

Arbitration: Committee preferences and information acquisition

MALIN ARVE* AND CLAUDINE DESRIEUX†

March 6, 2017

Abstract

We model three-arbitrator committees whose task is to solve a conflict between two disputants. The correct decision depends on the state of the world that is imperfectly known. Committee member can make an effort to learn about the true state of the world. We compare committees made up neutral arbitrators (neutral committees) to committees including two biased arbitrators (polarized committees). We determine some conditions under which polarized committees may perform better than neutral committees. Our results have implications for the procedural rules governing the appointment of arbitrators.

1 Introduction

Whether in international commercial contracts, foreign direct investments or labor management disputes, arbitration has become an often-used method of dispute resolution. Instead of going to courts, the conflict opposing two parties is submitted to a third party (called *arbitrator*) - or a panel of third parties (*an arbitral tribunal*) - whose final decision is binding. Arbitration allows experts as judges, confidentiality about the decisions, and may be more flexible and faster than litigation. A key characteristic is also the arbitrators' appointment principle. Under a three-arbitrator panel, each party appoints one arbitrator and the third member, who serves as President, is decided by mutual agreement or by the appointed co-arbitrators. International conventions generally mention that all arbitrators must be independent and free of conflict of interest.¹ But the temptation is high for any

*NHH Norwegian School of Economics. E-mail: malin.arve@nhh.no.

†CRED, University Paris 2. E-mail: claudine.desrieux@u-paris2.fr.

¹As an example, the article 14(1) of the ICSID (International Centre for Investment Dispute) Convention stipulates that all arbitrators must be “persons of high moral character and reconized competence in the fields of law, commerce, industry, finance, who may be relied upon to exercise independent judgment”.

party to look for a supporter of one's situation rather than a strict neutral arbitrator. In this paper, our goal is to determine whether the presence of pro-appointer arbitrators impacts the efficiency of the dispute resolution or not. To address this issue, we compare the efficiency of three-arbitrator committees when they include pro-appointer arbitrators or only neutral arbitrators.

Statistics from the International Court of Arbitration of the International Chamber of Commerce (ICC), the most popular arbitral organization, show that 930 arbitrators among the 1,301 arbitrators appointed in ICC arbitrations were selected by the parties (Brekoulakis (2013)). The right of the parties to participate in the constitution of arbitral tribunals is even considered as "the very essence of arbitration" (Rau (1997)).² Having the right to choose the panel composition does not yet mean that biased arbitrators should be designated. Several recent examples illustrate this point: IMF Chief Christine Lagarde was recently accused of negligence in overseeing an arbitration case with an impartial arbitrator³, and in the United Kingdom, the High Court has removed an arbitrator from a construction dispute in April 2016 (*Cofely Ltd v Bingham and Knowles Ltd*), because he may have been biased towards one of the parties involved. More broadly, arbitrators should have no significant financial or personal interest in one of the parties, or the outcome of the case.⁴ Yet, as one practitioner puts it: "*in selecting his party appointed arbitrator, [the counsel's] choice will be guided not primarily by an interest in finding a strictly impartial or neutral individual, but by the hope of employing one with qualities which tend to give him and his client the greatest assurance that their viewpoint will be understood, appreciated and, ultimately will prevail (...) strictly neutral panels are not what the disputants seek*".⁵ In our model, we assume that arbitrators can be either neutral or in favor of one party. Political scientists and legal scholars have discussed arguments about these two assumptions. On the one hand, arbitrators are a close-knit community. Professional barriers to entry (notably the requirement of legal experience) and institutional codes of ethics regulate the conduct of individual arbitrators. On the other hand, because arbitrators compete for re-appointment, pro-appointer bias may develop to hope for future nominations. Some arbitrators may also have the mistaken belief that they have an obligation to the party that appointed them. To avoid - or at least

²An arbitration clause that would provide that 'if a dispute arises, one party will appoint all members of the tribunal' would most likely be an invalid arbitration clause. In its decision dated of 7 January 1991 (*Dutco v. BKMI and Siemens*), the French *Cour de Cassation* relies on the principle of equality of the parties in the appointment of arbitrators [which] is a matter of public policy."

³In this case, Bernard Tapie, a French tycoon, was awarded in 2008 more than 400 million euros to settle a dispute with the partly state-owned bank *Credit Lyonnais*. A scandal emerged as one of the arbitrator, a former senior French Judge, was said to have ties with Mr Tapie's lawyer. Mrs Lagarde was charged with negligence for allowing the arbitration and for declining to appeal the verdict. In December 2016, a special French court found Lagarde guilty of negligence but not for allowing the arbitration in the first place.

⁴See the IBA (*International Bar Association*) *Guidelines on Conflicts of Interest in International Arbitration* (October 2014) for lists of specific situations indicating whether they warrant disclosure or disqualification of an arbitrator.

⁵"Effective Selection of International Arbitrators in International Arbitration", James Wangelin, Mealey's International Arbitration Report, November 1999.

limit - these situations, some legal scholars even suggest that an external authority could be in charge of arbitrators' appointment instead of the parties (Martinez (2012); Brekoulakis (2013)). Surprisingly, little has been done in the theoretical economic literature to contribute to this question. Our paper tries to fill this gap by exploring how incentives to search for truth are determined by the appointment of neutral or pro-appointer arbitrators in three-member panels. In our model, we consider arbitration committees made up of three members whose goal is to solve a dispute between two parties. The correct decision depends on the realized state of the world that is imperfectly known by the committee members. However, the committee members receive a signal correlated with the true state of the world, and whose quality is increasing with a costly effort: a higher level of effort implies a higher correlation between the true state of the world and the signal. Two types of committees -polarized and neutral committees- are under study. A polarized committee means that each party to the conflict appoints for an arbitrator defending its own interest whatever the state of the world. The third member of the committee prefers the "correct" decision, i.e. wants to make the decision regarding the realized state of the world. He then represents the "pivotal" member of the committee that basically makes the decision. On the opposite, a neutral committee is made up of three members looking for a fair decision, i.e. they all want to match the decision with the true state of the world. We then explore the behavior of each member regarding the effort to learn about the true state of the world, when the effort cost function is strictly convex, and efforts can be either perfect complements or substitutes. We also explore the case of weakly convex cost functions. Our results show that neutral committees perform better to determine the decision in accordance to the true state of the world when the effort cost function is strictly convex, and efforts are complements or substitutes. Yet, they may underperform with a weakly convex cost function. Our results may contribute to current discussions on the procedures governing arbitrators' appointment.

This paper is related to several strands of the economic literature. First, many papers have investigated collective decision making in committees using game theoretic settings.⁶ Based on the seminal work of Condorcet (1785), the modern literature has investigated problems of jury's size (Feddersen and Pesendorfer (1998); Cai (2009)), optimal decision rule (Levy (2007); Ben Yasar and Nitzan (2014)), strategic voting (Austen (1996); Feddersen and Pesendorfer (1996, 1999)), incentives for information acquisition (Dewatripont and Tirole (1999); Martinelli (2006); Mukhopadhyaya (2003); Persico (2000); Gershkov and Szentes (2009)), conflicting interests (Feddersen and Pesendorfer (1997); Gerardi (2000); Gruner and Kiel (2004); Li (2001)) and communication (Doraszelski et al. (2003); Gerardi and Yariv (2007); Schulte (2012)). We build on this literature, and especially on Feddersen and Pesendorfer (1998) and Schulte (2010), to model how committee members decide when information is imperfect. Another part of the literature has been dedicated to the study of alternative dispute resolution. Some papers have compared arbitration and mediation (Goltsman et al. (2009); Horner et al. (2015)). The comparison between the various types of arbitration (i.e. Final Offer Arbitration or conventional Arbitration) has

⁶See Gerling et al. (1997) for a survey.

also drawn some attention for long (Crawford (1979); Pecorino (1998, 2003); Olszewski (2011)). While our focus is also on arbitration, we depart from this literature by exploring the specific issue of arbitrators' appointment. We consider three-arbitrator committees whose composition may diverge: the three members can be either neutral, or two of them may be polarized. The empirical literature gives us some evidence to justify the partiality of some arbitrators. Strezhnev (2016) shows that the nationality of the presiding member or its professional background may significantly impact the decision. Repeated appointments of arbitrators may also influence their behavior (Waibel and Wu (2012); Van Harten (2007)). However, empirical evidence is mixed as some other works show no significant correlations between those factors and the decisions made in arbitration cases (Frank (2009); Kapeliuk (2010); Schneiderman (2010)). This gives empirical support to our two assumptions (neutral and biased arbitrators). Our theoretical model sheds a new light on this literature by exploring the consequence of polarized and neutral committees on the dispute resolution.

Our paper is organized as follows. Section 2 describes our theoretical set-up. Section 3 established the committee members' incentives to make effort under polarized committees, while section 4 determines these incentives under neutral committees. Section 5 compares the committees' efficiency under two alternative assumptions: either the cost function is strictly convex (and efforts can be perfect substitutes or complements), or the cost function is weakly convex. Section 6 discusses our results and concludes.

2 The model

A conflict between two parties arises and the parties have chosen to resolve the issue using arbitration. Thus, a collective decision $x \in \{a, b\}$ has to be made by majority voting without abstention in an arbitration committee consisting of three members. A decision $x = a$ represents a decision in favor of party A and $x = b$ in favor of party B.⁷ Utility from the decision is state-dependent. There are two possible states of nature, $\omega \in \{A, B\}$. In state $\omega = A$ party A is correct and in state $\omega = B$ party B is correct. There is uncertainty about the realization of the state of the world. Ex ante both states are equally likely.

The committee receives a signal $\sigma \in \{\alpha, \beta\}$, which is correlated with the true state of the world:

$$\text{prob}\{\sigma = \alpha | \omega = A\} = \text{prop}\{\sigma = \beta | \omega = B\} = q(e), \frac{1}{2} < q(e) < 1.$$

The signal is imperfectly informative about the state of the world and depends on the effort that the committee members invest in working on the case. We denote by e_i , committee member i 's effort, $i \in \{1, 2, 3\}$ and $e \equiv (e_1, e_2, e_3)$. We assume that more effort implies a higher correlation between the true state of the world and the signal, i.e.,

⁷For instance, the conflict could be about which disputant will pay for accidental damages or it could involve the allocation of a valuable resource in a commercial dispute.

$q_{e_i}(e) \geq 0$. The cross derivatives will be important for our results.

The signal is received by the entire committee. Let us not that if each member receives private signals but these are hard information, our model should work in the same way. There will be full information revelation in equilibrium as long as the preferences of each member are known: if one member would refuse to reveal his own signal, the others would know that the information is unfavourable to his favorite decision.

Effort is costly for the committee members. The cost of effort for committee member i is $C(e_i)$, where this cost is increasing and (weakly) convex ($C'(e_i) > 0$ and $C''(e_i) \geq 0$).

The committee members derive state-dependent utility from the collective decision $U_i = u_i(x, w)$. Throughout the analysis we assume a certain degree of homogeneity in preferences, which ensures that the desirability of decision $x = a$ weakly increases in the probability that the state is $\omega = A$ for each agent. This assumption is formally stated in the following Assumption.

Assumption 1.

$$u_i(a, A) + u_i(b, B) - u_i(a, B) - u_i(b, A) > 0, \forall i \in \{1, 2, 3\}.$$

Let $p(\omega = A)$ denote the probability that the committee assigns to the state of the world $\omega = A$ given the information available to them. A committee member i prefers the implementation of a rather than b if and only if

$$p(\omega = A) > \frac{u_i(b, B) - u_i(a, B)}{u_i(a, A) + u_i(b, B) - u_i(a, B) - u_i(b, A)}.$$

Notice that even though the committee has access to the same information and have the same beliefs about the state of the world, their threshold for preferring action $x = a$ varies across their preferences. This threshold above which committee member i prefers decision $x = a$ is called *threshold of doubt* in the literature (Feddersen and Pesendorfer, 1998; Schulte, 2010).

Given Assumption 1, a threshold below 0 means that $u_i(b, B) - u_i(a, B) < 0$. In other words, the committee member i always prefers decision a whatever the true state of the world (A or B). Symmetrically, a threshold above 1 means that committee member i always prefers decision b regardless of the true state of world. It is only when the threshold is between 0 and 1 that agent i is willing to make his decision (a or b) regarding to the probability that the true state of the world is A .

Preferences are common knowledge and we do not allow for transfer schemes. The solution concept is Perfect Bayesian Nash equilibrium. That is, at each possible node of the game in which a player is asked to take an action, the action is required to be a best response to the other players' strategies given the beliefs, and beliefs need to be consistent with equilibrium strategies.

The timing of the game is as follows:

1. Nature chooses the state of the world.

2. Each committee member decides for its level of effort e_i .
3. The committee gets a signal correlated to the efforts made by the members.
4. Committee members vote for their preferred decision. The majority rule is applied to determine the final decision and payoffs are realized.

3 Polarized committees

Consider the case where the committee members have the following preferences:

$$\begin{aligned}
 u_1(a, A) &= u_1(a, B) = 1, & u_1(b, A) &= u_1(b, B) = 0, \\
 u_2(a, A) &= u_2(b, B) = 1, & u_2(a, B) &= u_2(b, A) = 0, \\
 u_3(b, A) &= u_3(b, B) = 1, & u_3(a, A) &= u_3(a, B) = 0.
 \end{aligned}$$

This implies that committee member 1 always prefers $x = a$ regardless of the probability that A is the true state. Likewise, committee member 3 always prefers $x = b$. However, committee member 2 prefers to match the state w and the decision x , i.e., he prefers the “correct” decision.

With such a polarized committee, in a vote for what decision to choose, committee member 2 is always pivotal and determines the final outcome x after having observed the signal σ and updated his beliefs about the state of the world.

Given that committee member 2 will be crucial for determining what decision is taken, each committee member chooses the effort to be put into the case. Each committee member i chooses effort so as to maximize his own expected utility from the decision. Formally

$$\max_{e_i} \frac{1}{2} [q(e)U_i(a, A) + (1 - q(e))u_i(b, A) + (1 - q(e))u_i(a, B) + q(e)u_i(b, B)] - C(e_i)$$

It is straightforward to see that both committee member 1 and 3 have no incentive to put effort into improving the signal as $q(e)$ does not influence their expected utility. This holds regardless of what level of effort is chosen by the other committee members. Committee member 2, however, chooses an effort level e_2^P in a polarized committee that equalizes his marginal benefit from an improved signal and the marginal cost of effort:

$$q_{e_2}(0, e_2^P, 0) = C'(e_2^P).$$

4 Neutral committees

Consider now the case where the committee is neutral and each member would prefer to match the decision to the true state of the world in such a way that:

$$u_i(a, A) = u_i(b, B) = 1, \quad u_i(a, B) = u_i(b, A) = 0, \quad \forall i.$$

At the decision stage, the committee always agrees on what the best decision is and following a signal $\sigma = \alpha$ decision $x = a$ is made unanimously and following $\sigma = \beta$ decision $x = b$ is chosen.

In this environment, each committee member chooses effort to maximize his expected utility:

$$\max_{e_i} q(e) - C(e_i).$$

In other words, each member i chooses effort e_i such that

$$q_{e_i}(e) = C'(e_i).$$

If each member's effort has the same effect on the likelihood of observing an informative signal, they all choose the same effort level.

5 Committees' efficiency

5.1 Strictly convex effort cost function

We first explore the case of strictly convex effort cost functions, i.e. $c'(e_i) > 0$ and $c''(e_i) > 0$. For instance, arbitrators need to learn a lot about the case and the environment so that each effort corresponds to a strictly convex effort.

5.1.1 Efforts as perfect substitutes

When efforts are perfect substitutes (strategic complements), they can be aggregated to get the signal about the true state of the world. Let's denote E the total effort of the committee to get the signal. The probability to get a representative signal becomes

$$q(E) = q(e_1 + e_2 + e_3)$$

Under a neutral committee, $\forall i, j, k \in \{1; 2; 3\}$ with $i \neq j$, $j \neq k$, $k \neq i$, we get:

$$q'(E^{N_s}) = q'(e_i^{N_s} + e_j^{N_s} + e_k^{N_s}) = c'(e_i^{N_s}) \quad (1)$$

where the superscript N_s stands for "Neutral committees and perfect Substitutes".

Under a polarized committee, only committee member i (the neutral member) has some incentives to acquire information. The other members (k, j) choose $e_j^{P_s} = e_k^{P_s} = 0$. The incentives of committee member i to acquire information are given by:

$$q'(e_i^{P_s}) = c'(e_i^{P_s}) \quad (2)$$

where the superscript P_s stands for "Polarized committees and perfect Substitutes".

Result 1. (a) The neutral party exerts more effort in a polarized committee than under a neutral committee ($e_i^{P_s} > e_i^{N_s}$).

(b) The total efforts are higher in a neutral committee than in a polarized committee ($e_1^{N_s} + e_2^{N_s} + e_3^{N_s} > e_1^{P_s}$ with $e_2^{P_s} = e_3^{P_s} = 0$).

Proof in appendix.

5.2 Efforts as perfect complements

When efforts are perfect complements, they only provide information when they are made together. The total effort function is represented by:

$$q(E) = q(\min(e_1, e_2, e_3))$$

Under a neutral committee, each committee member has an incentive to exert effort such that:

$$q'(e_i^{N_c}) = c'(e_i^{N_c})$$

where the superscript N_c stands for “Neutral committees and perfect Complements”.

On the opposite, any member makes effort in a polarized committee. Biased members do not have any interest to make efforts, so that the yield of the neutral committee member is zero when efforts are perfect complements. We get $e_i^{P_c} = 0 \forall i \in \{1; 2; 3\}$ and $E^{P_c} = 0$.

Result 2. (a) When efforts are perfect complements, the incentives to make efforts to get a signal are higher in a neutral committee compared to a polarized one: $E^{P_c} = e_2^{P_c} = 0 < e_2^{N_c} < E^{N_c}$.

(b) The signal is more accurate in a neutral committee than in a polarized one ($q(E^{N_c}) < q(E^{P_c})$).

5.3 Weakly convex cost function

Our previous results show that neutral committees are better at searching information to decide on the case than polarized committees. However, our previous results stand for strictly convex cost functions. Let us now examine the case of a weakly convex function. For instance, arbitrators are well-known experts in their field so that searching for information implies a weakly convex cost. We assume that $c(e_i) = e_i$ so that $c'(\cdot)$ is independant of e_i and $c''(e_i) = 0$.

We also choose the following function to account for the signal’s quality:

$$q(e_1, e_2, e_3) = X - \alpha_1 \sum_{i=1}^3 (1 - e_i)^2 + \alpha_2 (e_1 e_2 + e_1 e_3 + e_2 e_3)$$

with $\alpha_1 > \frac{1}{2}$ and $\alpha_1 > \alpha_2$.

The probability to get a signal correlated to the true state of the world then depends on efforts made by all committee members. However, we distinguish two impacts of committee member i 's effort. The first impact is a direct effect of this effort on the signal's quality (measured by the coefficient α_1). The second impact is similar to an externality effect of member i 's effort on the other members (j and k , with $i \neq j \neq k$). The coefficient α_2 accounts for externality effects between each pair of members' efforts. The function $q(\cdot)$ is strictly concave ($q_{e_i e_i} < 0$.)

We assume that $\alpha_1 \geq 1$ and $\alpha_2 < \alpha_1$. The direct effect of the effort is stronger than the indirect one ($\alpha_1 > \alpha_2$).

5.3.1 Individual efforts under neutral and polarized committees

In a neutral committee, each member's effort becomes $q'(e_i) = c'(e_i) \Leftrightarrow 2\alpha_1(1 - e_i) + 2\alpha_2 e_i = 1$. This leads to

$$e_i^N = \frac{2\alpha_1 - 1}{2(\alpha_1 - \alpha_2)} \quad (3)$$

In a polarized committee, assuming that member 2 is the neutral member, his incentive to make an effort e_2 is given by $2\alpha_1(1 - e_2) = 1$. This leads to

$$e_2^P = \frac{2\alpha_1 - 1}{2\alpha_1} \text{ and } e_1^P = e_3^P = 0 \quad (4)$$

5.3.2 Comparison between neutral and partial committees

Let us now compare whether some cases occur where the signal's quality is higher under a polarized committee than under a neutral one. By replacing e_i by their respective values, and putting the probability to get a signal to zero in case of negative values, we get:

$$q(E^N) = -3\alpha_1 \left(1 - \frac{2\alpha_1 - 1}{2(\alpha_1 - \alpha_2)}\right)^2 + 3\alpha_2 \left(\frac{2\alpha_1 - 1}{2(\alpha_1 - \alpha_2)}\right)^2$$

$$q(E^P) = -\alpha_1 \left(1 - \frac{2\alpha_1 - 1}{2\alpha_1}\right)^2$$

$$q^P > q^N \Leftrightarrow \alpha_2 < \frac{4\alpha_1}{12\alpha_1^2 - 1}$$

Result 3. When $\alpha_2 < \frac{4\alpha_1}{12\alpha_1^2 - 1}$, i.e. for sufficiently small externality effects between committee members' efforts, polarized committees perform better than neutral ones.

See Appendix for demonstration.

6 Conclusion

In this paper, we show some conditions under which a polarized committee may perform better than a neutral committee. Our results have implications for the current debate on the procedural rules regarding the appointment of arbitrators. By allowing the parties to appoint one arbitrator, we cannot exclude that they choose an arbitrator with sympathy for their own cause. Surprisingly, our results show that there are some situation where this situation may increase the incentives of the arbitral tribunal to acquire information on the case. The complementarity/substitutability between the effort of the committee members' effort and the convexity of the cost of effort play a crucial role in the outcome and efficiency of the two types of committees.

Appendix

Proof of Result 1. Suppose that $e_i^P < e_i^N$. Since $c''(e) > 0$, this is equivalent to $c'(e_i^P) < c'(e_i^N)$. From equations (1 and 2), we get $q'(e_i^P) < q'(3e_i^N)$. Since q is strictly concave, this implies $e_i^P > 3e_i^N > e_i^N$. This contradicts $e_2^P < e_2^N$.

Proof of Result 2. Suppose that $e_2^P > e_1^N + e_2^N + e_3^N$. Then, $q'(e_2^P) < q'(e_1^N + e_2^N + e_3^N) \Leftrightarrow c'(e_2^P) < c'(e_1^N + e_2^N + e_3^N)$. This implies $e_2^P < e_1^N + e_2^N + e_3^N$. Contradiction.

Proof of Result 3. $q(E^P) > q(E^N) \Leftrightarrow \alpha_1(1 - \frac{1}{2\alpha_1})^2 < 3\alpha_1(1 - \frac{2\alpha_1-1}{2(\alpha_1-\alpha_2)})^2 - 3\alpha_2(\frac{1-2\alpha_1}{2(\alpha_1-\alpha_2)})^2$. This implies $\alpha_2 < \frac{4\alpha_1}{12\alpha_1^2-1}$

□

References

- AUSTEN-SMITH, D. AND BANKS, J.S. (1996), "Information Aggregation, Rationality, and the Condorcet Jury Theorem". *American Political Science Review*, 90, 34-45.
- BEN YASAR, RUTH AND NITZAN, SHMUEL (2014), "On the significance of the prior of a correct decision in committees". *Theory and Decision*, 76(3), 317-327.
- BREKOULAKIS, STAVROS (2013), "Systemic Bias and the Institution of International Arbitration: A New Approach to Arbitral Decision-Making". *Journal of International Dispute Settlement*, 4(3), 553:585.
- CAI, HONGBIN (2009), "Optimal committee design with heterogeneous preferences". *The Rand Journal of Economics*, 40(1), 173-189.
- DE CONDORCET, NICOLAS (2009), "Essai sur l'application de l'analyse a la probabilité de décisions rendues la pluralité des voix". *L'imprimerie royale*, Paris.

- CRAWFORD, VINCENT (1979), "On compulsory-Arbitration Schemes". *Journal of Political Economy*, 87(1), 131-159.
- DEWATRIPONT, MATTHIAS AND TIROLE, JEAN (1999), "Advocates". *Journal of Political Economy*, 107, 1-39.
- DORASZELSKI, U., GERARDI, D., AND SQUINTANI, F (2003), "Communication and Voting with Double-Sided Information". *Contributions to Theoretical Economics*, 3(6).
- FEDDERSEN, TIMOTHY AND PESENDORFER, WOLFGANG (1996), "The swing voter's curse". *American Economic Review*, 86, 408-424.
- FEDDERSEN, TIMOTHY AND PESENDORFER, WOLFGANG (1997), "Voting Behavior and information aggregation in elections with private information". *Econometrica*, 65, 1029-1058.
- FEDDERSEN, TIMOTHY AND PESENDORFER, WOLFGANG (1998), "Convicting the Innocent: The Inferiority of Unanimous Jury Verdicts under Strategic Voting". *American Political Science Review*, 92(1), 23-35.
- FEDDERSEN, TIMOTHY AND PESENDORFER, WOLFGANG (1999), "Abstention in elections with asymmetric information and diverse preferences". *American Political Science Review*, 93, 381-398.
- FRANK, SUSAN D. (2009), "Development and Outcomes of Investment Treaty Arbitration". *Harvard International Law Journal*, 50(2).
- FRANK, SUSAN D. (2011), "The ICSID Effect? Considering Potential Variations in Arbitration Awards". *Virginia International Law Journal*, 51(4).
- GERARDI, DINO (2000), "Jury Verdicts and preference diversity". *American Political Science Review*, 94, 395-406.
- GERARDI, DINO AND YARIV, LEEAT (2007), "Deliberative Voting". *Journal of Economic Theory*, 134, 317-338.
- GERSHKOV, ALEX AND SZENTES, BALAZS (2009), "Optimal voting schemes with costly information acquisition". *Journal of Economic Theory*, 144(1), 36-68.
- GERLING, KERSTIN, GRUNER HANS, HANS PETER, KIEL, ALEXANDRA AND SCHULTE, ELISABETH (2005), "Information acquisition and decision making in committees: A Survey". *European Journal of Political Economy*, 21, 563-597.
- GOLTSMAN, MARIA, HORNERB, JOHANNES AND PAVLOVA, GREGORY (2009), "Mediation, Arbitration and Negotiation". *Journal of Economic Theory*, 144(4), 1397-1420.
- GRUNER, H.P. AND KIEL, A. (2004), "Collective Decisions with interdependent valuations". *European Economic Review*, 48, 1147-1168.

- HORNER, JOHANNES, MORELLI, MASSIMO, AND SQUINTANI, FRANCESCO (2015), “Mediation and Peace”. *Review of Economics Studies*, First published on-line, March 2015.
- KAPELIUK, DAPHNA (2010), “The Repeat Appointment Factor: Exploring Decision Patterns of Elite Investment Arbitrators”. *Cornell Law Review*, 96, 47-90.
- LEVY, GILAT (2007), “Decision Making in Committees: Transparency, Reputation, and Voting Rules”. *American Economic Review*, 97(1), 150-168.
- LI, H. AND ROSEN, S. AND SUEN, W. (2001), “Conflicts and common interests in committees”. *American Economic Review*, 91, 1478-1497.
- MARTINELLI, CESAR (2006), “Would rational voters acquire information?”. *Journal of Economic Theory*, 129(1), 225-251.
- MARTINEZ, LUIS (2012), “The ICDR’s Arbitrator Appointment Process - The Institutional Role and Available Options”. *ABA Section of International Law*, 1(1), 20-24.
- MUKHOPADHAYA K. (2003), “Jury Size and the free rider problem”. *Journal of Law, Economics and Organization*, 19, 24-44.
- OLSZEWSKI, WOJCIECH (2003), “A Welfare Analysis of Arbitration”. *American Economic Journal: Microeconomics*, 3(1), 174-213.
- FARMER, AMY AND PECORINO, PAUL (2003), “Bargaining with Informative Offers: An Analysis of Final-Offer Arbitration”. *Journal of Legal Studies*, 27, 415-32.
- FARMER, AMY AND PECORINO, PAUL (2003), “Bargaining with Voluntary Transmission of Private Information: Does the Use of Final Offer Arbitration Impede Settlement?”. *Journal of Law, Economics and Organization*, 19(1), 64-82.
- PERSICO, NICOLAS (2000), “Committee Design with endogenous information”. *Review of Economic Studies*, 71, 165-191.
- SCHNEIDERMAN, DAVID (2010), “Judicial Politics and International Investment Arbitration: Seeking an Explanation or Conflicting Outcomes”. *Northwestern Journal of International Law and Business*, 30(2), 383-496.
- SCHULTE, ELISABETH (2010), “Information aggregation and preference heterogeneity in Committees”. *Theory and Decision*, 69(1), 97-118.
- SCHULTE, ELISABETH (2012), “Communication in committees: who should listen?”. *Public Choice*, 150, 97-117.
- RAU, ALAN SCOTT (1997), “Integrity in Private Judging”. *South Texas Law Review*, 38.
- STREZHNEV, ANTON (2016), “Detecting Bias in International Investment Arbitration”. *Working Paper*.

SCHULTE, E. (2010), “Information aggregation and preference heterogeneity in committees”. *Theory and Decision*, 69, 97-118.

VAN HARTEN, GUS (2007), “*Investment Treaty Arbitration and Public Law*”, Oxford University Press, 240pp.

WAIBEL, MICHAEL AND WU, YANHUI (2012), “Are Arbitrators political?”. *Working Paper*.