DP} = (1-\mu)^2\alpha x^*(1+\delta)l^0 + \frac{1}{2}\beta\mu(1-\mu)[\alpha x^*(1-y^*)(1+\delta)l^0 + \alpha x^* y^* C]$$

is decreasing in β ($\frac{\partial L^{DP}}{\partial\beta} = (1-\mu)^2\alpha(1+\delta)l^0\frac{\partial x(\beta)}{\partial\beta} < 0$). Thus, punishments that reduce the probability of manipulation are not desirable. ■

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