Reputational Concerns and Bias in Arbitration*

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Abstract

We analyze how reputational concerns of arbitrators affect the quality of their decision making. We assume that arbitrators differ in their ability to evaluate the correct decision and that information acquisition by arbitrators is costly and unobservable. We show that reputational concerns increase incentives for information acquisition but may induce the arbitrator to bias his decision towards one party in the dispute. This decision bias is greater when the dispute is confidential rather than when it is public, and the parties are more likely to choose confidentiality for less complex subject matters.

In light of these results, we study the circumstances under which the parties to a contract choose to employ arbitration, rather than litigation in court, to resolve their disputes. We show that arbitration is more likely to be chosen by symmetric and long-lived parties.

Keywords: confidentiality, decision making, experts, information acquisition, reputational concerns.

JEL Classification: D83, K41, J52

1 Introduction

In this paper we study decision making in arbitration. Arbitration is a process that allows for binding non-judicial resolution of a dispute and it is widespread in commercial transactions. At the time of writing a contract, the parties may agree to insert an arbitration clause providing for the use of arbitration in the event that a dispute arises.[1] Under arbitration,

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[1] We focus on 'ex ante' arbitration agreements as opposed to 'ex post' arbitration agreements where the parties agree to employ arbitration once a dispute has already arisen.

the parties submit their dispute to an arbitrator (or to an arbitral tribunal) who rules on pre-hearing disputes or questions, conducts the arbitral hearing and issues an award that binds the parties.

The arbitration clause usually defines the process by which the arbitrator will be selected; often it also specifies the qualifications the arbitrator is required to have. There are many selection procedures. For example, the parties may consult, or eliminate and rank, names from lists of arbitrators maintained by arbitration institutions such as the American Arbitration Association (AAA) or the International Chamber of Commerce (ICC). Alternatively, they may opt for a tripartite arbitral panel, where each party appoints its own arbitrator and then the party-appointed arbitrators select the third arbitrator, who serves as the chair. A common aspect of these and of most selection procedures is that the parties' preferences are taken into account in the selection of the arbitrator(s). This is indeed the first important feature of arbitration.

The second feature of arbitration is finality. Under the court system, lower-court decisions can be appealed on questions of law or (in some instances) of fact, and then be reversed by an appeals court. Instead, most arbitration proceedings purport to be final and binding, with the result that courts are reluctant to review arbitral awards, even if it is alleged that the arbitrator found facts unsupported by evidence or misapplied the law.[2]

The third main feature of arbitration is confidentiality. Arbitration is not a public proceeding, contrary to trial before court. The arbitration clause can contain a confidentiality provision establishing that contractual disputes will be kept confidential to the parties. Confidentiality is also the default option under many arbitration rules.[3]

In a general sense these three features of arbitration can make arbitration an attractive dispute-resolution process. First, at the time the contract is written it is in the interest of both contractual parties to enhance contractual enforcement, because better enforcement generates better incentives for relationship-specific investment. Many disputes that arise in commercial transactions are concerned with technical aspects of contractual interpretation, and with arbitration the parties can take advantage of the opportunity to select an arbitrator who is expert in the particular subject matter.[4] Second, the parties may benefit from knowing

[2]One of the few grounds for vacating an arbitral award is that the arbitrator was corrupt, exceeded his powers or there was evidence of partiality.

[3]This is the case for example under the rules of the the London Court of International Arbitration (LCIA).

[4]In line with this point, in many studies on arbitration, arbitrators are viewed as experts who are able

that the dispute will be resolved quickly thanks to the restriction on the right to appeal; and, thirdly, confidentiality can protect the parties from the negative publicity that the mere existence of the dispute may generate. Arbitration is also said to be cheaper than court proceedings, although evidence is mixed.

However, the desirability of arbitration as a dispute-resolution process rests largely on the perception that the selected arbitrator will be able to understand the terms of the dispute, identify the correct decision and make the decision thus identified. If the arbitral process is perceived as unfair and imprecise, the parties may prefer litigation in court. This is even more relevant because the restriction on the right to appeal implies lack of peer monitoring between arbitrators which, compared with litigation in court, deprives arbitration of an important monitoring device for efficient decision making.[5] Further, the (potential) confidential nature of the proceedings and of the arbitral award suggests that in many instances the market never learns anything about the arbitral decision and thus also market monitoring may be inadequate under arbitration.

In practice, we observe that contractual parties *often* choose to employ arbitration as a dispute-resolution process. But, we also observe that arbitration is *not always* chosen by contractual parties. We infer from this that the characteristics of arbitration must work well in some circumstances but not in others. This paper is an attempt to identify how the characteristics of arbitration affect the efficiency of its decision-making process and in which circumstances the parties to a contract are likely to choose arbitration rather than litigation in court.

We incorporate the three main features of arbitration in a stylized model where arbitrators have private information about their competency. More competent arbitrators are able to acquire better information on the state of the world, i.e. the correct decision resolving a dispute. The parties to the dispute have some private and unverifiable information about the correct decision and are likely to be optimistic in their views. Arbitrators care about appearing competent to the outside market and to any party in the dispute who may need their service in the future. We refer to such parties as 'long-lived' parties. In contrast, a 'short-lived' party does not to need arbitral services again, say because of the limited extent

to verify dimensions of commercial contracts better than court judges (see for example Dixit, 2003; and Chakravarty and Makris, 2005).

[5] For a model of monitoring of decision makers through appeals see Iossa and Palumbo (2005).

of its business activities.

We show that the incentive for an arbitrator to acquire costly and unverifiable information on the state of the world, is strengthened by the ability of the parties to select the arbitrator, and thus by the arbitrator having reputational concerns with the parties. However, incentives for costly and unverifiable information acquisition can come at a cost. If a party in the dispute is long-lived whilst the other one is short-lived, in equilibrium a decision bias in favour of the long-lived party arises endogenously from the desire of the arbitrator to appear competent. Thus with asymmetric parties, selection of arbitrators by the parties generates a trade-off: it increases incentives to acquire information but it generates a decision bias in favour of the long-lived party.

The decision bias in favour of the long-lived party and at the expense of the short-lived one is greater in the presence of a confidentiality provision than when the dispute is public. By increasing the bias, confidentiality also reduces the incentives of the arbitrator to acquire information on the correct decision. In light of this, we endogenize the choice of the parties as to whether to opt for confidentiality. We show that when, at the time of writing the arbitration clause, the parties expect technical issues to arise in the event of a dispute, then they are likely to be better off in the absence of a confidentiality provision.

Our first result suggests that, other things equal, arbitrators who seek to be hired in the future have an incentive to favour repeated players (the long-lived party) with the aim of appearing competent. Thus, *if chosen,* arbitration is likely to favour corporations and parties with a large volume of affairs or with a greater degree of litigiousness. In fact, precisely because of this inherent unfairness of arbitration with asymmetric parties, we can expect asymmetric parties not to agree on the use of arbitration as a dispute-resolution process, and to opt instead for a court system. In the final part of the paper we formalize this intuition by explicitly comparing arbitration with litigation in court, assuming that under the latter the decision maker has no reputational concerns with the parties, the dispute proceedings are public and appeals are allowed. We show that arbitration is more likely to be chosen when the parties to a contract are both long-lived. High value of confidentiality also favours arbitration whilst an efficient appeals system favours litigation in court. We highlight the difference in the incentives provided to decision makers under arbitration and under litigation in court as one between ex ante and ex post monitoring. Ex-ante monitoring is the selection of arbitrators by the parties, whilst ex-post monitoring is the appeals system.

Our results highlight the importance of leaving the parties free to choose the dispute-resolution process. With voluntary arbitration the nonrepeated players (the short-lived party) has the option to insist on an unbiased dispute-resolution process, whilst with mandatory arbitration he does not. The risk of bias embedded in the use of mandatory arbitration has long been recognized by legal scholars, see for example Fitz (1999).

Arbitrator bias is also not uncommon. In the seminal U.S. Supreme Court Case *Commonwealth Coating Cort. v. Continental Casualty Co.* (395 U.S. 145, 1968) one of the parties discovered that the neutral arbitrator had previously provided certain consulting services for the other party, and failure to disclose the commercial relationship was viewed as a manifest violation of his duties. Since *Commonwealth Coatings*, a number of courts have considered repeated economic contacts of one form or another as relevant evidence on the question of arbitrator bias. Bloom and Cavanagh (1986) give evidence of arbitrator bias in favour of the employer in wage disputes in labour relationships. Repeated players bias is also found and discussed in Bingham (1998).

Our paper is related to literature on careerist decision makers, such as regulators, managers or experts who try to prove their ability to make the correct decision. For example, in Levy (2005) careerist judges may contradict precedents too often in order to signal their ability, whilst in Leaver (2004) less able bureaucrats may use soft policies for fear of criticism. The paper is in general related to the carrier concerns literature dating back to Holmström (1982), although in most of this literature, and contrary to our approach, it is assumed that the quality of the decision is verifiable ex post. See for example Levy (2004), Ottaviani and Soerensen (2005) and Bourjade and Jullien (2005) for recent studies on bias in experts' advice.

The rest of the paper is organized as follows. In section 2 we set up the model. Section 3 and 4 discuss the equilibrium when the award is confidential and when it is public, respectively. Section 5 studies the choice of confidentiality, whilst section 6 compares arbitration with litigation in court. Section 6 concludes.

2 The basic model

The players and the general setting

There are two periods and four players, an arbitrator (he), two parties, P_1 (she) and P_2

(she), and a market player M (it). At the beginning of period 1, P_1 and P_2 enter a contractual relationship involving issues of technical complexity summarized by a parameter $\chi \in [0,1]$ and decide which dispute-resolution process to use in the event of a dispute. They have two options: arbitration and litigation in court. Under arbitration, the parties select the decision maker (i.e. the arbitrator) and choose whether to insert a confidentiality provision in the contract, appeals are not allowed. Under litigation in court, the decision-maker is randomly selected, the dispute proceedings are always public information and appeals are allowed. In this basic model we focus on the case of arbitration. We extend the basic model to study the case of litigation in court in Section 6.

A dispute may refer to problems of inadequate performance or breach. For simplicity, we treat the occurrence of a dispute as an exogenous event and we model a dispute as disagreement between the parties over the realization of a state of the world θ. There are two states, 1 and 2, and it is common knowledge that $\Pr(\theta = 1) = 1/2$. For simplicity and without loss of generality, we assume that there are only two possible decisions, $d \in \{1, 2\}$. A decision $d = 1$ favours P_1 whilst a decision $d = 2$ favours P_2. Decision $d = 1$ is the most appropriate in state $\theta = 1$ whilst decision $d = 2$ is the most appropriate in state $\theta = 2$. We shall refer to $d = \theta$ as 'the correct decision'. With a confidentiality provision, only P_1 and P_2 observe d, whilst in the absence of confidentiality, d is observed also by M. The parties benefit from keeping the dispute confidential. This is because for example the mere existence of a dispute may be damaging to a firm's market reputation and have a negative impact on the firm's share values. We denote by $c \in [0, \overline{c}]$ the value of confidentiality for the parties.

The parties value a correct decision $u > 0$ and an incorrect decision at zero. Net of dispute-resolution cost, the parties surplus from a dispute-resolution process is

$$U = \Pr(d = \theta)u + \omega c \tag{1}$$

where ω is a dummy variable with $\omega = 1$ if there is confidentiality and $\omega = 0$ if there is not. This formulation captures in a reduced form the idea that better enforcement of contractual terms helps to ensure better incentives for relationship-specific investments, which in turn increases the joint surplus from the contractual relationship.[6,7] Thus, at the time the parties choose the dispute-resolution process, which is before a dispute arises, it is in the parties' reciprocal interest to choose the dispute-resolution process which, ceteris paribus, ensures the best enforcement of the agreed contractual terms.

The parties P_1 and P_2 can be either short-lived or long-lived. The critical difference between a long-lived and a short-lived party is that, other things equal, the former is more likely than the latter to bring future business to an arbitrator. Long-lived parties can also be thought as parties who have a larger volume of affairs compared to short lived parties, to the extent that large businesses are more likely to need arbitral services than small businesses. An alternative interpretation of the difference between long-lived parties and short-lived parties is that a long-lived party has a wider network of business relationships and is thus more effective in recommending arbitrators. Word of months plays indeed a critical role in the choice of arbitrators in practice. We assume that whether a party is long-lived or short lived is common knowledge, and, unless stated otherwise, P_1 is long-lived whilst P_2 is short-lived.

Period 2 captures the effect of repeated interaction in a highly stylized way. In period 2 the long-lived party, P_1 and M need the service of an arbitrator with positive probability.

The information of the parties and of the market

In modelling the information structure we wish to capture two central features of dispute-resolution processes. First, the parties to a dispute are likely to have some information about the state of the world, and this information can be more or less precise depending

[6] Shavell (1995) discusses this point in relationships to the choice between courts and any type of alternative dispute resolution (ADR). He gives an illustrative example of how correct assessment of performance can improve incentives. We report is below.

"Suppose that the value of good performance to a contract buyer is \$1,000 and the cost to a contract seller of supplying it is \$400, while the value of substandard performance to the buyer is \$500 and the cost of supplying it is \$300. Then the joint value of the contract to the parties is only \$200 if performance is substandard, for \$500 - \$300 = \$200, but the joint value is \$600 if performance is good, as \$1,000 - \$400 = \$600. Hence, the parties would both prefer good performance. Assume, for instance, that the contract price is such that they split their joint value. Then if performance is substandard, the price would be \$400, the seller's benefit would be \$100 (namely, \$400 - \$300), and the buyer's benefit would also be \$100 (that is, \$500 - \$400). But if performance is good, the price would be \$700, and the seller's benefit would be \$300, as would the buyer's. Suppose too that the courts are unable to detect substandard performance, while ADR-designated arbitrators can. Then without ADR, performance would be substandard since the seller could always save \$100 by adopting substandard performance. But with ADR, good performance could be induced by the threat of the seller's having to pay damages if substandard performance were detected, which it would be. Hence, the parties would be better off with ADR–each would obtain a benefit of \$300 rather than \$100."

[7] However, there can be instances where efficiency calls for the dipute-resolution process not to enforce the will of the parties expressed in the contract. On this point, see Anderlini, Felli and Postelwaite (2006).

upon the specific circumstances of the dispute. Second, at the time the parties start the arbitral proceedings, they are more likely to have a favourable view of the dispute than an unfavourable one. This might be due to one of the following three reasons. First, in a model with pre-trial information gathering, the parties to a dispute will search for favourable information to submit to the court or arbitrator in order to support their case. In the course of this search, a party can acquire information which although unverifiable still supports her case. Second, the parties always have the opportunity to voluntarily settle their dispute out of court instead of resorting to costly litigation, and arbitration is no exception. One of the reasons why settlement may fail is because parties may have different priors, with P_i assigning a higher probability to $\theta = i$ than P_j. Different priors is a standard assumption in the literature on dispute resolutions and is often viewed as one of the main reasons why parties litigate. Third, in the context of court litigation and settlement bargaining with asymmetric information, various economic models have shown that settlement is more likely to fail when each party has a favourable view about the state of the world. Thus, cases where parties do not hold favourable views are more likely to settle and, when a case is not settled, an inference can be drawn that each party is likely to have a favourable view about the case (see for example Schweizer, 1989; and Hay and Spier,1998 for a review of the literature on litigation and settlement).

Formally, we assume that it is common knowledge that each party has some information about the state of the world, θ: in each state θ, P_i observes a private and unverifiable signal $\sigma_i \in \{1, 2\}$. The realization of the signal depends on the state θ and on the identity of the party: P_i is more likely to observe a favourable signal $\sigma_i = i$ than an unfavourable one $\sigma_i = j$; P_i is also more likely to observe a favourable signal $\sigma_i = i$ in the state where the correct decision is the one in her favour (i.e. when $\theta = i$) than the one against (i.e. $\theta = j$). In particular, we assume that in state i P_i always observes $\sigma_i = i$. In state j she observes $\sigma_i = j$ with probability ν and $\sigma_i = i$ with probability $1 - \nu$. That is: $Pr(\sigma_i = i \,|\theta = i) = 1$, $Pr(\sigma_i = j \,|\theta = i) = 0$, $\Pr(\sigma_i = j \,|\theta = j) = \nu$ and $Pr(\sigma_i = i \,|\theta = j) = 1 - \nu$.

Accordingly, when P_i observes $\sigma_i = i$, her posterior belief that $\theta = i$ is $Pr(\theta = i \,|\sigma_i = i) = \frac{1}{2-\nu}$, whilst if P_i observes $\sigma_i = j$, she is certain that the state is j: $Pr(\theta = i \,|\sigma_i = j) = 0$. Thus, ν captures the precision of the information in the hands of the parties. When $\nu = 0$, parties are uninformed: each party observes $\sigma_i = i$ regardless of the state of the world. When $\nu = 1$, parties are perfectly informed; observing $\sigma_i = i$ reveals to P_i that the state is $\theta = i$, whilst observing $\sigma_i = j$ reveals to P_i that the state is $\theta = j$.

M has no private information. He observes d if the award is public; if the award is confidential he observes nothing.

The competency and the information of the arbitrator

At the outset the arbitrator has no information. However, before taking a decision he can choose to exert costly and unobservable effort into acquiring information about the state of the world θ. The precision of the information acquired depends on the ability of the arbitrator. For simplicity, we assume that there are only two types t of arbitrators: the competent ($t = C$) and the incompetent ($t = I$). If type C exerts effort, he observes θ with probability 1, otherwise he observes nothing. Instead, type I observes nothing no matter how hard he tries. The model can be generalized to continuous types (as in Levy 2005). The cost of acquiring information in terms of disutility of effort is $\Psi \in [0, 1]$. Ψ is distributed according to a cumulative distribution function $F(\Psi, \chi)$, with $F_\chi(\Psi, \chi) < 0$: the more technical the subject matter the higher the expected disutility of effort; we also assume that $F_{\chi\Psi} \geq 0$, which implies that a greater technical complexity raises the expected disutility of effort at a decreasing rate.

We denote by e^t the effort exerted by the arbitrator of type t, with $e^t = 1$ if the arbitrator exerts effort and $e^t = 0$ otherwise. Since it is immediate that $e^I = 0$, we shall focus on effort by type C. The arbitrator knows his type, whilst P_1 and P_2, and M only know that the fraction of type C is given by $\gamma \in (0, 1)$. For simplicity and without loss of generality we assume that Ψ is realized after a dispute has arisen and that the realized value of Ψ is observable. Relaxing this assumption would just add an additional parameter.

The objectives of the arbitrator and selection of arbitrators

The arbitrator has reputational concerns in the sense that he wishes to appear competent. The reputational concerns of the arbitrator stem from a desire to boost his future income although it may also stem from prestige seeking. In expression (1), we have seen that parties value dispute-resolution processes where correct decisions are more likely to be made. We will show later in the paper that more competent arbitrators are indeed more likely to make the correct decision, which implicitly rationalizes the relationship between income and reputation for competency. We also allow for the possibility that the arbitrator has outcome concerns by assuming that he enjoys some private benefits from taking the correct decision, although outcome concerns play a limited role in what follows. Using the parameter $\mu \in (0,1)$ to capture the relative concern for the correct decision and y to denote future income, the payoff of the arbitrator when he is type t, $t = C, I$, is given by

$$\mu \Pr(d = \theta) + y - e^t \Psi^t$$

where y is an increasing function of the perception that the arbitrator's future 'employer' has of the arbitrator's competency. The future employer of an arbitrator can be either M or the long-lived party P_1. Thus the reputational concerns of the arbitrator make him care about the posterior beliefs held by P_1 and by M that he is competent. In practice one can think of situations where arbitrators may also wish to build a reputation for favouring one party in the dispute (e.g. the union in a labour dispute), although the mutual consent required for the appointment of an arbitrator does in practice offer some sort of safeguard towards this kind of favoritism. Also as shown by Bloom and Cavanagh (1986), there is only weak evidence that parties reward "loyal" arbitrators by reappointing them. Evidence is much stronger that parties value experience in arbitrators and good qualifications. Then by focusing on reputation for competency in this paper we highlight a much less intuitive and therefore more risky source of favoritism, the one arising precisely from the desire to appear competent. In light of this and to keep things as simple as possible, we assume that y equals the highest posterior belief of the arbitrator's future employer (P_1 or M); a lower weight assigned to the belief of P_1 blurs the distinction between a long-lived player and a short-lived one but has no qualitative impact on our results.

P_1 and M update their beliefs about the competency of the arbitrator rationally (being short-lived, the belief of P_2 play no role). We denote by $\alpha^d_{\sigma_1}$ $P_1's$ posterior belief that the arbitrator is competent upon observing signal σ_1, decision d, and given $P_1's$ conjecture about the strategy of C and I. The posterior belief of M depends on whether there is confidentiality. Under confidentiality, M does not observe the decision and therefore its posterior belief is equal to the prior γ. When instead the decision is public information the posterior belief of M, given a decision d and $M's$ conjecture about the strategy of C and I, is denoted by γ^d. We then have

$$y = \begin{cases} \max\left\{\alpha^d_{\sigma_1}, \gamma\right\} & \text{if there is confidentiality} \\ \max\left\{\alpha^d_{\sigma_1}, \gamma^d\right\} & \text{if the award is public information} \end{cases} \tag{2}$$

We use the concept of Perfect Bayesian Equilibrium to solve the model. Beliefs are derived from players' equilibrium strategies and the strategies are rational given those beliefs.

Further, we ignore "mirror" equilibrium, i.e. equilibria which take the original equilibrium and switch decisions from 1 to 2.

Timing

Period 1. (1.0) Two parties enter a contractual relationship involving technical issues of a dimension summarized by χ. Parties agree on whether to employ arbitration or a court system. If they agree on arbitration they select an arbitrator and choose whether to opt for confidentiality. (1.1) A dispute arises with unobservable state of the world θ, then Ψ is realized. (1.2) Each party observes a private signal σ_i, and the arbitrator chooses unobservable effort e^t in information acquisition. (1.3.) The competent arbitrator observes θ if in period 1.2. he has chosen $e^C = 1$, he observes nothing otherwise. (1.4.) The arbitrator chooses d, which is always observed by P_1 and P_2, and it is observed by M only if the award is public. P_1, P_2 and M update their beliefs on the arbitrator$'$s type.

Period 2. The arbitrator obtains income y, as defined in (2).

3 Confidential award

In this and in the next two sections we study decision making in arbitration. We then analyze the conditions under which parties choose to employ arbitration.

3.1 The payoffs

We start by considering the case of confidentiality. We proceed as follows. First we study the behaviour of the arbitrator C and of I, assuming that C has acquired information on θ. Then, in Section 3.3, we analyze the incentives for C to acquire information.

When the award is confidential, $M's$ posterior belief that the arbitrator is competent is equal to the prior γ. Thus the arbitrator can always obtain an income of at least γ in period 2. The arbitrator will obtain an income higher than γ only if he manages to "impress" P_1, i.e., only if $P_1's$ posterior belief $\alpha^d_{\sigma_1}$ is greater than γ. Since $P_1's$ posterior belief depends not only on d but also on the realization of σ_1, knowledge of θ can help the arbitrator predict σ_1 and thus affect his future income. In particular, if the arbitrator observes $\theta = i$ and makes a decision d, his expected income is given by

$$y = Pr(\sigma_1 = 1\,|\theta = i)\max\{\gamma, \alpha^d_1\} + Pr(\sigma_1 = 2\,|\theta = i)\max\{\gamma, \alpha^d_2\} \quad (3)$$

Instead, if the arbitrator has no information on the realization of θ, his expected income is

$$y = Pr(\sigma_1 = 1)\max\{\gamma, \alpha_1^d\} + Pr(\sigma_1 = 2)\max\{\gamma, \alpha_2^d\} \tag{4}$$

In light of this, let us now analyze the behavior of C. When C observes $\theta = 1$, he knows that P_1 can only have observed $\sigma_1 = 1$, since $Pr(\sigma_1 = 1\,|\theta = 1) = 1$. His expected income in period 2 is therefore $y = \max\{\gamma, \alpha_1^d\}$. It follows that if C chooses $d = 1$ his expected payoff is

$$V\,(d = 1|\,\theta = 1) = \mu + \max\{\gamma, \alpha_1^1\} \tag{5}$$

whilst if C chooses $d = 2$, he obtains

$$V\,(d = 2|\,\theta = 1) = \max\{\gamma, \alpha_1^2\} \tag{6}$$

Now consider the case where C observes $\theta = 2$. Here C knows that P_1 has observed $\sigma_1 = 1$ with probability $(1 - \nu)$ and $\sigma_1 = 2$ with probability ν. This is because $Pr(\sigma_1 = 1\,|\theta = 2) = 1 - \nu$, and $Pr(\sigma_1 = 1\,|\theta = 2) = \nu$. Thus, the expected payoff of C if he chooses $d = 1$ is

$$V\,(d = 1|\,\theta = 2) = \left[(1 - \nu)\max\{\gamma, \alpha_1^1\} + \nu\max\{\gamma, \alpha_2^1\}\right] \tag{7}$$

whilst if C chooses $d = 2$, his expected payoff is

$$V\,(d = 2|\,\theta = 2) = \mu + \left[(1 - \nu)\max\{\gamma, \alpha_1^2\} + \nu\max\{\gamma, \alpha_2^2\}\right] \tag{8}$$

We now turn to the behavior of I. Since I has no information on the state of the world, his expected income is given by (4), for any decision d. Using the fact that $\Pr(\sigma_1 = 1) = \frac{1}{2}(2 - \nu)$ and $\Pr(\sigma_1 = 2) = \frac{1}{2}\nu$, it follows that if I chooses $d = 1$ his expected payoff is

$$V(d = 1) = \frac{1}{2}\mu + \frac{1}{2}\left[(2 - \nu)\max\{\gamma, \alpha_1^1\} + \nu\max\{\gamma, \alpha_2^1\}\right] \tag{9}$$

whilst if he chooses $d = 2$, his expected payoff is given by

$$V(d = 2) = \frac{1}{2}\,\mu + \frac{1}{2}\left[(2 - \nu)\max\{\gamma, \alpha_1^2\} + \nu\max\{\gamma, \alpha_2^2\}\right] \tag{10}$$

In the next sections we use these payoffs to analyze the equilibrium of the game when the award is confidential.

3.2 Equilibrium

Consider first the case of a pooling equilibrium, and suppose that both C and I always choose $d = i$. Then using Bayes rule we have: $\alpha_1^i = \alpha_2^i = \gamma$, the posterior belief of P_1, given a decision $d = i$, is equal to the prior γ, regardless of the realization of σ_i. In this case when C observes $\theta = j$, if he chooses $d = i$ he obtains a payoff of γ, whilst if he chooses $d = j$, he obtains

$$V\left(d=j|\,\theta=j\right)=\mu+\left[\Pr\left(\sigma_1=1|\,\theta=j\right)\max\{\gamma,\alpha_1^j\}+\Pr\left(\sigma_1=2|\,\theta=j\right)\max\{\gamma,\alpha_2^j\}\right]$$

which is greater or equal to $\mu + \gamma$. Since $\mu > 0$, it follows that a pooling equilibrium where both C and I choose $d = i$ does not exist because C has an incentives to deviate to $d = j$ when he observes $\theta = j$. By so doing, he can guarantee himself a future income of γ and, at the same time, also enjoy the private benefit μ from taking the correct decision. Thus, when the award is confidential, if an equilibrium exists it must involve some separation between types. However, as the lemma below suggests, full separation is never an equilibrium.

Lemma 1 *Let $e^C = 1$. Under arbitration with a confidentiality provision, at the equilibrium (i) type I uses mixed strategies, implying*

$$\nu\left[\max\{\gamma,\alpha_2^2\}-\max\{\gamma,\alpha_2^1\}\right]=(2-\nu)\left[\max\{\gamma,\alpha_1^1\}-\max\{\gamma,\alpha_1^2\}\right] \tag{11}$$

and (ii) type C always chooses $d = \theta$.

Proof of Lemma 1 (i) Suppose by contradiction that I strictly prefers $d = i$ to $d = j$ and thus that he chooses $d = i$ with probability 1. Then $d = j$ is chosen in equilibrium only by C, and it is chosen with positive probability since we have shown that there is no pooling equilibrium. Using Bayes rule this implies $\alpha_1^i, \alpha_2^i < 1$ and $\alpha_1^j = \alpha_2^j = 1$. Therefore I obtains

$$\frac{1}{2}\mu+\left[Pr(\sigma_1=1)\max\left\{\gamma,\alpha_1^i\right\}+Pr(\sigma_1=2)\left\{\gamma,\alpha_2^i\right\}\right]\ \text{ if } d=i$$
$$\frac{1}{2}\mu+1 \text{ if } d=j$$

implying that I has incentives to deviate and choose $d = j$. It follows that at the equilibrium I must be indifferent between $d = 1$ and $d = 2$, implying $V(d = 1) = V(d = 2)$. Using (9) and (10), this yields (11). (ii) By rearranging terms we can rewrite (11) as

$$\left[(1-\nu)\max\{\gamma,\alpha_1^2\}+\nu\max\{\gamma,\alpha_2^2\}\right]-\left[(1-\nu)\max\{\gamma,\alpha_1^1\}+\nu\max\{\gamma,\alpha_2^1\}\right]=\left[\max\{\gamma,\alpha_1^1\}-\max\{\gamma,\alpha_1^2\}\right]$$

which in light of (5) to (8) suggests that if $LHS = RHS > 0$, then C always strictly prefers $d = \theta$ to $d \neq \theta$. If instead $LHS = RHS < 0$, then C prefers to choose $d = \theta$ for μ high and $d \neq \theta$ for μ small. The case of $d \neq \theta$ is a mirror equilibrium which we disregard.■

Lemma 1 follows from the desire of arbitrators to appear competent. The way for C to transmit information about his type in the clearest possible way is to select a different decision for any different θ. Ruling out mirror equilibria, this leads C to chooses $d = \theta$. Instead, I mixes over the two possible decisions, so that his decision conveys the least possible information about his type.

From Lemma 1, we can calculate the posterior belief of P_1. Using Bayes rule and the arbitrator′s equilibrium strategies, we have

$$\begin{gathered}\alpha_1^1 = \tfrac{\gamma}{\gamma+(2-\nu)(1-\gamma)z};\ \alpha_2^1 = 0 \\ \alpha_1^2 = \tfrac{\gamma(1-\nu)}{\gamma(1-\nu)+(2-\nu)(1-\gamma)(1-z)}; \alpha_2^2 = \tfrac{\gamma}{\gamma+(1-\gamma)(1-z)}\end{gathered} \tag{12}$$

where z denotes the probability that I chooses $d = 1$.

Lemma 2 *When the award is confidential, at the solution we have:* $\alpha_1^1, \alpha_2^2 > \gamma > \alpha_1^2, \alpha_2^1$.

Proof of Lemma 2. By taking the difference between $\alpha_{\sigma_i}^d$ and γ, we have $\alpha_2^2 > \gamma > \alpha_2^1$, and $\alpha_1^1 > \gamma > \alpha_1^2$ if $z \leq \frac{1}{(2-\nu)}$ and vice versa. Suppose that $z > \frac{1}{(2-\nu)}$ and therefore $\alpha_2^2, \alpha_1^2 > \gamma > \alpha_1^1, \alpha_2^1$. Then (11) implies: $\nu\left[\alpha_2^2 - \gamma\right] = (2-\nu)[\gamma - \alpha_1^2]$, which cannot hold since $\gamma < \alpha_2^2, \alpha_1^2$. Therefore it must be $z \geq \frac{1}{(2-\nu)}$.■

According to Lemma 2, $P_1's$ posterior belief $\alpha_{\sigma_i}^d$ that the arbitrator is competent is greater than the prior γ whenever the arbitrator's decision confirms the expectation of P_1, that is, whenever $d = \sigma_1$. This is critical since it suggests that the way for the arbitrator to secure himself a future income greater than γ is to "impress" P_1 by confirming his expectation. In light of Lemma 2, condition (11) becomes

$$\nu(\alpha_2^2 - \gamma) = (2-\nu)\left(\alpha_1^1 - \gamma\right), \tag{13}$$

$$i.e,$$

$$\frac{\nu z}{\gamma + (1-\gamma)(1-z)} = \frac{(2-\nu)(1-(2-\nu)z)}{\gamma + (2-\nu)(1-\gamma)z}$$

Let $l(z) \equiv \frac{\nu z}{\gamma+(1-\gamma)(1-z)}$ and $r(z) \equiv \frac{(2-\nu)(1-(2-\nu)z)}{\gamma+(2-\nu)(1-\gamma)z}$ in the above expression, thus $l(z)-r(z)$ is the difference in the expected payoff of I from choosing $d = 2$ rather than $d = 1$. Note that

$l(z)$ is increasing in z, with $l(z=0)=0$ and $l(z=1)=\frac{\nu}{\gamma}$, whilst $r(z)$ is decreasing in z, with $r(z=0)=\frac{(2-\nu)}{\gamma}>0$ and $r(z=1)=\frac{-(1-\nu)(2-\nu)}{\gamma+(2-\nu)(1-\gamma)}<0$. Thus $l(z)-r(z)$ is increasing in z : the greater the probability z that I chooses $d=1$ the less P_1 is impressed by a decision $d=1$ and the more he is impressed by a decision $d=2$. Furthermore, a solution to (13) with $z>0$ always exists and it is unique.[8] At $z=\frac{1}{2}$ we have

$$l(z=\frac{1}{2})-r(z=\frac{1}{2})=\frac{\nu\frac{1}{2}}{\gamma+(1-\gamma)\frac{1}{2}}-\frac{(2-\nu)\nu\frac{1}{2}}{\gamma+(2-\nu)(1-\gamma)\frac{1}{2}}\begin{cases}<0 & \text{for } \nu\neq 0,1\\ =0 & \text{for } \nu=0,1\end{cases}$$

which suggests that at $z=\frac{1}{2}$, I strictly prefers to choose $d=1$ to $d=2$ for $\nu\neq 0,1$. The following proposition is then obtained.

Proposition 1 *Let* $e^C=1$. *Under arbitration, when there is a confidentiality provision, there exists a decision bias in favour of the long-lived party and at the expense of the short-lived party. This decision bias is due to the incompetent arbitrator choosing* $d=1$ *with probability* $\widehat{z}(\nu,\gamma)\geq\frac{1}{2}$, *where* $\widehat{z}(\nu,\gamma)=\frac{1}{2}$ *for* $\nu=0,1$ *and* $\widehat{z}(\nu,\gamma)=(\frac{1}{2},1)$ *for* $\nu\neq 0,1$.

When the award is confidential, a decision bias in favour of the long-lived party arises. Whilst C always makes the correct decision (Lemma 1), I biases his decision in favour of the long-lived party with the aim to appear competent and thus increase his own chance to be employed by the long-lived party again. Since it is common knowledge that P_1 is more likely to observe $\sigma_1=1$ than to $\sigma_1=2$, the best way to pretend to be informed is to chooses $d=1$ more often than not; $z=\frac{1}{2}$ cannot be an equilibrium since I would strictly prefers to choose $d=1$ to $d=2$. Of course, I will not always decide in favour of the long-lived party because an excessive bias would signal incompetence, making the long-lived party attribute higher reputation to those arbitrators who decide against her.

There are only two cases where the decision bias does not arise: $\nu=0$ and $\nu=1$. When $\nu=0$, the parties are uninformed and the belief of P_1 following a decision d only depends on whether I is more likely to choose $d=1$ or $d=2$ at the equilibrium. I would then suffer a loss of reputation if he biased (in equilibrium) his decision in favour of P_1, since a decision $d=1$ would be associated with a posterior belief lower than γ. When $\nu=1$, the parties are perfectly informed and the belief of P_1 does not depend on which decision it is taken. The only way for the arbitrator to impress P_1 is by taking the correct decision.

[8] Since $r(z=\frac{1}{(2-\nu)})=0$, at the solution we must have $z<\frac{1}{(2-\nu)}$.

Proposition 1 shows that reputational concerns may create a decision bias in favour of P_1; the corollary below highlights how this bias is ultimately due to the parties being asymmetric.

Corollary 1 *When the parties are symmetric, i.e. they are either both long-lived or they are both short lived, there is no decision bias under arbitration and confidentiality.*

Proof of Corollary 1. Suppose that also P_2 is long-lived and let $\beta^d_{\sigma_2}$ denote his posterior belief that the arbitrator is competent following a decision d, upon observing a signal σ_2 and using players' equilibrium strategies. Following the same procedure as for the case of asymmetric parties, the payoff of C from choosing $d = \theta$ is given by

$$\begin{aligned} V\left(d=1|\,\theta\right. &= \left.1\right) = \mu + \left[(1-\nu)\alpha_1^1 + \nu\beta_1^1\right] \\ V\left(d=2|\,\theta\right. &= \left.2\right) = \mu + \left[(1-\nu)\beta_2^2 + \nu\alpha_2^2\right] \end{aligned}$$

whilst the payoff of I is

$$\begin{aligned} V(d &= 1) = \frac{1}{2}\mu + \frac{1}{2}\left[(2-\nu)\alpha_1^1 + \nu\beta_1^1\right] \\ V(d &= 2) = \frac{1}{2}\mu + \frac{1}{2}\left[(2-\nu)\beta_2^2 + \nu\alpha_2^2\right] \end{aligned}$$

Therefore, the mixed strategy condition becomes

$$\left[(2-\nu)\alpha_1^1 + \nu\beta_1^1\right] = \left[(2-\nu)\beta_2^2 + \nu\alpha_2^2\right]$$

leading to $\widehat{z} = \frac{1}{2}$. A similar procedure shows that $\widehat{z} = \frac{1}{2}$ when both P_1 and P_2 are short-lived.■

3.3 Information acquisition

Suppose now that $e^C = 0$. In this case C has no information about the state of the world and his behavior is the same as the behaviour of I. We can therefore calculate the value of information for C, by comparing the expected payoff of C when $e^C = 1$ with the expected payoff of I. From Lemma 1, and from (5) and (8), the expected payoff of C when he exerts effort is given by

$$EV^C = \mu + \frac{1}{2}\left(\alpha_1^1 + (1-\nu)\gamma + \nu\alpha_2^2\right)$$

whilst the expected payoff of C when he chooses $e^C = 0$ from Lemma 1 and from (9) is given by (using the fact that in equilibrium (9) and (10) are equal)

$$EV^I = \frac{1}{2}\mu + \frac{1}{2}\left[(2-\nu)\alpha_1^1 + \nu\gamma\right]$$

Taking the difference between the two expected payoffs and using (13) we obtain the value of information

$$EV^C - EV^I = \frac{1}{2}\mu + \frac{1}{2}\left(\alpha_1^1 - \gamma\right) \tag{14}$$

which yields the following lemma.

Proposition 2 *(i) Under arbitration, when there is a confidentiality provision, reputational concerns with the parties increase the incentives of the arbitrator to acquire information. In particular, type C exerts effort into information acquisition (i.e., $e^C = 1$) if $\Psi \leq \widehat{\Psi}$, where*

$$\widehat{\Psi}\left(\mu, \gamma, \nu\right) = \frac{1}{2}\mu + \frac{1}{2}\left(\alpha_1^1\left(\widehat{z}\left(\gamma, \nu\right)\right) - \gamma\right) \tag{15}$$

with $\widehat{\Psi}(\nu, .)$ increasing in ν. (ii) The presence of a decision bias reduces the incentives to acquire information.

Proof of Proposition 2 (i) It follows from the value of information being given by (14). (ii) Differentiating $\widehat{\Psi}(.)$ with respect to $\widehat{z}$ we have $\frac{\partial \widehat{\Psi}(.)}{\partial \widehat{z}} < 0$, implying $\widehat{\Psi}\left(\widehat{z}\right) < \widehat{\Psi}\left(z = \frac{1}{2}\right)$ for $\widehat{z} > \frac{1}{2}$.■

In principle, arbitration rules could be designed in such a way as to take away the control by the parties over the appointment of the arbitrator.[9] The benefit of this lack of control is that it can eliminate the decision bias, by reducing the incentives of the arbitrator to impress the long-lived party in the dispute. However, this benefit comes at a cost: as Proposition 2 suggests reputational concerns with the parties (even if it is just with one party) matter since they increase the incentives of the arbitrator to exert effort into information acquisition.

In particular, there are two factors that provide incentives to C to acquire information. First there are the outcome concerns, which are increasing in μ. Second, there are the reputational concerns with P_1. Since the arbitrator knows that P_1 may want to hire him again in the future if he perceives him as competent, C has incentives to appear competent to P_1. This is easier if C has information about θ than if he does not, because this is the advantage that C has over I : by observing θ, C can predict better than I, who does not observe θ, the realization of the signal σ_1 and therefore the view that P_1 has about the state of the world. For this reason reputational concerns with the parties increase incentives to acquire information. Instead, reputational concerns with M have no impact on the behaviour of the

[9] This is for example what the LCIA has done.

arbitrator. Since M is uninformed about θ and the decision is confidential, the behaviour of the arbitrator has no impact on the belief of M. Proposition 2 then also shows that the decision bias reduces the gain for C from observing θ and thus it weakens the incentives to acquire information. This is because the greater z the less P_1 is impressed by a favourable decision when he observes $\sigma_1 = 1$ and thus the lower the gain from impressing P_1.

Note that when the realized level of Ψ is greater than $\widehat{\Psi}$, it is public information that the arbitrator will not have sufficient incentives to acquire information and arbitration performs very poorly. However, what exactly happens in this case is irrelevant to our analysis; it could be that the parties renegotiate and decide to go to court, or that they throw a coin. For simplicity we assume that when $\Psi > \widehat{\Psi}$ each party obtains a favourable decision with probability $\frac{1}{2}$. It follows that the ex ante payoff of the party under confidentiality is given by

$$\widehat{U} = \frac{1}{2}(1 + F(\widehat{\Psi}, \chi)\gamma)u + c \tag{16}$$

Remark 1 *We have assumed that the parties suffer a loss from an incorrect decision $d \neq \theta$ but we have ruled out the possibility that a decision bias is harmful to the parties per se. However, in practice the decision bias can indeed reduce the joint surplus from the contractual relationship, when for example it is costly to raise funds to compensate the short-lived party for the future unfair division of the surplus that the decision bias will generate. If we introduced an explicit cost of decision bias, the case for arbitration with asymmetric parties would be further reduced. Our qualitative results would however remain unchanged.*

4 Public award

Now suppose that the parties choose to opt for a public award. Then M can observe the decision made by the arbitrator and update its belief accordingly. In particular, using Bayes rule we have

$$\begin{aligned} \gamma^1 &= \frac{\frac{1}{2}\gamma}{\frac{1}{2}\gamma + (1-\gamma)z} \\ \gamma^2 &= \frac{\frac{1}{2}\gamma}{\frac{1}{2}\gamma + (1-\gamma)(1-z)} \end{aligned} \tag{17}$$

where $\gamma^1 > \gamma > \gamma^2$ for $z < 1/2$ and vice versa. That is, if I chooses $d = 1$ with probability $z < 1/2$, M assigns a greater probability to the arbitrator being competent when it sees a decision $d = 1$ than when it sees a decision $d = 2$ The opposite holds if $z > 1/2$.

In this setting, it is easy to show that Lemma 1 continues to hold, implying that the posterior beliefs of P^1 are still given by (12), and that the mixed strategy condition, $V(d = 1) = V(d = 2)$, still holds. However, since $M\prime s$ beliefs are given by γ^d and not by γ, the mixed strategy condition now leads to

$$\nu\left[\max\{\gamma^2, \alpha_2^2\} - \max\{\gamma^1, \alpha_2^1\}\right] = (2-\nu)\left[\max\{\gamma^1, \alpha_1^1\} - \max\{\gamma^2, \alpha_1^2\}\right] \tag{18}$$

Taking the difference $\alpha_{\sigma_i}^d - \gamma^d$, using (12) and (17), it is also easy to show that an equivalent version of Lemma 2 continues to hold. In particular, we have

$$\alpha_{\sigma_1}^{d=\sigma_1} > \gamma^d > \alpha_{\sigma_1}^{d\neq\sigma_1} \text{for } \nu, z > 0 \tag{19}$$

Thus if the arbitrator confirms the belief of P_1, by choosing $d = \sigma_1$, he impresses P_1 and manages to secure himself a future income $y = \alpha_{\sigma_1}^{d=\sigma_1}$ greater than the income γ^d he would obtain from M in period 2. In light of (19), condition (18) becomes

$$\nu\left[\alpha_2^2 - \gamma^1\right] = (2-\nu)\left[\alpha_1^1 - \gamma^2\right] \tag{20}$$

which leads to the following proposition.

Proposition 3 *Let* $e^C = 1$. *Under arbitration, with public proceedings, there exists a decision bias in favour of the long-lived party and at the expense of the short-lived party. Whilst C chooses* $d = \theta$, *I randomizes by choosing* $d = 1$ *with probability* $\widetilde{z} \geq \frac{1}{2}$, *where* $\widetilde{z}(\nu, \gamma) = \frac{1}{2}$ *for* $\nu = 0, 1$ *and* $\widetilde{z}(\nu, \gamma) > \left(\frac{1}{2}, \widehat{z}\right)$ *for* $\nu \neq 0, 1$. *Compared to the case of confidentiality, the decision bias is reduced.*

Proof of Proposition 3. We can rewrite (20) as

$$\nu\left[\alpha_2^2 - \gamma\right] - (2-\nu)\left[\alpha_1^1 - \gamma\right] = \nu\left[\gamma^1 - \gamma\right] + (2-\nu)\left[\gamma - \gamma^2\right] \tag{21}$$

where

$$\nu\left[\gamma^1 - \gamma\right] + (2-\nu)\left[\gamma - \gamma^2\right] \begin{cases} \geq 0 & \text{if} \quad z \leq 0.5 \\ \leq 0 & \text{if} \quad z \geq 0.5 \end{cases} \tag{22}$$

Let $\widetilde{z}$ denote the solution in z to (21) and suppose, by contradiction, that $\widetilde{z} \leq 0.5$ for $\nu \neq 0, 1$. Then from (21) and (22), the LHS of (21) must be positive. Since the LHS of (21) is increasing in z and equal to zero at $z = \widehat{z}$ (from Proposition 1 and in particular condition 13) it follows that $\widetilde{z} \geq \widehat{z}$. Since $\widehat{z} > 0.5$ (from Proposition 1), we have a contradiction. Therefore, $\widetilde{z} > 0.5$. This in turn implies from (22) that at $z = \widetilde{z}$, the LHS of (21) must be negative. Using the fact that the LHS is increasing in z and equal to zero for $z = \widehat{z}$ it follows that $\widetilde{z} \in \left(\frac{1}{2}, \widehat{z}\right)$.■

Proposition 3 shows that the decision bias in favour of the long-lived party is greater when the award is confidential than when it is public, for any $\nu \in (0,1)$. The intuition can be understood by noticing that in equilibrium it is always I who biases his decision in favour of P_1 and the direction of the bias is anticipated by M. These two things imply that $M's$ posterior belief that the arbitrator is competent is higher when M observes a decision $d = 2$ than when he observes $d = 1$ (in fact $\gamma^1 > \gamma^2$ when $z > \frac{1}{2}$). Other things equal, this has the effect of decreasing the expected income of I from taking a decision $d = 1$, which reduces the incentives of I to bias his decision in favour of the long-lived party. Instead, when $\nu = 0{,}1$, the behaviour of I is the same as under confidentiality, and no decision bias arises.

4.1 Information acquisition

We can now calculate how the incentives of C to acquire information change when the award is public. Following the same procedure as in Section 3.3 we obtain the following lemma.

Lemma 3 *Under arbitration, with public proceedings, C acquires information if $\Psi \leq \widetilde{\Psi}$, where*

$$\widetilde{\Psi}(\mu, \gamma, \nu) = \frac{1}{2}\mu + \frac{1}{2}\left(\alpha_1^1\left(\widetilde{z}(\gamma, \nu)\right) - \gamma^2\left(\widetilde{z}(\gamma, \nu)\right)\right)$$

with $\widetilde{\Psi}(\nu, .)$ increasing in ν. Compared to the case of confidentiality, incentives to acquire information are stronger: $\widetilde{\Psi}(.) \geq \widehat{\Psi}(.)$.

Proof of Lemma 3. From Lemma 1, the expected payoff of C when he chooses $e^C = 1$ is given by

$$EV^C = \mu + \frac{1}{2}(1-\mu)\left(\alpha_1^1 + (1-\nu)\gamma^2 + \nu\alpha_2^2\right)$$

whilst the expected payoff of C when he chooses $e = 0$ coincides with that of I, given by

$$EV^I = \frac{1}{2}\mu + \frac{1}{2}(1-\mu)\left[(2-\nu)\alpha_1^1 + \nu\gamma^1\right]$$

Taking the difference between the two expected payoffs we have

$$EV^E - EV^I = \frac{1}{2}\mu + \frac{1}{2}(1-\mu)\left[\nu\left(\alpha_2^2 - \gamma^1\right) - (1-\nu)\left(\alpha_1^1 - \gamma^2\right)\right]$$

which in light of $\nu\left[\alpha_2^2-\gamma^1\right]=(2-\nu)\left[\alpha_1^1-\gamma^2\right]$ from (20), yields $\widetilde{\Psi}(\mu,\gamma,\nu)$ in the lemma. Simple computations show that for $\widetilde{z}(.)=\widehat{z}(.)=0.5$, $\widetilde{\Psi}(.)=\widehat{\Psi}(.)$. Since $0>\frac{\partial}{\partial\widetilde{z}}\widetilde{\Psi}(.)>\frac{\partial}{\partial\widehat{z}}\widehat{\Psi}(.)$, it follows that $\widetilde{\Psi}(.)>\widehat{\Psi}(.)$, for $\widetilde{z}(.)<\widehat{z}(.)$.■

As under confidentiality, with public proceedings the incentives for C to acquire information stem from both the outcome concerns and the reputational concerns of the arbitrator. However, incentives to acquire information are stronger with public proceedings. Intuitively, we have seen in Lemma 3 that the presence of decision bias reduces the incentives for C to acquire information. Since the bias in favour of P_1 is smaller when the award is public than when it is confidential, incentives to acquire information are greater when the award is public.

In light of Proposition 3 and Lemma 3, the ex ante payoff of the parties under public proceedings is

$$\widetilde{U}=\frac{1}{2}\left(1+F(\widetilde{\Psi},\chi)\gamma\right)u \tag{23}$$

5 Choosing confidentiality

Consider the choice of the parties as to whether to opt for confidentiality at the beginning of period 1. Conditional on the parties using arbitration in the event of a dispute, the parties will choose confidentiality if

$$\widehat{U}\geq\widetilde{U}$$

where $\widehat{U}$ and $\widetilde{U}$ are given by (16) and (23), respectively. Differentiating the difference between $\widehat{U}$ and $\widetilde{U}$ with respect to χ, we obtain the following proposition.

Proposition 4 *Conditional on the parties using arbitration, the incentives of the parties to choose confidentiality are non-increasing in the technical complexity of the subject matter and increasing in the value of confidentiality, c.*

Proof of 4 It follows from $F_{\chi\Psi}(.)\geq0$, implying $F_\chi(\widetilde{\Psi}(.),\chi)\leq F_\chi(\widehat{\Psi},\chi)$. ■

We have seen in Lemma 3 that $\widehat{\Psi}<\widetilde{\Psi}$, which implies that confidentiality increases the probability that $e^C=0$ is chosen by C. Building on this insight, the proposition above highlights a trade-off: when the subject matter is complex, providing incentives to C to acquire information is critical. To increase incentives for information acquisition, asymmetric parties may choose to give up confidentiality. However, when parties are both long-lived or are both short-lived there is no issue of bias and confidentiality can be optimally chosen whenever arbitration is chosen.

6 Arbitration versus Court

6.1 Selection of arbitrators by the parties

In this section we compare arbitration (A) with litigation in court (L), where litigation in court is identified as a dispute-resolution process in which the decision-maker is randomly selected, the dispute is public information and appeals are allowed. To study the role of appeals, we modify the basic model as follows. We assume that there is an appeals court, and if there is an appeal, the appeals court will be able to find verifiable evidence of the correct decision with probability r, whilst with probability $(1-r)$ it will find nothing and confirm the initial decision. The parameter r captures in a simple way the efficacy of the appeal system. Whether the appeal court finds the verifiable evidence or not is observable. Thus there is no agency problem with the appeals court, which allows us to continue to focus on incentives of decision makers. Recourse to appeal is costly for the party seeking an appeal; the cost is a random variable H distributed uniformly over the interval $[0,1]$. We assume that H is realized only after an initial decision is made, which implies that the decision maker views the appeal as uncertain. Relaxing this assumption has no qualitative impact on our results; it only adds an additional parameter. To simplify the analysis, we assume that a court judge in period 1 cannot become an arbitrator in period 2. Together with the fact that the decision maker is randomly selected, this implies that there is no role for reputational concerns with the parties under L. Relaxing this assumption would have no qualitative impact on our results concerning the choice between A and L, although it could introduce a decision bias in favour of the long-lived party also under L.

Let $e^C = 1$. As under A, under L, at the equilibrium the following strategies are adopted: type C chooses $d = \theta$, whilst type I randomizes by choosing $d = 1$ with probability z and $d = 2$ with probability $1 - z$. However, now there is no decision bias. To see this, take the behaviour of the losing party. Upon observing a decision $d = i$, P_j never goes to trial if she has observed an unfavourable signal $\sigma_j = i$, since she knows that $\Pr(\theta = j | \sigma_j = i) = 0$. Instead, P_j may gain from appealing if she has observed a favourable signal $\sigma_j = j$. In particular, P_j will choose to appeal if she has sufficiently high expectations to reverse the initial decision, that is if

$$r\Pr(\theta = j|\,\sigma_j = j, d = i)u - H \geq 0$$

Note that the incentive of the losing party to appeal increases in r and decreases in the cost of an appeal, H. For all $H \leq \overline{H}^i u$, where, using Bayes rule and players' equilibrium strategies,

$$\overline{H}^i \equiv r\Pr(\theta = j|\,\sigma_j = j, d = i) = \begin{cases} \frac{r(1-\gamma)z}{[\gamma(1-\nu)+(2-\nu)(1-\gamma)z]} & \text{if } d = 1 \\ \frac{r(1-\gamma)(1-z)}{[\gamma(1-\nu)+(2-\nu)(1-\gamma)(1-z)]} & \text{if } d = 2 \end{cases}$$

the losing party will appeal if and only if she has observed a favourable signal. For all $H > \overline{H}^i$, the losing party never appeals.

Now consider the payoff of type C from choosing $d = \theta$. Appeals have an impact on the decision-maker's reputation.[10] In particular, with probability $\overline{H}^i$, $H \leq \overline{H}^i$ is realized and the losing party appeals if she has observed a favourable signal. Since $d = \theta$, in appeal, $C's$ decision is proven correct with probability r, and, through Bayesian updating $M's$ posterior beliefs are given by

$$\overline{\gamma}^1 = \frac{\gamma}{\gamma + (1-\gamma)z};\ \overline{\gamma}^2 = \frac{\gamma}{\gamma + (1-\gamma)(1-z)}$$

Instead, with probability $1-r$, the appeal court does not observe any verifiable information and the initial decision is automatically confirmed. In this case, however, the signal of the losing party is inferred by M through her decision to appeal. Thus $M's$ posterior beliefs, following a decision $d = 1$ and decision $d = 2$, are respectively

$$\overline{\overline{\gamma}}^1 = \frac{\gamma(1-\nu)}{\gamma(1-\nu) + (2-\nu)(1-\gamma)(1-z)};\ \overline{\overline{\gamma}}^2 = \frac{\gamma(1-\nu)}{\gamma(1-\nu) + (2-\nu)(1-\gamma)z} \tag{24}$$

Finally, when $H > \overline{H}^i$ is realized, which occurs with probability $(1 - \overline{H}^i)$, appeals costs are so high that under no circumstances will the losing party consider to appeal. Thus no information about the correctness of $C's$ decision is revealed.

In light of the above, the payoff of C from choosing $d = \theta$ is

$$V^C(d = i|\,\theta = i) = \mu + \overline{H}^i\left(r\overline{\gamma}^i + (1-r)\overline{\overline{\gamma}}^i\right) + (1 - \overline{H}^i)\gamma^i$$

with γ^i given by (17).

[10] Infrequency of reversal on appeal plays a significant part in judicial promotion in almost all countries (see e.g. Miceli and Cosgel, 1994).

Consider now the payoff of I from randomizing between decisions. With probability $\frac{1}{2}$, I takes the correct decision and obtains the same payoff as C. With probability $\frac{1}{2}$, $I's$ decision is incorrect. In this case, with probability $r\overline{H}^i$, the decision is reversed in appeal and $I's$ type is fully revealed. In the remaining case, $M's$ posterior beliefs will be the same as in the discussion above for type C and thus be given by (24). It follows that the expected payoff of I when he chooses $d = i$ is given by

$$V^I(d=i) = \frac{1}{2}V^C(d=i|\,\theta=i) + \overline{H}^i(1-r)\overline{\overline{\gamma}}^i + \frac{1}{2}(1-\overline{H}^i)\gamma^i$$

Let superscript $k = ll, ss, sl$ denote a situation where both parties are long lived (indexed by ll), or both parties are short lived (indexed by ss) or one party is long-lived and one is short-lived (indexed by sl), we obtain the following proposition.

Proposition 5 *(i) There exists a cutoff value of* r, *denoted by* $r_k(c)$ *such that for* $r \leq r_k(c)$ *parties prefer arbitration to litigation in court, whilst for* $r > r_k(c)$, *the opposite holds. (ii)* $r_k(c)$ *is non-decreasing in* c, *that is parties are more likely to prefer arbitration to litigation in court when the value of confidentiality is high; (iii)* $r_{ll}(c) < r_{sl}(c) < r_{ss}(c)$, *parties are most likely to choose arbitration when they are both long-lived whilst they are least likely to choose arbitration when they are both short lived.*

Proof of Proposition 5. By equating $V^I(d=1)$ to $V^I(d=2)$, we obtain $\overline{z} = \frac{1}{2}$. The difference between EV^C and $V^I(d=1)$, then gives $\overline{\Psi} = \frac{1}{2}\mu + \frac{1}{2}r\overline{H}^1\overline{\gamma}^1$. In light of this, the ex ante payoff of the parties under L in case k is

$$\overline{U}_k^L(r) = \left[\frac{1}{2}\left(1 + F(\overline{\Psi},\chi)\gamma\right) + \frac{1}{2}(1-\gamma)\,r\overline{H}^1\left(r - \overline{H}^1\right)\right]u$$

where it is immediate that $\overline{U}_{ll}^L(r) = \overline{U}_{ls}^L(r) = \overline{U}_{sl}^L(r)$, since period 2 plays no role. Now, with a slight abuse of notation, let us denote by $\widehat{U}_k^A$ and $\widetilde{U}_k^A$ the expected payoff of the parties in case k under A, respectively when there is a confidentiality provision and when there is not. Following the same procedure as in Section 3, we have $\widehat{U}_{ll}^A > \widehat{U}_{ls}^A > \widehat{U}_{ss}^A$. This result intuitively follows from Corollary 1 and Proposition 2(ii). Comparing $\overline{U}_k^L$ with $\max\{\widetilde{U}_k^A, \widehat{U}_k^A\}$, noting that $\overline{U}_k^L(r)$ is increasing in r, with $\overline{U}_k^L(r) \geq \widetilde{U}_{ss}^A = \frac{1}{2}\left(1 + F(\frac{1}{2}\mu,\chi)\gamma\right)$, for all r, and $\overline{U}_k^L(r=1) > \widetilde{U}_{ll}^A > \overline{U}_k^L(r=0)$, the result follows.■

To highlight the role of selection of arbitrators by the parties as opposed to random selection of judges under litigation in court, consider the case where there are no appeals not just under A but also under L. This occurs when $r = 0$. In this case, the incentives to acquire information are weaker under L than under A because of the incentives role that reputational concerns with the parties generate under A and not under L. For this reason the parties prefer A to L when $r = 0$.

Now consider the opposite case, where appeals take place and are perfectly informative, as is the case when $r = 1$. Appeals improve the quality of the decision under L for two reasons. First, if there is an appeal, the correct decision is found with probability $r = 1$. Second, if there is no appeal but the cost of an appeal is low, it is inferred that the losing party had a pessimistic view as to the probability of winning, which perfectly reveals her signal. Because of these two reasons, the decision maker is subject to a better assessment of the quality of his decision than under no appeals and, being the assessment symmetric, there is no decision bias. Finally, under L the incompetent decision maker faces the threat of reversal in appeal where reversal perfectly revels his incompetency, whereas under A, the arbitrator's incompetency is never perfectly revealed to the market. For this reason incentives to acquire information are higher under L than under A, and parties prefer L to A.

Cases where $r \in (0, 1)$ fall between these two extremes. Then we obtain three results. First, A is more likely to be chosen when the value of confidentiality is high. This is because the parties can always choose confidentiality under A, whilst they cannot choose it under L. Second, A is most likely to be chosen when parties are both long-lived parties. This follows from Proposition 1 and Corollary 1. When parties are symmetric, no decision bias arises, and if they are also both long-lived rather than short-lived, reputational concerns with the parties generate the strongest incentives to acquire information. If instead both parties are short-lived, reputational concerns with the parties pay no role and the incentives for the arbitrator to acquire information only depend on outcome concerns. The case of one long-lived party and one short-lived one falls between these two extreme. In this case reputational concerns still enhance information acquisition incentives although to a lower extent than when both parties are long lived, since the decision bias reduces the incentives to acquire information.

From this discussion it is apparent that the comparison between A and L is one between ex ante and ex-post monitoring. Under A, appeals are not allowed and therefore there is no ex post monitoring. However, parties have the possibility to select the decision maker and thus to use their knowledge of the decision maker competency to make their decision. Under L, parties' preferences play no rule in the selection of the court judge and as such ex ante monitoring is absent.

7 Conclusion

In this paper we have argued that the three main features of arbitration, namely, selection of arbitrators by the parties, finality of the decision and confidentiality, may result in biased and uninformed decision making when the parties to the dispute are asymmetric. In this respect the paper predicts that asymmetric parties will be, ceteris paribus, less inclined to choose arbitration as their dispute-resolution mechanism than symmetric and long-lived parties. However, selection of arbitrators by the parties has beneficial effects since it compensates for the lack of an appeal mechanism as monitoring device for arbitrators. Its effects are the highest when both parties to the disputes are long lived.

Our results help to explain the role for arbitration institutions. Arbitration institutions have created a market for their services by developing mechanisms for selecting and monitoring their recommended arbitrators so as to reduce problems of bias (for an extensive discussion, see Drahozal, 2001).[11] Some institutions have even chosen explicitly to be in charge of appointing arbitrators (for example the LCIA). In any case, the list of arbitrators held by the arbitration institution is normally consulted by the parties, and the institutions update and change their list of arbitrators on a regular basis. Arbitration institutions also require their arbitrators to disclose any information that might be relevant to the standards of neutrality, including service as a neutral in any past or pending case involving any of the parties (see e.g. ICC Rules of Arbitration or AAA's National Rules for the Resolution of Employment Disputes). Failure to abide by these rules can expose the award to challenge, and jeopardize the reputation of the arbitrator. Also according to the AAA Code of Ethics for Arbitrators (2004), for example, for a reasonable period of time after the decision of a case, arbitrators should avoid entering into any business, professional, or personal relationship with any of the parties to the disputes. Failure to comply is likely to lead to the arbitrator being struck off the institutional list of recommended arbitrators.[12] An explicitly modelling

[11] This is administered or institutional arbitration as opposed to a non-administered or ad hoc arbitration. It is often argued that ad hoc arbitration may be problematic due to the lack of institutional oversight.

[12] Legal scholars have also suggested (see Bingham 1998) to increase the pool from which arbitrators may be selected so as to render their economic interest less direct, or to adopt random assignment of arbitrators to lists so as to reduce the likelihood of repeat appearance on each list of any single arbitrator. In *Thomas v. Workmen's Compensation App. Board, 680 A.2d 24* (Pa. Comm. 1996), the court used the fact that an arbitator was randomly assigned to hear the case as tending to show there was no bias.

of the role of arbitral institutions could constitute an interesting scope for future research.

A possibility not analyzed in this paper is the use of tripartite arbitral panels. Practitioners tend to recommends the use of tripartite panels for disputes with a great financial stake, and the use of a sole arbitrator otherwise. This suggests that incentives to make the correct decision may be stronger when the number of arbitrators increases. However, the incentives to acquire information of an individual arbitrator may be weaker, because of free riding. A full analysis of decision making by tripartite arbitral panels could constitute an interesting scope for future research.

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