Four Means of Assurance for Trade: Self-governance, Reputation Entrepreneurs, Courts & Arbitrators

Richard R. W. Brooks* and Bruno Deffains†

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Abstract

We consider four essential modalities of assuring trade: namely, the use of self-governance structures, reputation entrepreneurs, national courts and arbitration. We offer several implications from the comparison of these governance structures. First, self-governance and reputation entrepreneurs may seek to limit their member’s access to formal court enforcement. Second, in addition to being an enforcer of contracts, courts also operate as reputation propagators as because of their public quality and formal, generally discoverable, records. Third, a key function of modern arbitration is its ability to separate enforcement of awards from reputation. Given that type 1 and 2 errors are prone to occur, traders who receive negative judgments in court may lose much more than what the adjudicator orders them to pay. By maintaining confidentiality in arbitral awards, traders are more able to defend their claims without excessive risk to their reputations. Additional implications of the interactions between governance modalities are also considered.

*Yale Law School. Email: richard.brooks@yale.edu. Thanks to Avinash Dixit, Ben Polak, Sarath Sanga and Elizabeth Song for very helpful comments.
†Université Paris 2 and European Business School at Wiesbaden. E-mail: bruno.deffains@u-paris2.fr
1 Introduction

Assurance is the basic challenge of trade. When trade cannot be completed at one moment, when one party’s performance must precede another’s, transactional insecurity is paramount. The risk that the second party will not perform after the first party has completed her end of the bargain can make an otherwise mutually desirable trade improbable.\(^1\) Hobbes recognized this peculiar type of insecurity:

For he that performeth first, has no assurance the other will perform after; because the bonds of words are too weak to bridle mens ambition, avarice, anger, and other passions, without the fear of some coercive power[].\(^2\)

Fear of the Leviathan, the state, was the coercive power that Hobbes would invoke to address the problem of assurance, but it is not the only solution. Fear and coercion are not unique to the state—a point not lost on Hobbes, of course—and they have long been enlisted to accomplish trade in the face of transactional insecurity. Conceptualizing the various means of solving the assurance problem, and how they influence each other, is the principal aim of this paper. Building on Avinash Dixit’s (2003) framework, we consider four essential modalities of ensuring trade: namely, the use of self-governance structures, reputation entrepreneurs, national courts and ar-

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\(^1\)Without sufficient assurance, traders are left in a state of transactional insecurity because there is always a sequential element to exchange. One party must always first invest or exert effort in the procurement (i.e., the production, purchase, or acquisition by other means) of goods or service skills that are the subject of of trade. Even with preexisting goods and service skills, temporal hurdles remain in accomplishing trade. In spot transactions, for example, where exchanges are practically simultaneous, a buyer of goods or services is often unable to fully appreciate the quality of that tendered at the moment of trade. Bernstein’s (1992, 132, n. 39) description of transaction in the fast-pace wholesale diamond industry is telling: “Using lasers and chemical processes, diamonds can be treated to artificially enhance color and disguise flaws. Small flaws and differences in color dramatically affect the value of a stone. Many of these “treatments,” however, cannot be detected without sophisticated equipment. Although in theory buyers could have every stone evaluated by a gemological laboratory to determine whether or not it had been altered, this would be prohibitively time consuming and expensive.” Allowing the buyer to inspect first until fully assured of quality would only create insecurity for the seller, who would have to forgo other opportunities or expend transaction-specific resources that facilitate inspection. Trade, in one way or another, projects itself into the future, which “means simply that at least some elements of the exchange occur some time after one or both parties started planning on its future occurrence.” (Macneil 1978, 10, n.15) See also, Ian R. Macneil, “The Many Futures of Contracts,” 47 S. Cal. L. Rev. 691 (1974).

bitration. A brief description of each follows immediately. The subsequent sections progressively incorporate each modality into a basic model.

2 Assurance Mechanisms of Trade

Absent trust between rational self-interested counterparties, neither would expect or predict that the other would follow through with an agreement after receiving her sought after performance—unless of course sanctions, like those imposed by law, can be brought to bear on the breacher.³

2.1 Self-governance

Among the various ways trading partners provide assurance to each other, perhaps the most obvious is that trade is an exchange of promises. Promises supply moral reasons for conduct. Hence, promises along with oaths, pledges and the like can take on great salience when law’s sanctions are not present.⁴ A second common response to transactional insecurity entails the use of relational ties. Command, role, and status in familial and non-kinship relational dyads—including e.g., master and slave, lord and vassal, guardian and ward, etc.—have historically been a central mode of facilitating

³For some, this is the singular purpose of law. “If you want to know the law and nothing else,” said Holmes Oliver Wendell in a historic speech to law students and faculty at Boston University, “you must look at it as a bad man, who cares only for the material consequences which such knowledge enables him to predict, not as a good one, who finds his reasons for conduct, whether inside the law or outside of it, in the vaguer sanctions of conscience.” Oliver Wendell Holmes, “The Path of the Law,” 10 Harv. L. Rev. 457 (1897).

⁴These devices also work in the presence of law and some legal theorists would say they are constitutive of law, particularly contract law, see e.g., Charles Fried, Contract as Promise, (1981). Others reject the idea of “promise” having any force in contract performance. Take, for instance, Holmes’s “bad man” view of law, which he felt was particularly applicable to contracts. “Nowhere is the confusion between legal and moral ideas more manifest,” said Holmes, “than in the law of contract.” Oliver Wendell Holmes, “The Path of the Law,” 10 Harv. L. Rev. 457, 462 (1897). Cf., Hart (1961) who argued for a more encompassing notion of law: “Why should not law be equally if not more concerned with the ‘pluzzled man’ or ‘ignorant man’ who is willing to do what is required, if only he can be told what it is? Or with the ‘man who wishes to arrange his affairs’ if only he can be told how to do it?” H.L.A. Hart, The Concept of Law, (1961) at 39. “It is of course very important, if we are to understand the law, to see how the courts administer it when they come to apply its sanctions. But this should not lead us to think that all there is to understand is what happens in courts. The principal functions of the law as a means of social control are not to be seen in private litigation or prosecutions, which represent vital but still ancillary provisions for the failures of the system. It is to be seen in the diverse ways in which the law is used to control, to guide, and to plan life out of court.” Id.
trade.\(^5\) Additionally, ‘primitive’ societies are said to overcome the transaction costs of finding assurance in trade by effecting a “transformation of an arm’s-length contract relationship into an intimate status relationship.”\(^6\)

Yet trade through command, role, and status is not restricted to historic and primitive economies. It remains pervasive today, which was exactly the point of Ronald Coase’s claim in *The Nature of the Firm*. When trade through a market won’t easily allow a desired transaction, it may be pursued within the firm. Coase recognized contracts and firms as alternatives, but what’s important to note here is the status-relational aspects of the firm. Within it lie a web of relationships—between supervisors and subordinates, partners, principals and agents, and so on.\(^7\) By transforming the role or status of the parties to the transaction (for example, from ‘counterparties’ to ‘partners’, ‘joint-venturers’ or ‘principal and agent’) trade may be facilitated where it would otherwise fail.

John Commons asserted that “the true unit of economic theory is not an individual but a going concern composed of individuals in their many transactions of principal and agent, superior and inferior, employer and employee, seller and customer, creditor and debtor, bailor and bailee, patron and client, etc.”\(^8\) These dyads come with scripts and roles that often entail status and hierarchy, allowing parties to use command and fiat to guide exchange. Promise, command, role, kinship structures, religious obligations, habits and other behavioral patterns can all provide assurance to make trade possible absent the state (Macneil 1978, 11). Observe, however, that most of these mechanisms presume the existence of some relationship between the parties. What are strangers to do? When strangers are not too distant from each other, the central self-governance mechanism is reputation operating through word-of-mouth and other casual communication. Informal reputation is most effective with proximity, either social (i.e., some shared associations or source of homophily that encourages trust) and spatial (i.e., geographic), which means word-of-mouth doesn’t have as far to travel.\(^9\)

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\(^5\) As Sir Henry Maine famously wrote in *Ancient Law*, (1861) “the movement of the progressive societies has hitherto been a movement from Status to Contract.” By Status, Maine had in mind familial and other relational networks that determined entitlements and prospects for trade through established status orders.

\(^6\) Richard A. Posner, Primitive Societies, 172. “In some primitive societies if you trade repeatedly with the same man he becomes your blood brother and you owe him the same duty of generous and fair dealing that you would owe a kinsman. This ‘barter friendship’ is a way of bringing reciprocity into the exchange process and thereby increasing the likelihood that promises will be honored despite the absence of a public enforcement authority.” Id.; (Kronman 1985, 22)

\(^7\) Notwithstanding popular claims that the firms are merely a nexus of contract, law often treats what happens within the firm in terms of Status, not Contract, and imposes fiduciary duties that go beyond ordinary contract duties. *Cf.* Frank Easterbrook and Daniel Fischel, who argue that fiduciary duties are merely contract duties.

\(^8\) See e.g., John R. Commons, “Law and Economics,” 34 Yale. L. J. 371, 374-375 (1925)

\(^9\) Frequency of interaction may reduce the requisite proximity, which is discussed later
2.2 Reputation Entrepreneurs

As trade expands, spatial and social proximity recedes. Assurance in long-distance and impersonal trade is fleeting as it becomes increasingly improbable that any two currently matched trading partners will be matched again (or that either will be matched with another trader who will learn of their conduct in a current match). In such cases traders have incentive to cheat each other at every opportunity (Milgrom, North & Weingast 1990, Theorem 2, p.9). While this presents a critical barrier to trade, it also affords an opportunity to entrepreneurs who specialize in the procurement of reputation data. An early instance of this institutional adaption to the loss of proximity is observable in the practices of the medieval law merchant.

Between the eleventh and fifteenth centuries trade across much of Europe was governed by practices of the law merchant (Greif 1993, Benson 1992). The law merchant served both as an arbiter of disputes between traders and as a storehouse of their commercial reputations. Aggrieved parties brought their disputes before the law merchant, who would determine liability and order remedies. Compliance with orders was voluntary, in the sense that the law merchant had no police powers to enforce its awards, nor could it invoke those powers of the state. The effectiveness of the law merchant hinged on its ability to generate and disseminate information about traders who not only breached their contracts, but also failed to comply with its directives (Milgrom et al. 1990, Benson 1992). A trader’s reputation, as captured in his history of trade with prior partners is a critical asset, particularly in the absence of effective state enforcement. The law merchant was able to leverage reputation to expand the bounds of medieval trade beyond local borders and insular communities.

The capacity to cultivate and hold as hostage reputational assets is

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10“This legal system was voluntarily produced, voluntarily adjudicated and voluntarily enforced. Indeed, it had to be. There was no other potential source of such law, including nation-states (Trakman 1983: 13).” (Benson 1992, 15)

11The law merchant did more than merely issue orders to disputants; it also established and spread commercial norms that facilitated trade and reduced friction, which is to say, the law merchant regime lowered the transaction costs of non-proximal trade. “The regime embodied certain constitutive principles, including: good faith (promises made must be kept); reciprocity, non-discrimination between foreigners and locals at the site of exchange; third-party dispute settlement; and conflict resolution favoring equity settlements. In practice, the [medieval law merchant] required traders to use contracts, which were gradually standardized, and to settle their disputes in courts staffed by other merchants (experts, not generalists). Traders and their merchant judges placed a premium on quick judgments, and de-emphasized adversarial procedure. The function of dispute resolution was not so much to declare a ‘winner,’ or punish a ‘loser,’ but to resuscitate the contractual agreement and to cajole the parties to get on with their business, using norms of fairness, as between the parties. (Sweet 2006, 629-30)
an essential means of assuring impersonal and long-distance trade. But, again, this mechanism of assurance is not a relic of the past. If anything, its use has grown radically, piggybacking on the exponential growth of data tracking and management accompanying the information age. Modern-day reputation entrepreneurs include auditing and credit-reporting agencies, as well as trade associations and the like. They function in largely the same way as the medieval law merchant: leveraging threats to reputation to make compliance self-enforcing.

2.3 Courts of Nation-States

The rise of the Westphalian nation-state coincided with the decline of the law merchant. In the twelfth century English and Continental governments made early incursions into the jurisdiction of the law merchant by adapting many of its procedural and substantive norms of commercial practice. Allowing traders to resolve their disputes in the royal courts didn’t necessarily imply a significant loss of authority or power in the law merchant. But when the royal court gave traders access to appeal, effectively denying finality to the law merchant’s determinations and orders, the balance of power shifted heavily toward sovereign courts. “By the close of the sixteenth century, the private commercial law of the nation state and the states law courts had reduced the significance and scope of the Law Merchant, while never quite replacing it.”

12 Having won the battle against the law merchant, leaving it diminished but not dead, the Westphalian states turned to the inevitable conflicts amongst themselves. Conflict was entirely predictable, because while the nation-states incorporated aspects of the commercial order developed by the law merchant, each retained and promoted its own commercial law and judicial practice. No great burden is posed by this retention in domestic trade. Yet that was not the case for international commerce. When commercial disputes arise between traders of different countries, which laws and courts control? This is the central question of contemporary international commerce. Failing to find an adequate answer poses dire consequences for trade. “Traders and their lawyers today work consciously to avoid conflict of laws problems in national courts, because such problems generate unacceptable costs.”

13 “From the point of view of long-range traders, state building had its advantages. The eighteenth and nineteenth centuries, for example, saw huge reductions in transaction costs, due to improvements in transportation and communication, in physical security and policing, and to the emergence of modern banking and insurance practices. By the end of the nineteenth century, national legal regimes largely governed transnational commercial activity.” (Sweet 2006, 630)

13 “Costs include (1) the expense and time it takes to adjudicate claims in national
Three basic responses are available to address the question of controlling laws and courts. First, the parties can confront the issue ex post, each vying for refuge in its domestic laws and courts after a breach has occurred. No well-advised trader would take this route. Second, the parties may ex ante specify in their agreement the laws and courts that should control any disputes. Such specifications are known as choice-of-law and forum-selection clauses. Third, the parties may choose something other than the domestic laws of either party (using perhaps the laws of a third nation or transnational commercial law) and select arbitrators, as opposed to national judges, to preside over their disputes. This final approach is in its ascendancy as appeal to national courts, whether through ex ante or ex post determination by the parties, proves increasingly unavailing to the demands of commercial international trade.\textsuperscript{14}

\section*{2.4 Commercial Arbitration}

Modern commercial arbitration reflects elements of both the old \textit{Lex Mercatoria}, the law merchant, and national courts. Like the law merchant adjudicators, contemporary arbitrators often have specific expertise in the subject matter of the disputes they are called on to adjudicate; they also have the capacity to leverage reputation to bring about compliance with their orders. Unlike the law merchant, however, commercial arbitration is less at odds with the courts of nation-states. Indeed most nation states, including the United States, show great deference to the determinations of arbitrators.\textsuperscript{15}

Moreover, under the New York Convention, three quarters (146 out of 193 states) of the United Nations member states have agreed to recognize courts, which are raised if the presiding court has to educate itself about foreign law, and (2) the uncertainty associated with conflict of laws adjudication.”\textsuperscript{14} See also, Sweet (2004).

\textsuperscript{14}“"The indicators of dysfunction in national regimes are clear enough. On the one hand, as Newman (1998: 1) puts it, litigation means entanglement with a judicial process that is time-consuming, possibly biased in favor of locals, and perhaps even corrupt. Yet, even assuming that judges will always do their best to be as efficient and fair as possible, the various national commercial codes and laws of contract are deeply entrenched, slow to change to inputs from more cosmopolitan environments, and have a lock on too many judges imaginations. Further, conflict of laws techniques are in deep crisis. In the absence of such techniques, judges simply nationalize transnational disputes, which would be unacceptable to traders; yet the use of such techniques may produce even worse outcomes from the point of view of transnational society. In private international law adjudication, judges must decide which foreign law is to be assigned to the case, according to a complex set of criteria including policy considerations, which normally leads the litigants to solicit advice (another significant transaction cost) on the relative advantages of various regimes.”\textsuperscript{15} See Sweet (2006, 631)

\textsuperscript{15}The U.S. Federal Arbitration Act, 9 U.S.C. §§1-16, and a substantial and growing body of U.S. Supreme Court case law continue to expand the scope and deference to arbitration, domestic and international.
and enforce arbitral awards from other signatory states of the Convention.\textsuperscript{16} This implies that arbitrators' awards may be enforced not only in one or the other domestic courts of the disputing parties, but also in the courts of most countries around the world. These new enforcement powers, along with its reputation for efficiency and impartiality, have fueled the growth of commercial arbitration in recent years.

3 Modeling the Community of Traders

We construct an economic, legal and social environment building on a framework introduced by Dixit (2003). Agents in this framework are traders, who are continuously and uniformly distributed on a circle's circumference equal to distance $2S$, as shown in the figure below.\textsuperscript{17} Distance between any two traders can be interpreted in terms of actual geographic distance, or as language differences, cultural dissimilarities or, more generally, social distance—where, for example, traders within some clan or kinship group are represented as being close in proximity.

3.1 Matching Technology

In two separate periods, traders are matched with prospective trading partners, using a matching technology that pairs together nearby traders more often than those who have greater distance between them. Matches are made using a technology, like the spinner depicted in the figure above, where some randomly identified trader $O$ is matched with a prospective trading partner, $x$, based on a where the pointer of the spinner comes to rest after being spun once. In our model, the spinner can be spun in either direction, clockwise or counterclockwise, from the initial point, $O$, but it will not go beyond the initial point.


\textsuperscript{17}Actually, we assume there is some mass of traders distributed along the circumference. As Dixit (2004, 86) observes “[t]he mass of traders per unit length of arc is normalized to 1,” but the text (taking a little liberty) refers to traders at specific points rather than density mass at points. Additionally, whenever we speak of a distance between any two traders, the distance should always be interpreted as the shorter of the two arcs between them on the circle.
To capture the intuition that traders are more likely to be matched with others near them, we treat the area immediately around point $O$ as the most likely place for the pointer to come to rest and the likelihood of it stopping at locations further away from $O$ decreases steadily going toward point $S$ in either direction.\footnote{Compare this with a simple probability model where the spinner can only go clockwise and the pointer is equally likely to come to rest at any point (except $O$) on the circumference. In the continuous case, the probability of any $x \in X$ being selected is zero, which isn’t to say that the likelihood of every outcome is zero. We know, for instance, that the probability that the spinner stops somewhere on the circle is equal to 1, and that the probability that it comes to rest to the right of $O$ before $S$ (which is the same as to the left of $O$ before $S$) is one-half. More generally, the probability that the spinner stops between $O$ and any point $x \in X$ can be found by integrating the density function $f(x)$ over the over the relevant range between $O$ and $x$. Note that $f(x)$, is not the probability of $x$, rather $f(x)dx$ is the probability of the outcome $x$ Grinstead & Snell (1997).}{18} Formally, the decrease in likelihood of being matched with traders not in one’s proximity is represented by a negative exponential density function, $e^{-\alpha x}$, where $\alpha > 0$ can be thought of as the degree of resistance added to the spinner. Bigger $\alpha$’s means that the pointer is less likely to come to rest at a neighborhood near $S$ and far away from $O$, and as $\alpha \to 0$ then all neighborhoods become equally likely (i.e., uniform density).\footnote{Actually, the density function is a little more complicated: $\frac{e^{-\alpha z}}{2[1 - e^{-\alpha S}]/\alpha}$.}{19} Finally, every player knows the “location” of her paired trading partner and this is common knowledge to all players. With this background, we can now specify the basic interactions among traders.

### 3.2 Basic Interaction

There are exactly two rounds of play, where in each round pairs of traders are matched according to the matching technology described above. There
is no correlation between whom one is matched with across the two periods, which is to say all spins of the spinner are independent. The timeline below depicts the sequence of events in each round of play.

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At date 1 the traders are matched. Each trader in the matched pairing may choose not to trade, i.e., *don’t trade*, at date 2. If either chooses not to trade, no trade is possible for both traders in the current round. If they both choose to engage in trade, then at date 3 each trader must decide whether to play *honest* or *cheat*. At date 4, aggrieved parties may report (through informal channels) that they were cheated by their trading partners. In later versions of the model we allow, at date 5, the parties to seek formal enforcement through reputation entrepreneurs, national courts, and arbitration. Final payoffs for the round are realized at date 6, after which the sequence is repeated once, and only once, more. At the start of the second round, traders may learn if the prior partner of their current trading partner reported being aggrieved in the prior round.

4 Self-governance

Self-governance (also referred to as ‘community enforcement’) works through word-of-mouth. When a trader cheats an honest trading partner, that information spreads “costlessly” across the circle in both directions from the point of the honest trader. Though transmitted without cost, information concerning prior cheating may not reach everyone. More specifically, in the second round, everyone in the community of traders operating along the circle has some positive chance of learning whether some trader with whom she is matched cheated in the prior round. When a trader plays *cheat* against a match partner who plays *honest* in the first round, the probability that someone located at distance $y$ from the cheated partner learns of the trader’s deception is $e^{-\beta y}$, where the parameter $\beta > 0$ captures a decay of information flow that occurs with distance. All traders are hesitant to trade with others who have a reputation of cheating their prior partners. Traders would

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20 Allowing traders, or prior trades, to influence the likelihood matching in subsequent rounds would not alter the basic results so long as some stochasticity remains in the matching technology.

21 Dixit assumes that “news travels from the victim to any third person along the shorter arc of the circle connecting them. If news travels in both directions, then the probability
refuse to transact with known “cheats” if they could only rely on informal enforcement.

We begin the analysis of self-governance applied to a simplified version of the model, using a normal form setup with complete and perfection information. These assumptions are relaxed in the general model that follows. The stage game between any given player, say $O$, and her matched trading partner, $N$, is symmetric and has three available actions—honest, cheat and don’t trade. When both players, $O$ and $N$, play honest they each get positive payoff $C$. When both play cheat they each get a lower, but still positive, payoff $D$. The highest payoff in the game is $W$, which goes to the player who plays cheat when the other player plays honest. Call those players who play honest in that situation suckers—i.e., those who receive the lowest possible payoff, $L$, by playing honest against an ordinary opponent who cheats—in order to distinguish them from victims, who also receive $L$, but principally from the misfortune of being matched and trading with a “Machiavellian” trader.\textsuperscript{22} Players can always choose not to trade with their matched partners by playing don’t trade, which results in a normalized payoff of 0 for both traders.

<table>
<thead>
<tr>
<th></th>
<th>$O$</th>
<th>$N$</th>
</tr>
</thead>
<tbody>
<tr>
<td>honest</td>
<td>$C, C$</td>
<td>$L, W$</td>
</tr>
<tr>
<td>cheat</td>
<td>$W, L$</td>
<td>$D, D$</td>
</tr>
<tr>
<td>don’t trade</td>
<td>$0, 0$</td>
<td>$0, 0$</td>
</tr>
</tbody>
</table>

of its reaching someone distant $y$ from the victim is:,

$$1 - (1 - e^{-\beta y})[1 - e^{-\beta (2S-y)}],$$

which implies that for any fixed $y$, as $S \to \infty$, equation 1 goes to $e^{-\beta y}$ (Dixit 2003, 1298). Hence for $S$ sufficiently large the one-way shortest-distance flow of information assumption is harmless. “For smaller $|S|$, two-way flow would increase the probability of the spread of news and therefore reduce the incentive to cheat, but the qualitative results remain unaffected.” Id.\textsuperscript{22} The distinction between ordinary traders (which Dixit calls N-types, for normal types) and Machiavellian trader (so-called M-types) will be put to use shortly and then become more meaningful. For now it’s enough to note that there are small number (or amount, in terms of mass) of M-types uniformly distributed around the circumference and that N-types always receive a payoff of $L$ whenever they trade with M-types.

\textsuperscript{11}
With the payoffs satisfying inequalities $W > C > D > 0 > L$ there are two equilibria in the stage game—one where both traders cheat and a second equilibrium where both don’t trade. Without the option don’t trade the game reduces to a Prisoners’ Dilemma, where cheat is the dominant unique (Nash) equilibrium strategy for both traders. Adding a second Nash equilibrium (in this case both playing don’t trade) may facilitate non-Nash stage-game play in a finitely repeated interaction. Specific, mutual honest trade in the first of a two-round game is now possible.

4.1 Simplified Numerical Example

How might mutual honest trade in the first of a two-round game come about as part of an equilibrium? To make the point simply, let’s use numbers for the payoffs, where $W = 5$, $C = 4$, $D = 2$ and $L = -1$, as shown in Table 1. Also, for the moment, assume that every instance of cheating by a trader is known to all other traders. Now consider the strategy that we will call nice-guy rules, which entails “playing honest in the first round and cheat in the second round, but if, and only if, one’s matched partner didn’t cheat in the first round, else don’t trade in the second round.”

<table>
<thead>
<tr>
<th></th>
<th>honest</th>
<th>cheat</th>
<th>don’t trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>honest</td>
<td>4, 4</td>
<td>-1, 5</td>
<td>0, 0</td>
</tr>
<tr>
<td>trader N</td>
<td>cheat</td>
<td>5, -1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2, 2</td>
<td>0, 0</td>
</tr>
<tr>
<td>don’t trade</td>
<td></td>
<td>0, 0</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0, 0</td>
</tr>
</tbody>
</table>

Table 1: Numerical example of stage-game payoffs.

Let’s assume, again for the moment, that the traders can commit to carrying out the second-stage threat of don’t trade if prior cheating has been observed. Although don’t trade is weakly dominated by cheat in the stage game, this is not a crucial factor for our analysis. We could specify a negative payoff, say $\varepsilon < 0$, for a player who plays cheat against an opponent who play’s don’t trade (maybe a little shame in revealing oneself as a cheater) to get rid of the weak dominance without altering the basic structure of the game (but making it a little more complicated to describe).

This is a crucial assumption and a potential problem for the nice-guy strategy. Still, there are a number of ways to address the problem (some more plausible than others).
When we add the payoffs of the stipulated second-stage-play (according to nice-guy rules) to the first-stage game, the summed payoffs of the two-rounds of play can be depicted in normal form, as shown in Table 2, revealing a third Nash equilibrium where the traders are honest in the first stage and cheat in the second stage. But is this a plausible equilibrium? Suppose trader O played cheat in the first-round and this is known to her second-round partner. If trader O said to her new partner that she intended to play cheat again, that statement would seem believable. And if O’s second-round partner really believed that O would play cheat, it would be best to play cheat too. In this case O’s second-round trading partner gets 2 (instead of an assured 0 by playing don’t trade). Yet if this eventuality is the foreseen at the start of the game, then there is no incentive for a trader to play honest in round 1 out of a concern that no one will trade with her in round 2.

To address the unravelling of the nice-guy equilibrium strategy, recall the Machiavellian traders—few in number, but scattered uniformly and stealthily among ordinary traders. Abandon, at this point, the assumption that everyone knows if any trader has ever played cheat in the past. Instead, assume that every trader learns (with some positive probability) at the start

Behavioral or emotional motives, for instance, can lead people to carry out what would appear to be non-credible threats (Rabin 1993). Tying one’s hands (or being tied to the mast) ex ante, the extent to which that is possible, is another means of making an otherwise implausible threat credible. See Shavell & Spier (2002) for nice short treatment on the credibility of threats in finite and infinitely-repeated games. As we will discuss, dealing with the commitment problem of carrying out a non-credible threat in a finite game is the entire purpose of the M-types being introduced in the model here.

25It is self-committing—which is to say, if the receiver of the message believes it, that belief creates incentive for the speaker to carry it out—and though it is not strictly self-signaling—meaning that the sender wants to say it if, and only if, it is true—there is no cost to O’s second-round trading partner of deviating from the don’t trade dictate of the nice-guy strategy by playing cheat and getting 2, or 5, 0. (Farrell & Rabin 1996, 111).
of round 2 whether the round-1 partner of her or his current trading partner suffered a loss, $L$, in round 1. This means that ordinary traders who cheat suckers in round 1 (i.e., by playing cheat against an opponent who plays honest) are indistinguishable from Machiavellian traders, with whom no one ever wants to trade in any round.

As it becomes increasingly likely that others would learn of $O$’s round-1 partner (a sucker, who might appear as a possible victim) suffering a loss, $L$, then $O$ will be increasingly concerned that those others will not trade with her in round 2, fearing she may be Machiavellian. To the extent $O$ is likely to be matched with those knowledgeable of her prior partner’s fate, there is a costly risk to her of being confused as an M-type when she cheats an honest trader. Given this cost, $O$ now has incentive to play honest in round 1 when partnered with someone who is sufficiently likely to share his woes of loss, $L$, among traders with whom $O$ is likely to be matched in round 2. This is how the nice-guy equilibrium strategy is salvaged. Within some limited zone (or distance, or community, or whatever space through which stories of loss are likely shared) ordinary traders will have incentive to play honest in round 1.26 How limited is this zone of honesty? Could it extend over the entire space? Characterizing, as Dixit (2004, 71) calls it, this “extent of honesty” is the principal aim of his model. Before addressing the extent of honesty, however, it may be useful to say a little more about the communication technology assumed in the more general framework.

### 4.2 Model with Incomplete & Imperfect Information

Since traders are unaware of prior actions chosen by their partners, the interaction is now a game of imperfect information; and as they do not know the type or payoffs of their matched partners, it is also a game of incomplete information. In this more general setting, players must form beliefs about the type (and prior actions) of traders they face. The known share of M-types in the population (given as $\epsilon > 0$, but small) contributes significantly to this belief, as does the likelihood of learning that one is now associated with a trader who caused a former partner to suffer a loss of $L$. We can now specify how this learning occurs.

Everyone has some chance of learning the identity of any trader who

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26The traders will still cheat in the final round as part of the equilibrium strategy. Honesty in round 1 is also not maintained outside of the zone. When matched, in round 1, with someone unlikely to communicate with the traders that $O$ is likely to be matched with in round 2, there is both more to be gained from cheating (because the parameter $\theta$, discussed below, is positive) and less chance of being discovered as a cheat (which is relevant only when one’s partner plays honest, itself an off-equilibrium play outside of the zone of honesty. In any event, in round 1 $O$ has less incentive to play honest and more to play cheat outside of the determined zone.
causes another to suffer a loss, \( L \), and that chance is greater the closer one is to the party who suffered the loss. How close must the traders be to each other for this learning to have some bite? Dixit offers a very precise answer. Take some distance \( X \) containing trader \( O \) and her matched first-round trading partner \( N \). When \( X \) is sufficiently small—such that the likelihood that others within \( X \) would learn that \( N \) received payoff \( L \) (and therefore would refuse to trade with \( O \) in round 2) and this fact makes trader \( O \) just prefer to play honest against any \( N \) within \( X \) in round 1—we have identified the limit or extent of honesty. Within \( X \) traders are likely enough to know about the outcomes of one’s prior partners that playing cheat against them in round 1 isn’t worth it.

Equilibrium play among traders within \( X \) looks a lot like the simplified description above where everyone knows of every cheat. But now when a trader plays cheat against a partner who plays honest in the first round, the probability that someone located at some distance, say \( y \), from the cheated partner learns of the trader’s deception is \( e^{-\beta y} \), where the parameter \( \beta > 0 \) captures the decay of information flow that occurs with distance. Of course it is not simply the likelihood of learning that a former partner of a current match suffered a loss which informs the key result. It is also the likelihood of being matched in the second round with someone within \( X \) (determined, in part, by \( e^{-\alpha x} \)) and the gains from trading with prospective partners (which varies by distance and is determined by \( e^{\theta x} \)).

Now we may finally describe the key result of the general model.

### 4.2.1 Extent of Honest Trade

Dixit (2004, 71) introduces a general measure of the social benefits of honest trade in the first period, which is essentially the expected social payoff of two would-be ‘nice guys’ being matched (i.e., a match between two local traders—local within \( X \)—not known to have previously cheated an honest trader). Hence the payoff is equal to the probability of being matched with someone within distance \( X \) of the relevant trader, e.g., trader \( O \), which is \( e^{-\alpha x}/2(1 - e^{-\alpha S})/\alpha \) in each direction (and so must be multiplied by 2) times the proportional payoff from trading with some trader, \( N \), at distance \( x \in X \), (i.e., \( e^{\theta x} \)). Integrating over this product (in curly brackets below) gives us,

\[
V(X, S) = \int_o^X \left\{ \frac{e^{-\alpha z}}{2[1 - e^{-\alpha S}]/\alpha} \cdot 2 \cdot e^{\theta z} \right\} dz,
\]

\(^{27}\)Hence, it is assumed that \( \alpha > \theta > 0 \) in order to assure that honest play obtains within \( X \) as part of the equilibrium.
which can be written as,

\[ V(X, S) = \frac{\alpha}{2(1 - e^{-\alpha S})} 2 \int_o^X e^{-\alpha z} e^{\theta z} dz. \]  

(2)

Equation 2 is the first equation on page 71 of Dixit (2004); the second equation on that page is derived as follows,

\[ V(X, S) = \frac{\alpha}{(1 - e^{-\alpha S})} \int_o^X e^{-(\alpha - \theta)z} dz \]

\[ = \frac{\alpha}{(1 - e^{-\alpha S})} \left[ \frac{1}{(\alpha - \theta)} e^{-(\alpha - \theta)z} \right]_o^X \]

\[ = \frac{\alpha}{(1 - e^{-\alpha S})} \left[ -\frac{1}{(\alpha - \theta)} \left(e^{-(\alpha - \theta)X} - 1\right) \right] \]

\[ = \frac{\alpha}{(1 - e^{-\alpha S})} \left[ \frac{1}{(\alpha - \theta)} \left(1 - e^{-(\alpha - \theta)X}\right) \right] \]

\[ = \frac{\alpha}{(\alpha - \theta)} \cdot \frac{1 - e^{-(\alpha - \theta)X}}{1 - e^{-\alpha S}}. \]  

(3)

Looking at equation 3 we observe that honest trade is decreasing in \( S \) and increasing in \( X \). Why? Well for any given \( X \), as the space gets larger \( O \) is (i) less likely to be matched with someone within the ‘extent of honest trade’ for any given \( \alpha > 0 \), (ii) more likely to be seduced by the prospect of cheating, an effect of \( \theta > 0 \) and (iii) less likely to be known as a cheater of honest traders or suspected of being a Machiavellian type, an effect of \( \beta > 0 \) for a given \( \epsilon \). Similarly, for any given \( S \), increasing \( X \) subjects \( O \) to countervailing influences and thus leads to more honesty. Finally, it is possible for the zone of honesty to extend over the entire space, but only for \( S \) sufficiently small.\(^{28}\)

5 Reputation Entrepreneurs

We now introduce an enforcement mechanism that operates like the law merchant or modern-day credit reporting agencies. This means of enforcement is what we refer to as reputation entrepreneurs. We assume the traders may establish the formal reporting system, at per capita lump cost \( c \), for reporting when someone causes another to suffer loss, \( L \). This is simply a formal

\(^{28}\)Dixit (2004, 72) discusses in the section entitled “The Limits of Honest Trade” and shows nicely in his Figure 3.4.
alternative to the word-of-mouth diffusion of information in the relational model, implicitly having zero cost of communication. The formal reporting system is assumed flawless and operative over the whole circle. Dixit (2004) refers to this means of enforcement as ‘formal or official rule-based governance,” but it is important to emphasize that formal governance here is not like a court of legal enforcement.29

Comparing the reputation entrepreneurs to “self-enforcing governance” (i.e., trading under the relational model discussed above) two things are worth noting. First, when the zone of honest trade covers less than the whole circle, a formal reporting system even at strictly positive costs may bring greater returns than an informal self-governance at zero assumed costs. As the circle of trade expands relative to the zone of honesty, the formal reporting system will come to dominate self-governance.

\[
\text{Population} = 2S
\]

\[
f(t) = 2S(1 - e^{-\gamma t})
\]

people who know of the trader’s deception at \( t \)

Second, if word-of-mouth transmission of reputation is cumulative—for instance, if cheating is recalled and repeated over many rounds, then word-of-mouth reputation is not just a flow of information, but a stock—then the value of informal reputation transmission will improve. Consider, for example, what happens as rounds of play increase (while memories and reputation persist across rounds). A differential equation may be used to describe the diffusion of information in the population. Given a population of size \( 2S \), let \( f(t) \) describe the number of people who learn, by round \( t \geq 2 \) of a trader’s prior deception in any prior round. Then \( 2S - f(t) \) is the number of persons who have not yet heard the news of a trader’s deception. We could then imagine that the number of people who learn the news by any round \( t \) is proportional to the number of uninformed persons in the population, \( f(t) = 2S(1 - e^{-\gamma t}) \) for \( \gamma > 0 \).

The point of this exercise is to observe a kind of time-distance trade-off. The distance from the incidence of the cheating (a key feature of the

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29Formal governance here should not be confused with the alternative of parties being able to enforce agreements to play honest.
informal self-governance model) would matter less as the rounds of play and stock of information increase. A stock of information growing through informal communication over time could be a strong competitor to the formal (reporting) governance system, or perhaps a complement.

6 Courts of Nation-States

We now introduce formal enforcement by national courts. Courts in our model, however, do not exercise jurisdiction over the whole circle; rather, each court has jurisdiction over some arc of the circle.\(^{30}\) The jurisdictional confines may coincide with state or national boundaries, but they needn’t. There are no lawless spaces (i.e., every point on the circle is subject to the jurisdiction of some court). For simplicity we assume there are just two fixed jurisdictions, \(j\), on the circle, \(j \in \{1, 2\}\). Prospective plaintiffs may file suit within the jurisdiction where the trade agreement was formed (\textit{lex loci contractus}), which is a function of the location of the matched parties. Namely, if the two matched parties are from the same jurisdiction, then courts of that jurisdiction have unique authority over any dispute between the parties; if the matched parties reside in different jurisdictions, the jurisdiction of one party or the other will be controlling with equal likelihood.\(^{31}\) Alternatively, the parties may utilize choice-of-law and forum selection clauses in their agreement to, \textit{ex ante}, direct the court resolving their dispute.

We initially assume that the competence of courts and the applicable laws are the same in both jurisdictions. Additionally, we assume that domestic parties (i.e., claimants residing within the controlling jurisdiction) have an advantage over foreign parties—which may be conceived as lower legal costs or local judicial bias—such that the probability of victory for a domestic claimant with a valid claim, \(\pi_d\), is greater than that of a foreign claimant with a valid claim, \(\pi_f\). Like Masten & Prufer, we treat courts as imperfect enforcers, \(\pi_f < \pi_d < 1\), but we allow courts to make both type 1 and type 2 errors.\(^{32}\) Courts are more costly than reporting agencies, but

\(^{30}\)Masten & Prufer (2011) also compare judicial enforcement to self-governance, but the Court in their model have unique jurisdiction over the entire circle. Moreover, in their framework “[t]he capacity of courts to adjudicate disputes is related to the characteristics and complexity of transactions (relative to the courts inherent ability) but not to the location of the transactors: Transactors locations have no differential effects on the effectiveness of courts.” (emphasis added).

\(^{31}\)This is just for convenience and can be motivated by conventional rules of offer, acceptance and contract formation, where the last act constituting acceptance, and therefore contract formation, may be equally likely to fall on either side. Parties often stipulate forum and we will allow for the possibility later.

\(^{32}\)The court in Masten & Prufer’s (2011) model makes type 1, but not type 2, errors. The possibility of type 2 errors, however, ought not be discounted. Consider the example offered by Bernstein (1992, 127), which could have caused such an error to occur.”In one
they provide distinct benefits.

Courts award expectation damages to victorious parities (that is, a sum of money that leaves the plaintiff as well as performance would) and the determinations of courts are publicly, permanently (and costlessly) available over the entire circle. Hence, in additional to enforcing trade, albeit imperfectly, courts also provide an additional benefit of providing information to parties about the prior practices of their match counterparties. While the combination of its costs and imprecision implies that court enforcement does not everywhere dominate self-governance and the reputation entrepreneurs, court enforcement brings the benefit of assuring performance, or its value, as its precision improves. As court enforcement becomes more reliable, the threat of not trading in the second period (which keeps traders on the equilibrium path in the reputation games) is weakened. For this reason, reputation entrepreneurs may seek to limit their client’s access to formal court enforcement.33

Similarly, as discussed in the implications section below, self-governance structures may also seek to limit their members’ access to formal courts of law in order to preserve its institutional benefits. “For example, under Jewish law, a Jew is forbidden to voluntarily go into the courts of non-Jews to resolve commercial disputes with another Jew. Should he do so, he is to be ridiculed and shamed.”34

In one case, a dealer falsely accused another dealer of stealing a stone. The accuser subsequently remembered where he had put the stone and apologized to the other dealer. As the incident had become widely known throughout the club, however, the wrongly accused dealer brought an arbitration action against the owner of the stone for impugning his good name. The board ordered the man to make a full public apology and a fifty thousand dollar donation to a Jewish charity.” In Masten & Prufer’s (2011) “characterization, courts have the ability to investigate claims of defection but, rather than merely reporting incidents of cheating as in Dixit’s model, we ascribe to courts the power to impose damages on defecting parties.

33As Bernstein (1992, 139, n.50) observes of reputation entrepreneurs in the diamond trade, the risk of losing ordinary social reputation—which includes ‘primary’, i.e., business (i.e. the willingness of local traders to engage with a party based on word-of-mouth) as well as ‘secondary’, i.e., personal (the intra-personal and non-commercial interpersonal benefits of maintaining a positive reputation, which is to say, thinking well of oneself and being thought well of by one’s neighbors) and social bonds that are sacrifice upon breach—allows the reputation entrepreneur to cultivate parties reputations for purposes of commercial exchange. It is a reputation that is tailored to the purposes of the transaction conducted in the trade: it is trade-specific reputation which has little value, and may not even be accessible, outside of the trade also compel performance. But if one can assure their contracting partner of performance through the formal court system, the value of reputation system is lowered. Bernstein (1992, 139, n.50) continues, “it is important to keep in mind that the club’s ability to enforce its arbitration judgments, whether through fines, suspension, or expulsion, depends on its ability to harness the force of a reputation bond and that the DDC can only enforce its judgments if noncompliance results in forfeiture of a type of reputation bond that is recognized and given value by market forces.”

34Bernstein (1992, 141). In diamond industry, which Bernstein studies, the trade orga-
Lastly, we introduce a fourth mechanism of enforcement: arbitration. Parties may agree to arbitrate their disputes. Arbitrators operate over the entire circle. Arbitrators apply the same laws and are equally competent to courts, but unlike courts in our model, they do not displace any bias toward either party. Two additional factors distinguish arbitrators from courts in our framework: first, arbitrators are more costly than courts, which are publicly subsidized; second, the determinations of arbitrators are not publicly available. Arbitral awards are assumed enforceable in all jurisdictions at costs normalized to zero.

We suggest that a key function of modern arbitration is its ability to separate enforcement of awards from reputation. Given that type 1 and 2 errors are prone to occur, traders who receive negative judgments in court may lose much more than what the adjudicator orders them to pay. By maintaining confidentiality in arbitral awards, traders are more able to defend their claims without excessive risk to their reputations. Among the benefits of arbitration is that “[i]t enables parties to resolve disputes and enforce judgments quickly, inexpensively, and secretly, thereby containing damage to reputation and reducing the actual damage suffered by the promisee in event of breach.”

In addition to limiting damage to reputation, secrecy of arbitral proceedings also shields a company’s information from competitors, government monitors, and present and prospective trading partners with whom the trader may negotiate in the future. While keeping the proceedings secret, arbitration allows for effective enforcement in many jurisdictions throughout the world. The combination of these features tends to advantage arbitration over national courts when it comes to international commercial transactions.

Arbitrators are often treaded as more competent. In Masten & Prufer’s (2011) model courts “are ‘generalists,’ that is, they lack the ‘local’ expertise and knowledge of transactors in the economy; courts may not always be able to determine fault as accurately as would members of a community.”
8 Implications

Finally we conclude with a brief discussion of general applications and implications of the comparative exercise proposed in this paper. Consider, first, Jim Scott’s (2009) The Art of Not Being Governed, which describes the inhabitants of Zomia, a name given to the highlands of Southeast Asia’s mountainous spine, stretching over a number of countries (including China, India, Vietnam, Cambodia, Laos, Thailand, and Burma) and hosting scores of “tribal” groups. While there are many interesting facets to Scott’s perceptive book, the compelling overarching theme lies in the contrast between the informally-ordered groups living in the mountains and the state-ordered systems in the lowlands of the various nations through which the mountains cut.\(^{36}\)

To translate this context into our model, imagine a cone, instead of a circle, as the spatial analog of Zomia and its relationship to the various formal governance systems in the lowlands. At some positive height a small lateral circle may be drawn around the surface of the cone, where informal governance (the “extent of honesty”) may pervade over the entire circumference. For traders on this small circumference there is little or no benefit from formal governance, and there may be some costs (e.g., taxes, constrains on political liberty and such). Yet for traders at the base, operating around the circle at the foot of the cone, their circumference may be too large to maintain a proportionately meaningful “extent of honesty” around the rim of this lateral slice. A formal system may bring net benefits to these lowland traders.\(^{37}\)

Two or more circles (a small highland one and larger lowland ones) may operate independently with distinct optimal governance structures. Still more interesting are issues raised by considering the potential interaction between circles at various heights. Significant gains may be realized from trades between high and low circles due to specialization and comparative advantages. For example, because different crops grow at different altitudes (which Scott nicely addresses) trade between circles at different heights may be particularly valuable, not just for dietary variety, but also to assure food supply through diversification.

A whole new set of questions are suggested by the possibility of inter-

\(^{36}\)Scott argues against the common suggestion that these highland groups are merely composed of hillbillies, too isolated and remote (or worse, too backward) to access the civilized state-system in the lowlands. These groups, Scott insightfully writes, should be seen as having intentionally chosen and maintained informal self-governance over the state-sponsored alternative.

\(^{37}\)Dixit’s (2004, 78) “model suggests that as economies become larger and more globalized, such self-governance must eventually give way to formal rule-based governance.”
circle (vertical) trade. Which governance structure is best matched to facilitate vertical trade? What effect might this have on the governance of intra-circle (horizontal) trade? Might leaders (or institution designers) have incentive to add (or remove) resistance to vertical trade? Recall the prohibition of Jewish law on its members’ use of state courts. What about asymmetric resistance, for instance, where it is easier for a lowland trader to transact within the higher circle than it is for a highlander to transact in the larger lower circle? Asymmetry of this sort may be brought about through cultural, educational and other institutional differences across circles.

9 Conclusion

[To be completed.]

References


